

TECHNICAL PROGRAM | EXHIBITION GUIDE

# SPIE. OPTICS+ PHOTONICS

20 - 24 AUGUST 2023 | SAN DIEGO CONVENTION CENTER  
SAN DIEGO, CALIFORNIA, USA

**NEW: Co-located Conference**

**SPIE.** CONFERENCE ON  
**ADVANCED  
PHOTONICS**



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22-23 August 2023

# SPIE. OPTICS+ PHOTONICS

THE LEADING MULTIDISCIPLINARY OPTICAL SCIENCES AND  
TECHNOLOGY MEETING

20 - 24 August 2023

**Conferences and Courses**

San Diego Convention Center  
San Diego, California, USA

22 - 24 August 2023

**Exhibition**

Cutting-Edge Research

Exhibition

Industry Program

Training and Education

**NEW: Co-located Conference**

**SPIE.** CONFERENCE ON  
**ADVANCED  
PHOTONICS**

22-23 August 2023

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## NANOSCIENCE + ENGINEERING

The preeminent nanotechnology program on nanoscale developments that are transforming technology and creating new applications.

### Symposium Chairs:



**Gennady Shvets**  
Cornell Univ. (USA)



**Cornelia Denz**  
Physikalisch-Technische Bundesanstalt (Germany)

### Symposium Co-Chairs:



**Giovanni Volpe**  
Göteborgs Univ. (Sweden)



**Sonja Franke-Arnold**  
Univ. Glasgow (United Kingdom)

## ORGANIC PHOTONICS + ELECTRONICS

A comprehensive offering on organic-based materials and devices advancing renewable energy sources and other commercial applications.

### Symposium Chairs:



**Zakya Kafafi**  
Lehigh Univ. (USA)



**Ifor D. W. Samuel**  
Univ. of St. Andrews (United Kingdom)

## OPTICAL ENGINEERING + APPLICATIONS

Focused developments presented in optical design and engineering, impacting photonic device and applications research.

### Track Chairs:

#### OPTICAL DESIGN

**José Sasián**, Wyant College of Optical Sciences (USA)

#### OPTICAL ALIGNMENT, TESTING, AND FABRICATION

**H. Philip Stahl**, NASA Marshall Space Flight Ctr. (USA)

#### SIGNAL, IMAGE, AND DATA PROCESSING

**Khan Iftekharuddin**, Old Dominion Univ. (USA)

#### ASTRONOMICAL OPTICS AND INSTRUMENTATION

**Oswald H. Siegmund**, Space Sciences Lab. (USA)

#### PHOTONIC DEVICES AND APPLICATIONS

**Ruyan Guo**, The Univ. of Texas at San Antonio (USA)

#### REMOTE SENSING AND ATMOSPHERIC PROPAGATION

**Stephen Hammel**, Naval Information Warfare Ctr. Pacific (USA)

**Alexander M. J. van Eijk**, TNO Defence, Security, and Safety (Netherlands)

#### X-RAY, GAMMA-RAY, AND PARTICLE TECHNOLOGIES

**Ali Khounsary**, Illinois Institute of Technology (USA)

**Ralph James**, Savannah River National Lab. (USA)

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#SPIEOpticsPhotonics



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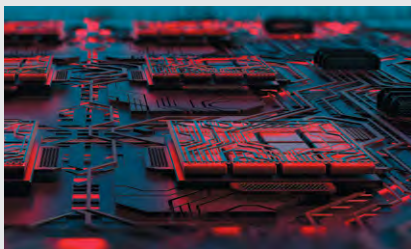
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Spectroscopy Magazine  
The Optronics Co., Ltd.



## Experience the energy of SPIE Optics + Photonics

Get ready to enjoy real conversations, hear the latest breakthroughs, and make important connections in person. The event where the latest advances are shared by the optics and photonics community in optical engineering, nanotechnology, quantum science, organic photonics, and astronomical instrumentation.

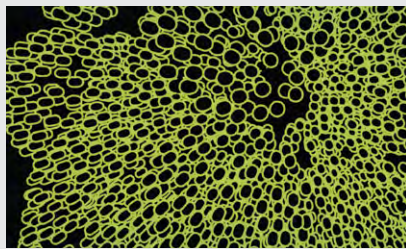
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Advances in metamaterials, plasmonics, quantum materials and devices, optical trapping, spintronics, and more.

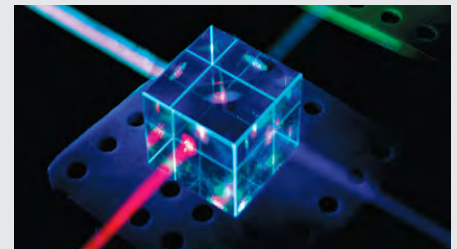
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#### **ORGANIC PHOTONICS + ELECTRONICS**

Organic-based materials and devices that advance renewable energy sources and other commercial applications.

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#### **OPTICAL ENGINEERING + APPLICATIONS**

Optical design, alignment, testing and fabrication, photonic devices, and particle technologies.

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**Booth #734 20 - 24 August 2023**

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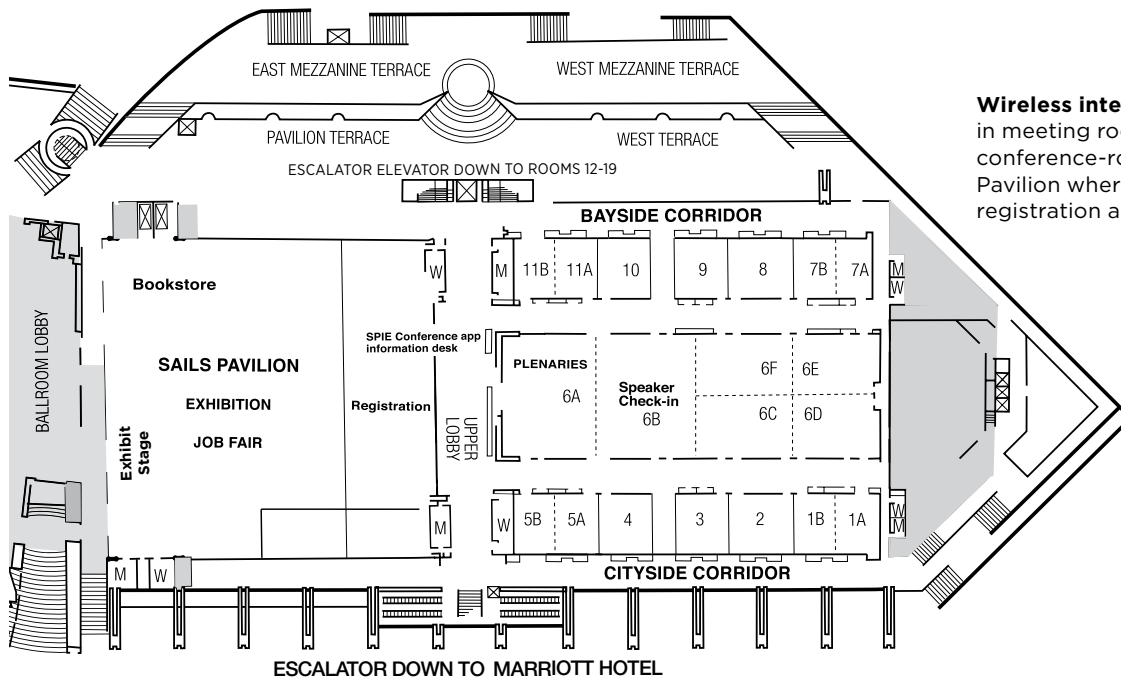
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t: +44 (0)117 905 5351



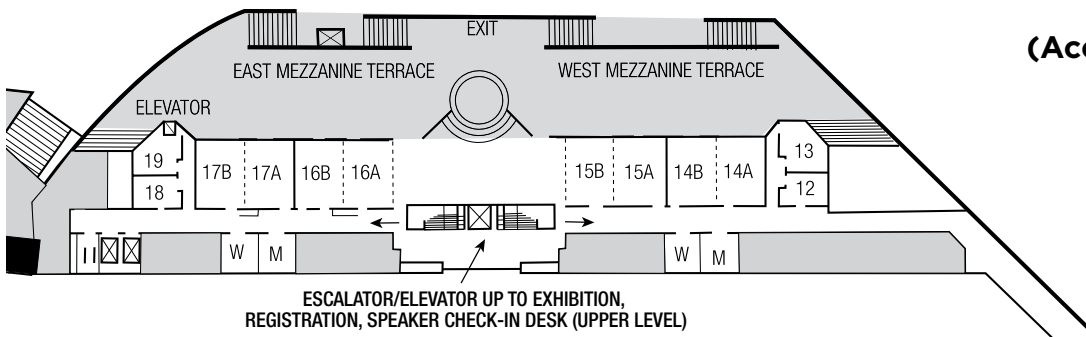
# SAN DIEGO CONVENTION CENTER, UPPER LEVEL, MEZZANINE, AND GROUND LEVEL

## Upper Level



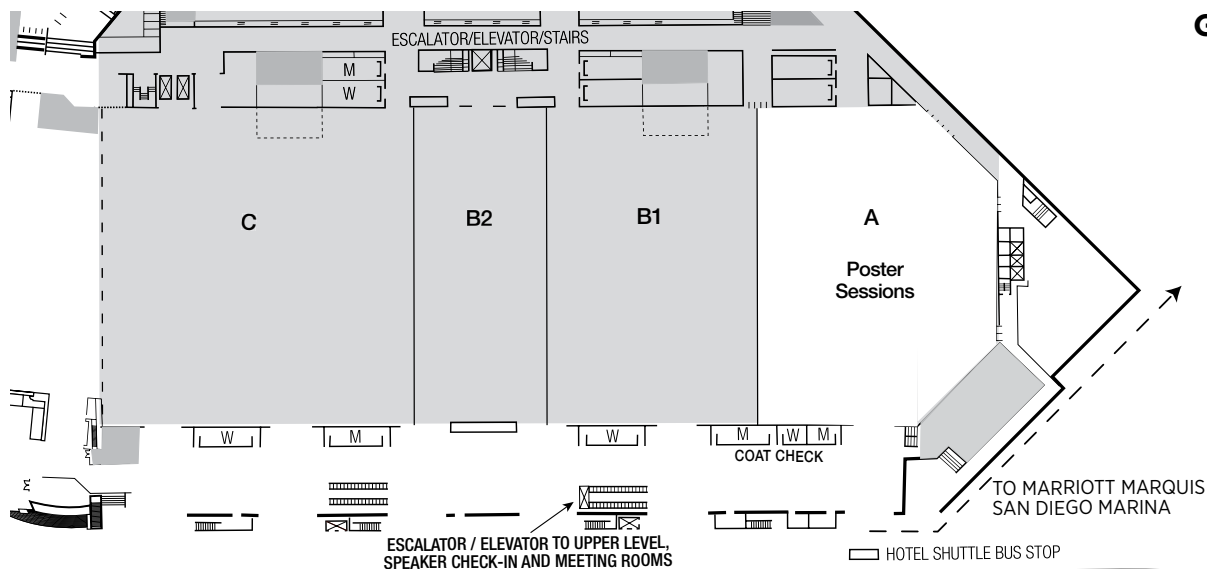
**Wireless internet** access is available in meeting rooms, lobbies on the conference-room level and in the Sails Pavilion where the exhibition and registration are located.

## Mezzanine Level (Access via Upper Level)



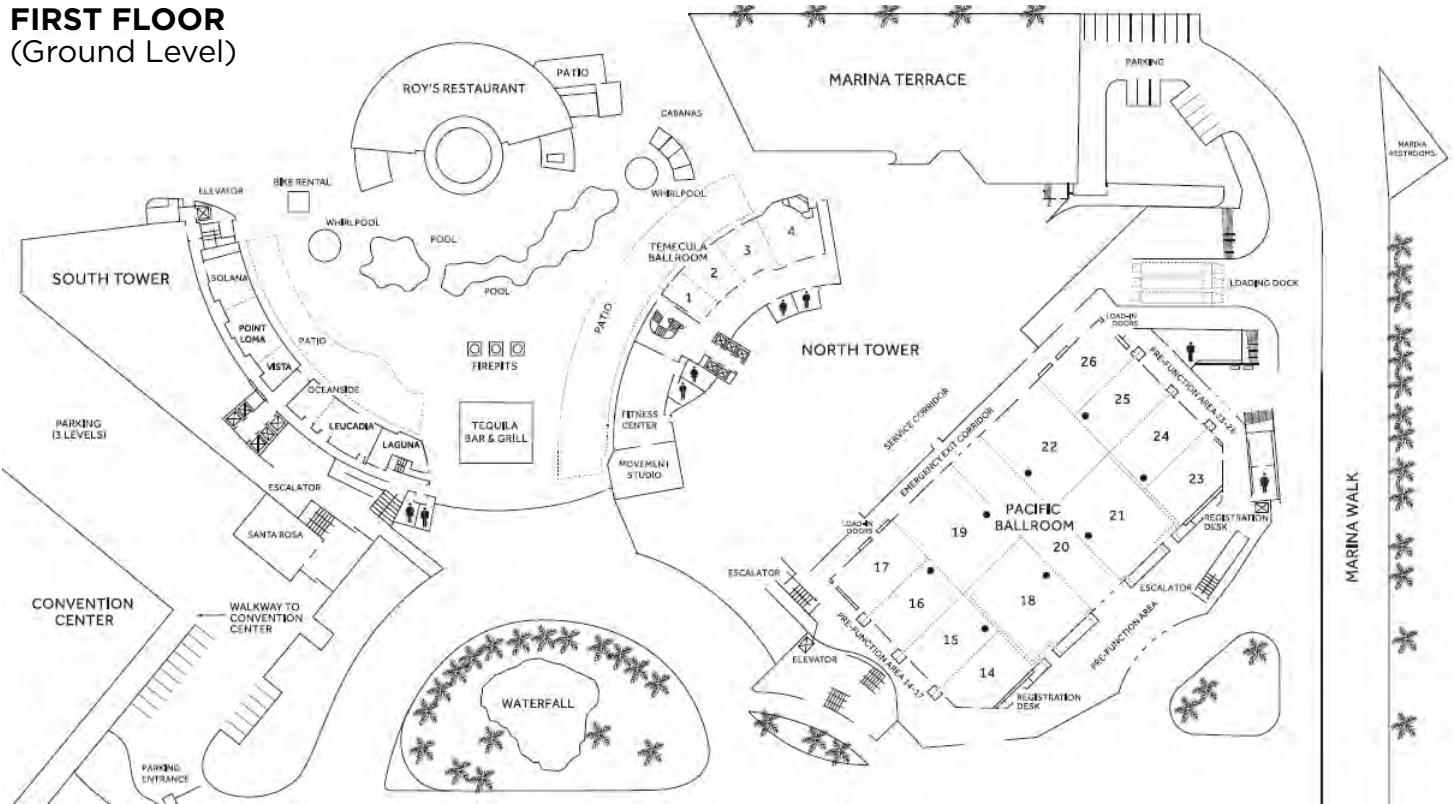
ESCALATOR/ELEVATOR UP TO EXHIBITION,  
REGISTRATION, SPEAKER CHECK-IN DESK (UPPER LEVEL)

## Ground Level

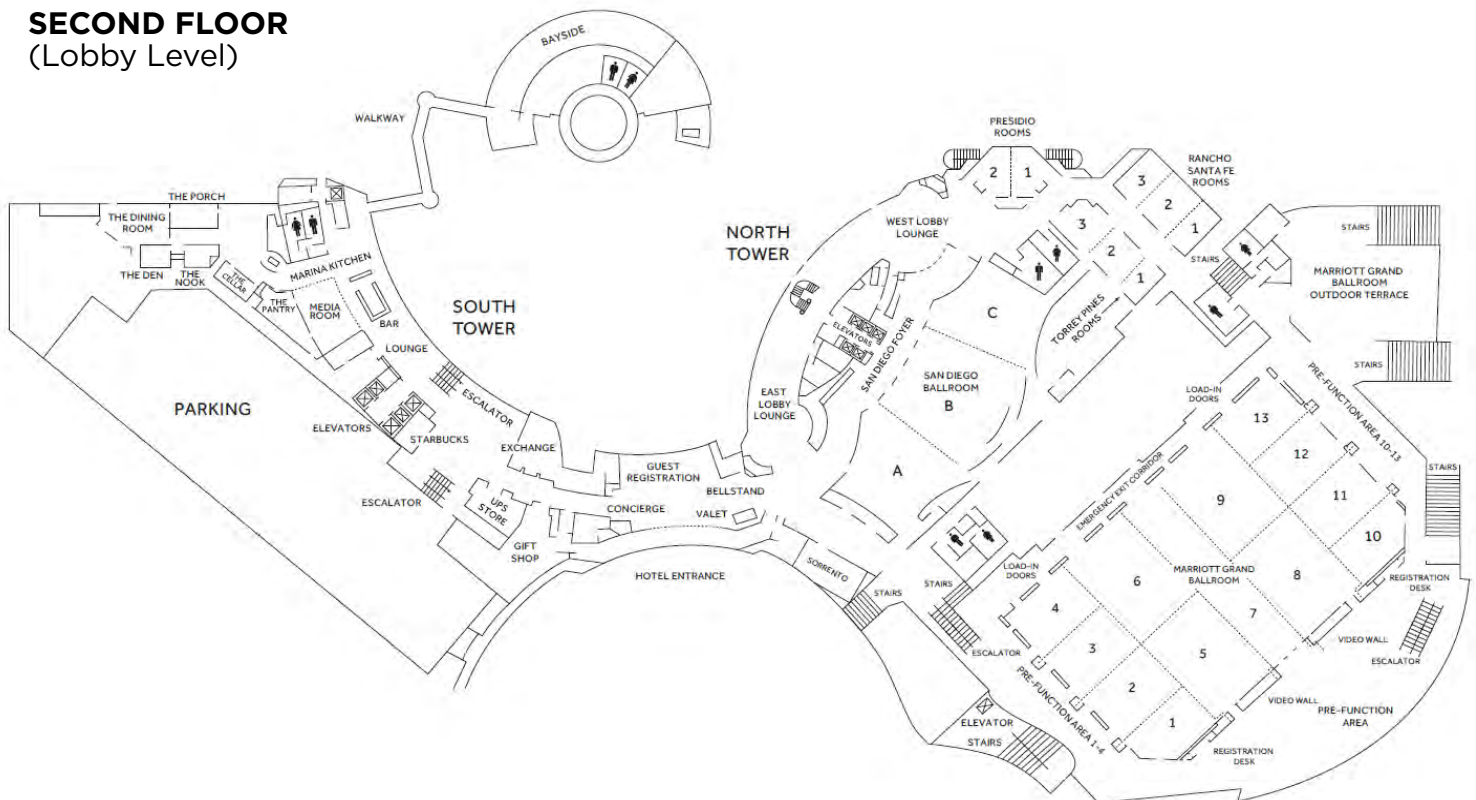


# MARRIOTT MARQUIS SAN DIEGO MARINA

## FIRST FLOOR (Ground Level)

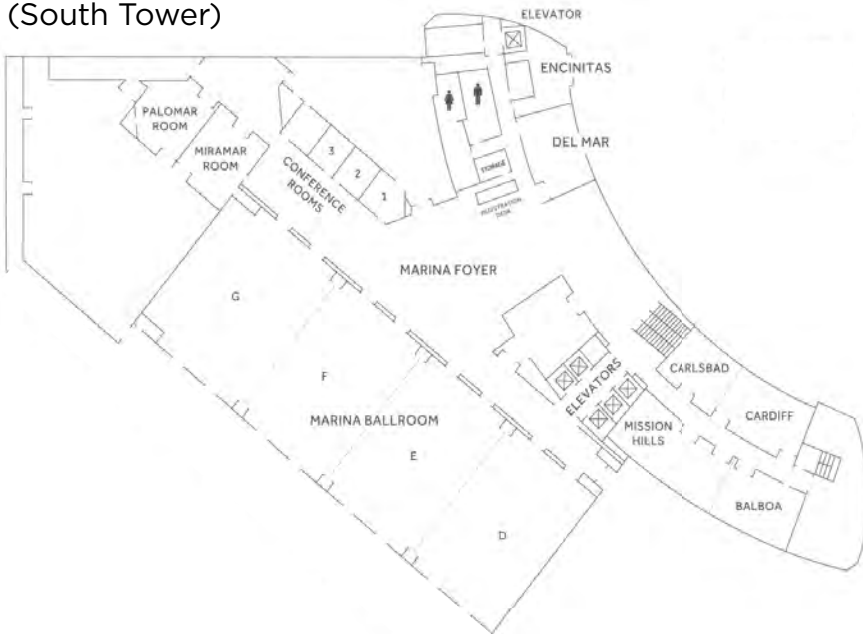


## SECOND FLOOR (Lobby Level)

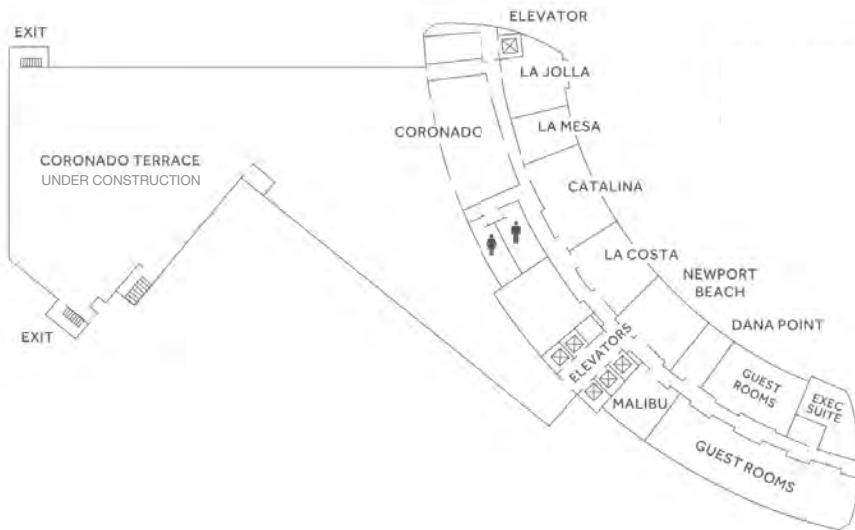




**THIRD FLOOR**  
(South Tower)



**FOURTH FLOOR**  
(South Tower)



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**HARASSMENT**

consists of unwanted, unwelcomed, and uninvited behavior that demeans, threatens, or offends another.

To report harassment you have witnessed or experienced at this meeting, contact any SPIE staff member or use the SPIE reporting hotline at 1-888-818-6898 or [spie.ethicspoint.com](http://spie.ethicspoint.com).

More information:

[spie.org/conduct](http://spie.org/conduct)

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# GENERAL INFORMATION

## Badge pick up and registration hours

Location: San Diego Convention Center - Sails Pavilion (upper level)

Sunday 20 August	7:15 AM - 5:00 PM
Monday 21 August	7:30 AM - 5:00 PM
Tuesday 22 August	7:30 AM - 5:00 PM
Wednesday 23 August	7:45 AM - 5:00 PM
Thursday 24 August	7:45 AM - 2:00 PM

## SPIE Cashier

Location: Conv. Ctr. Sails Pavilion (upper level) Registration area — open during registration hours

## REGISTRATION PAYMENTS ONLINE ONLY

If you have already registered and wish to add a course, workshop, or special event, you may do this online by signing into your SPIE account.

## RECEIPT AND CERTIFICATE OF ATTENDANCE

Preregistered attendees who need an SPIE-stamped receipt or attendees who need a certificate of attendance may obtain those at Badge Corrections and Receipts.

## BADGE CORRECTIONS

Badge corrections can be made at the Badge Corrections station. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

## Speaker check-in and preview station

Location: Conv. Ctr., Room 6B (upper level)

Sunday 20 August	7:15 AM - 5:00 PM
Monday 21 August	7:30 AM - 5:00 PM
Tuesday 22 August	7:30 AM - 5:00 PM
Wednesday 23 August	7:30 AM - 5:00 PM
Thursday 24 August	7:30 AM - 4:00 PM

All speakers must visit Speaker Check-in to upload their slide presentation files or check on presentations that were uploaded in advance. All presentations should be confirmed at Speaker Check-in at least two hours prior to their scheduled session or the day before if presenting in the first session of the day.

Speakers are not able to present using their own devices. All conference rooms are equipped with a laptop, projector, screen, lapel microphone, and laser pointer.

## Internet access

Location: Conv. Ctr. lobbies, meeting rooms, exhibition hall, and registration area

Complimentary wireless internet access provided in meeting rooms and lobbies on the conference room level and in the Sails Pavilion where the exhibition and registration are located. Instructions will be posted onsite.

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## SPIE Conference App and event information

Location: Conv. Ctr. Sails Pavilion (upper level) — open during registration hours

Our SPIE App developer will be onsite and available to answer any questions on its use or navigation and how to get the best user experience. We welcome your feedback.

This useful tool allows you to search and browse the program, special events, participants, exhibitors, courses, and more. It is free and available for iPhone and Android phones. If you don't already have it, you can download the SPIE app here.

**SPIE Information Desk** - SPIE staff will be available to assist in answering any meeting and exhibition related questions you might have. Stop by to pick up conference materials, face masks, and hand sanitizer.

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## SPIE Bookstore

Location: Conv. Ctr. Sails Pavilion — Exhibition Hall (upper level)

Tuesday/Wednesday	10:00 AM - 5:00 PM
Thursday	10:00 AM - 2:00 PM

Stop by the SPIE Bookstore to browse the latest SPIE Press books and educational materials. While there, get a t-shirt and other gifts to bring home to the family.

Credit card and debit cards only please; no cash.

## SPIE Course Materials Desk

Location: Conv. Ctr. Sails Pavilion (upper level) — open during registration hours

Once you have registered for your course(s) you will need to stop by the Course Desk to pick up your course materials and get your classroom location. You are also welcome to further browse course offerings or learn more about SPIE courses available in portable formats such as online and customizable, in-company courses.

## SPIE Luggage & Coat Check

Location: Conv. Ctr. Hall A Lobby (Ground level)

Sunday 20 August	7:15 AM - 8:15 PM
Monday 21 August	7:30 AM - 8:45 PM
Tuesday 22 August	7:30 AM - 6:00 PM
Wednesday 23 August	7:45 AM - 7:15 PM
Thursday 24 August	7:45 AM - 6:00 PM

Complimentary luggage, package, and coat storage are available. Please note hours; no late pickup available.

## FedEx Office

Location: Conv. Ctr., Hall D Lobby (Ground level)

Monday - Thursday	8:00 AM - 5:00 PM
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Services include photocopying, faxing, printing services, and shipping. Office supplies are also available. Phone +1 619 525 5450

## Child Care Services

### Sitterwise

Email: sarah@sitterwise.com

Office: +1 619 303 4379 or text +1 619 663 4379

Learn more and make a reservation online: [www.sitterwise.com](http://www.sitterwise.com)  
SPIE does not imply an endorsement nor recommendation of these services. They are provided on an "information only" basis for your further analysis and decision. Other services may be available.

### ATMs

Location: Conv. Ctr. Halls B and E Lobbies (lower level)

### Courtesy Phones

Location: Conv. Ctr. (lower level)

For local calls.

### Inclusive Restroom

Location: Conv. Ctr. Hall A Lobby (lower level)

This gender-neutral and accessible restroom has two private single-occupancy rooms, each with a locking door and floor-to-ceiling walls.

### Charging Stations

Location: Conv. Ctr. Lobbies (lower level)

Keep those battery levels up during your breaks. Charging stations (including ADA) are located throughout the lower-level lobbies.

### Mothers' Lounge

Location: Conv. Ctr. Halls A and E Lobbies (lower level)

- The Mothers' Lounge in Hall A is a separate lounge and has a full sink in the area.
- The Mothers' Lounge/pods in Hall E are located inside the Women's Restroom. Neither of these Mothers' Lounges have a refrigerator or storage.

Location: Conv. Ctr. Sails Pavilion (upper level) - open during registration hours

- Lockable room intended for mothers to pump or breastfeed.
- Running water is available in the nearby restrooms.
- Refrigeration for breastmilk is available in this lounge.
- Key available at the Cashier.

### Quiet Room

Location: Conv. Ctr. Sails Pavilion (upper level) - open during registration hours

The Quiet Room is intended for silent meditation, reflection or prayer. No mobile device or computer use, and no food nor beverages are allowed.

### Urgent message line

An urgent message line is available during registration hours: +1 619 525 5444



## Lost and Found

Location: SPIE Cashier, Conv. Ctr. Sails Pavilion (upper level) - open during registration hours

Found items will be kept at SPIE Cashier in the registration area during the meeting and available only during registration hours. At the end of the meeting, all found items will be turned over to the San Diego Convention Center Security. Contact via the lost and found hotline +1 619 525 5490 or from house phone 5490.

## Food and beverage services

### COFFEE BREAKS - COMPLIMENTARY COFFEE

Sunday 20 August	
Room 6 Lobby, Conv. Ctr. (upper level)	7:30 AM - 4:00 PM
Monday 21 August	
Room 6 Lobby, Conv. Ctr. (upper level)	7:30 AM - 4:00 PM
Tuesday 22 August	
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Room 6 Lobby, Conv. Ctr. (upper level)	7:30 AM - 9:30 AM
Exhibition Hall, Conv. Ctr. Sails Pavilion (upper level)	10:00 AM - 4:00 PM
Wednesday 23 August	
SPONSORED BY 	
Room 6 Lobby, Conv. Ctr. (upper level)	7:30 AM - 9:30 AM
Exhibition Hall, Conv. Ctr. Sails Pavilion (upper level)	10:00 AM - 4:00 PM
Thursday 24 August	
SPONSORED BY 	
Room 6 Lobby, Conv. Ctr. (upper level)	7:30 AM - 9:30 AM
Exhibition Hall, Conv. Ctr. Sails Pavilion (upper level)	10:00 AM - 1:30 PM
Room 6 Lobby, Conv. Ctr. (upper level)	2:00 PM - 4:00 PM

### FOOD AND REFRESHMENTS FOR PURCHASE

#### Starbucks

Location: Conv. Ctr., Lobby A

Sunday - Wednesday	7:00 AM - 3:00 PM
Thursday	7:00 AM - 2:00 PM

Days and times subject to change

#### Mrs. Fields Cookies and Auntie Anne's Pretzels

Location: Conv. Ctr. Sails Pavilion

Sunday - Wednesday	7:30 AM - 4:00 PM
Thursday	7:30 AM - 12:00 PM

Days and times subject to change

#### Café Express Cart

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Tuesday - Thursday	11:00 AM - 2:00 PM
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Variety of food and drink options, such as deli sandwiches, salads, and pastries available for purchase. Credit cards payments only.

# PLENARY SESSIONS

Optics + Photonics plenary sessions feature presentations from a wide range of leaders in the field, focusing on developing research and visions of the future of optical science technologies.

## Sunday Evening Plenary

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: **Bernard Kress**, Google (USA)

6:00 PM - 6:05 PM:

### Welcome and Opening Remarks



6:05 PM - 6:40 PM:

### A perovskite paved pathway to multi-terawatt scale photovoltaics

**Joseph J. Berry**, National Renewable Energy Lab. (USA)



6:40 PM - 7:15 PM:

### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems

**Jenny Clark**, The Univ. of Sheffield (United Kingdom)



7:15 PM - 7:50 PM:

### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs

**Alexandra Boltasseva**, Purdue Univ. (USA) and The Quantum Science Ctr., Oak Ridge National Lab. (USA)

## Nanoscience + Engineering

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: **Gennady Shvets**, Cornell Univ. (USA) and **Cornelia Denz**, Physikalisch-Technische Bundesanstalt (Germany)

8:30 AM - 8:35 AM:

### Welcome and Opening Remarks



8:35 AM - 9:15 AM:

### Nanophotonics for energy applications

**Shanhui Fan**, Stanford Univ. (USA)



9:15 AM - 9:55 AM:

### From atoms to black holes: with nano-engineering to next-level precision experiments

**Stefanie Kroker**, Technische Univ. Braunschweig (Germany)



## X-Ray, Gamma-Ray, and Particle Technologies

21 August 2023 • 4:00 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: **Gennady Shvets**, Cornell Univ. (USA) and **Cornelia Denz**, Physikalisch-Technische Bundesanstalt (Germany)

4:00 PM - 4:05 PM:

### Welcome and Opening Remarks



4:05 PM - 4:45 PM:

### FLASH Radiotherapy: a new cancer treatment modality and its challenges, physics, engineering, and biology

**Magdalena Bazalova-Carter**, Univ. of Victoria (Canada)



4:45 PM - 5:25 PM:

### Recent advances in X-ray, gamma-ray, and charged-particle imaging

**Lars Furenlid**, The Univ. of Arizona (USA)



See full details and updates at [spie.org/op](https://spie.org/op) or on the **SPIE App**

## Organic Photonics + Electronics

22 August 2023 • 8:35 AM - 11:50 AM | Conv. Ctr. Room 6A

Session Chairs: **Zakya H. Kafafi**, Lehigh Univ. (USA);  
**Ifor D. W. Samuel**, Univ. of St. Andrews (United Kingdom)

8:35 AM - 8:40 AM:

### Welcome and Opening Remarks



8:40 AM - 9:20 AM:

### Organic photothermal films for light induced thermal engineering and photoenergy harvesting

**Eunkyong Kim**, Yonsei Univ. (Republic of Korea)



9:20 AM - 10:00 AM:

### Solution-processed organic solar cells: current progress and challenges

**Thuc-Quyen Nguyen**, Univ. of California, Santa Barbara (USA)

Coffee Break 10:00 AM - 10:30 AM



10:30 AM - 11:10 AM:

### Photonic interfaces for abiotic/biotic coupling

**Guglielmo Lanzani**, CNST-Italian Institute of Technology (Italy) and Politecnico di Milano (Italy)



11:10 AM - 11:50 AM:

### Strong light-matter coupling in molecules and 2D materials: from condensation to quantum nonlinearity

**Vinod M. Menon**, The City College of New York (USA)

## Signal, Image, and Data Processing

22 August 2023 • 1:30 PM - 2:30 PM | Conv. Ctr. Room 6A

Session Chair: **Khan Iftekharuddin**, Old Dominion Univ. (USA)

1:30 PM - 1:35 PM:

### Welcome and Opening Remarks



1:35 PM - 2:30 PM:

### AI/ML in signal and image processing

**Donald Wunsch**, Missouri Univ. of Science and Technology (USA)

## Optical Engineering

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: **Tony Hull**, The Univ. of New Mexico (USA) and  
**Daewook Kim**, Wyant College of Optical Sciences (USA)

3:30 PM - 3:35 PM:

### Welcome and Opening Remarks



3:35 PM - 4:15 PM:

### Optic technologies enabling fusion ignition at the National Ignition Facility

**Tayyab Suratwala**, Lawrence Livermore National Lab. (USA)



4:15 PM - 4:55 PM:

### The Habitable Worlds Observatory: Progress, Future Plans, and Opportunities for Community Participation

**Julie Crooke**, NASA (USA)



4:55 PM - 5:35 PM:

### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems

**Laura Coyle**, Ball Aerospace (USA)

## Astronomical Optics and Instrumentation

23 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6A

Session Chair: **Daewook Kim**, Wyant College of Optical Sciences (USA)

9:15 AM - 9:20 AM:

### Welcome and Opening Remarks



9:20 AM - 10:00 AM:

### Lessons from the development and servicing of HST for future astronomy missions

**John W. MacKenty**, Space Telescope Science Institute (USA)



# TECHNICAL EVENTS

Connect with your colleagues and explore topics in depth. Events include daily technical networking sessions and poster sessions.

## Panel on International Heliostat Market: Experience and Future Developments

20 August 2023 • 1:30 PM - 3:30 PM | Conv. Ctr. Room 11B

Panel Moderator: **Ali M. Khounsary**, Illinois Institute of Technology (USA)

With the growing international market in heliostats, we have invited leaders of heliostat and power tower CSP developers around the world to share their achievements, experiences, and thoughts at this panel. The panel includes presentations on the state-of-the-art heliostat technologies in US and around the world, and a discussion of the market developments and competitiveness as well as the technological challenges in providing low-cost and high-performance heliostats.

*Part of the Advances in Solar Energy: Heliostat Systems Design, Implementation, and Operation conference.*

## An Optical Believe It or Not: Key Lessons Learned

21 August 2023 • 8:30 PM - 10:00 PM  
Marriott Marquis, Marina Ballroom E

Join us as we share key optical lessons learned from leaders in the fields of optics and optical systems engineering. This year's speaker, Conrad Wells, will discuss lessons learned from the 20-year JWST program.

## Panel Discussion: Neuromorphic Computing and Brain Imaging

22 August 2023 • 11:00 AM - 12:30 PM | Conv. Ctr. Room 6C

Panel Moderators: **Joana B. Pereira**, Karolinska Institute (Sweden); **Daniel Brunner**, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

*Part of the Emerging Topics in Artificial Intelligence (ETAI) conference.*

## Charting a Roadmap for Lighting Transformation: Impact of 3D Printing on Lighting and Architecture

22 August 2023 • 6:00 PM - 8:00 PM  
Marriott Marquis, Catalina

Join us for a fascinating discussion, including perspectives from key stakeholders and leaders in additive manufacturing, materials, and lighting industries, as we explore opportunities to shape the future of lighting.



## Poster Sessions

<b>Monday 21 August 2023</b> 5:30 PM - 7:00 PM	Conv. Ctr. Exhibit Hall A
<b>Wednesday 23 August 2023</b> 5:30 PM - 7:00 PM	Conv. Ctr. Exhibit Hall A

Conference attendees are invited to view a collection of posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

**Monday Poster Setup is between 10:00 AM and 4:30 PM.**

**Wednesday Poster Setup is between 10:00 AM and 4:30 PM.**

Poster authors, for additional set-up instructions visit:  
<https://spie.org/OP/poster-presentation-guidelines>



See full details and updates at [spie.org/op](https://spie.org/op) or on the **SPIE App**

## Lens Design Technical Event

22 August 2023 • 8:00 PM - 10:00 PM  
Marriott Marquis, Marina Ballroom E

Session Chair: **Scott Lerner**


### “Let’s Give ‘Em Something to Talk About!”

Lens designers! Join us for our annual gathering to meet and discuss...lens design! Let’s talk about what we’re designing, how we’re going about doing it (what materials, software, techniques, etc.), and which problems we’re encountering. We’ll also explore current technical and commercial trends in the marketplace.

This year’s invited speaker will be Breann Sitarski, NASA Goddard Space Flight Ctr. USA.

*Part of the Current Developments in Lens Design and Optical Engineering XXIV conference.*

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Illuminating Ideas

LIGHT REFRESHMENTS SPONSORED BY:  
The Optical Solutions Group at  **SYNOPSYS**

## Workshop on X-Ray Optics

22 August 2023 • 8:00 PM - 10:00 PM  
Marriott Marquis, Balboa

The X-Ray Optics Working Group provides an informal setting for the interested engineers and scientists to meet and discuss issues related to the design, analysis, cooling, fabrication, and metrology of x-ray optics.

## Deep Learning for Microscopy and Brain Connectivity Demonstrations

23 August 2023 • 5:15 PM - 6:30 PM  
Conv. Ctr. Room 6C

This event showcases the latest advancements in deep learning for microscopy and brain connectivity. Leading experts in the field will present live demonstrations, highlighting the cutting-edge techniques used in image analysis, cell classification, and brain mapping. Explore the transformative applications of artificial intelligence in these domains and gain valuable insights into the future of deep learning.



**Electro Optics**  
Photonics business, applications & technology

**Picture perfect**  
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# PROFESSIONAL DEVELOPMENT EVENTS

Enhance your career and hone your skills through these development events



PROFESSIONAL DEVELOPMENT WORKSHOPS  
PRESENTED BY

**Jean-luc Doumont**  
Principiae

## Structuring and Delivering Research Talks

20 August 2023 • 1:00 PM - 4:00 PM  
Marriott Marquis, Balboa

Learn and refine the most effective presentation styles with crowd favorite, Jean-luc Doumont!

## Conveying Messages with Graphs

21 August 2023 • 9:00 AM - 12:00 PM  
Marriott Marquis, Balboa

This workshop discusses how to create more effective graphs that are truly visual, are truthful to the data, and get the message across.



PROFESSIONAL DEVELOPMENT WORKSHOPS  
PRESENTED BY

**Suzie Smyth**  
Endless Possibilities, LLC

## Career Skills Workshop: Time Management

21 August 2023 • 1:00 PM - 2:25 PM  
Marriott Marquis, Balboa

Time management is one of the most critical skills one can have in their career. Expert Suzie Smyth will give us tools to develop this skill.

## Career Skills Workshop: Project Management

21 August 2023 • 2:35 PM - 4:00 PM  
Marriott Marquis, Balboa

Project management is a critical skill to advance your career. Expert Suzie Smyth will give us tools to develop this skill.

## Career SWOT! Strategic Planning for Your Career

22 August 2023 • 9:00 AM - 10:00 AM  
Marriott Marquis, Balboa

Join in on this mini-workshop activity to analyze, clarify and improve your career trajectory.

## Career Skills Workshop: What It Means to Be a Leader

22 August 2023 • 10:30 AM - 12:00 PM  
Marriott Marquis, Balboa

Develop your leadership skills in this insightful and informative mini-workshop.

## Job Fair

22 August 2023 • 10:00 AM - 5:00 PM  
23 August 2023 • 10:00 AM - 5:00 PM  
Conv. Ctr. Sails Pavilion, Exhibition Hall

Meet with companies seeking to hire professionals like you. Bring your resume and put your best foot forward to land your dream job at this two-day job fair.

## Lunch & Learn: Beaded Privilege

22 August 2023 • 12:00 PM - 1:00 PM  
Conv. Ctr. Sails Pavilion, Exhibit Stage



Join us for a lunchtime activity and learn about how privilege affects our lives..

Facilitator: **Jessica Wade**

## The Great Career Showdown! An Exploration of Careers in Optics and Photonics

22 August 2023 • 3:00 PM - 4:00 PM  
Conv. Ctr. Sails Pavilion, Exhibit Stage

Join us for this Jeopardy!-style showdown to ask questions of panelists of diverse career stages. Learn about their career-path choices using a fun and interactive gameshow format.

## Student and Early Career Speed Mentoring Extravaganza!

22 August 2023 • 6:00 PM - 7:00 PM  
Marriott Marquis, Del Mar

Looking to get advice on critical career choices, life in academia or industry, and more? Join us for this fun and casual speed-mentoring session at the Marriott Marquis. Food and drinks provided!

## Lunch & Learn: Working with the world - Diversity and intercultural communication

23 August 2023 • 12:00 PM - 1:00 PM  
Conv. Ctr. Sails Pavilion, Exhibit Stage

Join us for lunch and learn more about collaborating with diverse multi-cultural teams.



Presenter: **George Monagan**

Seattle-based diversity, equity and inclusion consultant





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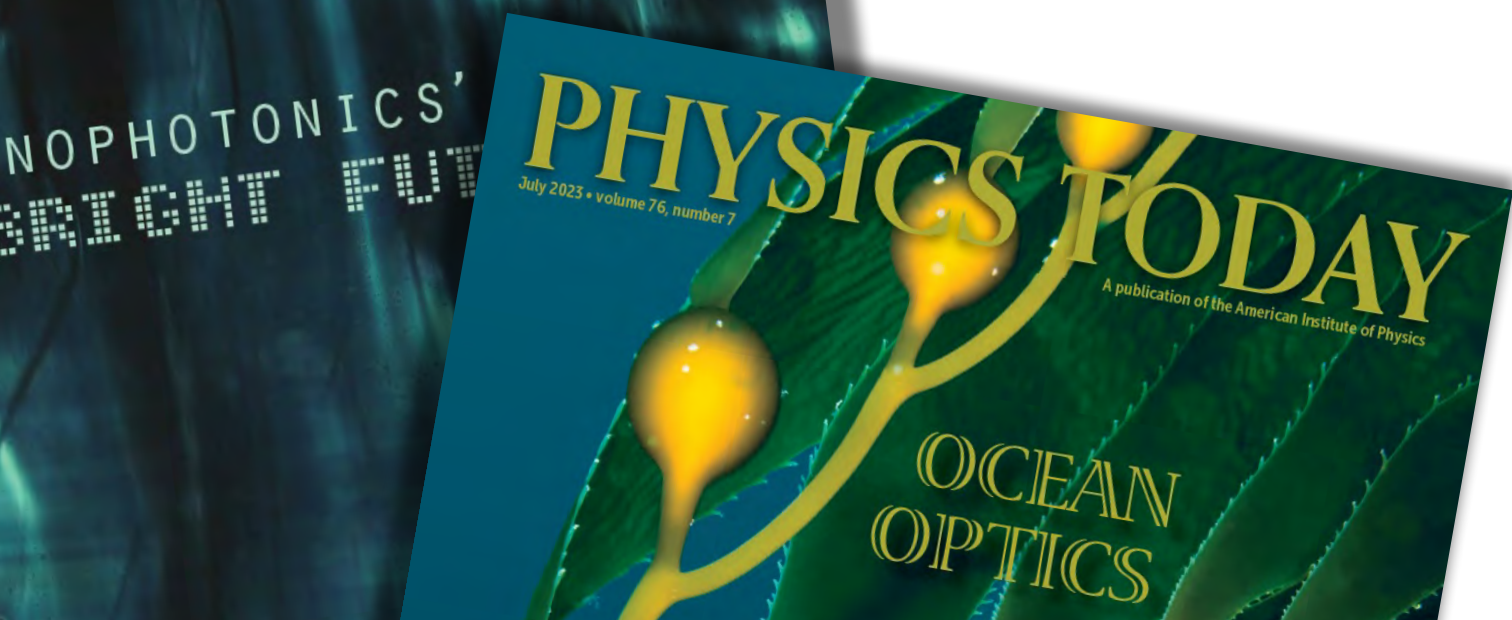
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# SOCIAL AND NETWORKING EVENTS

Connect with your colleagues throughout the conference in both small and large settings

## Heliostat Networking Event

20 August 2023 • 3:30 PM - 5:30 PM  
Conv. Ctr. Bayside Corridor behind Room 11B

Network with colleagues in the Concentrating Solar Power (CSP) community and discuss exciting developments in this community.

## Black in Photonics Meetup

20 August 2023 • 7:30 PM - 8:30 PM | Marriott Marquis, Del Mar

Join us for an informal Black in Photonics meetup at SPIE Optics + Photonics. Network and celebrate the people of color in our community.

## Women in Optics Meetup

21 August 2023 • 10:00 AM - 11:00 AM  
Marriott Marquis, Del Mar

Join other women in the field for an informal networking brunch in the Community Lounge.

## SPIE Student Member Meetup

21 August 2023 • 4:30 PM - 5:30 PM | Marriott Marquis, Del Mar

Come meet your fellow Student Members from all over the world! Make new friends, meet MKS industry representatives, SPIE leadership, and expand your network.

## SPIE Strides

Location: Hotel Lobby - Marriott Marquis, Omni, and Hilton Bayfront

Tuesday morning 22 August	6:30 AM - 8:00 AM
Wednesday morning 23 August	6:30 AM - 8:00 AM
Thursday morning 24 August	6:30 AM - 8:00 AM

Looking for a way to meet new people and prioritize your health simultaneously? Look no further than SPIE Strides!

## LGBTQ+ Social

22 August 2023 • 8:30 PM - 9:30 PM | Marriott Marquis, Del Mar

Join us in the Community Lounge and socialize and network with other LGBTQ+ and allies in the optics and photonics community.



## Cappuccinos at the SPIE Membership Booth

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Wednesday morning 23 August	10:00 AM - 12:00 PM
Thursday morning 24 August	10:00 AM - 12:00 PM

Visit the SPIE Membership and Community Development booth for a custom made cappuccino! Chat with your colleagues about SPIE Membership opportunities and how SPIE can help you in your journey.



## All-Conference Welcome Reception

**21 August 2023**  
7:00 PM - 8:30 PM  
Conv. Ctr. West Terrace (Upper Level)

Relax, socialize, and enjoy refreshments while viewing the wonders of the night sky, thanks to the San Diego Astronomy Club. All paid attendees welcome.

SPONSORED BY:



## Afternoon Networking Social with Exhibitors - Wednesday

23 August 2023 • 3:00 PM - 4:00 PM  
Conv. Ctr. Sails Pavilion, Exhibition Hall

Come to the Optics + Photonics exhibition, 2nd level Sails Pavilion - Join exhibitors for light refreshments during this social gathering time.

## SPIE Publications Reception

23 August 2023 • 5:00 PM - 6:00 PM  
Marriott Marquis, Carlsbad

This reception is for all volunteers who serve as Editors on an SPIE journal or are on the Publications Committee. Private Event: Invitation Only

## SPIE Awards Banquet and Celebration

23 August 2023 • 6:00 PM - 9:00 PM  
Marriott Marquis, Marina Terrace

Attend the 2023 Society Awards Reception and Banquet. Purchase tickets when registering for the conference, or onsite at the SPIE Cashier Desk.

2023 Presidential Student chapter Award to be presented to Optics Students Karlsruhe (OSKar) chapter, Karlsruhe, Germany following the society award presentations.

## Networking Brunch with Exhibitors - Thursday

24 August 2023 • 10:00 AM - 11:00 AM  
Conv. Ctr. Sails Pavilion, Exhibition Hall

Come to the Optics + Photonics exhibition in the 2nd level Sails Pavilion - Join exhibitors during this informal networking brunch.

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# SPIE MEMBER EVENTS

Membership has its privileges and is evident when attending an SPIE conference. Look for many ways to connect with colleagues this week.

## SPIE Fellow Member Luncheon

22 August 2023 • 12:00 PM - 1:30 PM  
Marriott Marquis, Marina Ballroom D

All SPIE Fellows are invited to join your colleagues for this SPIE-hosted luncheon. The new Fellows in attendance will be recognized and introduced. Please join us for this informal gathering and a chance to interact with other Fellows.

## Annual General Meeting of the SPIE Corporation

22 August 2023 • 6:00 PM - 7:00 PM  
Marriott Marquis, Marina Ballroom D

This is the general business meeting of the Society. All SPIE Members are welcome and encouraged to attend.



## SPIE Member Reception

22 August 2023 • 7:00 PM - 8:30 PM  
Marriott Marquis, Marina Terrace

All SPIE Members are invited to this reception in their honor. Come relax and talk with your colleagues. Refreshments will be served.

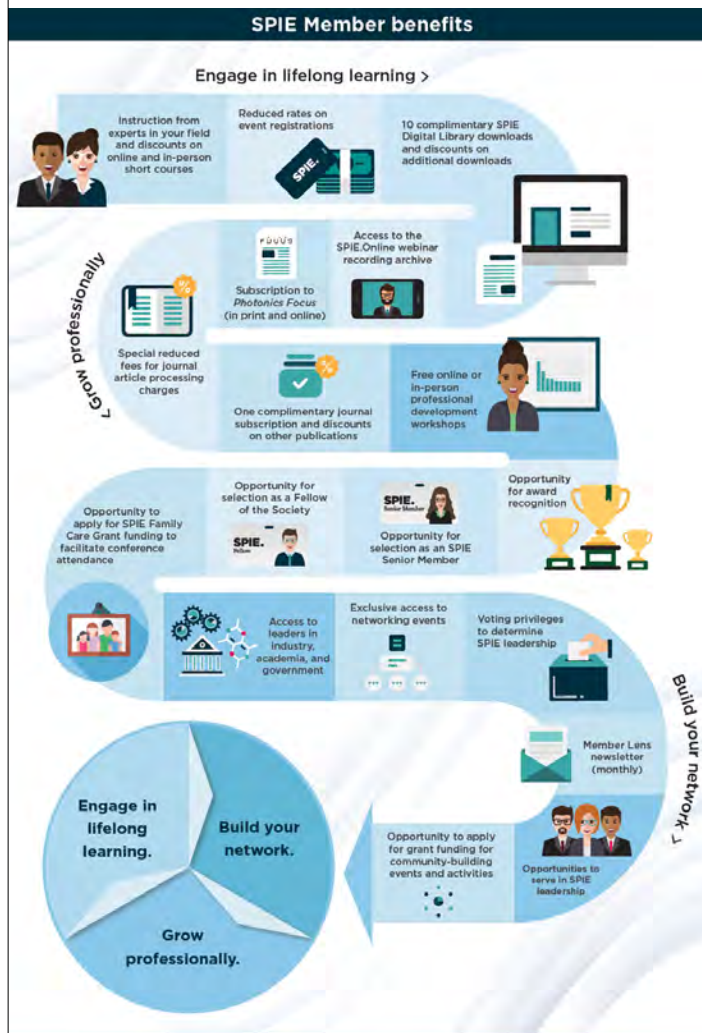
## SPIE Senior Member Breakfast

23 August 2023 • 8:00 AM - 9:00 AM  
Marriott Marquis, Marina Ballroom D

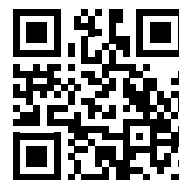
All SPIE Senior Members are invited to join your colleagues for this SPIE-hosted buffet breakfast. Join us for this informal gathering and a chance to interact with other Senior Members.

# SPIE.MEMBERSHIP

**Your Membership. Your way.**  
Create a Membership experience that grows with you, each step of your professional journey



Join or renew today to make more progress toward your next career move





# FACILITATING INNOVATION ACROSS the **OPTICS AND PHOTONICS SPECTRUM**

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# COURSE SCHEDULE

Courses complement and expand your Optics + Photonics experience. Take advantage of this great opportunity to meet face-to-face with an expert instructor and a group of people with similar goals and challenges. See SPIE cashier to register.

SUNDAY 20	MONDAY 21	TUESDAY 22	WEDNESDAY 23	THURSDAY 24
<b>SC1220</b> <b>Imaging Spectrometry</b> Nathan Hagen 1:30 PM-5:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	<b>SC003</b> <b>Practical Optical System Design</b> S. Craig Olson 8:30 AM-5:30 PM Member: \$780, Non-Member: \$915 Student Member: \$441	<b>SC010</b> <b>Introduction to Optical Alignment Techniques</b> Kenneth Castle 8:30 AM-5:30 PM Member: \$780, Non-Member: \$915 Student Member: \$441	<b>SC1071</b> <b>Understanding Diffractive and Meta-Optics</b> Yakov Soskind 8:30 AM-5:30 PM Member: \$815, Non-Member: \$950 Student Member: \$455	
<b>SC1222</b> <b>Deep Learning and Its Applications in Image Processing</b> Nasser Nasrabadi 8:30 AM-5:30 PM Member: \$780, Non-Member: \$915 Student Member: \$441	<b>SC014 (Day 2 of 2)</b> <b>Introduction to Optomechanical Design</b> Daniel Vukobratovich 8:30 AM-5:30 PM Member: \$1460, Non-Member: \$1730 Student Member: \$767	<b>SC1139</b> <b>Systems Engineering and Large Telescope Observatories</b> Paul Lightsey, Jonathan Arenberg 8:30 AM-5:30 PM Member: \$835, Non-Member: \$970 Student Member: \$463	<b>SC1311</b> <b>Understanding Optical System Specifications: Identifying and Managing Hidden Conflicts</b> Julie Bentley 1:30 PM-5:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	
<b>SC1247</b> <b>Polarized Light and Optical Design</b> Russell Chipman 8:30 AM-5:30 PM Member: \$780, Non-Member: \$915 Student Member: \$441	<b>SC015</b> <b>Fastening Optical Elements with Adhesives</b> John Daly 8:30 AM-12:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	<b>SC1310</b> <b>Optical Metrology for AR/VR/MR</b> Will Zhou 1:30 PM-5:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	<b>SC1323</b> <b>CMOS Image Sensors: Technology, Applications and Camera Design Methodology</b> Richard Crisp 8:30 AM-12:30 PM Member: \$555, Non-Member: \$630 Student Member: \$327	
<b>SC1277</b> <b>Photodetectors: Theory, Practice and Applications</b> Slawomir Jitlik 8:30 AM-12:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	<b>SC1086</b> <b>Optical Materials, Fabrication and Testing for the Optical Engineer</b> Jessica DeGrove Nelson 1:30 PM-5:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	<b>SC1330</b> <b>Optics of the Eye for Engineers</b> Vasudevan Lakshminarayanan 8:30 AM-12:30 PM Member: \$505, Non-Member: \$580 Student Member: \$307	<b>SC1331</b> <b>Embedded Optical Systems</b> Michael Kudrinskiy 8:30 AM-12:30 PM Member: \$470, Non-Member: \$545 Student Member: \$293	

SPIE reserves the right to cancel a course due to insufficient advance registration.

## MONEY-BACK GUARANTEE

We are confident that once you experience an SPIE course for yourself you will look to us for your future education needs. However, if for any reason you are dissatisfied, we will gladly refund your money. We just ask that you tell us what you did not like; suggestions for improvement are always welcome.

## Digital badges and certificates

SPIE awards digital badges and certificates to participants who attend courses and complete the evaluation and quiz. Digital credentials are always accessible, easily shareable, printable at any time, and verified. For more information visit [spie.org/digital-badges](http://spie.org/digital-badges)


## Onsite courses

View course descriptions and register online.



**SPIE Members and Student Members receive discounts on courses.**

Check the SPIE App frequently for descriptions, updates, and course times

SUNDAY 20	MONDAY 21	TUESDAY 22	WEDNESDAY 23	THURSDAY 24
<p><b>SC1329</b>  <b>Interference Microscopy</b>  <b>Peter de Groot</b>            8:30 AM–5:30 PM            Member: \$780,            Non-Member: \$915            Student Member: \$441</p>	<p><b>SC1165</b>  <b>Introduction to Applied Probability for Systems Engineers</b>  <b>Jonathan Arenberg</b>            1:30 PM–5:30 PM            Member: \$470,            Non-Member: \$545            Student Member: \$293</p>	<p><b>SC720</b>  <b>Cost-Conscious Tolerancing of Optical Systems</b>  <b>Jean-De Michel</b>            8:30 AM–5:30 PM            Member: \$780,            Non-Member: \$915            Student Member: \$441</p>	<p><b>SC567</b>  <b>Introduction to Optical Remote Sensing Systems</b>  <b>Joseph Shaw</b>            1:30 PM–5:30 PM            Member: \$470,            Non-Member: \$545            Student Member: \$293</p>	
<p><b>SC157</b>  <b>MTF in Optical and Electro-Optical Systems</b>  <b>Glenn Boreman</b>            8:30 AM–5:30 PM            Member: \$825,            Non-Member: \$960            Student Member: \$459</p>	<p><b>SC1169</b>  <b>Optical Manufacturing Fundamentals</b>  <b>Ray Williamson</b>            8:30 AM–5:30 PM            Member: \$810,            Non-Member: \$945            Student Member: \$453</p>	<p><b>SC863</b>  <b>Introduction to Modern Optical Drawings - the ISO 10110 Standard</b>  <b>David Aitens</b>            1:30 PM–5:30 PM            Member: \$520,            Non-Member: \$595            Student Member: \$313</p>	<p><b>SC915</b>  <b>Radiometry Revealed</b>  <b>Joseph Shaw</b>            8:30 AM–12:30 PM            Member: \$470,            Non-Member: \$545            Student Member: \$293</p>	
<p><b>SC212</b>  <b>Modern Optical Testing</b>  <b>Daewook Kim</b>            1:30 PM–5:30 PM            Member: \$505,            Non-Member: \$580            Student Member: \$307</p>	<p><b>SC1170</b>  <b>A Hands-On Introduction to Optics</b>  <b>Damon Diehl</b>            9:30 AM–12:30 PM            Member: \$325,            Non-Member: \$350            Student Member: \$215</p>			
<p><b>SC690</b>  <b>Optical System Design: Layout Principles and Practice</b>  <b>Julie Bentley</b>            8:30 AM–5:30 PM            Member: \$815,            Non-Member: \$950            Student Member: \$455</p>	<p><b>SC1272</b>  <b>Mirror System Design with Freeform Surfaces</b>  <b>José Sasiá</b>            8:30 AM–12:30 PM            Member: \$470,            Non-Member: \$545            Student Member: \$293</p>			
<p><b>SC014 (Day 1 of 2)</b>  <b>Introduction to Optomechanical Design</b>  <b>Daniel Vukobratovich</b>            8:30 AM–5:30 PM            Member: \$1460,            Non-Member: \$1730            Student Member: \$767</p>				

# TECHNICAL CONFERENCES SCHEDULE

## Nanoscience + Engineering Applications

Check the SPIE App frequently for updates, presentation times are subject to change

SUNDAY 20	MONDAY 21	TUESDAY 22	WEDNESDAY 23	THURSDAY 24
<b>Nanoscience</b>				
12646 <b>Metamaterials, Metadevices, and Metasystems 2023</b> , Chairs: Nader Engheta; Mikhail A. Noginov; Nikolay I. Zheludev (Location: Conv. Ctr. Room 2)				
12647 <b>Active Photonic Platforms (APP) 2023</b> , Chairs: Ganapathi S. Subramania; Stavroula Foteinopoulou (Location: Conv. Ctr. Room 3)				
12648 <b>Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XXI</b> , Chairs: Takuo Tanaka; Yu-Jung Lu (Location: Conv. Ctr. Room 4)				
12649 <b>Optical Trapping and Optical Micromanipulation XX</b> , Chair(s): Kishan Dholakia; Gabriel C. Spalding (Location: Conv. Ctr. Room 6D)				
12650 <b>Physical Chemistry of Semiconductor Materials and Interfaces XXII</b> , Chairs: Andrew J. Musser; Derya Baran (Location: Conv. Ctr. Room 10)				
			12651 <b>Low-Dimensional Materials and Devices 2023</b> , Chairs: Nobuhiko P. Kobayashi; A. Alec Talin; Albert V. Davydov; M. Saif Islam (Location: Conv. Ctr. Room 11A)	
12652 <b>UV and Higher Energy Photonics: From Materials to Applications 2023</b> , Chairs: Gilles Lérondel; Yong-Hoon Cho; Atsushi Taguchi; Satoshi Kawata (Location: Conv. Ctr. Room 9)				
12653 <b>Nanoengineering: Fabrication, Properties, Optics, Thin Films, and Devices XX</b> , Chairs: Balaji Panchapakesan; André-Jean Attias; Wounjhang Park (Location: Conv. Ctr. Room 1A)				
12654 <b>Enhanced Spectroscopies and Nanoimaging 2023</b> , Chairs: Prabhat Verma; Yung Doug Suh (Location: Conv. Ctr. Room 1B)				
12655 <b>Emerging Topics in Artificial Intelligence (ETAI) 2023</b> , Chairs: Giovanni Volpe; Joana B. Pereira; Daniel Brunner; Aydogan Ozcan (Location: Conv. Ctr. Room 6C)				
<b>Quantum Sciences and Technology</b>				
12656 <b>Spintronics XVI</b> , Chairs: Jean-Eric Wegrowe; Joseph S. Friedman; Manijeh Razeghi; Henri Jaffrès (Location: Conv. Ctr. Rooms 5A & 5B)				
12692 <b>Quantum Communications and Quantum Imaging XXI</b> , Chairs: Keith S. Deacon; Ronald E. Meyers (Location: Conv. Ctr. Room 15A)		12657 <b>Quantum Nanophotonic Materials, Devices, and Systems 2023</b> , Chairs: Cesare Soci; Matthew T. Sheldon; Igor Aharonovich (Location: Conv. Ctr. Room 1A)		

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## Organic Photonics + Electronics

Check the SPIE App frequently for updates, presentation times are subject to change

SUNDAY 20	MONDAY 21	TUESDAY 22	WEDNESDAY 23	THURSDAY 24
<b>Organic Photonics + Electronics</b>				
12658 <b>Liquid Crystals XXVII</b> , Chair: Iam Choon Khoo (Location: Conv. Ctr. Room 7A)				
12659 <b>Organic and Hybrid Light Emitting Materials and Devices XXVII</b> , Chairs: Ji-Seon Kim; Tae-Woo Lee; Franky So (Location: Conv. Ctr. Room 7B)				
		12660 <b>Organic, Hybrid, and Perovskite Photovoltaics XXIV</b> , Chairs: Gang Li; Natalie Stingelin; Ana Flávia Nogueira; Thuc-Quyen Nguyen; Ellen Moons; Barry P. Rand (Location: Conv. Ctr. Room 10)		
12661 <b>Organic and Hybrid Sensors and Bioelectronics XVI</b> , Chairs: Ioannis Kyriassis; Emil J. W. List-Kratochvil; Sahika Inal (Location: Conv. Ctr. Room 6F)				
	12662 <b>Organic and Hybrid Transistors XXII</b> , Chairs: Iain McCulloch; Oana D. Jurchescu (Location: Conv. Ctr. Room 6F (Mon PM) and 11B (Tue-Wed))			
		12663 <b>Molecular and Nanophotonic Machines VI</b> , Chairs: Zouheir Sekkat; Takashige Omatsu (Location: Conv. Ctr. Room 8)		

## Optical Engineering + Applications

### Optical Design

	12664 <b>Optical Modeling and Performance Predictions XIII</b> , Chair: Mark A. Kahan (Location: Conv. Ctr. Room 17A)			
		12665 <b>Novel Optical Systems, Methods, and Applications XXVI</b> , Chairs: Cornelius F. Hahlweg; Joseph R. Mulley (Location: Conv. Ctr. Room 14A)		
12667 <b>Laser Beam Shaping XXIII</b> , Chairs: Angela Dudley; Alexander V. Laskin (Location: Conv. Ctr. Room 17A)		12666 <b>Current Developments in Lens Design and Optical Engineering XXIV</b> , Chairs: R. Barry Johnson; Virendra N. Mahajan; Simon Thibault; Ching-Cherng Sun; Alfonso Padilla-Vivanco (Location: Conv. Ctr. Room 14A)	12668 <b>New Concepts in Solar and Thermal Radiation Conversion V</b> , Chairs: Peter Bermel; Jeremy N. Munday (Location: Conv. Ctr. Room 17B)	
12669 <b>Optomechanical Engineering 2023</b> , Chairs: Keith B. Doyle; Brandon D. Chalifoux; Kenneth R. Castle; José M. Sasián (Location: Conv. Ctr. Room 16B)		12670 <b>3D Printing for Lighting</b> , Chairs: Nadarajah Narendran; Govi Rao; Samuel T. Mills (Location: Conv. Ctr. Room 18)		
12671 <b>Advances in Solar Energy: Heliostat Systems Design, Implementation, and Operation</b> , Chairs: Guangdong Zhu; Marc Röger; Zhifeng Wang; Ali M. Khounsary (Location: Conv. Ctr. Room 11B)				

### Optical Alignment, Testing, and Fabrication

		12672 <b>Applied Optical Metrology V</b> , Chairs: Erik Novak; Christopher C. Wilcox (Location: Conv. Ctr. Room 9)		
	12677 <b>Astronomical Optics: Design, Manufacture, and Test of Space and Ground Systems IV</b> , Chairs: Tony B. Hull; Daewook Kim; Pascal Hallibert (Location: Conv. Ctr. Room 16A (Mon-Wed); Room 9 (Thu))			

# TECHNICAL CONFERENCES SCHEDULE

Check the SPIE App frequently for updates, presentation times are subject to change

SUNDAY 20	MONDAY 21	TUESDAY 22	WEDNESDAY 23	THURSDAY 24
<b>Signal, Image, and Data Processing</b>				
			<b>12673 Optics and Photonics for Information Processing XVII</b> , Chairs: Khan M. Iftekharuddin; Abdul A. S. Awwal; Victor Hugo Diaz-Ramirez; Andrés Márquez (Location: Conv. Ctr. Room 14B)	
			<b>12674 Applications of Digital Image Processing XLVI</b> , Chairs: Andrew G. Tescher; Touradj Ebrahimi (Location: Conv. Ctr. Room 12)	
			<b>12675 Applications of Machine Learning 2023</b> Chair(s): Michael E. Zelinski; Tarek M. Taha; Jonathan Howe; Barath Narayanan Narayanan; Abdul A. S. Awwal; Khan M. Iftekharuddin (Location: Conv. Ctr. Room 15B (Wed); Room 7B (Thu))	
<b>Astronomical Optics and Instrumentation</b>				
<b>12676 UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts XI</b> , Chairs: Allison A. Barto; Fanny Keller; H. Philip Stahl (Location: Conv. Ctr. Room 16A)				
	<b>12677 Astronomical Optics: Design, Manufacture, and Test of Space and Ground Systems IV</b> , Chairs: Tony B. Hull; Daewook Kim; Pascal Hallibert (Location: Conv. Ctr. Room 16A (Mon-Wed); Room 9 (Thu))			
<b>12678 UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII</b> , Chairs: Oswald H. Siegmund; Keri Hoadley (Location: Conv. Ctr. Room 17B)				
		<b>12679 Optics for EUV, X-Ray, and Gamma-Ray Astronomy XI</b> , Chairs: Stephen L. O'Dell; Jessica A. Gaskin; Giovanni Pareschi; Daniele Spiga (Location: Conv. Ctr. Room 17A (Tues-Wed); Room 11B (Thu))		
	<b>12680 Techniques and Instrumentation for Detection of Exoplanets XI</b> , Chairs: Garreth J. Ruane (Location: Conv. Ctr. Room 16B (Mon-Wed); Room 11A (Thu))			
<b>Photonic Devices and Applications</b>				
<b>12681 Ultrafast Nonlinear Imaging and Spectroscopy XI</b> , Chairs: Zhiwen Liu; Demetri Psaltis; Kebin Shi (Location: Conv. Ctr. Room 18)				
<b>12682 Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XVII</b> , Chairs: Shizhuo Yin; Ruyan Guo (Location: Conv. Ctr. Room 11A)				
<b>12683 Terahertz Emitters, Receivers, and Applications XIV</b> , Chairs: Manijeh Razeghi; Mona Jarrahi (Location: Conv. Ctr. Room 14B)				
<b>12684 ODS 2023: Industrial Optical Devices and Systems</b> , Chairs: Ryuichi Katayama; Yuzuru Takashima (Location: Conv. Ctr. Room 14A)		<b>12687 Infrared Sensors, Devices, and Applications XIII</b> , Chairs: Priyalal Wijewarnasuriya; Arvind I. D'Souza; Ashok K. Sood (Location: Conv. Ctr. Room 7A)		

Check the SPIE App frequently for updates, presentation times are subject to change

SUNDAY 20	MONDAY 21	TUESDAY 22	WEDNESDAY 23	THURSDAY 24
<b>Remote Sensing and Atmospheric Propagation</b>				
		12685 <b>Earth Observing Systems XXVIII</b> , Chairs: Xiaoxiong (Jack) Xiong; Xingfa Gu; Jeffrey S. Czapla-Myers (Location: Conv. Ctr. Room 6F)		
12688 <b>Imaging Spectrometry XXVI: Applications, Sensors, and Processing</b> , Chairs: Emmett J. Ientilucci; Christine L. Bradley (Location: Conv. Ctr. Room 6E)	12686 <b>Infrared Remote Sensing and Instrumentation XXXI</b> , Chairs: Marija Strojnik; Jörn Helbert (Location: Conv. Ctr. Room 14A)	12687 <b>Infrared Sensors, Devices, and Applications XIII</b> , Chairs: Priyalal Wijewarnasuriya; Arvind I. D'Souza; Ashok K. Sood (Location: Conv. Ctr. Room 7A)		
12689 <b>CubeSats, SmallSats, and Hosted Payloads for Remote Sensing VII</b> , Chairs: Sachidananda R. Babu; Thomas S. Pagano; Jeffery J. Puschell (Location: Conv. Ctr. Room 8)	12690 <b>Polarization Science and Remote Sensing XI</b> , Chairs: Meredith K. Kupinski; Joseph A. Shaw; Frans Snik (Location: Conv. Ctr. Room 8 (Mon-TueAM) and Room 6F (TuePM))			
12692 <b>Quantum Communications and Quantum Imaging XXI</b> , Chairs: Keith S. Deacon; Ronald E. Meyers (Location: Conv. Ctr. Room 15A)	12691 <b>Laser Communication and Propagation through the Atmosphere and Oceans XII</b> , Chairs: Jaime A. Anguita; Jeremy P. Bos; David T. Wayne (Location: Conv. Ctr. Room 6E (Tue) and 7B (Wed))			
	12693 <b>Unconventional Imaging, Sensing, and Adaptive Optics 2023</b> , Chairs: Jean J. Dolne; Mark F. Spencer; Santasri R. Bose-Pillai (Location: Conv. Ctr. Room 6E)			

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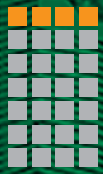


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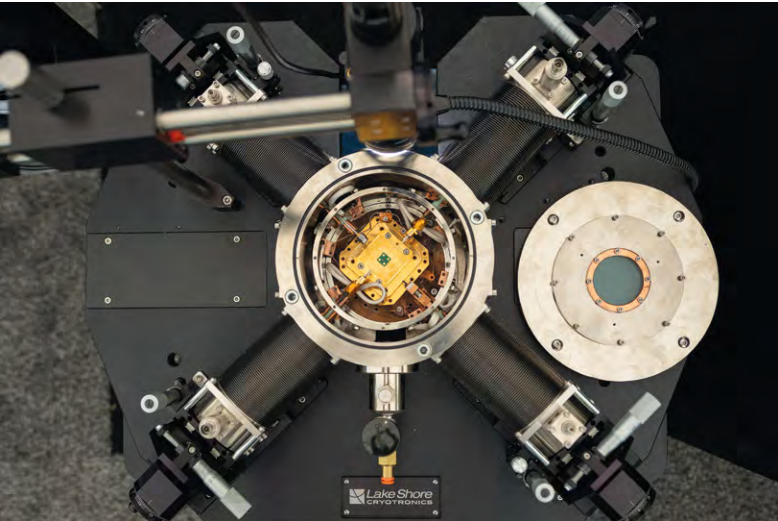
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Exhibitors are listed in alphabetical order with full contact information and booth location. Full company descriptions, product announcements, and other information are available on the SPIE App and on [spie.org](http://spie.org).



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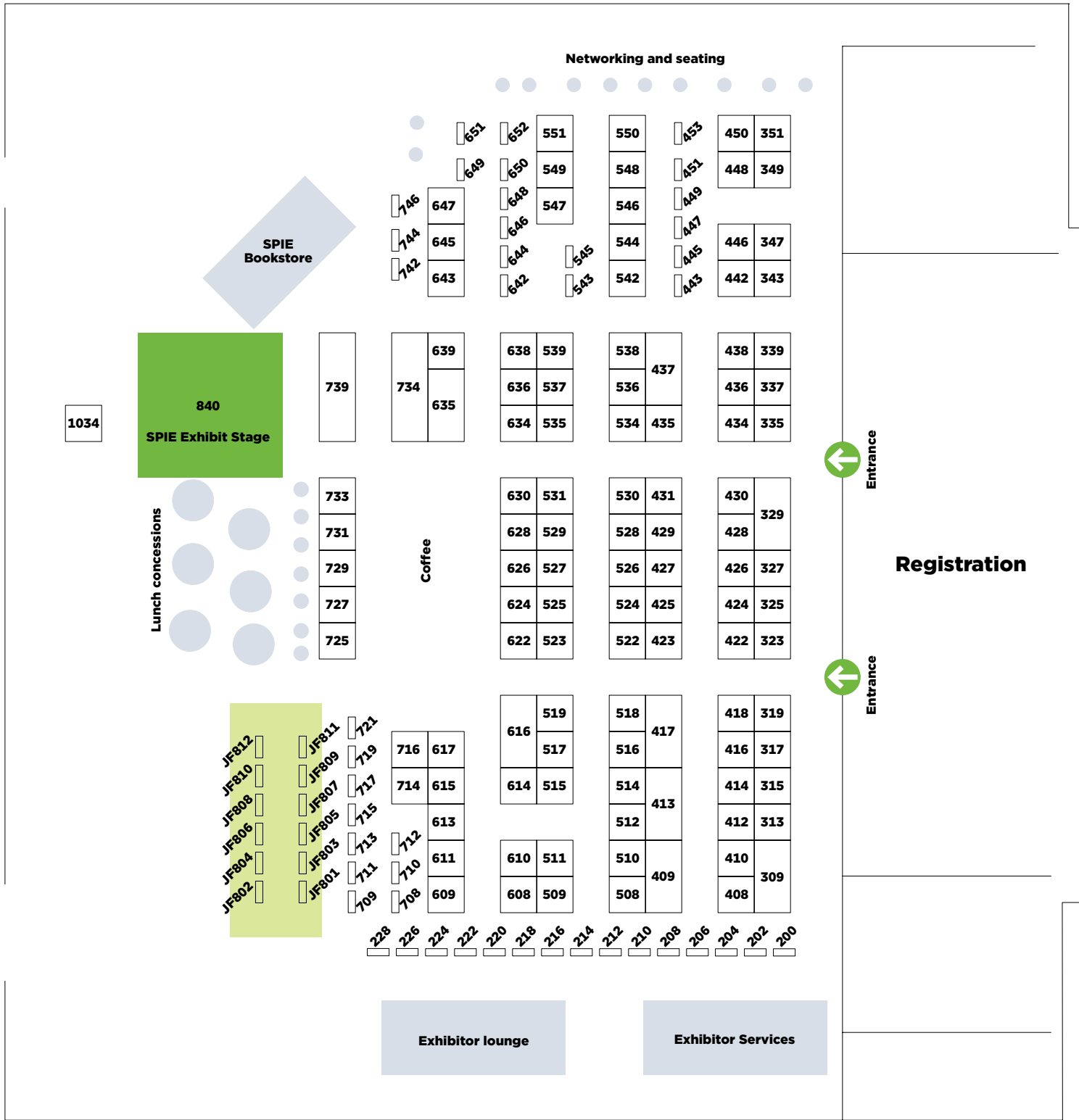
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Hamamatsu Corp.  
Labsphere, Inc.  
OZ Optics Ltd.

## Lighting and Illumination

Armadillo SIA  
Himax IGI Precision Ltd.  
HOYA Corp. USA  
IMT Precision on Glass  
Infinite Optics Inc.  
Isuzu Glass, Inc.  
KostaCLOUD Inc.  
Reynard Corp.

Sutter Instrument Corp.  
Synopsys, Inc.

### **Lithographic Equipment**

IMT Precision on Glass  
Natsume Optical Corporation  
NM Laser Products, Inc.

### **Machine Vision, Factory Automation**

4D Technology Corp.  
AccuCoat Inc.  
Hamamatsu Corp.  
IMT Precision on Glass

### **New Imaging Technologies**

OptoTech Optical Machinery Inc.  
Photonic Cleaning Technologies  
Reynard Corp.  
Riverhawk Co.  
SmarAct Inc.  
Vincent Associates

### **Materials Processing, Lasers in Manufacturing**

Armadillo SIA  
attocube systems Inc.  
LAYERTEC GmbH  
OZ Optics Ltd.  
RPMC Lasers, Inc.  
Sutter Instrument Corp.

### **Materials, Abrasives, Chemicals**

Infinite Optics Inc.  
Isuzu Glass, Inc.  
Leonardo UK Ltd.  
Ohara Corp.  
Photonic Cleaning Technologies  
SCHOTT North America, Inc.

### **Microscopes**

Applied Surface Technologies  
Armadillo SIA  
attocube systems Inc.  
Mad City Labs., Inc.  
Meadowlark Optics, Inc.  
Minus K Technology Inc.  
Optical Perspectives Group, LLC  
SmarAct Inc.  
Sutter Instrument Corp.  
Vincent Associates  
Microtechnology

### **IMT Precision on Glass**

Misc consumables and equipment  
Applied Surface Technologies  
Minus K Technology Inc.  
Mounts, Tables, Vibration Isolation  
Minus K Technology Inc.  
OptoSigma Corp.  
SmarAct Inc.  
Sutter Instrument Corp.

### **Nanotechnology products**

Himax IGI Precision Ltd.  
IMT Precision on Glass  
MOXTEK, Inc.

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AccuCoat Inc.  
Alluxa, Inc.  
Coherent Corp.  
GS Plastic Optics  
Hardin Optical Co.  
HOYA Corp. USA  
Infinite Optics Inc.  
Iridian Spectral Technologies Ltd.  
Labsphere, Inc.  
LaCroix Precision Optics  
LAYERTEC GmbH  
Leonardo UK Ltd.  
MLOPTIC Corp.  
Natsume Optical Corporation  
NTFL  
OptoSigma Corp.  
OptoTech Optical Machinery Inc.  
Reynard Corp.  
SCHOTT North America, Inc.  
scia Systems GmbH  
Teledyne SciCam Group

### **Optical Components - Filters, Mirrors, Other**

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Hardin Optical Co.  
Himax IGI Precision Ltd.  
HOYA Corp. USA  
IMT Precision on Glass  
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Iridian Spectral Technologies Ltd.  
Isuzu Glass, Inc.  
LaCroix Precision Optics  
LAYERTEC GmbH  
Mad City Labs., Inc.  
Meadowlark Optics, Inc.  
Mindrum Precision, Inc.  
MLOPTIC Corp.  
MOXTEK, Inc.  
Natsume Optical Corporation  
NTFL  
Ohara Corp.  
OptoSigma Corp.  
Reynard Corp.  
SCHOTT North America, Inc.  
Teledyne SciCam Group

### **Optical Components - Lenses**

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Coherent Corp.  
Diverse Optics Inc.  
GS Plastic Optics  
Hardin Optical Co.  
Himax IGI Precision Ltd.  
HOYA Corp. USA  
Infinite Optics Inc.  
Isuzu Glass, Inc.  
KostaCLOUD Inc.  
LaCroix Precision Optics  
LAYERTEC GmbH

Mindrum Precision, Inc.  
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Ohara Corp.  
OptoSigma Corp.  
Reynard Corp.  
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### **Optical Design and Engineering**

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Ansys, Inc.  
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Labsphere, Inc.  
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Ohara Corp.  
Optikos Corp.  
Riverhawk Co.  
Synopsys, Inc.  
Vincent Associates

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Photonic Cleaning Technologies  
scia Systems GmbH  
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Hardin Optical Co.  
HOYA Corp. USA  
Infinite Optics Inc.  
Isuzu Glass, Inc.  
Labsphere, Inc.  
LaCroix Precision Optics  
LAYERTEC GmbH  
Mindrum Precision, Inc.  
MLOPTIC Corp.  
MOXTEK, Inc.  
Natsume Optical Corporation  
Ohara Corp.  
Optical Perspectives Group, LLC  
Optikos Corp.  
OptiPro Systems, LLC

OptoTech Optical Machinery Inc.  
Photonic Cleaning Technologies  
Reynard Corp.  
Riverhawk Co.  
SCHOTT North America, Inc.  
scia Systems GmbH

### **Optomechanical Components, Devices**

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Riverhawk Co.  
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Ohara Corp.  
PI (Physik Instrumente) L.P.  
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SmarAct Inc.

### **Software**

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Agilent Technologies, Inc.  
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Synopsys, Inc.

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Optikos Corp.  
OptiPro Systems, LLC  
OptoTech Optical Machinery Inc.  
Photonic Cleaning Technologies  
PI (Physik Instrumente) L.P.  
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## Vacuum, Cooling, Gas Handling Equipment

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scia Systems GmbH

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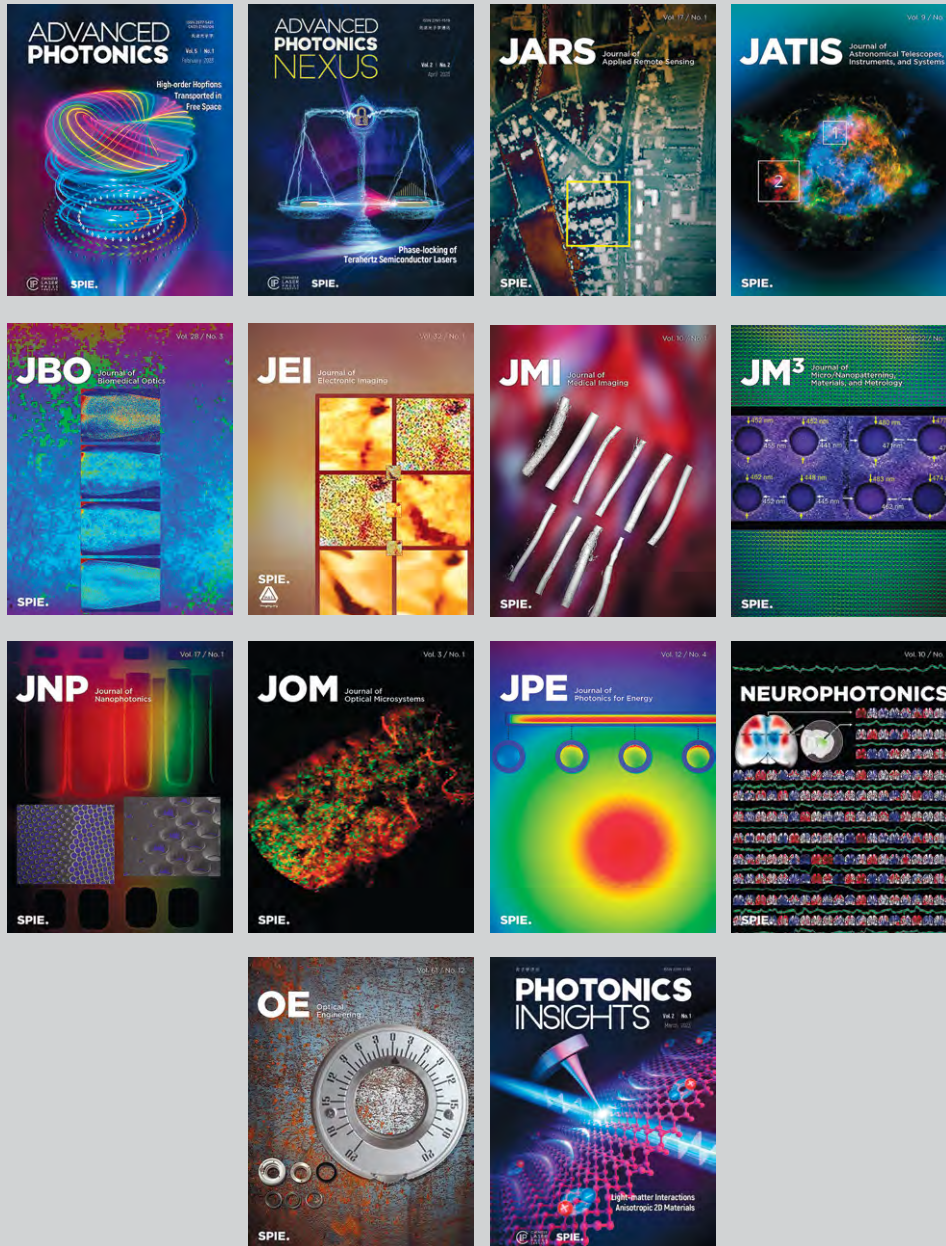
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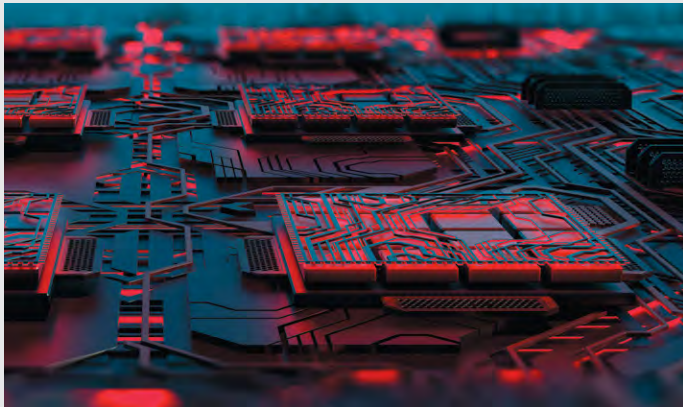
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## NANOSCIENCE + ENGINEERING

Advances in metamaterials, plasmonics, quantum materials and devices, optical trapping, spintronics, and more.

CONFERENCE 12646 ..... 50

### Metamaterials, Metadevices, and Metasystems 2023

Chair(s): Nader Engheta; Mikhail A. Noginov; Nikolay I. Zheludev  
20 - 23 August 2023 | Conv. Ctr. Room 2

CONFERENCE 12647 ..... 58

### Active Photonic Platforms (APP) 2023

Chair(s): Ganapathi S. Subramania; Stavroula Foteinopoulou  
20 - 24 August 2023 | Conv. Ctr. Room 3

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### Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XXI

Chair(s): Takuo Tanaka; Yu-Jung Lu  
20 - 24 August 2023 | Conv. Ctr. Room 4

CONFERENCE 12649 ..... 76

### Optical Trapping and Optical Micromanipulation XX

Chair(s): Kishan Dholakia; Gabriel C. Spalding  
20 - 24 August 2023 | Conv. Ctr. Room 6D

CONFERENCE 12650 ..... 86

### Physical Chemistry of Semiconductor Materials and Interfaces XXII

Chair(s): Andrew J. Musser; Derya Baran  
20 - 22 August 2023 | Conv. Ctr. Room 10

CONFERENCE 12651 ..... 90

### Low-Dimensional Materials and Devices 2023

Chair(s): Nobuhiko P. Kobayashi; A. Alec Talin; Albert V. Davydov; M. Saif Islam  
21 - 23 August 2023 | Conv. Ctr. Room 11A

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### UV and Higher Energy Photonics: From Materials to Applications 2023

Chair(s): Gilles Lérondel; Yong-Hoon Cho; Atsushi Taguchi; Satoshi Kawata  
20 - 21 August 2023 | Conv. Ctr. Room 9

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### Nanoengineering: Fabrication, Properties, Optics, Thin Films, and Devices XX

Chair(s): Balaji Panchapakesan; André-Jean Attias; Wounjhang Park  
20 - 21 August 2023 | Conv. Ctr. Room 1A

CONFERENCE 12654 ..... 102

### Enhanced Spectroscopies and Nanoimaging 2023

Chair(s): Prabhat Verma; Yung Doug Suh  
20 - 23 August 2023 | Conv. Ctr. Room 1B

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### Emerging Topics in Artificial Intelligence (ETAI) 2023

Chair(s): Giovanni Volpe; Joana B. Pereira; Daniel Brunner; Aydogan Ozcan  
20 - 24 August 2023 | Conv. Ctr. Room 6C

CONFERENCE 12656 ..... 116

### Spintronics XVI

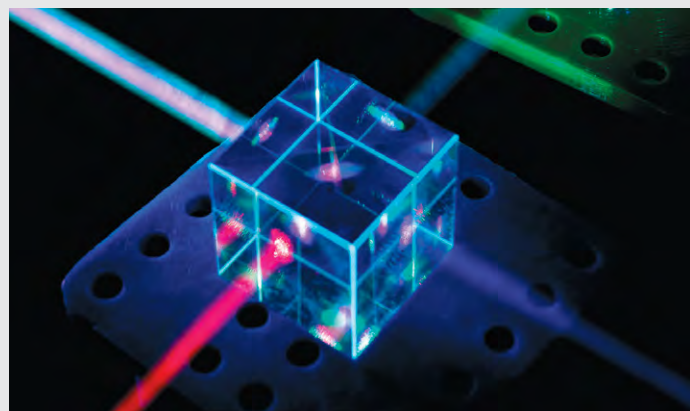
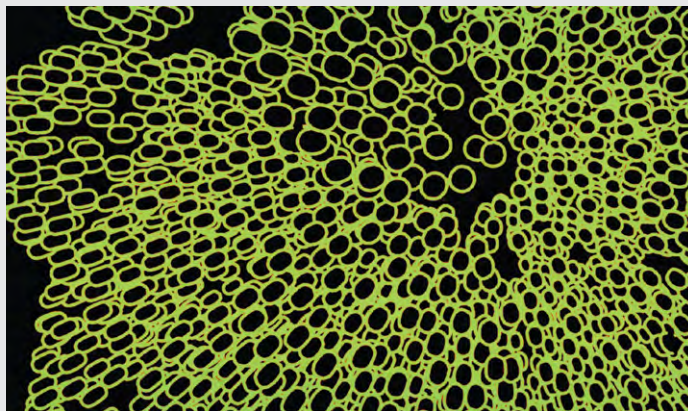
Chair(s): Jean-Eric Wegrowe; Joseph S. Friedman; Manijeh Razeghi; Henri Jaffrès  
20 - 24 August 2023 | Conv. Ctr. Rooms 5A & 5B

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### Quantum Nanophotonic Materials, Devices, and Systems 2023

Chair(s): Cesare Soci; Matthew T. Sheldon; Igor Aharonovich  
23 - 24 August 2023 | Conv. Ctr. Room 1A





## ORGANIC PHOTONICS + ELECTRONICS

Organic-based materials and devices that advance renewable energy sources and other commercial applications.

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### Liquid Crystals XXVII

Chair(s): Iam Choon Khoo

20 - 21 August 2023 | Conv. Ctr. Room 7A

CONFERENCE 12659 ..... 139

### Organic and Hybrid Light Emitting Materials and Devices XXVII

Chair(s): Ji-Seon Kim; Tae-Woo Lee; Franky So

20 - 22 August 2023 | Conv. Ctr. Room 7B

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### Organic, Hybrid, and Perovskite Photovoltaics XXIV

Chair(s): Gang Li; Natalie Stingelin; Ana Flávia Nogueira; Thuc-Quyen Nguyen; Ellen Moons; Barry P. Rand

22 - 24 August 2023 | Conv. Ctr. Room 10

CONFERENCE 12661 ..... 150

### Organic and Hybrid Sensors and Bioelectronics XVI

Chair(s): Ioannis Kyriassis; Emil J. W. List-Kratochvil; Sahika Inal

20 - 21 August 2023 | Conv. Ctr. Room 6F

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### Organic and Hybrid Transistors XXII

Chair(s): Iain McCulloch; Oana D. Jurchescu

21 - 23 August 2023 | Conv. Ctr. Room 6F (Mon PM) and 11B (Tue-Wed)

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### Molecular and Nanophotonic Machines VI

Chair(s): Zouheir Sekkat; Takashige Omatsu

22 - 24 August 2023 | Conv. Ctr. Room 8

## OPTICAL ENGINEERING + APPLICATIONS

Optical design, alignment, testing and fabrication, photonic devices, and particle technologies.

CONFERENCE 12664 ..... 162

### Optical Modeling and Performance Predictions XIII

Chair(s): Mark A. Kahan

21 - 22 August 2023 | Conv. Ctr. Room 17A

CONFERENCE 12665 ..... 166

### Novel Optical Systems, Methods, and Applications XXVI

Chair(s): Cornelius F. Hahlweg; Joseph R. Mulley

22 - 23 August 2023 | Conv. Ctr. Room 14A

CONFERENCE 12666 ..... 170

### Current Developments in Lens Design and Optical Engineering XXIV

Chair(s): R. Barry Johnson; Virendra N. Mahajan; Simon Thibault; Ching-Cherng Sun; Alfonso Padilla-Vivanco

22 August 2023 | Conv. Ctr. Room 14A

CONFERENCE 12667 ..... 173

### Laser Beam Shaping XXIII

Chair(s): Angela Dudley; Alexander V. Laskin

20 August 2023 | Conv. Ctr. Room 17A

CONFERENCE 12668 ..... 176

### New Concepts in Solar and Thermal Radiation Conversion V

Chair(s): Peter Bermel; Jeremy N. Munday

23 August 2023 | Conv. Ctr. Room 17B

CONFERENCE 12669 ..... 178

### Optomechanical Engineering 2023

Chair(s): Keith B. Doyle; Brandon D. Chalifoux; Kenneth R. Castle; José M. Sasián

20 August 2023 | Conv. Ctr. Room 16B

CONFERENCE 12670 ..... 181

### 3D Printing for Lighting

Chair(s): Nadarajah Narendran; Govi Rao; Samuel T. Mills

22 - 23 August 2023 | Conv. Ctr. Room 18

# TECHNICAL CONFERENCES SCHEDULE

Check the SPIE App frequently for updates, presentation times are subject to change

CONFERENCE 12671 . . . . . 184 <b>Advances in Solar Energy: Heliostat Systems Design, Implementation, and Operation</b> Chair(s): Guangdong Zhu; Marc Röger; Zhifeng Wang; Ali M. Khounsary 20 - 22 August 2023   Conv. Ctr. Room 11B	CONFERENCE 12681 . . . . . 243 <b>Ultrafast Nonlinear Imaging and Spectroscopy XI</b> Chair(s): Zhiwen Liu; Demetri Psaltis; Kebin Shi 20 - 21 August 2023   Conv. Ctr. Room 18
CONFERENCE 12672 . . . . . 188 <b>Applied Optical Metrology V</b> Chair(s): Erik Novak; Christopher C. Wilcox 22 - 23 August 2023   Conv. Ctr. Room 9	CONFERENCE 12682 . . . . . 247 <b>Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XVII</b> Chair(s): Shizhuo Yin; Ruyan Guo 20 August 2023   Conv. Ctr. Room 11A
CONFERENCE 12673 . . . . . 192 <b>Optics and Photonics for Information Processing XVII</b> Chair(s): Khan M. Iftekharruddin; Abdul A. S. Awwal; Victor Hugo Diaz-Ramirez; Andrés Márquez 23 August 2023   Conv. Ctr. Room 14B	CONFERENCE 12683 . . . . . 250 <b>Terahertz Emitters, Receivers, and Applications XIV</b> Chair(s): Manijeh Razeghi; Mona Jarrahi 20 - 22 August 2023   Conv. Ctr. Room 14B
CONFERENCE 12674 . . . . . 195 <b>Applications of Digital Image Processing XLVI</b> Chair(s): Andrew G. Tescher; Touradj Ebrahimi 21 - 23 August 2023   Conv. Ctr. Room 12	CONFERENCE 12684 . . . . . 255 <b>ODS 2023: Industrial Optical Devices and Systems</b> Chair(s): Ryuichi Katayama; Yuzuru Takashima 20 August 2023   Conv. Ctr. Room 14A
CONFERENCE 12675 . . . . . 200 <b>Applications of Machine Learning 2023</b> Chair(s): Michael E. Zelinski; Tarek M. Taha; Jonathan Howe; Barath Narayanan Narayanan; Abdul A. S. Awwal; Khan M. Iftekharruddin 23 - 24 August 2023   Conv. Ctr. Room 15B (Wed); Room 7B (Thu)	CONFERENCE 12685 . . . . . 258 <b>Earth Observing Systems XXVIII</b> Chair(s): Xiaoxiong (Jack) Xiong; Xingfa Gu; Jeffrey S. Czaplak-Myers 22 - 24 August 2023   Conv. Ctr. Room 6F
CONFERENCE 12676 . . . . . 204 <b>UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts XI</b> Chair(s): Allison A. Barto; Fanny Keller; H. Philip Stahl 20 - 21 August 2023   Conv. Ctr. Room 16A	CONFERENCE 12686 . . . . . 264 <b>Infrared Remote Sensing and Instrumentation XXXI</b> Chair(s): Marija Strojnik; Jörn Helbert 21 August 2023   Conv. Ctr. Room 14A
CONFERENCE 12677 . . . . . 210 <b>Astronomical Optics: Design, Manufacture, and Test of Space and Ground Systems IV</b> Chair(s): Tony B. Hull; Daewook Kim; Pascal Hallibert 21 - 24 August 2023   Conv. Ctr. Room 16A (Mon-Wed); Room 9 (Thu)	CONFERENCE 12687 . . . . . 267 <b>Infrared Sensors, Devices, and Applications XIII</b> Chair(s): Priyalal Wijewarnasuriya; Arvind I. D'Souza; Ashok K. Sood 22 - 23 August 2023   Conv. Ctr. Room 7A
CONFERENCE 12678 . . . . . 217 <b>UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII</b> Chair(s): Oswald H. Siegmund; Keri Hoadley 20 - 22 August 2023   Conv. Ctr. Room 17B	CONFERENCE 12688 . . . . . 271 <b>Imaging Spectrometry XXVI: Applications, Sensors, and Processing</b> Chair(s): Emmett J. Ientilucci; Christine L. Bradley 20 August 2023   Conv. Ctr. Room 6E
CONFERENCE 12679 . . . . . 224 <b>Optics for EUV, X-Ray, and Gamma-Ray Astronomy XI</b> Chair(s): Stephen L. O'Dell; Jessica A. Gaskin; Giovanni Pareschi; Daniele Spiga 22 - 24 August 2023   Conv. Ctr. Room 17A (Tues-Wed); Room 11B (Thu)	CONFERENCE 12689 . . . . . 274 <b>CubeSats, SmallSats, and Hosted Payloads for Remote Sensing VII</b> Chair(s): Sachidananda R. Babu; Thomas S. Pagano; Jeffery J. Puschell 20 August 2023   Conv. Ctr. Room 8
CONFERENCE 12680 . . . . . 231 <b>Techniques and Instrumentation for Detection of Exoplanets XI</b> Chair(s): Garreth J. Ruane 21 - 24 August 2023   Conv. Ctr. Room 16B (Mon-Wed); Room 11A (Thu)	CONFERENCE 12690 . . . . . 276 <b>Polarization Science and Remote Sensing XI</b> Chair(s): Meredith K. Kupinski; Joseph A. Shaw; Frans Snik 21 - 22 August 2023   Conv. Ctr. Room 8 (Mon-Tue AM) and Room 6F (Tue PM)
	CONFERENCE 12691 . . . . . 280 <b>Laser Communication and Propagation through the Atmosphere and Oceans XII</b> Chair(s): Jaime A. Anguita; Jeremy P. Bos; David T. Wayne 22 - 23 August 2023   Conv. Ctr. Room 6E (Tue) and 7B (Wed)

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Check the SPIE App frequently for updates, presentation times are subject to change

CONFERENCE 12692 ..... 284

**Quantum Communications and Quantum Imaging XXI**

Chair(s): Keith S. Deacon; Ronald E. Meyers

20 - 21 August 2023 | Conv. Ctr. Room 15A

CONFERENCE 12693 ..... 288

**Unconventional Imaging, Sensing, and Adaptive Optics 2023**

Chair(s): Jean J. Dolne; Mark F. Spencer; Santasri R. Bose-Pillai

21 - 24 August 2023 | Conv. Ctr. Room 6E

CONFERENCE 12694 ..... 294

**Advances in X-Ray/EUV Optics and Components XVIII**

Chair(s): Hidekazu Mimura; Ali M. Khounsary; Christian Morawe

22 August 2023 | Conv. Ctr. Room 15B

CONFERENCE 12695 ..... 297

**Advances in Metrology for X-Ray and EUV Optics X**

Chair(s): Lahsen Assoufid; Haruhiko Ohashi; Frank Siewert

23 August 2023 | Conv. Ctr. Room 13

CONFERENCE 12696 ..... 300

**Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXV**

Chair(s): Nerine J. Cherepy; Michael Fiederle; Ralph B. James

21 - 22 August 2023 | Conv. Ctr. Room 13

CONFERENCE 12697 ..... 304

**Advances in Computational Methods for X-Ray Optics VI**

Chair(s): Oleg Chubar; Takashi Tanaka

20 - 21 August 2023 | Conv. Ctr. Room 15B

CONFERENCE 12698 ..... 307

**X-Ray Nanoimaging: Instruments and Methods VI**

Chair(s): Barry Lai; Andr ea Somogyi

23 - 24 August 2023 | Conv. Ctr. Room 7A

# TECHNICAL CONFERENCES

## Conference 12646

# Metamaterials, Metadevices, and Metasystems 2023

20 - 23 August 2023 | Conv. Ctr. Room 2

Conference Chairs: **Nader Engheta**, Univ. of Pennsylvania (United States); **Mikhail A. Noginov**, Norfolk State Univ. (United States); **Nikolay I. Zheludev**, Univ. of Southampton (United Kingdom)

Program Committee: **Andrea Alù**, The City Univ. of New York Advanced Science Research Ctr. (United States); **Alexandra Boltasseva**, Purdue Univ. (United States); **Igal Brener**, Sandia National Labs. (United States); **Mark Brongersma**, Stanford Univ. (United States); **Joshua D. Caldwell**, Vanderbilt Univ. (United States); **Subhasish Dutta Gupta**, Univ. of Hyderabad (India); **Jonathan A. Fan**, Stanford Univ. (United States); **Javier García de Abajo**, ICFO - Institut de Ciències Fotòniques (Spain); **Behrad Gholipour**, Univ. of Alberta (Canada); **Harald W. Giessen**, Univ. Stuttgart (Germany); **Maria Kafesaki**, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas (Greece); **Jacob B. Khurgin**, Johns Hopkins Univ. (United States); **Alexander V. Kildishev**, Purdue Univ. (United States); **Yuri S. Kivshar**, The Australian National Univ. (Australia); **Kuniaki Konishi**, The Univ. of Tokyo (Japan); **Uriel Levy**, The Hebrew Univ. of Jerusalem (Israel); **Yu-Jung Lu**, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); **Natalia M. Litchinitser**, Duke Univ. (United States); **Renmin Ma**, Peking Univ. (China); **Tigran V. Shahbazyan**, Jackson State Univ. (United States); **Timur Shegai**, Chalmers Univ. of Technology (Sweden); **Gennady B. Shvets**, Cornell Univ. (United States); **David R. Smith**, Duke Univ. (United States); **Sergei Tretyakov**, Aalto Univ. School of Science and Technology (Finland); **Din Ping Tsai**, City Univ. of Hong Kong (Hong Kong, China); **Jeong Weon Wu**, Ewha Womans Univ. (Republic of Korea)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: FUNDAMENTALS I

20 August 2023 • 8:00 AM - 10:05 AM | Conv. Ctr. Room 2  
Session Chair: Owen D. Miller, Yale Univ. (United States)

12646-3

#### **Role of complex frequency singularities in nanophotonics** (*Invited Paper*)

Author(s): Patrice Genevet, Colorado School of Mines (France)  
20 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 2

12646-2

#### **Fundamental limits to linear and nonlinear optical materials and metamaterials** (*Invited Paper*)

Author(s): Francesco Monticone, Cornell Univ. (United States)  
20 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 2

12646-4

#### **From Radiative to nonradiative Mie-tronics with the topology of light and matter** (*Invited Paper*)

Author(s): Natalia M. Litchinitser, Hooman Barati Sedeh, Duke Univ. (United States)  
20 August 2023 • 8:50 AM - 9:15 AM | Conv. Ctr. Room 2

12646-1

#### **Topological plasmonics and plasmonic twistrionics: Skyrmions, merons, quasicrystals, and sykrmion bags** (*Invited Paper*)

Author(s): Harald Giessen, Univ. Stuttgart (Germany)  
20 August 2023 • 9:15 AM - 9:40 AM | Conv. Ctr. Room 2

12646-93

#### **Semi-general deep learning surrogate photonic simulators** (*Invited Paper*)

Author(s): Jonathan A. Fan, Stanford Univ. (United States)  
20 August 2023 • 9:40 AM - 10:05 AM | Conv. Ctr. Room 2

Coffee Break 10:05 AM - 10:35 AM

#### SESSION 2: FUNDAMENTALS II

20 August 2023 • 10:35 AM - 12:30 PM | Conv. Ctr. Room 2  
Session Chair: Francesco Monticone, Cornell Univ. (United States)

12646-5

#### **Leveraging materials anisotropy for polarization and chirality control** (*Invited Paper*)

Author(s): Georgia T. Papadakis, Michael Enders, Aleksandra Deeva, Lu Wang, Mitraddeep Sarkar, ICFO - Institut de Ciències Fotòniques (Spain)  
20 August 2023 • 10:35 AM - 11:00 AM | Conv. Ctr. Room 2

12646-6

#### **Convex nanophotonics: Hidden structure in Maxwell's equations** (*Invited Paper*)

Author(s): Owen D. Miller, Yale Univ. (United States)  
20 August 2023 • 11:00 AM - 11:25 AM | Conv. Ctr. Room 2

12646-7

#### **Photonic black hole** (*Invited Paper*)

Author(s): Nina Vaidya, Univ. of Southampton (United Kingdom); Eric Plum, Optoelectronics Research Ctr., Ctr. for Photonic Metamaterials (United Kingdom); Anton N. Vetlugin, Nanyang Technological Univ., Ctr. for Disruptive Photonic Technologies (Singapore); Nikolay I. Zheludev, Optoelectronics Research Ctr., Ctr. for Photonic Metamaterials (United Kingdom), Nanyang Technological Univ., Ctr. for Disruptive Photonic Technologies (Singapore)  
20 August 2023 • 11:25 AM - 11:50 AM | Conv. Ctr. Room 2

12646-8

#### **The effective permittivity of a composite material** (*Invited Paper*)

Author(s): Evgenii E. Narimanov, Purdue Univ. (United States)  
20 August 2023 • 11:50 AM - 12:15 PM | Conv. Ctr. Room 2

12646-92

#### **Integrated optical control of atomic systems**

Author(s): Amit K. Agrawal, National Institute of Standards and Technology (United States)  
20 August 2023 • 12:15 PM - 12:30 PM | Conv. Ctr. Room 2

Lunch Break 12:30 PM - 1:50 PM

### SESSION 3: EMISSION

20 August 2023 • 1:50 PM - 3:15 PM | Conv. Ctr. Room 2

Session Chair: Georgia Theano Papadakis, ICFO - Institut de Ciències  
Fotòniques (Spain)

12646-9

#### Scalable quantum photonics with single-photon emitters in silicon nitride (*Invited Paper*)

Author(s): Vladimir M. Shalaev, Purdue Univ. (United States)

20 August 2023 • 1:50 PM - 2:15 PM | Conv. Ctr. Room 2

12646-10

#### Chiral emission from perovskite metasurfaces via chiral quasi-bound states in the continuum

Author(s): Young Chul Jun, Ulsan National Institute of Science and Technology (Republic of Korea)

20 August 2023 • 2:15 PM - 2:30 PM | Conv. Ctr. Room 2

12646-11

#### Enhancing semiconductor quantum dot emission with electric and magnetic dipole modes in Mie metasurfaces

Author(s): Samuel Prescott, Univ. College London (United Kingdom); Prasad P. Iyer, Hyunseung Jung, Ting Shan Luk, Jacob Henshaw, Andrew Mounce, Sadvikas J. Addamane, Igal Brener, Sandia National Labs. (United States); Oleg Mitrofanov, Univ. College London (United Kingdom), Sandia National Labs. (United States)

20 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 2

12646-12

#### Interferometric all-optical routing of upconverted light by dielectric metasurfaces

Author(s): Attilio Zilli, Agostino Di Francescantonio, Politecnico di Milano (Italy); Davide Rocco, Univ. degli Studi di Brescia (Italy); Fabrizio Conti, Politecnico di Milano (Italy); Vincent Vinel, Adrien Borne, Univ. Paris Cité, CNRS, Lab. Matériaux et Phénomènes Quantiques (France); Aristide Lemaître, Univ. Paris-Saclay, CNRS, Ctr. de Nanosciences et de Nanotechnologies (France); Paolo Biagioni, Lamberto Duò, Politecnico di Milano (Italy); Costantino De Angelis, Univ. degli Studi di Brescia (Italy), Istituto Nazionale di Ottica (Italy); Giuseppe Leo, Univ. Paris Cité, CNRS, Lab. Matériaux et Phénomènes Quantiques (France); Marco Finazzi, Michele Celebrano, Politecnico di Milano (Italy)

20 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 2

12646-14

#### Realization of a PT-symmetric microchip laser in the polarization space using nanostructured laser mirrors

Author(s): Shawn Lapointe, Théo Courval, Univ. de Moncton (Canada); Fangfang Li, Ctr. for Photonic Sciences, Univ. of Eastern Finland (Finland); Marina Fetisova, Ctr. for Photonic Sciences (Finland); Thomas Kampfe, Lab. Hubert Curien, Institut d'Optique Graduate School, Univ. Lyon, Univ. Jean Monnet Saint-Etienne, CNRS (France); Isabelle Verrier, Lab. Hubert Curien (France); Yves Jourlin, Univ. Lyon (France), Univ. Jean Monnet Saint-Etienne (France); Petri Karvinen, Markku Kuittinen, Ctr. for Photonic Sciences, Univ. of Eastern Finland (Finland); Jean-Francois Bisson, Univ. de Moncton (Canada)

20 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 2

Coffee Break 3:15 PM - 3:45 PM

### SESSION 4: ENZ PHENOMENA

20 August 2023 • 3:45 PM - 5:25 PM | Conv. Ctr. Room 2

Session Chair: Natalia M. Litchinitser, Duke Univ. (United States)

12646-15

#### Intrinsic and extrinsic effects in epsilon-near-zero nonlinear optics (*Invited Paper*)

Author(s): Nathaniel Kinsey, Adam Ball, Virginia Commonwealth Univ. (United States); Dhruv Fomra, National Institute of Standards and Technology (United States), Virginia Commonwealth Univ. (United States); Jingwei Wu, Virginia Commonwealth Univ. (United States); Ray Secondo, Azimuth Corp. (United States), Air Force Research Lab. (United States); Samprity Saha, Virginia Commonwealth Univ. (United States); Amit Agrawal, Henri Lezec, National Institute of Standards and Technology (United States)

20 August 2023 • 3:45 PM - 4:10 PM | Conv. Ctr. Room 2

12646-17

#### Optical nonreciprocity in metasurfaces with epsilon-near zero materials

Author(s): Aditya Tripathi, The Australian National Univ. (Australia); Rebecca H. Aschwanden, Univ. Paderborn (Germany); Piyush Jangid, The Australian National Univ. (Australia); Basudeb Sain, Thomas Zentgraf, Univ. Paderborn (Germany); Sergey Kruk, The Australian National Univ. (Australia), Univ. Paderborn (Germany)

20 August 2023 • 4:10 PM - 4:25 PM | Conv. Ctr. Room 2

12646-18

#### High reflectance multilayered epsilon-near-zero AZO/ZnO metamaterial

Author(s): Blake Buckner, Lyuba Kuznetsova, San Diego State Univ. (United States)

20 August 2023 • 4:25 PM - 4:40 PM | Conv. Ctr. Room 2

12646-19

#### Epsilon-near-zero phase-matching for second-harmonic generation in semiconductor-based nanowire hyperbolic metamaterial

Author(s): Surawut Wicharn, Srinakharinwirot Univ. (Thailand); Prathan Buranasiri, King Mongkut's Institute of Technology Ladkrabang (Thailand)

20 August 2023 • 4:40 PM - 4:55 PM | Conv. Ctr. Room 2

12646-95

#### Invertible ultrafast nonlinearity in epsilon-near-zero materials

Author(s): Hayk Harutyunyan, Chentao Li, Xinyu Tian, Guoce Yang, Emory Univ. (United States); Sukrith U. Dev, Monica Allen, Jeffery Allen, Air Force Research Lab. (United States)

20 August 2023 • 4:55 PM - 5:10 PM | Conv. Ctr. Room 2

12646-16

#### Magnetically tunable zero-index metamaterials

Author(s): Yucong Yang, Univ. of Electronic Science and Technology of China (China); Yueyang Liu, Tsinghua Univ. (China); Jun Qin, Songgang Cai, Jiejun Su, Longjiang Deng, Univ. of Electronic Science and Technology of China (China); Yang Li, Tsinghua Univ. (China); Lei Bi, Univ. of Electronic Science and Technology of China (China)

20 August 2023 • 5:10 PM - 5:25 PM | Conv. Ctr. Room 2

# TECHNICAL CONFERENCES

## Conference 12646

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics *(Plenary Presentation)*

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems *(Plenary Presentation)*

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs *(Plenary Presentation)*

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications *(Plenary Presentation)*

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments *(Plenary Presentation)*

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

Coffee Break 9:55 AM - 10:20 AM

### SESSION 5: SPACE-TIME PHENOMENA

21 August 2023 • 10:20 AM - 11:35 AM | Conv. Ctr. Room 2

Session Chair: Tigran V. Shahbazyan, Jackson State Univ. (United States)

12646-20

#### Generating structured space-time light bullets with nonlocal metasurface *(Invited Paper)*

Author(s): Cheng Guo, Stanford Univ. (United States); Meng Xiao, Wuhan Univ. (China); Meir Orenstein, Technion-Israel Institute of Technology (Israel); Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 10:20 AM - 10:45 AM | Conv. Ctr. Room 2

12646-21

#### Experimental demonstration of space-time modulated metasurfaces *(Invited Paper)*

Author(s): Jared Sisler, Prachi Thureja, Meir Y. Grajower, Ruzan Sokhoyan, Harry A. Atwater, Caltech (United States)

21 August 2023 • 10:45 AM - 11:10 AM | Conv. Ctr. Room 2

12646-23

#### Mechanisms of spontaneous synchronization in photonic metamaterial continuous time crystals *(Invited Paper)*

Author(s): Tongjun Liu, Venugopal Raskatla, Jun-Yu Ou, Kevin F. MacDonald, Univ. of Southampton (United Kingdom); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom), Nanyang Technological Univ. (Singapore)

21 August 2023 • 11:10 AM - 11:35 AM | Conv. Ctr. Room 2

Lunch Break 11:35 AM - 1:05 PM

### SESSION 6: FUNDAMENTALS III

21 August 2023 • 1:05 PM - 2:40 PM | Conv. Ctr. Room 2

Session Chair: Natalia M. Litchinitser, Duke Univ. (United States)

12646-24

#### Interference effects in plasmon-enhanced metal photoluminescence *(Invited Paper)*

Author(s): Jawnaye A. Nash, Tigran V. Shahbazyan, Jackson State Univ. (United States)

21 August 2023 • 1:05 PM - 1:30 PM | Conv. Ctr. Room 2

12646-25

#### Why optics needs thickness and how much it needs *(Invited Paper)*

Author(s): David A. B. Miller, Stanford Univ. (United States)

21 August 2023 • 1:30 PM - 1:55 PM | Conv. Ctr. Room 2

12646-26

#### Intrinsic strong light-matter coupling with self-hybridized bound states in the continuum in van der Waals metasurfaces

Author(s): Thomas Weber, Lucca Kühner, Luca Sortino, Ludwig-Maximilians-Univ. München (Germany); Amine Ben Mhenni, Nathan Wilson, Julius Kühne, Jonathan Finley, Technische Univ. München (Germany); Stefan Maier, Monash Univ. (Australia); Andreas Tittl, Ludwig-Maximilians-Univ. München (Germany)

21 August 2023 • 1:55 PM - 2:10 PM | Conv. Ctr. Room 2

12646-27

### Plasmonic bound states in the continuum to tailor light-matter coupling

Author(s): Andreas Aigner, Andreas Tittl, Juan Wang, Thomas Weber, Ludwig-Maximilians-Univ. München (Germany); Yuri Kivshar, The Australian National Univ. (Australia); Stefan Maier, Haoran Ren, Monash Univ. (Australia)

21 August 2023 • 2:10 PM - 2:25 PM | Conv. Ctr. Room 2

12646-29

### Optical beam shaping by Dirac-mass engineered topological junction metasurfaces

Author(s): Ki Young Lee, Jae Woong Yoon, Hanyang Univ. (Republic of Korea)

21 August 2023 • 2:25 PM - 2:40 PM | Conv. Ctr. Room 2

Coffee Break 2:40 PM - 3:10 PM

#### SESSION 7: DEVICES I

21 August 2023 • 3:10 PM - 5:30 PM | Conv. Ctr. Room 2

Session Chair: David A. B. Miller, Stanford Univ. (United States)

12646-30

### Vertical MIM metamaterial absorber for IR spectroscopic detection of gas molecules *(Invited Paper)*

Author(s): Takuo Tanaka, RIKEN (Japan)

21 August 2023 • 3:10 PM - 3:35 PM | Conv. Ctr. Room 2

12646-31

### Meta-optical systems for coherent field transformations *(Invited Paper)*

Author(s): Yakov Soskind, Coherent Photonics, LLC (United States)

21 August 2023 • 3:35 PM - 4:00 PM | Conv. Ctr. Room 2

12646-33

### Infrared imaging via third-order nonlinear processes

Author(s): Ze Zheng, Gabriel Sanderson, Cuifeng Ying, Nottingham Trent Univ. (United Kingdom); Lujun Huang, East China Normal Univ. (China); Arman Yousefi, Nottingham Trent Univ. (United Kingdom); Dragomir N. Neshev, The Australian National Univ. (Australia); Lei Xu, Mohsen Rahmani, Nottingham Trent Univ. (United Kingdom)

21 August 2023 • 4:00 PM - 4:15 PM | Conv. Ctr. Room 2

12646-34

### Humidity-responsive full color nano-pixels via nanoporous Fabry-Pérot structure

Author(s): Jaekyung Kim, Byoungsu Ko, Younghwan Yang, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

21 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 2

12646-35

### Design, fabrication, and characterization of metasurfaces for wavefront sensing and high-contrast imaging in the visible

Author(s): Tobias Wenger, Jet Propulsion Lab. (United States), Caltech (United States); Garreth Ruane, Jeff Jewell, Mahmood Bagheri, James K. Wallace, Jet Propulsion Lab. (United States)

21 August 2023 • 4:30 PM - 4:45 PM | Conv. Ctr. Room 2

12646-94

### Fabricating high-performance polarized-insensitive metalens using nano-imprint lithography

Author(s): Zahrah Alankhli, King Abdullah Univ. of Science and Technology (Saudi Arabia)

21 August 2023 • 4:45 PM - 5:00 PM | Conv. Ctr. Room 2

12646-97

### Low loss silicon nitride photonics for short wavelengths

Author(s): Hani Nejadriahi, Eric Kittlaus, Jet Propulsion Lab. (United States)

21 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 2

12646-32

### Theoretical analysis of graphene-coated coaxial slot antenna for microwave hyperthermic ablation

Author(s): Tayyab H. Malik, Ctr. of Advanced Studies in Health & Technology (Pakistan)

21 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 2

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12646-81

### Gap-plasmon-driven liquid-crystal integrated chiral metasurface for intensity tunable hologram at the visible frequencies

Author(s): Younghwan Yang, Hongyoon Kim, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-82

### Structural coloration using bandgap engineered, low-optical losses hydrogenated amorphous silicon

Author(s): Younghwan Yang, Jaehyuck Jang, Chungwan Jung, Trevon Badloe, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-84

### Analysis of plasmonic topological edge states using dual-layered complementary structures by finite-difference time-domain method

Author(s): Shihhui Gilbert Chang, National Cheng Kung Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-85

### Efficient broadband mid-infrared linear-to-circular polarization conversion using a nanorod-based metasurface

Author(s): Huanling Zou, Geoffrey Nash, Univ. of Exeter (United Kingdom)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12646

12646-86

### Compact coherent perfect absorber using topological guided-mode resonances

Author(s): Chan Young Park, Ki Young Lee, Jae Woong Yoon, Hanyang Univ. (Republic of Korea)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-87

### MWIR metalenses designed with adjoint optimized libraries

Author(s): Joshua Rollag, KBR, Inc. (United States), Air Force Research Lab. (United States); Ray Wambold, Ricky Gibson, Air Force Research Lab. (United States)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-88

### End-to-end optimization of meta-lens doublet for high-quality wide-angle imaging

Author(s): Yeongmyeong Park, Byoungho Lee, Yoonchan Jeong, Seoul National Univ. (Republic of Korea)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-89

### Manipulating phonon-polariton resonances in patterned $\alpha$ -MoO<sub>3</sub>

Author(s): Mariia S. Stepanova, Zhaoxu Li, Mashnoon A. Sakib, Naveed Hussain, Hemantha K. Wickramasinghe, Maxim R. Shcherbakov, Univ. of California, Irvine (United States)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12646-90

### Multilayer dielectric reflective metalens without metallic mirror

Author(s): Jose Carlos Basilio-Ortiz, Ivan Moreno, Univ. Autónoma de Zacatecas (Mexico)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 8: METASURFACES

22 August 2023 • 8:00 AM - 10:05 AM | Conv. Ctr. Room 2  
Session Chair: Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

12646-36

### Electro-optic metasurfaces for controlling amplitude, phase, and polarisation of light (*Invited Paper*)

Author(s): Ilya V. Shadrivov, Luyao Wang, The Australian National Univ. (Australia)  
22 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 2

12646-37

### Bandgap engineered low-loss a-Si:H for efficient dielectric metasurfaces at visible frequencies

Author(s): Younghwan Yang, Pohang Univ. of Science and Technology (Republic of Korea); Gwanho Yoon, Seoul National Univ. of Science and Technology (Republic of Korea); Minkyung Kim, Gwangju Institute of Science and Technology (Republic of Korea); Dasol Lee, Yonsei Univ. (Republic of Korea); Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)  
22 August 2023 • 8:25 AM - 8:40 AM | Conv. Ctr. Room 2

12646-38

### Humidity-responsive tunable metasurfaces with nanoimprinted structural polyvinyl alcohol

Author(s): Byoungsu Ko, Trevon Badloe, Younghwan Yang, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)  
22 August 2023 • 8:40 AM - 8:55 AM | Conv. Ctr. Room 2

12646-39

### Breaking the efficiency limit of polarisers with a single-layer metasurface

Author(s): Neuton Li, The Australian National Univ. (Australia); Shaun Lung, Friedrich-Schiller-Univ. Jena (Germany); Jihua Zhang, Dragomir Neshev, Andrey Sukhorukov, The Australian National Univ. (Australia)  
22 August 2023 • 8:55 AM - 9:10 AM | Conv. Ctr. Room 2

12646-40

### Nanophotonics by using metasurface for full-space structured light and dynamic imaging system

Author(s): Yeseul Kim, Trevon Badloe, Pohang Univ. of Science and Technology (Republic of Korea); Inki Kim, Sungkyunkwan Univ. (Republic of Korea); Gyeongtae Kim, Jooyeong Yun, Pohang Univ. of Science and Technology (Republic of Korea)  
22 August 2023 • 9:10 AM - 9:25 AM | Conv. Ctr. Room 2

12646-42

### Topological polaritons in two-dimensional materials integrated photonic topological metasurfaces (*Invited Paper*)

Author(s): Sriram Guddala, Filipp Komissarenko, Svetlana Kiriushchikina, Anton Vakulenko, Vinod M. Menon, Alexander B. Khanikaev, The City College of New York (United States); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States)  
22 August 2023 • 9:25 AM - 9:50 AM | Conv. Ctr. Room 2

12646-43

### Active and tunable metasurfaces

Author(s): Zhengli Han, Christian Frydendahl, Stia Ram Indukuri, Noa Mazurski, Uriel Levy, Aharon Weiss, The Hebrew Univ. of Jerusalem (Israel)  
22 August 2023 • 9:50 AM - 10:05 AM | Conv. Ctr. Room 2

### Coffee Break 10:05 AM - 10:30 AM

### SESSION 9: DEVICES II

22 August 2023 • 10:30 AM - 12:25 PM | Conv. Ctr. Room 2  
Session Chair: Ilya V. Shadrivov, The Australian National Univ. (Australia)

12646-44

### Ultrasensitive plasmonic superconducting single-photon detectors for visible light (*Invited Paper*)

Author(s): Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)  
22 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 2

12646-45

### Design and verification of periodic metallic mesh structures for optical windows

Author(s): Ilker Gunay, Tolga Yelboga, ASELSAN A.S. (Turkey); Asim Egemen Yilmaz, Ankara Univ. (Turkey)  
22 August 2023 • 10:55 AM - 11:10 AM | Conv. Ctr. Room 2



12646-46

### Continuously-varifocal metalens in the visible frequency

Author(s): Po-Sheng Huang, Shih-Hsiu Huang, National Cheng Kung Univ. (Taiwan); Cheng Hung Chu, National Taiwan Univ. (Taiwan); Takuo Tanaka, RIKEN Ctr. for Advanced Photonics (Japan); Pin Chieh Wu, National Cheng Kung Univ. (Taiwan)

22 August 2023 • 11:10 AM - 11:25 AM | Conv. Ctr. Room 2

12646-47

### Compensation of coupling-induced phase error in meta-optical devices

Author(s): Shengyuan Chang, Xingjie Ni, The Pennsylvania State Univ. (United States)

22 August 2023 • 11:25 AM - 11:40 AM | Conv. Ctr. Room 2

12646-48

### Broadband analog image processing with inverse-designed metaoptics in the mid-infrared

Author(s): Phillippe Pearson, Gregory Roberts, Andrei Faraon, Caltech (United States)

22 August 2023 • 11:40 AM - 11:55 AM | Conv. Ctr. Room 2

12646-49

### All-dielectric metasurface infrared absorber with symmetry-protected bound states in continuum

Author(s): Ming-Jyun Ye, National Yang Ming Chiao Tung Univ. (Taiwan); Dmitrii N. Maksimov, Institute of Physics L. V. Kirensky SB RAS (Russian Federation); Kuo-Ping Chen, National Yang Ming Chiao Tung Univ. (Taiwan)

22 August 2023 • 11:55 AM - 12:10 PM | Conv. Ctr. Room 2

12646-50

### Terahertz metamaterial-based sensor for sensing of ethanol and glucose

Author(s): Ruchi Bhati, Anil K. Malik, Chaudhary Charan Singh Univ. (India)

22 August 2023 • 12:10 PM - 12:25 PM | Conv. Ctr. Room 2

Lunch/Exhibition Break 12:25 PM - 1:55 PM

#### SESSION 10: DEVICES III

22 August 2023 • 1:55 PM - 3:20 PM | Conv. Ctr. Room 2

Session Chair: Takuo Tanaka, RIKEN (Japan)

12646-51

### Leveraging thermo-optical effects in nanoantennas and metasurfaces (*Invited Paper*)

Author(s): Giulia Tagliabue, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

22 August 2023 • 1:55 PM - 2:20 PM | Conv. Ctr. Room 2

12646-53

### Metasurface-enabled lossy non-monotonous imaging via bullseye focus

Author(s): Sinuhé Perea-Puente, Francisco J. Rodríguez-Fortuño, King's College London (United Kingdom)

22 August 2023 • 2:20 PM - 2:35 PM | Conv. Ctr. Room 2

12646-54

### Metadiffuser fabricated by DUV lithography for high-precision wavefront manipulation

Author(s): Hsuehli Liu, Chunyen Chuo, Wilson Guo, Linchia Huang, Peichen Yu, National Yang Ming Chiao Tung Univ. (Taiwan); Chunghsuan Huang, Chaujern Cheng, National Taiwan Normal Univ. (Taiwan)

22 August 2023 • 2:35 PM - 2:50 PM | Conv. Ctr. Room 2

12646-56

### Fabrication of high aspect ratio structures for meta-surface optics

Author(s): D. Bruce Burckel, Katherine M. Musick, Travis R. Young, Loren Gastian, John Mudrick, Sandia National Labs. (United States)

22 August 2023 • 2:50 PM - 3:05 PM | Conv. Ctr. Room 2

12646-96

### 3D sensing with III-V metasurface-coupled VCSELs

Author(s): Fenghao Xu, Jung-Hwan Song, Jiho Hong, Joao Paulo Berenguer, Benjamin A. Reeves, Yan Joe Lee, Mark L. Brongersma, Stanford Univ. (United States)

22 August 2023 • 3:05 PM - 3:20 PM | Conv. Ctr. Room 2

Coffee Break 3:20 PM - 3:50 PM

#### SESSION 11: TOPOLOGICAL PHENOMENA

22 August 2023 • 3:50 PM - 5:30 PM | Conv. Ctr. Room 2

Session Chair: Alexander V. Kildishev, Purdue Univ. (United States)

12646-57

### Trapped phonon-polariton modes induced by topological defects in mid-IR metasurfaces integrated with hexagonal boron nitride (*Invited Paper*)

Author(s): Daria Smirnova, The Australian National Univ. (Australia); Filipp Komissarenko, Anton Vakulenko, Svetlana Kiriushchekina, The City College of New York (United States); Ekaterina Smolina, The Australian National Univ. (Australia); Sriram Guddala, The City College of New York (United States); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States), The City College of New York (United States); Alexander B. Khanikaev, The City College of New York (United States)

22 August 2023 • 3:50 PM - 4:15 PM | Conv. Ctr. Room 2

12646-58

### Control of scattering, trapping, and guiding of light with adiabatic topological photonic metasurfaces (*Invited Paper*)

Author(s): Anton Vakulenko, Svetlana Kiriushchekina, The City College of New York (United States); Daria Smirnova, The Australian National Univ. (Australia); Sriram Guddala, Filipp Komissarenko, The City College of New York (United States); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States); Monica Allen, Jeffery Allen, Air Force Research Lab. (United States); Alexander B. Khanikaev, The City College of New York (United States)

22 August 2023 • 4:15 PM - 4:40 PM | Conv. Ctr. Room 2

12646-59

### Circular photogalvanic effect in nanostructured topological insulators (*Invited Paper*)

Author(s): Alexander M. Dubrovkin, Giorgio Adamo, Nikolay I. Zheludev, Cesare Soci, Nanyang Technological Univ. (Singapore)

22 August 2023 • 4:40 PM - 5:05 PM | Conv. Ctr. Room 2

# TECHNICAL CONFERENCES

## Conference 12646

12646-60

### Beam splitters, interferometers, and cavities based on topological waveguides *(Invited Paper)*

Author(s): Gennady B. Shvets, Cornell Univ. (United States)

22 August 2023 • 5:05 PM - 5:30 PM | Conv. Ctr. Room 2

## WEDNESDAY 23 AUGUST 2023

### SESSION 12: DEVICES IV

23 August 2023 • 8:10 AM - 10:00 AM | Conv. Ctr. Room 2

Session Chair: Viktor A. Podolskiy,  
Univ. of Massachusetts Lowell (United States)

12646-61

### Intelligent meta-devices for multimodal perception *(Invited Paper)*

Author(s): Din Ping Tsai, Xiaoyuan Liu, Muku Chen, City Univ. of Hong Kong (Hong Kong, China)

23 August 2023 • 8:10 AM - 8:35 AM | Conv. Ctr. Room 2

12646-62

### Ultrashort pulse management with nanorod and nanotube metamaterials *(Invited Paper)*

Author(s): Anatoly V. Zayats, Anastasiia Zaleska, Alexey Krasavin, Anton Bykov, Francisco J. Rodríguez-Fortuño, Jack Kingsley-Smith, Francesco Lotti, King's College London (United Kingdom); Tomasz Stefaniuk, Univ. of Warsaw (Poland); Jingyi Wu, Wayne Dickson, King's College London (United Kingdom)

23 August 2023 • 8:35 AM - 9:00 AM | Conv. Ctr. Room 2

12646-63

### CMOS Nanophotonics: Converting CMOS chips to active metamaterials

Author(s): Mohamed El Kabbash, Dirk Englund, Sivan Trajtenberg Mills, Isaac Harris, Ruonan Han, Massachusetts Institute of Technology (United States)

23 August 2023 • 9:00 AM - 9:15 AM | Conv. Ctr. Room 2

12646-64

### Simulink-based study on frequency tuning and bandgap characteristics of flexible metastructural-beams with adjustable mass location

Author(s): Hossein Alimohammadi, Kristina Vassilyeva, Tallinn Univ. of Technology (Estonia); S. Hassan HosseinNia, Technische Univ. Delft (Netherlands); Eduard Petlenkov, Tallinn Univ. of Technology (Estonia)

23 August 2023 • 9:15 AM - 9:30 AM | Conv. Ctr. Room 2

12646-65

### Near-field imaging of optical resonance modes in silicon metasurfaces using photoelectron microscopy

Author(s): Alex Boehm, Sandia National Labs. (United States); Sylvain D. Gennaro, Chloe F. Doiron, Sandia National Labs. (United States), The Ctr. for Integrated Nanotechnologies (United States); Thomas E. Beechem, Birck Nanotechnology Ctr., Purdue Univ. (United States); Michael B. Sinclair, Sandia National Labs. (United States); Igal Brener, Raktim Sarma, Sandia National Labs. (United States), The Ctr. for Integrated Nanotechnologies (United States); Taisuke Ohta, Sandia National Labs. (United States)

23 August 2023 • 9:30 AM - 9:45 AM | Conv. Ctr. Room 2

12646-91

### 2D Bessel beam generation using symphotonic medium

Author(s): Divya Pande, Duke Univ. (United States); Patrick T. Bowen, Metaccept Systems (United States); David R. Smith, Duke Univ. (United States), Metaccept Systems (United States)

23 August 2023 • 9:45 AM - 10:00 AM | Conv. Ctr. Room 2

Coffee Break 10:00 AM - 10:30 AM

### SESSION 13: NOVEL PHENOMENA I

23 August 2023 • 10:30 AM - 11:45 AM | Conv. Ctr. Room 2

Session Chair: Mu Ku Chen,  
City Univ. of Hong Kong (Hong Kong, China)

12646-67

### Efficient spatial and temporal shaping of mid-IR light at the nanoscale with photonic funnels *(Invited Paper)*

Author(s): Viktor A. Podolskiy, Jacob LaMountain, Univ. of Massachusetts Lowell (United States); Amogh Raju, Daniel Wasserman, The Univ. of Texas at Austin (United States)

23 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 2

12646-69

### Probing laser-induced dewetting and damage mechanisms in plasmonic thin films for high power beam manipulation *(Invited Paper)*

Author(s): Thejaswi U. Tumkur Umanath, Lawrence Livermore National Lab. (United States); Ruzan Sokhoyan, Caltech (United States); Elias Anwar, Mikhail A. Noginov, Norfolk State Univ. (United States); Harry A. Atwater, Caltech (United States); Selim Elhadi, Seurat Technologies (United States); Eyal Feigenbaum, Lawrence Livermore National Lab. (United States)

23 August 2023 • 10:55 AM - 11:20 AM | Conv. Ctr. Room 2

12646-70

### Two-dimensional materials for nanophotonics *(Invited Paper)*

Author(s): F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain)

23 August 2023 • 11:20 AM - 11:45 AM | Conv. Ctr. Room 2

Lunch/Exhibition Break 11:45 AM - 1:15 PM

### SESSION 14: NOVEL PHENOMENA II

23 August 2023 • 1:15 PM - 3:15 PM | Conv. Ctr. Room 2

Session Chair: Vinod M. Menon,  
The City College of New York (United States)

12646-71

### Manipulation of light through structuring of the orbital angular momentum *(Invited Paper)*

Author(s): Antonio Ambrosio, Istituto Italiano di Tecnologia (Italy)

23 August 2023 • 1:15 PM - 1:40 PM | Conv. Ctr. Room 2

12646-72

### Inverse designed integrated photonics *(Invited Paper)*

Author(s): Jelena Vuckovic, Stanford Univ. (United States)

23 August 2023 • 1:40 PM - 2:05 PM | Conv. Ctr. Room 2

12646-73

### **Ultrasensitive optical toroidal mode in all-dielectric nanostructures**

Author(s): Ai-Yin Liu, Snow H. Tseng, Hui-Hsin Hsiao, National Taiwan Univ. (Taiwan)

23 August 2023 • 2:05 PM - 2:20 PM | Conv. Ctr. Room 2

12646-74

### **Anomalous free-form optical ring resonators enabled by non-uniform synthetic gauge fields**

Author(s): Yuma Kawaguchi, The City College of New York (United States); Daria Smirnova, The Australian National Univ. (Australia); Filipp Komissarenko, Svetlana Kiriushchikina, Anton Vakulenko, The City College of New York (United States); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States); Alexander B. Khanikaev, The City College of New York (United States)

23 August 2023 • 2:20 PM - 2:35 PM | Conv. Ctr. Room 2

12646-75

### **Controlled transverse spin generation with a vector field controlling metasurface**

Author(s): Pavel D. Terekhov, Md Tarek Rahman, Lidan Zhang, Yimin Ding, Shengyuan Chang, Xingwang Zhang, Xingjie Ni, The Pennsylvania State Univ. (United States)

23 August 2023 • 2:35 PM - 2:50 PM | Conv. Ctr. Room 2

12646-22

### **Modulating in space and time: What is alike and what is not? (Invited Paper)**

Author(s): Jacob B. Khurgin, Johns Hopkins Univ. (United States)

23 August 2023 • 2:50 PM - 3:15 PM | Conv. Ctr. Room 2

**Coffee Break 3:15 PM - 3:45 PM**

#### **SESSION 15: NOVEL PHENOMENA III**

23 August 2023 • 3:45 PM - 5:30 PM | Conv. Ctr. Room 2

Session Chair: Viktor A. Podolskiy,  
Univ. of Massachusetts Lowell (United States)

12646-76

### **Light matter interaction in van der Waals magnets (Invited Paper)**

Author(s): Vinod M. Menon, The City College of New York (United States)

23 August 2023 • 3:45 PM - 4:10 PM | Conv. Ctr. Room 2

12646-77

### **Inverse-designed optical metalelements, metadevices, and metasystems (Invited Paper)**

Author(s): Alexander V. Kildishev, Zhaxylyk Kudyshev, Omer Yesilyurt, Purdue Univ. (United States)

23 August 2023 • 4:10 PM - 4:35 PM | Conv. Ctr. Room 2

12646-78

### **Light trapping in symmetric metasurface via electric octupole resonance**

Author(s): Pavel D. Terekhov, The Pennsylvania State Univ. (United States); Alexei V. Prokhorov, Mikhail Y. Gubin, Shesterikov V. Alexander, Jilin Univ. (China); Xingjie Ni, The Pennsylvania State Univ. (United States); Vladimir Tuz, Jilin Univ. (China); Andrey B. Evlyukhin, Leibniz Univ. Hannover (Germany)

23 August 2023 • 4:35 PM - 4:50 PM | Conv. Ctr. Room 2

12646-79

### **Paradigms for engineering degenerate bound states in the continuum and identifying super-Mossian materials (Invited Paper)**

Author(s): Chloe F. Doiron, Sandia National Labs. (United States)

23 August 2023 • 4:50 PM - 5:15 PM | Conv. Ctr. Room 2

12646-80

### **Collective resonances in super-Mossian nanoantennas**

Author(s): Md Sakibul Islam, Viktoriia E. Babicheva, The Univ. of New Mexico (United States)

23 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 2

# TECHNICAL CONFERENCES

## Conference 12647

### Active Photonic Platforms (APP) 2023

20 - 24 August 2023 | Conv. Ctr. Room 3

Conference Chair: **Ganapathi S. Subramania**, Sandia National Labs. (United States); **Stavroula Foteinopoulou**, The Univ. of New Mexico (United States)

Program Committee: **Andrea Alù**, The City Univ. of New York (United States); **Koray Aydin**, Northwestern Univ. (United States); **Harish Bhaskaran**, Univ. of Oxford (United Kingdom); **Paul V. Braun**, Univ. of Illinois at Urbana-Champaign (United States); **Che Ting Chan**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Zhigang Chen**, Nankai Univ. (China); **Dmitry N. Chigrin**, RWTH Aachen Univ. (Germany); **Shanhui Fan**, Stanford Univ. (United States); **Didier Felbacq**, Univ. Montpellier (France); **Juejun Hu**, Massachusetts Institute of Technology (United States); **Stephen Hughes**, Queen's Univ. (Canada); **Boubacar Kante**, Univ. of California, Berkeley (United States); **Mercedeh Khajavikhan**, The Univ. of Southern California (United States); Alexander V. Kildishev, Purdue Univ. (United States); **Nathaniel Kinsey**, Virginia Commonwealth Univ. (United States); **Yuri S. Kivshar**, The Australian National Univ. (Australia); **A. Femius Koenderink**, AMOLF (Netherlands); **Aude L. Lereu**, Institut Fresnel (France); **Cefe López**, Consejo Superior de Investigaciones Científicas (Spain); **Liam O'Faolain**, Munster Technological Univ. (Ireland); **Rupert F. Oulton**, Imperial College London (United Kingdom); **Nicolas-Coriolan Panoiu**, Univ. College London (United Kingdom); **Ruwen Peng**, Nanjing Univ. (China); **Ekaterina Poutrina**, Air Force Research Lab. (United States); **Michelle L. Povinelli**, The Univ. of Southern California (United States); **Subramaniam Anantha Ramakrishna**, Indian Institute of Technology Kanpur (India); **Christophe Sauvan**, Lab. Charles Fabry (France); **Jörg Schilling**, Martin-Luther-Univ. Halle-Wittenberg (Germany); **Gennady B. Shvets**, Cornell Univ. (United States); **Volker J. Sorger**, The George Washington Univ. (United States); **Isabelle Staude**, Friedrich-Schiller-Univ. Jena (Germany); **Andrey A. Sukhorukov**, The Australian National Univ. (Australia); **Philippe Tassin**, Chalmers Univ. of Technology (Sweden); **Kosmas L. Tsakmakidis**, National and Kapodistrian Univ. of Athens (Greece); **Georgios Veronis**, Louisiana State Univ. (United States); **Daniel M. Wasserman**, The Univ. of Texas at Austin (United States); **Sharon M. Weiss**, Vanderbilt Univ. (United States)

#### SUNDAY 20 AUGUST

##### OPENING REMARKS

20 August 2023 • 8:20 AM - 8:30 AM | Conv. Ctr. Room 3

Session Chair: Ganapathi S. Subramania,  
Sandia National Labs. (United States)

Opening remarks and welcome from conference chairs.

##### SESSION 1: DYNAMIC AND RECONFIGURABLE PHOTONICS

20 August 2023 • 8:30 AM - 10:30 AM | Conv. Ctr. Room 3

Session Chair: Mikhail A. Kats,  
Univ. of Wisconsin-Madison (United States)

12647-1

##### Electrically switchable plasmonic polymer metasurfaces for video-rate beam switching and multi-focal metaobjectives with CMOS voltages (*Invited Paper*)

Author(s): Harald Giessen, Julian Karst, Mario Hentschel, Yohan Lee, Univ. Stuttgart (Germany)

20 August 2023 • 8:30 AM - 8:55 AM | Conv. Ctr. Room 3

12647-3

##### Tunable dielectric metasurfaces with fast and ultrafast response (*Invited Paper*)

Author(s): Dragomir N. Neshev, The Australian National Univ. (Australia)

20 August 2023 • 8:55 AM - 9:20 AM | Conv. Ctr. Room 3

12647-4

##### MEMS-tunable metasurface for reflectivity modulation in the visible

Author(s): Dorian Herle, Andrei Kiselev, Luis Guillermo Villanueva, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Niels Quack, The Univ. of Sydney (Australia)

20 August 2023 • 9:20 AM - 9:35 AM | Conv. Ctr. Room 3

12647-6

##### Dynamic diffraction from a photomechanical molecular crystal

Author(s): Christopher J. Bardeen, Wangxiang Li, Univ. of California, Riverside (United States)

20 August 2023 • 9:35 AM - 9:50 AM | Conv. Ctr. Room 3

12647-7

##### Flat optics for dynamic wavefront manipulation (*Keynote Presentation*)

Author(s): Mark L. Brongersma, Geballe Lab. for Advanced Materials (GLAM) (United States)

20 August 2023 • 9:50 AM - 10:30 AM | Conv. Ctr. Room 3

Coffee Break 10:30 AM - 11:00 AM

## Conference 12647

### SESSION 2: NEW PHYSICS IN THERMAL PHOTONICS

20 August 2023 • 11:00 AM - 12:30 PM | Conv. Ctr. Room 3

Session Chair: Artur R. Davoyan, UCLA Samueli School of Engineering (United States)

12647-8

#### **Non-reciprocity and energy harvesting** (*Keynote Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

20 August 2023 • 11:00 AM - 11:40 AM | Conv. Ctr. Room 3

12647-9

#### **“Thermal” radiation from emitters not quite in equilibrium** (*Invited Paper*)

Author(s): Mikhail A. Kats, Univ. of Wisconsin-Madison (United States)

20 August 2023 • 11:40 AM - 12:05 PM | Conv. Ctr. Room 3

12647-10

#### **An imaginary axis for real thermal light sources** (*Invited Paper*)

Author(s): Gururaj V. Naik, Cyril S. Prasad, Rice Univ. (United States)

20 August 2023 • 12:05 PM - 12:30 PM | Conv. Ctr. Room 3

Lunch Break 12:30 PM - 2:00 PM

### SESSION 3: ADVANCES IN PLATFORMS FOR NON-CLASSICAL LIGHT

20 August 2023 • 2:00 PM - 3:20 PM | Conv. Ctr. Room 3

Session Chair: Teri W. Odom, Northwestern Univ. (United States)

12647-11

#### **Nearfield strong coupling and entanglement of quantum emitters for ambient temperature quantum applications** (*Keynote Presentation*)

Author(s): Ortwin Hess, Trinity College Dublin (Ireland)

20 August 2023 • 2:00 PM - 2:40 PM | Conv. Ctr. Room 3

12647-12

#### **Photon thermalisation and condensation in a quantum well open microcavity**

Author(s): Rupert F. Oulton, Ross Schofield, Ming Fu, Himadri Dhar, Rick Mukherjee, Imperial College London (United Kingdom); Ian Farrer, Edmund Clarke, Jon Heffernan, The Univ. of Sheffield (United Kingdom); Florian Mintert, Robert Nyman, Imperial College London (United Kingdom)

20 August 2023 • 2:40 PM - 2:55 PM | Conv. Ctr. Room 3

12647-70

#### **Nonlinear and quantum nano-optics with atomically-thin materials** (*Invited Paper*)

Author(s): Joel D. Cox, Univ. of Southern Denmark (Denmark)

20 August 2023 • 2:55 PM - 3:20 PM | Conv. Ctr. Room 3

Coffee Break 3:20 PM - 3:50 PM

### SESSION 4: ADVANCES IN PLATFORMS FOR NANOSCALE SOURCES AND LASING

20 August 2023 • 3:50 PM - 5:20 PM | Conv. Ctr. Room 3

Session Chair: Michaël Lobet, Univ. de Namur (Belgium)

12647-15

#### **More than band-edge lasing: Plasmonic lattices with high-gain materials** (*Keynote Presentation*)

Author(s): Teri W. Odom, Northwestern Univ. (United States)

20 August 2023 • 3:50 PM - 4:30 PM | Conv. Ctr. Room 3

12647-16

#### **Tuning free and broad band Purcell enhancement at a nanofocus** (*Invited Paper*)

Author(s): Rupert F. Oulton, Imperial College London (United Kingdom); Nicholas A. Gusken, Stanford Univ. (United States); Ming Fu, Imperial College London (United Kingdom); Michael P. Nielsen, The Univ. of New South Wales (Australia); Monica Mota, Imperial College London (United Kingdom); Maximilian Zapf, Robert Roder, Friedrich-Schiller-Univ. Jena (Germany); Xiaofei Xiao, Stefan A. Maier, Imperial College London (United Kingdom); Alex Clark, Univ. of Bristol (United Kingdom); Carsten Ronning, Friedrich-Schiller-Univ. Jena (Germany)

20 August 2023 • 4:30 PM - 4:55 PM | Conv. Ctr. Room 3

12647-18

#### **Time-domain modeling of random lasing in quasi-2D perovskites** (*Invited Paper*)

Author(s): Ludmila J. Prokopeva, Miroslava Marinova, Vahagn Mkhitarian, Colton B. Fruhling, Sarah Chowdhury, Alexander Kildishev, Purdue Univ. (United States)

20 August 2023 • 4:55 PM - 5:20 PM | Conv. Ctr. Room 3

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### **Welcome and Opening Remarks**

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### **A perovskite paved pathway to multi-terawatt scale photovoltaics** (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### **Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems** (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### **Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs** (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12647

MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

Coffee Break 9:55 AM - 10:30 AM

### SESSION 5: 2D MATERIALS FOR QUANTUM SOURCES AND DEVICES

21 August 2023 • 10:30 AM - 12:05 PM | Conv. Ctr. Room 3

Session Chair: Deep Jariwala, Univ. of Pennsylvania (United States)

12647-19

#### Quantum spin defects in hBN: Enhanced emission and optically detected magnetic resonances (*Keynote Presentation*)

Author(s): Vladimir M. Shalaev, Purdue Univ. (United States)

21 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 3

12647-20

#### Efficient light harvesting from single-photon emitters in 2D materials

Author(s): Rudolf Bratschitsch, Westfälische Wilhelms-Univ. Münster (Germany)

21 August 2023 • 11:10 AM - 11:25 AM | Conv. Ctr. Room 3

12647-21

#### Integrated quantum photonics with atomically thin materials (*Invited Paper*)

Author(s): Galan Moody, Kamyar Parto, Univ. of California, Santa Barbara (United States)

21 August 2023 • 11:25 AM - 11:50 AM | Conv. Ctr. Room 3

12647-22

#### Single-photon emission near a transdimensional plasmonic plate

Author(s): Igor V. Bondarev, North Carolina Central Univ. (United States)

21 August 2023 • 11:50 AM - 12:05 PM | Conv. Ctr. Room 3

Lunch Break 12:05 PM - 1:25 PM

### SESSION 6: PHOTONICS AND OPTOELECTRONICS WITH 2D MATERIAL

21 August 2023 • 1:25 PM - 3:10 PM | Conv. Ctr. Room 3

Session Chair: Georgia Theano Papadakis, ICFO - Institut de Ciències Fotòniques (Spain)

12647-23

#### Active metamaterials and devices: From rapidly-tunable lenses to emergent polaritonic materials (*Keynote Presentation*)

Author(s): Gennady B. Shvets, Cornell Univ. (United States)

21 August 2023 • 1:25 PM - 2:05 PM | Conv. Ctr. Room 3

12647-24

#### Two-dimensional semiconductors for chiral directionality and electro-optic modulation in photonic systems

Author(s): Jonathan Foerste, Victor Funk, Johannes Scherzer, Shen Zhao, Alexander Hoegele, Samarth Vadia, Ludwig-Maximilians-Univ. München (Germany), Munich Ctr. for Quantum Science and Technology (Germany)

21 August 2023 • 2:05 PM - 2:20 PM | Conv. Ctr. Room 3

12647-25

#### Excitonic metamaterials for actively tunable photonic platforms (*Invited Paper*)

Author(s): Deep Jariwala, Univ. of Pennsylvania (United States)

21 August 2023 • 2:20 PM - 2:45 PM | Conv. Ctr. Room 3

12647-26

#### Lateral confinement in two-dimensional semiconductors using ultra-miniaturized heterostructures (*Invited Paper*)

Author(s): Hossein Taghinejad, Ali Adibi, Georgia Institute of Technology (United States)

21 August 2023 • 2:45 PM - 3:10 PM | Conv. Ctr. Room 3

Coffee Break 3:10 PM - 3:35 PM

### SESSION 7: EXPLORING EXTREME MATERIALS FOR PHOTONICS: CHARACTERIZATION AND NOVEL PHENOMENA

21 August 2023 • 3:35 PM - 5:30 PM | Conv. Ctr. Room 3

Session Chair: Ali Adibi, Georgia Institute of Technology (United States)

12647-27

#### Nano-optical probe of van der Waals interfaces (*Keynote Presentation*)

Author(s): Dmitri N. Basov, Columbia Univ. (United States)

21 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 3

12647-28

#### Probing topological properties of materials via high-order harmonic generation (*Invited Paper*)

Author(s): Shambhu Ghimire, SLAC National Accelerator Lab. (United States)

21 August 2023 • 4:15 PM - 4:40 PM | Conv. Ctr. Room 3

12647-29

### **Emerging low-dimensional and phase-change materials for thermal photonics** (*Invited Paper*)

Author(s): Georgia T. Papadakis, Mitraddeep Sarkar, Maxime Giteau, Michael T. Enders, Aleksandra Deeva, Lu Wang, ICFO - Institut de Ciències Fotòniques (Spain)

21 August 2023 • 4:40 PM - 5:05 PM | Conv. Ctr. Room 3

12647-30

### **All-van der Waals metadevices** (*Invited Paper*)

Author(s): Artur R. Davoyan, UCLA Samueli School of Engineering (United States)

21 August 2023 • 5:05 PM - 5:30 PM | Conv. Ctr. Room 3

## POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Session Chairs: Nathaniel Furman, Univ. of California, Irvine (United States), Daniel Lawson, Univ. of Southampton (United Kingdom), Raana Sabri Khiavi, Northeastern Univ. (United States), Bo K. Shrewsbury, The Univ. of Southern California (United States)

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12647-94

### **Realizing colorful holographic mimicry by metasurfaces**

Author(s): Yu Liu, Bo Xiong, Jia-Nan Wang, Ben-Qi Hou, Ru-Wen Peng, Mu Wang, Nanjing Univ. (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-95

### **Broadband photodetectors based on perovskite metasurfaces**

Author(s): Yi Zhu, Cheng-Yao Li, Jie He, Hao Jing, Dong-Xiang Qi, Kong-Liang Zou, Ren-Hao Fan, Ru-Wen Peng, Mu Wang, Nanjing Univ. (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-98

### **PT-symmetry vs topological charge for ring vortex beams**

Author(s): Cristian Mejía-Cortés, Jesús Muñoz, Univ. del Atlántico (Colombia)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-100

### **Relocation of edge state in 2D honeycomb lattices**

Author(s): Parinaz Amaniabdolmalaki, Ata Shakeri, Hamidreza Ramezani, The Univ. of Texas Rio Grande Valley (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-101

### **Sub-picosecond optical modulation of ion-irradiated VO<sub>2</sub>**

Author(s): Jin-Woo Cho, Tairan Xi, Chenghao Wan, Arjun Ashok Patel, Hongyan Mei, Univ. of Wisconsin-Madison (United States); Tae Joon Park, Purdue Univ. (United States); Martin Hafermann, Friedrich-Schiller-Univ. Jena (Germany); Yuzhe Xiao, Univ. of North Texas (United States); Carsten Ronning, Friedrich-Schiller-Univ. Jena (Germany); Shriram Ramanathan, Purdue Univ. (United States); Rutgers, The State Univ. of New Jersey (United States); Jun Xiao, Mikhail A. Kats, Univ. of Wisconsin-Madison (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-102

### **Design of a circularly polarized thin-film visible emitter**

Author(s): Eun-Joo Lee, Young-Bin Kim, Sun-Kyung Kim, Kyung Hee Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-104

### **Volatile broadband switchable thermo-optic properties of phase change chalcogenide semiconductors**

Author(s): Kwanghyun Kim, Haoyang Cheng, Avik Mandal, Behrad Gholipour, Univ. of Alberta (Canada)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-105

### **Electrochemically modulated structural color filter with polarization sensitive transmission**

Author(s): Jaekyung Kim, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12647-106

### **Multilayer broadband switchable absorbers based on phase-change materials**

Author(s): Md Tanvir Emrose, Louisiana State Univ. (United States); Emily L. Payne, Brigham Young Univ.-Idaho (United States); Chenglong You, Georgios Veronis, Louisiana State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 8: PHOTONIC PLATFORMS FOR COMPUTING AND INFORMATION ENCODING

22 August 2023 • 8:00 AM - 10:35 AM | Conv. Ctr. Room 3

Session Chair: Nathan Youngblood,  
Univ. of Pittsburgh (United States)

12647-31

### **Energy-based neural network models with coherent laser networks** (*Invited Paper*)

Author(s): Mohammad-Ali Miri, Queens College (United States)  
22 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 3

12647-32

### **Hamiltonian engineering using coupled cavity arrays** (*Invited Paper*)

Author(s): Arka Majumdar, Univ. of Washington (United States)  
22 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 3

# TECHNICAL CONFERENCES

## Conference 12647

12647-33

### Image encryption using infrared metamaterials (Invited Paper)

Author(s): Michelle L. Povinelli, Romil Audhkhasi, Max Lien, The Univ. of Southern California (United States)

22 August 2023 • 8:50 AM - 9:15 AM | Conv. Ctr. Room 3

12647-34

### Photonic in-memory computing using continuous-time data (Invited Paper)

Author(s): Harish Bhaskaran, Bowei Dong, Univ. of Oxford (United Kingdom)

22 August 2023 • 9:15 AM - 9:40 AM | Conv. Ctr. Room 3

12647-35

### Deep spike heterostructure photonic neuro-transistors for effective neuromorphic computation and low energy consumption

Author(s): Sungwoo Jeong, Jong Min Lee, Eun Chong Ju, Chung-Ang Univ. (Republic of Korea); Sung Woon . Cho, Sunchon National Univ. (Republic of Korea); Sung Kyu Park, Chung-Ang Univ. (Republic of Korea)

22 August 2023 • 9:40 AM - 9:55 AM | Conv. Ctr. Room 3

12647-36

### Integrated Photonic Fractional Convolution Accelerator

Author(s): Kevin Zelaya, Mohammad-Ali Miri, Queens College (United States)

22 August 2023 • 9:55 AM - 10:10 AM | Conv. Ctr. Room 3

12647-37

### Programmable Chips & Applications (Invited Paper)

Author(s): Nicola Peserico, Univ. of Florida (United States); Xiaoxuan Ma, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence, LLC (United States); Hamed Dalir, Univ. of Florida (United States); Volker J. Sorger, The George Washington Univ. (United States), Univ. of Florida (United States)

22 August 2023 • 10:10 AM - 10:35 AM | Conv. Ctr. Room 3

Coffee Break 10:35 AM - 11:00 AM

#### SESSION 9: EXPLORING THE 4TH DIMENSION IN MATERIAL RESPONSES: EXPERIMENTS AND THEORY

22 August 2023 • 11:00 AM - 12:40 PM | Conv. Ctr. Room 3

Session Chair: Gennady B. Shvets, Cornell Univ. (United States)

12647-38

### Dynamic nanophotonics with conducting oxides and metal nitrides: from all-optical switching to new phenomena (Keynote Presentation)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States)

22 August 2023 • 11:00 AM - 11:40 AM | Conv. Ctr. Room 3

12647-40

### Momentum considerations inside metamaterials with extreme parameters

Author(s): Michaël Lobet, Univ. de Namur (Belgium); Inigo Liberal, Angel Ortega-Gomez, J. Enrique Vázquez-Lozano, Univ. Pública de Navarra (Spain); Larissa Vertchenko, Sparrow Quantum ApS (Denmark); Andrei V. Lavrinenko, DTU Fotonik (Denmark); Nader Engheta, Univ. of Pennsylvania (United States); Eric Mazur, Harvard Univ. (United States)

22 August 2023 • 11:40 AM - 11:55 AM | Conv. Ctr. Room 3

12647-39

### Beyond physical limitations in electromagnetism and photonics through time-Floquet systems

Author(s): Zeki Hayran, Francesco Monticone, Cornell Univ. (United States)

22 August 2023 • 11:55 AM - 12:10 PM | Conv. Ctr. Room 3

12647-41

### Manipulating coherence of near-field thermal radiation in time-modulated systems

Author(s): Renwen Yu, Shanhui Fan, Stanford Univ. (United States)

22 August 2023 • 12:10 PM - 12:25 PM | Conv. Ctr. Room 3

12647-42

### Space-time high-quality-factor metasurface for nonreciprocal wavefront manipulation

Author(s): Raana Sabri, Hossein Mosallaei, Northeastern Univ. (United States)

22 August 2023 • 12:25 PM - 12:40 PM | Conv. Ctr. Room 3

Lunch/Exhibition Break 12:40 PM - 2:05 PM

#### SESSION 10: PHOTONICS WITH PHASE-CHANGE MATERIALS I: ARCHITECTURE DESIGN AND THEORY

22 August 2023 • 2:05 PM - 3:35 PM | Conv. Ctr. Room 3

Session Chair: Michelle L. Povinelli,

The Univ. of Southern California (United States)

12647-43

### Controlling electric and magnetic resonances of individual meta-atoms with dielectric and plasmonic phase-change materials (Invited Paper)

Author(s): Thomas Taubner, RWTH Aachen Univ. (Germany)

22 August 2023 • 2:05 PM - 2:30 PM | Conv. Ctr. Room 3

12647-44

### Exploring Fano resonances for efficient reconfigurable beam splitting with phase-change material metagratings

Author(s): Nikolaos L. Tsitsas, Aristotle Univ. of Thessaloniki (Greece); Stavroula Foteinopoulou, The Univ. of New Mexico (United States)

22 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 3

12647-45

### Switching between topological edge states using phase-change materials (Invited Paper)

Author(s): Georgios Veronis, Louisiana State Univ. (United States); Yin Huang, Central South Univ. (China); Yuecheng Shen, Sun Yat-Sen Univ. (China)

22 August 2023 • 2:45 PM - 3:10 PM | Conv. Ctr. Room 3

12647-46

### Phase change materials based nanophotonics: Multiphysics analysis (Invited Paper)

Author(s): Dmitry N. Chigrin, DWI an der RWTH Aachen e.V. (Germany)

22 August 2023 • 3:10 PM - 3:35 PM | Conv. Ctr. Room 3

Coffee Break 3:35 PM - 4:00 PM



WEDNESDAY 23 AUGUST 2023

### SESSION 11: PHOTONICS WITH PHASE-CHANGE MATERIALS II: MATERIAL PROPERTIES AND DEVICES

22 August 2023 • 4:00 PM - 5:40 PM | Conv. Ctr. Room 3  
Session Chair: Harish Bhaskaran, Univ. of Oxford (United Kingdom)

12647-47

#### Reconfigurable phase-change photonic platforms for fast and efficient in-memory computing (*Invited Paper*)

Author(s): Nathan Youngblood, Univ. of Pittsburgh (United States)  
22 August 2023 • 4:00 PM - 4:25 PM | Conv. Ctr. Room 3

12647-48

#### Non-volatile Phase-only Transmissive Spatial Light Modulator

Author(s): Zhuoran Fang, Rui Chen, Johannes E. Froech, Quentin A. Tanguy, Univ. of Washington (United States); Asir I. Khan, Xiangjin Wu, Stanford Univ. (United States); Arnab Manna, Matthew S. Reynolds, Univ. of Washington (United States); Eric Pop, Stanford Univ. (United States); Arka Majumdar, Univ. of Washington (United States)  
22 August 2023 • 4:25 PM - 4:40 PM | Conv. Ctr. Room 3

12647-49

#### Reconfigurable nonlocal metasurface based on phase change materials

Author(s): Guoce Yang, Mengyun Wang, June Sang Lee, Nikolaos Farmakidis, Harish Bhaskaran, Univ. of Oxford (United Kingdom)  
22 August 2023 • 4:40 PM - 4:55 PM | Conv. Ctr. Room 3

12647-50

#### Nonvolatile electrically programmable 5-bit integrated photonics using Sb<sub>2</sub>S<sub>3</sub>

Author(s): Rui Chen, Zhuoran Fang, Univ. of Washington (United States); Christopher Perez, Stanford Univ. (United States); Forrest Miller, Khushboo Kumari, Abhi Saxena, Jiajiu Zheng, Univ. of Washington (United States); Sarah J. Geiger, The Charles Stark Draper Laboratory (United States); Kenneth E. Goodson, Stanford Univ. (United States); Arka Majumdar, Univ. of Washington (United States)  
22 August 2023 • 4:55 PM - 5:10 PM | Conv. Ctr. Room 3

12647-51

#### Optical switching dynamics of sub-micrometer Sb<sub>2</sub>Se<sub>3</sub> thin films for active photonics

Author(s): Daniel Lawson, Otto Muskens, Ioannis Zeimpekis, Sophie Blundell, Univ. of Southampton (United Kingdom)  
22 August 2023 • 5:10 PM - 5:25 PM | Conv. Ctr. Room 3

12647-52

#### Dispersion-engineered phase change material integrated silicon photonics modulators with controlled insertion losses

Author(s): James Davis, Yihao Cui, Behrad Gholipour, Univ. of Alberta (Canada)  
22 August 2023 • 5:25 PM - 5:40 PM | Conv. Ctr. Room 3

### SESSION 12: NEW APPROACHES FOR THE DESIGN OF PHOTONIC PLATFORMS

23 August 2023 • 8:00 AM - 10:25 AM | Conv. Ctr. Room 3  
Session Chair: Nasim Mohammadi Estakhri, Univ. of Pennsylvania (United States)

12647-14

#### Polarization manipulation and multiplexing via metasurfaces (*Invited Paper*)

Author(s): Ruwen Peng, Nanjing Univ. (China); Mu Wang, Nanjing Univ. (China), American Physical Society (United States)  
23 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 3

12647-54

#### Tailored photonic zero modes (*Invited Paper*)

Author(s): Hamidreza Ramezani, The Univ. of Texas Rio Grande Valley (United States)  
23 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 3

12647-53

#### Linear and nonlinear photonic engineering using supersymmetry (*Keynote Presentation*)

Author(s): Natalia M. Litchinitser, Hooman Barati Sedeh, Nitish Chandra, Duke Univ. (United States); Liang Feng, Univ. of Pennsylvania (United States); Seth R. Bank, The Univ. of Texas at Austin (United States)  
23 August 2023 • 8:50 AM - 9:30 AM | Conv. Ctr. Room 3

12647-55

#### AI for photonics and topological physics (*Keynote Presentation*)

Author(s): Marin Soljacic, Massachusetts Institute of Technology (United States)  
23 August 2023 • 9:30 AM - 10:10 AM | Conv. Ctr. Room 3

12647-56

#### Holographic scattering matrix for large scattering problems

Author(s): Didier Felbacq, Emmanuel Rousseau, Univ. de Montpellier (France); Emmanuel Kling, Safran Electronics & Defense (France)  
23 August 2023 • 10:10 AM - 10:25 AM | Conv. Ctr. Room 3

Coffee Break 10:25 AM - 10:50 AM

### SESSION 13: SYMMETRIES FOR EXTREME LIGHT CONTROL

23 August 2023 • 10:50 AM - 12:35 PM | Conv. Ctr. Room 3  
Session Chair: Stephen Hughes, Queen's Univ. (Canada)

12647-57

#### Optical skyrmions (*Keynote Presentation*)

Author(s): Stephen M. Barnett, Sijia Gao, Fiona C. Speirits, Claire Cisowski, Zhujun Ye, Joerg B. Goette, Sonja Franke-Arnold, Univ. of Glasgow (United Kingdom)  
23 August 2023 • 10:50 AM - 11:30 AM | Conv. Ctr. Room 3

# TECHNICAL CONFERENCES

## Conference 12647

12647-58

### **Symmetries and helicity in optical vortices** (*Keynote Presentation*)

Author(s): David L. Andrews, Univ. of East Anglia (United Kingdom)  
23 August 2023 • 11:30 AM - 12:10 PM | Conv. Ctr. Room 3

12647-59

### **Principle and applications of metasurfaces to enhance the spin Hall effect of light** (*Invited Paper*)

Author(s): Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)  
23 August 2023 • 12:10 PM - 12:35 PM | Conv. Ctr. Room 3

Lunch/Exhibition Break 12:35 PM - 2:05 PM

## SESSION 14: PT-SYMMETRIC, NON-HERMITIAN AND PSEUDO-HERMITIAN PHOTONIC SYSTEMS

23 August 2023 • 2:05 PM - 3:05 PM | Conv. Ctr. Room 3  
Session Chair: Didier Felbacq, Univ. de Montpellier (France)

12647-61

### **Robust bulk zero modes**

Author(s): Hamidreza Ramezani, Jannatul Ferdous, The Univ. of Texas Rio Grande Valley (United States); Cem Yuçe, Eskisehir Technical Univ. (Turkey); Andrea Alu, The City Univ. of New York (United States)  
23 August 2023 • 2:05 PM - 2:20 PM | Conv. Ctr. Room 3

12647-62

### **Impact of waveguide imperfections on lasing near a stationary inflection point**

Author(s): Nathaniel Furman, Albert Herrero-Parareda, Univ. of California, Irvine (United States); Bradley Thompson, Air Force Research Lab. (United States); Dean Brown, Air Force Research Lab. (United States), UES Inc. (United States); Ricky D. Gibson, Ilya Vitebskiy, Robert Bedford, Air Force Research Lab. (United States); Filippo Capolino, Univ. of California, Irvine (United States)  
23 August 2023 • 2:20 PM - 2:35 PM | Conv. Ctr. Room 3

12647-63

### **Photonic crystal defect mode with maximum chirality at exceptional point**

Author(s): Pi-Ju Cheng, Academia Sinica (Taiwan); Chao-Chieh Cheng, Tzu-Wei Huang, Academia Sinica (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan); Wei-Ting Wang, Academia Sinica (Taiwan); Jui-Tse Tsai, Academia Sinica (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan); Min-Hsiung Shih, Academia Sinica (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan), National Sun Yat-Sen Univ. (Taiwan); Shu-Wei Chang, Academia Sinica (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan)  
23 August 2023 • 2:35 PM - 2:50 PM | Conv. Ctr. Room 3

12647-64

### **Nonreciprocal fiber-optic amplifier enabled by encircling-an-EP emulation and gain saturation nonlinearity**

Author(s): Yu Sung Choi, Seunghan Shin, Sung Ill Moon, Mi Ji Kim, Jae Woong Yoon, Hanyang Univ. (Republic of Korea)  
23 August 2023 • 2:50 PM - 3:05 PM | Conv. Ctr. Room 3

Coffee Break 3:05 PM - 3:35 PM

## SESSION 15: TOPOLOGICAL AND NON-RECIPROCAL PHOTONICS

23 August 2023 • 3:35 PM - 5:20 PM | Conv. Ctr. Room 3  
Session Chair: Natalia M. Litchinitser, Duke Univ. (United States)

12647-65

### **Light-matter interactions in topological photonic crystal waveguides: Chiral emitters, disorder, and inverse design** (*Keynote Presentation*)

Author(s): Stephen Hughes, Queen's Univ. (Canada)  
23 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 3

12647-66

### **Pseudo-spin switches and geometrical phases in topological photonic systems** (*Invited Paper*)

Author(s): Yuma Kawaguchi, The City College of New York (United States); Daria A. Smirnova, The Australian National Univ. (Australia); Filipp Komissarenko, Svetlana Kiriushchekina, Anton Vakulenko, The City College of New York (United States); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (United States); Alexander B. Khanikaev, The City College of New York (United States)

23 August 2023 • 4:15 PM - 4:40 PM | Conv. Ctr. Room 3

12647-67

### **Nonlinear topological photonics**

Author(s): Bo Zhen, Univ. of Pennsylvania (United States)  
23 August 2023 • 4:40 PM - 4:55 PM | Conv. Ctr. Room 3

12647-68

### **Nonlinear optical interactions in certain topological photonic systems** (*Invited Paper*)

Author(s): Nicolae C. Panoiu, Jitong Wang, Yupei Wang, Univ. College London (United Kingdom)  
23 August 2023 • 4:55 PM - 5:20 PM | Conv. Ctr. Room 3

## THURSDAY 24 AUGUST 2023

## SESSION 16: NOVEL NON-LINEAR PHOTONIC PHENOMENA AND SYSTEMS

24 August 2023 • 8:25 AM - 9:50 AM | Conv. Ctr. Room 3  
Session Chair: Nicolae C. Panoiu, Univ. College London (United Kingdom)

12647-73

### **Transverse optical rectification effect in a one-dimensional grating**

Author(s): Richard M. Osgood, U.S. Army Combat Capabilities Development Command Soldier Ctr. (United States); Joseph Plumitallo, Petr Moroshkin, Jimmy Xu, Brown Univ. (United States); Tetsuyuki Ochiai, National Institute for Materials Science (Japan); Jin Ho Kim, U.S. Army Combat Capabilities Development Command Soldier Ctr. (United States)

24 August 2023 • 8:25 AM - 8:40 AM | Conv. Ctr. Room 3

12647-72

### **Linear and nonlinear light matter interactions in aluminum nanolayers and nanostructures** (*Invited Paper*)

Author(s): Michael Scalora, U.S. Army Combat Capabilities Development Command (United States); Shroddha Mukhopadhyay, Univ. Politècnica de Catalunya (Spain); Kent Hallman, PeopleTec, Inc. (United States); Ramon Vilaseca, Crina Cojocaru, Jose Trull, Univ. Politècnica de Catalunya (Spain); Domenico de Ceglia, Maria Antonietta A. Vincenti, Univ. degli Studi di Brescia (Italy)

24 August 2023 • 8:40 AM - 9:05 AM | Conv. Ctr. Room 3

12647-71

### **Interband nonlinearity in aluminum-doped zinc oxide epsilon-near-zero metamaterial**

Author(s): Lyuba Kuznetsova, Trang Bao Minh Tran, San Diego State Univ. (United States)

24 August 2023 • 9:05 AM - 9:20 AM | Conv. Ctr. Room 3

12647-74

### **Dielectric metasurfaces for switchable nonlinear optics**

Author(s): Lei Kang, Douglas H. Werner, The Pennsylvania State Univ. (United States)

24 August 2023 • 9:20 AM - 9:35 AM | Conv. Ctr. Room 3

12647-75

### **High-efficiency sum frequency generation from inverse designed metasurfaces**

Author(s): Neuton Li, Jihua Zhang, Dragomir N. Neshev, Andrey A. Sukhorukov, The Australian National Univ. (Australia)

24 August 2023 • 9:35 AM - 9:50 AM | Conv. Ctr. Room 3

**Coffee Break 9:50 AM - 10:30 AM**

#### **SESSION 17: NOVEL PLATFORMS FOR SENSORS**

24 August 2023 • 10:30 AM - 11:35 AM | Conv. Ctr. Room 3

Session Chair: Peter Qiang Liu, Univ. at Buffalo (United States)

12647-77

### **Nature-inspired 3D-architected colorimetric metasurfaces for polarization-tunable colorimetry** (*Invited Paper*)

Author(s): Lisa Poulidakos, Zaid Haddadin, Dev Shah, Loren Phillips, Anna My Nguyen, Univ. of California, San Diego (United States)

24 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 3

12647-78

### **Plasmonic and interferometric optical fiber sensors for electrical system monitoring applications** (*Invited Paper*)

Author(s): Paul R. Ohodnicki, Dolendra Karki, Yang-Duan Su, Tulika Khanikar, Khurram Naeem, Univ. of Pittsburgh (United States); Nageswara R. Lalam, Jeffrey K. Wuenschell, Ruishu F. Wright, National Energy Technology Lab. (United States)

24 August 2023 • 10:55 AM - 11:20 AM | Conv. Ctr. Room 3

12647-80

### **Mixed quantum-dot neuromorphic vision sensors for broad spectral perception**

Author(s): Jong Min Lee, Sungwoo Jeong, Eun Chong Ju, Chung-Ang Univ. (Republic of Korea); Sung Woon Cho, Suncheon National Univ. (Republic of Korea); Sung Kyu Park, Chung-Ang Univ. (Republic of Korea)

24 August 2023 • 11:20 AM - 11:35 AM | Conv. Ctr. Room 3

**Lunch/Exhibition Break 11:35 AM - 1:20 PM**

#### **SESSION 18: ADVANCES IN FABRICATION FOR ACTIVE PHOTONICS**

24 August 2023 • 1:20 PM - 2:55 PM | Conv. Ctr. Room 3

Session Chair: Lisa V. Poulidakos,  
Univ. of California, San Diego (United States)

12647-81

### **Liquid-metal-based reconfigurable nanophotonics** (*Invited Paper*)

Author(s): Peter Q. Liu, Univ. at Buffalo (United States)

24 August 2023 • 1:20 PM - 1:45 PM | Conv. Ctr. Room 3

12647-82

### **Improved TIRF imaging through resonant dielectric multilayer optimization** (*Invited Paper*)

Author(s): Anita Mouttou, Institut de Recherche en Infectiologie de Montpellier (France); Yousra Toumi, Fabien Lemarchand, Cihan Koc, Antonin Moreau, Institut Fresnel (France); Delphine Muriaux, Institut de Recherche en Infectiologie de Montpellier (France); Guillaume Demésy, Julien Lumeau, Institut Fresnel (France); Cyril Favard, Institut de Recherche en Infectiologie de Montpellier (France); Aude L. Lereu, Institut Fresnel (France)

24 August 2023 • 1:45 PM - 2:10 PM | Conv. Ctr. Room 3

12647-83

### **SU-8 resonators as indicators of changes in refractive index for quantum photonics**

Author(s): Salvador A. Medina-Rangel, Tyndall National Institute (Ireland), Munster Technological Univ. (Ireland); Emanuele Pelucchi, Tyndall National Institute (Ireland); Liam O'Faolain, Munster Technological Univ. (Ireland); Nicola Maraviglia, Tyndall National Institute (Ireland); Artem S. Vorobev, Munster Technological Univ. (Ireland)

24 August 2023 • 2:10 PM - 2:25 PM | Conv. Ctr. Room 3

12647-84

### **Topological polaritonic structures based on patterned bulk transition metal dichalcogenide WS<sub>2</sub> crystals**

Author(s): Sriram Guddala, Svetlana Kiriushchikina, Yuma Kawaguchi, Anton Vakulenko, Edda Monique Otilie Proenca Hobuss, Andrea Alù, Alexander B. Khanikaev, The City College of New York (United States)

24 August 2023 • 2:25 PM - 2:40 PM | Conv. Ctr. Room 3

12647-85

### **Enhancement of exciton-plasmon coupling via functional plasmonic metal oxide metastructures**

Author(s): Seyed M. Sadeghi, The Univ. of Alabama in Huntsville (United States)

24 August 2023 • 2:40 PM - 2:55 PM | Conv. Ctr. Room 3

**Coffee Break 2:55 PM - 3:20 PM**

# TECHNICAL CONFERENCES

## Conference 12647

### SESSION 19: NOVEL PLATFORMS FOR ABSORPTION, PHOTODETECTORS, AND THERMAL EMISSION

24 August 2023 • 3:20 PM - 4:55 PM | Conv. Ctr. Room 3

Session Chair: Aude L. Lereu, Institut Fresnel (France)

12647-86

#### **Self-dual systems for backscattering cancellation** (Invited Paper)

Author(s): Nasim Mohammadi Estakhri, Chapman Univ. (United States)

24 August 2023 • 3:20 PM - 3:45 PM | Conv. Ctr. Room 3

12647-87

#### **Broadband ultrathin absorber for microbolometer applications** (Invited Paper)

Author(s): Ting Shan S. Luk, Guangping Xu, Willard Ross, John Nogan, Ethan A. Scott, Sandia National Labs. (United States); Sergei A. Ivanov, Los Alamos National Lab. (United States); Oana Niculescu, Univ. of Cambridge (United Kingdom); Oleg Mitrofanov, Univ. College London (United Kingdom); Charles T. Harris, Sandia National Labs. (United States)

24 August 2023 • 3:45 PM - 4:10 PM | Conv. Ctr. Room 3

12647-88

#### **Electrically-controlled switching of a narrowband absorption resonance**

Author(s): Bo K. Shrewsbury, Romil Audhkhasi, Michelle L. Povinelli, The Univ. of Southern California (United States)

24 August 2023 • 4:10 PM - 4:25 PM | Conv. Ctr. Room 3

12647-90

#### **Designing silicon-germanium photodetectors with numerical optimization: the tradeoffs and limits**

Author(s): Ergun Simsek, Curtis R. Menyuk, Univ. of Maryland, Baltimore County (United States)

24 August 2023 • 4:25 PM - 4:40 PM | Conv. Ctr. Room 3

12647-91

#### **Thermal stability of aligned carbon nanotubes in ambient air environment**

Author(s): Chacko Mathai, Xielin Wang, Ciril S. Prasad, Gururaj V. Naik, Rice Univ. (United States)

24 August 2023 • 4:40 PM - 4:55 PM | Conv. Ctr. Room 3

#### **Closing Remarks**

24 August 2023 • 4:55 PM - 5:00 PM | Conv. Ctr. Room 3

Session Chair: Stavroula Foteinopoulou, The Univ. of New Mexico (United States)

**CLOSING REMARKS FROM CONFERENCE CHAIRS.**

## Conference 12648

# Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XXI

20 - 24 August 2023 | Conv. Ctr. Room 4

Conference Chairs: **Takuo Tanaka**, RIKEN (Japan); **Yu-Jung Lu**, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

Program Committee: **Martin Aeschlimann**, Technische Univ. Kaiserslautern (Germany); **Hatice Altug**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Harry A. Atwater**, Caltech (United States); **David J. Bergman**, Tel Aviv Univ. (Israel);

**Humeyra Caglayan**, Tampere Univ. (Finland); **Che Ting Chan**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Yun-Chong Chang**, Academia Sinica (Taiwan); **Harald W. Giessen**, Univ. Stuttgart (Germany); **Naomi J. Halas**, Rice Univ. (United States); **Dai-Sik Kim**, Ulsan National Institute of Science and Technology (Republic of Korea); **Wakana Kubo**, Tokyo Univ. of Agriculture and Technology (Japan); **Laurens K. Kuipers**, Kavli Institute of Nanoscience Delft (Netherlands); **Mikhail Lapine**, Univ. of Technology, Sydney (Australia); **Ai Qun Liu**, Nanyang Technological Univ. (Singapore); **Olivier J. F. Martin**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Peter Nordlander**, Rice Univ. (United States); **George C. Schatz**, Northwestern Univ. (United States); **Tigran V. Shahbazyan**, Jackson State Univ. (United States); **Vladimir M. Shalaev**, Purdue Univ. (United States); **Gennady B. Shvets**, Cornell Univ. (United States); **Din Ping Tsai**, City Univ. of Hong Kong (Hong Kong, China); **Niek F. van Hulst**, ICFO - Institut de Ciències Fotòniques (Spain); **Prabhat Verma**, Osaka Univ. (Japan); **Hongxing Xu**, Wuhan Univ. (China); **Shumin Xiao**, Harbin Institute of Technology Shenzhen Graduate School (China); **Nikolay I. Zheludev**, Optoelectronics Research Ctr. (United Kingdom)

### SUNDAY 20 AUGUST

#### OPENING REMARKS

20 August 2023 • 8:25 AM - 8:30 AM | Conv. Ctr. Room 4  
Opening remarks and welcome by conference chairs.

#### SESSION 1: FUNDAMENTAL OF PLASMONICS I

20 August 2023 • 8:30 AM - 10:00 AM | Conv. Ctr. Room 4  
Session Chair: Takuo Tanaka, RIKEN (Japan)

12648-1

#### Extreme time modulation of materials properties and Hawking radiation (*Invited Paper*)

Author(s): John B. Pendry, Imperial College London (United Kingdom)

20 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 4

12648-54

#### Compact meta-devices for virtual reality and stereo vision (*Invited Paper*)

Author(s): Wen-Cheng Hsu, National Yang Ming Chiao Tung Univ. (Taiwan), Hon Hai Research Institute (Taiwan); Yu-Heng Hong, Shih-Chen Chen, Hon Hai Research Institute (Taiwan); Chia-Hsun Chang, National Yang Ming Chiao Tung Univ. (Taiwan); Hao-Chung Kuo, Hon Hai Research Institute (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan); Zhaoyi Li, Federico Capasso, Harvard Univ. (United States); Yao-Wei Huang, National Yang Ming Chiao Tung Univ. (Taiwan)

20 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 4

12648-3

#### Abnormal dispersion of surface plasmon polaritons in the ultra-strong coupling regime (*Invited Paper*)

Author(s): Mikhail A. Noginov, Md Golam R. Chowdhury, Leila Hesami, Shamaar R. Howard, Kanij Khabir, Norfolk State Univ. (United States)

20 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 4

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: NONLINEAR I

20 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 4  
Session Chair: Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

12648-4

#### Near-zero-index materials for nonlinear optics and beyond (*Invited Paper*)

Author(s): Vladimir M. Shalaev, Purdue Univ. (United States)  
20 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 4

12648-5

#### A plasmonic nonlinear pseudo-diode (*Invited Paper*)

Author(s): Sergejs Boroviks, Andrei Kiselev, Karim Achouri, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)  
20 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 4

12648-6

#### Nonlinear metasurfaces for UV light generation and control (*Invited Paper*)

Author(s): Ming Lun Tseng, National Yang Ming Chiao Tung Univ. (Taiwan); Michael Semmlinger, Ming Zhang, Catherine Arndt, Jian Yang, Rice Univ. (United States); Mu Ku Chen, Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China); Peter Nordlander, Naomi J. Halas, Rice Univ. (United States)  
20 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 4

Lunch Break 12:00 PM - 1:30 PM

# TECHNICAL CONFERENCES

## Conference 12648

### SESSION 3: METASURFACES I

20 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 4

Session Chair: Ming Lun Tseng,  
National Yang Ming Chiao Tung Univ. (Taiwan)

12648-33

#### **All-dielectric nanostructures for highly-sensitive molecular spectroscopies** (*Invited Paper*)

Author(s): Taka-aki Yano, Ryo Kato, Takuo Tanaka, Tokushima Univ. (Japan), RIKEN (Japan)

20 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 4

12648-8

#### **From free space optical components to metasurface-integrated optics** (*Invited Paper*)

Author(s): Pin Chieh Wu, National Cheng Kung Univ. (Taiwan)

20 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 4

12648-9

#### **Super-resolution, deep-penetration, and non-destructive imaging with plasm-acoustic metasurfaces** (*Invited Paper*)

Author(s): Lisa V. Poulidakos, Jiuk Byun, Julia Holland, Shahrose Khan, Nicholas Boechler, Univ. of California, San Diego (United States)

20 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 4

Coffee Break 3:00 PM - 3:30 PM

### SESSION 4: PLASMONIC APPLICATIONS I

20 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 4

Session Chair: Pin Chieh Wu, National Cheng Kung Univ. (Taiwan)

12648-10

#### **Plasmonic photodetectors with superior optoelectronic performance demonstrated in MIR, visible and UV regions** (*Invited Paper*)

Author(s): Ta-Jen Yen, Shyam Narayan Singh Yadav, Ching-Han Mao, Yu-Ping Kuang, Shangjr Gwo, Chang Hua Liu, National Tsing Hua Univ. (Taiwan); Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

20 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 4

12648-11

#### **Monocrystalline gold: Light absorption, emission, and photoelectrochemistry** (*Invited Paper*)

Author(s): Giulia Tagliabue, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 4

12648-12

#### **Active spatially reconfigurable mid-infrared polarization modulation with a vertical split-ring resonator array**

Author(s): Chun-Yen Chen, National Tsing Hua Univ. (Taiwan); Che-Chin Chen, Taiwan Instrument Research Institute (Taiwan); Takuo Tanaka, RIKEN (Japan); Ta-Jen Yen, National Tsing Hua Univ. (Taiwan)

20 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 4

12648-13

#### **Manipulation of lasing polarization through metasurface-embedded microcavity**

Author(s): Shih-Hsiu Huang, Po-Sheng Huang, National Cheng Kung Univ. (Taiwan); Zhiyi Yuan, Yu-Cheng Chen, Nanyang Technological Univ. (Singapore); Pin Chieh Wu, National Cheng Kung Univ. (Taiwan)

20 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 4

12648-14

#### **MoS<sub>2</sub> plasmonic grating integrated indium selenide for polarization-sensitive multi-band photodetection in near-infrared**

Author(s): Yu-Te Chu, Ta-Jen Yen, National Tsing Hua Univ. (Taiwan)

20 August 2023 • 5:10 PM - 5:30 PM | Conv. Ctr. Room 4

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### **Welcome and Opening Remarks**

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### **A perovskite paved pathway to multi-terawatt scale photovoltaics** (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### **Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems** (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### **Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs** (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

#### Coffee Break 9:55 AM - 10:30 AM

#### SESSION 5: NONLINEAR II

21 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 4

Session Chair: Yun-Chorng Chang, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

12648-15

#### Enhancing second harmonic generation in Weyl semimetal TaAs with plasmonics (*Invited Paper*)

Author(s): Alexandra Boltasseva, Morris Yang, Demid Sychev, Samuel Peana, Vahagn Mkhitaryan, Purdue Univ. (United States); David G. Mandurus, Hasitha Arachchige, The Univ. of Tennessee Knoxville (United States); Vladimir M. Shalaev, Purdue Univ. (United States)

21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 4

12648-16

#### Control of nonlinear thermoelectric transport in near-field plasmonic resonators (*Invited Paper*)

Author(s): Frank D. Bello, Daniel D. Clarke, Illya Tarasenko, John F. Donegan, Ortwin Hess, Trinity College Dublin (Ireland)

21 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 4

12648-17

#### Photo-thermo-optical nonlinearity in metal and semiconductor Mie resonators (*Invited Paper*)

Author(s): Te-Hsin Yen, Po-Hsueh Tseng, Yu-Chieh Chen, Jhih-Jia Chen, Kentaro Nishida, National Taiwan Univ. (Taiwan); Junichi Takahara, Osaka Univ. (Japan); Shi-Wei Chu, National Taiwan Univ. (Taiwan)

21 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 4

#### Lunch Break 12:00 PM - 1:30 PM

#### SESSION 6: METASURFACES II

21 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 4

Session Chair: Howard Lee, Univ. of California, Irvine (United States)

12648-18

#### Optical metasurface for biomedical applications (*Invited Paper*)

Author(s): Yuan Luo, National Taiwan Univ. (Taiwan)

21 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 4

12648-19

#### Rapid laser printing of multiplexed images based on quasi-random plasmonic metasurfaces (*Invited Paper*)

Author(s): Van Doan Le, Lab. Hubert Curien (France); Nicolas Dalloz, HID GLOBAL SAS (France); Manuel Alejandro Flores Figueroa, Francis Vocanson, Nathalie N. Destouches, Lab. Hubert Curien (France)

21 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 4

12648-20

#### Nonlinearly pumped vortex lasing from perovskite metasurface based on quasi-bound states in the continuum (*Invited Paper*)

Author(s): Chi-Ching Liu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Hui-Hsin Hsiao, National Taiwan Univ. (Taiwan); Yun-Chorng Chang, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

21 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 4

#### Coffee Break 3:00 PM - 3:30 PM

#### SESSION 7: PLASMONIC MATERIALS AND NANOSTRUCTURES I

21 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 4

Session Chair: Wakana Kubo, Tokyo Univ. of Agriculture and Technology (Japan)

12648-21

#### Epsilon-near-zero optics in planar and optical fiber platforms (*Invited Paper*)

Author(s): Howard Lee, Aleksei Anopchenko, Christopher M. Gonzalez, David Dang, Quynh T. Dang, Stuart Love, Leon Zhang, Sudip J. Gurung, Kent Nguyen, Tiger Chen, Juan Manuel Raffo Calixto, Sudarsh Kunnavakkam, Andrew Palmer, Univ. of California, Irvine (United States), Beckman Laser Institute and Medical Clinic (United States)

21 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 4

12648-22

#### Collective resonances of lossy metal and metalloid antennas (*Invited Paper*)

Author(s): Amanda Romero, Md Sakibul Islam, Viktoriia E. Babicheva, The Univ. of New Mexico (United States)

21 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 4

12648-23

#### Experimental demonstration of deep learning enabled ultra-broadband epsilon-near-zero perfect absorbers

Author(s): David Dang, Sudip J. Gurung, Juan Manuel Raffo Calixto, Xuguo Zhou, Aleksei Anopchenko, Howard Lee, Univ. of California, Irvine (United States)

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 4

# TECHNICAL CONFERENCES

## Conference 12648

12648-24

### Tuning plasmonic coupling of nanocube dimers via nanoscale gap morphology

Author(s): Yina Wu, ICFO - Institut de Ciències Fotòniques (Spain); Andrea Konečná, Brno Univ. of Technology (Czech Republic); ShinHum Cho, Keimyung Univ. (Republic of Korea); Delia J. Milliron, The Univ. of Texas at Austin (United States); Jordan A. Hachtel, Oak Ridge National Lab. (United States); F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

21 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 4

12648-25

### Statistical measurements of the density of photon states in randomly formed Au nanoparticle clusters

Author(s): Belkis Gökbulut, Mehmet Naci İnci, Bogaziçi Üniv. (Turkey)

21 August 2023 • 5:10 PM - 5:30 PM | Conv. Ctr. Room 4

## POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12648-66

### Gold nanourchin-based SERS microfluidic platform for immuno-detection of disease biomarkers

Author(s): Andra-Sorina Tatar, Ioana-Andreea Brezestean, Daniel Marconi, Alia Colnita, Institutul National de Cercetare-Dezvoltare pentru Tehnologii Izotopice si Moleculare Cluj-Napoca (Romania); Sanda Boca, Institutul National de Cercetare-Dezvoltare pentru Tehnologii Izotopice si Moleculare Cluj-Napoca (Romania), Univ. Babes-Bolyai (Romania)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-67

### Fluctuation of SERS spectra evaluated by density-based spatial clustering analysis

Author(s): Kota Uchiyama, Takahiro Kondo, Yuika Saito, Gakushuin Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-68

### Plasmonic sensor for house wastewater monitoring

Author(s): Guillermo E. Sánchez-Guerrero, Perla M. Viera González, Edgar Martínez Guerra, Karim Acuña Askar, Univ. Autónoma de Nuevo León (Mexico); Rodolfo Cortes Martínez, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-69

### Protocol to design plasmonic sensors for the characterization of materials at the atomic scale

Author(s): Perla M. Viera-González, Guillermo E. Sánchez-Guerrero, Edgar Martínez-Guerra, Univ. Autónoma de Nuevo León (Mexico); Edgar Martínez-Guerra, Ctr. de Investigación en Materiales Avanzados, S.C. (Mexico); Rodolfo Cortés Martínez, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-70

### Large scale three-dimensional optical Yagi-Uda nanoantenna array fabricated using nanospherical-lens lithography

Author(s): Chia-Ling Tsao, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan), National Taiwan Univ. (Taiwan); Chi-Ching Liu, Academia Sinica (Taiwan), National Taiwan Univ. (Taiwan); Chieh-Chun Chang, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan), National Taiwan Univ. (Taiwan); Yun-Chorng Chang, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-71

### Collective circular dichroism of 2D helicoid crystals for ultrasensitive molecular chirality analysis

Author(s): Ryeong Myeong Kim, Ki Tae Nam, Seoul National Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-72

### Novel high entropy alloy (AgAlCuNiTi) hybridized MoS<sub>2</sub>/Si nanowires heterostructure with plasmonic enhanced photocatalytic activity

Author(s): Yu-Hsuan Cheng, Ta-Jen Yen, National Tsing Hua Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-73

### Giant circular dichroic SHG behavior of double SP resonant chiral aluminum nanorod dimer structures

Author(s): Atsushi Sugita, Shizuoka Univ (Japan); Kenshin Muroi, Sota Tamotsu, Shizuoka Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-74

### Control of plasmon dephasing dynamics by plasmon-exciton strong coupling systems

Author(s): Hiroki Takeuchi, Keisuke Imaeda, Sou Ryuzaki, Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-75

### Topological darkness in random gold metasurfaces for high sensitivity detection using phase interrogation

Author(s): Juan Pablo Cuanalo Fernandez, Nikolai Korneev, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Ismael Cosme-Bolaños, Instituto Nacional de Astrofísica (Mexico); María Beatriz de la Mora Mojica, Universidad Nacional Autónoma de México (Mexico); Irving Gazga Gurrión, Svetlana Mansurova, Rubén Ramos García, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A



12648-76

### **Moiré metalens-based fluorescence optical sectioning microscopy**

Author(s): Yu-Hsin Chia, National Taiwan Univ. (Taiwan); Cheng Hung Chu, NTU YongLin Institute of Health (Taiwan); Sunil Vyas, Yi-You Huang, National Taiwan Univ. (Taiwan); Din Ping Tsai, City Univ. of Hong Kong (China); Yuan Luo, National Taiwan Univ. (Taiwan), NTU YongLin Institute of Health (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-77

### **Enhanced optical forces and tunable LSPR of Ag triangular nanoplates**

Author(s): Xiudong Sun, Pengxue Jia, Harbin Institute of Technology (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-78

### **Fabrication and infrared spectral properties of graphene plasmonic nanostructures**

Author(s): Naoya Nomoto, Keisuke Imaeda, Sou Ryuzaki, Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-79

### **Modulation of coherent acoustic phonons via chemisorption on plasmonic Au nanostructures**

Author(s): Shimba Ushikoshi, Yuto Shikama, Keisuke Imaeda, Sou Ryuzaki, Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-80

### **Fabrication of Au plasmonic nanostructures embedded in microfluidic devices and their optical properties**

Author(s): Sora Inoue, Keisuke Imaeda, Sou Imaeda, Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-81

### **Thermal camera with 100° dynamic FOV enabled by reconfigurable metasurface beam deflector.**

Author(s): Zhirui Zeng, Weiming Zhu, Univ. of Electronic Science and Technology of China (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-82

### **Reconfigurable metasurface beam deflector based on angular mode hopping effect and its applications on optical communication channel switching**

Author(s): Dongyu Hu, Univ. of Electronic Science and Technology of China (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-83

### **Position-sensitive photodetector for plasmonic detection in a random metasurface**

Author(s): Carla Neiré Labastida Ortiz, Juan P. Cuanalo, Irving Gazga, Rubén Ramos, Svetlana Mansurova, Nikolai Korneev, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-84

### **Plasmonic response of a random metasurface based on gold nano-islands in attenuated total reflection configuration**

Author(s): Juan Pablo Cuanalo, Irving Gazga, Ismael Cosme-Bolaños, Nikolai Korneev, Rebeca Lugo, Ruben Ramos, Svetlana Mansurova, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-85

### **Gouy phase due to tapering of evanescent fields in plasmonic systems**

Author(s): Valeriya Khanikaeva, Stony Brook Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-86

### **Structured surface plasmon generated with interfered evanescent waves**

Author(s): Fabián C. Cubillos Morales, Gabriel E. Martínez Niconoff, Ilse I. Cazares Aguilar, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-87

### **Dielectric nanoantenna stickers for photoluminescence control**

Author(s): Shunsuke Murai, Yuto Inoue, TienYang Lo, Katsuhisa Tanaka, Kyoto Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-88

### **Room-temperature lasing from Quasi-2D Ruddlesden-Popper perovskites coupled with plasmonic lattices**

Author(s): Linchyn Yuan, Xing-Hao Lee, National Taiwan Univ. (Taiwan), Academia Sinica (Taiwan); Jia-Wern Chen, Academia Sinica (Taiwan); Chiung-Han Chen, National Taiwan Univ. (Taiwan); Yen-Yu Wang, Chih-Wei Chu, Academia Sinica (Taiwan); Chu-Chen Chueh, National Taiwan Univ. (Taiwan); Yu-Jung Lu, National Taiwan Univ. (Taiwan), Academia Sinica (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-89

### **Optoinduced magnetization in plasmonic nanostructures from the spin and orbital angular momenta of light**

Author(s): Vage Karakhanyan, Clément Eustache, Yannick Lefier, Thierry R. Grosjean, Univ. Bourgogne Franche-Comté (France)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-90

### **Gap surface plasmon induced effective diffraction for wide angle of incidence**

Author(s): Sungjae Jin, Kyutae Lee, Bumjin Kim, In-Sub Han, Kang-Yeol Park, Jieun Ryu, Yanghyun Joo, LG Innotek (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12648

12648-92

### Versatile dual-plasmonic hetero-nanoarchitectures integrating noble metals and copper chalcogenides

Author(s): Hao Jing, Mariia Ivanchenko, Alison Carroll, George Mason Univ. (United States); Andrea Brothers, American Univ. (United States); Nicolas Large, The Univ. of Texas at San Antonio (United States); Alline Myers, National Institute of Standards and Technology (United States); Andrew Evangelista, George Mason Univ. (United States); Vida Nooshnab, The Univ. of Texas at San Antonio (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12648-93

### Spectrally selective thermal emission from graphene decorated with silver nanorings

Author(s): Jayden Craft, Univ. of Central Florida (United States); Richard Osgood, U.S. Army Combat Capabilities Development Command Soldier Ctr. (United States); Michael N. Leuenberger, Univ. of Central Florida (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 8: PLASMONIC MATERIALS AND NANOSTRUCTURES II

22 August 2023 • 8:30 AM - 10:20 AM | Conv. Ctr. Room 4  
Session Chair: Giulia Tagliabue, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12648-26

### Semicontinuous silver films: Plasmonic color printing and advanced disordered media modeling (*Invited Paper*)

Author(s): Alexander V. Kildishev, Sarah N. Chowdhury, Ludmila J. Prokopeva, Jeffrey Simon, Karthik Pagadala, Purdue Univ. (United States); Michal P. Nowak, Piotr Nyga, Wojskowa Akademia Techniczna im. Jaroslawa Dabrowskiego (Poland); Colton Fruhling, Vladimir M. Shalaev, Alexandra Boltasseva, Purdue Univ. (United States)

22 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 4

12648-27

### Full-colour tuning of optical properties based on nanophotonics and plasmonics (*Invited Paper*)

Author(s): Koichi Okamoto, Osaka Metropolitan Univ. (Japan)

22 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 4

12648-28

### Metamaterial thermal management (*Invited Paper*)

Author(s): Wakana Kubo, Tokyo Univ. of Agriculture and Technology (Japan)

22 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 4

12648-29

### Interplay between conduction and valence band electrons in nonlinear absorption of epsilon-near-zero oxides

Author(s): Quynh T. Dang, Sudip J. Gurung, Aleksei Anopchenko, Ho Wai Howard Lee, Univ. of California, Irvine (United States), Beckman Laser Institute and Medical Clinic (United States)

22 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 4

Coffee Break 10:20 AM - 11:00 AM

### SESSION 9: RADIATION ENGINEERING

22 August 2023 • 11:00 AM - 12:00 PM | Conv. Ctr. Room 4  
Session Chair: Satoshi Iwamoto, The Univ. of Tokyo (Japan)

12648-30

### Wavefront shaping to enhance light remission from deep inside diffusive media (*Invited Paper*)

Author(s): Hui Cao, Yale Univ. (United States)

22 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 4

12648-31

### Excitation dependent fluorescence and Raman scattering in the strong coupling regime (*Invited Paper*)

Author(s): Wan-Ping Chan, National Cheng Kung Univ. (Taiwan); Chi Chen, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Shiuian-Yeh Chen, National Cheng Kung Univ. (Taiwan)

22 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 4

Lunch/Exhibition Break 12:00 PM - 1:30 PM

### SESSION 10: ADVANCED NANOPHOTONIC DESIGN

22 August 2023 • 1:30 PM - 3:30 PM | Conv. Ctr. Room 4  
Session Chair: Hui-Hsin Hsiao, National Taiwan Univ. (Taiwan)

12648-32

### Slow light waveguide based on semiconductor valley photonic crystal (*Invited Paper*)

Author(s): Satoshi Iwamoto, Hironobu Yoshimi, The Univ. of Tokyo (Japan); Kazuhiro Kuruma, Harvard Univ. (United States), The Univ. of Tokyo (Japan); Ryosuke Miyazaki, The Univ. of Tokyo (Japan); Yasutomo Ota, Keio Univ. (Japan)

22 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 4

12648-7

### Perspectives of design, materials, and fabrication for metasurfaces (*Invited Paper*)

Author(s): Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 4

12648-34

### Phase-locked photon electron interactions without a laser (*Invited Paper*)

Author(s): Nahid Talebi Sarvari, Christian-Albrechts-Univ. zu Kiel (Germany)

22 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 4

12648-35

### Thermomechanical nanoengineering of phonon-polaritonic van der Waals materials (*Invited Paper*)

Author(s): Maxim R. Shcherbakov, Naveed Hussain, Mashnoon A. Sakib, Zhaoxu Li, Mariia S. Stepanova, Hematha K. Wickramasinghe, Univ. of California, Irvine (United States)

22 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 4

Coffee Break 3:30 PM - 4:00 PM

### SESSION 11: METASURFACES III

22 August 2023 • 4:00 PM - 5:40 PM | Conv. Ctr. Room 4  
Session Chair: Koichi Okamoto, Osaka Metropolitan Univ. (Japan)

12648-51

#### **Singularity protected topological metasurfaces and its applications** (*Invited Paper*)

Author(s): Qinghua Song, Tsinghua Shenzhen International Graduate School (China)

22 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 4

12648-38

#### **The chiral dichroism detections with designed near infrared chiral metasurface**

Author(s): Hsiang-Chen Chui, National Cheng Kung Univ. (Taiwan), Dalian Univ. of Technology (China); Rui Li, Zhequan Wang, Dalian Univ. of Technology (China)

22 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 4

12648-39

#### **Variable metalens-based optical sectioning fluorescence microscopy with HiLo algorithm**

Author(s): Cheng Hung Chu, Yu-Hsin Chia, National Taiwan Univ. (Taiwan); Mu Ku Chen, City Univ. of Hong Kong (Hong Kong, China); Sunil Vyas, National Taiwan Univ. (Taiwan); Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China); Yuan Luo, National Taiwan Univ. (Taiwan)

22 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 4

12648-37

#### **Fast beam steering based on reconfigurable metasurface and its applications** (*Invited Paper*)

Author(s): Zhirui Zeng, Weiming Zhu, Univ. of Electronic Science and Technology of China (China)

22 August 2023 • 5:10 PM - 5:40 PM | Conv. Ctr. Room 4

## WEDNESDAY 23 AUGUST 2023

### SESSION 12: PLASMONIC APPLICATIONS II

23 August 2023 • 9:00 AM - 10:00 AM | Conv. Ctr. Room 4  
Session Chair: Kuo-Ping Chen, National Tsing Hua Univ. (Taiwan)

12648-42

#### **Nanoscale imaging of phonon modes in a plasmonic nano-cavity using tip-enhanced Raman spectroscopy in ambient** (*Invited Paper*)

Author(s): Maria Vanessa Oguchi, Norihiko Hayazawa, Takuo Tanaka, RIKEN (Japan)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 4

12648-40

#### **Plasmonic nanocavity induced coupling and emission of spin-forbidden dark excitons** (*Invited Paper*)

Author(s): Dangyuan Lei, City Univ. of Hong Kong (Hong Kong, China)

23 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 4

Coffee Break 10:00 AM - 10:30 AM

### SESSION 13: METASURFACES IV

23 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 4  
Session Chair: Taka-aki Yano, Tokushima Univ. (Japan)

12648-50

#### **Dynamically tunable transmissive metasurfaces for beam steering applications** (*Invited Paper*)

Author(s): Ruzan Sokhoyan, Claudio Hail, Morgan Foley, Meir Y. Grajower, Harry A. Atwater, Caltech (United States)

23 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 4

12648-44

#### **New materials and fabrication platforms for metasurfaces** (*Invited Paper*)

Author(s): Uriel Levy, Oren Goldberg, Noa Mazurski, Jacob Engelberg, The Hebrew Univ. of Jerusalem (Israel)

23 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 4

12648-45

#### **Piezoelectric MEMS-empowered dynamic metasurfaces** (*Invited Paper*)

Author(s): Fei Ding, Univ. of Southern Denmark (Denmark)

23 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 4

Lunch/Exhibition Break 12:00 PM - 1:30 PM

### SESSION 14: FUNDAMENTAL OF PLASMONICS II

23 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 4  
Session Chair: Ruzan Sokhoyan, Caltech (United States)

12648-46

#### **All optical switching via hyperbolic metamaterials** (*Invited Paper*)

Author(s): Humeyra Caglayan, Alessandro Pianelli, Rakesh Dhama, Tampere Univ. (Finland)

23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 4

12648-47

#### **Metrology of exciton-surface plasmon polaritons in the time-domain**

Author(s): Matthew Y. Sfeir, Evripidis Michail, The City Univ. of New York (United States); Bin Liu, Kamyar Rashidi, Vinod M. Menon, The City College of New York (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 4

12648-48

#### **Disentangling the processes of the nanoparticle plasmon decay by the combination of attosecond to picosecond pump-probe experiments**

Author(s): Holger Lange, Univ. Hamburg (Germany); Andreas Knorr, Technische Univ. Berlin (Germany); Kartik Ayyer, Max-Planck-Institut für Struktur und Dynamik der Materie (Germany); Francesca Calegari, Deutsches Elektronen-Synchrotron (Germany); Matthias Kling, SLAC National Accelerator Lab. (United States), Stanford Univ. (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 4

# TECHNICAL CONFERENCES

## Conference 12648

12648-49

### Assymmetric absorption in plasmonic based grating for visible and infrared frequencies

Author(s): Miriele Carvalho Paim, Vitaly F. Rodriguez-Esquerre, Escola Politécnica da Univ. Federal da Bahia (Brazil)  
23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 4

Coffee Break 3:00 PM - 3:30 PM

#### SESSION 15: METASURFACES V

23 August 2023 • 3:30 PM - 5:20 PM | Conv. Ctr. Room 4  
Session Chair: Yao-Wei Huang,  
National Yang Ming Chiao Tung Univ. (Taiwan)

12648-43

### Meta-lens for intelligent aerial, underwater, and land imaging (*Invited Paper*)

Author(s): Din Ping Tsai, Xiaoyuan Liu, Mu Ku Chen, City Univ. of Hong Kong (Hong Kong, China); Takuo Tanaka, RIKEN (Japan)  
23 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 4

12648-36

### All-dielectric toroidal metasurfaces for sensing applications (*Invited Paper*)

Author(s): Hui-Hsin Hsiao, Ai-Yin Liu, National Taiwan Univ. (Taiwan)  
23 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 4

12648-57

### Tamm plasmon polaritons in hydrogen sensing and hot-electron photodetectors (*Invited Paper*)

Author(s): Kuo-Ping Chen, National Tsing Hua Univ. (Taiwan)  
23 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 4

12648-53

### Abrupt autofocusing beam meta-optics for biomedical applications

Author(s): Surag Suresh, National Tsing Hua Univ. (Taiwan), National Taiwan Univ. (Taiwan); Sunil Vyas, Cheng Hung Chu, Yuan Luo, Pan-Chyr Yang, National Taiwan Univ. (Taiwan); J. Andrew Yeh, National Tsing Hua Univ. (Taiwan); Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China), National Taiwan Univ. (Taiwan)  
23 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 4

## THURSDAY 24 AUGUST 2023

#### SESSION 16: METASURFACES VI

24 August 2023 • 9:00 AM - 10:20 AM | Conv. Ctr. Room 4  
Session Chair: Kyoko Namura, Kyoto Univ. (Japan)

12648-2

### Plasmons in atomically thin metals (*Invited Paper*)

Author(s): F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain)  
24 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 4

12648-55

### Dynamic non-volatile tuning of multispectral light- and heat-managing metasurfaces via reversible electrochemistry (*Invited Paper*)

Author(s): Po-Chun Hsu, The Univ. of Chicago (United States)  
24 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 4

12648-56

### Green $\mu$ LEDs beamed emission using resonant modes in plasmonic metasurfaces

Author(s): Mohamed Mahmoud Saad Abdelkhalik Mohamed, Aleksande V. Vaskin, Technische Univ. Eindhoven (Netherlands); Toni López, Lumileds Germany GmbH (Germany); Anton Matthijs Berghuis, Technische Univ. Eindhoven (Netherlands); Aimi Abass, ams-OSRAM International GmbH (Germany); Jaime Gómez Rivas, Technische Univ. Eindhoven (Netherlands)  
24 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 4

Coffee Break 10:20 AM - 10:50 AM

#### SESSION 17: PLASMONIC APPLICATIONS: SENSING

24 August 2023 • 10:50 AM - 12:20 PM | Conv. Ctr. Room 4  
Session Chair: Cheng Hung Chu,  
NTU YongLin Institute of Health (Taiwan)

12648-58

### Microfluidic mixing on plasmonic nanostructures (*Invited Paper*)

Author(s): Kyoko Namura, Ryoma Sakanai, Yasushi Kojima, Motofumi Suzuki, Kyoto Univ. (Japan)  
24 August 2023 • 10:50 AM - 11:20 AM | Conv. Ctr. Room 4

12648-59

### Self-assembled deep ultraviolet rhodium nanogap antenna-in-box for label-free protein sensing

Author(s): Prithu Roy, Institut Fresnel (France), Aix-Marseille Univ. (France); Siyuan Zhu, Jie Liu, Duke Univ. (United States); Jerome Wenger, Institut Fresnel (France), Aix-Marseille Univ. (France)  
24 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 4

12648-60

### Rapid COVID-19 immunity screening by machine learning aided multiplexed nanoplasmonic biosensor

Author(s): Aidana Beisenova, Wihan Adi, S. Janna Bashar, Monniesh Velmurugan, Kenzie B. Germanson, Miriam A. Shelef, Filiz Yesilkoy, Univ. of Wisconsin-Madison (United States)  
24 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 4

12648-91

### Surface plasmon and localized photonic mode coupling induced Rabi splitting and biosensing application

Author(s): Hong-Jhang Syu, Shu-Cheng Lo, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Pei-Kuen Wei, Academia Sinica (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan)  
24 August 2023 • 12:00 PM - 12:20 PM | Conv. Ctr. Room 4

Lunch/Exhibition Break 12:20 PM - 1:50 PM

### SESSION 18: FUNDAMENTAL OF PLASMONICS III

24 August 2023 • 1:50 PM - 2:50 PM | Conv. Ctr. Room 4

Session Chair: Maria Vanessa Oguchi, RIKEN (Japan)

12648-61

#### **Fundamental limits to large-area plasmonic field enhancements**

Author(s): Zhaowei Dai, Owen D. Miller, Yale Univ. (United States)

24 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 4

12648-62

#### **Beyond the Purcell effect: Modifying spontaneous emission via plasmonic doping**

Author(s): Mohsin Ijaz, Univ. of Otago (New Zealand), Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand), MacDiarmid Institute for Advanced Materials and Nanotechnology (New Zealand); Boyang Ding, Univ. of Otago (New Zealand), Coherent Scientific Pty Ltd. (Australia); Richard J. Blaikie, Univ. of Otago (New Zealand), Dodd-Walls Ctr. for Photonic and Quantum Technologies (New Zealand), MacDiarmid Institute for Advanced Materials and Nanotechnology (New Zealand)

24 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 4

12648-63

#### **Effective diffraction in broad angle of incidence via gap surface plasmon**

Author(s): Kyutae Lee, Sungjae Jin, Bumjin Kim, In-Sub Han, Kang-Yeol Park, Yanghyun Joo, LG Innotek (Republic of Korea)

24 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 4

# TECHNICAL CONFERENCES

## Conference 12649

# Optical Trapping and Optical Micromanipulation XX

20 - 24 August 2023 | Conv. Ctr. Room 6D

Conference Chairs: **Kishan Dholakia**, Univ. of St. Andrews (United Kingdom); **Gabriel C. Spalding**, Illinois Wesleyan Univ. (United States)

Program Committee: **Ashley R. Carter**, Amherst College (United States); **Jürgen W. Czarske**, TU Dresden (Germany); **Yale E. Goldman**, Univ. of Pennsylvania (United States); **Reuven Gordon**, Univ. of Victoria (Canada); **Catherine M. Herne**, State Univ. of New York at New Paltz (United States); **Masud Mansuripur**, Wyant College of Optical Sciences (United States); **James Millen**, King's College London (United Kingdom); **David C. Moore**, Yale Univ. (United States); **Justus C. Ndukaife**, Vanderbilt Univ. (United States); **Daniel H. Ou-Yang**, Lehigh Univ. (United States); **Daryl Preece**, Beckman Laser Institute and Medical Clinic (United States); **Ruben Ramos-Garcia**, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia); **Nick Vamivaka**, The Institute of Optics, Univ. of Rochester (United States); **Karen P. Volke-Sepúlveda**, Univ. Nacional Autónoma de México (Mexico); **Giovanni Volpe**, Göteborgs Univ. (Sweden); **Yuebing Zheng**, The Univ. of Texas at Austin (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: CELEBRATING OPTICAL FORCE, TORQUE, AND CONTROL FOR BIOPHYSICAL STUDIES AND MORE

20 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 6D

Session Chair: Halina Rubinsztein-Dunlop,  
The Univ. of Queensland (Australia)

12649-1

#### Holographic Optical Force and Torque Measurement *(Invited Paper)*

Author(s): Monika Ritsch-Marte, Gregor Thalhammer-Thurner,  
Medizinische Univ. Innsbruck (Austria)

20 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 6D

12649-2

#### Optical trapping of soft and active particles - a (his) story of light-based control of colloidal matter *(Invited Paper)*

Author(s): Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany), Westfälische Wilhelms-Universität Münster (Germany); Valeria Ahlborn, Matthias Rüschenbaum, Randhir Kumar, Westfälische Wilhelms-Universität Münster (Germany)

20 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 6D

12649-3

#### Cancer cell mechanics: From the optical stretcher to clinical applications *(Invited Paper)*

Author(s): Josef A. Käs, Univ. Leipzig (Germany)

20 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 6D

12649-4

#### Fatty tissue as a modulator of cancer cell mechanics

Author(s): Eliane Blauth, Hans Kubitschke, Univ. Leipzig (Germany); Benjamin Wolf, Universitätsklinikum Leipzig (Germany); Peter Kovacs, Medical Department III - Endocrinology, Nephrology, Rheumatology, University Hospital Leipzig (Germany); Matthias Blüher, Medical Department III - Endocrinology (Germany); Nadja Dornhöfer, Department of Gynecology, Women's and Children's Centre, University Hospital Leipzig (Germany); Bahriye Aktas, Universitätsklinikum Leipzig (Germany); Josef A. Käs, Univ. Leipzig (Germany)

20 August 2023 • 9:30 AM - 9:45 AM | Conv. Ctr. Room 6D

12649-5

#### Understanding cellular damage with a multi-modal biophotonic workstation

Author(s): Daryl C. Preece, Beckman Laser Institute and Medical Clinic (United States)

20 August 2023 • 9:45 AM - 10:00 AM | Conv. Ctr. Room 6D

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: OPTICALLY DRIVEN MICRORHEOLOGY AND MECHANOBIOLOGY

20 August 2023 • 10:30 AM - 12:15 PM | Conv. Ctr. Room 6D

Session Chair: Elliot L. Botvinick,  
Univ. of California, Irvine (United States)

12649-6

#### Optical Tweezers in Mechanobiology *(Invited Paper)*

Author(s): Halina Rubinsztein-Dunlop, Mark L. Watson, Itia Favre-Bulle, Patrick Grant, Timo A. Nieminen, Alexander B. Stilgoe, The Univ. of Queensland (Australia)

20 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 6D

12649-7

#### Sensing inertia with rotational optical tweezers *(Invited Paper)*

Author(s): Mark L. Watson, Alexander B. Stilgoe, The Univ. of Queensland (Australia); Itia A. Favre-Bulle, The Univ. of Queensland (Australia), Queensland Brain Institute (Australia); Timo A. Nieminen, Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

20 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 6D

12649-8

#### Time-shared optical tweezers for active microrheology inside cells *(Invited Paper)*

Author(s): Frederic Català-Castro, ICFO - Institut de Ciències Fotòniques (Spain); Paolo Antonio Frigeri, Impetux Optics, S.L. (Spain); Santiago Ortiz-Vásquez, Carmen Martínez-Fernández, Michael Krieg, ICFO - Institut de Ciències Fotòniques (Spain)

20 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 6D

12649-9

### **Decoupling noises generated by active forces from noises generated by a combination of passive and active stochastic forces on an optically trapped particle**

Author(s): H. Daniel Ou-Yang, Chong Shen, Simin Xia, Lehigh Univ. (United States)

20 August 2023 • 12:00 PM - 12:15 PM | Conv. Ctr. Room 6D

Lunch Break 12:15 PM - 1:45 PM

### **SESSION 3: STUDIES OF DYNAMICAL BIOPHYSICAL SYSTEMS**

20 August 2023 • 1:45 PM - 3:15 PM | Conv. Ctr. Room 6D

Session Chair: Daryl C. Preece, Beckman Laser Institute and Medical Clinic (United States)

12649-10

### **Optical tweezers assessment of local ECM mechanical heterogeneity during capillary morphogenesis** (*Invited Paper*)

Author(s): Michelle Lanterman, Univ. of California, Irvine (United States); Irene Zhang, Univ. of Michigan (United States); Sarah Eldeen, Ulysses Castillo, Univ. of California, Irvine (United States); Andrew Putnam, Univ. of Michigan (United States); Elliot L. Botvinick, Univ. of California, Irvine (United States)

20 August 2023 • 1:45 PM - 2:15 PM | Conv. Ctr. Room 6D

12649-11

### **Cilia function as calcium-mediated mechanosensors that instruct left-right asymmetry** (*Invited Paper*)

Author(s): Mohammed Mahamdeh, Lydia Djenoune, Massachusetts General Hospital, Harvard Medical School (United States); Thai V. Truong, The Univ. of Southern California (United States); Christopher T. Nguyen, Cleveland Clinic (United States); Scott E. Fraser, The Univ. of Southern California (United States); Martina Brueckner, Jonathon Howard, Yale School of Medicine (United States); Shialou Yuan, Massachusetts General Hospital, Harvard Medical School (United States)

20 August 2023 • 2:15 PM - 2:45 PM | Conv. Ctr. Room 6D

12649-12

### **Real time spatial light modulation for informed photostimulation of neuronal cells**

Author(s): Wolfgang Losert, Dulara de Zoysa, Univ. of Maryland, College Park (United States)

20 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 6D

12649-13

### **Influence of plasmonic nano-particles on the poikilocytosis of erythrocytes revealed by a combined use of optical tweezers and microscopy modalities**

Author(s): Tatiana I. Avsievich, Univ. of Oulu (Finland); Andrei I. Pastukhov, Aix-Marseille Univ. (France); Alexander V. Bykov, Univ. of Oulu (Finland); Andrei V. Kabashin, Aix-Marseille Univ. (France); Igor V. Meglinski, Univ. of Oulu (Finland)

20 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 6D

Coffee Break 3:15 PM - 3:45 PM

### **SESSION 4: VIRUS AND SINGLE-MOLECULE BIOPHYSICAL STUDIES AND TECHNOLOGIES I**

20 August 2023 • 3:45 PM - 5:30 PM | Conv. Ctr. Room 6D

Session Chair: Yale E. Goldman, Univ. of Pennsylvania (United States)

12649-14

### **Power at the nanoscale: Speed, strength, and efficiency in biological motors** (*Invited Paper*)

Author(s): Carlos J. Bustamante, Univ. of California, Berkeley (United States)

20 August 2023 • 3:45 PM - 4:15 PM | Conv. Ctr. Room 6D

12649-15

### **Force-activated DNA substrates for single-molecule studies**

Author(s): Arnulf Taylor, Stephen Okoniewski, Lyle Uyetake, Thomas T. Perkins, JILA, Univ. of Colorado Boulder (United States), National Institute of Standards and Technology (United States)

20 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 6D

12649-16

### **Structural and mechanical insights into DNA and chromosomes under strain using optical tweezers and fluorescence microscopy** (*Invited Paper*)

Author(s): Erwin Peterman, Vrije Univ. Amsterdam (Netherlands)

20 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 6D

12649-17

### **Step-by-step RNA unwinding by three DEAD-box helicases revealed by combined tweezers and fluorescence spectroscopy** (*Invited Paper*)

Author(s): Kasun B. Senanayake, Rajeev Yadav, Kyle Cotter, Eric M. Patrick, Michigan State Univ. (United States); Andrea A. Putnam, Eckhard Jankowski, Case Western Reserve Univ. (United States); Matthew J. Comstock, Michigan State Univ. (United States)

20 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 6D

### **SUNDAY EVENING PLENARY**

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

### **Welcome and Opening Remarks**

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### **A perovskite paved pathway to multi-terawatt scale photovoltaics** (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### **Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems** (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### **Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs** (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12649

MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

#### Coffee Break 9:55 AM - 10:30 AM

### SESSION 5: VIRUS AND SINGLE-MOLECULE BIOPHYSICAL STUDIES AND TECHNOLOGIES II

21 August 2023 • 10:30 AM - 12:20 PM | Conv. Ctr. Room 6D

Session Chair: Erwin Peterman, Vrije Univ. Amsterdam (Netherlands)

12649-18

#### Temporal patterning of excitation light for photophysical control and enhanced FRET sensing in an Anti-Brownian Electrokinetic (ABEL) Trap (*Invited Paper*)

Author(s): Allison H. Squires, The Univ. of Chicago (United States)

21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 6D

12649-19

#### Monitoring physical and chemical properties of individual carboxysomes trapped in solution

Author(s): William Carpenter, Abhijit A. Lavania, Stanford Univ. (United States); Julia B. Turnsek, Luke M. Oltrogge, Univ. of California, Berkeley (United States); Davis D. Perez, Stanford Univ. (United States); Peter D. Dahlberg, Stanford Univ. (United States), SLAC National Accelerator Lab. (United States); David F. Savage, Univ. of California, Berkeley (United States); W. E. Moerner, Stanford Univ. (United States)

21 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 6D

12649-20

#### Ultrafast force-clamp spectroscopy to investigate microtubule-binding proteins

Author(s): Fazoil Ataulkhanov, Vladimir Demidov, Fedor Balabin, Univ. of Pennsylvania (United States)

21 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 6D

12649-21

#### Advances in optical trap studies on actomyosin that enable reliable measurement of attachment kinetics

Author(s): Robert C. Cail, Univ. of Pennsylvania (United States); Donald A. Winkelmann, Rutgers, The State Univ. of New Jersey (United States); Michael Ostap, Yale E. Goldman, Univ. of Pennsylvania (United States)

21 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 6D

12649-22

#### Manipulation of force geometry using optical tweezers reveals novel features of biomolecular interactions

Author(s): Serapion Pyrpasopoulos, Eberhard Karls Univ. Tübingen (Germany); Michael Ostap, Henry Shuman, Univ. of Pennsylvania (United States); William O. Hancock, Taylor M. Zaniewski, Allison M. Gicking, The Pennsylvania State Univ. (United States)

21 August 2023 • 12:00 PM - 12:20 PM | Conv. Ctr. Room 6D

#### Lunch Break 12:20 PM - 1:40 PM

### SESSION 6: PRECISION MEASUREMENT

21 August 2023 • 1:40 PM - 2:50 PM | Conv. Ctr. Room 6D

Session Chair: Allison H. Squires, The Univ. of Chicago (United States)

12649-23

#### Symmetry breaking at cellular adhesion complexes (*Invited Paper*)

Author(s): Alexander Dunn, Stanford Univ. (United States)

21 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 6D

12649-24

#### Plasmonic nanopore sensing with continuous AC modulation

Author(s): Scott Renkes, George Alexandrakis, The Univ. of Texas at Arlington (United States); MinJun Kim, Southern Methodist Univ. (United States)

21 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 6D

12649-25

#### Real-time measurement of velocity fields in colloidal systems

Author(s): Sohila Abdelhafiz, Amir M. Jazayeri, Aristide Dogariu, Univ. of Central Florida (United States)

21 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 6D

#### Coffee Break 2:50 PM - 3:20 PM

### SESSION 7: OPTICAL STUDIES OF ACTIVE SWIMMERS AND HYDRODYNAMICS

21 August 2023 • 3:20 PM - 5:20 PM | Conv. Ctr. Room 6D

Session Chair: Rubén Ramos-García, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

12649-26

#### Measuring attachment rate of predatory bacteria to prey using optical tweezers

Author(s): Claire E. O'Connor, Allyson C. Sheneman, Megan A. Ferguson, Catherine M. Herne, State Univ. of New York at New Paltz (United States)

21 August 2023 • 3:20 PM - 3:35 PM | Conv. Ctr. Room 6D



12649-27

### Studies on the photodamage induced effects on live active rotors in isolated and paired configurations in optical traps

Author(s): Ashwini V. Bhat, Bangalore Univ. (India); Naveena C.S., Sharath Ananthamurthy, Univ. of Hyderabad (India)

21 August 2023 • 3:35 PM - 3:50 PM | Conv. Ctr. Room 6D

12649-28

### On-chip optical nanotweezers for bacteria and bacteriophages viruses trapping and susceptibility testing

Author(s): Romuald Houdré, Nicolas Villa, Enrico Tartari, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Simon Glicenstein, Emmanuel Picard, Grenoble INP, Univ. Grenoble Alpes (France); Pierre Marcoux, Marc Zelsmann, Univ. Grenoble Alpes (France), CEA-LETI (France); Grégory Resch, Ctr. Hospitalier Univ. Vaudois (Switzerland); Emmanuel Hadji, Univ. Grenoble Alpes (France), Grenoble INP (France), CEA-DRF (France)

21 August 2023 • 3:50 PM - 4:05 PM | Conv. Ctr. Room 6D

12649-32

### Playing with active matter

Author(s): Agnese Callegari, Göteborgs Univ. (Sweden); Angelo Barona Balda, Chalmers Univ. of Technology (Sweden); Aykut Argun, Giovanni Volpe, Göteborgs Univ. (Sweden)

21 August 2023 • 4:05 PM - 4:20 PM | Conv. Ctr. Room 6D

12649-30

### Understanding collective motion of living systems with fully steerable optical active particles

Author(s): Zhihan Chen, Yuebing Zheng, The Univ. of Texas at Austin (United States)

21 August 2023 • 4:20 PM - 4:35 PM | Conv. Ctr. Room 6D

12649-31

### Biohybrid microbots driven by light (*Invited Paper*)

Author(s): Roberto Di Leonardo, Nicola Pellicciotta, Ojus S. Bagal, Viridiana Carmona Sosa, Giacomo Frangipane, Sapienza Univ. di Roma (Italy); Gaszton Vizsnyiczai, Biological Research Ctr. (Hungary)

21 August 2023 • 4:35 PM - 5:05 PM | Conv. Ctr. Room 6D

12649-29

### Hydrodynamics mediated interactions between live active rotors in dual optical tweezers

Author(s): Sharath Ananthamurthy, Univ. of Hyderabad (India); Ashwini V. Bhat, Bangalore Univ. (India); Naveena C.S., Univ. Of Hyderabad (India)

21 August 2023 • 5:05 PM - 5:20 PM | Conv. Ctr. Room 6D

#### CONFERENCE PHOTO

21 August 2023 • 5:20 PM - 5:30 PM | Conv. Ctr. Room 6D

Join fellow participants of the Optical Trapping and Optical Micromanipulation XX conference for a group photo to commemorate 20 years.

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12649-86

### Levitation and quantum control of a fast nanodiamond rotor in high vacuum

Author(s): Kunhong Shen, Yuanbin Jin, Xingyu Gao, Peng Ju, Tongcang Li, Purdue Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-87

### Parametric excitation of thin-film silicon nitride cantilever with optical trapping

Author(s): Philip Andrango, Univ. of Oregon (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-88

### A new optomechanical interaction and a model with non-trivial classical dynamics

Author(s): Kewen Xiao, Rochester Institute of Technology (United States); Satyam S. Jha, The Graduate Ctr., CUNY (United States); Mishkatul Bhattacharya, Rochester Institute of Technology (United States); Lev I. Deych, Queens College (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-89

### High-performance sensor based on bound state in the continuum

Author(s): Guodong Zhu, Sen Yang, Justus C. Ndukaife, Vanderbilt Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-90

### Opto-hydrodynamic fiber tweezers for stimulated raman imaging cytometry of leukemic cells

Author(s): Shreyas Vasantham, Institute of Physical Chemistry PAS (Poland); Piotr Garstecki, Ladislav Derzsi, Polish Academy of Sciences (Poland); Abhay Kotnala, Univ. of Houston (United States), Polish Academy of Sciences (Poland)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-91

### Investigation of optical properties of opto-thermally assembled three-dimensional photonic crystals

Author(s): Diptabrata Paul, Desmond Quinn, Frank Cichos, Univ. Leipzig (Germany)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-93

### Optothermal multimodal manipulations along various surfaces

Author(s): Hongru Ding, Zhihan Chen, Yuebing Zheng, The Univ. of Texas at Austin (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12649

12649-94

### **Diffusiophoresis-induced nanoscale particle transport, trapping, and manipulation using optical anapole antenna**

Author(s): Ikjun Hong, Chuchuan Hong, Theodore Anyika, Justus C. Ndukaife, Vanderbilt Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-96

### **Janus particles in geometrical optics**

Author(s): Agnese Callegari, Giovanni Volpe, Göteborgs Univ. (Sweden)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-97

### **Analysis of quasinormal modes in the null-field framework**

Author(s): Benjamin Vennes, McGill Univ. (Canada)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-100

### **Optical fiber and the microscopic interactions of light with matter**

Author(s): Héctor Hugo Cerecedo-Núñez, Patricia Padilla-Sosa, Univ. Veracruzana (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-101

### **Test rig for comparison of particle types for 3D optical trap displays**

Author(s): Cooper D. Bond, Brigham Young Univ. (United States); Omner Cervantes, Kyle E. Chaney, Benjamin Coers, John J. Sheridan, Spatial Forces (United States); Daniel E. Smalley, Brigham Young Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-103

### **Tracking of C. Reinhardtii flagellar disassembly following femtosecond laser ablation**

Author(s): Katelyn Lee, Univ. of California, San Diego (United States); Hiroaki Ishikawa, Univ. of California, San Francisco (United States); Celina Jiang, Bethany Campbell, Elise Stuman, Jiayu Hu, Veronica Gomez-Godinez, Univ. of California, San Diego (United States); Wallace Marshall, Univ. of California, San Francisco (United States); Linda Z. Shi, Univ. of California, San Diego (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-104

### **Effects of laser induced shockwave on neurons from an Alzheimer's mouse model**

Author(s): Veronica Gomez-Godinez, Steven Zheng, Matthew Hsin-De Tran, Chengbiao Wu, Linda Z. Shi, Univ. of California, San Diego (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-105

### **Effects of H<sub>2</sub>O<sub>2</sub> and high doses of nicotinamide on laser-induced neuronal degeneration in mouse model of Huntington's disease**

Author(s): Sophia Barber, Sarah Chen, Veronica Gomez Godinez, Chengbiao Wu, Linda Z. Shi, Univ. of California, San Diego (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12649-106

### **Dynamic excitation for photophysical control and enhanced FRET sensing in an Anti-Brownian Electrokinetic (ABEL) Trap**

Author(s): Ayesha Ejaz, Kavya Vaidya, Allison H. Squires, The Univ. of Chicago (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 8: PRECISION MEASUREMENT, INCLUDING TESTING FUNDAMENTAL PHYSICS I

22 August 2023 • 8:00 AM - 10:25 AM | Conv. Ctr. Room 6D

Session Chair: Kishan Dholakia, Univ. of St. Andrews (Australia)

12649-33

### **Measuring gravitational force from Femto-gram source masses**

Author(s): Mohamed El Kabbash, Massachusetts Institute of Technology (United States)

22 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6D

12649-34

### **Testing Newtonian gravity at the micron scale**

Author(s): Giorgio Gratta, Stanford Univ. (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6D

12649-35

### **Optical trapping of high-aspect-ratio dielectric plates for high frequency gravitational wave detection**

Author(s): Andrew Geraci, Northwestern Univ. (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6D

12649-36

### **Searching for dark matter with optically levitated sensors**

Author(s): Yu-Han Tseng, Benjamin Siegel, Molly Watts, Luke Mozarsky, Emily Peng, Juan Recoaro, David C. Moore, Miriam Martinez, Geena Benga, Jiaxiang Wang, Thomas Penny, Yale Univ. (United States)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 6D

12649-37

### **Measurement of the neutrality of matter using levitated microparticles at the standard quantum limit**

Author(s): Lorenzo Magrini, Stanford Univ. (United States)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 6D

12649-38

### **All in a spin: Rotational levitated optomechanics (Invited Paper)**

Author(s): Kishan Dholakia, The Univ. of Adelaide (Australia)

22 August 2023 • 9:40 AM - 10:10 AM | Conv. Ctr. Room 6D

12649-78

### **Combined dielectrophoresis and optical tweezers for trapping and sensing at the ultimate nanoscale**

Author(s): Marco Riccardi, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

22 August 2023 • 10:10 AM - 10:25 AM | Conv. Ctr. Room 6D

Coffee Break 10:25 AM - 10:50 AM

### SESSION 9: PRECISION MEASUREMENT, INCLUDING TESTING FUNDAMENTAL PHYSICS II

22 August 2023 • 10:50 AM - 1:00 PM | Conv. Ctr. Room 6D

Session Chair: Mohamed El Kabbash, Massachusetts Institute of  
Technology (United States)

12649-39

#### **GHz rotation and sensing with an optically levitated nanodumbbell near a surface**

Author(s): Peng Ju, Yuanbin Jin, Kunhong Shen, Purdue Univ. (United  
States); Yao Duan, The Pennsylvania State Univ. (United States);  
Zhujing Xu, Xingyu Gao, Purdue Univ. (United States); Alejandro  
J. Grine, Sandia National Labs. (United States); Xinjie Ni, The  
Pennsylvania State Univ. (United States); Tongcang Li, Purdue Univ.  
(United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6D

12649-40

#### **Simulation of microparticle launching and loading into optical traps**

Author(s): Kiana Malmir, Kwan Seob Park, Martin Y. Sohn, Thomas  
W. LeBrun, National Institute of Standards and Technology (United  
States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6D

12649-41

#### **Phonon lasing creation and transfer in an optically levitated nanoparticle system**

Author(s): Kai Zhang, Danika R. Luntz-Martin, Univ. of Rochester  
(United States); Sandeep Sharma, KAIST (Republic of Korea);  
Mishkatul Bhattacharya, Rochester Institute of Technology (United  
States); Nick Vamivakas, Univ. of Rochester (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6D

12649-42

#### **Imaging-based cavity optomechanics**

Author(s): Christian M. Pluchar, Aman R. Agrawal, Dalziel J. Wilson,  
The Univ. of Arizona (United States)

22 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 6D

12649-43

#### **Towards absolute cooling of levitated nanoparticles**

Author(s): Cyril Laplane, Peng Ren, Reece R. Roberts, Yiqing Lu,  
Thomas Volz, Macquarie Univ. (Australia)

22 August 2023 • 12:10 PM - 12:30 PM | Conv. Ctr. Room 6D

12649-44

#### **Analysis of optically and plasmonically driven nanoscale motion of nanoparticles (Invited Paper)**

Author(s): Keiji Sasaki, Hokkaido Univ. (Japan)

22 August 2023 • 12:30 PM - 1:00 PM | Conv. Ctr. Room 6D

**Lunch/Exhibition Break 1:00 PM - 2:30 PM**

### SESSION 10

#### *Joint Session with Conferences 12649 and 12655*

22 August 2023 • 2:30 PM - 5:45 PM | Conv. Ctr. Room 6D

Session Chairs: Giovanni Volpe, Göteborgs Univ. (Sweden),  
Gabriel C. Spalding, Illinois Wesleyan Univ. (United States)

12655-29

#### **Accelerating optical tweezers simulations with auto- encoders (Invited Paper)**

Author(s): Isaac C. D. Lenton, Institute of Science and Technology  
Austria (Austria); Halina Rubinsztein-Dunlop, The Univ. of  
Queensland (Australia); Scott R. Waitukaitis, Institute of Science and  
Technology Austria (Austria)

22 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 6D

12649-45

#### **3D cell rotation in multicore fiber-based optical diffraction tomography with isotropic resolution using deep learning**

Author(s): Jiawei Sun, Nektarios Koukourakis, Juergen W. Czarske,  
TU Dresden (Germany)

22 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 6D

**Coffee Break 3:15 PM - 3:45 PM**

12655-30

#### **Optical diffraction tomography based on AI-driven adaptive optical cell-rotation (Invited Paper)**

Author(s): Nektarios Koukourakis, Jiawei Sun, Jürgen W. Czarske, TU  
Dresden (Germany)

22 August 2023 • 3:45 PM - 4:15 PM | Conv. Ctr. Room 6D

12655-31

#### **Faster and more accurate geometrical-optics optical force calculation using neural networks**

Author(s): Agnese Callegari, Göteborgs Univ. (Sweden); David  
Bronte Ciriza, Alessandro Magazzù, Istituto per i Processi Chimico  
Fisici (Italy); Gunther D. Barbosa, Antonio A. R. Neves, Univ. Federal  
do ABC (Brazil); Maria Antonia Iati, Istituto per i Processi Chimico  
Fisici (Italy); Giovanni Volpe, Göteborgs Univ. (Sweden); Onofrio M.  
Maragò, Istituto per i Processi Chimico Fisici (Italy)

22 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 6D

12655-32

#### **Self-folding kirigami at the microscale (Invited Paper)**

Author(s): Nuno Araujo, Univ. de Lisboa (Portugal)

22 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 6D

12649-46

#### **Inverse design of plasmonic nanotweezers by topology optimization**

Author(s): Damian Nelson, Sejeong Kim, The Univ. of Melbourne  
(Australia); Kenneth B. Crozier, The Univ. of Melbourne (Australia),  
Australian Research Council (Australia)

22 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 6D

12655-33

#### **Rotation-assisted optical trapping for deep learning- based single-cell imaging and classification**

Author(s): Yaoran Liu, Rohit Unni, Yuebing Zheng, The Univ. of Texas  
at Austin (United States)

22 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 6D

# TECHNICAL CONFERENCES

## Conference 12649

12655-34

### Experimental realization of supervised learning in a swarm of autonomous robots

Author(s): Laura Natali, Giovanni Volpe, Göteborgs Univ. (Sweden); Joakim Stenhammar, Jason Lewis, Lund Univ. (Sweden); Vide Ramsten, Lars Bengtsson, Göteborgs Univ. (Sweden)

22 August 2023 • 5:30 PM - 5:45 PM | Conv. Ctr. Room 6D

## WEDNESDAY 23 AUGUST 2023

### SESSION 11: BASIC RESEARCH I

23 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 6D

Session Chair: Halina Rubinsztein-Dunlop,  
The Univ. of Queensland (Australia)

12649-47

### Controlling individual atoms with optical tweezers

Author(s): Marvin Weyland, Rhys Hobbs, Mikkel F. Andersen, Lucile Sanchez, Poramaporn Ruksasakchai, Univ. of Otago (New Zealand); Stuart S. Szigeti, The Australian National Univ. (Australia)

23 August 2023 • 8:00 AM - 8:15 AM | Conv. Ctr. Room 6D

12649-48

### Point singularity array with metasurfaces for blue-detuned atomic traps

Author(s): Soon Wei Daniel Lim, Joon-Suh Park, Dmitry Kazakov, Christina M. Spaegele, Ahmed H. Dorrah, Maryna L. Meretska, Federico Capasso, Harvard John A. Paulson School of Engineering and Applied Sciences (United States)

23 August 2023 • 8:15 AM - 8:30 AM | Conv. Ctr. Room 6D

12649-49

### Electromagnetic angular momentum of quantized wavepackets in free space

Author(s): Masud Mansuripur, Wyant College of Optical Sciences (United States)

23 August 2023 • 8:30 AM - 8:45 AM | Conv. Ctr. Room 6D

12649-50

### Lateral optical force optimisation based on periodic arrays of a single motif

Author(s): Bo Gao, Univ. of Bristol (United Kingdom); Henkjan Gersen, Univ. of Bristol (United Kingdom), iLof (Portugal); Simon Hanna, Univ. of Bristol (United Kingdom)

23 August 2023 • 8:45 AM - 9:00 AM | Conv. Ctr. Room 6D

12649-51

### Comparing classical electrodynamic theories through simulations of optical deformation of droplets (*Invited Paper*)

Author(s): Kenneth J. Chau, The Univ. of British Columbia Okanagan (Canada); Cael Warner, Ying Y. Tsui, Univ. of Alberta (Canada)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 6D

12649-107

### Searching for chameleon dark energy with mechanical systems (*Invited Paper*)

Author(s): Swati Singh, Univ. of Delaware (United States)

23 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 6D

Coffee Break 10:00 AM - 10:30 AM

### SESSION 12: BASIC RESEARCH II

23 August 2023 • 10:30 AM - 11:45 AM | Conv. Ctr. Room 6D

Session Chair: Masud Mansuripur,  
Wyant College of Optical Sciences (United States)

12649-52

### Optical trapping with magnetic fields of light

Author(s): Yanzeng Li, Rosalind Huang, Jumanah AlMalki, The Univ. of Chicago (United States); Marcos Perez, Uttam Manna, Mahua Biswas, Illinois State Univ. (United States); Norbert F. Scherer, The Univ. of Chicago (United States)

23 August 2023 • 10:30 AM - 10:45 AM | Conv. Ctr. Room 6D

12649-53

### A constituent unit for optically reconfigurable particulate matter

Author(s): Amir M. Jazayeri, Sohila Abdelhafiz, Aristide Dogariu, Univ. of Central Florida (United States)

23 August 2023 • 10:45 AM - 11:00 AM | Conv. Ctr. Room 6D

12649-54

### Magnetic resonance sensing with optically trapped nanodiamonds (*Invited Paper*)

Author(s): Peter J. Reece, The Univ. of New South Wales (Australia)

23 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 6D

12649-55

### Optical force spectroscopy of bright SiV nanodiamonds

Author(s): Cyril Laplane, James White, Reece P. Roberts, David Inglis, Thomas Volz, Macquarie Univ. (Australia)

23 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 6D

### SESSION 13: STATISTICAL MECHANICS OF SMALL SYSTEMS

23 August 2023 • 11:45 AM - 12:30 PM | Conv. Ctr. Room 6D

Session Chair: H. Daniel Ou-Yang, Lehigh Univ. (United States)

12649-56

### Studies of defects in 2d colloidal crystals using optical tweezers and video microscopy (*Invited Paper*)

Author(s): Xinsheng S. Ling, Brown Univ. (United States)

23 August 2023 • 11:45 AM - 12:15 PM | Conv. Ctr. Room 6D

12649-57

### Out-of-equilibrium coupling of colloidal particles with critical baths

Author(s): Ignacio A. Martinez, Univ. Gent (Belgium); Sergio Ciliberto, Ecole Normale Supérieure de Lyon (France), Ctr. National de la Recherche Scientifique (France); Kristiaan Neyts, Univ. Gent (Belgium)

23 August 2023 • 12:15 PM - 12:30 PM | Conv. Ctr. Room 6D

Lunch/Exhibition Break 12:30 PM - 2:00 PM

### SESSION 14: OPTICALLY BOUND MATTER AND FABRICATION TECHNOLOGIES

23 August 2023 • 2:00 PM - 3:15 PM | Conv. Ctr. Room 6D

Session Chair: Gabriel C. Spalding,  
Illinois Wesleyan Univ. (United States)

12649-59

#### Negative optical torque in optically bound nanoparticles

Author(s): Zijie Yan, The Univ. of North Carolina at Chapel Hill  
(United States)

23 August 2023 • 2:00 PM - 2:15 PM | Conv. Ctr. Room 6D

12649-60

#### Dynamics of mixed refractive index particles in complex fields

Author(s): William Davie, Tom Morling, Michael J. O'Donnell, Simon  
Hanna, Univ. of Bristol (United Kingdom)

23 August 2023 • 2:15 PM - 2:30 PM | Conv. Ctr. Room 6D

12649-61

#### Opto-thermal assembly of three-dimensional photonic crystals

Author(s): Diptabrata Paul, Desmond Quinn, Frank Cichos, Univ.  
Leipzig (Germany)

23 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 6D

12649-62

#### Automated microscale assembly using optical tweezers

Author(s): Natalie Shultz, Jeffrey E. Melzer, Euan McLeod, Wyatt  
College of Optical Sciences (United States)

23 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 6D

12649-63

#### Optical manipulation of light-absorbing particles in a surfactant-based solid media

Author(s): Pavana Siddhartha Kollipara, Zhihan Chen, Yuebing  
Zheng, The Univ. of Texas at Austin (United States)

23 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 6D

Coffee Break 3:15 PM - 3:45 PM

### SESSION 15: METASURFACE/METAMATERIALS AND OPTICAL MOMENTUM

23 August 2023 • 3:45 PM - 4:45 PM | Conv. Ctr. Room 6D

Session Chair: Reuven Gordon, Univ. of Victoria (Canada)

12649-64

#### Metasurface microparticles driven by optical forces (Invited Paper)

Author(s): Mikael Käll, Chalmers Univ. of Technology (Sweden)

23 August 2023 • 3:45 PM - 4:15 PM | Conv. Ctr. Room 6D

12649-65

#### Assembling metamaterials using light gradient forces in a standing wave optical trap

Author(s): Apurba Paul, Alexander Volk, Mohammad Hokmabadi,  
Eveline Rigo, Koshala Sarveswaran, Volker Kurz, Lisa Almonte-Garcia,  
Hamideh Kermani, Pravin Vaity, Gregory Timp, Univ. of Notre Dame  
(United States)

23 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 6D

12649-66

#### Photonic metasurfaces for biophotonics

Author(s): Tomasz Plaskocinski, Jianling Xiao, Mohammad  
Biabanifard, Saydulla Persheyev, Andrea Di Falco, Univ. of St.  
Andrews (United Kingdom)

23 August 2023 • 4:30 PM - 4:45 PM | Conv. Ctr. Room 6D

### SESSION 16: SYSTEMS WITH BROKEN SYMMETRY

23 August 2023 • 4:45 PM - 5:45 PM | Conv. Ctr. Room 6D

Session Chair: Simon Hanna, Univ. of Bristol (United Kingdom)

12649-67

#### Plasmonic manipulation in chiral crystallization of sodium chlorate

Author(s): An-Chieh Cheng, Hokkaido Univ. (Japan); Teruki  
Sugiyama, National Yang Ming Chiao Tung Univ. (Taiwan); Keiji  
Sasaki, Hokkaido Univ. (Japan)

23 August 2023 • 4:45 PM - 5:00 PM | Conv. Ctr. Room 6D

12649-68

#### Optimally chiral optical trapping

Author(s): Albert Herrero Parareda, Filippo Capolino, Univ. of  
California, Irvine (United States)

23 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 6D

12649-69

#### Multiple trapping with vortex diffractive lenses

Author(s): Francisco Misael Muñoz Pérez, Vicente Ferrando, Univ.  
Politécnica de València (Spain); Walter D. Furlan, Univ. de València  
(Spain); Juan C. Castro-Palacio, J. Ricardo Arias Gonzalez, Juan A.  
Monsoriu, Univ. Politècnica de València (Spain)

23 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 6D

12649-70

#### Simulation of particle dynamics in the evanescent field of an ultrathin optical fiber

Author(s): Pramitha P. Praveen Kamath, Viet Giang Truong, Souvik  
Sil, Sile Nic Chormaic, Okinawa Institute of Science and Technology  
Graduate Univ. (Japan)

23 August 2023 • 5:30 PM - 5:45 PM | Conv. Ctr. Room 6D

## THURSDAY 24 AUGUST 2023

### SESSION 17: RESONANT ENHANCEMENTS AND MANIPULATION IN GASEOUS MEDIA

24 August 2023 • 8:00 AM - 9:15 AM | Conv. Ctr. Room 6D

Session Chair: Rubén Ramos-García, Instituto Nacional de  
Astrofísica, Óptica y Electrónica (Mexico)

12649-71

#### Exploiting resonances for enhanced optical trapping (Invited Paper)

Author(s): Graham D. Bruce, Univ. of St. Andrews (United Kingdom);  
Kishan Dholakia, The Univ. of Adelaide (Australia)

24 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 6D

# TECHNICAL CONFERENCES

## Conference 12649

12649-72

### Optical manipulation of resonant nanoparticles for thermal and rheological measurements

Author(s): Pawel Karpinski, Wroclaw Univ. of Science and Technology (Poland)

24 August 2023 • 8:30 AM - 8:45 AM | Conv. Ctr. Room 6D

12649-74

### Exploring dynamics of microparticle optical levitation upon launching in air

Author(s): Kwan Seob Park, Kiana Malmir, Glenn E. Holland, Martin Y. Sohn, Thomas W. LeBrun, National Institute of Standards and Technology (United States)

24 August 2023 • 8:45 AM - 9:00 AM | Conv. Ctr. Room 6D

12649-76

### Generation, 3D trapping and self-oscillation microbubbles

Author(s): José Manuel Pérez-Corte, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Julio Aurelio Sarabia-Alonso, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico), Univ. Politécnica de Tulancingo (Mexico); José Gabriel Ortega-Mendoza, Univ. Tecnológica de Tulancingo (Mexico); Karina Ortega-Sánchez, Alfonso Padilla-Vivanco, Univ. Politécnica de Tulancingo (Mexico); Rubén Ramos-García, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

24 August 2023 • 9:00 AM - 9:15 AM | Conv. Ctr. Room 6D

## SESSION 18: COMBINED DIELECTROPHORESIS AND OPTICAL SORTING

24 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6D

Session Chair: Rubén Ramos-García, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

12649-77

### Exploring nanodynamics with optical and dielectrophoretic trapping

Author(s): Vatsal Joshi, Negar Danesh, Hyejin Moon, Michael Cho, Alan P. Bowling, The Univ. of Texas at Arlington (United States)

24 August 2023 • 9:15 AM - 9:30 AM | Conv. Ctr. Room 6D

12649-108

### Using optical trapping forces for sorting: laser nudging (Invited Paper)

Author(s): Cather M. Simpson, The Univ. of Auckland (New Zealand)

24 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 6D

Coffee Break 10:00 AM - 10:30 AM

## SESSION 19: FEMTOSECOND OPTICAL TRAPPING

24 August 2023 • 10:30 AM - 11:15 AM | Conv. Ctr. Room 6D

Session Chair: Reuven Gordon, Univ. of Victoria (Canada)

12649-79

### Applications and advantages of femtosecond optical tweezers (Invited Paper)

Author(s): Debabrata Goswami, Indian Institute of Technology Kanpur (India)

24 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 6D

12649-80

### Using flat-top light sheet generated by femtosecond-pulsed laser for optical manipulation of microscopic particles

Author(s): Krishangi Krishna, Joshua A. Burrow, Mbaye Diouf, Jieliyue Sun, Mitchell Harling, Kimani C. Toussaint, Brown Univ. (United States)

24 August 2023 • 11:00 AM - 11:15 AM | Conv. Ctr. Room 6D

## SESSION 20: FROM PLASMONIC TRAPPING TO NANOPLASTICS

24 August 2023 • 11:15 AM - 12:15 PM | Conv. Ctr. Room 6D

Session Chair: Yuebing Zheng, The Univ. of Texas at Austin (United States)

12649-81

### Nanoscale upconverter thermometers in a double-nanohole optical tweezer

Author(s): Elham Hosseini Toodeshki, Adriaan L. Frencken, Frank C. J. M. van Veggel, Reuven Gordon, Univ. of Victoria (Canada)

24 August 2023 • 11:15 AM - 11:30 AM | Conv. Ctr. Room 6D

12649-82

### Thermoplasmonics mediated membrane fusion for investigating membrane affinity of influenza virus spike proteins

Author(s): Guillermo M. Pescador, Mohammad R. Arastoo, Victoria T. Ruhoff, Niels Bohr Institute (Denmark); Salvatore Chiantia, Univ. Potsdam (Germany); Robert Daniels, U.S. Food and Drug Administration (United States); Poul M. Bendix, Niels Bohr Institute (Denmark)

24 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 6D

12649-83

### Optically assisted thermophoretic trapping using resonant plasmonic bowtie nano-antennas

Author(s): Theodore Anyika, Justus C. Ndukaife, Chuchuan Hong, Ikjun Hong, Vanderbilt Univ. (United States)

24 August 2023 • 11:45 AM - 12:00 PM | Conv. Ctr. Room 6D

12649-84

### Investigation of optical properties of microplastics

Author(s): Noorulhoda Kazemi, Mimi Truong, Viktor Nascak, Anna S. Bezryadina, California State Univ., Northridge (United States)

24 August 2023 • 12:00 PM - 12:15 PM | Conv. Ctr. Room 6D

**SESSION 21: CELEBRATING THE COMPLETION  
OF 20 YEARS OF OTOM**

24 August 2023 • 12:15 PM - 12:30 PM | Conv. Ctr. Room 6D

Session Chair: Kishan Dholakia, Univ. of St. Andrews (Australia)

12649-85

**Partnerships for our future**

Author(s): Gabriel C. Spalding, Illinois Wesleyan Univ. (United States)

24 August 2023 • 12:30 PM - 12:45 PM | Conv. Ctr. Room 6D

# TECHNICAL CONFERENCES

## Conference 12650

# Physical Chemistry of Semiconductor Materials and Interfaces XXII

20 - 22 August 2023 | Conv. Ctr. Room 1

Conference Chairs: **Andrew J. Musser**, Cornell Univ. (United States); **Derya Baran**, King Abdullah Univ. of Science and Technology (Saudi Arabia)

Program Committee: **Artem A. Bakulin**, Imperial College London (United Kingdom); **Natalie Banerji**, Univ. Bern (Switzerland); **Hugo A. Bronstein**, Univ. of Cambridge (United Kingdom); **Jenny Clark**, The Univ. of Sheffield (United Kingdom); **Daniel Congreve**, Stanford Univ. (United States); **Felix Deschler**, Technische Univ. München (Germany); **Alexandre Fürstenberg**, Univ. de Genève (Switzerland); **David S. Ginger**, Univ. of Washington (United States); **Naomi S. Ginsberg**, Univ. of California, Berkeley (United States); **Paul Meredith**, Swansea Univ. (United Kingdom); **Christian Nielsen**, Queen Mary Univ. of London (United Kingdom); **Linda A. Peteanu**, Carnegie Mellon Univ. (United States); **Lee J. Richter**, National Institute of Standards and Technology (United States); **Carlos Silva**, Georgia Institute of Technology (United States); **Sergei Tretiak**, Los Alamos National Lab. (United States); **Lauren Webb**, The Univ. of Texas at Austin (United States); **Omer Yaffe**, Weizmann Institute of Science (Israel)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: EMERGING TOOLS FOR EXCITONIC MATERIALS AND DEVICES

20 August 2023 • 8:30 AM - 10:50 AM | Conv. Ctr. Room 10

Session Chair: Sascha Feldmann,  
The Rowland Institute at Harvard (United States)

12650-1

#### **Nonlinear spectroscopy with classical and quantum light to probe coherent dynamics of excitons** (*Invited Paper*)

Author(s): Ajay Ram Srimath Kandada, Wake Forest Univ. (United States); Esteban Rojas Gatjens, Georgia Institute of Technology (United States); David Tiede, Instituto de Ciencia de Materiales de Sevilla (Spain); Lorenzo Uboldi, Politecnico di Milano (Italy); Katherine Koch, Evan Kumar, Wake Forest Univ. (United States); Eric Bittner, Univ. of Houston (United States)

20 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 10

12650-2

#### **Quantitative characterisation of conjugated polymers: Mass distribution and polymerisation defects determined by molecular scale imaging**

Author(s): Stefania Moro, Giovanni Costantini, Univ. of Birmingham (United Kingdom); Michael Sommer, Technische Univ. Chemnitz (Germany)

20 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 10

12650-3

#### **Soft Photoelectrochemical systems for solar fuels**

Author(s): Erin L. Ratcliff, The Univ. of Arizona (United States)

20 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 10

12650-4

#### **Photoluminescence vibrationally promoted electronic resonance spectroscopy of high mobility organic single crystals**

Author(s): Dmitrii R. Maslennikov, Navendu Mondal, Imperial College London (United Kingdom); Vladimir Bruevich, Vitaly Podzorov, Rutgers, The State Univ. of New Jersey (United States); Artem Bakulin, Imperial College London (United Kingdom)

20 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 10

12650-5

#### **Excitons in electronics: Developing metrics and measurements in existing technology** (*Invited Paper*)

Author(s): Emily G. Bittle, Katelyn Goetz, Chad Cruz, John Stephenson, Curt Richter, National Institute of Standards and Technology (United States)

20 August 2023 • 10:00 AM - 10:30 AM | Conv. Ctr. Room 10

12650-6

#### **All-optical photoacoustic measurement of localized chirality in crystal suspensions**

Author(s): Gil Otis, Matan Benyamin, Yitzhak Mastai, Zeev Zalevsky, Bar-Ilan Univ. (Israel)

20 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 10

**Coffee Break 10:50 AM - 11:20 AM**

#### SESSION 2: STRUCTURAL CONTROL OF EXCITON PHYSICS I

20 August 2023 • 11:20 AM - 12:30 PM | Conv. Ctr. Room 10

Session Chair: Emily G. Bittle, National Institute of Standards and Technology (United States)

12650-7

#### **Using the solvation environment to drive the self assembly of conjugated polymers**

Author(s): Linda A. Peteanu, Carnegie Mellon Univ. (United States); Stephanie Kramer, Case Western Reserve Univ. (United States); Megan Rice, Kevin J. T. Noonan, Carnegie Mellon Univ. (United States)

20 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 10

12650-8

#### **Controlling energy flow to improve solid-state triplet-triplet annihilation upconversion**

Author(s): Pournima Narayanan, Emma Belliveau, Manchen Hu, Ghada Ahmed, Stanford Univ. (United States); Vongaishe Mutatu, Univ. of Notre Dame (United States); Qi Zhou, Dan Congreve, Stanford Univ. (United States)

20 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 10



12650-9

### **Exciton & polarization control through supramolecular engineering** (*Invited Paper*)

Author(s): Sascha Feldmann, The Rowland Institute at Harvard (United States)

20 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 10

**Lunch Break 12:30 PM - 2:00 PM**

### **SESSION 3: STRUCTURAL CONTROL OF EXCITON PHYSICS II**

20 August 2023 • 2:00 PM - 2:40 PM | Conv. Ctr. Room 10

Session Chair: Emrys W. Evans, Swansea Univ. (United Kingdom)

12650-10

### **Concentration, polarization and power dependence study of TIPS-pentacene concentrated solutions using femtosecond stimulated Raman spectroscopy.**

Author(s): Akasha Kaleem, Murad Tayebjee, Michael P. Nielsen, Timothy Schmidt, The Univ. of New South Wales (Australia)

20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 10

12650-11

### **Direct exciton harvesting from a bound triplet pair**

Author(s): Guiying He, The City Univ. of New York Advanced Science Research Ctr. (United States); Kaia R. Parenti, Luis M. Campos, Columbia Univ. (United States); Matthew Y. Sfeir, The City Univ. of New York Advanced Science Research Ctr. (United States)

20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 10

**Coffee Break 2:40 PM - 3:10 PM**

### **SESSION 4: ORGANIC SPIN-OPTICAL SYSTEMS**

20 August 2023 • 3:10 PM - 4:30 PM | Conv. Ctr. Room 10

Session Chair: Erin L. Ratcliff, The Univ. of Arizona (United States)

12650-13

### **Unconventional photophysics in infrared absorbing polymers** (*Invited Paper*)

Author(s): Matthew Y. Sfeir, Peter Budden, The City College of New York (United States); Taketo Handa, Xiaoyang Zhu, Columbia Univ. (United States); Jason Azoulay, Georgia Institute of Technology (United States)

20 August 2023 • 3:10 PM - 3:40 PM | Conv. Ctr. Room 10

12650-14

### **Radical design of intermolecular spin-optical interfaces in organic semiconductors**

Author(s): John Hudson, Emrys W. Evans, Swansea Univ. (United Kingdom)

20 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 10

12650-16

### **Molecular spin-optical dynamics for optoelectronics** (*Invited Paper*)

Author(s): Emrys W. Evans, Swansea Univ. (United Kingdom)

20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 10

### **SUNDAY EVENING PLENARY**

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

### **Welcome and Opening Remarks**

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### **A perovskite paved pathway to multi-terawatt scale photovoltaics** (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### **Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems** (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### **Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs** (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

## **MONDAY 21 AUGUST 2023**

### **NANOSCIENCE + ENGINEERING PLENARY**

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

### **Welcome and Opening Remarks**

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

### **Nanophotonics for energy applications** (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

### **From atoms to black holes: with nano-engineering to next-level precision experiments** (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

**Coffee Break 9:55 AM - 10:30 AM**

# TECHNICAL CONFERENCES

## Conference 12650

### SESSION 5: LOW-DIMENSIONAL MATERIALS AND INTERFACES

21 August 2023 • 10:30 AM - 12:40 PM | Conv. Ctr. Room 10  
Session Chair: Wanyi Nie, Los Alamos National Lab. (United States)

12650-17

#### **Bidirectional phonon emission in 2D heterostructures triggered by ultrafast charge transfer** (*Invited Paper*)

Author(s): Aditya Sood, Princeton Univ. (United States)  
21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 10

12650-18

#### **Room temperature wavelike exciton transport in a van der Waals superatomic semiconductor**

Author(s): Jakhangirkhodja A. Tulyagankhodjaev, Petra Shih, Jessica Yu, Xavier Roy, Timothy C. Berkelbach, Milan Delor, Columbia Univ. (United States)  
21 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 10

12650-19

#### **Organic color center quantum defects in carbon nanotube semiconductors: Progresses, challenges, and opportunities** (*Invited Paper*)

Author(s): YuHuang Wang, Univ. of Maryland, College Park (United States)  
21 August 2023 • 11:20 AM - 11:50 AM | Conv. Ctr. Room 10

12650-20

#### **Spin dynamics at symmetry-broken interfaces: Junctions and soft lattices**

Author(s): Emily Raulerson, National Renewable Energy Lab. (United States)  
21 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 10

12650-21

#### **Study and regulation of biomolecular interactions at electrified interfaces** (*Invited Paper*)

Author(s): Sasha A. Moonitz, McKenzie Jonely, Rodrigo Noriega Manez, The Univ. of Utah (United States)  
21 August 2023 • 12:10 PM - 12:40 PM | Conv. Ctr. Room 10

Lunch Break 12:40 PM - 2:10 PM

### SESSION 6: PEROVSKITE PHOTOPHYSICS AND DEVICES

21 August 2023 • 2:10 PM - 3:30 PM | Conv. Ctr. Room 10  
Session Chair: Aditya Sood, Princeton Univ. (United States)

12650-22

#### **Perovskite thin film and heterostructure detectors for X-ray and visible photons** (*Invited Paper*)

Author(s): Wanyi Nie, Los Alamos National Lab. (United States); Hsinhan Tsai, Univ. of California, Berkeley (United States); Kendon Shirley, Kairos Sensors, LLC (United States)  
21 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 10

12650-24

#### **Coexistence of large polaron and polaronic exciton in hybrid lead halide perovskite nanocrystals**

Author(s): Juno Kim, Yuanze Xu, Andrew J. Musser, Qiuming Yu, Cornell Univ. (United States)  
21 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 10

12650-25

#### **Controlling phase transitions in 2D perovskites** (*Invited Paper*)

Author(s): Connor Bischak, The Univ. of Utah (United States)  
21 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 10

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12650-36

#### **Structural and electronic properties of borophene and BC3 over H-diamond (100)**

Author(s): Alyana A. Carrell, Michael Groves, California State Univ., Fullerton (United States); Mahesh R. Neupane, Univ. of California, Riverside (United States)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12650-37

#### **Growth of highly crystalline WO3 nanorod using a facile hydrothermal synthesis**

Author(s): Anuprava Mandal, Kantimay Das Gupta, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 7: STRONG LIGHT-MATTER COUPLING I

22 August 2023 • 9:00 AM - 10:40 AM | Conv. Ctr. Room 10  
Session Chair: Connor Bischak, The Univ. of Utah (United States)

12650-26

#### **Imaging and controlling ballistic polarons and polaritons** (*Invited Paper*)

Author(s): Ding Xu, Jack Tulyag, Shan-Wen Cheng, James Baxter, Haowen Su, Inki Lee, Paul Brown, Milan Delor, Columbia Univ. (United States)  
22 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 10

12650-27

#### **Insights on exciton photophysics in organic and organic/inorganic hybrid materials with strong light-matter coupling**

Author(s): Victoria Quiros-Cordero, Yulong Zheng, Esteban Rojas-Gatjens, Martin Gomez-Dominguez, Juan-Pablo Correa-Baena, Natalie Stingelin, Georgia Institute of Technology (United States); Carlos Silva-Acuña, Georgia Tech Research Institute (United States)  
22 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 10

12650-28

### Room temperature exciton-polaritons from CdSe nanoplatelets

Author(s): Mitesh Amin, Ovishek Morshed, Trevor Tumieli, Nicole Cogan, Robert Collison, William Girten, Farwa Awan, Nickolas Vamvakas, Pengfei Huo, Todd Krauss, Univ. of Rochester (United States)

22 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 10

12650-29

### Polariton-assisted ultrafast energy delocalization in a donor-acceptor organic microcavity probed by two-dimensional electronic spectroscopy (*Invited Paper*)

Author(s): Margherita Maiuri, Mattia Russo, Politecnico di Milano (Italy); Kyriakos Georgiou, Univ. of Cyprus (Greece); Armando Genco, Politecnico di Milano (Italy); Simone De Liberato, Univ. of Southampton (United Kingdom); Giulio Cerullo, Politecnico di Milano (Italy); David Lidzey, The Univ. of Sheffield (United Kingdom); Andreas Othonos, Univ. of Cyprus (Greece); Tersilla Virgili, CNR-Istituto di Fotonica e Nanotecnologie (Italy)

22 August 2023 • 10:10 AM - 10:40 AM | Conv. Ctr. Room 10

Coffee Break 10:40 AM - 11:10 AM

## SESSION 8: STRONG LIGHT-MATTER COUPLING II

22 August 2023 • 11:10 AM - 12:30 PM | Conv. Ctr. Room 10

Session Chair: Milan Delor, Columbia Univ. (United States)

12650-30

### Ultrafast dynamics of molecular vibrational polaritons (*Invited Paper*)

Author(s): Wei Xiong, Univ. of California, San Diego (United States)

22 August 2023 • 11:10 AM - 11:40 AM | Conv. Ctr. Room 10

12650-31

### Light-matter coherence drives chemical reactivity in infrared cavities via ensemble strong coupling

Author(s): Johan Triana, Felipe Herrera, Felipe Recabal, Univ. de Santiago de Chile (Chile); Blake S. Simpkins, U.S. Naval Research Lab. (United States)

22 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 10

12650-32

### Non-adiabatic dynamics of photochemistry in plasmonic environments (*Invited Paper*)

Author(s): Yu Zhang, Los Alamos National Lab. (United States)

22 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 10

Lunch/Exhibition Break 12:30 PM - 2:00 PM

## SESSION 9: ORGANIC AND HYBRID MATERIALS IN PHOTOVOLTAICS

### Joint Session with Conferences 12650 and 12660

22 August 2023 • 2:00 PM - 5:10 PM | Conv. Ctr. Room 10

Session Chairs: Derya Baran, King Abdullah Univ. of Science and Technology (Saudi Arabia), Gang Li, The Hong Kong Polytechnic Univ. (Hong Kong, China)

12660-6

### Conjugated polymers and polyelectrolytes for organic- and organic/inorganic hybrid solar cells (*Invited Paper*)

Author(s): Han Young Woo, Korea Univ. (Republic of Korea)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 10

12660-2

### Photostability of Y-type electron acceptor molecules and their copolymers

Author(s): Suraj Prasad, Cleber Marchiori, Karlstad Univ. (Sweden); Zewdneh Genene Wolkeba, Chalmers Univ. of Technology (Sweden); Leif K. E. Ericsson, C. Moyses Araujo, Karlstad Univ. (Sweden); Ergang Wang, Chalmers Univ. of Technology (Sweden); Ellen Moons, Karlstad Univ. (Sweden)

22 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 10

12650-33

### Mind the subgap: The important role of midgap trap states in organic and perovskite semiconductors (*Invited Paper*)

Author(s): Ardalan Armin, Swansea Univ. (United Kingdom)

22 August 2023 • 2:50 PM - 3:20 PM | Conv. Ctr. Room 10

Coffee Break 3:20 PM - 3:50 PM

12650-34

### Highly emissive layered double perovskites: Exploring photophysical properties and applications (*Invited Paper*)

Author(s): Diego Solis-Ibarra, Instituto de Investigaciones en Materiales, Univ. Nacional Autónoma de México (Mexico)

22 August 2023 • 3:50 PM - 4:20 PM | Conv. Ctr. Room 10

12650-35

### A new doping strategy of Spiro-OMeTAD: Towards instantly efficient and stable perovskite solar cells (*Invited Paper*)

Author(s): Feng Gao, Linköping Univ. (Sweden)

22 August 2023 • 4:20 PM - 4:50 PM | Conv. Ctr. Room 10

12660-29

### Understanding charge-transporting layers for perovskite solar cells

Author(s): Mathias Nyman, Christian Ahläng, Sebastian Wilken, Abo Akademi Univ. (Finland); Changzeng Ding, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China); Li Yin, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China), Xi'an Jiaotong-Liverpool Univ. (China); Chang-Qi Ma, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China); Ronald Österbacka, Abo Akademi Univ. (Finland), Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China)

22 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 10

# TECHNICAL CONFERENCES

## Conference 12651

# Low-Dimensional Materials and Devices 2023

21 - 23 August 2023 | Conv. Ctr. Room 11A

Conference Chairs: **Nobuhiko P. Kobayashi**, Univ. of California, Santa Cruz (United States); **A. Alec Talin**, Sandia National Labs. (United States); **Albert V. Davydov**, National Institute of Standards and Technology (United States)

Conference Co-Chair: **M. Saif Islam**, Univ. of California, Davis (United States)

Program Committee: **Deji Akinwande**, The Univ. of Texas at Austin (United States); **Kristine A. Bertness**, National Institute of Standards and Technology (United States); **Sonia Conesa-Boj**, Technische Univ. Delft (Netherlands); **Hamed Dalir**, Univ. of Florida (United States); **Alexey Kuposov**, Institute for Energy Technology (Norway); **Andrey Krayev**, HORIBA Scientific (United States); **Marina S. Leite**, Univ. of Maryland, College Park (United States); **Paola Prete**, Istituto per la Microelettronica e Microsistemi (Italy); **Volker J. Sorger**, The George Washington Univ. (United States); **George T. Wang**, Sandia National Labs. (United States); **Sanshui Xiao**, Technical Univ. of Denmark (Denmark)

### MONDAY 21 AUGUST 2023

#### SESSION 1: MATERIALS AND DEVICES FOR ENERGY EFFICIENT COMPUTING I

21 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 11A

Session Chair: A. Alec T. Talin, Sandia National Labs. (United States)

12651-1

**More is different: Physical computing discovery** (*Invited Paper*)

Author(s): Elliot J. Fuller, Sandia National Labs. (United States)

21 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 11A

12651-2

**Electrical Characterization and Benchmarking of Memory Devices for Energy Efficient Analog In-Memory Computing** (*Invited Paper*)

Author(s): Matthew J. Marinella, Arizona State Univ. (United States); Patrick Xiao, Chris H. Bennett, William Wahby, Sapan Agarwal, Sandia National Labs. (United States)

21 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 11A

12651-3

**Design of defects and interfaces in memristive devices** (*Invited Paper*)

Author(s): Aiping Chen, Sundar Kunwar, Pinku Roy, Di Zhang, Los Alamos National Lab. (United States)

21 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 11A

Coffee Break 3:00 PM - 3:30 PM

#### SESSION 2: MATERIALS AND DEVICES FOR ENERGY EFFICIENT COMPUTING II

21 August 2023 • 3:30 PM - 5:25 PM | Conv. Ctr. Room 11A

Session Chair: Nobuhiko P. Kobayashi, Univ. of California, Santa Cruz (United States)

12651-4

**Heterostructures for Low-Power Logic and Memory Devices** (*Keynote Presentation*)

Author(s): Deep Jariwala, Univ. of Pennsylvania (United States)

21 August 2023 • 3:30 PM - 4:15 PM | Conv. Ctr. Room 11A

12651-5

**Multimodal scanning probe microscopy for intrinsic dynamics in switching and neuromorphic materials** (*Invited Paper*)

Author(s): Petro Maksymovych, Oak Ridge National Lab. (United States)

21 August 2023 • 4:15 PM - 4:45 PM | Conv. Ctr. Room 11A

12651-6

**Fully Interface controlled memristive devices for artificial synapse and neuromorphic computing**

Author(s): Sundar Kunwar, Aiping Chen, Los Alamos National Lab. (United States)

21 August 2023 • 4:45 PM - 5:05 PM | Conv. Ctr. Room 11A

12651-7

**Mid-infrared near-field fingerprint spectroscopy of the 2D electron gas in LaAlO<sub>3</sub>/SrTiO<sub>3</sub> at low temperatures**

Author(s): Julian Barnett, Konstantin G. Wirth, RWTH Aachen Univ. (Germany); Richard Hentrich, Yasin C. Durmaz, attocube systems AG (Germany); Felix Gunkel, Marc-Andre Rose, Forschungszentrum Jülich GmbH (Germany); Thomas Taubner, RWTH Aachen Univ. (Germany)

21 August 2023 • 5:05 PM - 5:25 PM | Conv. Ctr. Room 11A

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

**Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12651-43

### Lithography-free vertical Au/WS<sub>2</sub>/Ag Schottky-junction photovoltaic devices

Author(s): Anh Thi Nguyen, Ewha Womans Univ. (Republic of Korea); Jun Wang, Harbin Univ. of Science and Technology (China); Eunseo Cho, Seoyoung Lim, Ewha Womans Univ. (Republic of Korea); Soyeong Kwon, Univ. of California, Irvine (United States); Jungeun Song, Ewha Womans Univ. (Republic of Korea); Keya Zhou, Harbin Institute of Technology (China); Dong-Wook Kim, Ewha Womans Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-44

### Surface plasmon polariton mediated charge transfer in graphene/Au-nanopillar-arrays

Author(s): Jungyoon Cho, Ewha Womans Univ. (Republic of Korea); Soyeong Kwon, Univ. of California, Irvine (United States); Jungeun Song, Seoyoung Lim, Seawoo Moon, Ewha Womans Univ. (Republic of Korea); Jungtae Nam, Keun Soo Kim, Sejong Univ. (Republic of Korea); Dong-Wook Kim, Ewha Womans Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-45

### Exciton-plasmon coupling in WS<sub>2</sub> flakes integrated with Au nanogratings

Author(s): Seoyoung Lim, Jungyoon Cho, Jiyun Jeong, Anh T. Nguyen, Eunseo Cho, Jungeun Song, Dong-Wook Kim, Ewha Womans Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-47

### Validation of stable p-type phosphorus (P) doped ZnO thin films formation by investigating the photoresponse properties of P:ZnO/Ga<sub>2</sub>O<sub>3</sub> heterojunctions

Author(s): Archishman Saha, Madhuri Mishra, Rajib Saha, Indian Institute of Technology Bombay (India); Avijit Dalal, National Institute of Technology, Durgapur (India); Ankita Sengupta, Univ. of Calcutta (India); Aniruddha Mondal, National Institute of Technology, Durgapur (India); Sanatan Chattopadhyay, Univ. of Calcutta (India); Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-48

### In-situ tailoring of band alignment between strain-coupled surface and buried InAs/GaAs quantum dots for sensor applications

Author(s): Manas R. Mantri, Indian Institute of Technology Bombay (India); Debi P. Panda, Physical Research Lab. (India); Rajib Saha, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-49

### A theoretical study on strain and optical property of InAs SK quantum dot with varying capping in SK-SML coupled surface quantum dot heterostructure

Author(s): Manas R. Mantri, Indian Institute of Technology Bombay (India); Debi P. Panda, Physical Research Lab. (India); Ravindra Kumar, Samishta Choudhary, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-50

### WS<sub>2</sub>/Au and WS<sub>2</sub>/Ag structures fabricated by metal-assisted exfoliation: Thickness-dependent physical properties

Author(s): Eunseo Cho, Dong-Wook Kim, Nahyun Kim, Anh T. Nguyen, Seoyoung Lim, Jungeun Song, Jungyoon Cho, Ewha Womans Univ. (Republic of Korea); Soyeong Kwon, Univ. of California, Irvine (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-52

### Spectromicroscopic insights into oxidation of large-scale molybdenum disulfide and its relation to photoelectric properties

Author(s): Yeong Min Kwon, Yi Rang Lim, Garam Bae, Da Som Song, Hyeong-ku Jo, Se Yeon Park, Moonjeong Jang, Soonmin Yim, Sung Myung, Jongsun Lim, Sun Sook Lee, Wooseok Song, Korea Research Institute of Chemical Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-53

### Optimization of electrical characteristics of high density low dimensional graphene-based interdigital micro supercapacitor for energy storage

Author(s): Reena Sri Selvarajan, Asia Pacific Univ. of Technology & Innovation (Malaysia); Hafzaliza Erny Zainal Abidin, Institute of Microengineering and Nanoelectronics, Univ. Kebangsaan Malaysia (Malaysia); Sivakumar Sivanesan, Vinesh Thiruchelvam, Asia Pacific Univ. of Technology & Innovation (Malaysia); Azrul Azlan Hamzah, Institute of Microengineering and Nanoelectronics, Univ. Kebangsaan Malaysia (Malaysia)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12651-54

### Photon upconversion in pure and doped carbon quantum dots synthesized from gelatine

Author(s): Vijeesh P., Muhammed Rashid P. S., Flagon Xavier, The Cochin College (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 3: QUANTUM AND 2D MATERIALS I

22 August 2023 • 8:30 AM - 10:20 AM | Conv. Ctr. Room 11A  
Session Chair: A. Alec T. Talin, Sandia National Labs. (United States)

12651-8

### Hyperspectral (Non)linear optical microscopy and nanoscopy of low-dimensional (quantum) materials *(Invited Paper)*

Author(s): Patrick Z. El-Khoury, Pacific Northwest National Lab. (United States)

22 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 11A

12651-9

### Landau level spectroscopy of narrow bands in moiré quantum matter *(Invited Paper)*

Author(s): Nikolai Zhitenev, National Institute of Standards and Technology (United States)

22 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 11A

# TECHNICAL CONFERENCES

## Conference 12651

12651-10

### Unlocking twisted 2D materials: A nanoscale exploration of bandgap dynamics *(Invited Paper)*

Author(s): Sonia Conesa-Boj, Kavli Institute of Nanoscience Delft, Technische Univ. Delft (Netherlands)

22 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 11A

12651-11

### Correlated TERS and KPFM Imaging of the SeMoS Janus monolayer crystals

Author(s): Andrey Krayev, HORIBA Scientific (United States); Ziyang Gan, Antony George, Andrey Turchanin, Friedrich-Schiller-Univ. Jena (Germany)

22 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 11A

Coffee Break 10:20 AM - 10:50 AM

## SESSION 4: QUANTUM AND 2D MATERIALS II

22 August 2023 • 10:50 AM - 12:40 PM | Conv. Ctr. Room 11A  
Session Chair: A. Alec T. Talin, Sandia National Labs. (United States)

12651-13

### Extrinsic and intrinsic p-type doping of pulsed laser deposited few-layer WS<sub>2</sub> films *(Invited Paper)*

Author(s): Nigel Shepherd, Urmila Rathod, Andrey Voevodin, Univ. of North Texas (United States)

22 August 2023 • 10:50 AM - 11:20 AM | Conv. Ctr. Room 11A

12651-15

### 2D crystalline acceptors towards extreme control of charge *(Invited Paper)*

Author(s): Kenneth Burch, Boston College (United States)

22 August 2023 • 11:20 AM - 11:50 AM | Conv. Ctr. Room 11A

12651-16

### Integration of WSe<sub>2</sub> with gate dielectrics: synthesis and interfaces *(Invited Paper)*

Author(s): Stephen McDonnell, Maria Gabriela Sales, Univ. of Virginia (United States); Sina Najmaei, Wendy Sarney, Alex Mazzoni, U.S. Army Research Lab. (United States)

22 August 2023 • 11:50 AM - 12:20 PM | Conv. Ctr. Room 11A

12651-17

### Negative differential resistance induced by sulfur vacancies in monolayer MoS<sub>2</sub> transistors

Author(s): Wen-Hao Chang, National Taiwan Normal Univ. (Taiwan); Chun-I Lu, Taiwan Semiconductor Research Institute (Taiwan); Tilo H. Yang, Shu-Ting Yang, National Taiwan Normal Univ. (Taiwan); Kristan B. Simbulan, Univ. of Santo Tomas (Philippines); Ting-Hua Lu, Yann-Wen Lan, National Taiwan Normal Univ. (Taiwan)

22 August 2023 • 12:20 PM - 12:40 PM | Conv. Ctr. Room 11A

Lunch/Exhibition Break 12:40 PM - 2:10 PM

## SESSION 5: QUANTUM AND 2D MATERIALS III

22 August 2023 • 2:10 PM - 4:10 PM | Conv. Ctr. Room 11A

Session Chair: Patrick Z. El-Khoury,  
Pacific Northwest National Lab. (United States)

12651-19

### Dependence of e-h pair collection efficiency on fin aspect ratio in AlGa<sub>N</sub> Fin light-emitting diodes *(Invited Paper)*

Author(s): Babak Nikoobakht, National Institute of Standards and Technology (United States)

22 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 11A

12651-20

### Enabling electrical and magnetic properties by tailoring dimensions *(Invited Paper)*

Author(s): Keshab R. Sapkota, Ping Lu, Sadvikas J. Addamane, Douglas L. Medlin, Sandia National Labs. (United States); Wenyong Wang, Univ. of Wyoming (United States); George T. Wang, Sandia National Labs. (United States)

22 August 2023 • 2:40 PM - 3:10 PM | Conv. Ctr. Room 11A

12651-21

### Advancing multi-dimensional vision: Nanostructures and AI-driven imaging using photodetectors

Author(s): M. Saif Islam, Ahasan Ahamed, Amita Rawat, Lisa N. McPhillips, Ekaterina Ponizovskaya Devine, Univ. of California, Davis (United States); Shih-Yuan Wang, W&Wsens Devices Inc. (United States)

22 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 11A

12651-22

### Optical characterization of excitonic dynamics at the type-II polytype interface of InP platelets

Author(s): Asmita Jash, Anders Gustafsson, Mats-Erik Pistol, Sebastian Lehmann, Kimberly D. Thelander, Lund Univ. (Sweden)

22 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 11A

12651-23

### Valley polarization in transition metal dichalcogenide via spin filtering

Author(s): Shreetu Shrestha, Mingxing Li, Mircea Cotlet, Brookhaven National Lab. (United States)

22 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 11A

## WEDNESDAY 23 AUGUST 2023

## SESSION 6: EMERGING APPLICATIONS I

23 August 2023 • 8:00 AM - 10:10 AM | Conv. Ctr. Room 11A

Session Chair: M. Saif Islam, Univ. of California, Davis (United States)

12651-24

### Novel designs for single photon detection based on molecular and nanoscale materials *(Invited Paper)*

Author(s): Francois Leonard, Sandia National Labs. (United States)

23 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 11A

12651-25

### Exploring intercalative and through-dielectric layer hydrogenation of diamond surfaces for electronic device applications (*Invited Paper*)

Author(s): Andrei A. Kolmakov, National Institute of Standards and Technology (United States)

23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 11A

12651-26

### Beyond protonic diodes: Toward 2D gases, spintronics, and topological insulators based on protons (*Invited Paper*)

Author(s): Leanna Schulte, Ethan Heffernan, Shane Ardo, Univ. of California, Irvine (United States)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 11A

12651-27

### Inkjet printed ternary logic circuits based on carbon nanotube homojunctions

Author(s): JiHyun Lee, Sookmyung Women's Univ. (Republic of Korea); Hyung Woo Choi, Univ. of Ottawa (Canada); Bongjun Kim, Sookmyung Women's Univ. (Republic of Korea)

23 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 11A

12651-28

### A strain modulated and self-powered broadband photodetector based on MoS<sub>2</sub>/Sb<sub>2</sub>Te<sub>3</sub> heterojunction

Author(s): Jiaqi Ye, Univ. of Florida (United States); Hao Wang, Optelligence, LLC (United States); Salem Altaieb, Volker Sorger, Hamed Dalir, Univ. of Florida (United States)

23 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 11A

Coffee Break 10:10 AM - 10:40 AM

#### SESSION 7: EMERGING APPLICATIONS II

23 August 2023 • 10:40 AM - 12:00 PM | Conv. Ctr. Room 11A

Session Chair: Sonia Conesa-Boj,  
Technische Univ. Delft (Netherlands)

12651-29

### Epitaxial growth of Weyl semimetal TaAs for energy efficiency and renewable energy applications (*Invited Paper*)

Author(s): Jocienne Nelson, National Renewable Energy Lab. (United States)

23 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 11A

12651-30

### Chemical twists and turns of one-dimensional solids across various length scales (*Invited Paper*)

Author(s): Maxx Arguilla, Univ. of California, Irvine (United States)

23 August 2023 • 11:10 AM - 11:40 AM | Conv. Ctr. Room 11A

12651-31

### Precise control of threshold voltage in ultra-thin quasi-2D oxide semiconductor based transistors

Author(s): Robert Tseng, Der-Hsien Lien, National Yang Ming Chiao Tung Univ. (Taiwan)

23 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 11A

Lunch/Exhibition Break 12:00 PM - 1:30 PM

#### SESSION 8: EMERGING APPLICATIONS III

23 August 2023 • 1:30 PM - 3:20 PM | Conv. Ctr. Room 11A

Session Chair: Jocienne Nelson

12651-32

### Platforms for characterizing thin film electrochemical energy storage devices (*Invited Paper*)

Author(s): David M. Stewart, Victoria C. Ferrari, Haotian Wang, Gary W. Rubloff, Univ. of Maryland, College Park (United States)

23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 11A

12651-33

### In operando correlated chemical and functional studies in energy materials (*Invited Paper*)

Author(s): Anton V. Ilevlev, Oak Ridge National Lab. (United States)

23 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 11A

12651-34

### The keys to extending anisotropic KOH silicon etching to higher aspect ratio features (*Invited Paper*)

Author(s): Patrick Finnegan, Christian L. Arrington, Jonathan J. Coleman, Amber L. Dagel, Sandia National Labs. (United States)

23 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 11A

12651-35

### Single-nanoparticle measurements of charge transport in SrTiO<sub>3</sub>:Rh and BiVO<sub>4</sub> photocatalysts for Z-scheme water splitting

Author(s): Brian Zutter, Sandia National Labs. (United States); Akihiko Kudo, Tokyo Univ. of Science (Japan); Rohini Bala Chandran, Univ. of Michigan (United States); Daniel V. Esposito, Columbia Univ. (United States); Shane Ardo, Univ. of California, Irvine (United States); Alec T. Talin, Sandia National Labs. (United States)

23 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 11A

Coffee Break 3:20 PM - 3:50 PM

#### SESSION 9: EMERGING APPLICATIONS IV

23 August 2023 • 3:50 PM - 5:00 PM | Conv. Ctr. Room 11A

Session Chair: Nigel Shepherd, Univ. of North Texas (United States)

12651-38

### Electrostatic modulation of junction potential in photodiode based on MoTe<sub>2</sub>/WS<sub>2</sub> p-n Junction

Author(s): Jiachi Ye, Elham Heidari, Volker Sorger, Hamed Dalir, Univ. of Florida (United States)

23 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 11A

12651-40

### Spectroscopic ellipsometry characterisation of the complex refractive index of -RuCl<sub>3</sub> nanoflakes in the visible and near-infrared

Author(s): Tatyana V. Ivanova, Daniel Andres-Penares, Heriot-Watt Univ. (United Kingdom); Yiping Wang, Boston College (United States); Jiaqiang Yan, Oak Ridge National Lab. (United States); Kenneth S. Burch, Boston College (United States); Brian D. Gerardot, Mauro Brotons-Gisbert, Heriot-Watt Univ. (United Kingdom)

23 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 11A

12651-55

### Energy level alignment and hot carrier extraction from MoS<sub>2</sub> photoelectrodes (*Invited Paper*)

Author(s): Justin Sambur, Colorado State Univ. (United States)

23 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 11A

# TECHNICAL CONFERENCES

## Conference 12652

# UV and Higher Energy Photonics: From Materials to Applications 2023

20 - 21 August 2023 | Conv. Ctr. Room 9

Conference Chairs: **Gilles Lérondel**, Univ. de Technologie Troyes (France); **Yong-Hoon Cho**, KAIST (Republic of Korea); **Atsushi Taguchi**, Hokkaido Univ. (Japan)

Conference Co-Chair: **Satoshi Kawata**, Osaka Univ. (Japan)

Program Committee: **Sanford A. Asher**, Univ. of Pittsburgh (United States); **Steve Blair**, The Univ. of Utah (United States); **Zhanghai Chen**, Fudan Univ. (China); **Yasin Ekinci**, Paul Scherrer Institut (Switzerland); **Torsten Frosch**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Naomi J. Halas**, Rice Univ. (United States); **Hans D. Hallen**, North Carolina State Univ. (United States); **Chennupati Jagadish**, The Australian National Univ. (Australia); **Junyong Kang**, Xiamen Univ. (China); **Yoichi Kawakami**, Kyoto Univ. (Japan); **Jong Kyu Kim**, Pohang Univ. of Science and Technology (Republic of Korea); **Paul T. Matsudaira**, National Univ. of Singapore (Singapore); **Eva Monroy**, CEA Grenoble (France); **Fernando Moreno**, Univ. de Cantabria (Spain); **Yukihiro Ozaki**, Kwansei Gakuin Univ. (Japan); **Sung-Jin Park**, Univ. of Illinois (United States); **Jérôme Plain**, Univ. de Technologie de Troyes (France); **Remo Proietti Zaccaria**, Istituto Italiano di Tecnologia (Italy); **Olivier Soppera**, Institut de Sciences des Matériaux de Mulhouse (France); **Yunshan Wang**, The Univ. of Utah (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: UV AND HIGHER ENERGY MATERIALS AND LIGHT SOURCES I

20 August 2023 • 9:00 AM - 10:20 AM | Conv. Ctr. Room 9

Session Chair: Gilles Lérondel, Univ. de Technologie Troyes (France)

12652-1

#### Progress in 230nm-band AlGaN far-UVC LEDs and demonstration of 100mW class LED panels (*Invited Paper*)

Author(s): Hideki Hirayama, RIKEN (Japan)

20 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 9

12652-3

#### Solid-state femtosecond UV lasers: recent advances and challenges (*Invited Paper*)

Author(s): Lukas Rimkus, Light Conversion Ltd. (Lithuania), Vilnius Univ. (Lithuania); Julius Darginavicius, Light Conversion Ltd. (Lithuania); Erikas Atkocaitis, Light Conversion Ltd. (Lithuania), Vilnius Univ. (Lithuania); Aurimas Augus, Light Conversion Ltd. (Lithuania)

20 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 9

12652-4

#### UV-B laser diodes fabricated on lattice relaxed high quality AlGaN templates (*Invited Paper*)

Author(s): Motoaki Iwaya, Meijo Univ. (Japan); Sho Iwayama, Meijo Univ. (Japan); Mie Univ. (Japan); Tetsuya Takeuchi, Satoshi Kamiyama, Meijo Univ. (Japan); Hideto Miyake, Mie Univ. (Japan)

20 August 2023 • 9:50 AM - 10:20 AM | Conv. Ctr. Room 9

Coffee Break 10:20 AM - 10:50 AM

#### SESSION 2: UV AND HIGHER ENERGY MATERIALS AND LIGHT SOURCES II

20 August 2023 • 10:50 AM - 12:10 PM | Conv. Ctr. Room 9

Session Chair: Yong-Hoon Cho, KAIST (Republic of Korea)

12652-5

#### Hexagonal boron nitride based deep ultraviolet light emitter (*Invited Paper*)

Author(s): Young Duck Kim, Kyung Hee Univ. (Republic of Korea)

20 August 2023 • 10:50 AM - 11:20 AM | Conv. Ctr. Room 9

12652-6

#### Two-dimensional perovskite materials towards violet and ultraviolet light-emitting diodes

Author(s): Manchen Hu, Natalia Murrietta, Junrui Lyu, Daniel N. Congreve, Sebastian Fernandez, Qi Zhou, Pournima Narayanan, Tracy Schloemer, Arynn Gallegos, Ghada Ahmed, Stanford Univ. (United States)

20 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 9

12652-7

#### Ferroelectric III-nitride ultrawide bandgap semiconductors for high efficiency UV-C optoelectronics and integrated quantum photonics (*Invited Paper*)

Author(s): Zetian Mi, Univ. of Michigan (United States)

20 August 2023 • 11:40 AM - 12:10 PM | Conv. Ctr. Room 9

Lunch Break 12:10 PM - 1:40 PM



### SESSION 3: UV AND HIGHER ENERGY APPLICATIONS: MICROSCOPY, SPECTROSCOPY AND BIOSENSING

20 August 2023 • 1:40 PM - 3:30 PM | Conv. Ctr. Room 9  
Session Chair: Atsushi Taguchi, Hokkaido Univ. (Japan)

12652-8

#### UV photoluminescence microscopy of individual ZnO nanoparticle

Author(s): Takahiro Kondo, Kotaro Suzuki, Shunsuke Toya, Hayato Higashi, Yuika Saito, Gakushuin Univ. (Japan)  
20 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 9

12652-9

#### Reaching ultimate sensitivity of label-free protein detection with deep-UV nanoantennas and aluminium nanophotonics

Author(s): Prithu Roy, Institut Fresnel, Aix-Marseille Univ. (France); Jean-Benoît Claude, Institut Fresnel (France); Jerome Wenger, Institut Fresnel, Aix-Marseille Univ. (France)  
20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 9

12652-10

#### Evaluations of single ZnO nanoparticle by photoluminescence spectroscopy

Author(s): Shunsuke Toya, Takahiro Kondo, Yuika Saito, Gakushuin Univ. (Japan)  
20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 9

12652-11

#### Ultra-low power electronic nose using micro UV-LED-based monolithic gas sensor and deep learning (*Invited Paper*)

Author(s): Inkyu Park, Kichul Lee, KAIST (Republic of Korea); Incheol Cho, SAMSUNG Electronics Co., Ltd. (Republic of Korea); Yong-Hoon Cho, KAIST (Republic of Korea)  
20 August 2023 • 2:40 PM - 3:10 PM | Conv. Ctr. Room 9

12652-22

#### Rapid detection of synthetic cannabinoids via fluorescence spectral fingerprints

Author(s): Ranjeet Kumar, Gyles E. Cozier, Rachael C. Andrews, Christopher R. Pudney, Univ. of Bath (United Kingdom)  
20 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 9

Coffee Break 3:30 PM - 4:00 PM

### SESSION 4: UV AND HIGHER ENERGY RELATED APPLICATIONS: NANOFABRICATION

20 August 2023 • 4:00 PM - 5:10 PM | Conv. Ctr. Room 9  
Session Chair: David J. Rogers, Nanovation (France)

12652-12

#### Advanced material fabrication in 3D with DUV light (*Invited Paper*)

Author(s): Atsushi Taguchi, Hokkaido Univ. (Japan)  
20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 9

12652-13

#### Fabrication of superconducting quantum circuits on 12-inch wafers using an ArF immersion lithography system

Author(s): Satoru Odate, Naooki Saito, Kosuke Suzuki, Hajime Aoyama, Nikon Corp. (Japan); Koichi Kusuyama, RIKEN (Japan); Yasunobu Nakamura, RIKEN (Japan), The Univ. of Tokyo (Japan); Hiroyuki Tsukamoto, Nikon Corp. (Japan)  
20 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 9

12652-14

#### Compact and low cost interference lithography based on external cavity diode laser and prism

Author(s): Daiki Matsubayashi, Univ. de Technologie Troyes (France), Muroran Institute of Technology (Japan); Agnieszka Gwiazda, Komla D. Nomenyo, Univ. de Technologie Troyes (France); Hiroshi Kano, Muroran Institute of Technology (Japan); Gilles Lérondel, Univ. de Technologie Troyes (France)  
20 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 9

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)  
20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)  
20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)  
20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12652

MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

#### Coffee Break 9:55 AM - 10:30 AM

### SESSION 5: UV AND HIGHER ENERGY RELATED APPLICATIONS AND PHYSICS

21 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 9

Session Chair: Hideki Hirayama, RIKEN (Japan)

12652-16

#### Investigating ultraviolet LED decontamination of tritium contaminated surfaces

Author(s): George K. Larsen, Savannah River National Lab. (United States)

21 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 9

12652-17

#### Enhancement of second-order optical nonlinearities and UV second harmonic generation from periodically poled boron-substituted aluminum nitride thin films

Author(s): Albert Suceava, John Hayden, The Pennsylvania State Univ. (United States); Kyle P. Kelley, Oak Ridge National Lab. (United States); Yihuang Xiong, Ismaila Dabo, Susan Trolier-McKinstry, Jon-Paul Maria, Venkatraman Gopalan, The Pennsylvania State Univ. (United States)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 9

12652-18

#### Dielectric lattices working in ultraviolet region (*Invited Paper*)

Author(s): Shunsuke Murai, Shuhei Tomita, Katsuhisa Tanaka, Kyoto Univ. (Japan)

21 August 2023 • 11:10 AM - 11:40 AM | Conv. Ctr. Room 9

12652-19

#### Strong coupling between exciton and superscar mode in ultraviolet emitting GaN triangular structure (*Invited Paper*)

Author(s): Yong-Hoon Cho, Chang Young Sung, KAIST (Republic of Korea)

21 August 2023 • 11:40 AM - 12:10 PM | Conv. Ctr. Room 9

Lunch Break 12:10 PM - 1:40 PM

### SESSION 6: UV AND HIGHER ENERGY ADVANCED LIGHT SOURCES

21 August 2023 • 1:40 PM - 3:20 PM | Conv. Ctr. Room 9

Session Chair: Atsushi Taguchi, Hokkaido Univ. (Japan)

12652-20

#### Higher Harmonics and Supercontinuum Generated from the response time of the Kerr medium effect using intense femtosecond laser pulses in different states of matter from an electromagnetic model (*Keynote Presentation*)

Author(s): Robert R. Alfano, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States)

21 August 2023 • 1:40 PM - 2:20 PM | Conv. Ctr. Room 9

12652-21

#### Spatiotemporally structured synchrotron radiation (*Invited Paper*)

Author(s): Masahiro Katoh, Hiroshima Univ. (Japan)

21 August 2023 • 2:20 PM - 2:50 PM | Conv. Ctr. Room 9

12652-15

#### Laser direct writing photoluminescent patterns from ZnO nanocrystals (*Invited Paper*)

Author(s): Quentin Kirscher, Institut de Sciences des Matériaux de Mulhouse (France); Fabien Grasset, Institut des Sciences Chimiques de Rennes, Univ. Rennes, CNRS (France); Dominique Berling, Olivier Soppera, Institut de Sciences des Matériaux de Mulhouse (France)

21 August 2023 • 2:50 PM - 3:20 PM | Conv. Ctr. Room 9

## Conference 12653

# Nanoengineering: Fabrication, Properties, Optics, Thin Films, and Devices XX

20 - 21 August 2023 | Conv. Ctr. Room 1A

Conference Chairs: **Balaji Panchapakesan**, Vellore Institute of Technology (India); **André-Jean Attias**, Sorbonne Univ. (France); **Wounghang Park**, Univ. of Colorado Boulder (United States)

Program Committee: **Bharat Bhushan**, The Ohio State Univ. (United States); **Stephane Bruynooghe**, Carl Zeiss Jena GmbH (Germany); **Francesco Chiadini**, Univ. degli Studi di Salerno (Italy); **Pankaj Kumar Choudhury**, Zhejiang Univ. (China); **Luca Dal Negro**, Boston Univ. (United States); **Elizabeth A. Dobisz**, SLAC National Accelerator Lab. (United States); **Ghassan E. Jabbour**, Arizona State Univ. (United States); **Yi-Jun Jen**, National Taipei Univ. of Technology (Taiwan); **Anders Kristensen**, DTU Nanotech (Denmark); **Akhlesh Lakhtaki**, The Pennsylvania State Univ. (United States); **Tom G. Mackay**, The Univ. of Edinburgh (United Kingdom); **Robert Magnusson**, The Univ. of Texas at Arlington (United States); **Dorota A. Pawlak**, Institute of Electronic Materials Technology (Poland); **Michael T. Postek**, Univ. of South Florida (United States); **Dianne L. Poster**, National Institute of Standards and Technology (United States); **Anne E. Sakdinawat**, SLAC National Accelerator Lab. (United States); **Andrew M. Sarangan**, Univ. of Dayton (United States); **Geoffrey B. Smith**, Univ. of Technology, Sydney (Australia); **Motofumi Suzuki**, Kyoto Univ. (Japan); **Tomas Tolenis**, Ctr. for Physical Sciences and Technology (Lithuania); **Chee Wei Wong**, Univ. of California, Los Angeles (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: DEVICES AND PROPERTIES OF NANOSTRUCTURES FOR PHOTONICS

20 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 1A

Session Chair: Balaji Panchapakesan,  
Vellore Institute of Technology (India)

12653-1

#### Extremely broadband topological waveguide coupler based on an odd-sized Su-Schrieffer-Heeger model

Author(s): Yu Sung Choi, Jae Woong Yoon, Hanyang Univ. (Republic of Korea)

20 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 1A

12653-3

#### Optical phased array with high speed and wide steering angle using organic EO polymer and inorganic waveguide structure

Author(s): Shun Kamada, National Institute of Information and Communications Technology (Japan); Maaya Tsukamoto, Toshihiro Okamoto, Masanobu Haraguchi, Tokushima Univ. (Japan); Akira Otomo, National Institute of Information and Communications Technology (Japan)

20 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 1A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: LIGHT MATTER INTERACTIONS

20 August 2023 • 10:30 AM - 11:30 AM | Conv. Ctr. Room 1A

Session Chair: Balaji Panchapakesan,  
Vellore Institute of Technology (India)

12653-5

#### NIR-induced color/fluorescence changing inks to prevent counterfeiting

Author(s): Àlex Julià López, Distinkt SL. (Spain)

20 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 1A

12653-6

#### A novel broadband photodetector realized using graphene based heterojunction on a silicon substrate

Author(s): Carmela Bonavolontà, Maurizio Casalino, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); Teresa Crisci, Univ. degli Studi della Campania Luigi Vanvitelli (Italy); Mariano Giofrè, Antonio Vettoliere, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); Mikhail Lisitskiy, CNR SPIN (Italy); Ivo Rendina, Berardo Ruggiero, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); Paolo Silvestrini, Univ. degli Studi della Campania Luigi Vanvitelli (Italy); Massimo Valentino, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy)

20 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 1A

12653-7

#### Transverse anderson localization of light waves through Au nanoparticles in a 3D optical waveguide

Author(s): Belkis Gökbulut, Bogaziçi Üniv. (Turkey)

20 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 1A

Lunch Break 11:30 AM - 1:00 PM

#### SESSION 3: NANO- AND MICRO-OPTICS

20 August 2023 • 1:00 PM - 2:00 PM | Conv. Ctr. Room 1A

Session Chair: Balaji Panchapakesan,  
Vellore Institute of Technology (India)

12653-8

#### Shannon's entropy and structural complexity of random antireflective nanostructures on fused silica surfaces

Author(s): Subhasree Srenevas, Menelaos K. Poutous, The Univ. of North Carolina at Charlotte (United States)

20 August 2023 • 1:00 PM - 1:20 PM | Conv. Ctr. Room 1A

# TECHNICAL CONFERENCES

## Conference 12653

12653-11

### Development of mechanical polishing methods for multilayer Laue lens fabrication

Author(s): Juan Zhou, Hanfei Yan, Brookhaven National Lab. (United States); Ray P. Conley, Argonne National Lab. (United States), Brookhaven National Lab. (United States); Stefano Giorgio, Yong S. Chu, Nathalie Bouet, Brookhaven National Lab. (United States)  
20 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 1A

12653-12

### Metasurface layout correction algorithm for intra-atom fabrication compatibility

Author(s): Pavel D. Terekhov, Shengyuan Chang, Md Tarek Rahman, Sadman Shafi, Xingjie Ni, The Pennsylvania State Univ. (United States)  
20 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 1A

Coffee Break 2:00 PM - 2:30 PM

### SESSION 4: INNOVATIVE PATTERNING, MATERIALS ENGINEERING, NANOFABRICATION, AND NANOLITHOGRAPHY

20 August 2023 • 2:30 PM - 4:30 PM | Conv. Ctr. Room 1A

Session Chair: Balaji Panchapakesan,  
Vellore Institute of Technology (India)

12653-13

### Injection molding process for fabricating metalens with high aspect ratio nanostructures

Author(s): Yui Ishii, Sony Semiconductor Solutions Corp. (Japan); Takafumi Anzai, Sony Global Manufacturing & Operations Corp. (Japan); Yuri Nakamura, Hiromi Sawai, Nobuyuki Suzuki, Hideki Ono, Akira Akiba, Hidehiko Takanashi, Sony Semiconductor Solutions Corp. (Japan)  
20 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 1A

12653-14

### 3D resist master evaluation protocol for nanoimprint lithography

Author(s): Diana Stephany Fernandez Rodas, Jérôme Rêche, Raluca Tiron, CEA-LETI (France), Univ. Grenoble Alpes (France)  
20 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 1A

12653-16

### Coupling structures between Nb<sub>2</sub>O<sub>5</sub> and plasmonic waveguide for high-speed and wide-steering angle optical phased array

Author(s): Maaya Tsukamoto, Tokushima Univ. (Japan); Shun Kamada, National Institute of Information and Communications Technology (Japan); Masanobu Haraguchi, Toshihiro Okamoto, Kenzo Yamaguchi, Tokushima Univ. (Japan)  
20 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 1A

12653-17

### Visible meta-optics reality: Volume production enabled by NIL

Author(s): Bradley R. Williams, Daniel Bacon-Brown, Matthew C. George, Romyana V. Petrova, Adam W. Korb, Jamie C. Stocks, MOXTEK, Inc. (United States)  
20 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 1A

12653-18

### Investigation on the lithographic process to improve the nanostructuring of a high-precision direct laser writing system

Author(s): Annika-Verena Häcker, Eberhard Manske, Technische Univ. Ilmenau (Germany)  
20 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 1A

12653-48

### Intelligent reticle modification enabled large-area metalens patterning

Author(s): Chunyen Chou, Hsuehli Liu, Linchia Huang, Wilson Guo, Peichen Yu, Youchia Chang, Yaowei Huang, National Yang Ming Chiao Tung Univ. (Taiwan); Jiamin Shieh, Taiwan Semiconductor Research Institute (Taiwan)  
20 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 1A

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)  
20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)  
20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)  
20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and  
Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

#### Coffee Break 9:55 AM - 10:30 AM

### SESSION 5: NANOSTRUCTURED THIN FILMS I

21 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 1A

Session Chair: Wounjhang Park,  
Univ. of Colorado Boulder (United States)

12653-20

#### Design and fabrication of resonant grating laser mirrors for single mode emission in microchip lasers

Author(s): Ratish Rao Nagaraj Rao, Univ. de Moncton (Canada), Univ. Jean Monnet Saint-Etienne (France); Fangfang Li, Marina Fetisova, Univ. of Eastern Finland (Finland); Théo Courval, Shawn Lapointe, Univ. de Moncton (Canada); Thomas Kampfe, Isabelle Verrier, Yves Jourlin, Univ. de Lyon (France), Univ. Jean Monnet Saint-Etienne (France), Institut d'Optique Graduate School (France); Petri Karvinen, Markku Kuittinen, Univ. of Eastern Finland (Finland); Jean-francois Bisson, Univ. de Moncton (Canada)

21 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 1A

12653-21

#### C/Ti/C/Al/C/Si multilayer and C+Ti/C+Al/C+Si composite thin films: synthesis and characterization

Author(s): Victor Ciupina, Gabriel C. Prodan, Rodica Vladoiu, Univ. "Ovidius" din Constanta (Romania); Corneliu Porosnicu, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); Virginia Nicolescu, Ceronav (Romania); Veronica V. Satulu, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 1A

12653-22

#### Generating and tuning slow photons at multiple spectral regions in bilayer inverse opal TiO<sub>2</sub>-BiVO<sub>4</sub> photonic structures for highly enhanced visible light photocatalysis

Author(s): Thomas Lourdu Madanu, Sébastien Mouchet, Laroussi Chaabane, Olivier Deparis, Bao-Lian Su, Univ. de Namur (Belgium)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 1A

12653-23

#### Tuning the optical properties of phase change material through glancing angle deposition techniques

Author(s): Viraj Vishnu Bhingardive, Avik Mandal, Abbas Sheikh Ansari, Behrad Gholipour, Univ. of Alberta (Canada)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 1A

12653-24

#### Nanostructured thin films for Meissner effect transition-edge-sensor devices

Author(s): Patrick S. Finnegan, Christian L. Arrington, Christopher St. John, Stephen M. Carr, Sandia National Labs. (United States)

21 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 1A

#### Lunch Break 12:10 PM - 1:40 PM

### SESSION 6: NANOSTRUCTURED THIN FILMS II

21 August 2023 • 1:40 PM - 2:20 PM | Conv. Ctr. Room 1A

Session Chair: Wounjhang Park,  
Univ. of Colorado Boulder (United States)

12653-26

#### Exploration of diode behavior in an applied magnetic field

Author(s): Guinevere Strack, Alkim Akyurtlu, Univ. of Massachusetts Lowell (United States)

21 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 1A

12653-27

#### Optical properties of a split nanotube array prepared by oblique angle deposition of metal on a polymer grating

Author(s): Yi-Jun Jen, You-Ting Jian, Cian-Hao Li, National Taipei Univ. of Technology (Taiwan)

21 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 1A

#### Coffee Break 2:20 PM - 2:50 PM

### SESSION 8: INNOVATIVE PATTERNING

21 August 2023 • 2:50 PM - 4:30 PM | Conv. Ctr. Room 1A

Session Chair: Wounjhang Park,  
niv. of Colorado Boulder (United States)

12653-28

#### UV-LED-based projection lithography for rapid high-resolution micro- and nanostructuring

Author(s): Lei Zheng, Leibniz Univ. Hannover (Germany); Carsten Reinhardt, Hochschule Bremen Univ. of Applied Sciences (Germany); Bernhard Roth, Leibniz Univ. Hannover (Germany)

21 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 1A

12653-29

#### Simulation of gallium phosphide cutting mechanism in ductile regime using molecular dynamics

Author(s): Michel Reis Pedreira Muniz Tavares, Technische Univ. Berlin (Germany), Univ. Federal de Santa Catarina (Brazil); Daniel Alexandre Rolón, Julian Christian Bernhard Kober, Stefan Kühne, Dirk Oberschmidt, Technische Univ. Berlin (Germany); Rolf Bertrand Schroeter, Univ. Federal de Santa Catarina (Brazil)

21 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 1A

# TECHNICAL CONFERENCES

## Conference 12653

12653-30

### Single-shot spectroscopy using continuously variable filters

Author(s): Roseanna G. Lawandi, Zhanibek Bolatbek, Imad Agha, Keigo Hirakawa, Andrew M. Sarangan, Univ. of Dayton (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 1A

12653-31

### Light management and color conversion for micro-LEDs using self-assembled nanostructures

Author(s): Ulrich Lemmer, Junchi Chen, Karlsruher Institut für Technologie (Germany); Yidenekachew J. Donie, Univ. of Minnesota, Twin Cities (United States)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 1A

12653-32

### Subdiffraction 3D nanofabrication and application

Author(s): Chenliang Ding, Dazhao Zhu, Xi Liu, Qiulan Liu, Zhejiang Lab. (China); Cuifang Kuang, Xu Liu, Zhejiang Univ. (China)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 1A

## POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12653-33

### Optimization of lift process in fabrication of graphene-based field effect transistors with 3 um channel gap

Author(s): Reena Sri Selvarajan, Asia Pacific Univ. of Technology & Innovation (Malaysia); Azrul Azlan Hamzah, Hafzaliza Erny Zainal Abidin, Institute of Microengineering and Nanoelectronics, Univ. Kebangsaan Malaysia (Malaysia); Vinesh Thiruchelvam, Sivakumar Sivanesan, Asia Pacific Univ. of Technology & Innovation (Malaysia)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-34

### Transparent radiative cooling with non-diffractive perforated-mirror structure

Author(s): Byoungsu Ko, Jaebum Noh, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-36

### Plasmonic contribution to photovoltaic performance of NiO/ZnO-Heterojunctions with ZnO-coated Ag-nanowire top electrodes

Author(s): Jungeun Song, Ewha Womans Univ. (Republic of Korea); Malkeshkumar Patel, Incheon National Univ. (Republic of Korea); Sara E. Johannesson, Ewha Womans Univ. (Republic of Korea), The Univ. of Edinburgh (United Kingdom); Joondong Kim, Incheon National Univ. (Republic of Korea); Dong-Wook Kim, Ewha Womans Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-37

### Design, modeling, and numerical simulation of Arrayed Waveguide Gratings (AWG) based on silicon on insulator

Author(s): Jeffry H. Martínez Valdiviezo, Ctr. de Investigaciones Ópticas (Argentina), Univ. Nacional de Quilmes (Argentina), Comisión Nacional de Energía Atómica (Argentina); Roberto R. Peyton, Stämm (Argentina), Univ. Nacional de Quilmes (Argentina); Gustavo A. Torchia, Ctr. de Investigaciones Ópticas (Argentina), Univ. Nacional de Quilmes (Argentina)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-39

### Enhancement of NIR emission varying thulium of ZrO<sub>2</sub>:2Yb<sup>3+</sup>-xTm<sup>3+</sup> nanoparticles by sonochemical method

Author(s): Anabel Herrera Rodriguez, Tzarara López-Luke, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Gonzalo Ramírez-García, Univ. Nacional Autónoma de México (Mexico); Andrea Ceja-Fdez, Univ. de Guanajuato (Mexico); Salvador Áviles Barrientos, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Victor Hugo Romero Arellano, Univ. de Guadalajara (Mexico); Juan Zárate-Medina, Univ. Michoacana de San Nicolás de Hidalgo (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-40

### High-yield fabrication technique for mechanically stable suspended-graphene FETs

Author(s): Hyunsuk Shin, Gwangju Institute of Science and Technology (Republic of Korea); Sungbae J. Lee, Korea Institute of Energy Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-41

### Plasmon-enhanced photon upconversion from short-wave infrared to visible using indium tin oxide nanoparticles

Author(s): Sung Woo Jang, Tuhin Samanta, Won-Bin Im, Hanyang Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-42

### Ambipolar inverter circuits based on bilayer of MoS<sub>2</sub> and DPP-DTT nanowire

Author(s): Siwon Hwang, Hye Young Lee, Sookmyung Women's Univ. (Republic of Korea); Ji-Hoon Ahn, Hanyang Univ. (Republic of Korea); Young Tea Chun, Korea Maritime and Ocean Univ. (Republic of Korea); Bongjun Kim, Sookmyung Women's Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-43

### High-aspect ratio HgTe colloidal quantum dots for IR photodetection

Author(s): Shea Sanvordenker, Jungchul Noh, The Univ. of Texas at Austin (United States); Jamie Howell, Richard Pimpinella, Sivananthan Labs., Inc. (United States); Brian A. Korgel, The Univ. of Texas at Austin (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-44

### **Manipulation of superfluorescence time dynamics through cavity engineering**

Author(s): Yash Mehta, Kenan Gundogdu, Franky So, North Carolina State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-45

### **Impact of UV-Ozone (UVO) treatment on optical and electrical properties of RF sputtered Ga<sub>2</sub>O<sub>3</sub> thin films for opto-electronic application**

Author(s): Madhuri Mishra, Rajib Saha, Sangita Bhowmick, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-46

### **Deposition and characterization of distributed feedback resonant-cavities with complex index active layers**

Author(s): Angelica Drees, Univ. of Dayton (United States); Lirong Sun, Azimuth Corp. (United States); Peter Stevenson, Air Force Research Lab. (United States); Andrew M. Sarangan, Univ. of Dayton (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-47

### **Large area optically transparent frequency selective surface absorber for dual band millimeter-wave / IR stealth**

Author(s): JinA Lee, Kiwook Han, JaeWon Hahn, Yonsei Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-49

### **Optical anisotropy of NbOCl<sub>2</sub>**

Author(s): Shuin Jian Wu, Centre for Quantum Technologies (Singapore); Yi Wei Ho, National Univ. of Singapore (Singapore); Isa Ahmadalidokht, Centre for Quantum Technologies (Singapore); Goki Eda, National Univ. of Singapore (Singapore); Alexander Ling, Ctr. for Quantum Technologies (Singapore)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-50

### **Restrained charge injection via work-function-control of advanced electrode design for efficient organic photodetectors**

Author(s): Woongsik Jang, Byung Gi Kim, Jae Sang Cho, Ji Hyun Lim, Min Soo Kim, Jin Young Kim, Chung-Ang Univ. (Republic of Korea); Keum Hwan Park, Korea Electronics Technology Institute (Republic of Korea); Dong Hwan Wang, Chung-Ang Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12653-52

### **HA/rGO/Pd nanocomposite thin film coating on SST 304: synthesize, characterization, and properties investigations**

Author(s): Huda Alyafei, Qatar Univ. (Qatar)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12654

# Enhanced Spectroscopies and Nanoimaging 2023

20 - 23 August 2023 | Conv. Ctr. Room 1B

Conference Chair: **Prabhat Verma**, Osaka Univ. (Japan); **Yung Doug Suh**, Ulsan National Institute of Science and Technology (Republic of Korea)

Program Committee: **Tamitake Itoh**, AIST (Japan); **Ryo Kato**, Tokushima Univ. (Japan); **Satoshi Kawata**, Osaka Univ. (Japan); **Naresh Kumar**, ETH Zurich (Switzerland); **Jung-Hoon Lee**, Soonchunhyang Univ. (Republic of Korea); **Dangyuan Lei**, City Univ. of Hong Kong (Hong Kong, China); **Alfred J. Meixner**, Eberhard Karls Univ. Tübingen (Germany); **Yukihiro Ozaki**, Kwansai Gakuin Univ. (Japan); **Matthew A. Pelton**, Univ. of Maryland, Baltimore County (United States); **Markus B. Raschke**, Univ. of Colorado Boulder (United States); **Bin Ren**, Xiamen Univ. (China); **P. James Schuck**, Columbia Univ. (United States); **Zachary D. Schultz**, The Ohio State Univ. (United States); **Ze Xiang Shen**, Nanyang Technological Univ. (Singapore); **Takayuki Umakoshi**, Osaka Univ. (Japan); **Siva Umopathy**, Indian Institute of Science, Bengaluru (India); **Katherine A. Willets**, Temple Univ. (United States); **Peng Xi**, Peking Univ. (China); **Hongxing Xu**, Wuhan Univ. (China); **Taka-aki Yano**, Tokushima Univ. (Japan); **Renato Zenobi**, ETH Zurich (Switzerland)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: NANOIMAGING IN 2D-MATERIALS

20 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 1B

Session Chair: Prabhat Verma, Osaka Univ. (Japan)

12654-4

#### **Nano-photoluminescence and Raman imaging of TMD moire domains and excitons strongly coupled to nanocavities** (*Invited Paper*)

Author(s): P. James Schuck, Columbia Univ. (United States)

20 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 1B

12654-5

#### **Plasmonic near-fields for probing strong light-matter interactions in excitonic semiconductors and buried interfaces** (*Invited Paper*)

Author(s): Deep Jariwala, Univ. of Pennsylvania (United States)

20 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 1B

12654-6

#### **Tip-induced control of excitonic behaviors in the nanoscale space** (*Invited Paper*)

Author(s): Kyoung-Duck Park, Pohang Univ. of Science and Technology (Republic of Korea)

20 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 1B

12654-7

#### **Investigation of transition metal dichalcogenide flakes with tip-enhanced Raman spectroscopy and wide-field Raman microscopy with stochastic optical reconstruction post-processing** (*Invited Paper*)

Author(s): Joachim Jelken, Cedric Lambin, Maria Aviles, François Lagugné-Labarthe, Western Univ. (Canada)

20 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 1B

Lunch Break 12:30 PM - 2:00 PM

#### SESSION 2: ENHANCED SPECTROSCOPY FOR BIOSENSING I

20 August 2023 • 2:00 PM - 3:30 PM | Conv. Ctr. Room 1B

Session Chair: Tomoko Inose, Kyoto Univ. (Japan)

12654-8

#### **Point of use SERS-based lateral flow test for pathogenic infections** (*Invited Paper*)

Author(s): Duncan Graham, Waleed A. Hassanain, Sian Sloan-Dennison, Karen Faulds, Univ. of Strathclyde (United Kingdom)

20 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 1B

12654-9

#### **Plasmonic metallic nanoparticle-based biosensors** (*Invited Paper*)

Author(s): Jung-Hoon Lee, Soonchunhyang Univ. (Republic of Korea)

20 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 1B

12654-10

#### **Nanogap-enhanced biomolecular spectroscopies using plasmonic and dielectric nanostructures** (*Invited Paper*)

Author(s): Taka-aki Yano, Ryo Kato, Takuo Tanaka, Tokushima Univ. (Japan), RIKEN (Japan)

20 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 1B

Coffee Break 3:30 PM - 4:00 PM

#### SESSION 3: ENHANCED SPECTROSCOPY FOR BIOSENSING II

20 August 2023 • 4:00 PM - 5:00 PM | Conv. Ctr. Room 1B

Session Chair: Taka-aki Yano, Tokushima Univ. (Japan)

12654-12

#### **Surface engineering of plasmonic nanowire probes toward efficient intracellular material sensing and delivery systems** (*Invited Paper*)

Author(s): Tomoko Inose, Kyoto Univ. (Japan)

20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 1B

12654-13

#### **Single-molecule biosensing using plasmon-enhanced fluorescence** (*Invited Paper*)

Author(s): Peter Zijlstra, Technische Univ. Eindhoven (Netherlands)

20 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 1B



### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics *(Plenary Presentation)*

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems *(Plenary Presentation)*

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs *(Plenary Presentation)*

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

## MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A  
Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisches Institut (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications *(Plenary Presentation)*

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments *(Plenary Presentation)*

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

Coffee Break 9:55 AM - 10:30 AM

### SESSION 4: TERS & NANOIMAGING

21 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 1B  
Session Chair: Yung Doug Suh, Ulsan National Institute of Science and Technology (Republic of Korea)

12654-14

#### Label-free analysis of biological membranes at the nanoscale using tip enhanced Raman spectroscopy *(Invited Paper)*

Author(s): Naresh Kumar, ETH Zurich (Switzerland)

21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 1B

12654-15

#### Ultrastable tip-enhanced Raman spectroscopic imaging of 2D material systems *(Invited Paper)*

Author(s): Ryo Kato, Tokushima Univ. (Japan); Takayuki Umakoshi, Prabhat Verma, Osaka Univ. (Japan); Taka-aki Yano, Tokushima Univ. (Japan); Takuo Tanaka, RIKEN (Japan)

21 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 1B

12654-16

#### Sub-tip-radius near-field interactions in nano-FTIR vibrational spectroscopy on single protein particles

Author(s): Jun Nishida, Akihiro Otomo, Ryota Iino, Takashi Kumagai, Institute for Molecular Science (Japan)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 1B

12654-17

#### Importance of multi-color TERS imaging for the nanoscale characterization of 2D semiconductors and heterostructures thereof

Author(s): Andrey Krayev, HORIBA Scientific (United States)

21 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 1B

Lunch Break 12:10 PM - 1:50 PM

### SESSION 5: CHEMICAL ACTIVITIES THROUGH PLASMONICS

21 August 2023 • 1:50 PM - 3:20 PM | Conv. Ctr. Room 1B  
Session Chair: Naresh Kumar, ETH Zurich (Switzerland)

12654-18

#### Broadband plasmon nanofocusing for nanoscale optical switching of photochromic materials *(Invited Paper)*

Author(s): Takayuki Umakoshi, Haruki Kidoguchi, Hiroshi Arata, Prabhat Verma, Osaka Univ. (Japan)

21 August 2023 • 1:50 PM - 2:20 PM | Conv. Ctr. Room 1B

12654-19

#### Spectroscopic probing of non-thermal reactant activation in plasmon-catalyzed reactions *(Invited Paper)*

Author(s): Zee Hwan Kim, Hyun-Hang Shin, Jaeyoung Jeong, Hyungjun Park, Seoul National Univ. (Republic of Korea)

21 August 2023 • 2:20 PM - 2:50 PM | Conv. Ctr. Room 1B

12654-20

#### Plasmon-controlled photochemical processes for spectroscopy and chemical reactions *(Invited Paper)*

Author(s): Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 2:50 PM - 3:20 PM | Conv. Ctr. Room 1B

# TECHNICAL CONFERENCES

## Conference 12654

Coffee Break 3:20 PM - 3:50 PM

### SESSION 6: ENHANCEMENT AT METASURFACES

21 August 2023 • 3:50 PM - 5:10 PM | Conv. Ctr. Room 1B  
Session Chair: Ryo Kato, Tokushima Univ. (Japan)

12654-21

#### **Dielectric metasurfaces for DUV surface-enhanced spectroscopy** (*Invited Paper*)

Author(s): Bo Ray Lee, Ting An Hsu, Pei Ying Ho, Yu Chieh Peng, Yu Chia Chung, Yu Jie Wang, Institute of Electronics, National Yang Ming Chiao Tung Univ. (Taiwan); Yao Wei Huang, National Yang Ming Chiao Tung Univ. (Taiwan); Ming Lun Tseng, Institute of Electronics, National Yang Ming Chiao Tung Univ. (Taiwan)

21 August 2023 • 3:50 PM - 4:20 PM | Conv. Ctr. Room 1B

12654-22

#### **Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure** (*Invited Paper*)

Author(s): Lisa V. Poulikakos, Paula Kirya, Samantha Bordy, Justin Hochberg, Jonathan Pokorski, Omonigho Aisagbonhi, Univ. of California, San Diego (United States)

21 August 2023 • 4:20 PM - 4:50 PM | Conv. Ctr. Room 1B

12654-23

#### **Plasmonic metasurfaces for enhanced spectrochemical tissue imaging**

Author(s): Yuber Samir Sanchez Rosas, Keegan A. Schoeller, Edward Chang, Hongyan Mei, Mikhail A. Kats, Kevin W. Eliceiri, Xinyu Zhao, Filiz Yesilkoy, Univ. of Wisconsin-Madison (United States)

21 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 1B

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12654-46

#### **Disorder in optical and electronic properties of the lead halide perovskites on the nanoscale**

Author(s): Andrii Shcherbakov, Felix Deschler, Shangpu Liu, Stanislav Bodnar, Jonathan Zerhoch, Markus Heindl, Ruprecht-Karls-Univ. Heidelberg (Germany)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-52

#### **Fundamental characteristics of remote plasmonic-enhanced Raman spectroscopy without close contact between analyte and metallic nanostructure**

Author(s): Sota Inoue, Hiroki Tanioka, Takeshi Yasui, Tokushima Univ. (Japan); Yukihiko Morimoto, Ushio Inc. (Japan); Masahiro Kawasaki, Mitsuo Kawasaki, Kyoto Univ. Graduate School of Engineering (Japan); Takeo Minamikawa, Tokushima Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-53

#### **SERS biosensing of sickle cell hemoglobin from normal hemoglobin**

Author(s): Sara Abbasi, Vrije Univ. Brussel (Belgium); Bastián Carnero Groba, Univ. de Santiago de Compostela (Spain); Ilse Weets, Univ. Ziekenhuis Brussel (Belgium); Qing Liu, Francesco Ferranti, Heidi Ottevaere, Vrije Univ. Brussel (Belgium)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-54

#### **Orientation-dependent interaction between gold nanocups and WS<sub>2</sub> monolayer**

Author(s): Xinyue XIA, Ruoqi AI, Jianfang Wang, The Chinese Univ. of Hong Kong (Hong Kong, China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-55

#### **Photoluminescence and nonlinear optical properties of coupled plasmonic nanostructures**

Author(s): Aya Takahashi, Hiyori Sakamoto, Keisuke Imaeda, Sou Ryuzaki, Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-56

#### **Infrared spectral properties of pillared carbon/Au nanochains**

Author(s): Chiaki Akiba, Keisuke Imaeda, Sou Ryuzaki, Kosei Ueno, Hokkaido Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-57

#### **Phase identification on infiltrated thermal barrier materials by 2D Raman spectroscopy**

Author(s): Ivan F. Bedoya Trujillo, Univ. Michoacana de San Nicolás de Hidalgo (Mexico), Ctr. de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico); Anabel Herrera Rodríguez, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Jhon Sebastian Perez-Bedoya, Natalia Brizuela-Colmenares, Ctr. de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico); Juan Zarate-Medina, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Juan Muñoz-Saldaña, Ctr. de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-59

#### **Nanoimprinted pyramid scanning probe for near-field optical mapping**

Author(s): Junze Zhou, Edward S. Barnard, Lawrence Berkeley National Lab. (United States); Keiko Munechika, HighRI Optics, Inc. (United States); Adam M. Schwartzberg, Alexander Weber-Bargioni, Lawrence Berkeley National Lab. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-60

#### **Single molecule imaging towards 1-nm resolution Raman microscopy**

Author(s): Apitchaya Sanchai, The Univ. of Edinburgh (United Kingdom)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-61

### Development of a new biosensor for the detection of pathogens by RAMAN spectroscopy

Author(s): Louise Lejeune, Clémentine Gevers, Roselien Vercauteren, Laurent A. Francis, Sophie Hermans, Univ. Catholique de Louvain (Belgium)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12654-62

### Implementation of a numerical model for the computation of the electric field enhancement of nanodumbbells

Author(s): Clémentine Gevers, Louise Lejeune, Roselien Vercauteren, Sophie Hermans, Laurent A. Francis, Univ. Catholique de Louvain (Belgium)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 7: PLASMONICS AND NANOIMAGING I

22 August 2023 • 8:30 AM - 10:00 AM | Conv. Ctr. Room 1B

Session Chair: Eric O. Potma,  
Univ. of California, Irvine (United States)

12654-2

### Scanning near-field optical microscopy methods for studies of chemistry and materials approaching the atomic scale (*Invited Paper*)

Author(s): Jeremy F. Schultz, National Institute of Standards and Technology (United States); Linfei Li, Sayantan Mahapatra, Nan Jiang, Univ. of Illinois at Chicago (United States); Andrea Centrone, National Institute of Standards and Technology (United States)

22 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 1B

12654-24

### Metamaterial assisted illumination nanoscopy (MAIN) (*Invited Paper*)

Author(s): Zhaowei Liu, Univ. of California, San Diego (United States)

22 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 1B

12654-25

### Atomic-scale optical spectroscopy at surfaces (*Invited Paper*)

Author(s): Takashi Kumagai, Institute for Molecular Science (Japan)

22 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 1B

Coffee Break 10:00 AM - 10:30 AM

### SESSION 8: PLASMONICS AND NANOIMAGING II

22 August 2023 • 10:30 AM - 12:20 PM | Conv. Ctr. Room 1B

Session Chair: Takayuki Umakoshi, Osaka Univ. (Japan)

12654-27

### Evolution of nanoscale optical spectroscopy from NSOM to photo induced force microscopy (*Invited Paper*)

Author(s): H. K. Wickramasinghe, Univ. of California, Irvine (United States)

22 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 1B

12654-28

### Thermal dynamics of atomically sharp tips (*Invited Paper*)

Author(s): Eric O. Potma, Abid A. Sifat, Univ. of California, Irvine (United States)

22 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 1B

12654-29

### Electrochemical tip-enhanced Raman spectroscopy for the elucidation of complex electrochemical reactions (*Invited Paper*)

Author(s): Alice Fiocco, Aja Pavlic, Emmanuel Maisonhaute, Sorbonne Univ. (France); Jean-Marc Noël, Univ. Paris Diderot (France); Ivan T. Lucas, Sorbonne Univ. (France)

22 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 1B

12654-30

### Ambient tip-enhanced (non)linear photoluminescence with sub-5 nm spatial resolution using multimodal hyperspectral micro/nanoscopy

Author(s): Chih-Feng Wang, Patrick Z. El-Khoury, Pacific Northwest National Lab. (United States)

22 August 2023 • 12:00 PM - 12:20 PM | Conv. Ctr. Room 1B

Lunch/Exhibition Break 12:20 PM - 2:00 PM

### SESSION 9: SURFACE ENHANCED SPECTROSCOPY

22 August 2023 • 2:00 PM - 3:30 PM | Conv. Ctr. Room 1B

Session Chair: Takashi Kumagai,  
Institute for Molecular Science (Japan)

12654-31

### A unified framework for the description of plasmonically enhanced ultrafast and cw Raman spectroscopies (*Invited Paper*)

Author(s): Lawrence Ziegler, Boston Univ. (United States)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 1B

12654-32

### Plasmonics in cubic Au crystals (*Invited Paper*)

Author(s): Jeong-Eun Park, Gwangju Institute of Science and Technology (Republic of Korea)

22 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 1B

12654-33

### Remote plasmonic-enhanced Raman spectroscopy: Exploring plasmon-molecule coupling over distances greater than 100 nm (*Invited Paper*)

Author(s): Takeo Minamikawa, Tokushima Univ. (Japan)

22 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 1B

Coffee Break 3:30 PM - 4:00 PM

# TECHNICAL CONFERENCES

## Conference 12654

### SESSION 10: PLASMONICS AT NANOSCALE

22 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 1B  
Session Chair: Yung Doug Suh, Ulsan National Institute of Science and Technology (Republic of Korea)

12654-34

#### Room temperature plasmonic molecule trapping at electrified interfaces (*Invited Paper*)

Author(s): Kei Murakoshi, Hokkaido Univ. (Japan)  
22 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 1B

12654-35

#### Control of excitons in two-dimensional materials with localized plasmons (*Invited Paper*)

Author(s): Jianfang Wang, The Chinese Univ. of Hong Kong (Hong Kong, China)  
22 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 1B

12654-36

#### Studies of inverse faraday effect with varying thickness nanodisks (*Invited Paper*)

Author(s): Luat T. Vuong, Alma Gonzales, Victor Ortiz, Xinping Shi, Ji Feng, Richard B. Wilson, Univ. of California, Riverside (United States)  
22 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 1B

## WEDNESDAY 23 AUGUST 2023

### SESSION 11: OTHER PHENOMENA AT NANOSCALE I

23 August 2023 • 8:30 AM - 10:00 AM | Conv. Ctr. Room 1B  
Session Chair: Prabhat Verma, Osaka Univ. (Japan)

12654-37

#### Electromagnetic asymmetry and optical magnetism in symmetry-broken plasmonic nanocavities (*Invited Paper*)

Author(s): Dangyuan Lei, City Univ. of Hong Kong (Hong Kong, China)  
23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 1B

12654-11

#### Label-free plasmonic imaging and spectroscopy for quantitative analysis of nanoscale objects and molecules (*Invited Paper*)

Author(s): Wei-Chuan Shih, Univ. of Houston (United States)  
23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 1B

12654-38

#### Influences of nanoparticle loading in paper-SERS sensors (*Invited Paper*)

Author(s): Li-Lin Tay, Shawn Poirier, Ali Ghaemi, Hal Bowen-Smith, John E. Hulse, National Research Council Canada (Canada)  
23 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 1B

Coffee Break 10:00 AM - 10:30 AM

### SESSION 12: OTHER NANOIMAGING TECHNIQUES

23 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 1B  
Session Chair: Li-Lin Tay, National Research Council Canada (Canada)

12654-40

#### Chemical investigation of materials in ionic environment with scanning ion-conductance microscopy based tip-enhanced Raman spectroscopy (*Invited Paper*)

Author(s): Naihao Chiang, Univ. of Houston (United States)  
23 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 1B

12654-41

#### Nano-optical imaging of van der Waals crystals: from ultrafast exciton dynamics to anisotropic waveguide modes (*Invited Paper*)

Author(s): Fabian Mooshammer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Xinyi Xu, Chiara Trovatiello, Yinming Shao, Shuai Zhang, P. James Schuck, D. N. Basov, Columbia Univ. (United States)  
23 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 1B

12654-42

#### Imaging electronic and atomic motion in molecules (*Invited Paper*)

Author(s): Manish Garg, Max-Planck-Institut für Festkörperforschung (Germany)  
23 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 1B

Lunch/Exhibition Break 12:00 PM - 1:30 PM

### SESSION 13: OTHER PHENOMENA AT NANOSCALE II

23 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 1B  
Session Chair: Ivan T. Lucas, Sorbonne Univ. (France)

12654-43

#### Single-molecule circuitry beyond the diffraction limit (*Invited Paper*)

Author(s): Albert C. Aragonès, Univ. de Barcelona (Spain)  
23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 1B

12654-44

#### Exploring the limits to spatially resolved optical spectroscopy with free electrons (*Invited Paper*)

Author(s): F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain)  
23 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 1B

12654-45

#### Interferometric second-harmonic generation in two-dimensional heterocrystals (*Invited Paper*)

Author(s): Sunmin Ryu, Pohang Univ. of Science and Technology (Republic of Korea)  
23 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 1B

Coffee Break 3:00 PM - 3:30 PM

### SESSION 14: ENHANCED IR SPECTROSCOPY

23 August 2023 • 3:30 PM - 5:00 PM | Conv. Ctr. Room 1B  
Session Chair: Yung Doug Suh, Ulsan National Institute of Science  
and Technology (Republic of Korea)

12654-47

#### **Photo-induced dipole and thermal forces for spectroscopic nanoimaging** (*Invited Paper*)

Author(s): Junghoon Jahng, Korea Research Institute of Standards  
and Science (Republic of Korea)

23 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 1B

12654-48

#### **A novel infrared spectroscopic approach to study the interaction of Amyloid- $\beta$ with cell-penetrating peptides: A possible new class of drugs to combat the Alzheimer's disease**

Author(s): Suman Paul, attocube systems AG (Germany); Andreas  
Barth, Astrid Gräslund, Stockholm Univ. (Sweden)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 1B

12654-49

#### **On-demand mid-IR to visible upconversion with a near-field microscope**

Author(s): Philippe Roelli, CIC nanoGUNE (Spain); Isabel Pascual,  
Ctr. de Física de Materiales (Spain); Iris Niehues, CIC nanoGUNE  
(Spain); Javier Aizpurua, Ctr. de Física de Materiales (Spain); Rainer  
Hillenbrand, CIC nanoGUNE (Spain)

23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 1B

12654-50

#### **Correlative multiscale chemical and elemental nano-imaging of morphology and disorder at organic-inorganic interfaces in biomineralization**

Author(s): Brian O'Callahan, Pacific Northwest National Lab. (United  
States); Amy Larson, Univ. of Washington (United States); Sarah  
Leichty, John B. Cliff, Pacific Northwest National Lab. (United  
States); Alex Gagnon, Univ. of Washington (United States); Markus B.  
Raschke, Univ. of Colorado Boulder (United States)

23 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 1B

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12654-51

#### **Parametric modeling of diffuse reflectance**

Author(s): Jesse Duncan, Rachel Viger, Scott Ramsey, Troy B. Mayo,  
Samuel G. Lambrakos, U.S. Naval Research Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12655

# Emerging Topics in Artificial Intelligence (ETAI) 2023

20 - 24 August 2023 | Conv. Ctr. Room 6C

Conference Chairs: **Giovanni Volpe**, Göteborgs Univ. (Sweden); **Joana B. Pereira**, Karolinska Institute (Sweden); **Daniel Brunner**, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France); **Aydogan Ozcan**, UCLA Samueli School of Engineering (United States)

Program Committee: **Jonas Andersson**, Volvo Car Corp. (Sweden); **Frank Cichos**, Univ. Leipzig (Germany); **Margaretta Colangelo**, Jthereum Corp. (United States); **Miguel C. Cornelles Soriano**, Instituto de Física Interdisciplinar y Sistemas Complejos (Spain); **Jürgen W. Czarske**, TU Dresden (Germany); **Meltem Elitas**, Sabanci Univ. (Turkey); **Yong Fan**, Penn Medicine (United States); **Claudio Gallicchio**, Univ. di Pisa (Italy); **Antoni Homs-Corbera**, Cherry Biotech (France); **Pablo Loza-Alvarez**, ICFO - Institut de Ciències Fotòniques (Spain); **Kathy Lüdge**, Technische Univ. Ilmenau (Germany); **Carlo Manzo**, Univ. de Vic (Spain); **Paula Merino Serrais**, Cajal Institute (Spain); **Mite Mijalkov**, Karolinska Institute (Sweden); **Armand Niederberger**, Stanford Photonics Research Ctr. (United States); **Yair Rivenson**, Pictor Labs (United States); **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia); **Roser Sala-Llonch**, Univ. de Barcelona (Spain); **Bhavin J. Shastri**, Queen's Univ. (Canada); **Guohai Situ**, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China); **Volker J. Sorger**, The George Washington Univ. (United States); **Lei Tian**, Boston Univ. (United States); **Mattia Veronese**, Univ. degli Studi di Padova (Italy); **Axel Wismüller**, Univ. of Rochester Medical Ctr. (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: NEUROMORPHIC COMPUTING I

20 August 2023 • 1:00 PM - 3:00 PM | Conv. Ctr. Room 6C

Session Chair: Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

12655-1

#### Hardware-efficient large-scale reconfigurable optical neural network (ONN) using complex media (*Invited Paper*)

Author(s): Fei Xia, Ecole Normale Supérieure (France), Sorbonne Univ. (France); Ziao Wang, Ecole Normale Supérieure (France); Logan G. Wright, Tatsuhiro Onodera, Martin M. Stein, Cornell Univ. (United States); Jianqi Hu, Ecole Normale Supérieure (France); Peter L. McMahon, Cornell Univ. (United States); Sylvain Gigan, Ecole Normale Supérieure (France), Sorbonne Univ. (France)

20 August 2023 • 1:00 PM - 1:30 PM | Conv. Ctr. Room 6C

12655-2

#### Photonic decision making using optical spatiotemporal chaos generated from spatial light modulator

Author(s): Atsushi Uchida, Kensei Morijiri, Kento Takehana, Kazutaka Kanno, Saitama Univ. (Japan)

20 August 2023 • 1:30 PM - 1:45 PM | Conv. Ctr. Room 6C

12655-3

#### Brain-inspired nanophotonic spike-based devices for neuromorphic light-emitting and sensing AI applications (*Invited Paper*)

Author(s): Bejoys Jacob, INL - International Iberian Nanotechnology Lab. (Portugal); Matej Hejda, Weikang Zhang, Antonio Hurtado, Univ. of Strathclyde (United Kingdom); Bruno Romeira, INL - International Iberian Nanotechnology Lab. (Portugal)

20 August 2023 • 1:45 PM - 2:15 PM | Conv. Ctr. Room 6C

12655-4

#### Online learning strategies for optical neural networks

Author(s): Mirko Goldmann, Instituto de Física Interdisciplinar y Sistemas Complejos (Spain); Anas Skalli, Daniel Brunner, FEMTO-ST (France)

20 August 2023 • 2:15 PM - 2:30 PM | Conv. Ctr. Room 6C

12655-5

#### Photonic Spiking Neural Networks (*Invited Paper*)

Author(s): Antonio Hurtado, Dafydd Owen-Newns, Weikang Zhang, Matej Hejda, Joshua Robertson, Univ. of Strathclyde (United Kingdom)

20 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 6C

#### Coffee Break 3:00 PM - 3:30 PM

#### SESSION 2: NEUROMORPHIC COMPUTING II

20 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 6C

Session Chair: Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

12655-6

#### Fundamental Properties of Optical Diffractive Neural Networks Through Co-Design

Author(s): Francois Leonard, Elliot Fuller, Corinne Teeter, Craig M. Vineyard, Sandia National Labs. (United States)

20 August 2023 • 3:30 PM - 3:45 PM | Conv. Ctr. Room 6C

12655-7

#### Nonlinear spatiotemporal optical computing (*Invited Paper*)

Author(s): Ugur Tegin, Koç Univ. (Turkey); Mustafa Yildirim, Ilker Oguz, Christophe Moser, Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

20 August 2023 • 3:45 PM - 4:15 PM | Conv. Ctr. Room 6C

MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A  
Session Chairs: Gennady Shvets, Cornell Univ. (United States) and  
Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)  
21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)  
21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

Coffee Break 9:55 AM - 10:30 AM

### SESSION 3: BIOMEDICAL APPLICATIONS I

21 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 6C  
Session Chair: Jürgen W. Czarske, TU Dresden (Germany)

12655-12

#### U-Net-based segmentation of Escherichia coli cells in the absence and presence of ciprofloxacin exposure

Author(s): Ozge Umut, Sabanci Univ. (Turkey); Miray Esra Palaz, Istanbul Univ. (Turkey); Deniz Muratli, Sabanci Univ. (Turkey); Aleyra Kizilyer, Istanbul Technical Univ. (Turkey); Sumeyra Vural Kaymaz, Tugce Ermis, Meltem Elitas, Sabanci Univ. (Turkey)  
21 August 2023 • 10:30 AM - 10:45 AM | Conv. Ctr. Room 6C

12655-13

#### Learning-based lensless fiber bundle imaging with real-time resolution enhancement for biomedicine (*Invited Paper*)

Author(s): Tijue Wang, Lab. for Measurement and Sensor System Technique, TU Dresden (Germany); Jakob Dremel, Lab. for Measurement and Sensor System Technique, TU Dresden (Germany); Else-Kröner-Fresenius-Ctr., TU Dresden (Germany); Jiachen Wu, Lab. for Measurement and Sensor System Technique, TU Dresden (Germany), Tsinghua Univ. (China); Ortrud Uckermann, Universitätsklinikum Carl Gustav Carus Dresden (Germany), Else-Kröner-Fresenius-Ctr., TU Dresden (Germany); Roberta Galli, TU Dresden (Germany); Ilker Eyüpoglu, Universitätsklinikum Carl Gustav Carus Dresden (Germany), Else-Kröner-Fresenius-Ctr., TU Dresden (Germany); Jürgen W. Czarske, Robert Kuschmierz, Lab. for Measurement and Sensor System Technique, TU Dresden (Germany), Else-Kröner-Fresenius-Ctr., TU Dresden (Germany)  
21 August 2023 • 10:45 AM - 11:15 AM | Conv. Ctr. Room 6C

12655-8

#### Nanoelectronic implementation of Equilibrium Propagation

Author(s): Marie Drouhin, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France), Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France); Clément Turck, Kamel-Eddine Harabi, Adrien Renaudineau, Thomas Bersani-Veroni, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); Elisa Vianello, CEA-LETI, Univ. Grenoble Alpes (France); Jean-Michel Portal, Institut Matériaux Microélectronique Nanosciences de Provence, Aix-Marseille Univ., CNRS (France); Julie Grollier, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France); Damien Querlioz, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France)  
20 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 6C

12655-9

#### Machine learning applications to ultrafast nonlinear dynamics in optical fibers (*Invited Paper*)

Author(s): Goëry Genty, Tampere Univ. (Finland)  
20 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 6C

12655-10

#### Some (crucial) differences between neural network concepts and physical hardware and resulting consequences (*Invited Paper*)

Author(s): Daniel Brunner, FEMTO-ST (France)  
20 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 6C

### ETAI NETWORKING

20 August 2023 • 5:30 PM - 5:55 PM | Conv. Ctr. Room 6C  
Join colleagues for informal networking before the  
Sunday Evening Plenary

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)  
20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)  
20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)  
20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12655

12655-14

### Artificial intelligence for synchrotron-radiation tomography *(Invited Paper)*

Author(s): Julian P. Moosmann, Helmholtz-Zentrum Hereon GmbH (Germany); Bashir Kazimi, Forschungszentrum Jülich GmbH (Germany); Philipp Heuser, Helmholtz Association (Germany); Frank Schlünzen, Ivo Baltruschat, Sahar Kakavand, Deutsches Elektronen-Synchrotron (Germany); Christian Lucas, Stefan Bruns, Berit Zeller-Plumhoff, Florian Wieland, Hanna Cwieka, Silja Flenner, Imke Greving, Jörg U. Hammel, Felix Beckmann, Helmholtz-Zentrum Hereon GmbH (Germany)

21 August 2023 • 11:15 AM - 11:45 AM | Conv. Ctr. Room 6C

12655-40

### Phenotype-preserving metric design for high-content image reconstruction by generative inpainting

Author(s): Vaibhav Sharma, Ctr. for Advanced Systems Understanding (Germany); Artur Yakimovich, CASUS Ctr. for Advanced Systems Understanding, Helmholtz-Zentrum Dresden-Rossendorf e. V., Helmholtz Association (Germany)

21 August 2023 • 11:45 AM - 12:00 PM | Conv. Ctr. Room 6C

Lunch Break 12:00 PM - 1:30 PM

#### SESSION 4: BIOMEDICAL APPLICATIONS II

21 August 2023 • 1:30 PM - 2:45 PM | Conv. Ctr. Room 6C  
Session Chair: Jürgen W. Czarske, TU Dresden (Germany)

12655-16

### Multimodal and Neuromorphic Approaches for Implantable Neural Interfaces *(Invited Paper)*

Author(s): Duygu Kuzum, Univ. of California, San Diego (United States)

21 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 6C

12655-17

### Objective assessment of medical image quality – does AI change our paradigm? *(Invited Paper)*

Author(s): Kyle J. Myers, Puente Solutions, LLC (United States)

21 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 6C

12655-18

### Using Monte Carlo simulated PPGs signals to train a deep learning model to predict hemoglobin levels

Author(s): Michael Alvarez, Emmanuel Arzuaga, Heidy Sierra, Univ. de Puerto Rico Mayagüez (United States)

21 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 6C

Coffee Break 2:45 PM - 3:15 PM

#### SESSION 5: BIOMEDICAL APPLICATIONS III

21 August 2023 • 3:15 PM - 4:30 PM | Conv. Ctr. Room 6C  
Session Chair: Giovanni Volpe, Göteborgs Univ. (Sweden)

12655-19

### Deep-learning enabled point-of-care sensor for Lyme disease diagnosis

Author(s): Hyou-Arm Joung, Rajesh Ghosh, Artem Goncharov, Barath Palanisamy, Kevin Ngo, Katarina Pejcinovic, Nicole Krockenberger, Univ. of California, Los Angeles (United States); Elizabeth J. Horn, Lyme Disease Biobank Foundation (United States); Raymond J. Dattwyler, Paul M. Arnaboldi, New York Medical College (United States); Omai B. Garner, Dino Di Carlo, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

21 August 2023 • 3:15 PM - 3:30 PM | Conv. Ctr. Room 6C

12655-20

### Virtual biomarkers - an emerging high throughput research tool *(Invited Paper)*

Author(s): Yair Rivenson, PictorLabs (United States)

21 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 6C

12655-21

### The two-way street between Artificial Intelligence and Medical Imaging *(Invited Paper)*

Author(s): Aaron Carass, Johns Hopkins Univ. (United States)

21 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 6C

#### POSTER POPS

21 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Exhibit Hall A

Join the poster presenters of the Emerging Topics in Artificial Intelligence conference for their two-minute oral presentation. Each poster author is invited to give a brief (two-minute) preview of their research with a maximum of two slides during this poster pop session. The posters will be available for viewing at the Poster Session immediately following the poster pops.

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12655-60

### Observing sequential aspects of metasurface with deep neural networks

Author(s): Jaebum Noh, Younghwan Yang, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A



TUESDAY 22 AUGUST 2023

12655-61

### Unveiling the complex dynamics of soft granular materials using deep learning

Author(s): Jesús D. Pineda Castro, Göteborgs Univ. (Sweden); Michal Bogdan, Institute of Physical Chemistry (Poland); Giovanni Volpe, Göteborgs Univ. (Sweden); Jan Guzowski, Institute of Physical Chemistry (Poland)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12655-63

### Assessment of nonlinear changes in functional brain connectivity during aging using deep learning

Author(s): Jiawei Sun, Blanca Zufiria Gerbolés, Daniel Vereb, Mite Mijalkov, Karolinska Institute (Sweden); Jesús D. Pineda Castro, Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12655-64

### Cell classification framework using U-Net: convolutional networks for cervix cell segmentation

Author(s): Tugce Ermis, Emre Sener, Meltem Elitas, Sabanci Univ. (Turkey)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12655-65

### Joint identification of functionally connected cortical-surface and deep-brain structures for TMS treatment

Author(s): Yuncong Ma, Hongming Li, Desmond J. Oathes, Yong Fan, Univ. of Pennsylvania (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12655-66

### Standard-dose PET image synthesis from low-dose images using a GAN-transformer

Author(s): Hang Zhao, Peter Young, Jesús D. Pineda, Göteborgs Univ. (Sweden); Anna Hitzel, Ctr. Hospitalier Univ. de Toulouse (France); Fiona Heeman, Amsterdam UMC (Netherlands), Vrije Univ. Amsterdam (Netherlands); Jan Axelsson, Umeå Univ. (Sweden); Lyduine E. Collij, Amsterdam UMC (Netherlands), Vrije Univ. Amsterdam (Netherlands); Amirhossein Sanaat, Hôpitalux Univ. Genève (Switzerland); Aida Niñerola Baizan, Ctr. Hospitalier Univ. de Toulouse (France); Andrés Perissinotti, Hospital Clínic de Barcelona (Spain); Mark Lubberink, Uppsala Univ. (Sweden); Giovanni Frisoni, Univ. de Genève (Switzerland); Habib Zaidi, Hôpitalux Univ. Genève (Switzerland); Frederik Barkhof, UCL Queen Square Institute of Neurology (United Kingdom); Gill Farrar, GE HealthCare (United Kingdom); Suzanne Baker, Helen Wills Neuroscience Institute, Univ. of California, Berkeley (United States); Juan Domingo Gispert, Barcelonabeta Brain Research Ctr., Pasqual Maragall Foundation (Spain); Valentina Garibotto, Hôpitalux Univ. Genève (Switzerland); Anna Rieckmann, Institut für Psychologie, Univ. der Bundeswehr München (Germany); Joana B. Pereira, Karolinska Institute (Sweden); Giovanni Volpe, Michael Schöll, Göteborgs Univ. (Sweden)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12655-67

### Exploring age-related changes in anatomical brain connectivity using deep learning analysis in cognitively healthy individuals

Author(s): Blanca Zufiria Gerbolés, Karolinska Institute (Sweden); Jesús D. Pineda Castro, Göteborgs Univ. (Sweden); Daniel Vereb, Jiawei Sun, Mite Mijalkov, Karolinska Institute (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

#### SESSION 6: BRAIN IMAGING

22 August 2023 • 8:45 AM - 10:30 AM | Conv. Ctr. Room 6C  
Session Chair: Joana B. Pereira, Karolinska Institute (Sweden)

12655-22

### Cascaded convolutional networks for unsupervised brain tissue segmentation and bias field estimation

Author(s): Hongming Li, Yong Fan, Univ. of Pennsylvania (United States)

22 August 2023 • 8:45 AM - 9:00 AM | Conv. Ctr. Room 6C

12655-23

### Leveraging large-scale Granger causality and neural networks to measure the level of consciousness in DoC patients

Author(s): Ali Vosoughi, Univ. of Rochester (United States); Theresa Raiser, Tina Luther, Lina Willacker, Ludwig-Maximilians-Univ. München (Germany); Martin Rosenfelder, Univ. Ulm (Germany); Akhil Kasturi, Univ. of Rochester (United States); Jacobo Diego Sitt, Sorbonne Université, Institut du Cerveau (France); Dragana Manasova, Sorbonne Université (France); Angela Comanducci, IRCCS Fondazione Don Carlo (Italy); Andreas Bender, Ludwig-Maximilians-Univ. München (Germany); Axel Wismüller, Univ. of Rochester Medical Ctr. (United States)

22 August 2023 • 9:00 AM - 9:15 AM | Conv. Ctr. Room 6C

12655-24

### Uncovering vulnerable connections in the aging brain using reservoir computing

Author(s): Mite Mijalkov, Blanca Zufiria Gerbolés, Daniel Vereb, Karolinska Institute (Sweden); Kathy Lüdge, Institute of Physics, Technische Univ. Ilmenau (Germany); Daniel Brunner, FEMTO-ST, Univ. de Franche-Comté (France); Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden)

22 August 2023 • 9:15 AM - 9:30 AM | Conv. Ctr. Room 6C

12655-26

### Detecting landmarks in anatomical medical images using transformer-based networks

Author(s): Akhil Kasturi, Ali Vosoughi, Nathan Hadjijski, Univ. of Rochester (United States); Larry Stockmaster, Univ. of Rochester Medical Ctr. (United States); William J. Sehnert, Carestream Health, Inc. (United States); Axel Wismüller, Univ. of Rochester Medical Ctr. (United States)

22 August 2023 • 9:30 AM - 9:45 AM | Conv. Ctr. Room 6C

12655-27

### Multi-level subspace analysis with applications to neuroimaging (*Invited Paper*)

Author(s): Rogers F. Silva, Ctr. for Translational Research in Neuroimaging and Data Science (United States)

22 August 2023 • 9:45 AM - 10:15 AM | Conv. Ctr. Room 6C

12655-28

### Synthesizing tau pathology from structural brain imaging using deep learning

Author(s): Yu-Wei Chang, Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden)

22 August 2023 • 10:15 AM - 10:30 AM | Conv. Ctr. Room 6C

Coffee Break 10:30 AM - 11:00 AM

# TECHNICAL CONFERENCES

## Conference 12655

### SESSION 7: PANEL DISCUSSION: NEUROMORPHIC COMPUTING AND BRAIN IMAGING

22 August 2023 • 11:00 AM - 12:30 PM | Conv. Ctr. Room 6C

#### PANEL MODERATORS:

Joana B. Pereira, Karolinska Institute (Sweden); Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

#### PANELISTS:

Kyle J. Myers, U.S. Food and Drug Administration (United States)

Yair Rivenson, Pictor Labs, Inc. (United States)

Rogers F. Silva, Ctr. for Translational Research in Neuroimaging and Data Science (United States)

Fei Xia, Ecole Normale Supérieure (France), Sorbonne Univ. (France)

Bruno Romeira, INL - International Iberian Nanotechnology Lab. (Portugal)

Jingxi Li, UCLA Samueli School of Engineering (United States)

Starting with the Nobel-winning studies of Spanish neuroscientist Ramón y Cajal, optical microscopy, brain connectivity, and artificial neural networks (ANNs) have always been closely intertwined. With the emergent surge of photonic ANNs, this triad's synergy has been further cemented. The panel discussion will explore the challenges and insights that could enhance our understanding of these fields, aiming to spotlight unexploited opportunities and predict key future challenges.

Open to all SPIE Optics + Photonics 2023 paid conference attendees.

Lunch/Exhibition Break 12:30 PM - 2:30 PM

### SESSION 8

#### Joint Session with Conferences 12649 and 12655

22 August 2023 • 2:30 PM - 5:45 PM | Conv. Ctr. Room 6D

Session Chairs: Giovanni Volpe, Göteborgs Univ. (Sweden), Gabriel C. Spalding, Illinois Wesleyan Univ. (United States)

12655-29

#### Accelerating optical tweezers simulations with auto-encoders *(Invited Paper)*

Author(s): Isaac C. D. Lenton, Institute of Science and Technology Austria (Austria); Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia); Scott R. Waitukaitis, Institute of Science and Technology Austria (Austria)

22 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 6D

12649-45

#### 3D cell rotation in multicore fiber-based optical diffraction tomography with isotropic resolution using deep learning

Author(s): Jiawei Sun, Nektarios Koukourakis, Juergen W. Czarske, TU Dresden (Germany)

22 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 6D

Coffee Break 3:15 PM - 3:45 PM

12655-30

#### Optical diffraction tomography based on AI-driven adaptive optical cell-rotation *(Invited Paper)*

Author(s): Nektarios Koukourakis, Jiawei Sun, Jürgen W. Czarske, TU Dresden (Germany)

22 August 2023 • 3:45 PM - 4:15 PM | Conv. Ctr. Room 6D

12655-31

#### Faster and more accurate geometrical-optics optical force calculation using neural networks

Author(s): Agnese Callegari, Göteborgs Univ. (Sweden); David Bronte Ciriza, Alessandro Magazzù, Istituto per i Processi Chimico Fisici (Italy); Gunther D. Barbosa, Antonio A. R. Neves, Univ. Federal do ABC (Brazil); Maria Antonia Iati, Istituto per i Processi Chimico Fisici (Italy); Giovanni Volpe, Göteborgs Univ. (Sweden); Onofrio M. Maragò, Istituto per i Processi Chimico Fisici (Italy)

22 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 6D

12655-32

#### Self-folding kirigami at the microscale *(Invited Paper)*

Author(s): Nuno Araujo, Univ. de Lisboa (Portugal)

22 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 6D

12649-46

#### Inverse design of plasmonic nanotweezers by topology optimization

Author(s): Damian Nelson, Sejeong Kim, The Univ. of Melbourne (Australia); Kenneth B. Crozier, The Univ. of Melbourne (Australia), Australian Research Council (Australia)

22 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 6D

12655-33

#### Rotation-assisted optical trapping for deep learning-based single-cell imaging and classification

Author(s): Yaoran Liu, Rohit Unni, Yuebing Zheng, The Univ. of Texas at Austin (United States)

22 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 6D

12655-34

#### Experimental realization of supervised learning in a swarm of autonomous robots

Author(s): Laura Natali, Giovanni Volpe, Göteborgs Univ. (Sweden); Joakim Stenhammar, Jason Lewis, Lund Univ. (Sweden); Vide Ramsten, Lars Bengtsson, Göteborgs Univ. (Sweden)

22 August 2023 • 5:30 PM - 5:45 PM | Conv. Ctr. Room 6D

## WEDNESDAY 23 AUGUST 2023

### SESSION 9: MICROSCOPY AND PHOTONICS WITH AI I

23 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 6C

Session Chair: Joana B. Pereira, Karolinska Institute (Sweden)

12655-35

#### Chromatic aberration correction using reinforcement learning

Author(s): Katharina Schmidt, Ning Guo, Wenjie Wang, Juergen W. Czarske, Nektarios Koukourakis, TU Dresden (Germany)

23 August 2023 • 8:00 AM - 8:15 AM | Conv. Ctr. Room 6C

12655-36

#### Deep learning for nanofluidic scattering microscopy

Author(s): Henrik Klein Moberg, Bohdan Yeroshenko, Chalmers Univ. of Technology (Sweden); Daniel Midtvedt, Göteborgs Univ. (Sweden); Joachim Fritzsche, Chalmers Univ. of Technology (Sweden); Barbora Špacková, Institute of Physics of the CAS, v.v.i. (Czech Republic); David Albinsson, Envue Technologies (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden); Christoph Langhammer, Chalmers Univ. of Technology (Sweden)

23 August 2023 • 8:15 AM - 8:30 AM | Conv. Ctr. Room 6C

12655-37

### Deep learning-designed unidirectional imagers

Author(s): Jingxi Li, Tianyi Gan, Yifan Zhao, Bijie Bai, Che-Yung Shen, Songyu Sun, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

23 August 2023 • 8:30 AM - 8:45 AM | Conv. Ctr. Room 6C

12655-38

### Decoding microplankton life through holographic microscopy and deep learning

Author(s): Harshith Bachimanchi, Benjamin Midtvedt, Daniel Midtvedt, Erik Selander, Giovanni Volpe, Göteborgs Univ. (Sweden)

23 August 2023 • 8:45 AM - 9:00 AM | Conv. Ctr. Room 6C

12655-39

### Investigation on attention-based convolutional architectures applied to optical proximity corrections

Author(s): Albert Lin, Han-Chun Tung, Yen-Wei Feng, Peichen Yu, National Yang Ming Chiao Tung Univ. (Taiwan)

23 August 2023 • 9:00 AM - 9:15 AM | Conv. Ctr. Room 6C

12655-41

### Exploring spatiotemporal dynamics in living cells through a data-driven approach (*Invited Paper*)

Author(s): Carlo Manzo, Univ. de Vic (Spain)

23 August 2023 • 9:15 AM - 9:45 AM | Conv. Ctr. Room 6C

12655-42

### All-optical Computation of a large group of linear transformations using a broadband diffractive optical network

Author(s): Jingxi Li, Tianyi Gan, Bijie Bai, Yi Luo, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

23 August 2023 • 9:45 AM - 10:00 AM | Conv. Ctr. Room 6C

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 10: MICROSCOPY AND PHOTONICS WITH AI II

23 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 6C

Session Chair: Joana B. Pereira, Karolinska Institute (Sweden)

12655-43

### Single-shot self-supervised object detection in microscopy

Author(s): Benjamin Midtvedt, Jesús D. Pineda, Fredrik Skärberg, Göteborgs Univ. (Sweden); Erik Olsén, Chalmers Univ. of Technology (Sweden); Harshith Bachimanchi, Göteborgs Univ. (Sweden); Emelie V. Wesén, Elin K. Esbjörner, Chalmers Univ. of Technology (Sweden); Erik Selander, Daniel Midtvedt, Giovanni Volpe, Göteborgs Univ. (Sweden)

23 August 2023 • 10:30 AM - 10:45 AM | Conv. Ctr. Room 6C

12655-44

### Reference-less phase retrieval of multimode fibers using a deep neural network

Author(s): Qian Zhang, Yuan Sui, Dennis Pohle, Nektarios Koukourakis, Jürgen W. Czarske, Stefan Rothe, TU Dresden (Germany)

23 August 2023 • 10:45 AM - 11:00 AM | Conv. Ctr. Room 6C

12655-45

### Time-lapse image classification using a diffractive optical network

Author(s): Md Sadman Sakib Rahman, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

23 August 2023 • 11:00 AM - 11:15 AM | Conv. Ctr. Room 6C

12655-46

### Deep learning enabled control of active metasurface antenna

Author(s): Jaebum Noh, Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

23 August 2023 • 11:15 AM - 11:30 AM | Conv. Ctr. Room 6C

12655-47

### All-optical quantitative phase imaging through random diffusers using a diffractive network

Author(s): Yuhang Li, Yi Luo, Deniz Mengü, Bijie Bai, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

23 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 6C

12655-49

### Data class-specific all-optical transformations using diffractive computing

Author(s): Bijie Bai, Univ. of California, Los Angeles (United States); Heming Wei, Shanghai Univ. (China); Xilin Yang, Tianyi Gan, Deniz Mengü, Mona Jarrahi, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

23 August 2023 • 11:45 AM - 12:00 PM | Conv. Ctr. Room 6C

12655-68

### In-line digital holography with deep learning investigation of *Moina macroscopa* morphology and population dynamic

Author(s): Bunyarit Voochaiyaphum, Setthanun Thongsuwan, King Mongkut's Institute of Technology Ladkrabang (Thailand); Suwan Plaipichit, Srinakharinwirot Univ. (Thailand); Pachara Thonglim, Chulabhorn Royal Academy (Thailand); Chinnapat Ruttanasirawit, Prathan Buranasiri, King Mongkut's Institute of Technology Ladkrabang (Thailand)

23 August 2023 • 12:00 PM - 12:15 PM | Conv. Ctr. Room 6C

12655-48

### Predicting photonic resonances in disordered arrangements of dielectric scatterers using a deep neural network

Author(s): Sebastian W. Schmitt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Klaus Schwarzburg, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Kevin M. Roccapiore, Rama K. Vasudevan, Oak Ridge National Lab. (United States); Dennis Arslan, Friedrich-Schiller-Universität Jena (Germany); Falk X. Eilenberger, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

23 August 2023 • 12:15 PM - 12:30 PM | Conv. Ctr. Room 6C

Lunch/Exhibition Break 12:30 PM - 2:00 PM

# TECHNICAL CONFERENCES

## Conference 12655

### SESSION 11: AI AND NANOPHOTONIC MACHINES

#### Joint Session with Conferences 12655 and 12663

23 August 2023 • 2:00 PM - 5:15 PM | Conv. Ctr. Room 8

Session Chairs: Giovanni Volpe, Göteborgs Univ. (Sweden), Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

12655-50

#### Machine learning meets photonics (*Invited Paper*)

Author(s): Francesco Da Ros, DTU Fotonik (Denmark)

23 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 8

12655-51

#### MAGIK: Microscopic motion analysis through graph inductive knowledge

Author(s): Jesús D. Pineda Castro, Benjamin Midtvedt, Harshith Bachimanchi, Göteborgs Univ. (Sweden); Sergio Noé, Univ. de Vic - Univ. Central de Catalunya (Spain); Daniel Midtvedt, Giovanni Volpe, Göteborgs Univ. (Sweden); Carlo Manzo, Univ. de Vic - Univ. Central de Catalunya (Spain)

23 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 8

12663-18

#### Applications of optically generated forces to study cellular interactions and signaling (*Invited Paper*)

Author(s): Daryl C. Preece, Pegah Pouladian, Nicole Wakida, Beckman Laser Institute and Medical Clinic (United States); Veronica Gomez, Univ. of California, San Diego (United States)

23 August 2023 • 2:45 PM - 3:15 PM | Conv. Ctr. Room 8

12655-52

#### ASPIC with Sagnac mirror loop for solving PDE

Author(s): Chen Shen, Nicola Peserico, Volker J. Sorger, The George Washington Univ. (United States)

23 August 2023 • 3:15 PM - 3:30 PM | Conv. Ctr. Room 8

#### Coffee Break 3:30 PM - 4:00 PM

12663-19

#### Collective interaction of anisotropic light-propelled micro-machines

Author(s): Matthias Rüschenbaum, Elena Vinnemeier, Jörg Imbrock, Julian Jeggler, Raphael Wittkowski, Westfälische Wilhelms-Univ. Münster (Germany); Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany), Westfälische Wilhelms-Univ. Münster (Germany)

23 August 2023 • 4:00 PM - 4:15 PM | Conv. Ctr. Room 8

12655-53

#### Deep learning-enabled fluorescent point-of-care sensor for multiplexed quantification of biomarkers from serum

Author(s): Artem Goncharov, Hyou-Arm Joung, Rajesh Ghosh, Gyeo-Re Han, Zachary S. Ballard, Quinn Maloney, Alexandra Bell, Chew Tin Zar Aung, Omai B. Garner, Dino Di Carlo, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

23 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 8

12663-20

#### TPL-fabricated responsive hydrogel-based micro photonic structures for visible vapor sensing

Author(s): Jing Qian, Srikanth Kolagatla, Aleksejus Pacalova, Xia Zhang, Larisa Florea, Colm Delaney, A. Louise Bradley, Trinity College Dublin (Ireland)

23 August 2023 • 4:30 PM - 4:45 PM | Conv. Ctr. Room 8

12663-17

#### Shapeshifting diffractive optical elements for on-demand optical functionality (*Invited Paper*)

Author(s): Antonio Ambrosio, Istituto Italiano di Tecnologia (Italy)

23 August 2023 • 4:45 PM - 5:15 PM | Conv. Ctr. Room 8

### DEEP LEARNING FOR MICROSCOPY AND BRAIN CONNECTIVITY DEMONSTRATIONS

23 August 2023 • 5:15 PM - 6:30 PM | Conv. Ctr. Room 6C

This event showcases the latest advancements in deep learning for microscopy and brain connectivity. Leading experts in the field will present live demonstrations, highlighting the cutting-edge techniques used in image analysis, cell classification, and brain mapping. Explore the transformative applications of artificial intelligence in these domains and gain valuable insights into the future of deep learning.

## THURSDAY 24 AUGUST 2023

### SESSION 12: PHYSICS-INFORMED AND INTERPRETABLE AI I

24 August 2023 • 8:30 AM - 10:00 AM | Conv. Ctr. Room 6C

Session Chair: Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

12655-54

#### Physics-inspired computer vision algorithms for autonomous driving, security, and medical applications (*Invited Paper*)

Author(s): Bahram Jalali, UCLA Samueli School of Engineering (United States)

24 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 6C

12655-55

#### nEGXAI: a negation-based explainable AI through feature learning in Fourier domain

Author(s): Shan Suthaharan, The Univ. of North Carolina at Greensboro (United States)

24 August 2023 • 9:00 AM - 9:15 AM | Conv. Ctr. Room 6C

12655-56

#### Physics-aware-trained diffractive deep neural networks

Author(s): Kohei Yamamoto, Hiroyuki Yanagisawa, Sony Semiconductor Solutions Corp. (Japan)

24 August 2023 • 9:15 AM - 9:30 AM | Conv. Ctr. Room 6C

12655-57

#### Meta-atom design enabled by the synergy of machine learning and Mie-resonance theory (*Invited Paper*)

Author(s): Natalia M. Litchinitser, Wenhao Li, Hooman Barati Sedeh, Willie J. Padilla, Duke Univ. (United States); Jordan Malof, The Univ. of Montana (United States)

24 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 6C

#### Coffee Break 10:00 AM - 10:30 AM

### SESSION 13: PHYSICS-INFORMED AND INTERPRETABLE AI II

24 August 2023 • 10:30 AM - 11:30 AM | Conv. Ctr. Room 6C  
Session Chair: Daniel Brunner, Institut Franche-Comte Electronique  
Mecanique Thermique et Optique (France)

12655-58

#### **Analog photonic neural networks for large-scale AI at the quantum limit** (*Invited Paper*)

Author(s): Logan G. Wright, Yale Univ. (United States), NTT Research, Inc. (United States), Cornell Univ. (United States); Peter L. McMahon, Tatsuhiro Onodera, Tianyu Wang, Cornell Univ. (United States)

24 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 6C

12655-59

#### **Physics-informed machine learning for computational imaging: From lensless cameras to low light videography** (*Invited Paper*)

Author(s): Kristina Monakhova, Massachusetts Institute of Technology (United States)

24 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 6C

### SESSION 14: BIOMEDICAL APPLICATIONS IV

24 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 6C  
Session Chair: Giovanni Volpe, Göteborgs Univ. (Sweden)

12655-15

#### **AI research in medical imaging of cancer, brain injuries, and COVID-19** (*Invited Paper*)

Author(s): Maryellen L. Giger, The Univ. of Chicago (United States)

24 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 6C

### ETAI CONFERENCE AWARDS

24 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 6C  
Presentation of awards for early career researchers.

# TECHNICAL CONFERENCES

## Conference 12656

### Spintronics XVI

20 - 24 August 2023 | Conv. Ctr. Rooms 5A & 5B

Conference Chairs: **Jean-Eric Wegrowe**, Ecole Polytechnique (France); **Joseph S. Friedman**, The Univ. of Texas at Dallas (United States); **Manijeh Razeghi**, Northwestern Univ. (United States)

Conference Co-Chair: **Henri Jaffrès**, Unité Mixte de Physique CNRS/Thales (France)

Program Committee: **Jayasimha Atulasimha**, Virginia Commonwealth Univ. (United States); **Claire Baraduc**, SPINTEC, CEA-Grenoble (France); **Franco Ciccacci**, Politecnico di Milano (Italy); **Vincent Cros**, Unité Mixte de Physique CNRS/Thales (France); **Henri-Jean M. Drouhin**, Lab. des Solides Irradiés, Ecole Polytechnique (France); **Michel I. Dyakonov**, Univ. Montpellier 2 (France); **Michael E. Flatté**, The Univ. of Iowa (United States); **Pietro Gambardella**, ETH Zurich (Switzerland); **Jean-Marie George**, Unité Mixte de Physique CNRS/Thales (France); **Nils C. Gerhardt**, Ruhr-Univ. Bochum (Germany); **Julie Grollier**, Unité Mixte de Physique CNRS/Thales (France); **Erez Hasman**, Technion-Israel Institute of Technology (Israel); **Pedram Khalili**, Northwestern Univ. (United States); **Giti A. Khodaparast**, Virginia Polytechnic Institute and State Univ. (United States); **Mathias Klaui**, Univ. Konstanz (Germany); **Denis Kochan**, Univ. Regensburg (Germany); **Daniel Lacour**, Institut Jean Lamour (France); **Connie H. Li**, U.S. Naval Research Lab. (United States); **Aurélien ManchoN**, King Abdullah Univ. of Science and Technology (Saudi Arabia); **Xavier Marie**, INSA - Univ. of Toulouse (France); **Hans T. Nembach**, National Institute of Standards and Technology (United States); **Yoshichika Otani**, The Univ. of Tokyo (Japan); **Vlad Pribiag**, Univ. of Minnesota, Twin Cities (United States); **Dafiné Ravelosona**, Institut d'Électronique Fondamentale (France); **Nicolas Rougemaille**, Institut NÉEL (France); **Georg Schmidt**, Martin-Luther-Univ. Halle-Wittenberg (Germany); **Jing Shi**, Univ. of California, Riverside (United States); **Vasily V. Temnov**, Univ. du Maine (France); **Luc Thomas**, Applied Materials, Inc. (United States); **Olaf M. J. van 't Erve**, U.S. Naval Research Lab. (United States); **Joerg Wunderlich**, Univ. Regensburg (Germany); **Igor Zutic**, Univ. at Buffalo (United States)

### SUNDAY 20 AUGUST 2023

#### SESSIONS 1-4 RUN CONCURRENTLY WITH SESSIONS 5-7

#### SESSION 1: SPIN PHOTONICS

20 August 2023 • 9:00 AM - 10:00 AM | Conv. Ctr. Room 5A

Session Chair: Rudolf Bratschitsch,  
Westfälische Wilhelms-Univ. Münster (Germany)

12656-3

#### Efficient orientation of electron spin and nonlinear spin response at room temperature via defect spin filtering (Invited Paper)

Author(s): Yuqing Huang, Institute of Semiconductors, Chinese Academy of Sciences (China); Irina Buyanova, Weimin Chen, Linköping Univ. (Sweden)

20 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 5A

12656-2

#### On-chip spin-decoupling of VCSELs with metasurfaces (Invited Paper)

Author(s): Patrice Genevet, Colorado School of Mines (France)

20 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 5A

Coffee Break 10:00 AM - 10:30 AM

### SESSIONS 1-4 RUN CONCURRENTLY WITH SESSIONS 5-7

#### SESSION 2: IMAGING AND MAGNON-PHOTON COUPLING

20 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 5A  
Session Chair: Patrice Genevet, CRHEA (France)

12656-5

#### **Polarimetric coherent diffractive imaging of magnetic domains** *(Invited Paper)*

Author(s): Edwin Fohntung, Rensselaer Polytechnic Institute (United States)

20 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5A

12656-6

#### **Broadband high-performance Faraday rotation spectroscopy of 2D materials and thin magnetic films** *(Invited Paper)*

Author(s): Rudolf Bratschitsch, Westfälische Wilhelms-Univ. Münster (Germany)

20 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5A

12656-7

#### **Control of magnon-photon coupling by spin torque** *(Invited Paper)*

Author(s): Anish Rai, Benjamin Jungfleisch, Univ. of Delaware (United States)

20 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5A

12656-8

#### **Resonant phonon-magnon interactions in freestanding metal-ferromagnet multilayers acting as acoustic cavities** *(Invited Paper)*

Author(s): Antonia Ghita, Tudor-Gabriel Mocioi, Urban Vernik, Ecole Polytechnique (France); Alexey M. Lomonosov, Hochschule Offenburg (Germany); Jiwan Kim, Kunsan National Univ. (Republic of Korea); Paolo Vavassori, CIC nanoGUNE (Spain); Vasily V. Temnov, Ecole Polytechnique (France)

20 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 5A

**Lunch Break 12:30 PM - 2:00 PM**

#### SESSION 5: 2D AND VAN DER WAALS I

20 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 5B  
Session Chair: Joseph S. Friedman,  
The Univ. of Texas at Dallas (United States)

12656-16

#### **Epitaxial 2D Magnets** *(Invited Paper)*

Author(s): Roland K. Kawakami, The Ohio State Univ. (United States)

20 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5B

12656-17

#### **Terahertz spin resonance of proximitized Dirac electrons** *(Invited Paper)*

Author(s): Konstantin Denisov, Ioffe Institute (Russian Federation), Univ. at Buffalo, The State Univ. of New York (United States); Igor Rozhansky, The Univ. of Manchester (United Kingdom), Ecole Polytechnique (France); Sergio Valenzuela, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain); Igor Zutic, Univ. at Buffalo, The State Univ. of New York (United States)

20 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5B

12656-18

#### **Asymmetric terahertz emission in chiral two-dimensional metal halide perovskites** *(Invited Paper)*

Author(s): Yifan Dong, Matthew Hautzinger, Md Azimul Haque, National Renewable Energy Lab. (United States); Andrew Comstock, Aeron McConnell, Dali Sun, North Carolina State Univ. (United States); Matthew C. Beard, National Renewable Energy Lab. (United States)

20 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5B

**Lunch Break 12:00 PM - 1:30 PM**

# TECHNICAL CONFERENCES

## Conference 12656

SESSIONS 1-4 RUN CONCURRENTLY WITH SESSIONS 5-7

### SESSION 3: QUANTUM SENSING AND DEVICES

20 August 2023 • 2:00 PM - 3:30 PM | Conv. Ctr. Room 5A  
Session Chair: Yunqiu Kelly Luo, Cornell Univ. (United States)

12656-9

#### **High-sensitivity Sagnac optical interferometry for advanced spin-orbit torque metrology** (*Invited Paper*)

Author(s): Yunqiu Kelly Luo, The Univ. of Southern California (United States)

20 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5A

12656-10

#### **Sensing with quantum hybrid systems** (*Invited Paper*)

Author(s): Hans Huebl, Walther-Meissner-Institute (Germany)

20 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5A

12656-11

#### **Driven non-local quantum gates in spin-based double-quantum-dot qubits** (*Invited Paper*)

Author(s): Stephen McMillan, Guido Burkard, Univ. Konstanz (Germany)

20 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 5A

Coffee Break 3:30 PM - 4:00 PM

### SESSION 6: SPINTRONIC LOGICAL COMPUTING

20 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 5B  
Session Chair: Flavio Abreu Araujo,  
Univ. Catholique de Louvain (Belgium)

12656-19

#### **In-sensor processing with temporal encoding** (*Invited Paper*)

Author(s): Mircea R. Stan, Mohammad Nazmus Sakib, Univ. of Virginia (United States)

20 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5B

12656-20

#### **Manipulating excitations in magnetic oxides for memory and logic** (*Invited Paper*)

Author(s): Lucas Caretta, Brown Univ. (United States); Ramamoorthy Ramesh, Univ. of California, Berkeley (United States); Caroline Ross, Geoffrey S. D. Beach, Massachusetts Institute of Technology (United States)

20 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5B

12656-21

#### **Reliable pipelined domain wall processors using voltage controlled magnetic anisotropy** (*Invited Paper*)

Author(s): Tianyao P. Xiao, Sandia National Labs. (United States); Nicholas Zogbi, Samuel Liu, The Univ. of Texas at Austin (United States); Christopher H. Bennett, Sapan Agarwal, Sandia National Labs. (United States); Matthew J. Marinella, Arizona State Univ. (United States); Jean Anne C. Incorvia, The Univ. of Texas at Austin (United States)

20 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5B

Coffee Break 3:00 PM - 3:30 PM



### SESSIONS 1-4 RUN CONCURRENTLY WITH SESSIONS 5-7

#### SESSION 4: SKYRMION SPIN TEXTURES

20 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 5A  
Session Chair: Masashi Shiraishi, Kyoto Univ. (Japan)

12656-12

#### **Magneto-ionic control of spin textures and interfaces** *(Invited Paper)*

Author(s): Kai Liu, Georgetown Univ. (United States)  
20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5A

12656-13

#### **Soft x-ray vector ptycho-tomography: a new quantitative vector nanoimaging method for spin textures in 3D** *(Invited Paper)*

Author(s): Chen-Ting Liao, Sinéad Ryan, Charles Bevis, Robert Karl, Univ. of Colorado Boulder (United States); Young-Sang Yu, Hendrik Ohldag, David Shapiro, Lawrence Berkeley National Laboratory (United States); Sadegh Yazdi, Univ. of Colorado Boulder (United States); Thomas Mallouk, Penn State University (United States); Stanley J. Osher, University of California (United States); Henry Kapteyn, Univ. of Colorado Boulder (United States); Vincent Crespi, Penn State University (United States); Yaroslav Tserkovnyak, University of California (United States); Margaret M. Murnane, Univ. of Colorado Boulder (United States); Jianwei Miao, University of California (United States)  
20 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5A

12656-14

#### **Novel methods of characterizing topological spin textures with neutron probes** *(Invited Paper)*

Author(s): Dusan Sarenac, Univ. of Waterloo (Canada); Wangchun Chen, Charles W. Clark, National Institute of Standards and Technology (United States); David G. Cory, Connor Kapahi, Univ. of Waterloo (Canada); Benjamin Heacock, Northrop Grumman Corp. (United States); Melissa Henderson, Univ. of Waterloo (Canada); Michael Huber, National Institute of Standards and Technology (United States); Lisa DeBeer-Schmitt, Oak Ridge National Lab. (United States); Kirill Zhernenkov, Dmitry Pushin, Univ. of Waterloo (Canada)  
20 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 5A

#### SESSION 7: 2D AND VAN DER WAALS II

20 August 2023 • 3:30 PM - 5:00 PM | Conv. Ctr. Room 5B  
Session Chair: Roland K. Kawakami,  
The Ohio State Univ. (United States)

12656-22

#### **Control of skyrmion lattice order in the van der Waals ferromagnet Fe<sub>3</sub>GeTe<sub>2</sub>** *(Invited Paper)*

Author(s): Charudatta Phatak, Argonne National Lab. (United States)  
20 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 5B

12656-23

#### **Spin-orbit torque and spin pumping in van der Waals heterostructures of magnetic two-dimensional materials** *(Invited Paper)*

Author(s): Branislav Nikolic, Univ. of Delaware (United States)  
20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5B

12656-24

#### **Exploiting symmetry breaking and moire potentials for van der Waals magnet-based noncollinear spintronics** *(Invited Paper)*

Author(s): Pramey Upadhyaya, Purdue Univ. (United States)  
20 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5B

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### **Welcome and Opening Remarks**

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### **A perovskite paved pathway to multi-terawatt scale photovoltaics** *(Plenary Presentation)*

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)  
20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### **Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems** *(Plenary Presentation)*

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)  
20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### **Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs** *(Plenary Presentation)*

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)  
20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12656

MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### Welcome and Opening Remarks

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### Nanophotonics for energy applications (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### From atoms to black holes: with nano-engineering to next-level precision experiments (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

Coffee Break 9:55 AM - 10:30 AM

### SESSIONS 8-10 RUN CONCURRENTLY WITH SESSIONS 11-13

#### SESSION 8: THERMAL SPINTRONICS

21 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 5A

Session Chair: Georg Schmidt, Martin-Luther-Univ. Halle-Wittenberg (Germany)

12656-25

#### Magnon drag and non-electronic thermal conductivity in ferromagnetic metals with low damping (*Invited Paper*)

Author(s): Barry L. Zink, Univ. of Denver (United States)

21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5A

12656-26

#### A topological spin engine operating at the Landauer limit (*Invited Paper*)

Author(s): Inanc Adagideli, Sabanci Univ. (Turkey)

21 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5A

12656-27

#### Large magnon spin Nernst effect induced by phonon-mediated magnon-magnon interaction in a two-dimensional antiferromagnetic material (*Invited Paper*)

Author(s): Duy-Quang To, Joshua M. O. Zide, Matthew F. Doty, Univ. of Delaware (United States)

21 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5A

12656-102

#### Spin and orbital angular momenta of electromagnetic waves in classical and quantum electrodynamics (*Invited Paper*)

Author(s): Masud Mansuripur, Wyant College of Optical Sciences (United States)

21 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 5A

Lunch Break 12:30 PM - 1:30 PM

#### SESSION 11: MULTI-TERMINAL AND ANOMALOUS JOSEPHSON JUNCTIONS

21 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 5B

Session Chair: Baris Pekerten, Univ. at Buffalo (United States)

12656-37

#### Josephson tunnel junction arrays and Andreev weak links: what's the difference? (*Invited Paper*)

Author(s): A. Mert Bozkurt, QuTech (Netherlands); Valla Fatemi, Cornell Univ. (United States)

21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5B

12656-36

#### O,1,...,N: Exploring superconductor-semiconductor hybrids by adding Josephson junctions (*Invited Paper*)

Author(s): Andrew Higginbotham, Institute of Science and Technology Austria (Austria)

21 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5B

12656-35

#### Theory of complex topological states in multi-terminal superconducting structures (*Invited Paper*)

Author(s): Wolfgang Belzig, Univ. Konstanz (Germany)

21 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5B

Lunch Break 12:00 PM - 1:30 PM

### SESSIONS 8-10 RUN CONCURRENTLY WITH SESSIONS 11-13

#### SESSION 9: ULTRAFAST AND THZ SPINTRONIC

21 August 2023 • 1:30 PM - 3:30 PM | Conv. Ctr. Room 5A  
Session Chair: Barry L. Zink, Univ. of Denver (United States)

12656-28

##### **Charge dynamics in spintronic THz emitters** (*Invited Paper*)

Author(s): Georg Schmidt, Martin-Luther-Univ. Halle-Wittenberg (Germany)

21 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5A

12656-29

##### **Emergence in far-from-equilibrium ultrafast dynamics via the non-perturbative Boltzmann equation** (*Invited Paper*)

Author(s): Marco Battiato, Nanyang Technological Univ. (Singapore)

21 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5A

12656-30

##### **Investigating magnetism for spintronics** (*Invited Paper*)

Author(s): Mikel Holcomb, West Virginia Univ. (United States)

21 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5A

12656-31

##### **In-plane reorientation induced single laser pulse magnetization reversal in rare-earth-based multilayer** (*Invited Paper*)

Author(s): Yi Peng, Institut Jean Lamour (France); David Salomoni, Spintec, Grenoble INP, Univ. Grenoble Alpes, CEA, CNRS (France); Gregory Malinowski, Institut Jean Lamour (France); Wei Zhang, Institut Jean Lamour (France), Hefei Innovation Research Institute (China); Julius Hohlfeld, Institut Jean Lamour (France); Liliana Buda-Prejbeanu, Spintec, CEA, CNRS (France); Jon Gorchon, Jun-xiao Lin, Daniel Lacour, Institut Jean Lamour (France); Ricardo Sousa, Ioan-Lucian Prejbeanu, Spintec, CEA, CNRS (France); Stéphane Mangin, Michel Hehn, Institut Jean Lamour (France)

21 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 5A

**Coffee Break 3:30 PM - 4:00 PM**

#### SESSION 12: NEUROMORPHIC COMPUTING I

21 August 2023 • 1:30 PM - 3:30 PM | Conv. Ctr. Room 5B  
Session Chair: Mircea R. Stan, Univ. of Virginia (United States)

12656-38

##### **Spintronics-based neuromorphic computing or how to do more with less!** (*Invited Paper*)

Author(s): Flavio Abreu Araujo, Simon de Wergifosse, Chloé Chopin, Anatole Moureaux, Univ. Catholique de Louvain (Belgium)

21 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5B

12656-39

##### **3D magnetic nanowire networks for neuromorphic computing** (*Invited Paper*)

Author(s): Dhritiman Bhattacharya, Zhijie Chen, Erin Marlowe, Christopher Jensen, James Malloy, Georgetown Univ. (United States); Chen Liu, King Abdullah Univ. of Science and Technology (Saudi Arabia); Thomas Hulse, Univ. of Louisville (United States); Edward Burks, Univ. of California, Davis (United States); Xixiang Zhang, King Abdullah Univ. of Science and Technology (Saudi Arabia); Dustin Gilbert, The Univ. of Tennessee Knoxville (United States); Gen Yin, Kai Liu, Georgetown Univ. (United States)

21 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5B

12656-40

##### **Adapting equilibrium propagation to physical systems** (*Invited Paper*)

Author(s): Marie Drouhin, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France), Unité Mixte de Physique CNRS/Thales (France); Clément Turck, Kamel-Eddine Harabi, Adrien Renaudineau, Thomas Bersani-Veroni, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); Elisa Vianello, CEA-LETI (France), Univ. Grenoble Alpes (France); Jean-Michel Portal, Institut Matériaux Microélectronique Nanosciences de Provence, Aix-Marseille Univ., CNRS (France); Julie Grollier, Unité Mixte de Physique CNRS/Thales (France), Univ. Paris-Saclay (France); Damien Querlioz, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France)

21 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5B

12656-41

##### **Accelerating the simulations of spintronic oscillators using an unconventional data-driven approach** (*Invited Paper*)

Author(s): Simon de Wergifosse, Chloé Chopin, Flavio Abreu Araujo, Univ. Catholique de Louvain (Belgium)

21 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 5B

**Coffee Break 3:30 PM - 4:00 PM**

# TECHNICAL CONFERENCES

## Conference 12656

SESSIONS 8-10 RUN CONCURRENTLY WITH SESSIONS 11-13

### SESSION 10: 2D AND VAN DER WAALS III

21 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 5A  
Session Chair: Joseph S. Friedman,  
The Univ. of Texas at Dallas (United States)

12656-32

#### **Two-dimensional ferroic devices** (*Invited Paper*)

Author(s): Cheng Gong, Univ. of Maryland, College Park (United States)

21 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5A

12656-33

#### **Resonant charge to spin conversion in 2D structures** (*Invited Paper*)

Author(s): Igor Rozhansky, The Univ. of Manchester (United Kingdom), Ecole Polytechnique (France); Konstantin Denisov, Univ. of Buffalo (United States); Mikhail Rakitskii, Ecole Polytechnique (France)

21 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5A

12656-34

#### **Efficient spin transport and quantum phase change in a graphene/topological insulator heterostructure** (*Invited Paper*)

Author(s): Gregory M. Stephen, Jennifer E. DeMell, Lab. for Physical Sciences, Univ. of Maryland (United States); Ivan I. Naumov, Howard Univ. (United States); Nicholas A. Blumenschein, Lab. for Physical Sciences, Univ. of Maryland (United States); Y. J. Leo Sun, Univ. of Maryland (United States); Sharmila N. Shirodkar, Pratibha Dev, Howard Univ. (United States); Patrick J. Taylor, U.S. Army Research Lab. (United States); Jeremy T. Robinson, Paul M. Campbell, U.S. Naval Research Lab. (United States); Aubrey T. Hanbicki, Adam L. Friedman, Lab. for Physical Sciences, Univ. of Maryland (United States)

21 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 5A

Coffee Break 9:55 AM - 10:30 AM

### SESSION 13: SUPERCURRENT DIODE EFFECT I

21 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 5B  
Session Chair: Kirill Samokhin, Brock Univ. (Canada)

12656-42

#### **Superconducting diode effect in InAs/Al Josephson junctions at high in-plane magnetic fields** (*Invited Paper*)

Author(s): Javad Shabani, New York Univ. (United States)

21 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5B

12656-43

#### **Supercurrent nonreciprocity and vortex formation in superconductor heterostructures** (*Invited Paper*)

Author(s): Leonid Rokhinson, Purdue Univ. (United States)

21 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5B

12656-45

#### **Diode effect in Josephson junctions with a single magnetic atom: Experiment and theory** (*Invited Paper*)

Author(s): Felix von Oppen, Jacob Steiner, Larissa Melischek, Martina Trahms, Katharina Franke, Freie Univ. Berlin (Germany)

21 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 5B

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12656-121

#### **Investigation on the impact of spin current profile on the write time of SOT MRAMs**

Author(s): Md. Nahid Haque Shazon, Piyush Kumar, Azad Naeemi, Georgia Institute of Technology (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

TUESDAY 22 AUGUST 2023

SESSIONS 14-17 RUN CONCURRENTLY WITH SESSIONS 18-20

### SESSION 14: POWER SPINTRONICS AND SPIN CURRENT

22 August 2023 • 8:30 AM - 10:30 AM | Conv. Ctr. Room 5A  
Session Chair: Marco Battiato,  
Nanyang Technological Univ. (Singapore)

12656-46

#### **Energy harvesting by spin current** (*Keynote Presentation*)

Author(s): Sadamichi Maekawa, RIKEN Ctr. for Emergent Matter Science (Japan)

22 August 2023 • 8:30 AM - 9:30 AM | Conv. Ctr. Room 5A

12656-47

#### **Injection of Hall current and spin-Hall current into a lateral circuit: Theoretical and experimental determination of the maximum power efficiency** (*Invited Paper*)

Author(s): Jean-Eric Wegrowe, Ecole Polytechnique (France); Daniel Lacour, Michel Hehn, Institut Jean Lamour (France)

22 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 5A

12656-48

#### **Growth, optimization, and electrical detection of rare-earth iron garnets for spintronic applications** (*Invited Paper*)

Author(s): Can Onur Avci, Institut de Ciència de Materials de Barcelona, Consejo Superior de Investigaciones Científicas (Spain); Silvia Damerio, Institut de Ciència de Materials de Barcelona (Spain)

22 August 2023 • 10:00 AM - 10:30 AM | Conv. Ctr. Room 5A

**Coffee Break 10:30 AM - 11:00 AM**

### SESSION 18: NEUROMORPHIC COMPUTING II

22 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 5B  
Session Chair: Marie Drouhin, Univ. Paris-Saclay (France)

12656-58

#### **Spintronic neuromorphic computing: Domain walls, stochasticity, and frustration** (*Invited Paper*)

Author(s): Joseph S. Friedman, The Univ. of Texas at Dallas (United States)

22 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5B

12656-59

#### **Enabling efficient machine learning with device-to-algorithm co-design of spintronic hardware: Opportunities and challenges** (*Invited Paper*)

Author(s): Cheng Wang, Iowa State Univ. of Science and Technology (United States)

22 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5B

12656-60

#### **Neural networks three ways: Unlocking novel computing schemes using magnetic tunnel junction stochasticity** (*Invited Paper*)

Author(s): Matthew Daniels, William A. Borders, National Institute of Standards and Technology (United States); Nitin Prasad, Advait Madhavan, National Institute of Standards and Technology (United States), Univ. of Maryland, College Park (United States); Sidra Gibeault, Univ. of Maryland (United States); Temitayo Adeyeye, Liam Pocher, Univ. of Maryland, College Park (United States); Lei Wan, Michael Tran, Jordan A. Katine, Western Digital Corp. (United States); Dan Lathrop, Univ. of Maryland, College Park (United States); Brian D. Hoskins, National Institute of Standards and Technology (United States); Tiffany S. Santos, Patrick M. Braganca, Western Digital Corp. (United States); Mark D. Stiles, Jabez J. McClelland, National Institute of Standards and Technology (United States)

22 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5B

12656-61

#### **Tunable nanomagnetic synapses implement hardware variational inference engines** (*Invited Paper*)

Author(s): Christopher H. Bennett, Tianyao P. Xiao, Sandia National Labs. (United States); Samuel Liu, Nicholas Zogbi, Andrew Maicke, Thomas Leonard, The Univ. of Texas at Austin (United States); Jamin Pillars, Todd Monson, Sapan Agarwal, Sandia National Labs. (United States); Jean Anne C. Incorvia, The Univ. of Texas at Austin (United States)

22 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 5B

**Lunch/Exhibition Break 12:30 PM - 1:30 PM**

# TECHNICAL CONFERENCES

## Conference 12656

SESSIONS 14-17 RUN CONCURRENTLY WITH SESSIONS 18-20

### SESSION 15: SPIN HALL EFFECT

22 August 2023 • 11:00 AM - 12:30 PM | Conv. Ctr. Room 5A  
Session Chair: Jean-Eric Wegrowe, Ecole Polytechnique (France)

12656-49

#### **Spin-Hall transport and spin-orbit torque from first principles: From single layers to trilayers** (*Invited Paper*)

Author(s): Kirill D. Belashchenko, Giovanni G. Baez Flores, Wuzhang Fang, Alexey A. Kovalev, Univ. of Nebraska-Lincoln (United States); Vivek P. Amin, Indiana Univ.-Purdue Univ. Indianapolis (United States); Paul M. Haney, Mark D. Stiles, National Institute of Standards and Technology (United States)

22 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5A

12656-50

#### **Critical spin fluctuations for spin Hall effect** (*Invited Paper*)

Author(s): Satoshi Okamoto, Oak Ridge National Lab. (United States)

22 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5A

12656-51

#### **Spin/orbital-charge interconversion at KTaO<sub>3</sub> interfaces** (*Invited Paper*)

Author(s): Kaveh Ahadi, North Carolina State Univ. (United States)

22 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 5A

Lunch/Exhibition Break 12:30 PM - 2:00 PM

### SESSION 16: SPINTRONIC SENSORS AND DEVICES

22 August 2023 • 2:00 PM - 3:30 PM | Conv. Ctr. Room 5A  
Session Chair: Claire Baraduc, CEA-Grenoble (France)

12656-52

#### **Added value of spintronics for sensing solutions** (*Invited Paper*)

Author(s): Jean-Michel Daga, CrivaSense Technologies SAS (France)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5A

12656-53

#### **Extended spin lifetimes in transition metal doped hybrid lead halide perovskites** (*Invited Paper*)

Author(s): Jonathan Zerhoch, Ruprecht-Karls-Univ. Heidelberg (Germany), Technische Univ. München (Germany); Stanislav Bodnar, Shangpu Liu, Markus Heindl, Felix Deschler, Ruprecht-Karls-Univ. Heidelberg (Germany)

22 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5A

12656-54

#### **Amplifying magnetic sensor sensitivity with ultra-high gain flux concentrator** (*Invited Paper*)

Author(s): Claire Baraduc, Spintec, Univ. Grenoble Alpes. CEA, CNRS (France); Samuel Manceau, Thomas Brun, Spintec, Univ. Grenoble Alpes, CEA, CNRS (France), Lab. de Physique et Chimie de l'Environnement et de l'Espace, CNRS (France); Clarisse Ducruet, Crocus Technology (France); Philippe Sabon, Spintec, Univ. Grenoble Alpes, CEA, CNRS (France); Claude Cavoit, Guillaume Jannet, Lab. de Physique et Chimie de l'Environnement et de l'Espace, CNRS (France); Ioan-Lucian Prejbeanu, Spintec, Univ. Grenoble Alpes, CEA, CNRS (France); Matthieu Kretzschmar, Lab. de Physique et Chimie de l'Environnement et de l'Espace, CNRS (France)

22 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 5A

Coffee Break 3:30 PM - 4:00 PM

### SESSION 19: SUPERCURRENT DIODE EFFECT II

22 August 2023 • 1:30 PM - 3:30 PM | Conv. Ctr. Room 5B  
Session Chair: Felix von Oppen, Freie Univ. Berlin (Germany)

12656-62

#### **Unconventional Ginzburg-Landau energy: A common origin of novel physics** (*Invited Paper*)

Author(s): Kirill Samokhin, Brock Univ. (Canada)

22 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5B

12656-63

#### **Anisotropic vortex squeezing and supercurrent diode effect in non-centrosymmetric Rashba superconductors** (*Invited Paper*)

Author(s): Denis Kochan, Institute of Physics, Slovak Academy of Sciences (Slovakia)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5B

12656-64

#### **Nonreciprocal charge transport in finite-momentum superconductors** (*Invited Paper*)

Author(s): Akito Daido, Youichi Yanase, Kyoto Univ. (Japan)

22 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5B

12656-65

#### **Spin-orbit Interactions in noncentrosymmetric superconductors** (*Invited Paper*)

Author(s): Yuli B. Lyanda-Geller, Purdue Univ. (United States)

22 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 5B

Coffee Break 3:30 PM - 4:00 PM

### SESSIONS 14-17 RUN CONCURRENTLY WITH SESSIONS 18-20

#### SESSION 17: SPINTRONIC SENSORS II

22 August 2023 • 4:00 PM - 5:00 PM | Conv. Ctr. Room 5A

Session Chair: Jean-Michel Daga,  
CrivaSense Technologies SAS (France)

12656-55

#### **Tunnel magnetoresistance sensors with even-function resistance-magnetic field response** (*Invited Paper*)

Author(s): Tomoya Nakatani, Hirofumi Suto, Prabhanjan D. Kulkarni, Hitoshi Iwasaki, Yuya Sakuraba, National Institute for Materials Science (Japan)

22 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5A

12656-56

#### **Magnetic tunnel junctions designed for highly-sensitive magnetic sensor applications** (*Invited Paper*)

Author(s): Takafumi Nakano, Tohoku Univ. (Japan); Kosuke Fujiwara, Seiji Kumagai, Spin Sensing Factory Co., Ltd. (Japan); Yasuo Ando, Mikihiro Oogane, Tohoku Univ. (Japan)

22 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5A

#### SESSION 20: SUPERCURRENT DIODE EFFECT III

22 August 2023 • 4:00 PM - 6:00 PM | Conv. Ctr. Room 5B

Session Chair: Patrik Recher,  
Technische Univ. Braunschweig (Germany)

12656-66

#### **Zero-field superconducting diode effect in graphene moiré systems** (*Invited Paper*)

Author(s): Mathias S. Scheurer, Sayan Banerjee, Univ. Innsbruck (Austria); Harley Scammell, Univ. of Technology, Sydney (Australia); Jia Li, Jiangxiazhi Lin, Brown Univ. (United States)

22 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5B

12656-67

#### **Topology, anisotropy, disorder, and superconducting diode effect in planar Josephson junctions** (*Invited Paper*)

Author(s): Baris Pekerten, Tong Zhou, Jong Han, Univ. at Buffalo (United States); Alex Matos-Abiague, Wayne State Univ. (United States); Javad Shabani, New York Univ. (United States); Igor Zutic, Univ. at Buffalo (United States)

22 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5B

12656-68

#### **Planar Josephson junctions: From topological superconductivity to a time-dependent diode effect** (*Invited Paper*)

Author(s): David A. Monroe, Tong Zhou, Dario Tringali, Univ. at Buffalo (United States); Mohammad Alidoust, Norwegian Univ. of Science and Technology (Norway); Javad Shabani, New York Univ. (United States); Igor Zutic, Univ. at Buffalo (United States)

22 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 5B

12656-69

#### **Gate controlled supercurrent and anomalous Josephson effects** (*Invited Paper*)

Author(s): Mario Cuoco, Istituto Superconduttori, Materiali Innovativi e Dispositivi (Italy)

22 August 2023 • 5:30 PM - 6:00 PM | Conv. Ctr. Room 5B

# TECHNICAL CONFERENCES

## Conference 12656

WEDNESDAY 23 AUGUST 2023

SESSIONS 21-24 RUN CONCURRENTLY WITH SESSIONS 25-27

### SESSION 21: FERRIMAGNETIC SPINTRONICS AND MAGNONICS

23 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 5B  
Session Chair: John Davis, Univ. of Alberta (Canada)

12656-70

#### **Ferrimagnetic spin electronics** (*Keynote Presentation*)

Author(s): Michael Coey, Karsten Rode, Zsolt GerCSI, Trinity College Dublin (Ireland)

23 August 2023 • 8:00 AM - 9:00 AM | Conv. Ctr. Room 5B

12656-71

#### **Frequency multiplication and spin wave generation by nonlinear magnetization dynamics** (*Invited Paper*)

Author(s): Georg Woltersdorf, Rouven Dreyer, Chris Koerner, Martin-Luther-Univ. Halle-Wittenberg (Germany)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 5B

12656-72

#### **Enhancement of microwave to optical spin-based quantum transduction via a magnon mode** (*Invited Paper*)

Author(s): Tharnier O. Puel, The Univ. of Iowa (United States); Adam T. Turflinger, Sebastian P. Horvath, Jeff D. Thompson, Princeton Univ. (United States); Michael E. Flatté, The Univ. of Iowa (United States), Technische Univ. Eindhoven (Netherlands)

23 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 5B

Coffee Break 10:00 AM - 10:20 AM

### SESSION 22: MAGNONICS

23 August 2023 • 10:20 AM - 11:50 AM | Conv. Ctr. Room 5A  
Session Chair: Giovanni Vignale, Univ. of Missouri (United States)

12656-73

#### **Dynamical backaction magnomechanics and its evasion** (*Invited Paper*)

Author(s): John Davis, Univ. of Alberta (Canada)

23 August 2023 • 10:20 AM - 10:50 AM | Conv. Ctr. Room 5A

12656-74

#### **Dynamical control in hybrid magnonics** (*Invited Paper*)

Author(s): Jing Xu, Argonne National Lab. (United States); Changchun Zhong, The Univ. of Chicago (United States); Xu Han, Dafei Jin, Argonne National Lab. (United States); Liang Jiang, The Univ. of Chicago (United States); Xufeng Zhang, Northeastern Univ. (United States)

23 August 2023 • 10:50 AM - 11:20 AM | Conv. Ctr. Room 5A

12656-75

#### **Coherent microwave emission using cavity spintronics** (*Invited Paper*)

Author(s): Can-Ming Hu, Univ. of Manitoba (Canada)

23 August 2023 • 11:20 AM - 11:50 AM | Conv. Ctr. Room 5A

Lunch/Exhibition Break 11:50 AM - 1:10 PM

### SESSION 25: MAGNETIC MEMORY

23 August 2023 • 10:30 AM - 11:30 AM | Conv. Ctr. Room 5B  
Session Chair: Christopher H. Bennett, Sandia National Labs. (United States)

12656-84

#### **Magnetic data storage technology: From perpendicular magnetic recording to the computational-storage integration** (*Invited Paper*)

Author(s): Yoichiro Tanaka, Tohoku Univ. (Japan)

23 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5B

12656-85

#### **Modeling of spin-orbit torque (SOT) channel and high-density SOT magnetic random-access memory** (*Invited Paper*)

Author(s): Piyush Kumar, Azad Naeemi, Georgia Institute of Technology (United States)

23 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5B

Lunch/Exhibition Break 11:30 AM - 1:00 PM



### SESSIONS 21-24 RUN CONCURRENTLY WITH SESSIONS 25-27

#### SESSION 23: SPIN WAVES AND MAGNONICS

23 August 2023 • 1:10 PM - 3:10 PM | Conv. Ctr. Room 5A

Session Chair: Georg Woltersdorf,  
Martin-Luther-Univ. Halle-Wittenberg (Germany)

12656-76

#### **Atomically sharp domain wall as an antiferromagnetic spin wave polarizer** (*Invited Paper*)

Author(s): Giovanni Vignale, National Univ. of Singapore (Singapore)

23 August 2023 • 1:10 PM - 1:40 PM | Conv. Ctr. Room 5A

12656-77

#### **Spin-wave emission and propagation in a magnetically nanopatterned thick Synthetic Antiferromagnet** (*Invited Paper*)

Author(s): Davide Girardi, Politecnico di Milano (Italy); Simone Finizio, Paul Scherrer Institut (Switzerland); Claire Donnelly, Max-Planck-Institut für Chemische Physik Fester Stoffe (Germany); Guglielmo Rubini, Politecnico di Milano (Italy); Sina Mayr, Paul Scherrer Institut (Switzerland); Valerio Levati, Simone Cuccurullo, Federico Maspero, Politecnico di Milano (Italy); Jörg Raabe, Paul Scherrer Institute (Switzerland); Daniela Petti, Edoardo Albisetti, Politecnico di Milano (Italy)

23 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 5A

12656-78

#### **Strain driven magnetic textures** (*Invited Paper*)

Author(s): Shireen Adenwalla, Anil Adhikari, Christopher Keck, Univ. of Nebraska-Lincoln (United States)

23 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 5A

12656-79

#### **Spin dynamics in ferrimagnetic thin films: Pump-probe studies at visible, extreme UV photons and X-ray energies** (*Invited Paper*)

Author(s): Dario Arena, Univ. of South Florida (United States)

23 August 2023 • 2:40 PM - 3:10 PM | Conv. Ctr. Room 5A

Coffee Break 3:10 PM - 3:30 PM

#### SESSION 26: TOPOLOGICAL AND UNCONVENTIONAL SUPERCONDUCTIVITY I

23 August 2023 • 1:00 PM - 3:00 PM | Conv. Ctr. Room 5B

Session Chair: Alexey A. Kovalev,  
Univ. of Nebraska-Lincoln (United States)

12656-86

#### **Thermal versus electric response of superconducting topological materials: Are Majorana states more common than expected?** (*Invited Paper*)

Author(s): Ewelina Hankiewicz, Julius-Maximilians-Univ. Würzburg (Germany)

23 August 2023 • 1:00 PM - 1:30 PM | Conv. Ctr. Room 5B

12656-87

#### **Fraunhofer pattern in the presence of Majorana and Andreev bound states** (*Invited Paper*)

Author(s): Fernando Dominguez, Technische Univ. Braunschweig (Germany); Alena Astakhova, Technische Univ. Dresden (Germany); Patrik Recher, Technische Univ. Braunschweig (Germany)

23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5B

12656-88

#### **Topological superconductivity in phase-controlled Josephson junction arrays** (*Invited Paper*)

Author(s): Omri Lesser, Ady Stern, Yuval Oreg, Weizmann Institute of Science (Israel)

23 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5B

12656-89

#### **Superconductivity beyond the Pauli limit tuned by locally enhanced Zeeman field in Au(111)-superconductor heterostructures** (*Invited Paper*)

Author(s): Peng Wei, Univ. of California, Riverside (United States)

23 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 5B

Coffee Break 3:00 PM - 3:30 PM

# TECHNICAL CONFERENCES

## Conference 12656

SESSIONS 21-24 RUN CONCURRENTLY WITH SESSIONS 25-27

### SESSION 24: RASHBA SPIN-ORBIT COUPLING

23 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 5A  
Session Chair: Jean-Eric Wegrowe, Ecole Polytechnique (France)

12656-80

#### **Charge-spin conversion in two-subband quantum wells with conventional and unconventional Rashba spin-orbit coupling** (*Invited Paper*)

Author(s): Roberto Raimondi, Univ. degli Studi di Roma Tre (Italy); Gerson J. Ferreira, Univ. Federal de Uberlândia (Brazil); Jijong Fu, Qufu Normal Univ. (China)

23 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 5A

12656-81

#### **Observation of large and anisotropic spin conversion in bismuth** (*Invited Paper*)

Author(s): Masashi Shiraishi, Ryo Ohshima, Kyoto Univ. (Japan)

23 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5A

12656-82

#### **Addressing spin-orbit and light-matter interactions in group IV heterostructures** (*Invited Paper*)

Author(s): Simone Rossi, Univ. degli Studi di Milano-Bicocca (Italy); Enrico Talamas Simola, Marta Raimondo, Univ. degli Studi di Roma Tre (Italy); Maurizio Acciarri, Jacopo Pedrini, Univ. degli Studi di Milano-Bicocca (Italy); Andrea Balocchi, Xavier Marie, Institut National des Sciences Appliquées de Toulouse (France); Giovanni Isella, Politecnico di Milano (Italy); Fabio Pezzoli, Univ. degli Studi di Milano-Bicocca (Italy)

23 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5A

12656-83

#### **Tailoring the electronic structure of thin Bi films via the growth on vicinal Ge(111)** (*Invited Paper*)

Author(s): Francesco Goto, Alberto Calloni, Carlo Zucchetti, Federico Bottegoni, Marco Finazzi, Lamberto Duò, Franco Ciccacci, Gianlorenzo Bussetti, Politecnico di Milano (Italy)

23 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 5A

### SESSION 27: TOPOLOGICAL AND UNCONVENTIONAL SUPERCONDUCTIVITY II

23 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 5B  
Session Chair: Mario Cuoco, Istituto Superconduttori, Materiali Innovativi e Dispositivi (Italy)

12656-90

#### **Orbitronics effects in spin-singlet superconductors** (*Invited Paper*)

Author(s): Maria Teresa Mercaldo, Univ. degli Studi di Salerno (Italy)

23 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 5B

12656-91

#### **Odd-frequency pairing in hybrid magnetic-superconducting systems down to the atomic limit** (*Invited Paper*)

Author(s): Tristan Cren, Sorbonne Univ., CNRS (France)

23 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 5B

12656-92

#### **Intertype superconductivity and exotic magnetic flux patterns in ferromagnetic superconductors** (*Invited Paper*)

Author(s): Alexei Vagov, Univ. Bayreuth (Germany), HSE Univ. (Russian Federation); Tiago Saraiva, Arkady Shanenko, HSE Univ. (Russian Federation); Andrey Vasenko, HSE Univ. (Russian Federation), Donostia International Physics Ctr. (Spain); J. Albino Aguiar, Univ. Federal de Pernambuco (Brazil); Vasily Stolyarov, Moscow Institute of Physics and Technology (Russian Federation); Dmitry Rodichev, Institut des nanosciences de Paris (France)

23 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 5B

12656-93

#### **Intrinsic supercurrent decay in ballistic magnetic Josephson junctions** (*Invited Paper*)

Author(s): Mark van Schilfgaarde, National Renewable Energy Lab. (United States)

23 August 2023 • 5:00 PM - 5:30 PM | Conv. Ctr. Room 5B

**THURSDAY 24 AUGUST 2023**

**SESSIONS 28-30 RUN CONCURRENTLY WITH SESSIONS 31-32**

**SESSION 28: ORBITAL CURRENT AND TORQUES**

24 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 5A

Session Chair: Silvia Damerio,  
Zernike Institute for Advanced Materials (Spain)

12656-94

**Orbital torque in light metal/ferromagnet  
heterostructures** (*Invited Paper*)

Author(s): Shilei Ding, William Legrand, Paul Noel, Min-Gu Kang,  
Pietro Gambardella, ETH Zurich (Switzerland)

24 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 5A

12656-95

**Orbital torque in ferromagnetic metal/Cu/oxide thin  
films** (*Invited Paper*)

Author(s): Junyeon Kim, RIKEN Ctr. for Emergent Matter Science  
(Japan); YoshiChika Otani, RIKEN Ctr. for Emergent Matter Science  
(Japan), The Univ. of Tokyo (Japan)

24 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 5A

12656-96

**Unconventional spin-orbit torques** (*Invited Paper*)

Author(s): Daniel Kubler, Indiana Univ.-Purdue Univ. Indianapolis  
(United States); David Smith, Virginia Polytechnic Institute and State  
Univ. (United States); Giovanni G. Baez Flores, Alexey A. Kovalev,  
Kirill D. Belashchenko, Univ. of Nebraska-Lincoln (United States);  
Satoru Emori, Virginia Polytechnic Institute and State Univ. (United  
States); Vivek P. Amin, Indiana Univ.-Purdue Univ. Indianapolis  
(United States)

24 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 5A

12656-97

**Adiabatic orbital and spin pumping in metallic  
heterostructures** (*Invited Paper*)

Author(s): Armando Pezo, Aurelien Manchon, Ctr. Interdisciplinaire  
de Nanoscience de Marseille (France)

24 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 5A

**Coffee Break 10:00 AM - 10:30 AM**

# TECHNICAL CONFERENCES

## Conference 12656

SESSIONS 28-30 RUN CONCURRENTLY WITH SESSIONS 31-32

### SESSION 29: SPIN COHERENCE SILICON TECHNOLOGY

24 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 5A  
Session Chair: Can-Ming Hu, Univ. of Manitoba (Canada)

12656-98

#### **Icing mitigation through quantum sensing** (*Invited Paper*)

Author(s): Daniel R. Hart, NASA Glenn Research Ctr. (United States)  
24 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5A

12656-99

#### **Recent progress in electrically and optically detected quantum solid state magnetometry for space applications** (*Invited Paper*)

Author(s): Hannes Kraus, Corey J. Cochrane, Andreas P. Gottscholl, Jet Propulsion Lab., California Institute of Technology (United States); Michael E. Flatté, David E. Fehr, The Univ. of Iowa (United States); Thomas Aichinger, Infineon Technologies Austria AG (Austria)

24 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5A

12656-100

#### **Near zero field magnetoresistance spectroscopy in solid state electronic devices** (*Invited Paper*)

Author(s): Patrick Lenahan, The Pennsylvania State Univ. (United States); Elias Frantz, Sean King, Fedor Sharov, Intel Corp. (United States); Stephen Moxim, National Institute of Standards and Technology (United States); Kenneth Myers, Northrop Grumman Corp. (United States); Nicholas Harmon, Coastal Carolina Univ. (United States); Michael E. Flatté, The Univ. of Iowa (United States)

24 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5A

12656-101

#### **Theory of optically detected magnetic resonance of a silicon vacancy in SiC: A quantum sensor of magnetic fields** (*Invited Paper*)

Author(s): David E. Fehr, The Univ. of Iowa (United States); Hannes Kraus, Corey J. Cochrane, Jet Propulsion Lab., California Institute of Technology (United States); Michael E. Flatté, The Univ. of Iowa (United States)

24 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 5A

Lunch/Exhibition Break 12:30 PM - 1:30 PM

### SESSION 31: SUPERCONDUCTIVITY: TOPOLOGY, DISORDER, SPINTRONICS, AND MAGNETISM I

24 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 5B  
Session Chair: Akito Daido, Kyoto Univ. (Japan)

12656-120

#### **Non-reciprocal superconductivity and the field-free Josephson diode** (*Invited Paper*)

Author(s): Heng Wu, Delft University of Technology (Netherlands); Yaojia Wang, Mazhar N. Ali, Technische Univ. Delft (Netherlands)

24 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 5B

12656-106

#### **Role of magnetism, defects, and interfaces on Ising superconductivity** (*Invited Paper*)

Author(s): Darshana Wickramaratne, U.S. Naval Research Lab. (United States)

24 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 5B

12656-107

#### **Density-functional description of realistic heterostructures for topological qubits and superconducting spintronics** (*Invited Paper*)

Author(s): Philipp Rüßmann, Julius-Maximilians-Univ. Würzburg (Germany), Forschungszentrum Jülich GmbH (Germany); David Antognini Silva, Ilias Klepetsanis, Forschungszentrum Jülich GmbH (Germany); Björn Trauzettel, Julius-Maximilians-Univ. Würzburg (Germany); Phivos Mavropoulos, National and Kapodistrian Univ. of Athens (Greece); Stefan Blügel, Forschungszentrum Jülich GmbH (Germany)

24 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 5B

12656-108

#### **Low dimensional superconducting hybrids with spin-orbit coupling** (*Invited Paper*)

Author(s): Niladri Banerjee, Imperial College London (United Kingdom)

24 August 2023 • 12:00 PM - 12:30 PM | Conv. Ctr. Room 5B

Lunch/Exhibition Break 12:30 PM - 1:30 PM

### SESSIONS 28-30 RUN CONCURRENTLY WITH SESSIONS 31-32

#### SESSION 30: HALL EFFECT AND TORQUE DYNAMICS

24 August 2023 • 1:30 PM - 2:30 PM | Conv. Ctr. Room 5A

Session Chair: Patrick Lenahan,  
The Pennsylvania State Univ. (United States)

12656-103

#### **Enhanced photonic spin hall effect with polarization control using SPR-waveguided method** *(Invited Paper)*

Author(s): Monu N. Baitha, Jonghyeok Im, Kyoungsik Kim, Yonsei Univ. (Republic of Korea)

24 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5A

12656-122

#### **On the generality of the LLG equation to the optical limit: An optically-induced helicity dependent torque emerging from the LLG equation.** *(Invited Paper)*

Author(s): Benjamin Assouline, Amir Capua, The Hebrew Univ. of Jerusalem (Israel)

24 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5A

#### SESSION 32: SUPERCONDUCTIVITY: TOPOLOGY, DISORDER, SPINTRONICS, AND MAGNETISM II

24 August 2023 • 1:30 PM - 2:30 PM | Conv. Ctr. Room 5B

Session Chair: Joseph S. Friedman,  
The Univ. of Texas at Dallas (United States)

12656-109

#### **Low dissipation spin transport** *(Invited Paper)*

Author(s): Alexey A. Kovalev, Univ. of Nebraska-Lincoln (United States)

24 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 5B

12656-111

#### **New mechanisms to engineer magnetic skyrmions and topological superconductors** *(Invited Paper)*

Author(s): Panagiotis Kotetes, Institute of Theoretical Physics, Chinese Academy of Sciences (China); Yun-Peng Huang, Institute of Physics (China)

24 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 5B

# TECHNICAL CONFERENCES

## Conference 12657

# Quantum Nanophotonic Materials, Devices, and Systems 2023

23 - 24 August 2023 | Conv. Ctr. Room 1A

Conference Chairs: **Cesare Soci**, Nanyang Technological Univ. (Singapore); **Matthew T. Sheldon**, Texas A&M Univ. (United States); **Igor Aharonovich**, Univ. of Technology, Sydney (Australia)

Program Committee: **Mario Agio**, Univ. Siegen (Germany); **Vikas Anant**, Photon Spot, Inc. (United States); **Jennifer A. Dionne**, Stanford Univ. (United States); **Andrei Faraon**, Caltech (United States); **Stephan J. Goetzinger**, Max-Planck-Institut für die Physik des Lichts (Germany); **Mohammad Hafezi**, Joint Quantum Institute (United States); **Zubin Jacob**, Purdue Univ. (United States); **Je-Hyung Kim**, Ulsan National Institute of Science and Technology (Republic of Korea); **Mark Lawrence**, Washington Univ. in St. Louis (United States); **Chao-Yang Lu**, Univ. of Science and Technology of China (China); **Patrick Maletinsky**, Univ. Basel (Switzerland); **Maiken H. Mikkelsen**, Duke Univ. (United States); **Prineha Narang**, Harvard Univ. (United States); Kae Nemoto, National Institute of Informatics (Japan); **Teri W. Odom**, Northwestern Univ. (United States); **Dan Oron**, Weizmann Institute of Science (Israel); **Marina Radulaski**, Univ. of California, Davis (United States); **Kartik Srinivasan**, National Institute of Standards and Technology (United States); **Daniel L. Stick**, Sandia National Labs. (United States); **Mark Tame**, Stellenbosch Univ. (South Africa); **Wolfgang Tittel**, Technische Univ. Delft (Canada); **Hendrik Utzat**, Univ. of California, Berkeley (United States); **Ewold Verhagen**, AMOLF (Netherlands); **Ulrike Woggon**, Technische Univ. Berlin (Germany)

### MONDAY 21 AUGUST 2023

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12657-2

#### Exploring transient modification of hyperbolic metamaterials using InAsSb-based semiconductor

Author(s): Heather J. Haugan, Derek A. Bas, Augustine M. Urbas, Adam T. Neal, Kurt G. Eyink, Air Force Research Lab. (United States)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12657-20

#### Nonlinear optical properties of diblock poly (p-Phenylene Vinylene)

Author(s): Haraprasad Mandal, Univ. of Michigan (United States)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12657-22

#### Simulation of a quantum secured direct communication system using a hyperentangled photon source on polarization and orbital angular momentum

Author(s): Khaled A. Kirah, Dalia Selim, Ahmed Mahrous, Ain Shams Univ. (Egypt)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

#### SESSION 1: QUANTUM MATERIALS

23 August 2023 • 9:20 AM - 10:30 AM | Conv. Ctr. Room 1A

Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12657-4

#### Lattice reconstruction in MoSe<sub>2</sub>-WSe<sub>2</sub> heterobilayers synthesized by chemical vapor deposition (*Invited Paper*)

Author(s): Farsane Tabataba-Vakili, Zhijie Li, Shen Zhao, Anna Rupp, Ismail Bilgin, Munich Quantum Ctr. (Germany), CeNS Ctr. for NanoScience, Ludwig-Maximilians-Univ. München (Germany); Ziria Herdegen, Benjamin März, CeNS Ctr. for NanoScience, Ludwig-Maximilians-Univ. München (Germany); Kenji Watanabe, Takashi Taniguchi, National Institute for Materials Science (Japan); Gabriel R. Schleder, Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard Univ. (United States); Anvar S. Baimuratov, Munich Quantum Ctr. (Germany), CeNS Ctr. for NanoScience, Ludwig-Maximilians-Univ. München (Germany); Efthimos Kaxiras, Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard Univ. (United States); Knut Müller-Caspary, CeNS Ctr. for NanoScience, Ludwig-Maximilians-Univ. München (Germany); Alexander Högele, Munich Quantum Ctr. (Germany), CeNS Ctr. for NanoScience, Ludwig-Maximilians-Univ. München (Germany)

23 August 2023 • 9:20 AM - 9:45 AM | Conv. Ctr. Room 1A

12657-3

### Colossal optical anisotropy from atomic-scale modulations

Author(s): Hongyan Mei, Univ. of Wisconsin-Madison (United States); Guodong Ren, Washington Univ. in St. Louis (United States); Boyang Zhao, The Univ. of Southern California (United States); Jad Salman, Univ. of Wisconsin-Madison (United States); Gwan-Yeong Jung, Washington Univ. in St. Louis (United States); Huandong Chen, Shantanu Singh, The Univ. of Southern California (United States); Arashdeep S. Thind, John Cavin, Washington Univ. in St. Louis (United States); Jordan A. Hachtel, Miaofang Chi, Oak Ridge National Lab. (United States); Shanyuan Niu, The Univ. of Southern California (United States); Graham Joe, Chenghao Wan, Univ. of Wisconsin-Madison (United States); Nick Settineri, Simon J. Teat, Lawrence Berkeley National Lab. (United States); Bryan C. Chakoumakos, Oak Ridge National Lab. (United States); Jayakanth Ravichandran, The Univ. of Southern California (United States); Rohan Mishra, Washington Univ. in St. Louis (United States); Mikhail A. Kats, Univ. of Wisconsin-Madison (United States)

23 August 2023 • 9:45 AM - 10:05 AM | Conv. Ctr. Room 1A

12657-8

### Generation of single and entangled-pair polaritons *(Invited Paper)*

Author(s): F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain)

23 August 2023 • 10:05 AM - 10:30 AM | Conv. Ctr. Room 1A

Coffee Break 10:30 AM - 11:00 AM

## SESSION 2: SINGLE PHOTON EMISSION

23 August 2023 • 11:00 AM - 12:05 PM | Conv. Ctr. Room 1A  
Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12657-5

### Nanoscale measurement and manipulation of single-photon emitter photophysics *(Invited Paper)*

Author(s): Benjamin J. Lawrie, Alex A. Puzos, Oak Ridge National Lab. (United States); Weijun Luo, Xi Ling, Boston Univ. (United States)

23 August 2023 • 11:00 AM - 11:25 AM | Conv. Ctr. Room 1A

12657-6

### All-silicon single photon sources based on deterministic defect engineering in photonic diodes

Author(s): Sebastian W. Schmitt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Sebastian Ritter, Dennis Arslan, Friedrich-Schiller-Univ. Jena (Germany); Nico Klingner, Gregor Hlawacek, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); Falk X. Eilenberger, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

23 August 2023 • 11:25 AM - 11:45 AM | Conv. Ctr. Room 1A

12657-7

### Spectrally tunable single photon emission from individual hybrid perovskite quantum dots

Author(s): Qi Ying Tan, Nanyang Technological Univ. (Singapore); Marianna D'Amato, Quentin C. Glorieux, Alberto Bramati, Lab. Kastler Brossel, Sorbonne Univ., CNRS, Ecole normale supérieure - PSL (France); Cesare Soci, Nanyang Technological Univ. (Singapore)

23 August 2023 • 11:45 AM - 12:05 PM | Conv. Ctr. Room 1A

Lunch/Exhibition Break 12:05 PM - 2:05 PM

## SESSION 3: LIGHT CONFINEMENT

23 August 2023 • 2:05 PM - 2:55 PM | Conv. Ctr. Room 1A  
Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12657-9

### Cascade domino lithography for extreme photon squeezing at the sub-nanometer scale *(Invited Paper)*

Author(s): Junsuk Rho, Pohang Univ. of Science and Technology (Republic of Korea)

23 August 2023 • 2:05 PM - 2:30 PM | Conv. Ctr. Room 1A

12657-1

### Picoelectrodynamics inside matter *(Invited Paper)*

Author(s): Sathwik Bharadwaj, Vineet Punyamoorthy, Birck Nanotechnology Ctr., Purdue Univ. (United States); Todd Van Mechelen, Birck Nanotechnology Ctr., Purdue Univ. (United States); Zubin Jacob, Birck Nanotechnology Ctr., Purdue Univ. (United States)

23 August 2023 • 2:30 PM - 2:55 PM | Conv. Ctr. Room 1A

Coffee Break 2:55 PM - 3:25 PM

## SESSION 4: QUANTUM OPTICS IN DIAMOND

23 August 2023 • 3:25 PM - 5:05 PM | Conv. Ctr. Room 1A  
Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12657-10

### Diamond nanophotonics and electronics for quantum science and technology *(Invited Paper)*

Author(s): Mario Agio, Univ. Siegen (Germany), Consiglio Nazionale delle Ricerche (Italy)

23 August 2023 • 3:25 PM - 3:50 PM | Conv. Ctr. Room 1A

12657-21

### Simultaneous nanoscale rheology and thermometry in complex systems using diamond nanocrystals *(Invited Paper)*

Author(s): Helena Knowles, Univ. of Cambridge (United Kingdom)

23 August 2023 • 3:50 PM - 4:15 PM | Conv. Ctr. Room 1A

12657-12

### Nanodiamond sensors as probes for local temperature variations in the neuron *(Invited Paper)*

Author(s): Paolo Traina, Giulia Petrini, Istituto Nazionale di Ricerca Metrologica (Italy); Giulia Tomagra, Univ. degli Studi di Torino (Italy); Ettore Bernardi, Ekaterina V. Moreva, Istituto Nazionale di Ricerca Metrologica (Italy); Andrea Marcantoni, Univ. degli Studi di Torino (Italy); Federico Piccolo, Istituto Nazionale di Fisica Nucleare (Italy), Univ. degli Studi di Torino (Italy); Klaudiva Kvaková, Institute of Organic Chemistry & Biochemistry of the CAS, v.v.i. (Czech Republic), Charles Univ. (Czech Republic); Petr Cigler, Charles Univ. (Czech Republic); Ivo P. Degiovanni, Istituto Nazionale di Ricerca Metrologica (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Valentina Carabelli, Univ. degli Studi di Torino (Italy); Claudia Stella, Politecnico di Torino (Italy), Istituto Nazionale di Ricerca Metrologica (Italy); Elena Losero, Istituto Nazionale di Ricerca Metrologica (Italy); Marco Genovese, Istituto Nazionale di Ricerca Metrologica (Italy), Istituto Nazionale di Fisica Nucleare (Italy)

23 August 2023 • 4:15 PM - 4:40 PM | Conv. Ctr. Room 1A

# TECHNICAL CONFERENCES

## Conference 12657

12657-13

### **Quantum diamond voltage microscopy for bio-imaging applications** (*Invited Paper*)

Author(s): David A. Simpson, The Univ. of Melbourne (Australia)

23 August 2023 • 4:40 PM - 5:05 PM | Conv. Ctr. Room 1A

#### SESSION 5: QUANTUM DEVICES

24 August 2023 • 9:00 AM - 10:05 AM | Conv. Ctr. Room 1A

Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12657-14

### **Fiber-integrated single-photon device with an efficient fiber-quantum dot interface** (*Invited Paper*)

Author(s): Woong Bae Jeon, Jong Sung Moon, Ulsan National Institute of Science and Technology (Republic of Korea); Young-Ho Ko, Electronics and Telecommunications Research Institute (Republic of Korea); Christopher J. K. Richardson, Laboratory for Physical Sciences (United States); Edo Waks, University of Maryland (United States); Je-Hyung Kim, Ulsan National Institute of Science and Technology (Republic of Korea)

24 August 2023 • 9:00 AM - 9:25 AM | Conv. Ctr. Room 1A

12657-15

### **Potential of neurological disorder diagnosis with quantum dot-based detection of neurofilament light chains**

Author(s): Jaewon Choi, Yu-Rim Ahn, Sojin Shin, HakSeon Kim, Hyun-Ouk Kim, Kangwon National Univ. (Republic of Korea)

24 August 2023 • 9:25 AM - 9:45 AM | Conv. Ctr. Room 1A

12657-17

### **Superconducting single-photon detectors on lithium niobate-on-insulator**

Author(s): Christian Schmid, Fabian Wietschorke, Rasmus Flaschmann, Lucio Zugliani, Technische Univ. München (Germany); Stefan Strohauer, Stefanie Grotowski, Jonathan J. Finley, Walter Schottky Institut (Germany); Kai Müller, Technische Univ. München (Germany)

24 August 2023 • 9:45 AM - 10:05 AM | Conv. Ctr. Room 1A

**Coffee Break 10:05 AM - 10:35 AM**

#### SESSION 6: QUANTUM SYSTEMS

24 August 2023 • 10:35 AM - 11:25 AM | Conv. Ctr. Room 1A

Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12657-18

### **Versatile NISQ processors** (*Invited Paper*)

Author(s): William J. Munro, NTT Basic Research Labs. (Japan)

24 August 2023 • 10:35 AM - 11:00 AM | Conv. Ctr. Room 1A

12657-19

### **Quantum computational imaging and sensing** (*Invited Paper*)

Author(s): Mohan Sarovar, Sandia National Labs. (United States)

24 August 2023 • 11:00 AM - 11:25 AM | Conv. Ctr. Room 1A

**Show Abstract +**



## Conference 12658

### Liquid Crystals XXVII

20 - 21 August 2023 | Conv. Ctr. Room 7A

Conference Chair: **Iam Choon Khoo**, The Pennsylvania State Univ. (United States)

Program Committee: **Timothy J. Bunning**, Air Force Research Lab. (United States); **Julian S. Evans**, Zhejiang Univ. (China); **Jean-Pierre Huignard**, Jphopto (France); **Tomiki Ikeda**, Chuo Univ. (Japan); **Malgosia Kaczmarek**, Univ. of Southampton (United Kingdom); **Oleg D. Lavrentovich**, Kent State Univ. (United States); **Sin-Doo Lee**, Seoul National Univ. (Republic of Korea); **Tsung-Hsien Lin**, National Sun Yat-Sen Univ. (Taiwan); **Kenneth L. Marshall**, Univ. of Rochester (United States); **Francesco Simoni**, Univ. Politecnica delle Marche (Italy); **Nelson V. Tabiryan**, BEAM Engineering For Advanced Measurements Co. (United States); **David M. Walba**, Univ. of Colorado Boulder (United States); **Shin-Tson Wu**, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

#### SUNDAY 20 AUGUST 2023

##### SESSION 1: NOVEL LIQUID CRYSTALLINE MATERIALS AND STRUCTURES

20 August 2023 • 8:20 AM - 10:00 AM | Conv. Ctr. Room 7A

Session Chair: Iam-Choon Khoo,  
The Pennsylvania State Univ. (United States)

12658-1

##### **Liquid crystalline elastomers as dynamic optical materials** (*Keynote Presentation*)

Author(s): Timothy J. White, Univ. of Colorado Boulder (United States)

20 August 2023 • 8:20 AM - 8:45 AM | Conv. Ctr. Room 7A

12658-2

##### **Topology in phase separated liquid crystal systems** (*Invited Paper*)

Author(s): Julian S. Evans, Nan Wang, Sailing He, Zhejiang Univ. (China)

20 August 2023 • 8:45 AM - 9:05 AM | Conv. Ctr. Room 7A

12658-3

##### **Emergence of disordered branching patterns in confined chiral nematic liquid crystals** (*Invited Paper*)

Author(s): Marcel G. Clerc, Sebastian Echeverría-Alar, Ignacio Bordeu, Univ. de Chile (Chile)

20 August 2023 • 9:05 AM - 9:25 AM | Conv. Ctr. Room 7A

12658-4

##### **The structure transformation, deformation, and optical properties in chiral liquid crystal phases** (*Invited Paper*)

Author(s): Hui-Yu Chen, National Chung Hsing Univ. (Taiwan); Fumito Araoka, RIKEN Ctr. for Emergent Matter Science (Japan); Feng-Yu Chen, Jui Jiun Chen, Chun-Hsien Su, Nei-Jyun Wang, Kuan-Cheng Su, Ruo-Han Lin, National Chung Hsing Univ. (Taiwan)

20 August 2023 • 9:25 AM - 9:45 AM | Conv. Ctr. Room 7A

12658-39

##### **Liquid crystals for optical switches, smart windows, reconfigurable/tunable meta-structures, micro-resonator coupling and plasmonic nanostructures**

Author(s): Iam-Choon Khoo, The Pennsylvania State Univ. (United States)

20 August 2023 • 9:45 AM - 10:00 AM | Conv. Ctr. Room 7A

Coffee Break 10:00 AM - 10:30 AM

##### SESSION 2: LIQUID CRYSTALS FOR BIO-SENSING, LIGHT MODULATIONS

20 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 7A

Session Chair: Malgosia Kaczmarek,  
Univ. of Southampton (United Kingdom)

12658-6

##### **Cholesteric liquid crystals for label-free biosensing platforms** (*Keynote Presentation*)

Author(s): Mon-Juan Lee, Chang Jung Christian Univ. (Taiwan); Wei Lee, National Yang Ming Chiao Tung Univ. (Taiwan)

20 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 7A

12658-7

##### **Next-generation spatial light modulators based on liquid crystal-tunable metasurfaces with nanoantenna induced alignment** (*Invited Paper*)

Author(s): Rasna Maruthiyodan Veetil, A\*STAR Institute of Materials Research and Engineering (Singapore)

20 August 2023 • 10:55 AM - 11:15 AM | Conv. Ctr. Room 7A

12658-8

##### **Laser written stretchable diffractive optic elements in polymerizable liquid crystal gels**

Author(s): Bohan Chen, Zimo Zhao, Camron Nourshargh, Chao He, Patrick Salter, Martin J. Booth, Steve J. Elston, Stephen M. Morris, Univ. of Oxford (United Kingdom)

20 August 2023 • 11:15 AM - 11:30 AM | Conv. Ctr. Room 7A

12658-9

##### **Electrically tunable light reflection at oblique helicoidal cholesteric for obliquely incident light** (*Invited Paper*)

Author(s): Oleg D. Lavrentovich, Olena S. Iadlovska, Kamal Thapa, Sergij V. Shiyonovskii, Kent State Univ. (United States)

20 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 7A

12658-10

##### **Nonlinear properties of lyotropic-like human lipoproteins** (*Invited Paper*)

Author(s): Antônio M. Figueiredo Neto, Univ. de São Paulo (Brazil)

20 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 7A

Lunch Break 12:10 PM - 2:00 PM

# TECHNICAL CONFERENCES

## Conference 12658

### SESSION 3: NOVEL LIQUID CRYSTALS PROPERTIES AND STRUCTURES

20 August 2023 • 2:00 PM - 3:25 PM | Conv. Ctr. Room 7A

Session Chair: Nelson V. Tabiryan, BEAM Engineering for Advanced Measurements Co. (United States)

12658-11

#### Microscale surface structure formation by scanning wave photopolymerization of liquid crystals (*Keynote Presentation*)

Author(s): Atsushi Shishido, Tokyo Institute of Technology (Japan)

20 August 2023 • 2:00 PM - 2:25 PM | Conv. Ctr. Room 7A

12658-12

#### The impact of pi-electron delocalization on the chiroptical properties and laser damage resistance of chiral dopants and liquid crystal host mixtures for high-peak power laser applications (*Invited Paper*)

Author(s): Kenneth L. Marshall, Nathaniel D. Urban, Kyle R. P. Kafka, Stavros G. Demos, Jenny Zhao, Ji-Mi Jang, Faraan Hamad, Nhuja Maharjan, Vinay Pendri, Univ. of Rochester (United States)

20 August 2023 • 2:25 PM - 2:45 PM | Conv. Ctr. Room 7A

12658-13

#### Controlled formation of topological defects at liquid/liquid crystal interfaces and their application (*Invited Paper*)

Author(s): Kenji Katayama, Chuo Univ. (Japan)

20 August 2023 • 2:45 PM - 3:05 PM | Conv. Ctr. Room 7A

12658-14

#### Photopatterned topological structures in ferroelectric nematic liquid crystals (*Invited Paper*)

Author(s): Chao Zhou, Hao Chen, Southern Univ. of Science and Technology (China); Minghui Deng, South China Univ. of Technology (China); Miao Jiang, Southern Univ. of Science and Technology (China); Mingjun Huang, Satoshi Aya, South China Univ. of Technology (China); Qi-Huo Wei, Southern Univ. of Science and Technology (China)

20 August 2023 • 3:05 PM - 3:25 PM | Conv. Ctr. Room 7A

Coffee Break 3:25 PM - 3:55 PM

### SESSION 4: LC FOR SWITCHING, ULTRASONICS, SENSING, STEERING

20 August 2023 • 3:55 PM - 5:35 PM | Conv. Ctr. Room 7A

Session Chair: Iam-Choon Khoo,

The Pennsylvania State Univ. (United States)

12658-15

#### Technology within sight of the holy grail of planar optics (*Keynote Presentation*)

Author(s): Nelson V. Tabiryan, David E. Roberts, BEAM Engineering for Advanced Measurements Co. (United States); Jonathan E. Slagle, Michael E. McConney, Timothy J. Bunning, Air Force Research Lab. (United States)

20 August 2023 • 3:55 PM - 4:20 PM | Conv. Ctr. Room 7A

12658-16

#### Laser ultrasonics using photorefractive liquid crystals (*Invited Paper*)

Author(s): Takeo Sasaki, Toshinobu Takashi, Kaita Suzuki, Gouta Ikeda, Miku Nagaoka, Yukihiko Ishii, Khoa V. Le, Yumiko Naka, Tokyo Univ. of Science (Japan)

20 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 7A

12658-17

#### Optical Beam-steering and Polarization Property of a Liquid Crystal Laser

Author(s): Guanxiong Zhang, Univ. of Oxford (United Kingdom); Andy Schreier, Fraunhofer-Institut für Nachrichtentechnik, Heinrich-Hertz-Institut (Germany); Chao He, Atchutananda Surampudi, Grahame Faulkner, Steve J. Elston, Dominic O'Brien, Stephen M. Morris, Univ. of Oxford (United Kingdom)

20 August 2023 • 4:40 PM - 4:55 PM | Conv. Ctr. Room 7A

12658-18

#### Dual-frequency field assembly of over mm-thick nonlinear chiral photonic crystals for advanced photonic applications (*Invited Paper*)

Author(s): Iam-Choon Khoo, The Pennsylvania State Univ. (United States); Chun-Wei Chen, Yale Univ. (United States); Tsung-Hsien Lin, Ting-Mao Feng, National Sun Yat-sen Univ. (Taiwan)

20 August 2023 • 4:55 PM - 5:15 PM | Conv. Ctr. Room 7A

12658-47

#### Magnetic reorientation of 5CB nematic liquid crystals aligned by carbon nanotubes sheets (*Invited Paper*)

Author(s): Katarina Zakutanska, Institute of Experimental Physics SAS (Slovakia); Giusy Scalia, Univ. du Luxembourg (Luxembourg)

20 August 2023 • 5:15 PM - 5:35 PM | Conv. Ctr. Room 7A

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### SESSION 5: CHARACTERIZATION, MODULATION, SENSING AND IMAGING

21 August 2023 • 8:20 AM - 10:00 AM | Conv. Ctr. Room 7A  
Session Chair: Nelson V. Tabiryran, BEAM Engineering for Advanced  
Measurements Co. (United States)

12658-20

#### **Capturing parameters and stability of liquid crystal systems with optical techniques** (*Keynote Presentation*)

Author(s): Malgosia Kaczmarek, Giampaolo D'Alessandro, Denitsa  
Bankova, Nicolas Brouckaert, Oleksandr Buchnev, Nina Podoliak,  
Univ. of Southampton (United Kingdom)

21 August 2023 • 8:20 AM - 8:45 AM | Conv. Ctr. Room 7A

12658-21

#### **Dynamic control of molecular alignment in liquid- crystal elastomers by external materials** (*Invited Paper*)

Author(s): Osamu Tsutsumi, Yudai Fuwa, Mina Matsuda, Yuki Shikata,  
Kyohei Hisano, Ritsumeikan Univ. (Japan)

21 August 2023 • 8:45 AM - 9:05 AM | Conv. Ctr. Room 7A

12658-22

#### **Passive vibration sensing system using liquid crystals** (*Invited Paper*)

Author(s): Abhishek Srivastava, Hong Kong Univ. of Science and  
Technology (Hong Kong, China)

21 August 2023 • 9:05 AM - 9:25 AM | Conv. Ctr. Room 7A

12658-23

#### **Self-powered dynamic glazing based on twisted- nematic liquid crystals and organic photovoltaic layers** (*Invited Paper*)

Author(s): Thomas Heiser, Sadiara Fall, ICube, Univ. de Strasbourg  
(France), CNRS (France); Yuhan Zhong, Jing Wang, ICube, Univ.  
de Strasbourg (France), CNRS (France); Thomas Ducatel, ICube  
(France); Martin Brinkmann, Institut Charles Sadron, CNRS (France);  
Nicolas Leclerc, Institut de Chimie et Procédés pour l'Energie,  
l'Environnement et la Santé (France); Nicolas Brouckaert, Univ. of  
Southampton (United Kingdom); Thomas Regrettier, Voltec Solar  
(France); Olzhas A. Ibraikulov, ICube (France); Malgosia Kaczmarek,  
Univ. of Southampton (United Kingdom)

21 August 2023 • 9:25 AM - 9:45 AM | Conv. Ctr. Room 7A

12658-24

#### **Three-dimensional imaging of helicoidal pitch and structural characterization of cholesteric cellulose nanocrystals suspensions using second harmonic generation microscopy**

Author(s): Thibaut Legat, Wim Thielemans, Yovan de Coene, Thierry  
Verbiest, Stijn Van Cleuvenbergen, KU Leuven (Belgium)

21 August 2023 • 9:45 AM - 10:00 AM | Conv. Ctr. Room 7A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 6: NOVEL LC PROPERTIES, MICROSCOPY, DISORDER

21 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 7A

Session Chair: Malgosia Kaczmarek,  
Univ. of Southampton (United Kingdom)

12658-25

#### **Time evolution of the dynamic heterogeneity in the sol-gel transition of nematic gels observed by the novel fluctuation microscope** (*Keynote Presentation*)

Author(s): Jun Yamamoto, Kyoto Univ. (Japan)

21 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 7A

12658-26

#### **Intuitive understanding of the connection between Pancharatnam-Berry optical beam deflectors and polarization volume holograms** (*Invited Paper*)

Author(s): Fenglin Xi, Kent State Univ. (United States); HsienHui  
Cheng, Xiayu Feng, Lu Lu, Meta (United States); Philip J. Bos, Kent  
State Univ. (United States)

21 August 2023 • 10:55 AM - 11:15 AM | Conv. Ctr. Room 7A

12658-27

#### **Effect of host liquid crystal structure on nonlinear molecular reorientation of oligothiophene-doped liquid crystals**

Author(s): Junki Yokota, Tokyo Institute of Technology (Japan); Miho  
Aizawa, Tokyo Institute of Technology (Japan), PRESTO (Japan);  
Kyohei Hisano, Shoichi Kubo, Tokyo Institute of Technology (Japan);  
Rumiko Yamaguchi, Akita Univ. (Japan); Atsushi Shishido, Tokyo  
Institute of Technology (Japan)

21 August 2023 • 11:15 AM - 11:30 AM | Conv. Ctr. Room 7A

12658-28

#### **Photonic eigenmodes in cholesteric liquid crystals** (*Invited Paper*)

Author(s): Jaka Zaplotnik, Urban Mur, Univ. of Ljubljana (Slovenia);  
Igor Muševič, Jožef Stefan Institute (Slovenia); Miha Ravnik, Univ. of  
Ljubljana (Slovenia), Jožef Stefan Institute (Slovenia)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 7A

12658-29

#### **A possible large quadrupole moment driving torque in a smectic liquid crystal** (*Invited Paper*)

Author(s): Akihiro Mochizuki, i-CORE Technology, LLC (United  
States)

21 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 7A

Lunch Break 12:10 PM - 2:00 PM

#### SESSION 7: TUNABLE LENS AND CHIRAL OPTICS

21 August 2023 • 2:00 PM - 3:30 PM | Conv. Ctr. Room 7A

Session Chair: Kenneth L. Marshall, Univ. of Rochester (United States)

12658-30

#### **Electrically tunable chiral liquid crystal lens arrays** (*Keynote Presentation*)

Author(s): Kelum Perera, Nilanthi Haputhantrige, Md Sakhawat  
Hossain Himel, Md Mostafa, Alex Adaka, Oleg D. Lavrentovich, Antal  
I. Jáklí, Kent State Univ. (United States)

21 August 2023 • 2:00 PM - 2:25 PM | Conv. Ctr. Room 7A

# TECHNICAL CONFERENCES

## Conference 12658

12658-31

### Electrically tunable progressive lenses via nematic liquid crystals (*Invited Paper*)

Author(s): Yi-Hsin Lin, Wei-Cheng Cheng, National Yang Ming Chiao Tung Univ. (Taiwan); Victor Y. Reshetnyak, Taras Shevchenko National Univ. of Kyiv (Ukraine)

21 August 2023 • 2:25 PM - 2:45 PM | Conv. Ctr. Room 7A

12658-32

### Controlling radiant energy flow and privacy with liquid crystal-polymer composite switchable windows

Author(s): Suman Halder, Yunho Shin, Ziyuan Zhou, Xinfang Zhang, Lang Hu, Deng-Ke Yang, Kent State Univ. (United States)

21 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 7A

12658-33

### Photoaligned and photopatterned polymer-stabilized-liquid-crystals for optical anti-counterfeiting

Author(s): Siying Liu, Saleh Alfarhan, Kailong Jin, Xiangfan Chen, Arizona State Univ. (United States)

21 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 7A

12658-34

### A liquid crystal lens set in augmented reality systems and virtual reality systems for rapidly varifocal images and vision correction

Author(s): Ting-Wei Huang, Hao-Hsin Huang, Yi-Hsin Lin, Yu-Jen Wang, National Yang Ming Chiao Tung Univ. (Taiwan)

21 August 2023 • 3:15 PM - 3:30 PM | Conv. Ctr. Room 7A

Coffee Break 3:30 PM - 4:00 PM

### SESSION 8: BEAM SHAPING, TUNABLE METASURFACES, PRINTED PHOTONICS AND ENHANCED EO RESPONSE

21 August 2023 • 4:00 PM - 5:20 PM | Conv. Ctr. Room 7A

Session Chair: Iam-Choon Khoo,  
The Pennsylvania State Univ. (United States)

12658-35

### Dynamic LED beam shaping by using liquid crystals (*Keynote Presentation*)

Author(s): Tigran Galstian, Univ. Laval (Canada); Armen Zohrabyan, Vladimir Presniakov, Aram Bagramyan, LensVector, Inc. (Canada)

21 August 2023 • 4:00 PM - 4:25 PM | Conv. Ctr. Room 7A

12658-36

### Tuning metasurfaces by controlling liquid crystals in three dimensions (*Invited Paper*)

Author(s): Yana Izdebskaya, Ziwei Yang, Vladlen Shvedov, Dragomir Neshev, Ilya V. Shadrivov, The Australian National Univ. (Australia)

21 August 2023 • 4:25 PM - 4:45 PM | Conv. Ctr. Room 7A

12658-38

### Molecular engineering of polymer stabilizing network to enhance the electro-optic response of polymer-stabilized cholesteric liquid crystals

Author(s): Gaurav K. Pande, Brian P. Radka, Timothy J. White, Univ. of Colorado Boulder (United States)

21 August 2023 • 4:45 PM - 5:00 PM | Conv. Ctr. Room 7A

12658-5

### Knots in optical axis fields of uniaxial birefringent media (*Invited Paper*)

Author(s): Ivan I. Smalyukh, Univ. of Colorado Boulder (United States)

21 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 7A

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12658-40

### Vortex clustering in chiral nematic liquid crystal microdroplets

Author(s): Víctor Fernández-González, Sebastián Echeverría-Alar, Gregorio González-Cortés, Univ. de Chile (Chile); Jorge Vergara, Paulina I. Hidalgo, Universidad de Concepción (Chile); Marcel G. Clerc, Univ. de Chile (Chile)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12658-41

### Synthesis and alignment behavior of liquid-crystalline polymer-grafted ZnO nanorods

Author(s): Kaho Nakano, Kyohei Hisano, Miho Aizawa, Shoichi Kubo, Atsushi Shishido, Tokyo Institute of Technology (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12658-42

### Topological transition to a vortices lattice in a nematic liquid crystal cell

Author(s): Roberto Gajardo, Marcel G. Clerc, Univ. de Chile (Chile)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12658-43

### Turbulent labyrinthine patterns in liquid crystal light valve with optical feedback

Author(s): Pedro Aguilera-Rojas, Marcel G. Clerc, Sebastian Echeverría-Alar, Univ. de Chile (Chile); Youri Soupart, Mustapha Tlidi, Univ. Libre de Bruxelles (Belgium)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12658-44

### Tunable multifocal liquid crystal microlens array based on three-electrode structure

Author(s): Mareena Antony, Yu-Wu Wang, Che-Ju Hsu, Chi-Yen Huang, National Changhua Univ. of Education (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12658-45

### Image-based polarization detection and material recognition based on liquid crystals

Author(s): Hao-Hsin Huang, Yi-Hsin Lin, Yu-Jen Wang, Huai-An Hsieh, National Yang Ming Chiao Tung Univ. (Taiwan); Po-Lun Chen, General Interface Solution Holding Ltd. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## Conference 12659

# Organic and Hybrid Light Emitting Materials and Devices XXVII

20 - 22 August 2023 | Conv. Ctr. Room 7B

Conference Chairs: **Ji-Seon Kim**, Imperial College London (United Kingdom); **Tae-Woo Lee**, Seoul National Univ. (Republic of Korea); **Franky So**, North Carolina State Univ. (United States)

Program Committee: **Chantal Andraud**, Ecole Normale Supérieure de Lyon (France); **Hugo A. Bronstein**, Univ. of Cambridge (United Kingdom); **Paul L. Burn**, The Univ. of Queensland (Australia); **Moon Kee Choi**, Ulsan National Institute of Science and Technology (Republic of Korea); **Malte C. Gather**, Univ. of St. Andrews (United Kingdom); **Kenan Gundogdu**, North Carolina State Univ. (United States); **Hironori Kaji**, Kyoto Univ. (Japan); **Yun-Hi Kim**, Gyeongsang National Univ. (Republic of Korea); **Jian Li**, Arizona State Univ. (United States); **Jongwook Park**, Kyung Hee Univ. (Republic of Korea); **Linda A. Peteanu**, Carnegie Mellon Univ. (United States); **Barry P. Rand**, Princeton Univ. (United States); **Sebastian Reineke**, TU Dresden (Germany); **Ifor D. W. Samuel**, Univ. of St. Andrews (United Kingdom); **Ken-Tsung Wong**, National Taiwan Univ. (Taiwan); **Seunghyup Yoo**, KAIST (Republic of Korea)

### SUNDAY 20 AUGUST 2023

Coffee Break 10:10 AM - 10:40 AM

#### SESSION 1: MOLECULAR LEVEL APPROACHES FOR ORGANIC LIGHT-EMITTING MATERIALS

20 August 2023 • 8:15 AM - 10:10 AM | Conv. Ctr. Room 7B  
Session Chair: Jaesang Lee, Seoul National Univ. (Republic of Korea)

12659-1

#### Solvent-driven helix-coil transitions in emissive chiral conjugated polymers (*Invited Paper*)

Author(s): Linda A. Peteanu, Megan A. Rice, Erin T. Smith, Soren Westrey, Yuyang Shang, Seth Goldberg, Manami Kawakami, Kevin J. T. Noonan, Tomasz Kowalewski, Carnegie Mellon Univ. (United States)

20 August 2023 • 8:15 AM - 8:40 AM | Conv. Ctr. Room 7B

12659-2

#### Design strategy of highly efficient and color pure blue emitting materials (*Invited Paper*)

Author(s): Yun-Hi Kim, Gyeongsang National Univ. (Republic of Korea)

20 August 2023 • 8:40 AM - 9:05 AM | Conv. Ctr. Room 7B

12659-3

#### High resolution thermally activated delayed fluorescence x-ray imaging scintillators (*Invited Paper*)

Author(s): Omar F. Abdelsaboor, King Abdullah Univ. of Science and Technology (Saudi Arabia)

20 August 2023 • 9:05 AM - 9:30 AM | Conv. Ctr. Room 7B

12659-4

#### Emissive properties of carborane containing conjugated polymers and small molecules (*Invited Paper*)

Author(s): Martin J. Heeney, King Abdullah Univ. of Science and Technology (Saudi Arabia)

20 August 2023 • 9:30 AM - 9:55 AM | Conv. Ctr. Room 7B

12659-6

#### Design strategies for high performance light-emitting triarylmethyl radicals

Author(s): Alexander J. C. Kuehne, Univ. Ulm (Germany)

20 August 2023 • 9:55 AM - 10:10 AM | Conv. Ctr. Room 7B

#### SESSION 2: ORGANIC LIGHT-EMITTING MATERIALS AND DEVICES I

20 August 2023 • 10:40 AM - 12:00 PM | Conv. Ctr. Room 7B  
Session Chair: Omar F. Abdelsaboor, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12659-7

#### Suppression of Dexter transfer by covalent encapsulation for efficient matrix-free narrowband deep blue hyperfluorescent OLEDs (*Invited Paper*)

Author(s): Hugo A. Bronstein, Univ. of Cambridge (United Kingdom)  
20 August 2023 • 10:40 AM - 11:05 AM | Conv. Ctr. Room 7B

12659-8

#### Exciplex-forming systems for high-efficiency OLEDs (*Invited Paper*)

Author(s): Ken-Tsung Wong, National Taiwan Univ. (Taiwan)  
20 August 2023 • 11:05 AM - 11:30 AM | Conv. Ctr. Room 7B

12659-9

#### Achieving long-lived, deep blue phosphorescent organic light-emitting diodes via polariton enhanced Purcell effect

Author(s): Haonan Zhao, Stephen R. Forrest, Boning Qu, Dejiu Fan, Univ. of Michigan (United States)  
20 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 7B

12659-10

#### Evidence for generation of trap states during degradation of TADF OLEDs

Author(s): Stefano Sem, Antonio Cabas Vidani, FLUXiM AG (Switzerland); Edoardo Stanzani, FLUXiM AG (Switzerland), Instituto de Ciencia Molecular, Univ. de València (Spain); Sandra Jenatsch, FLUXiM AG (Switzerland); Simon Zuefle, Beat Ruhstaller, FLUXiM AG (Switzerland), Zürcher Hochschule für Angewandte Wissenschaften (Switzerland)

20 August 2023 • 11:45 AM - 12:00 PM | Conv. Ctr. Room 7B

Lunch Break 12:00 PM - 1:30 PM

# TECHNICAL CONFERENCES

## Conference 12659

### SESSION 3: ORGANIC LIGHT-EMITTING MATERIALS AND DEVICES II

20 August 2023 • 1:30 PM - 3:20 PM | Conv. Ctr. Room 7B  
Session Chair: Seunghyup Yoo, KAIST (Republic of Korea)

12659-11

#### High-performance organic semiconductors for OLED and transistor devices (*Keynote Presentation*)

Author(s): Karl Leo, TU Dresden (Germany)  
20 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 7B

12659-12

#### Controlling charge accumulation properties at organic hetero-interfaces using dipolar doping of hole transport layers (*Invited Paper*)

Author(s): Yutaka Noguchi, Meiji Univ. (Japan); Alexander Hofmann, Wolfgang Brütting, Univ. Augsburg (Germany)  
20 August 2023 • 2:00 PM - 2:25 PM | Conv. Ctr. Room 7B

12659-13

#### Towards understanding the morphology of OLED light-emitting layers (*Invited Paper*)

Author(s): Paul L. Burn, The Univ. of Queensland (Australia)  
20 August 2023 • 2:25 PM - 2:50 PM | Conv. Ctr. Room 7B

12659-14

#### Impact of trap position on the current density-voltage characteristics of organic semiconductor devices

Author(s): Donghyun Ko, Jaesang Lee, Seoul National Univ. (Republic of Korea)  
20 August 2023 • 2:50 PM - 3:05 PM | Conv. Ctr. Room 7B

12659-15

#### Highly conductive and transparent PEDOT: PSS film prepared via Cesium salt treatment and its application in optoelectronics

Author(s): Begimai Adilbekova, Mohamad Insan Nugraha, Hendrik Faber, King Abdullah Univ. of Science and Technology (Saudi Arabia); Alberto Scaccabarozzi, Istituto Italiano di Tecnologia (Italy); Vladimir Bruevich, Rutgers, The State Univ. of New Jersey (United States); Dipti Naphade, Husam N. Alshareef, King Abdullah Univ. of Science and Technology (Saudi Arabia); Vitaly Podzorov, Rutgers, The State Univ. of New Jersey (United States); Leonidas Tsetseris, National Technical Univ. of Athens (Greece); Thomas D. Anthopoulos, King Abdullah Univ. of Science and Technology (Saudi Arabia)  
20 August 2023 • 3:05 PM - 3:20 PM | Conv. Ctr. Room 7B

Coffee Break 3:20 PM - 3:50 PM

### SESSION 4: ORGANIC LIGHT-EMITTING MATERIALS AND DEVICES III

20 August 2023 • 3:50 PM - 5:35 PM | Conv. Ctr. Room 7B  
Session Chair: Ken-Tsung Wong, National Taiwan Univ. (Taiwan)

12659-16

#### A general framework for composition- and process-control of spontaneous orientation polarization in OLEDs (*Invited Paper*)

Author(s): Russell J. Holmes, Univ. of Minnesota, Twin Cities (United States)  
20 August 2023 • 3:50 PM - 4:15 PM | Conv. Ctr. Room 7B

12659-17

#### Current challenges in light-emitting diodes for VR/AR displays (*Invited Paper*)

Author(s): Jaesang Lee, Seoul National Univ. (Republic of Korea)  
20 August 2023 • 4:15 PM - 4:40 PM | Conv. Ctr. Room 7B

12659-18

#### Bistable organic upconversion devices

Author(s): Raju Lampande, The Pennsylvania State Univ. (United States); Jon-Paul DesOrmeaux, OLEDWorks LLC (United States); Hunter Bowman, The Pennsylvania State Univ. (United States); John Hamer, OLEDWorks LLC (United States); Noel Christopher Giebink, The Pennsylvania State Univ. (United States)  
20 August 2023 • 4:40 PM - 4:55 PM | Conv. Ctr. Room 7B

12659-19

#### Balancing aggregate-induced quenching and emission to achieve ultralong room temperature phosphorescence in an organic semiconductor

Author(s): Jesse A. Wisch, Marko R. Ivancevic, Quinn C. Burlingame, Yueh-Lin Loo, Barry P. Rand, Princeton Univ. (United States)  
20 August 2023 • 4:55 PM - 5:10 PM | Conv. Ctr. Room 7B

12659-74

#### Modeling and design strategies for high-performance circularly polarized light-emitting diodes (*Invited Paper*)

Author(s): Changsoon Kim, Yongmoon Lee, Hyungchae Kim, Seoul National Univ. (Republic of Korea)  
20 August 2023 • 5:10 PM - 5:35 PM | Conv. Ctr. Room 7B

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)  
20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)  
20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)  
20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### SESSION 5: PEROVSKITE LIGHT-EMITTING MATERIALS AND DEVICES I

21 August 2023 • 8:45 AM - 10:00 AM | Conv. Ctr. Room 7B  
Session Chair: Biwu Ma, Florida State Univ. (United States)

12659-22

#### Understanding white-light emission from layered halide perovskites (*Invited Paper*)

Author(s): Hemamala Karunadasa, Ethan Crace, Kurt Lindquist, Alexander Su, Joseph Thomaz, Michael Fayer, Stanford Univ. (United States)

21 August 2023 • 8:45 AM - 9:10 AM | Conv. Ctr. Room 7B

12659-24

#### Tuning the ionic and optical properties of halide perovskites (*Invited Paper*)

Author(s): Nripan Mathews, Nanyang Technological Univ. (Singapore)  
21 August 2023 • 9:10 AM - 9:35 AM | Conv. Ctr. Room 7B

12659-36

#### Spin switchable circularly polarized photoluminescence in 2D-superlattice perovskite film (*Invited Paper*)

Author(s): Bin A. Hu, The Univ. of Tennessee Knoxville (United States)

21 August 2023 • 9:35 AM - 10:00 AM | Conv. Ctr. Room 7B

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 6: PEROVSKITE LIGHT-EMITTING MATERIALS AND DEVICES II

21 August 2023 • 10:30 AM - 11:45 AM | Conv. Ctr. Room 7B  
Session Chair: Letian Dou, Purdue Univ. (United States)

12659-25

#### Light emitting diodes based on metal halide perovskites and perovskite-related materials (*Invited Paper*)

Author(s): Biwu Ma, Florida State Univ. (United States)

21 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 7B

12659-26

#### Perovskite nanocrystal light-emitting diodes for efficient, stable, and bright displays (*Invited Paper*)

Author(s): Tae-Woo Lee, Seoul National Univ. (Republic of Korea)

21 August 2023 • 10:55 AM - 11:20 AM | Conv. Ctr. Room 7B

12659-27

#### Blue LEDs based on mixed halide perovskites (*Invited Paper*)

Author(s): Feng Gao, Linköping Univ. (Sweden)

21 August 2023 • 11:20 AM - 11:45 AM | Conv. Ctr. Room 7B

Lunch Break 11:45 AM - 1:45 PM

#### SESSION 7: ORGANIC AND PEROVSKITE LASERS

21 August 2023 • 1:45 PM - 3:05 PM | Conv. Ctr. Room 7B  
Session Chair: Feng Gao, Linköping Univ. (Sweden)

12659-29

#### Colloidal quantum dot laser diodes (*Keynote Presentation*)

Author(s): Victor I. Klimov, Los Alamos National Lab. (United States)

21 August 2023 • 1:45 PM - 2:15 PM | Conv. Ctr. Room 7B

12659-30

#### Approaches to electrically driven organic semiconductor lasers (*Invited Paper*)

Author(s): Kou Yoshida, Junyi Gong, Graham Turnbull, Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

21 August 2023 • 2:15 PM - 2:40 PM | Conv. Ctr. Room 7B

12659-31

#### Light emission and lasing in organic semiconductor-incorporated perovskites (OSIPs) (*Invited Paper*)

Author(s): Letian Dou, Purdue Univ. (United States)

21 August 2023 • 2:40 PM - 3:05 PM | Conv. Ctr. Room 7B

Coffee Break 3:05 PM - 3:35 PM

#### SESSION 8: PHOTOPHYSICS OF PEROVSKITE LIGHT-EMITTING MATERIALS

21 August 2023 • 3:35 PM - 5:30 PM | Conv. Ctr. Room 7B  
Session Chair: Tae-Woo Lee, Seoul National Univ. (Republic of Korea)

12659-32

#### Real time tracing of superradiant phase transition in lead-halide Perovskites (*Invited Paper*)

Author(s): Kenan Gundogdu, North Carolina State Univ. (United States)

21 August 2023 • 3:35 PM - 4:00 PM | Conv. Ctr. Room 7B

12659-33

#### Revealing charge-carrier complexes and interactions in single lead-halide perovskites nanocrystals (*Invited Paper*)

Author(s): Brahim Lounis, Lab. Photonique, Numérique et Nanosciences (France)

21 August 2023 • 4:00 PM - 4:25 PM | Conv. Ctr. Room 7B

12659-34

#### Control of polarization in 2D metal-halide perovskites (*Invited Paper*)

Author(s): Lina Quan, Virginia Polytechnic Institute and State Univ. (United States)

21 August 2023 • 4:25 PM - 4:50 PM | Conv. Ctr. Room 7B

12659-35

#### Bright excitons and exciton complexes in CsPbBr<sub>3</sub> quantum dots (*Invited Paper*)

Author(s): Gabriele Raino, Chenglian Chu, ETH Zurich (Switzerland); Tan Nguyen, Univ. Rennes (France); Simon Böhme, Dmitry Dirin, ETH Zurich (Switzerland); Maryna Bodnarchuk, EMPA (Switzerland); Claudine Katan, Jacky Even, Univ. Rennes (France); Maksym V. Kovalenko, ETH Zurich (Switzerland)

21 August 2023 • 4:50 PM - 5:15 PM | Conv. Ctr. Room 7B

# TECHNICAL CONFERENCES

## Conference 12659

12659-37

### Bright circularly-polarized photoluminescence in chiral layered lead-halide perovskites

Author(s): Shangpu Liu, Felix Deschler, Stanislav Bodnar, Ruprecht-Karls-Univ. Heidelberg (Germany)

21 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 7B

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12659-47

### The trade-off between efficiency and stability in Mn<sup>2+</sup> doped perovskite light-emitting diodes

Author(s): Sebastian Fernandez, William Michaels, Manchen Hu, Pournima Narayanan, Natalia Murrietta, Arynn O. Gallegos, Ghada H. Ahmed, Junrui Lyu, Stanford Univ. (United States); Mahesh Gangishetty, Mississippi State Univ. (United States); Daniel N. Congreve, Stanford Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-48

### Strain-enhanced photoluminescence in soluble phthalocyanine thin films

Author(s): Libin Liang, The Univ. of Vermont (United States); Madalina Furis, Varun Nitin Mapara, Tabassum Haque Joyee, The Univ. of Oklahoma (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-49

### Ultrahigh-resolution transfer printing of nanocrystals for next-generation displays

Author(s): Jiwoong Yang, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea); Moon Kee Choi, Ulsan National Institute of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-51

### Hole transport materials for QLEDs: a combined approach of machine learning and atomistic simulation

Author(s): Hadi Abroshan, H. Shaun Kwak, Anand Chandrasekaran, Alex K. Chew, Alexandr Fonari, Mathew D. Halls, Schrödinger, LLC (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-53

### Rational design of silicone-incorporated organic light-emitting semiconductor for anisotropic micro-lithography

Author(s): Hyukmin Kweon, Hanyang Univ. (Republic of Korea); Keun-Yeong Choi, Ryungyu Lee, Soongsil Univ. (Republic of Korea); Ukjin Jeong, Borina Ha, Hanyang Univ. (Republic of Korea); Jang-Yeon Kwon, Yonsei Univ. (Republic of Korea); Kwun-Bum Chung, Dongguk Univ. (Republic of Korea); Moon Sung Kang, Sogang Univ. (Republic of Korea); Hojin Lee, Soongsil Univ. (Republic of Korea); Do Hwan Kim, Hanyang Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-54

### Demonstration of micro-OLED systems using MoS<sub>2</sub>-based multilayer electrodes

Author(s): Nahyun Kim, Seok Hee Hong, Wanqi Ren, Ho Jin Lee, Jinkyung Lee, Tae Geun Kim, Korea Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-57

### Distributed feedback cavity optimization of thin film lasers using deep-UV lithography defined high-quality gratings

Author(s): Nirav Annavarapu, Iakov Goldberg, Karim Elkhoully, Jan Genoe, imec (Belgium), KU Leuven (Belgium); Robert Gehlhaar, imec (Belgium); Paul Heremans, imec (Belgium), KU Leuven (Belgium)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-58

### In-plane electric-field-driven stretchable composite system for intense electroluminescence and mechanoluminescence

Author(s): Soon Moon Jeong, Seongkyu Song, Daegu Gyeongbuk Institute of Science & Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-59

### Dynamic behaviors of one- and two-photon light emission in single crystalline perovskite-nanoparticle hybrid configurations

Author(s): Tsung Sheng Kao, National Yang Ming Chiao Tung Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-60

### Investigation of random lasing action in the dye solution and perovskite thin films via the Monte Carlo simulations

Author(s): Tsung Sheng Kao, National Yang Ming Chiao Tung Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-61

### Analysis of the efficiency performance of different bilayered triplet-triplet fusion OLEDs with carriers and exciton simulations

Author(s): Hsiao-Chun Hung, Chia-Hsun Chen, Hung-Yi Lin, National Taiwan Univ. (Taiwan); Bo-Yen Lin, National Dong Hwa Univ. (Taiwan); Lian-Chun Huang, Yuan-Zhen Zhuang, Jiun-Haw Lee, National Taiwan Univ. (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan); Yuh-Renn Wu, National Taiwan Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A



12659-62

### **Efficient deep blue organic light-emitting diodes via the control of host-matrix morphology**

Author(s): Haonan Zhao, Jongchan Kim, Univ. of Michigan (United States); Jun Yeob Lee, Sungkyunkwan Univ. (Republic of Korea); Stephen R. Forrest, Univ. of Michigan (United States); Kan Ding, Harald Ade, North Carolina State Univ. (United States); Mina Jung, Max-Planck-Institut für Festkörperforschung (Germany); Yongxi Li, Univ. of Michigan (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-63

### **A novel approach to investigate degradation in inverted quantum dots light-emitting devices**

Author(s): Azadinia Mohsen, Hany Aziz, Univ. of Waterloo (Canada)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-64

### **Low divergent OLED**

Author(s): Shichen Yin, Franky So, North Carolina State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-65

### **Impact of Bi doping on the structural and optical properties of the lead-free double perovskites (Cs<sub>2</sub>SnCl<sub>6</sub>:Bi<sup>3+</sup>) for optoelectronic applications**

Author(s): Ajay Kumar, Neelu Sharma, Rajib Saha, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-66

### **Selection of hole transport layer for Pb-Sn binary perovskite solar cells**

Author(s): Chandan Howlader, Wilhelmus J. Geerts, Maggie Y. Chen, Texas State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-67

### **Synthesis and characterization of cesium europium chloride bromide lead-free Perovskite nanocrystals**

Author(s): Emmanuel Reyes, Humberto Sánchez, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Diego Esparza, Universidad Autónoma de Zacatecas (Mexico); Haggeo Desinera, Centro de Investigaciones en Óptica A.C. (Mexico); Jaime Espino, Anabel Herrera, Tzarara Lopez, Univ. Michoacana de San Nicolás de Hidalgo (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-69

### **Perovskite distributed feedback lasers by using gelatin grating for thermal nanoimprint**

Author(s): Isabel Allegro, Karlsruher Institut für Technologie (Germany); Víctor Bonal, Univ. de Alicante (Spain); Emil R. Mamleyev, Karlsruher Institut für Technologie (Germany); José M. Villalvilla, José A. Quintana, Univ. de Alicante (Spain); Qihao Jin, Ulrich Lemmer, Karlsruher Institut für Technologie (Germany); Maria A. Diaz-Garcia, Univ. de Alicante (Spain)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-70

### **Hot electron injection at FAPbBr<sub>3</sub>/IEICO-4F interface tracked by femtosecond mid-IR spectroscopy**

Author(s): Issatay Nadinov, Khulud Almasabi, Luis Gutiérrez-Arzaluz, Simil Thomas, Osman M. Bakr, Husam N. Alshareef, Omar F. Abdelsaboor, King Abdullah Univ. of Science and Technology (Saudi Arabia)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-71

### **Combinatorically inkjet-printed metal halide perovskite large area optoelectronic devices**

Author(s): Emil J. W. List-Kratochvil, Humboldt-Univ. zu Berlin (Germany)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-72

### **First principle study of electronic and optical properties of lead-free double perovskites Sr<sub>2</sub>LaZrO<sub>6</sub> using modified Becke Johnson potential study**

Author(s): P. Pavan K. Reddy, Vidya Jyothi Institute of Technology (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12659-73

### **Unleashing the potential of novel deep-blue 2-coordinate Au TADF complexes with short radiative lifetimes as emitters in OLEDs**

Author(s): Jonas Schaab, Collin N. Muniz, Anton Razgoniaev, Peter Djurovich, Mark E. Thompson, The Univ. of Southern California (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12659

TUESDAY 22 AUGUST 2023

### ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

22 August 2023 • 8:35 AM - 11:50 AM | Conv. Ctr. Room 6A

Session Chairs: Zakya H. Kafafi, Lehigh Univ. (United States); Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

#### Welcome and Opening Remarks

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-601

#### Organic photothermal films for light induced thermal engineering and photoenergy harvesting (*Plenary Presentation*)

Author(s): Eunkyong Kim, Yonsei Univ. (Republic of Korea)

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-602

#### Solution-processed organic solar cells: current progress and challenges (*Plenary Presentation*)

Author(s): Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States)

22 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

Coffee Break 10:00 AM - 10:30 AM

12661-603

#### Photonic interfaces for abiotic/biotic coupling (*Plenary Presentation*)

Author(s): Guglielmo Lanzani, Istituto Italiano di Tecnologia (Italy)

22 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 6A

12659-604

#### Strong light-matter coupling in molecules and 2D materials: from condensation to quantum nonlinearity (*Plenary Presentation*)

Author(s): Vinod M. Menon, The City College of New York (United States)

22 August 2023 • 11:10 AM - 11:50 AM | Conv. Ctr. Room 6A

Lunch/Exhibition Break 11:50 AM - 1:30 PM

### SESSION 9: FABRICATION OF FULL COLOR, PATTERNED, AND STRETCHABLE DISPLAYS I

22 August 2023 • 1:30 PM - 3:35 PM | Conv. Ctr. Room 7B  
Session Chair: Sihong Wang, The Univ. of Chicago (United States)

12659-38

#### Organic light-emitting diode (OLED) based bio-platform for phototherapeutics (*Invited Paper*)

Author(s): Yongjin Park, Eunhae Cho, Hyejeong Yeon, Young Cheol Seo, KAIST (Republic of Korea); Yongmin Jeon, Gachon Univ. (Republic of Korea); Kyung Cheol Choi, KAIST (Republic of Korea)

22 August 2023 • 1:30 PM - 1:55 PM | Conv. Ctr. Room 7B

12659-45

#### Morphing organic electroluminescence into different shapes and forms (*Invited Paper*)

Author(s): Malte C. Gather, Univ. zu Köln (Germany)

22 August 2023 • 1:55 PM - 2:20 PM | Conv. Ctr. Room 7B

12659-40

#### Directly patterned perovskite metamaterial, light source, and photodetector (*Invited Paper*)

Author(s): Qing Gu, North Carolina State Univ. (United States)

22 August 2023 • 2:20 PM - 2:45 PM | Conv. Ctr. Room 7B

12659-41

#### Silicone-engineered anisotropic lithography for solution-processed, ultrahigh-density OLEDs (*Invited Paper*)

Author(s): Do Hwan Kim, Hanyang Univ. (Republic of Korea)

22 August 2023 • 2:45 PM - 3:10 PM | Conv. Ctr. Room 7B

12659-42

#### Dry transfer printing of nanomaterials for the high resolution, highly efficient, and wearable displays (*Invited Paper*)

Author(s): Moon Kee Choi, Ulsan National Institute of Science and Technology (Republic of Korea)

22 August 2023 • 3:10 PM - 3:35 PM | Conv. Ctr. Room 7B

Coffee Break 3:35 PM - 4:00 PM

### SESSION 10: FABRICATION OF FULL COLOR, PATTERNED, AND STRETCHABLE DISPLAYS II

22 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 7B  
Session Chair: Do Hwan Kim, Hanyang Univ. (Republic of Korea)

12659-39

#### Tailoring OLEDs for healthcare applications (*Invited Paper*)

Author(s): Seunghyup Yoo, Jee Hoon Sim, Woochan Lee, Dong-ho Choi, KAIST (Republic of Korea)

22 August 2023 • 4:00 PM - 4:25 PM | Conv. Ctr. Room 7B

12659-44

#### Stretchable light-emitting polymers and devices based on thermally activated delayed fluorescence (TADF) (*Invited Paper*)

Author(s): Sihong Wang, Wei Liu, Cheng Zhang, Juan J. de Pablo, The Univ. of Chicago (United States)

22 August 2023 • 4:25 PM - 4:50 PM | Conv. Ctr. Room 7B

12659-43

#### Intrinsically stretchable organic light emitting diodes for next generation displays (*Invited Paper*)

Author(s): Jin-Woo Park, Yonsei Univ. (Republic of Korea)

22 August 2023 • 4:50 PM - 5:15 PM | Conv. Ctr. Room 7B

12659-46

#### Additive blending system of electron transport layer for intrinsically stretchable organic light-emitting diode

Author(s): Jeheon Oh, Jin-Woo Park, Yonsei Univ. (Republic of Korea)

22 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 7B

## Conference 12660

# Organic, Hybrid, and Perovskite Photovoltaics XXIV

22 - 24 August 2023 | Conv. Ctr. Room 10

Conference Chairs: **Gang Li**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Natalie Stingelin**, Georgia Institute of Technology (United States)

Conference Co-Chairs: **Ana Flávia Nogueira**, Univ. of Campinas (Brazil); **Thuc-Quyen Nguyen**, Univ. of California, Santa Barbara (United States); **Ellen Moons**, Karlstad Univ. (Sweden); **Barry P. Rand**, Princeton Univ. (United States)

Program Committee: **Harald W. Ade**, North Carolina State Univ. (United States); **Derya Baran**, King Abdullah Univ. of Science and Technology (Saudi Arabia); **David Beljonne**, Univ. de Mons (Belgium); **Hendrik J. Bolink**, Univ. de València (Spain); **Paul L. Burn**, The Univ. of Queensland (Australia); **Alexander Colsmann**, Karlsruhe Institut für Technologie (Germany); **Daniel Congreve**, Stanford Univ. (United States); **Renaud Demadrille**, Systèmes Moléculaires et nanoMatériaux pour l'Énergie et la Santé (France); **Giulia Grancini**, Univ. degli Studi di Pavia (Italy); **Martin J. Heaney**, Imperial College London (United Kingdom); **Zakya H. Kafafi**, Lehigh Univ. (United States); **Bumjoon Kim**, KAIST (Republic of Korea); **Monica Lira-Cantú**, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); **Paul Meredith**, Swansea Univ. (United Kingdom); **Hideo Ohkita**, Kyoto Univ. (Japan); **Annamaria Petrozza**, Istituto Italiano di Tecnologia (Italy); **Ifor D. W. Samuel**, Univ. of St. Andrews (United Kingdom); **Shuxia Tao**, Technische Univ. Eindhoven (Netherlands); **Yana Vaynzof**, TU Dresden (Germany); **Iris Visoly-Fisher**, Ben-Gurion Univ. of the Negev (Israel); **Atsushi Wakamiya**, Kyoto Univ. (Japan); **Hin-Lap (Angus) Yip**, City Univ. of Hong Kong (Hong Kong, China)

### SUNDAY 20 AUGUST 2023

#### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (Plenary Presentation)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (Plenary Presentation)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (Plenary Presentation)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12660-33

#### First principle study of electronic and optical properties lead-free of double perovskites Na<sub>2</sub>XAgCl<sub>6</sub> (X = Al; Ga,) using modified Becke Johnson potential study

Author(s): P. Pavan K. Reddy, Vidya Jyothi Institute of Technology (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-34

#### Photoexcited charge carrier and spin dynamics in methylammonium lead bromide doped by magnetic transition metals

Author(s): Stanislav Bodnar, Jonathan Zerhoch, Shanpu Liu, Andrii Shcherbakov, Felix Deschler, Ruprecht-Karls-Univ. Heidelberg (Germany)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-35

#### Unlocking the ambient temperature effect on FA-based perovskites crystallization by in-situ optical method

Author(s): Yunfan Wang, Zixin Zeng, Sai Wing Tsang, Sudhi Mahadevan, City Univ. of Hong Kong (Hong Kong, China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12660

12660-36

### Unraveling the crystallization process in mix halide wide bandgap perovskite by in-situ dynamic optical probing

Author(s): Zixin Zeng, Yunfan Wang, Sai Wing Tsang, Sudhi Mahadevan, City Univ. of Hong Kong (Hong Kong, China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-38

### Study on photo-induced carrier dynamics of mixed perovskite solar cells exposed to atmospheric conditions using ultrafast transient absorption spectroscopy

Author(s): Cheol Jo, Gwangju Institute of Science and Technology (Republic of Korea); Heejoo Kim, Gwangju Institute of Science and Technology (Kiribati, Republic of); Do-Kyeong Ko, Gwangju Institute of Science and Technology (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-39

### Novel oligomers enable high-efficiency, eco-friendly and scalable organic solar cells enabled via regulating morphology and mitigating energy losses

Author(s): Ying Zhang, Hao Xia, Gang Li, The Hong Kong Polytechnic Univ. (Hong Kong, China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-40

### The role of poly siloxane-spacer in Y6 derivative acceptor copolymers of all-polymer solar cells for mechanical robustness

Author(s): Jingwan Kim, Gyeongsang National Univ. (Republic of Korea); Jin-Woo Lee, KAIST (Republic of Korea); Yun-Hi Kim, Gyeongsang National Univ. (Republic of Korea); Bumjoon J. Kim, Sun-Woo Lee, KAIST (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-41

### Secondary ion mass spectrometry study of organic and inorganic interfaces in methylammonium lead triiodide solar cells

Author(s): Beatriz Montano, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); José Juan Jhonatan Díaz López, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico); Yuriy Kudriavtsev, Ctr. de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico); Ismael Cosme Bolaños, Svetlana Mansurova, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-43

### Photo electromotive force induced by running fringes for determination of ion mobility in perovskite semiconductors

Author(s): Ana Karem Vega Salgado, Nikolai Korneev, Rafael Valencia Yescas, Svetlana Mansurova, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Klaus Meerholz, Univ. zu Köln (Germany); Ismael Cosme Bolaños, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-44

### Effect of reaction temperature on CsPbBr<sub>3</sub> perovskite quantum dots with photovoltaic applications

Author(s): Hazael Ociel Ramírez-Ferreira, Ma. del Socorro Aguilar, Instituto de Investigación en Metalurgia y Materiales, Univ. Michoacana de San Nicolás de Hidalgo (Mexico); Isaac Zarazúa, Univ. de Guadalajara (Mexico); Haggeo Desirena, Centro de Investigaciones en Óptica, A.C. (Mexico); Anabel Herrera-Rodríguez, Tzarara López-Luke, Univ. Michoacana de San Nicolás de Hidalgo (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-46

### Screening of solvents for perovskite solar cells by using reverse engineering approach

Author(s): Luis Eduardo Ramirez Cardenas, Sophie Thiebaud-Roux, Vincent Gerbaud, Rachid Ouaret, Ecole Nationale Supérieure des Ingénieurs en Arts Chimique et Technologiques (France); Thomas Heiser, Lab. des sciences de l'Ingénieur, de l'Informatique et de l'Imagerie (France), Univ. de Strasbourg (France); Ivonne Rodriguez Donis, Ecole Nationale Supérieure des Ingénieurs en Arts Chimique et Technologiques (France)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-47

### Reduced graphene oxide (rGO)-CsSnI<sub>3</sub> nanocomposites: A cost-effective technique to improve the structural and optical properties for optoelectronic device applications

Author(s): Ajay Kumar, Rajib Saha, Deepak Punetha, Nivedita Pandey, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-48

### 2D modeling of perovskite/Si tandem solar cell

Author(s): Yegao Xiao, Michel Lestrade, Zhiqiang Li, Zhanming S. Li, Crosslight Software Inc. (Canada)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-50

### Impact of morphology change on hole transfer dynamic during charge separation process

Author(s): Dong Chan Lee, Jiho Ryu, Univ. of Ulsan (Republic of Korea); Chang-Mok Oh, In-Wook Hwang, Gwangju Institute of Science and Technology (Republic of Korea); Shinuk Cho, Univ. of Ulsan (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-52

### Reduced dark current density in organic photodiode with conjugated polymers bearing fluorinated moiety

Author(s): Jiyoul Lee, Pukyong National Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12660-53

### ZTO-based electron transporting layer improves the device performance in kesterite thin film solar cells

Author(s): Nafees Ahmad, Central South Univ. (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

### TUESDAY 22 AUGUST 2023

#### ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

22 August 2023 • 8:35 AM - 11:50 AM | Conv. Ctr. Room 6A

Session Chairs: Zakya H. Kafafi, Lehigh Univ. (United States); Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

#### Welcome and Opening Remarks

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-601

#### Organic photothermal films for light induced thermal engineering and photoenergy harvesting (*Plenary Presentation*)

Author(s): Eunkyong Kim, Yonsei Univ. (Republic of Korea)

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-602

#### Solution-processed organic solar cells: current progress and challenges (*Plenary Presentation*)

Author(s): Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States)

22 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

#### Coffee Break 10:00 AM - 10:30 AM

12661-603

#### Photonic interfaces for abiotic/biotic coupling (*Plenary Presentation*)

Author(s): Guglielmo Lanzani, Istituto Italiano di Tecnologia (Italy)

22 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 6A

12659-604

#### Strong light-matter coupling in molecules and 2D materials: from condensation to quantum nonlinearity (*Plenary Presentation*)

Author(s): Vinod M. Menon, The City College of New York (United States)

22 August 2023 • 11:10 AM - 11:50 AM | Conv. Ctr. Room 6A

#### Lunch/Exhibition Break 11:50 AM - 2:00 PM

#### SESSION 1: ORGANIC AND HYBRID MATERIALS IN PHOTOVOLTAICS

#### Joint Session with Conferences 12650 and 12660

22 August 2023 • 2:00 PM - 5:10 PM | Conv. Ctr. Room 10

Session Chairs: Derya Baran, King Abdullah Univ. of Science and Technology (Saudi Arabia), Gang Li, The Hong Kong Polytechnic Univ. (Hong Kong, China)

12660-6

#### Conjugated polymers and polyelectrolytes for organic- and organic/inorganic hybrid solar cells (*Invited Paper*)

Author(s): Han Young Woo, Korea Univ. (Republic of Korea)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 10

12660-2

#### Photostability of Y-type electron acceptor molecules and their copolymers

Author(s): Suraj Prasad, Cleber Marchiori, Karlstad Univ. (Sweden); Zewdneh Genene Wolkeba, Chalmers Univ. of Technology (Sweden); Leif K. E. Ericsson, C. Moyses Araujo, Karlstad Univ. (Sweden); Ergang Wang, Chalmers Univ. of Technology (Sweden); Ellen Moons, Karlstad Univ. (Sweden)

22 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 10

12650-33

#### Mind the subgap: The important role of midgap trap states in organic and perovskite semiconductors (*Invited Paper*)

Author(s): Ardalan Armin, Swansea Univ. (United Kingdom)

22 August 2023 • 2:50 PM - 3:20 PM | Conv. Ctr. Room 10

#### Coffee Break 3:20 PM - 3:50 PM

12650-34

#### Highly emissive layered double perovskites: Exploring photophysical properties and applications (*Invited Paper*)

Author(s): Diego Solis-Ibarra, Instituto de Investigaciones en Materiales, Univ. Nacional Autónoma de México (Mexico)

22 August 2023 • 3:50 PM - 4:20 PM | Conv. Ctr. Room 10

12650-35

#### A new doping strategy of Spiro-OMeTAD: Towards instantly efficient and stable perovskite solar cells (*Invited Paper*)

Author(s): Feng Gao, Linköping Univ. (Sweden)

22 August 2023 • 4:20 PM - 4:50 PM | Conv. Ctr. Room 10

12660-29

#### Understanding charge-transporting layers for perovskite solar cells

Author(s): Mathias Nyman, Christian Ahläng, Sebastian Wilken, Abo Akademi Univ. (Finland); Changzeng Ding, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China); Li Yin, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China), Xi'an Jiaotong-Liverpool Univ. (China); Chang-Qi Ma, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China); Ronald Österbacka, Abo Akademi Univ. (Finland), Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences (China)

22 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 10

### WEDNESDAY 23 AUGUST 2023

#### SESSION 2: PEROVSKITE PVS: FILM GROWTH AND CHARACTERIZATION

23 August 2023 • 8:30 AM - 10:20 AM | Conv. Ctr. Room 10

Session Chair: Gang Li,  
The Hong Kong Polytechnic Univ. (Hong Kong, China)

12660-21

#### Controlled epitaxial growth and fabrication of flexible hybrid halide perovskites (*Invited Paper*)

Author(s): Sheng Xu, Univ. of California, San Diego (United States)

23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 10

# TECHNICAL CONFERENCES

## Conference 12660

12660-3

### **Vacuum processing of perovskite films and solar cells** *(Invited Paper)*

Author(s): Michele Sessolo, Univ. de València (Spain)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 10

12660-4

### **Understanding and designing interfaces and defects in perovskite solar cells** *(Invited Paper)*

Author(s): Juan-Pablo Correa-Baena, Georgia Institute of Technology (United States)

23 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 10

12660-5

### **Defects, devices, and degradation of metal halide perovskites: an electrochemist's perspective**

Author(s): Erin L. Ratcliff, The Univ. of Arizona (United States)

23 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 10

**Coffee Break 10:20 AM - 10:50 AM**

### **SESSION 3: ORGANIC MATERIALS SYNTHESIS AND CHARACTERIZATION**

23 August 2023 • 10:50 AM - 12:40 PM | Conv. Ctr. Room 10

Session Chair: Ellen Moons, Karlstad Univ. (Sweden)

12660-1

### **Solar cells made of completely amorphous donor polymers** *(Invited Paper)*

Author(s): Mats R. Andersson, Flinders Univ. (Australia)

23 August 2023 • 10:50 AM - 11:20 AM | Conv. Ctr. Room 10

12660-7

### **Design of low complexity active materials for photovoltaic applications** *(Invited Paper)*

Author(s): Martin J. Heeney, King Abdullah Univ. of Science and Technology (Saudi Arabia)

23 August 2023 • 11:20 AM - 11:50 AM | Conv. Ctr. Room 10

12660-8

### **Leveraging thermotropic order to control photophysical response in PBTTT**

Author(s): Mark Weber, Anush Singhal, Teerapat Lapsirivatkul, Carlos Silva, Natalie Stingelin, Georgia Institute of Technology (United States)

23 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 10

12660-9

### **A hybrid bottom-up and top-down nmr crystallography approach for resolving structure-stability-property interrelations in non-fullerene acceptor organic solar cells** *(Invited Paper)*

Author(s): Hervé Vezin, Univ. de Lille (France), Lab. de Spectrochimie Infrarouge et Raman, CNRS (France); Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States); Manjunatha Reddy G. N., Univ. de Lille (France), Univ. d'Artois (France), Ctr. National de la Recherche Scientifique (France)

23 August 2023 • 12:10 PM - 12:40 PM | Conv. Ctr. Room 10

**Lunch/Exhibition Break 12:40 PM - 2:10 PM**

### **SESSION 4: DEVICES: OPVS, PHOTODETECTORS, AND BEYOND**

23 August 2023 • 2:10 PM - 3:30 PM | Conv. Ctr. Room 10

Session Chair: Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States)

12660-10

### **Binary organic solar cell with 19.31% enabled by non-monotonic intermediate state transition**

Author(s): Gang Li, Jiehao Fu, Patrick W. K. Fong, The Hong Kong Polytechnic Univ. (Hong Kong, China)

23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 10

12660-11

### **Design rules for nanoparticle dispersions towards the fabrication of efficient organic solar cells**

Author(s): Karen Fischer, Jonas Armleder, Felix Manger, Philipp Marlow, Christian Sprau, Holger Röhm, Alexander Colsmann, Karlsruher Institut für Technologie (Germany)

23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 10

12660-12

### **High-reproducibility production of solution processable near-infrared organic photodiode materials and inks for the image sensor industry**

Author(s): Hidenori Nakayama, Shigeru Nakane, Yasuo Miyata, Kazuhiro Mouri, Kazuhiro Nakabayashi, Izuru Takei, Mitsubishi Chemical Corp. (Japan)

23 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 10

12660-13

### **Throwing light on experimentally measured dark characteristics of organic photodiodes**

Author(s): Siddhartha Saggar, Giedrius Puidokas, Caroline Murawski, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V. (Germany)

23 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 10

**Coffee Break 3:30 PM - 4:00 PM**

### **SESSION 5: DEVICES: IMPLEMENTATION AND LIGHT/HEAT MANAGEMENT**

23 August 2023 • 4:00 PM - 5:10 PM | Conv. Ctr. Room 10

Session Chair: Alexander Colsmann, Karlsruher Institut für Technologie (Germany)

12660-14

### **Indoor light harvesting for the IoT: an ideal application for organic photovoltaics?** *(Invited Paper)*

Author(s): Paul Meredith, Swansea Univ. (United Kingdom)

23 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 10

12660-15

### **Leveraging extraordinary optical properties of inorganic lead halide perovskites for photonic luminescent solar concentrators**

Author(s): Lindsey E. Parsons, Carissa N. Eisler, Univ. of California, Los Angeles (United States)

23 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 10

12660-16

### **Polymer-based chirped broadband reflectors for thermal management**

Author(s): Joseph Mushyakov, Victoria Quiros Cordero, Georgia Institute of Technology (United States); Alex Balzer, Univ. of Delaware (United States); Carlos Silva, Natalie Stingelin, Georgia Institute of Technology (United States)

23 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 10

## THURSDAY 24 AUGUST 2023

### SESSION 6: DEVICES: PSC

24 August 2023 • 8:30 AM - 10:10 AM | Conv. Ctr. Room 10

Session Chair: Antonio Cabas Vidani, FLUXiM AG (Switzerland)

12660-17

### **Is charge generation in hybrid perovskites limited by diffusion or the interface?** (*Invited Paper*)

Author(s): Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

24 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 10

12660-18

### **Tin based perovskite solar cells and all-perovskite tandem solar cells**

Author(s): Shuzi Hayase, Liang Wang, Takeshi Kitamura, Huan Bi, Gaurav Kapil, The Univ. of Electro-Communications (Japan); Hiroshi Segawa, The Univ. of Tokyo (Japan); Saulius Grigalevicius, Kaunas Univ. of Technology (Lithuania)

24 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 10

12660-19

### **Semitransparent perovskite solar cells through a photonic approach** (*Invited Paper*)

Author(s): Sofia Masi, INAM, Universidad Jaume I (Spain); Marco Mazzeo, Università del Salento (Italy); Iván Mora-Seró, INAM (Spain)

24 August 2023 • 9:20 AM - 9:50 AM | Conv. Ctr. Room 10

12660-20

### **Constructing efficient and stable formamidinium-based perovskite photovoltaics**

Author(s): Rui Wang, Westlake Univ. (China)

24 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 10

**Coffee Break 10:10 AM - 10:40 AM**

### SESSION 7: PHOTOPHYSICS OF OSCS

24 August 2023 • 10:40 AM - 12:30 PM | Conv. Ctr. Room 10

Session Chair: Paul Meredith, Swansea Univ. (United Kingdom)

12660-22

### **Triplet excitons in organic solar cells** (*Invited Paper*)

Author(s): Alex Gillett, Univ. of Cambridge (United Kingdom)

24 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 10

12660-23

### **Electron-hole dynamics in high-efficiency organic solar cell materials**

Author(s): Philip Chow, The Univ. of Hong Kong (Hong Kong, China)

24 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 10

12660-24

### **Rapid exciton diffusion in non-fullerene acceptors and its implications for OPV device architectures and computational materials screening**

Author(s): Justin M. Hodgkiss, Victoria Univ. of Wellington (New Zealand)

24 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 10

12660-25

### **On the study of intermolecular charge transfer in aggregated non-fullerene acceptors using electroabsorption spectroscopy**

Author(s): Sudhi Mahadevan, City Univ. of Hong Kong (Hong Kong, China); Taili Liu, Yunnan Normal Univ. (China); Sai Wing Tsang, City Univ. of Hong Kong (Hong Kong, China)

24 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 10

12660-26

### **Deciphering the difference between flexible chain and hairy-rod polymer semiconductors**

Author(s): Natalie Stingelin, Georgia Institute of Technology (United States)

24 August 2023 • 12:10 PM - 12:30 PM | Conv. Ctr. Room 10

**Lunch/Exhibition Break 12:30 PM - 2:00 PM**

### SESSION 8: DEVICE PHYSICS AND FABRICATION

24 August 2023 • 2:00 PM - 3:10 PM | Conv. Ctr. Room 10

Session Chairs: Michele Sessolo, Univ. de València (Spain), Sofia Masi, Univ. Jaume I (Spain)

12660-27

### **Exploring structure, composition, and performance relationships in perovskite photovoltaics** (*Invited Paper*)

Author(s): Martyn A. McLachlan, Imperial College London (United Kingdom)

24 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 10

12660-28

### **Aging and characterization of high-bandgap perovskites for all thin-film tandem solar cell devices**

Author(s): Antonio Cabas Vidani, Sandra Jenatsch, FLUXiM AG (Switzerland); Radha Kothandraman, Fan Fu, EMPA (Switzerland); Arno Gadola, FLUXiM AG (Switzerland); Simon Zuefle, Beat Ruhstaller, FLUXiM AG (Switzerland), Zürcher Hochschule für Angewandte Wissenschaften (Switzerland)

24 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 10

12660-30

### **Efficient metal-halide perovskite photovoltaic cells deposited via vapor transport deposition**

Author(s): Wan-Ju Hsu, Emma C. Pettit, Univ. of Minnesota (United States); Richard Swartwout, Tamar Kadosh, Shreyas Srinivasan, Ella Wassweiler, Vladimir Bulovic, Massachusetts Institute of Technology (United States); Russell J. Holmes, Univ. of Minnesota (United States)

24 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 10

# TECHNICAL CONFERENCES

## Conference 12661

# Organic and Hybrid Sensors and Bioelectronics XVI

20 - 21 August 2023 | Conv. Ctr. Room 6F

Conference Chairs: **Ioannis Kymissis**, Columbia Univ. (United States); **Emil J. W. List-Kratochvil**, Humboldt-Univ. zu Berlin (Germany); **Sahika Inal**, King Abdullah Univ. of Science and Technology (Saudi Arabia)

Program Committee: **Magnus Berggren**, Linköping Univ. (Sweden); **Annalisa Bonfiglio**, Univ. degli Studi di Cagliari (Italy); **Paul L. Burn**, The Univ. of Queensland (Australia); **Paschalis Gkoupidenis**, Max-Planck-Institut für Polymerforschung (Germany); **Alon Gorodetsky**, Univ. of California, Irvine (United States); **George G. Malliaras**, Univ. of Cambridge (United Kingdom); **Róisín M. Owens**, Univ. of Cambridge (United Kingdom); **Rosaria Rinaldi**, Univ. del Salento (Italy); **Ifor D. W. Samuel**, Univ. of St. Andrews (United Kingdom); **Ruth Shinar**, Iowa State Univ. of Science and Technology (United States); **Franky So**, North Carolina State Univ. (United States); **Arash Takshi**, Univ. of South Florida (United States); **Luisa Torsi**, Univ. degli Studi di Bari Aldo Moro (Italy)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: ORGANIC AND HYBRID MATERIALS

20 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 6F

Session Chair: Emil J. W. List-Kratochvil,  
Humboldt-Univ. zu Berlin (Germany)

12661-9

#### Integration of printed organic electronics with plant tissues for environmental monitoring (*Invited Paper*)

Author(s): Gregory Whiting, Elliot Strand, Eloise Bihar, Univ. of Colorado Boulder (United States)

20 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 6F

12661-2

#### Zn-air battery as oxygen sensor to monitor root zone oxygen level in plants (*Invited Paper*)

Author(s): Arash I. Takshi, Kat-Kim Phan, Univ. of South Florida (United States)

20 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 6F

12661-3

#### Probing ion intercalation in amorphous and crystalline regions of organic mixed conductors

Author(s): Connor Bischak, The Univ. of Utah (United States)

20 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 6F

12661-4

#### Solution-processed infrared photodetectors using low-bandgap organic/hybrid semiconductors

Author(s): Do Young Kim, Oklahoma State Univ. (United States)

20 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 6F

Coffee Break 3:00 PM - 3:30 PM

#### SESSION 2: ORGANIC AND HYBRID MATERIALS AND DEVICES

20 August 2023 • 3:30 PM - 5:15 PM | Conv. Ctr. Room 6F

Session Chair: Ioannis Kymissis, Columbia Univ. (United States)

12661-5

#### Skin-interfaced wearable biosensors (*Invited Paper*)

Author(s): Wei Gao, Caltech (United States)

20 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 6F

12661-6

#### Studying the effect of thread materials on the response of fiber-based organic electrochemical transistors for pH sensing

Author(s): Nestor O. Marquez Rios, Nida Khattak, Bianca Seufert, Arash I. Takshi, Univ. of South Florida (United States)

20 August 2023 • 4:00 PM - 4:15 PM | Conv. Ctr. Room 6F

12661-7

#### Stability, reliability, and performance of organic light-emitting diodes and photodetectors in optogenetic studies

Author(s): Marcin Kielar, Roger Marek, Helen Gooch, The Univ. of Queensland (Australia); Cameron M. Cole, Queensland Univ. of Technology (Australia); Matthew Kenna, Li Xu, The Univ. of Queensland (Australia); Soniya D. Yambem, Ajay K. Pandey, Queensland Univ. of Technology (Australia); Pankaj Sah, The Univ. of Queensland (Australia)

20 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 6F

12661-8

#### Electrochemical analysis of copper phthalocyanine selectivity towards VOCs (*Invited Paper*)

Author(s): Mohammad Shakhawat Hossain, Arash I. Takshi, Univ. of South Florida (United States)

20 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 6F

12661-32

#### Wet-spun microfiber strain sensor for high-resolution strain sensing

Author(s): Pariya Nazari, Karlsruher Institut für Technologie (Germany); Rainer Bäuerle, Ruprecht-Karls-Univ. Heidelberg (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany); Jasmin Aghassi-Hagmann, Gerardo Hernandez Sosa, Uli Lemmer, Karlsruher Institut für Technologie (Germany)

20 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 6F



### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A  
Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### SESSION 3: ORGANIC AND HYBRID MATERIALS, DEVICES, AND APPLICATIONS

21 August 2023 • 8:30 AM - 9:30 AM | Conv. Ctr. Room 6F  
Session Chair: Arash I. Takshi, Univ. of South Florida (United States)

12661-11

#### Differential detection of G- and V-series nerve agents (*Invited Paper*)

Author(s): Paul L. Burn, The Univ. of Queensland (Australia)

21 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 6F

12661-12

#### Describing the non-volatile memory effect in organic electrochemical transistors (*Invited Paper*)

Author(s): Lukas Bongartz, Matteo Cucchi, Hans Kleemann, Karl Leo, TU Dresden (Germany)

21 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 6F

Coffee Break 9:30 AM - 10:00 AM

#### SESSION 4: ORGANIC AND HYBRID DEVICES AND APPLICATIONS

21 August 2023 • 10:00 AM - 12:00 PM | Conv. Ctr. Room 6F  
Session Chair: Paul L. Burn, The Univ. of Queensland (Australia)

12661-13

#### Application of machine learning models for data interpretation from an array of gas sensors (*Invited Paper*)

Author(s): Kat-Kim Phan, Matthew Southworth, Varun Teja Kolluru, Rahul Rawat, Arash I. Takshi, Ehsan O. Sheybani, Univ. of South Florida (United States)

21 August 2023 • 10:00 AM - 10:30 AM | Conv. Ctr. Room 6F

12661-14

#### Design of an intelligent irrigation system for plantations in the UCEVA agroecological farm, applying agro-photonics

Author(s): Luisa Cabezas, Karol Leal, Univ. Central del Valle del Cauca (Colombia)

21 August 2023 • 10:30 AM - 10:45 AM | Conv. Ctr. Room 6F

12661-15

#### Structurally tunable perovskite nanocones for artificial synaptic retina

Author(s): HoYeon Kim, Kyuho Lee, Cheolmin Park, Yonsei Univ. (Republic of Korea)

21 August 2023 • 10:45 AM - 11:00 AM | Conv. Ctr. Room 6F

12661-1

#### On the role of side-chain-free volume on the electrochemical behavior of propylenedioxythiophenes (*Invited Paper*)

Author(s): Natalie Stingelin, Georgia Institute of Technology (United States)

21 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 6F

12661-17

#### Biomimetic polymer sensors for intimate and stable bio-interfacing (*Invited Paper*)

Author(s): Sihong Wang, The Univ. of Chicago (United States)

21 August 2023 • 11:30 AM - 12:00 PM | Conv. Ctr. Room 6F

Lunch Break 12:00 PM - 1:30 PM

#### SESSION 5: ORGANIC ELECTROCHEMICAL TRANSISTORS I

##### *Joint Session with Conferences 12661 and 12662*

21 August 2023 • 1:30 PM - 3:25 PM | Conv. Ctr. Room 6F

Session Chair: Christian B. Nielsen,  
Queen Mary Univ. of London (United Kingdom)

12662-1

#### Organic electrochemical transistors for sensing and signal processing (*Keynote Presentation*)

Author(s): Jonathan Rivnay, Northwestern Univ. (United States)

21 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 6F

# TECHNICAL CONFERENCES

## Conference 12661

12662-2

### Organic neuromorphic electronics for sensory coding and biohybrid systems (*Invited Paper*)

Author(s): Yoeri van de Burgt, Technische Univ. Eindhoven (Netherlands)

21 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 6F

12661-18

### Electronic and photonic neuromorphic device concepts

Author(s): Emil J. W. List-Kratochvil, Humboldt-Univ. zu Berlin (Germany)

21 August 2023 • 2:40 PM - 2:55 PM | Conv. Ctr. Room 6F

12662-3

### Ion sensing with organic electrochemical transistors (*Invited Paper*)

Author(s): Paul W. M. Blom, Dimitrios A. Koutsouras, Katharina Lieberth, Paschalis Gkoupidenis, Max-Planck-Institut für Polymerforschung (Germany); Fabrizio Torricelli, Univ. degli Studi di Brescia (Italy)

21 August 2023 • 2:55 PM - 3:25 PM | Conv. Ctr. Room 6F

Coffee Break 3:25 PM - 3:55 PM

## SESSION 6: ORGANIC ELECTROCHEMICAL TRANSISTORS II

### Joint Session with Conferences 12661 and 12662

21 August 2023 • 3:55 PM - 5:35 PM | Conv. Ctr. Room 6F

Session Chair: Sahika Inal,

King Abdullah Univ. of Science and Technology (Saudi Arabia)

12662-4

### Biosensors based on organic electrochemical transistors (*Keynote Presentation*)

Author(s): Feng Yan, The Hong Kong Polytechnic Univ. (Hong Kong, China)

21 August 2023 • 3:55 PM - 4:35 PM | Conv. Ctr. Room 6F

12661-19

### Organic active-layer sensors based on transistors and dyes (*Invited Paper*)

Author(s): John E. Anthony, Univ. of Kentucky (United States)

21 August 2023 • 4:35 PM - 5:05 PM | Conv. Ctr. Room 6F

12662-5

### Organic bioelectronics using water-gated OFETs

Author(s): Axel Luukkonen, Kim Björkström, Åbo Akademi Univ. (Finland); Amit Tewari, Åbo Akademi Univ. (Finland), Tampere Univ. (Finland); Eleonora Macchia, Åbo Akademi Univ. (Finland), Univ. degli Studi di Bari Aldo Moro (Italy); Amir Mohammad Ghafari, Anni Eklund, Åbo Akademi Univ. (Finland); Luisa Torsi, Univ. degli Studi di Bari Aldo Moro (Italy), Åbo Akademi Univ. (Finland); Ronald Österbacka, Åbo Akademi Univ. (Finland)

21 August 2023 • 5:05 PM - 5:20 PM | Conv. Ctr. Room 6F

12661-20

### A lock-in amplifier biosensor for dairy applications

Author(s): Jasen Devasagayam, The Univ. of Guelph (Canada); Camille A. Leclerc, Malley B. Richardson, Christopher G. D. Ty, Abdulla K. AlSawalhi, Sean S. Worthington, Christopher M. Collier, The Univ. of British Columbia (Canada)

21 August 2023 • 5:20 PM - 5:35 PM | Conv. Ctr. Room 6F

## POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12661-22

### Wearable OLED device for photobiomodulation therapy

Author(s): Daeyul Baek, TENTECH (Republic of Korea); Jeongsu Heo, Hyunra Kim, Kihang Kim, Dongok Han, TENTECH (Republic of Korea); Yongmin Jeon, Gachon Univ. (Republic of Korea); Seontae Kim, Gachon Univ. Gil Medical Ctr. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12661-23

### Optical design strategy for under-display biometric imaging solution

Author(s): Sangin Hahn, Junghoon Yang, KAIST (Republic of Korea); Yeon-Wha Oh, Il-Suk Kang, National Nanofab Ctr. (Republic of Korea); Sang-Hee Ko Park, Seunghyup Yoo, KAIST (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12661-24

### Low bandgap donor-acceptor-donor-based TPA-azaBODIPY-TPA small molecule for flexible near-infrared organic photodetectors

Author(s): Gurudutt Bhat, Queensland Univ. of Technology (Australia); Marcin Kielar, Queensland Brain Institute (Australia); Mahnaz Gholami, Queensland Univ. of Technology (Australia); Pankaj Sah, Queensland Brain Institute (Australia); Ajay K. Pandey, Prashant M. Sonar, Queensland Univ. of Technology (Australia)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12661-26

### Organic optoelectronics for optogenetic stimulation and fluorescence imaging of neuronal activity

Author(s): Siddhartha Sagar, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V. (Germany); Giuseppe Ciccone, TU Dresden (Germany); Ilenia Meloni, Jens P. Weber, Caroline Murawski, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V. (Germany)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12661-27

### Remote monitoring of vital signs in older adults for prevention of cognitive decline

Author(s): Arcelia Bernal Díaz, Rosalinda Sánchez-Arenas Sánchez Arenas, Miguel González Martínez, Univ. Nacional Autónoma de México (Mexico); Ryosuke Shigematsu, Mie Univ. (Japan); Maximino A. Avendaño Alejo, Francisco Adrian Rodriguez Espitia, Diego Rolando González Álvarez, Brian Alberto Venegas Rayon, Univ. Nacional Autónoma de México (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

### ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

22 August 2023 • 8:35 AM - 11:50 AM | Conv. Ctr. Room 6A  
Session Chairs: Zakya H. Kafafi, Lehigh Univ. (United States); Ifor D.  
W. Samuel, Univ. of St. Andrews (United Kingdom)

#### Welcome and Opening Remarks

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-601

#### Organic photothermal films for light induced thermal engineering and photoenergy harvesting (*Plenary Presentation*)

Author(s): Eunkyong Kim, Yonsei Univ. (Republic of Korea)  
22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-602

#### Solution-processed organic solar cells: current progress and challenges (*Plenary Presentation*)

Author(s): Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States)  
22 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

#### Coffee Break 10:00 AM - 10:30 AM

12661-603

#### Photonic interfaces for abiotic/biotic coupling (*Plenary Presentation*)

Author(s): Guglielmo Lanzani, Istituto Italiano di Tecnologia (Italy)  
22 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 6A

12659-604

#### Strong light-matter coupling in molecules and 2D materials: from condensation to quantum nonlinearity (*Plenary Presentation*)

Author(s): Vinod M. Menon, The City College of New York (United States)  
22 August 2023 • 11:10 AM - 11:50 AM | Conv. Ctr. Room 6A

12661-28

#### Wearable piezoelectric nanogenerator-based hazardous gas monitoring gadget for self-powered ammonia early warning

Author(s): Deepak Punetha, Indian Institute of Technology Bombay (India), Indian Institute of Technology Patna (India); Ajay Kumar, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India); Saurabh Kumar Pandey, Indian Institute of Technology Patna (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12661-29

#### Applications of carbon materials for volatile organic compound sensors

Author(s): Chi-Feng Lin, Chin-Chung Chen, Tzu-Yang Cheng, National United Univ. (Taiwan); Yu-Hsuan Ho, National Taiwan Univ. (Taiwan); Po-Wei Chi, Academia Sinica (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12661-31

#### Self-powered finger motion-sensing structural color display enabled by block copolymer photonic crystal

Author(s): Jae Won Lee, Kangwon National Univ. (Republic of Korea)  
21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12662

### Organic and Hybrid Transistors XXII

21 - 23 August 2023 | Conv. Ctr. Room 6F (MonPM) and 11B (Tue-Wed)

Conference Chairs: **Iain McCulloch**, Univ. of Oxford (United Kingdom); **Oana D. Jurchescu**, Wake Forest Univ. (United States)

#### MONDAY 21 AUGUST 2023

##### SESSION 1: ORGANIC ELECTROCHEMICAL TRANSISTORS I

###### Joint Session with Conferences 12661 and 12662

21 August 2023 • 1:30 PM - 3:25 PM | Conv. Ctr. Room 6F

Session Chair: Christian B. Nielsen,  
Queen Mary Univ. of London (United Kingdom)

12662-1

###### Organic electrochemical transistors for sensing and signal processing (*Keynote Presentation*)

Author(s): Jonathan Rivnay, Northwestern Univ. (United States)

21 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 6F

12662-2

###### Organic neuromorphic electronics for sensory coding and biohybrid systems (*Invited Paper*)

Author(s): Yoeri van de Burgt, Technische Univ. Eindhoven (Netherlands)

21 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 6F

12661-18

###### Electronic and photonic neuromorphic device concepts

Author(s): Emil J. W. List-Kratochvil, Humboldt-Univ. zu Berlin (Germany)

21 August 2023 • 2:40 PM - 2:55 PM | Conv. Ctr. Room 6F

12662-3

###### Ion sensing with organic electrochemical transistors (*Invited Paper*)

Author(s): Paul W. M. Blom, Dimitrios A. Koutsouras, Katharina Lieberth, Paschalis Gkoupidenis, Max-Planck-Institut für Polymerforschung (Germany); Fabrizio Torricelli, Univ. degli Studi di Brescia (Italy)

21 August 2023 • 2:55 PM - 3:25 PM | Conv. Ctr. Room 6F

Coffee Break 3:25 PM - 3:55 PM

##### SESSION 2: ORGANIC ELECTROCHEMICAL TRANSISTORS II

###### Joint Session with Conferences 12661 and 12662

1 August 2023 • 3:55 PM - 5:35 PM | Conv. Ctr. Room 6F

Session Chair: Sahika Inal, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12662-4

###### Biosensors based on organic electrochemical transistors (*Keynote Presentation*)

Author(s): Feng Yan, The Hong Kong Polytechnic Univ. (Hong Kong, China)

21 August 2023 • 3:55 PM - 4:35 PM | Conv. Ctr. Room 6F

12661-19

###### Organic active-layer sensors based on transistors and dyes (*Invited Paper*)

Author(s): John E. Anthony, Univ. of Kentucky (United States)

21 August 2023 • 4:35 PM - 5:05 PM | Conv. Ctr. Room 6F

12662-5

###### Organic bioelectronics using water-gated OFETs

Author(s): Axel Luukkonen, Kim Björkström, Åbo Akademi Univ. (Finland); Amit Tewari, Åbo Akademi Univ. (Finland), Tampere Univ. (Finland); Eleonora Macchia, Åbo Akademi Univ. (Finland), Univ. degli Studi di Bari Aldo Moro (Italy); Amir Mohammad Ghafari, Anni Eklund, Åbo Akademi Univ. (Finland); Luisa Torsi, Univ. degli Studi di Bari Aldo Moro (Italy), Åbo Akademi Univ. (Finland); Ronald Österbacka, Åbo Akademi Univ. (Finland)

21 August 2023 • 5:05 PM - 5:20 PM | Conv. Ctr. Room 6F

12661-20

###### A lock-in amplifier biosensor for dairy applications

Author(s): Jasen Devasagayam, The Univ. of Guelph (Canada); Camille A. Leclerc, Malley B. Richardson, Christopher G. D. Ty, Abdulla K. AlSawalhi, Sean S. Worthington, Christopher M. Collier, The Univ. of British Columbia (Canada)

21 August 2023 • 5:20 PM - 5:35 PM | Conv. Ctr. Room 6F

##### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

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###### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12662-31

###### performance enhancement of isolated bidirectional DC-DC converter based on SiC FETs

Author(s): Salah Eltief, Mohammad A. Matin, Univ. of Denver (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

### TUESDAY 22 AUGUST 2023

#### ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

22 August 2023 • 8:35 AM - 11:50 AM | Conv. Ctr. Room 6A

Session Chairs: Zakya H. Kafafi, Lehigh Univ. (United States); Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

#### Welcome and Opening Remarks

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-601

#### Organic photothermal films for light induced thermal engineering and photoenergy harvesting (*Plenary Presentation*)

Author(s): Eunkyong Kim, Yonsei Univ. (Republic of Korea)

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-602

#### Solution-processed organic solar cells: current progress and challenges (*Plenary Presentation*)

Author(s): Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States)

22 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

#### Coffee Break 10:00 AM - 10:30 AM

12661-603

#### Photonic interfaces for abiotic/biotic coupling (*Plenary Presentation*)

Author(s): Guglielmo Lanzani, Istituto Italiano di Tecnologia (Italy)

22 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 6A

12659-604

#### Strong light-matter coupling in molecules and 2D materials: from condensation to quantum nonlinearity (*Plenary Presentation*)

Author(s): Vinod M. Menon, The City College of New York (United States)

22 August 2023 • 11:10 AM - 11:50 AM | Conv. Ctr. Room 6A

#### Lunch/Exhibition Break 11:50 AM - 1:30 PM

#### SESSION 3: FLEXIBLE ELECTRONICS

22 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 11B

Session Chair: Alexander Giovannitti, Stanford Univ. (Sweden)

12662-6

#### Flexible electronics: challenges and opportunities—a materials science perspective (*Invited Paper*)

Author(s): Natalie Stingelin, Georgia Institute of Technology (United States)

22 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 11B

12662-7

#### Developing a data infrastructure and tools for organic semiconductor discovery (*Invited Paper*)

Author(s): Chad Risko, Univ. of Kentucky (United States)

22 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 11B

12662-8

#### The long-debated story of homocoupling in alternating conjugated polymers: identification, quantification, prevention, and relevance for optoelectronic applications

Author(s): Jochen Vanderspikken, Univ. Hasselt (Belgium); Zhen Liu, Vrije Univ. Brussel (Belgium); Xiaocui Wu, Univ. of Birmingham (United Kingdom); Omar Beckers, Univ. Hasselt (Belgium); Stefania Moro, Univ. of Birmingham (United Kingdom); Tyler J. Quill, Stanford Univ. (United States); Quan Liu, Univ. Hasselt (Belgium); Mouna Hamid, Bart Goderis, Erik Nies, KU Leuven (Belgium); Vincent Lemaur, David Beljonne, Univ. de Mons (Belgium); Alberto Salles, Stanford Univ. (United States); Laurence Lutsen, Koen Vandewal, Univ. Hasselt (Belgium); Bruno Van Mele, Vrije Univ. Brussel (Belgium); Giovanni Costantini, Univ. of Birmingham (United Kingdom); Niko Van den Brande, Vrije Univ. Brussel (Belgium); Wouter Maes, Univ. Hasselt (Belgium)

22 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 11B

12662-9

#### High-resolution imaging for the analysis of microstructural properties influencing charge transport in IDT-BT

Author(s): Stefania Moro, Giovanni Costantini, Univ. of Birmingham (United Kingdom); Iain McCulloch, Univ. of Oxford (United Kingdom); Jenny Nelson, Imperial College London (United Kingdom)

22 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 11B

#### Coffee Break 3:00 PM - 3:30 PM

#### SESSION 4: TRANSISTORS FOR BIOELECTRONICS

22 August 2023 • 3:30 PM - 5:45 PM | Conv. Ctr. Room 11B

Session Chair: Jonathan Rivnay, Northwestern Univ. (United States)

12662-13

#### Next-generation polymeric organic semiconductors for electrochemical transistors in aqueous electrolytes (*Invited Paper*)

Author(s): Alexander Giovannitti, Chalmers Univ. of Technology (Sweden)

22 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 11B

12662-11

#### Tailoring organic semiconductors for mixed ionic and electronic transport (*Invited Paper*)

Author(s): Christian B. Nielsen, Queen Mary Univ. of London (United Kingdom)

22 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 11B

12662-12

#### Engineering solid-state organic electrochemical transistors for on-skin electronics

Author(s): Wei Lin Leong, Nanyang Technological Univ. (Singapore)

22 August 2023 • 4:30 PM - 4:45 PM | Conv. Ctr. Room 11B

12662-10

#### Stimuli-responsive electron-transporting conjugated polymers (*Invited Paper*)

Author(s): Sahika Inal, King Abdullah Univ. of Science and Technology (Saudi Arabia)

22 August 2023 • 4:45 PM - 5:15 PM | Conv. Ctr. Room 11B

# TECHNICAL CONFERENCES

## Conference 12662

12662-14

### **Wearable, implantable, tissue-interfaced organic transistors and sensors** (*Invited Paper*)

Author(s): Sungjune Jung, Pohang Univ. of Science and Technology (Republic of Korea)

22 August 2023 • 5:15 PM - 5:45 PM | Conv. Ctr. Room 11B

## WEDNESDAY 23 AUGUST 2023

### SESSION 5: DEVICE PHYSICS

23 August 2023 • 8:15 AM - 10:00 AM | Conv. Ctr. Room 11B

Session Chair: Suchismita Guha, Univ. of Missouri (United States)

12662-30

### **Optoelectronic learning in halide perovskite thin film transistors**

Author(s): Amoolya Nirmal, Darrell Jun Jie Tay, Natalia Yantara, Timothy Ng Si En, Divyam Sharma, Nripan Mathews, Nanyang Technological Univ. (Singapore)

23 August 2023 • 8:15 AM - 8:30 AM | Conv. Ctr. Room 11B

12662-15

### **Mitigation of contact resistance and short-channel effects in 10-400 nm channel length organic thin-film transistors** (*Invited Paper*)

Author(s): Ananth Dodabalapur, The Univ. of Texas at Austin (United States)

23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 11B

12662-16

### **Recent progress of monolayer organic semiconductor transistors** (*Invited Paper*)

Author(s): Paddy K. L. Chan, The Univ. of Hong Kong (Hong Kong, China)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 11B

12662-17

### **Bias stress stability in n-type polymer thin film transistors**

Author(s): Manikanta Makala, Derek Dremann, Wake Forest Univ. (United States); Maciej Barlog, Mohammed Al-Hashimi, Texas A&M Univ. at Qatar (Qatar); Oana D. Jurchescu, Wake Forest Univ. (United States)

23 August 2023 • 9:30 AM - 9:45 AM | Conv. Ctr. Room 11B

12662-18

### **Photomultiplication-type organic phototransistors: achieving high photosensitivity by suppressing dark current**

Author(s): Sanghoon Park, Dongho Choi, Haechang Lee, KAIST (Republic of Korea); Hanul Moon, Dong-A Univ. (Republic of Korea); Seunghyup Yoo, KAIST (Republic of Korea)

23 August 2023 • 9:45 AM - 10:00 AM | Conv. Ctr. Room 11B

Coffee Break 10:00 AM - 10:30 AM

### SESSION 6: CHEMISTRY

23 August 2023 • 10:30 AM - 11:45 AM | Conv. Ctr. Room 11B

Session Chair: Iain McCulloch, Univ. of Oxford (United Kingdom)

12662-19

### **Crystal design for organic transistors and sensors** (*Invited Paper*)

Author(s): John E. Anthony, Univ. of Kentucky (United States)

23 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 11B

12662-20

### **Doping oligothiophene semiconductors with fullerene and non-traditional acceptors** (*Invited Paper*)

Author(s): Alejandro L. Briseño, The Aerospace Corp. (United States), Caltech (United States)

23 August 2023 • 11:00 AM - 11:30 AM | Conv. Ctr. Room 11B

12662-21

### **Macroscopic and microscopic conductivity of doped polythiophenes**

Author(s): Eva Roeck, Natalie Banerji, Univ. Bern (Switzerland)

23 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 11B

Lunch/Exhibition Break 11:45 AM - 1:30 PM

### SESSION 7: DEFECTS

23 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 11B

Session Chair: Katelyn P. Goetz, National Institute of Standards and Technology (United States)

12662-23

### **Higher eigen mode imaging and nanomechanics of flexible electronic materials** (*Invited Paper*)

Author(s): Deepak Venkateshvaran, Univ. of Cambridge (United Kingdom)

23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 11B

12662-24

### **Nonlinear optical imaging of carrier transport at the semiconductor-insulator interface in organic field effect transistors** (*Invited Paper*)

Author(s): Suchismita Guha, Univ. of Missouri (United States)

23 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 11B

12662-25

### **What can the activation energy tell about the energetics at grain boundaries in polycrystalline organic films** (*Invited Paper*)

Author(s): Lisa S. Walter, Georg-August-Univ. Göttingen (Germany); Michael Kühn, BASF SE (Germany); Theresa Kammerbauer, LMU Munich (Germany); James W. Borchert, Thomas Weitz, Georg-August-Univ. Göttingen (Germany)

23 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 11B

Coffee Break 3:00 PM - 3:30 PM

### SESSION 8: EMERGING APPLICATIONS

23 August 2023 • 3:30 PM - 5:00 PM | Conv. Ctr. Room 11B

Session Chair: Thomas Weitz

12662-26

#### **Organic phototransistors and capacitive sensors for infrared detection** (*Invited Paper*)

Author(s): Tse Nga Ng, Univ. of California, San Diego (United States)

23 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 11B

12662-27

#### **Measuring the properties of singlet fission by using transistors** (*Invited Paper*)

Author(s): Katelyn Goetz, Chad D. Cruz, Sebastian Engmann, National Institute of Standards and Technology (United States); Samuel Marquez Gonzalez, National Institute of Standards and Technology (United States), Montgomery College (United States); Curt A. Richter, National Institute of Standards and Technology (United States); John E. Anthony, Univ. of Kentucky (United States); Emily G. Bittle, National Institute of Standards and Technology (United States)

23 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 11B

12662-28

#### **Control of microstructure and surface morphology of 2D lead-free perovskite for application in field-effect transistors** (*Invited Paper*)

Author(s): Tomasz Marszalek, Max-Planck-Institut für Polymerforschung (Germany)

23 August 2023 • 4:30 PM - 5:00 PM | Conv. Ctr. Room 11B

# TECHNICAL CONFERENCES

## Conference 12663

### Molecular and Nanophotonic Machines VI

22 - 24 August 2023 | Conv. Ctr. Room 8

Conference Chairs: **Zouheir Sekkat**, Univ. Mohamed V (Morocco); **Takashige Omatsu**, Chiba Univ. (Japan)

Program Committee: **Anna S. Bezryadina**, California State Univ., Northridge (United States); **Cornelia Denz**, Westfälische Wilhelms-Univ. Münster (Germany); **Katsumasa Fujita**, Osaka Univ. (Japan); **Tigran Galstian**, Univ. Laval (Canada); **Yasushi Inouye**, Osaka Univ. (Japan); **Hidekazu Ishitobi**, Osaka Univ. (Japan); **Satoshi Kawata**, Osaka Univ. (Japan); **Mark G. Kuzyk**, Washington State Univ. (United States); **Stefan A. Maier**, Imperial College London (United Kingdom); **Masud Mansuripur**, Wyant College of Optical Sciences (United States); **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia); **Atsushi Shishido**, Tokyo Institute of Technology (Japan); **Hong-Bo Sun**, Tsinghua Univ. (China); **Din Ping Tsai**, City Univ. of Hong Kong (Hong Kong, China); **Giovanni Volpe**, Göteborgs Univ. (Sweden); **Diederik S. Wiersma**, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy); **Ta-Jen Yen**, National Tsing Hua Univ. (Taiwan)

#### MONDAY 21 AUGUST 2023

##### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

##### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12663-24

##### Investigation of amylose and tailored amylose matrices for scavenging iodide

Author(s): Jinghuai Dou, Daisuke Sato, Juno Son, Qihui Liu, Jonathan S. Lindsey, North Carolina State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12663-25

##### Excited state motion driven by stabilization of charge transfer state in metal nanoclusters

Author(s): Wataru Ishii, Takuya Nakashima, Osaka Metropolitan Univ. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12663-27

##### Gold nanoparticles and their application as nanoantennas for surface enhanced visible absorption of dye molecules

Author(s): Amina Badir, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed V de Rabat (Morocco); Siham Refki, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco); Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed V de Rabat (Morocco)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12663-28

##### Fano resonance for ultrasensitive biosensors

Author(s): Siham Refki, Amina Badir, Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Mohammed VI Polytechnic Univ. (Morocco)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12663-29

##### Broadband light absorption enhancement by using plasmonic nano-optical designs in a-Si:H ultra-thin solar cells

Author(s): Nouredine Ben Afkir, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Mohammed VI Polytechnic Univ. (Morocco); Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed V de Rabat (Morocco)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12663-30

##### Resonant surface enhanced visible absorption of dye molecules by gold nanoparticles in solid films of polymers

Author(s): Ibrahim Boudene, Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

#### TUESDAY 22 AUGUST 2023

##### ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

22 August 2023 • 8:35 AM - 11:50 AM | Conv. Ctr. Room 6A

Session Chairs: Zakya H. Kafafi, Lehigh Univ. (United States); Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

##### Welcome and Opening Remarks

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-601

##### Organic photothermal films for light induced thermal engineering and photoenergy harvesting (*Plenary Presentation*)

Author(s): Eunyoung Kim, Yonsei Univ. (Republic of Korea)

22 August 2023 • 8:40 AM - 9:20 AM | Conv. Ctr. Room 6A

12660-602

##### Solution-processed organic solar cells: current progress and challenges (*Plenary Presentation*)

Author(s): Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (United States)

22 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

##### Coffee Break 10:00 AM - 10:30 AM



12661-603

### **Photonic interfaces for abiotic/biotic coupling** (*Plenary Presentation*)

Author(s): Guglielmo Lanzani, Istituto Italiano di Tecnologia (Italy)  
22 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 6A

12659-604

### **Strong light-matter coupling in molecules and 2D materials: from condensation to quantum nonlinearity** (*Plenary Presentation*)

Author(s): Vinod M. Menon, The City College of New York (United States)  
22 August 2023 • 11:10 AM - 11:50 AM | Conv. Ctr. Room 6A

Lunch/Exhibition Break 11:50 AM - 1:30 PM

### **SESSION 1: PLASMONICS AND PLASMONIC MACHINES AND LIGHT MATTER INTERACTION**

22 August 2023 • 1:30 PM - 3:25 PM | Conv. Ctr. Room 8  
Session Chair: Takashige Omatsu, Chiba Univ. (Japan)

12663-1

### **Plasmonically enhanced quantum emitters** (*Keynote Presentation*)

Author(s): Vladimir M. Shalaev, Purdue Univ. (United States)  
22 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 8

12663-2

### **Optically evolved assembling and swarming of gold nanoparticles at solution interface leading to a plasmonic machine** (*Invited Paper*)

Author(s): Hiroshi Masuhara, Chih-Hao Huang, National Yang Ming Chiao Tung Univ. (Taiwan)  
22 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 8

12663-3

### **A comparison of the classical and quantum theories of light interacting with nano-materials** (*Invited Paper*)

Author(s): Masud Mansuripur, Wyant College of Optical Sciences (United States)  
22 August 2023 • 2:40 PM - 3:10 PM | Conv. Ctr. Room 8

12663-4

### **Mode coupling in plasmonic layered structures: fano, PIT and MIM resonances, and application to sensing and switching**

Author(s): Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)  
22 August 2023 • 3:10 PM - 3:25 PM | Conv. Ctr. Room 8

Coffee Break 3:25 PM - 3:55 PM

### **SESSION 2: MOLECULAR SWITCHES AND MEMORIES, AND LIGHT-FUELED MOTION AND MACHINES**

22 August 2023 • 3:55 PM - 4:25 PM | Conv. Ctr. Room 8  
Session Chair: Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

12663-7

### **Particle transport by electric field induced gradient of molecular order** (*Invited Paper*)

Author(s): Tigran Galstian, Tigran Dadalyan, Univ. Laval (Canada)  
22 August 2023 • 3:55 PM - 4:25 PM | Conv. Ctr. Room 8

## WEDNESDAY 23 AUGUST 2023

### **SESSION 3: OPTICAL MANIPULATION AND NANO-BIO-MACHINES**

23 August 2023 • 8:00 AM - 10:10 AM | Conv. Ctr. Room 8  
Session Chair: Hiroshi Masuhara, National Yang Ming Chiao Tung Univ. (Taiwan)

12663-8

### **Critical fluctuations and critical Casimir forces** (*Keynote Presentation*)

Author(s): Giovanni Volpe, Göteborgs Univ. (Sweden)  
23 August 2023 • 8:00 AM - 8:40 AM | Conv. Ctr. Room 8

12663-9

### **Meta-devices for bio-imaging** (*Invited Paper*)

Author(s): Mu Ku Chen, Xiaoyuan Liu, City Univ. of Hong Kong (Hong Kong, China); Yuan Luo, National Taiwan Univ. (Taiwan); Takuo Tanaka, RIKEN (Japan); Din-Ping Tsai, City Univ. of Hong Kong (Hong Kong, China)  
23 August 2023 • 8:40 AM - 9:10 AM | Conv. Ctr. Room 8

12663-10

### **Bacterial biofilm formation with optical tweezers** (*Invited Paper*)

Author(s): Anna S. Bezryadina, Czarlyn Camba, Brooke Walter-Lakes, California State Univ., Northridge (United States)  
23 August 2023 • 9:10 AM - 9:40 AM | Conv. Ctr. Room 8

12663-11

### **Generation of optical skyrmion by using a spatial light modulator with a self-interferometer configuration**

Author(s): Rihito Tamura, Praveen Kumar, A. Srinivasa Rao, Katsuhiko Miyamoto, Takashige Omatsu, Chiba Univ. (Japan)  
23 August 2023 • 9:40 AM - 9:55 AM | Conv. Ctr. Room 8

12663-12

### **Tunable critical Casimir forces counteract Casimir-Lifshitz attraction**

Author(s): Agnese Callegari, Göteborgs Univ. (Sweden); Falko Schmidt, ETH Zurich (Switzerland); Abdallah Daddi-Moussa-Ider, Max-Planck-Institut für Dynamik und Selbstorganisation (Germany); Battulga Munkhbat, Technical Univ. of Denmark (Denmark); Ruggero Verre, Timur Shegai, Mikael Käll, Chalmers Univ. of Technology (Sweden); Hartmut Löwen, Heinrich-Heine-Univ. Düsseldorf (Germany); Andrea Gambassi, Scuola Internazionale Superiore di Studi Avanzati (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Giovanni Volpe, Göteborgs Univ. (Sweden)  
23 August 2023 • 9:55 AM - 10:10 AM | Conv. Ctr. Room 8

# TECHNICAL CONFERENCES

## Conference 12663

Coffee Break 10:10 AM - 10:40 AM

### SESSION 4: PHOTOMECHANICS AND STRUCTURED LIGHT

23 August 2023 • 10:40 AM - 11:55 AM | Conv. Ctr. Room 8  
Session Chair: Anna S. Bezryadina,  
California State Univ., Northridge (United States)

12663-14

#### Structured light for studies of active matter (*Invited Paper*)

Author(s): Halina Rubinsztein-Dunlop, Declan J. Armstrong, Mark Watson, Patrick Grant, Timo A. Nieminen, Itia Favre-Bulle, Alexander Stilgoe, The Univ. of Queensland (Australia)

23 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 8

12663-15

#### Exotic galaxy-shaped surface structures of azo-polymers by irradiation of pinning petal beams (*Invited Paper*)

Author(s): Takashige Omatsu, Chiba Univ. (Japan)

23 August 2023 • 11:10 AM - 11:40 AM | Conv. Ctr. Room 8

12663-16

#### Micropatterning of hemispherical lasing droplets by optical vortex laser-induced forward transfer

Author(s): Ken-ichi Yuyama, Osaka Metropolitan Univ. (Japan); Haruki Kawaguchi, Rong Wei, Takashige Omatsu, Chiba Univ. (Japan)

23 August 2023 • 11:40 AM - 11:55 AM | Conv. Ctr. Room 8

Lunch/Exhibition Break 11:55 AM - 2:00 PM

### SESSION 5: AI AND NANOPHOTONIC MACHINES

#### Joint Session with Conferences 12655 and 12663

23 August 2023 • 2:00 PM - 5:15 PM | Conv. Ctr. Room 8  
Session Chairs: Giovanni Volpe, Göteborgs Univ. (Sweden), Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

12655-50

#### Machine learning meets photonics (*Invited Paper*)

Author(s): Francesco Da Ros, DTU Fotonik (Denmark)

23 August 2023 • 2:00 PM - 2:30 PM | Conv. Ctr. Room 8

12655-51

#### MAGIK: Microscopic motion analysis through graph inductive knowledge

Author(s): Jesús D. Pineda Castro, Benjamin Midtvedt, Harshith Bachimanchi, Göteborgs Univ. (Sweden); Sergio Noé, Univ. de Vic - Univ. Central de Catalunya (Spain); Daniel Midtvedt, Giovanni Volpe, Göteborgs Univ. (Sweden); Carlo Manzo, Univ. de Vic - Univ. Central de Catalunya (Spain)

23 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 8

12663-18

#### Applications of optically generated forces to study cellular interactions and signaling (*Invited Paper*)

Author(s): Daryl C. Preece, Pegah Pouladian, Nicole Wakida, Beckman Laser Institute and Medical Clinic (United States); Veronica Gomez, Univ. of California, San Diego (United States)

23 August 2023 • 2:45 PM - 3:15 PM | Conv. Ctr. Room 8

12655-52

#### ASPIC with Sagnac mirror loop for solving PDE

Author(s): Chen Shen, Nicola Peserico, Volker J. Sorger, The George Washington Univ. (United States)

23 August 2023 • 3:15 PM - 3:30 PM | Conv. Ctr. Room 8

Coffee Break 3:30 PM - 4:00 PM

12663-19

#### Collective interaction of anisotropic light-propelled micro-machines

Author(s): Matthias Rüschenbaum, Elena Vinnemeier, Jörg Imbrock, Julian Jeggler, Raphael Wittkowski, Westfälische Wilhelms-Univ. Münster (Germany); Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany), Westfälische Wilhelms-Univ. Münster (Germany)

23 August 2023 • 4:00 PM - 4:15 PM | Conv. Ctr. Room 8

12655-53

#### Deep learning-enabled fluorescent point-of-care sensor for multiplexed quantification of biomarkers from serum

Author(s): Artem Goncharov, Hyoun-Arm Joung, Rajesh Ghosh, Gyeo-Re Han, Zachary S. Ballard, Quinn Maloney, Alexandra Bell, Chew Tin Zar Aung, Omai B. Garner, Dino Di Carlo, Aydogan Ozcan, Univ. of California, Los Angeles (United States)

23 August 2023 • 4:15 PM - 4:30 PM | Conv. Ctr. Room 8

12663-20

#### TPL-fabricated responsive hydrogel-based micro photonic structures for visible vapor sensing

Author(s): Jing Qian, Srikanth Kolagatla, Aleksejus Pacalova, Xia Zhang, Larisa Florea, Colm Delaney, A. Louise Bradley, Trinity College Dublin (Ireland)

23 August 2023 • 4:30 PM - 4:45 PM | Conv. Ctr. Room 8

12663-17

#### Shapeshifting diffractive optical elements for on-demand optical functionality (*Invited Paper*)

Author(s): Antonio Ambrosio, Istituto Italiano di Tecnologia (Italy)

23 August 2023 • 4:45 PM - 5:15 PM | Conv. Ctr. Room 8

## THURSDAY 24 AUGUST 2023

### SESSION 6: PHOTOACTIVE MATTER

24 August 2023 • 9:00 AM - 10:15 AM | Conv. Ctr. Room 8

Session Chair: Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

12663-21

#### A low-cost, highly stable, superior-efficient heterogeneous photocatalyst by the synergetic hybrid of 2D-MoS<sub>2</sub> nanofilms, 1D-Si nanowires, 0D Au nanoparticles for solar-driven hydrogen evolution (*Invited Paper*)

Author(s): Ta-Jen Yen, Chun-Yen Chen, National Tsing Hua Univ. (Taiwan); Takuo Tanaka, RIKEN (Japan)

24 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 8

12663-22

### **Nonlinear optical properties of DNA suspensions**

Author(s): Arturo Ramirez, Lipi Patel, Chhandak Basu, Anna S. Bezryadina, California State Univ., Northridge (United States)

24 August 2023 • 9:30 AM - 9:45 AM | Conv. Ctr. Room 8

12663-23

### **Multifunctional materials for emerging technologies**

*(Invited Paper)*

Author(s): Gurpreet Singh Selopal, Dalhousie Univ. (Canada);  
Federico Rosei, Institut National de la Recherche Scientifique  
(Canada)

24 August 2023 • 9:45 AM - 10:15 AM | Conv. Ctr. Room 8

# TECHNICAL CONFERENCES

## Conference 12664

# Optical Modeling and Performance Predictions XIII

21 - 22 August 2023 | Conv. Ctr. Room 17A

Conference Chair: **Mark A. Kahan**, Synopsys, Inc. (United States)

Program Committee: **George Z. Angeli**, GAAS Analytical (United States); **Robert P. Breault**, Breault Research Organization, Inc. (United States); **Robert J. Brown**, Ball Aerospace (United States); **Thomas G. Brown**, The Institute of Optics, Univ. of Rochester (United States); **Bill J. Cassarly**, Synopsys, Inc. (United States); **Russell A. Chipman**, Meta (United States); **Keith B. Doyle**, MIT Lincoln Lab. (United States); **G. Groot Gregory**, Synopsys, Inc. (United States); **Tony Hull**, The Univ. of New Mexico (United States); **Richard C. Juergens**, Coherent Corp. (United States); **Marie B. Levine-West**, Jet Propulsion Lab. (United States); **Gary W. Matthews**, ATA Aerospace, LLC (United States); **Gregory J. Michels**, Sigmadyne, Inc. (United States); **Duncan T. Moore**, Univ. of Rochester (United States); **David C. Redding**, Jet Propulsion Lab. (United States); **David A. Thomas**, GMTO Corp. (United States); **James C. Wyant**, Wyant College of Optical Sciences, UArizona (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: MODELING AND DESIGNS I

21 August 2023 • 8:20 AM - 10:00 AM | Conv. Ctr. Room 17A

Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-1

#### Integration of wave optics and ray optics simulations for advanced display design

Author(s): Chih Hao Chen, Ansys, Inc. (Taiwan); Xing Tong, Ansys (China); James Pond, Ansys Canada Ltd. (Canada); Fatema Chowdhury, Ansys, Inc. (United States)

21 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 17A

12664-2

#### Multicriteria optimization and correction of the electron beam spot with the multivariate Gaussian distribution and the spot sizes by the full width at half maximum as objective functions

Author(s): Dmitriy Hasenkampf, Helmut Fischer GmbH+Co. KG (Germany), Technische Univ. Berlin (Germany); Dirk Oberschmidt, Technische Univ. Berlin (Germany); Aniouar Bjeoumikhov, Helmut Fischer GmbH+Co. KG (Germany)

21 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 17A

12664-3

#### Minimal memory differentiable FDTD for photonic inverse design

Author(s): Rui Jie Tang, Univ. of Toronto (Canada); Soon Wei Daniel Lim, Marcus Ossiander, Harvard Univ. (United States); Xinghui Yin, Massachusetts Institute of Technology (United States); Federico Capasso, Harvard Univ. (United States)

21 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 17A

12664-4

#### Efficient inverse design automation for metalens

Author(s): Jan Bos, Synopsys Netherlands BV (Netherlands); Evan Heller, Rob Scarmozzino, Mayank Bahl, Synopsys, Inc. (United States); Li-Ce Hu, Synopsys Taiwan Co., Ltd. (Taiwan); Chenglin Xu, Synopsys, Inc. (United States)

21 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 17A

12664-5

#### Poke: an open-source, ray-based physical optics platform

Author(s): Jaren N. Ashcraft, Wyant College of Optical Sciences (United States); Ewan S. Douglas, Steward Observatory (United States); Daewook Kim, Wyant College of Optical Sciences (United States), Steward Observatory (United States); Ramya Anche, Steward Observatory (United States)

21 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 17A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: MODELING AND DESIGNS II

21 August 2023 • 10:30 AM - 11:10 AM | Conv. Ctr. Room 17A

Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-6

#### Ab-initio modeling of bend-losses in silicon nitride waveguides from visible to near-infrared

Author(s): Jakob W. Hinum-Wagner, Samuel M. Hörmann, ams-OSRAM AG (Austria), Technische Univ. Graz (Austria); Christian Schörner, Stephan Janka, Georg Rossbach, ams-OSRAM International GmbH (Germany); Desiree Rist, Jochen Kraft, ams-OSRAM AG (Austria); Alexander Bergmann, Technische Univ. Graz (Austria)

21 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 17A

12664-8

#### Deterministic geometrical analysis of sequential stray light from ideal baffles and extended sources

Author(s): Haley N. Knapp, Ian Carr, Michael Dittman, Ball Aerospace (United States)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 17A

### SESSION 3: SOURCES AND DETECTORS/PROCESSING

21 August 2023 • 11:10 AM - 11:50 AM | Conv. Ctr. Room 17A  
Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-9

#### Broadband fiber-amplified pulses as an OPA source

Author(s): Brittany Lu, Univ. of California, Los Angeles (United States); Keith Wernsing, Mesa Photonics, LLC (United States); Sergio Carbajo, Univ. of California, Los Angeles (United States), SLAC National Accelerator Lab. (United States)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 17A

12664-36

#### Single-shot, spatially resolved, simultaneous polarimetry and wavefront sensing

Author(s): David Spiecker, The Institute of Optics, Univ. of Rochester (United States)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 17A

Lunch Break 11:50 AM - 1:20 PM

### SESSION 4: FABRICATION AND TESTING

21 August 2023 • 1:20 PM - 2:00 PM | Conv. Ctr. Room 17A  
Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-11

#### Zernike based wavefront alignment in a deployable optic control test bed

Author(s): Ray Zhang, Daren Trinh, Vincent T. K. Sauer, Kristen Cote, Wyvern (Canada)

21 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 17A

12664-12

#### Loss-engineering of a bimodal waveguide interferometer: an optimized silicon nitride platform for chemical and biological sensing

Author(s): Samuel M. Hörmann, Jakob W. Hinum-Wagner, ams-OSRAM AG (Austria), Technische Univ. Graz (Austria); Alexander Bergmann, Technische Univ. Graz (Austria)

21 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 17A

### SESSION 5: MATERIALS, THERMO-OPTICS, AND END-TO-END MODELS/HW I

21 August 2023 • 2:00 PM - 3:00 PM | Conv. Ctr. Room 17A  
Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-13

#### Integrated modeling of the James Webb Space Telescope: flight performance and lessons learned (Keynote Presentation)

Author(s): Marie B. Levine-West, Jet Propulsion Lab. (United States); Gary Mosier, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 2:00 PM - 3:00 PM | Conv. Ctr. Room 17A

Coffee Break 3:00 PM - 3:30 PM

### SESSION 6: MATERIALS, THERMO-OPTICS, AND END-TO-END MODELS/HW II

21 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 17A  
Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-14

#### Modeling thermal stability of 1.5-m AMTD ULE® mirror using 'as-built' CTE data

Author(s): H. Philip Stahl, Stephen Cheney, NASA Marshall Space Flight Ctr. (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 17A

12664-15

#### Optical performance of reflectivity control devices for solar sail applications

Author(s): David D. Smith, Andrew F. Heaton, Saba Ramazani, Daniel A. Tyler, Les Johnson, NASA Marshall Space Flight Ctr. (United States); Charles Bachmann, Dylan J. Shultz, Chris S. Lapszynski, Nayma B. Nur, Chris H. Lee, Rochester Institute of Technology (United States); Neset Akozbek, U.S. Army Space and Missile Defense Command (United States); Dana Dement, CFD Research Corp. (United States); Samuel Dummer, Surface Optics Corp. (United States); Brandon Farmer, NeXolve Corp. (United States)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 17A

12664-16

#### Development of nonlinear optics simulation using the finite element code ACE3P

Author(s): Mohamed A. K. Othman, SLAC National Accelerator Lab. (United States)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 17A

12664-17

#### Nonlinear focal shift in an ultraintense light beam focused by a lens in air

Author(s): Adrián Aupart-Acosta, Jesús Garduño-Mejía, Martha Rosete-Aguilar, Oscar G. Rodríguez-Herrera, Univ. Nacional Autónoma de México (Mexico); Camilo Ruiz Mendez, Univ. de Salamanca (Spain)

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 17A

12664-34

#### Optical effects of fluids: simulation and analysis

Author(s): David Vega, Steven La Cava, Felipe Mercado, Joao Mendez Lopes, Ansys, Inc. (United States)

21 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 17A

12664-18

#### Closed loop light ray trajectories in transformation optic devices

Author(s): Maik Locher, Jiyu Tan, Univ. of Glasgow (United Kingdom); Jakub Belín, Univ. of Glasgow (United Kingdom), CEITEC - Central European Institute of Technology (Czech Republic), Brno Univ. of Technology (Czech Republic); Tomáš Tyc, Masaryk Univ. (Czech Republic); Johannes Courtial, Univ. of Glasgow (United Kingdom)

21 August 2023 • 5:10 PM - 5:30 PM | Conv. Ctr. Room 17A

# TECHNICAL CONFERENCES

## Conference 12664

### AN OPTICAL BELIEVE IT OR NOT: KEY LESSONS LEARNED

21 August 2023 • 8:30 PM - 10:00 PM  
Marriott Marquis, Marina Ballroom E

This event is dedicated to the sharing of key optical lessons learned. Nearly all optical engineers, scientists, researchers, or managers have dealt with the unexpected. Many of these situations in hindsight are quite funny, and have buried within them key optical/managerial lessons learned. The problem with simply listing lessons learned is that as a simple listing, they are clearly hard to remember, thus history repeats itself much to our collective debit. This event will help us all remember the important take-aways by presenting a collection of small stories or optical parables from Leaders in the fields of optics and optical systems engineering.

Please note that our Lessons Learned Speakers are encouraged to embellish their material (within editorial limits), and names, places, and dates may be changed to protect the guilty, but all the take-aways will have a basis in truth as avowed by the author. Audience participation will be allowed/encouraged, as time permits.

2023 speaker to be announced soon.

## TUESDAY 22 AUGUST 2023

### SESSION 7: COMMUNICATIONS AND POWER

22 August 2023 • 8:30 AM - 9:50 AM | Conv. Ctr. Room 17A  
Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-19

#### Performance analysis of imaging receivers for 6G laser-based optical wireless communications

Author(s): Elham Sarbazi, Hossein Kazemi, Univ. of Strathclyde (United Kingdom); Majid Safari, The Univ. of Edinburgh (United Kingdom); Harald Haas, Univ. of Strathclyde (United Kingdom)

22 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 17A

12664-20

#### Non-imaging receiver design for terabit laser-based optical wireless communication in 6G data center networks

Author(s): Hossein Kazemi, Elham Sarbazi, Univ. of Strathclyde (United Kingdom); Majid Safari, The Univ. of Edinburgh (United Kingdom); Harald Haas, Univ. of Strathclyde (United Kingdom)

22 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 17A

12664-22

#### A novel hybrid RF/optical communications antenna for deep space applications

Author(s): Julia Milton, Makan Mohageg, Barzia Tehrani, Jet Propulsion Lab. (United States)

22 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 17A

12664-23

#### Design of face-to-face optical wireless power transmission system based on robot arm visual tracking

Author(s): Shaopu Zhou, Sicheng Lu, Takeo Maruyama, Kanazawa Univ. (Japan)

22 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 17A

Coffee Break 9:50 AM - 10:20 AM

### SESSION 8: GRATING AND DIFFRACTIVE OPTICS

22 August 2023 • 10:20 AM - 11:20 AM | Conv. Ctr. Room 17A  
Session Chair: Mark A. Kahan, Synopsys, Inc. (United States)

12664-24

#### Time-Aware Fourier Optics: Modeling Implications and Device Performance Predictions

Author(s): Benjamin Wetherfield, Timothy D. Wilkinson, Univ. of Cambridge (United Kingdom)

22 August 2023 • 10:20 AM - 10:40 AM | Conv. Ctr. Room 17A

12664-25

#### Analytical representation of diffraction efficiencies of binary phase gratings for array illumination with ultrashort laser pulses

Author(s): Hidetoshi Nakano, Jun Amako, Toyo Univ. (Japan)

22 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 17A

12664-35

#### Hardware-accelerated inverse design of a large-area CMOS-compatible grating coupler

Author(s): Momchil Minkov, Emerson G. Melo, Xinzhong Chen, Tyler W. Hughes, Flexcompute, Inc. (United States)

22 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 17A

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A  
Session Chairs: Tony Hull, The Univ. of New Mexico (United States) and Daewook Kim, Wyant College of Optical Sciences (United States)

#### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

#### Optic technologies enabling fusion ignition at the National Ignition Facility (Plenary Presentation)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

#### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (Plenary Presentation)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

#### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (Plenary Presentation)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12664-27

#### **Non-sequential ray tracing optical modeling and performance predictions: methodology for evaluating operational performance in imaging and spectral instruments from human eye to large-aperture space telescopes**

Author(s): Dongok Ryu, Korea Aerospace Research Institute (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12664-28

#### **Characterization of transmission in a multiple core-offset Mach-Zehnder interferometer filter using single-mode fiber**

Author(s): Sheila Elvira Bazavilvazo Azua, Romeo de Jesus Selvas-Aguilar, Univ. Autónoma de Nuevo León (Mexico); J.M. Sierra-Hernández, Univ. de Guanajuato (Mexico); Mario Angel Rico-Mendez, Univ. Autónoma de Nuevo León (Mexico); E. Gallegos-Arellano, Univ. Tecnológica de Salamanca (Mexico); D. Toral-Acosta, Andrea Scarlett Herrera García, Univ. Autónoma de Nuevo León (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12664-29

#### **Inverse optical design using quasi-two-dimensional partially coherent imaging for photolithography overlay metrology**

Author(s): Akinori Ohkubo, Sungho Jang, Jungchul Lee, Sangwoo Bae, SAMSUNG Electronics Co., Ltd. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12664-30

#### **Coherent data system and slow data transmission in a single fiber with ITU grid spacing**

Author(s): Tomáš Horváth, Jaromir Sima, Jan Radil, Josef Vojtech, CESNET z.s.p.o. (Czech Republic)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12664-31

#### **Enhancing sugar solution analysis in water with a fiber optic refractometer**

Author(s): Sheila Elvira Bazavilvazo Azua, Pedro Alvarez Guzman, Mario Angel Rico-Mendez, Romeo de Jesus Selvas-Aguilar, Andrea Scarlett Herrera García, Univ. Autónoma de Nuevo León (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12664-33

#### **Effect of astigmatism on the beam quality factor of Hermite-Gauss laser beams**

Author(s): Chemist M. Mabena, Nokwazi Mphuthi, Lebohang Bell, Darryl Naidoo, CSIR National Laser Ctr. (South Africa)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12665

# Novel Optical Systems, Methods, and Applications XXVI

22 - 23 August 2023 | Conv. Ctr. Room 14A

Conference Chairs: **Cornelius F. Hahlweg**, bbw Hochschule (Germany); **Joseph R. Mulley**, IDEX Health & Science, LLC (United States)

Program Committee: **Joseph S. Choi**, Northrop Grumman Corp. (United States); **Blake G. Crowther**, Synopsys, Inc. (United States); **Stephan Fahr**, JENOPTIK Optical Systems GmbH (Germany); **Peter I. Goldstein**, Philips Color Kinetics (United States); **G. Groot Gregory**, Synopsys, Inc. (United States); **Eric Herman**, Synopsys, Inc. (United States); **R. John Koshel**, Wyant College of Optical Sciences (United States); **Sara Madaan**, The Univ. of Southern California (United States); **Bharathwaj Appan Narasimhan**, Magic Leap, Inc. (United States); **S. Craig Olson**, L3Harris Technologies, Inc. (United States); **José M. Sasián**, Wyant College of Optical Sciences (United States); **Hamilton Shepard**, Waymo, LLC (United States); **Haiyin Sun**, ChemImage Corp. (United States); **Akila S. Udage**, Rensselaer Polytechnic Institute (United States); **Udo Zölzer**, Helmut-Schmidt Univ. (Germany)

### TUESDAY 22 AUGUST 2023

#### SESSION 1: LASER SYSTEMS AND APPLICATIONS

22 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 14A

Session Chair: Cornelius F. Hahlweg, bbw Hochschule (Germany)

12665-1

#### Plasma torch produced Er<sup>3+</sup> doped tellurite whispering gallery mode microresonator for lasing application

Author(s): Snigdha Thekke Thalakkal, Davor Ristic, Ruder Boškovic Institute (Croatia); Gualtiero Nunzi Conti, Istituto di Fisica Applicata "Nello Carrara" (Italy); Hrvoje Gebavi, Ruder Boškovic Institute (Croatia); Stefano Pelli, Istituto di Fisica Applicata (Italy); Alessandro Chiasera, IFN-CNR, CSMFO Lab. and FBK Photonics Unit (Italy); Maurizio Ferrari, IFN-CNR (Italy); Mile Ivanda, Ruder Boškovic Institute (Croatia)

22 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 14A

12665-2

#### Towards next-generation ultrastable lasers with microstructured mirrors (*Invited Paper*)

Author(s): Johannes Dickmann, Steffen Sauer, Technische Univ. Braunschweig (Germany), Lab. for Emerging Nanometrology (Germany); Stefanie Kroker, Technische Univ. Braunschweig (Germany), Lab. for Emerging Nanometrology (Germany), Physikalisch-Technische Bundesanstalt (Germany)

22 August 2023 • 1:50 PM - 2:20 PM | Conv. Ctr. Room 14A

12665-3

#### Laser frequency stabilization using HCN gas cell

Author(s): Pengzhuo Wang, Felipe Guzman, Jose Sanjuan, Texas A&M Univ. (United States)

22 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 14A

12665-4

#### Non-destructive quality evaluation of periodically poled MgO:PPLN and Rb:PPKTP crystals based on parametric light generation

Author(s): Jonas Banyš, Jokubas Pimpe, Ona Balachninaite, Vygandas Jarutis, Julius Vengelis, Vilnius Univ. (Lithuania)

22 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 14A

Coffee Break 3:00 PM - 3:30 PM

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States) and Daewook Kim, Wyant College of Optical Sciences (United States)

#### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

#### Optic technologies enabling fusion ignition at the National Ignition Facility (*Plenary Presentation*)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

#### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (*Plenary Presentation*)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

#### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (*Plenary Presentation*)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A



### LENS DESIGN TECHNICAL EVENT

22 August 2023 • 8:00 PM - 10:00 PM  
Marriott Marquis, Marina Ballroom E

Session Chair: Scott Lerner

#### “Let’s Give ‘Em Something to Talk About!”

Lens designers! Join us for our annual gathering to meet and discuss... lens design! Let’s talk about what we’re designing, how we’re going about doing it (what materials, software, techniques, etc.), and which problems we’re encountering. We’ll also explore current technical and commercial trends in the marketplace.

This year’s invited speaker will be Breann Sitarski, NASA Goddard Space Flight Ctr. (United States), whose talk is entitled “Optical design throughout the project lifetime.” The optical design of a system is a significant contributor to the architecture and performance of a system. Through the lifetime of the project, the optical designer typically generates many redesigns until a solution is found that meets the often frequently changing requirements. This is particularly challenging if the domains and associated semantics (i.e., science vs. industry, etc.) between the designer and customer are not aligned. This talk will discuss some suggestions that could help the design process and more fluidly based on lessons learned from building some of the physically largest optics projects to date.

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## WEDNESDAY 23 AUGUST 2023

### SESSION 2: BIOMEDICAL APPLICATIONS

23 August 2023 • 8:20 AM - 9:20 AM | Conv. Ctr. Room 14A

Session Chair: Hamilton Shepard, Waymo, LLC (United States)

12665-5

#### Integrated interferometer design for zero cross-sensitivity to matrix perturbations

Author(s): Samuel M. Hörmann, Jakob W. Hinum-Wagner, ams-OSRAM AG (Austria), Technische Univ. Graz (Austria); Alexander Bergmann, Technische Univ. Graz (Austria)

23 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 14A

12665-6

#### A photoacoustic spectroscopy system for noninvasive diagnosis of endometriosis in the abdominal cavity

Author(s): Zi Xiong, Maya McKone-Sweet, Aaron Codrington, Chhavi Goenka, Franklin W. Olin College of Engineering (United States)

23 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 14A

12665-7

#### Metasurface-based optical system for the generation of Bessel beams with independent optical parameters in fluorescence microscopy

Author(s): Anna Archetti, Univ. degli Studi di Padova (Italy), Ecole Polytechnique Fédérale de Lausanne (Switzerland); Matteo Bruzzone, Univ. degli Studi di Padova (Italy); Giulia Tagliabue, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Marco dal Maschio, Univ. degli Studi di Padova (Italy)

23 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 14A

### SESSION 3: METROLOGY APPLICATIONS

23 August 2023 • 9:20 AM - 10:10 AM | Conv. Ctr. Room 14A

Session Chair: Hamilton Shepard, Waymo, LLC (United States)

12665-8

#### Building a low-cost strain sensor prototype using fiber Bragg gratings with resonant cavity light emitting diodes

Author(s): Carlos M. Gutierrez, Univ. of Notre Dame (United States); Milan Palei, The Univ. of Chicago (United States); Cagri Aydinkarahaliloglu, Univ. of Notre Dame (United States); Xiaoxiao Liu, Devin Sullivan, CTS Corp. (United States); Anthony J. Hoffman, Univ. of Notre Dame (United States)

23 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 14A

12665-9

#### New patterned silicon wafer shape metrology system (Invited Paper)

Author(s): Kiril Ivanov Kurtev, Wootpix (Spain); Juan M. Trujillo-Sevilla, Wootpix, S.L. (Spain); Guillermo Castro Luis, Miguel Jiménez, Rubén Abrantea, Wootpix (Spain); José Manuel Ramos-Rodríguez, Wootpix, S.L. (Spain); Jan O. Gaudestad, Wootpix, S.L. (United States)

23 August 2023 • 9:40 AM - 10:10 AM | Conv. Ctr. Room 14A

Coffee Break 10:10 AM - 10:40 AM

### SESSION 4: MULTI- AND HYPERSPECTRAL SYSTEMS

23 August 2023 • 10:40 AM - 12:00 PM | Conv. Ctr. Room 14A

Session Chair: Groot Gregory, Synopsys, Inc. (United States)

12665-11

#### Dual fiber coupled laser-driven light source

Author(s): Jing Zhou, Qingsong Wang, Neal Foley, Craig Schiller, Huiling Zhu, Energetiq Technology, Inc. (United States)

23 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 14A

12665-12

#### Advanced optics for EO/IR applications

Author(s): Jonathan Koerber, Naval Surface Warfare Ctr. Crane Div. (United States), The Univ. of North Carolina at Charlotte (United States); Thomas J. Suleski, The Univ. of North Carolina at Charlotte (United States); Daniel Gibson, Jasbinder Sanghera, Shyam Bavya, U.S. Naval Research Lab. (United States); Jason Valentine, Vanderbilt Univ. (United States); Gregory T. Forcherio, Naval Surface Warfare Ctr. Crane Div. (United States)

23 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 14A

12665-13

#### Snapshot 12-band multispectral imager

Author(s): Nathan A. Hagen, Shotaro Kinoshita, Yukitoshi Otani, Utsunomiya Univ. (Japan)

23 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 14A

12665-14

#### A 380-1100nm spectrum matching light source with high spectral resolution, throughput, speed, and stability

Author(s): Qingsong Wang, Kosuke Saito, Jing Zhou, Alex Cutler, William Grube, Craig Schiller, Don McDaniel, Debbie Gustafson, Huiling Zhu, Energetiq Technology, Inc. (United States)

23 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 14A

# TECHNICAL CONFERENCES

## Conference 12665

Lunch/Exhibition Break 12:00 PM - 1:30 PM

### SESSION 5: DESIGN, MODELING, AND METHODS

23 August 2023 • 1:30 PM - 2:50 PM | Conv. Ctr. Room 14A

Session Chair: Joseph R. Mulley,  
IDEX Health & Science, LLC (United States)

12665-16

#### Marker-based registration error estimation in see-through AR applications

Author(s): Lukas Jütte, Leibniz Univ. Hannover (Germany); Alexander Poschke, Institut für Integrierte Produktion Hannover gGmbH (Germany); Ludger Overmeyer, Leibniz Univ. Hannover (Germany)

23 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 14A

12665-17

#### Optimization of residual stress and micro-yield strength in an additively manufactured high-strength aluminum alloy

Author(s): Julian Lohser, Rafael J. Zaldivar, The Aerospace Corp. (United States); Jenn-Ming Yang, Univ. of California, Los Angeles (United States)

23 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 14A

12665-18

#### Large area dichroic mirrors by multilayer inkjet printing

Author(s): Ulrich Lemmer, Qiaoshuang Zhang, Qihao Jin, Andres Roesch, Karlsruher Institut für Technologie (Germany)

23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 14A

12665-15

#### High resolution imaging system with a large field of view for short wavelength applications

Author(s): Liang Chen, Tongji Univ. (China)

23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 14A

Coffee Break 2:50 PM - 3:20 PM

### SESSION 6: GEOLOGICAL APPLICATIONS

23 August 2023 • 3:20 PM - 4:20 PM | Conv. Ctr. Room 14A

Session Chair: Cornelius F. Hahlweg, bbw Hochschule (Germany)

12665-21

#### Photochromic gemstone analysis using in situ absorption spectroscopy

Author(s): Tsung-Han Tsai, Ulrika F. S. D'Haenens-Johansson, Zhen Wang, Gemological Institute of America (United States)

23 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 14A

12665-22

#### Optical fiber-based novel distributed pressure sensing

Author(s): Jyotsna Sharma, Louisiana State Univ. (United States); Kevin Chen, Shuda Zhong, Univ. of Pittsburgh (United States)

23 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 14A

12665-23

#### Design of a reduced glare optical system for mining machine area lights

Author(s): Edward Bailey, Illumination Machines (United States)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 14A

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12665-24

#### Excimer laser based photoluminescence device for diamond identification

Author(s): Zhen Wang, Tsung-Han Tsai, Wuyi Wang, Gemological Institute of America (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-27

#### Verification of methods to diagnose surfaces with different degrees of inhomogeneity

Author(s): O.V. Angelsky, Vladyslav M. Tkachuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine); Jun Zheng, Zhejiang Univ. (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-30

#### Method of polarization-maintaining photonic crystal fiber nonlinear response measurement using phase shift between orthogonal polarization modes

Author(s): Migle Kuliešaite, Jokubas Pimpe, Julius Vengelis, Vygandas Jarutis, Vilnius Univ. (Lithuania)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-31

#### Cephalopod eye camera for high contrast imaging under vertically uneven light environments

Author(s): Sehui Chang, Gwangju Institute of Science and Technology (Republic of Korea); Minsung Kim, Northwestern Univ. (United States); Minsu Kim, Seoul National Univ. (Republic of Korea), Institute for Basic Science (Republic of Korea); Ji-Eun Yeo, Min Seok Kim, Gwangju Institute of Science and Technology (Republic of Korea); Gil Ju Lee, Pusan National Univ. (Republic of Korea); Dae-Hyeong Kim, Seoul National Univ. (Republic of Korea), Institute for Basic Science (Republic of Korea); Young Min Song, Gwangju Institute of Science and Technology (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-32

#### View rotation spectacles

Author(s): Maik Locher, Johannes Courtial, Univ. of Glasgow (United Kingdom)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-33

#### Ideal thin lens lookalike

Author(s): Maik Locher, Univ. of Glasgow (United Kingdom); Adam Cepil, Univ. of Glasgow (United Kingdom), Masaryk Univ. (Czech Republic); Johannes Courtial, Univ. of Glasgow (United Kingdom)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-34

### **Resonant Cavity Design for Enhanced Magneto Optic Measurements**

Author(s): Syed Azer Reza, Maarij Syed, Cody Brelage, Rose-Hulman Institute of Technology (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-38

### **Tapered optical fiber sensor of acid and alkaline solution with MWCNT and alizarin red S**

Author(s): Mario Angel Rico-Mendez, Romeo Selvas-Aguilar, Gerardo Alejandro Montano-González, Oxana Vasilievna Kharissova, Daniel Toral-Acosta, Norma Patricia Puente-Ramírez, Univ. Autónoma de Nuevo León (Mexico); Alejandro Martínez-Rios, Centro de Investigaciones en Óptica, A.C. (Mexico); Boris Ildusovich Kharissov, Leonardo Jahir Arévalo Bautista, Univ. Autónoma de Nuevo León (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12665-39

### **3D-representation of skin malformations using spectral line imaging and modified Beer-Lambert law**

Author(s): Ilze Ošina, Janis Spigulis, Univ. of Latvia (Latvia)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12666

# Current Developments in Lens Design and Optical Engineering XXIV

22 August 2023 | Conv. Ctr. Room 14A

Conference Chairs: **R. Barry Johnson**, Alabama A&M Univ. (United States); **Virendra N. Mahajan**, Wyant College of Optical Sciences (United States); **Simon Thibault**, Univ. Laval (Canada)

Conference Co-Chairs: **Ching-Cherng Sun**, National Central Univ. (Taiwan); **Alfonso Padilla-Vivanco**, Univ. Politécnica de Tulancingo (Mexico)

Program Committee: **Julie L. Bentley**, The Institute of Optics, Univ. of Rochester (United States); **Nathalie Blanchard**, INO (Canada); **Florian Bociort**, Technische Univ. Delft (Netherlands); **Kit Cheong**, Optical Systems Design, LLC (United States); **Apostolos Deslis**, JENOPTIK Light & Optics (United States); **José Antonio Díaz Navas**, Univ. de Granada (Spain); **Sen Ha**, Suzhou Graduate School of Nanjing Univ. (China); **James E. Harvey**, Photon Engineering LLC (United States); **Lakshminarayan Hazra**, Univ. of Calcutta (India); **Pantazis Mouroulis**, Jet Propulsion Lab. (United States); **Jessica DeGroote Nelson**, Edmund Optics Inc. (United States); **Jocelyn Parent**, ImmerVision (Canada); **Anne-Sophie Poulin-Girard**, Univ. Laval (Canada); **Yuzuru Takashima**, Wyant College of Optical Sciences (United States); **María Josefa Yzuel Giménez**, Univ. Autònoma de Barcelona (Spain)

### TUESDAY 22 AUGUST 2023

#### SESSION 1: THEORY AND APPLICATIONS

22 August 2023 • 8:20 AM - 10:00 AM | Conv. Ctr. Room 14A

Session Chair: Simon Thibault, Univ. Laval (Canada)

12666-1

#### Wide field of regard metalens receiver for free space optical communication

Author(s): Md Shafiqul Islam, Ozdal Boyraz, Univ. of California, Irvine (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 14A

12666-3

#### Enhanced degrees of freedom of nanocomposite freeform gradient index optics

Author(s): George M. Williams, Paul Harmon, NanoVox, LLC (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 14A

12666-4

#### Optimization of freeform spectacle lenses based on high-order aberrations

Author(s): Keith Dillon, Jeffrey Chomyn, FormuLens (United States)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 14A

12666-5

#### Hybrid refractive-metalens design for imaging applications

Author(s): Yijun Ding, Bryan D. Stone, Mayank Bahl, Evan Heller, Robert Scarmozzino, Synopsys, Inc. (United States)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 14A

12666-6

#### Micro-LED and metalens-based augmented reality system

Author(s): Chi Sun, Jun-Hsun Liao, Guo-Dung Su, Graduate Institute of Photonics and Optoelectronics (Taiwan)

22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 14A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: INTEGRATION AND APPLICATIONS

22 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 14A

Session Chair: Ching-Cherng Sun, National Central Univ. (Taiwan)

12666-7

#### Halogen source illumination optimization using a beam shaping biconic lens array

Author(s): Lien Smeesters, Dries Rosseel, Michael Vervaeke, Hugo Thienpont, Vrije Univ. Brussel (Belgium), Flanders Make (Belgium)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 14A

12666-8

#### Multi-aperture pattern projection using arbitrary shaped microlenslets

Author(s): Rohan Kundu, Dirk Michaelis, Peter Schreiber, Philipp Schleicher, Anja Schöneberg, Robert Leitel, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Ulrich Breyer, OPTOFLUX GmbH (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 14A

12666-24

#### Variable angle spectroscopic ellipsometry study on the repeated application of First Contact Polymer on silicon-based surfaces

Author(s): Joshua J. Vawdrey, Brigham Young Univ. (United States); James P. Hamilton, Univ. of Wisconsin-Platteville (United States); David D. Allred, Brigham Young Univ. (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 14A

12666-10

#### Optical relays for imaging scintillators

Author(s): Robert M. Malone, Mission Support and Test Services LLC (United States); Stuart A. Baker, National Security Technologies, LLC (United States); Daniel K. Frayer, Todd J. Haines, Mission Support and Test Services LLC (United States); Kevin T. Joyce, Lawrence Livermore National Lab. (United States); Morris I. Kaufman, Paul K. Manhart, Katherine L. Walters, Eloisa Zepeda-Alarcon, Mission Support and Test Services LLC (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 14A

12666-11

### Study of an invariant impulse response in nonimaging design

Author(s): Shih-Kang Lin, Thi-Thu-Ngoc Le, Chi-Shou Wu, Yeh-Wei Yu, Tsung-Hsun Yang, Ching-Cherng Sun, National Central Univ. (Taiwan)

22 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 14A

12666-12

### Adaptive automotive headlamp incorporated with using volume holographic optical element

Author(s): Yong-Sheng Lin, National Central Univ. (Taiwan); Tsung-Xian Lee, National Taiwan Univ. of Science and Technology (Taiwan); Tsung-Hsun Yang, Yeh-Wei Yu, Ching-Cherng Sun, National Central Univ. (Taiwan)

22 August 2023 • 12:10 PM - 12:30 PM | Conv. Ctr. Room 14A

## OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States) and Daewook Kim, Wyant College of Optical Sciences (United States)

### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

### Optic technologies enabling fusion ignition at the National Ignition Facility (Plenary Presentation)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (Plenary Presentation)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (Plenary Presentation)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

## LENS DESIGN TECHNICAL EVENT

22 August 2023 • 8:00 PM - 10:00 PM

Marriott Marquis, Marina Ballroom E

Session Chair: Scott Lerner

### “Let’s Give ‘Em Something to Talk About!”

Lens designers! Join us for our annual gathering to meet and discuss... lens design! Let’s talk about what we’re designing, how we’re going about doing it (what materials, software, techniques, etc.), and which problems we’re encountering. We’ll also explore current technical and commercial trends in the marketplace.

This year’s invited speaker will be Breann Sitarski, NASA Goddard Space Flight Ctr. (United States), whose talk is entitled “Optical design throughout the project lifetime.” The optical design of a system is a significant contributor to the architecture and performance of a system. Through the lifetime of the project, the optical designer typically generates many redesigns until a solution is found that meets the often frequently changing requirements. This is particularly challenging if the domains and associated semantics (i.e., science vs. industry, etc.) between the designer and customer are not aligned. This talk will discuss some suggestions that could help the design process and more fluidly based on lessons learned from building some of the physically largest optics projects to date.

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## WEDNESDAY 23 AUGUST 2023

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12666-13

### Reliable monitoring UV-C irradiation of a specific LED system for application in extending the postharvest life of bananas

Author(s): Thi-Thu-Ngoc Le, National Central Univ. (Taiwan); Chung-Ta Liao, Taichung District Agricultural Research and Extension Station (Taiwan); Chi-Shou Wu, Shih-Kang Lin, Tsung-Hsun Yang, Yeh-Wei Yu, Ching-Cherng Sun, National Central Univ. (Taiwan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12666

12666-14

### **Non-typical design of K-mark LED headlamp with extreme-high contrast**

Author(s): Kun-Han Yu, Mei-Lin Cheng, Chi-Shou Wu, Shih-Kang Lin, Yong-Sheng Lin, Ching-Cherng Sun, Tsung-Hsun Yang, Yeh-Wei Yu, National Central Univ. (Taiwan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-15

### **Radial Ichikawa-Lohmann-Takeda method for the transport of intensity equation solution**

Author(s): Pablo Ortega Escorza, Alfonso Padilla-Vivanco, Univ. Politécnica de Tulancingo (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-16

### **Discrete-to-continuous optimization for wide-angle deep ultraviolet antireflective multilayers**

Author(s): Jae-Hyun Kim, Kyung Hee Univ. (Republic of Korea); Soonmin Yim, Korea Research Institute of Chemical Technology (Republic of Korea); Sun-Kyung Kim, Eungkyu Lee, Kyung Hee Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-17

### **FORMOSAT-8 stray light disposition**

Author(s): Tsung-Ping Lee, Yu-Sheng Liu, Po-Hsuan Huang, Chaojung Cheng, Sheng-Feng Lin, Yi-Kai Huang, Taiwan Space Agency (TASA) (Taiwan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-18

### **Machine learning enabled broadband antireflective multilayers for thermography**

Author(s): Jae-Seon Yu, Jae-Hyun Kim, Serang Jung, Eungkyu Lee, Sun-Kyung Kim, Kyung Hee Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-19

### **Convolutional neuronal network to restore images encoded by a wavefront coding imaging system**

Author(s): José Manuel Reyes-Alfaro, Carina Toxqui-Quitl, María Angélica Espejel Rivera, Enrique González Amador, Alfonso Padilla Vivanco, Univ. Politécnica de Tulancingo (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-20

### **Jacobi-Fourier phase masks solution for presbyopia**

Author(s): Ángel Salas Sánchez, Enrique González-Amador, Alfonso Padilla-Vivanco, Carina Toxqui-Quitl, Univ. Politécnica de Tulancingo (Mexico); Justo Arines, Eva Acosta, Univ. de Santiago de Compostela (Spain)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-22

### **UV optical surface cleaning with first contact polymer**

Author(s): Matthew Beasley, Noel A. Eloriaga, Michael Davis, Todd Veach, Southwest Research Institute (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12666-23

### **Spectrally aligned integration of miniaturized substrate-free thin-film filters for fiber optical networks**

Author(s): Philipp Gehrke, Anna K. Rüsseler, Gerd A. Hoffmann, Andreas Wienke, Dietmar Kracht, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## Conference 12667

# Laser Beam Shaping XXIII

20 August 2023 | Conv. Ctr. Room 17A

Conference Chairs: **Angela Dudley**, Univ. of the Witwatersrand, Johannesburg (South Africa); **Alexander V. Laskin**, AdlOptica Optical Systems GmbH (Germany)

Program Committee: **Fred M. Dickey**, FMD Consulting LLC (United States); **Andrew Forbes**, Univ. of the Witwatersrand, Johannesburg (South Africa); **Patrick Gretzki**, Pulsar Photonics GmbH (Germany); **Raul I. Hernandez-Aranda**

Tecnológico de Monterrey (Mexico); **Alexis V. Kudryashov**, Institute of Dynamics of Geospheres RAS (Russian Federation); **Todd E. Lizotte**, BOLD Laser Automation (United States); **Dorilian Lopez-Mago**, Tecnológico de Monterrey (Mexico); **Daryl Preece**, Beckman Laser Institute and Medical Clinic (United States); **Gediminas Račiukaitis**, Ctr. for Physical Sciences and Technology (Lithuania); **Carmelo Rosales-Guzmán**, Centro de Investigaciones en Óptica, A.C. (Mexico); **Mateusz Michal Szatkowski**, Wrocław Univ. of Science and Technology (Poland)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: VECTOR AND VORTEX BEAMS

20 August 2023 • 9:10 AM - 10:30 AM | Conv. Ctr. Room 17A

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

12667-1

#### Generation and characterization of complex vector modes with digital micromirror devices

Author(s): Carmelo Rosales-Guzmán, Centro de Investigaciones en Óptica, A.C. (Mexico); Xiao-Bo Hu, Zhejiang Sci-Tech Univ. (China)

20 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 17A

12667-2

#### Exploring the creation of uniformly enclosed optical bottle beams using vectorial wavefront shaping

Author(s): Daryl C. Preece, Nicolas Perez, Beckman Laser Institute and Medical Clinic (United States)

20 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 17A

12667-3

#### Multiclass classifier for singular beams

Author(s): Sunil Vyas, Yuan Luo, National Taiwan Univ. (Taiwan)

20 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 17A

12667-23

#### Optical vortex pulse generation with reflective achromatic phase converter

Author(s): Erick Ramón Baca Montero, Oleksiy Shulika, Univ. de Guanajuato (Mexico)

20 August 2023 • 10:10 AM - 10:30 AM | Conv. Ctr. Room 17A

Coffee Break 10:30 AM - 11:00 AM

#### SESSION 2: SLMS AND DMDS

20 August 2023 • 11:00 AM - 12:00 PM | Conv. Ctr. Room 17A

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

12667-4

#### Mimicking a piston-type deformable mirror on a spatial light modulator

Author(s): Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

20 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 17A

12667-5

#### Manipulating broadband light using a digital micromirror device

Author(s): Leerin Michaela Perumal, Andrew Forbes, Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

20 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 17A

12667-6

#### Stabilization of optical wireless power transmission system using spatial light modulator

Author(s): Khin Myo Thu, Takeo Maruyama, Kanazawa Univ. (Japan)

20 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 17A

Lunch Break 12:00 PM - 1:30 PM

#### SESSION 3: APPLICATIONS: OAM AND COMMS

20 August 2023 • 1:30 PM - 2:50 PM | Conv. Ctr. Room 17A

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

12667-7

#### Design and analysis of SiN optical waveguide for 2D beam steering

Author(s): Zhiwei Zhou, Yoshikazu Shimeno, Shotaro Kawai, Takeo Maruyama, Kanazawa Univ. (Japan)

20 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 17A

# TECHNICAL CONFERENCES

## Conference 12667

12667-8

### Demultiplexing OAM beams via Fourier optical convolutional neural network

Author(s): Jiachi Ye, Haoyan Kang, Hao Wang, Chen Shen, Elham Heidari, Navid Asadizanjani, Univ. of Florida (United States); Mohammad Ali Miri, Queens College of the City University of New York (United States); Volker Sorger, Hamed Dalir, Univ. of Florida (United States)

20 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 17A

12667-9

### Polarization sensitive security system

Author(s): Ulises Ruiz, Teresa Cerda, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

20 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 17A

12667-11

### Development of a novel beam profiling prototype with laser self-mixing via the knife-edge approach

Author(s): Yuanfu Tan, The Chinese Univ. of Hong Kong (Hong Kong, China)

20 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 17A

Coffee Break 2:50 PM - 3:20 PM

#### SESSION 4: APPLICATIONS: HIGH-POWER

20 August 2023 • 3:20 PM - 4:40 PM | Conv. Ctr. Room 17A

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

12667-12

### High-resolution large-area patterning of photonic structures using a multibeam direct write laser lithography technology

Author(s): Kahraman Keskinbora, Niek Kremers, Jan Aarts, Hendrik Postma, Viacheslav Vlasenko, Jacco Houter, Raith Laser Systems B.V. (Netherlands)

20 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 17A

12667-13

### Advanced diffuser-based grayscale lithography

Author(s): Marc Christophersen, Chi C. Cheung, U.S. Naval Research Lab. (United States)

20 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 17A

12667-14

### Bessel-Gaussian laser heater mode for microbunching instability suppression in free-electron lasers

Author(s): Ravi Varma, Univ. of California, Los Angeles (United States); Randy A. Lemons, SLAC National Accelerator Lab. (United States); Sergio Carbajo, Univ. of California, Los Angeles (United States)

20 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 17A

12667-15

### Determination of the biological variability of porcine explant tissue in retinal damage ex-vivo experiments with optical laser radiation

Author(s): Marc Herbst, Robert Bosch GmbH (Germany), Karlsruhe Institut für Technologie (Germany); Annette Frederiksen, Robert Bosch GmbH (Germany); Wilhelm Stork, Karlsruher Institut für Technologie (Germany)

20 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 17A

#### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### A perovskite paved pathway to multi-terawatt scale photovoltaics (Plenary Presentation)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (Plenary Presentation)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (Plenary Presentation)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

## MONDAY 21 AUGUST 2023

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12667-16

### Characterization of collimation quality of Gaussian beams produced with engineered diffusers

Author(s): Minjae Kim, Andy Krajecki, Arjent Imeri, Syed Azer Reza, Rose-Hulman Institute of Technology (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12667-21

### A new integrated machine learning framework for advanced photoemission

Author(s): Hao Zhang, UCLA Samueli School of Engineering (United States), SLAC National Accelerator Lab. (United States); Jack E. Hirschman, Stanford Univ. (United States), SLAC National Accelerator Lab. (United States); Randy A. Lemons, SLAC National Accelerator Lab. (United States), Colorado School of Mines (United States); Linshan Sun, Brittany Lu, Univ. of California, Los Angeles (United States); Sergio Carbajo, Univ. of California, Los Angeles (United States), SLAC National Accelerator Lab. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A



12667-22

### **Analytical analysis of the quality factor of quartically aberrated Laguerre-Gauss beams**

Author(s): Chemist M. Mabena, Lebohang Bell, Nokwazi Mphuthi, Darryl Naidoo, CSIR National Laser Ctr. (South Africa)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States)  
and Daewook Kim, Wyant College of Optical Sciences  
(United States)

### **Welcome and Opening Remarks**

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

### **Optic technologies enabling fusion ignition at the National Ignition Facility** *(Plenary Presentation)*

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

### **The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation** *(Plenary Presentation)*

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

### **Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems** *(Plenary Presentation)*

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12668

# New Concepts in Solar and Thermal Radiation Conversion V

23 August 2023 | Conv. Ctr. Room 17B

Conference Chairs: **Peter Bermel**, Purdue Univ. (United States); **Jeremy N. Munday**, Univ. of California, Davis (United States)

Program Committee: **Fiona Beck**, The Australian National Univ. (Australia); **Roberto Russo**, Consiglio Nazionale delle Ricerche (Italy); **Sheng Shen**, Carnegie Mellon Univ. (United States); **Wilfried G. J. H. M. van Sark**, Utrecht Univ. (Netherlands); **Xiaobo Yin**, The Univ. of Hong Kong (Hong Kong, China); **Zongfu Yu**, Univ. of Wisconsin-Madison (United States); **Jia Zhu**, Nanjing Univ. (China)

### WEDNESDAY 23 AUGUST 2023

#### SESSION 1: LUMINESCENT SOLAR CONCENTRATORS

23 August 2023 • 8:30 AM - 9:50 AM | Conv. Ctr. Room 17B  
Session Chair: Peter Bermel, Purdue Univ. (United States)

12668-1

#### Strategies for the optimization of color neutral, transparent, and efficient luminescent solar concentrators (*Invited Paper*)

Author(s): Wilfried G. J. H. M. van Sark, Thomas A. de Bruin, Raimon Terricabres Polo, Celso de Mello Donegá, Utrecht Univ. (Netherlands)  
23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 17B

12668-2

#### Luminescent solar funneling using vertically aligned semiconductor nanorods (*Invited Paper*)

Author(s): Matthew T. Sheldon, Texas A&M Univ. (United States)  
23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 17B

12668-3

#### Photonic luminescent solar concentrator designs for high efficiency, low-cost photovoltaics

Author(s): Carissa N. Eisler, Lindsey E. Parsons, Mounika Dudala, Univ. of California, Los Angeles (United States)  
23 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 17B

Coffee Break 9:50 AM - 10:20 AM

#### SESSION 2: PHOTOVOLTAICS I

23 August 2023 • 10:20 AM - 12:00 PM | Conv. Ctr. Room 17B  
Session Chair: Wilfried G. J. H. M. van Sark, Utrecht Univ. (Netherlands)

12668-4

#### Transparent crystalline silicon solar cells and modules (*Invited Paper*)

Author(s): Kwanyong Seo, Ulsan National Institute of Science and Technology (Republic of Korea)  
23 August 2023 • 10:20 AM - 10:50 AM | Conv. Ctr. Room 17B

12668-5

#### Advancing solar absorbers with femtosecond lasers and metamaterials for photo-thermal and photo-voltaic applications (*Invited Paper*)

Author(s): Chunlei Guo, The Institute of Optics, Univ. of Rochester (United States)  
23 August 2023 • 10:50 AM - 11:20 AM | Conv. Ctr. Room 17B

12668-6

#### Durability of emerging encapsulant materials for photovoltaic modules: situation and challenges

Author(s): Kamel Agroui, Lyes Maifi, Zaina Mezine, Said Nouali, Ctr. de Recherche en Technologie des Semi-conducteurs pour l'Energétique (Algeria)  
23 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 17B

12668-7

#### Tuning the optical property of heterostructure of HgCdTe and Li and K doped WS<sub>2</sub>

Author(s): Ravi Shankar Verma, Shipra Saini, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)  
23 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 17B

Lunch/Exhibition Break 12:00 PM - 1:30 PM

#### SESSION 3: PHOTOVOLTAICS II

23 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 17B  
Session Chair: Matthew T. Sheldon, Texas A&M Univ. (United States)

12668-8

#### Organic multiple exciton generation and silicon (OMEGA Si)

Author(s): Timothy W. Schmidt, Nicholas J. Ekins-Daukes, Murad Tayebjee, Michael P. Nielsen, Dane R. McCamey, Jessica Y. Jiang, Bram Hoex, Alison Ciesla, Phoebe M. Pearce, Nathan Chang, Jonathan E. Beves, The Univ. of New South Wales (Australia)  
23 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 17B

12668-9

#### Ultra-thin transition metal di-chalcogenides (TMDCs) as radiation-resistant photovoltaic materials for space

Author(s): Sayan Roy, Peter Bermel, Purdue Univ. (United States)  
23 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 17B

### SESSION 4: RADIATIVE COOLING

23 August 2023 • 2:10 PM - 2:50 PM | Conv. Ctr. Room 17B

Session Chair: Chunlei Guo, The Institute of Optics, Univ. of Rochester (United States)

12668-11

#### **A multifaceted polymer coating as thermal emitter for sub-ambient passive radiative cooling of buildings and photovoltaics**

Author(s): Udayan Banik, Hosni Meddeb, Oleg Sergeev, Nies Reininghaus, Kai Gehrke, Martin Vehse, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 17B

12668-12

#### **Adjoint Kirchhoff's law for all thermal emitters**

Author(s): Cheng Guo, Stanford Univ. (United States); Bo Zhao, Univ. of Houston (United States); Shanhui Fan, Stanford Univ. (United States)

23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 17B

Coffee Break 2:50 PM - 3:20 PM

### SESSION 5: RENEWABLE ENERGY APPLICATIONS

23 August 2023 • 3:20 PM - 5:00 PM | Conv. Ctr. Room 17B

Session Chairs: Peter Bermel, Purdue Univ. (United States), Jeremy N. Munday, Univ. of California, Davis (United States)

12668-13

#### **Effect of electrode materials on the photo-electric response of a hybrid solar cell-supercapacitor with a photoactive gel electrolyte**

Author(s): Reza Amirabad, Arash Takshi, Univ. of South Florida (United States)

23 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 17B

12668-14

#### **Outdoor characterization of a tracking-integrated, semi-transparent, high efficiency CPV technology for agro-voltaic applications**

Author(s): Kareem F. Younes, Majed Bin Saad, Khalifa Univ. (United Arab Emirates); Harry Apostoleris, DEWA Research Ctr. (United Arab Emirates); Gaël Nardin, Noé Bory, Mathieu Ackermann, Insolight SA (Switzerland); Matteo Chiesa, Khalifa Univ. (United Arab Emirates)

23 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 17B

12668-15

#### **A direct comparison between thermoradiative and thermophotovoltaic operation of HgCdTe photodiodes**

Author(s): Michael P. Nielsen, Muhammad H. Sazzad, Andreas Pusch, Phoebe M. Pearce, Peter J. Reece, Nicholas J. Ekins-Daukes, The Univ. of New South Wales (Australia)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 17B

12668-16

#### **High-temperature characterization of resilient materials for thermophotovoltaic and thermal barrier coating applications**

Author(s): Peter Bermel, Purdue Univ. (United States)

23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 17B

12668-17

#### **Evaluating materials combinations for thermophotovoltaic emitters with spectral selectivity**

Author(s): Mariama Rebello de Sousa Dias, Univ. of Richmond (United States); Tao Gong, Margaret A. Duncan, Stuart Ness, Scott J. McCormack, Marina S. Leite, Jeremy N. Munday, Univ. of California, Davis (United States)

23 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 17B

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12668-18

#### **Surfactant-free, easy, low cost, and large scale hydrothermal synthesis and characterization of CZTS ink for photovoltaic utility**

Author(s): Nivedita Pandey, Indian Institute of Technology Bombay (India); Sudheendra Prabhu, Indian Institute of Technology Bombay (India); Manipal Institute of Technology (India); Deepak Punetha, Subhananda Chakrabarti, Manas R. Mantri, Indian Institute of Technology Bombay (India)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12668-19

#### **Thermal and light management of transparent crystalline Si solar cells**

Author(s): Kangmin Lee, Kwanyong Seo, Ulsan National Institute of Science and Technology (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12669

# Optomechanical Engineering 2023

20 August 2023 | Conv. Ctr. Room 16B

Conference Chairs: **Keith B. Doyle**, MIT Lincoln Lab. (United States); **Brandon D. Chalifoux**, Wyant College of Optical Sciences (United States)

Conference Co-Chairs: **Kenneth R. Castle**, Ruda Optical (United States); **José M. Sasián**, Wyant College of Optical Sciences (United States)

Program Committee: **Anees Ahmad**, Raytheon Missiles & Defense (United States); **Laura E. Coyle**, Ball Aerospace (United States); **Victor L. Genberg**, Sigmadyne, Inc. (United States); **Steven R. Gillmer**, MIT Lincoln Lab. (United States); **Mark J. Hegge**, Ball Aerospace (United States); **Tony Hull**, The Univ. of New Mexico (United States); **Leslie Johnson**, ATA Aerospace, LLC (United States); **Frank W. Kan**, Simpson Gumpertz & Heger Inc. (United States); **Keith J. Kasunic**, Optical Systems Group, LLC (United States); **William Jeffrey Lees**, Johns Hopkins Univ. Applied Physics Lab., LLC (United States); **John W. Pepi**, L3Harris Technologies, Inc. (United States); **John J. Polizotti**, Southwest Research Institute (United States); **Justin J. Rey**, MIT Lincoln Lab. (United States); **Katie Schwartz**, Edmund Optics Inc. (United States); **Deming Shu**, Argonne National Lab. (United States); **Daniel Vukobratovich**, Raytheon Missiles & Defense (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: OPTICAL MOUNTS AND MECHANISMS

20 August 2023 • 8:40 AM - 10:00 AM | Conv. Ctr. Room 16B

Session Chair: Steven R. Gillmer, MIT Lincoln Lab. (United States)

12669-1

#### Faster optical alignment with Adjustable, Re-lockable, Ruggedized, and Kinematic (ARRK) mounting

Author(s): Steven R. Gillmer, Andrew Guzman, Joseph Flaherty, Kevin Sullivan, Peter Kull, Ava C. Thrasher, James Johnson, Christopher Roll, MIT Lincoln Lab. (United States)

20 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 16B

12669-2

#### The UHV chamber window glass mounting design and analysis

Author(s): Ming-Ying Hsu, Hok-Sum Fung, Gung-Chian Yin, National Synchrotron Radiation Research Ctr. (Taiwan)

20 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 16B

12669-3

#### Polygon scanner for laser surface cleaning

Author(s): My Hoang Ha, JiWhan Noh, Korea Institute of Machinery & Materials (Republic of Korea)

20 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 16B

12669-4

#### Optomechanical mounts for high stability in harsh environmental conditions

Author(s): Nichola Desnoyers, Frederic Lamontagne, Martin Grenier, Mathieu Legros, Simon Paradis, Mathieu Tremblay, INO (Canada); Bruno Leduc, ABB Inc. (Canada)

20 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 16B

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: OPTOMECHANICAL SYSTEMS, FABRICATION, ASSEMBLY, AND TESTING

20 August 2023 • 10:30 AM - 11:30 AM | Conv. Ctr. Room 16B

Session Chair: Katie Schwartz, Edmund Optics Inc. (United States)

12669-5

#### Dual-axis mirror scanners fabricated with 3D printing

Author(s): Yi-Wen Cheng, Wei-An Tsui, Pin-Hung Yeh, Ching-Kai Shen, Jui-che Tsai, National Taiwan Univ. (Taiwan)

20 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16B

12669-6

#### Optomechanical design of the Europa Imaging System Wide Angle Camera (EIS WAC)

Author(s): William Jeffrey Lees, Joe Centurelli, Kimberly Slack, Zibi Turtle, Derek Lewis, Johns Hopkins Univ. Applied Physics Lab., LLC (United States); Pierce Morgan, Optimax Systems, Inc. (United States)

20 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16B

12669-8

#### Investigation of ultrafast laser stress generation in fused silica, Corning Eagle XG glass, Corning ULE glass, and sapphire

Author(s): Kevin A. Laverty, Daewook Kim, Wyant College of Optical Sciences (United States); James B. Johnson, Michael Echter, MIT Lincoln Lab. (United States); Brandon D. Chalifoux, Wyant College of Optical Sciences (United States)

20 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16B

Lunch Break 11:30 AM - 1:00 PM

### SESSION 3: OPTICAL ALIGNMENT

20 August 2023 • 1:00 PM - 2:40 PM | Conv. Ctr. Room 16B

Session Chair: José M. Sasián,  
Wyant College of Optical Sciences (United States)

12669-10

#### Aligning the Giant Magellan Telescope with laser tracker metrology

Author(s): Breann N. Sitarski, NASA Goddard Space Flight Ctr. (United States); Aline de Souza, GMTO Corp. (United States); Andrew Rakich, Mersenne Optical Consulting (New Zealand); Antonin Bouchez, Hugo Chiquito, Brian Walls, Tim Bond, GMTO Corp. (United States)

20 August 2023 • 1:00 PM - 1:20 PM | Conv. Ctr. Room 16B

12669-11

#### Systematic method of optical alignment using aberrations

Author(s): Robert E. Parks, Optical Perspectives Group, LLC (United States)

20 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 16B

12669-12

#### Unusual astigmatism encountered in an optical assembly having a moderate field of view

Author(s): Kenneth R. Castle, Martin Tangari Larrategui, Kyle Price, Ruda Optical (United States)

20 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 16B

12669-13

#### Comparing novel and conventional methods for optical system alignment using deflectometry

Author(s): Hyemin Yoo, Matthew Dubin, Wyant College of Optical Sciences (United States)

20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16B

12669-14

#### Optomechanical analysis of alignment tolerances in threaded lens mounts

Author(s): Martin Tangari Larrategui, Peter McNiven, Christian Baker, Paul Tulungen, Bianka Camacho, Lee Johnson, Victor Densmore, Kate Medicus, Kenneth Castle, Tilman Stuhlinger, Ruda Optical (United States)

20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16B

Coffee Break 2:40 PM - 3:10 PM

### SESSION 4: OPTICAL TOLERANCING

20 August 2023 • 3:10 PM - 4:30 PM | Conv. Ctr. Room 16B

Session Chair: Kenneth R. Castle, Ruda Optical (United States)

12669-15

#### Sensitivity comparison of a NURBS freeform telescope

Author(s): Derek A. Kopon, Jenna Montague, Brian Primeau, Plamen Krastev, Gregory Cappiello, James Johnson, MIT Lincoln Lab. (United States)

20 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 16B

12669-16

#### Novel methods for tolerancing mobile phone lenses

Author(s): Eric Herman, Synopsys, Inc. (United States); Sandy Ng, Jianing Yao, Scott A. Lerner, Meta (United States)

20 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 16B

12669-17

#### Simultaneous piston and tip-tilt measurement of segmented optics with cross-fringe phasing sensor

Author(s): Seichi Sato, Tadahito Mizutani, Japan Aerospace Exploration Agency (Japan)

20 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 16B

12669-18

#### Wavefront aberration detection of a structured laser beam using artificial intelligence and its use for alignment

Author(s): Martin Dusek, Jean-Christophe Gayde, CERN (Switzerland); Miroslav Sulc, Technical Univ. of Liberec (Czech Republic)

20 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 16B

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12669

MONDAY 21 AUGUST 2023

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12669-7

#### Design of precision Camera Rotation System (CRS) and Grating Rotator and Exchange System (GRX) for the Wide-Field Optical Spectrograph (WFOS) of the Thirty Meter Telescope (TMT)

Author(s): Ajin Prakash, Hari Mohan Varshney, Sudharsan Yadav Kambhala, Govinda K.V., Ramya Sethuram, Indian Institute of Astrophysics (India); Reston Nash, Caltech (United States); Amirul Hasan, Devika Divakar, Thirupathi Sivarani, Indian Institute of Astrophysics (India); Charles Steidel, Caltech (United States); Alastair Heptonstall, Thirty Meter Telescope (United States); Jason Fucik, Caltech (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-20

#### Monolithic duplex layer aluminum mirror structure for low surface sag error

Author(s): Jimin Han, Kyung Hee Univ. (Republic of Korea); Joong Kyu Ham, Geon Hee Kim, Hanbat National Univ. (Republic of Korea); Bongkon Moon, Dae-Hee Lee, Korea Astronomy and Space Science Institute (Republic of Korea); Soojong Pak, Kyung Hee Univ. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-21

#### Lightweighting large optomechanical structures in astronomy instrumentation utilizing generative design and additive manufacturing

Author(s): James T. Wells, UK Astronomy Technology Ctr. (United Kingdom), The Univ. of Sheffield (United Kingdom); Marcell Westsik, UK Astronomy Technology Ctr. (United Kingdom), The Univ. of Manchester (United Kingdom); Younes Chahid, Alastair Macleod, Lawrence Bissell, Richard Kotlewski, Scott McPhee, William A. Cochrane, UK Astronomy Technology Ctr. (United Kingdom); Jonathan Orr, Misael P. E. E Silva, Scott McKegney, National Manufacturing Institute Scotland, Univ. of Strathclyde (United Kingdom); Carolyn Atkins, UK Astronomy Technology Ctr. (United Kingdom)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-22

#### CO<sub>2</sub> laser polishing of etched fused silica toward ultrafast laser welding of lightweight optomechanical structures

Author(s): Yong Xin Lai, Brandon D. Chalifoux, Wyant College of Optical Sciences, The Univ. of Arizona (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-23

#### Thermal stability of ultrafast laser-generated stress in fused silica

Author(s): Carolyn Hokin, Brandon Chalifoux, Wyant College of Optical Sciences, The Univ. of Arizona (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-24

#### Design of layered sapphire composites with ablation-tunable coefficient of thermal expansion

Author(s): Brandon D. Chalifoux, The Univ. of Arizona (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-25

#### Alignment strategy of an NA 0.8 Deep UV objective system for semiconductor defect inspection

Author(s): Yunjong Kim, Korea Astronomy and Space Science Institute (Republic of Korea); Young-Soo Kim, Green Optics Co. (Republic of Korea); Dong-Kyun Kim, Hyun-il Cho, Green Optics Co., Ltd. (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12669-26

#### Modern optics drawings update: translating from American MIL drawings to ISO 10110

Author(s): David M. Aikens, Savvy Optics Corp. (United States); Eric Herman, Synopsys, Inc. (United States); Richard N. Youngworth, Riyo LLC (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## Conference 12670

### 3D Printing for Lighting

22 - 23 August 2023 | Conv. Ctr. Room 18

Conference Chairs: **Nadarajah Narendran**, Rensselaer Polytechnic Institute (United States); **Govi Rao**, Phase Change Solutions (United States)

Conference Co-Chair: **Samuel T. Mills**, Eaton Corp. (United States)

Program Committee: **Hugo da Silva**, Stratasys Ltd. (Netherlands); **Marco de Visser**, 3DPrinting.Lighting (Netherlands); **Jean Paul Freyssonier**, Rensselaer Polytechnic Institute (United States); **Groot Gregory**, **Alejandro Guerrero**, Amerlux LLC (United States); **Dustin Kloempken**, HP, Inc. (United States); **Brienne Musselman**, Illuminating Engineering Society of North America (United States); **Indika U. Perera**, Rensselaer Polytechnic Institute (United States); **Meghan Rock**, Desktop Metal (United States); **Jesse Roitenberg**, Stratasys Ltd. (United States); **George M. Williams**, NanoVox (United States)

#### TUESDAY 22 AUGUST 2023

##### SESSION 1: OVERVIEW AND OPPORTUNITIES FOR 3D PRINTING FOR LIGHTING

22 August 2023 • 8:15 AM - 9:55 AM | Conv. Ctr. Room 18  
Session Chair: Samuel T. Mills, Eaton Corp. (United States)

12670-1

##### **Industry 5.0: radically transforming the lighting value chain** (*Keynote Presentation*)

Author(s): Govi Rao, Phase Change Solutions (United States)  
22 August 2023 • 8:15 AM - 8:55 AM | Conv. Ctr. Room 18

12670-2

##### **Recent advancements in 3D printing of lighting components and systems**

Author(s): Nadarajah Narendran, Jennifer Taylor, Rensselaer Polytechnic Institute (United States)  
22 August 2023 • 8:55 AM - 9:15 AM | Conv. Ctr. Room 18

12670-3

##### **How 3D printing technology is modeling our future**

Author(s): Jesse Roitenberg, Stratasys (United States); Mike Hayden, Stratasys Ltd. (United States)  
22 August 2023 • 9:15 AM - 9:35 AM | Conv. Ctr. Room 18

12670-5

##### **Standardization to enable lighting dematerialization**

Author(s): Alex Baker, National Electrical Manufacturers Association (United States)  
22 August 2023 • 9:35 AM - 9:55 AM | Conv. Ctr. Room 18

**Coffee Break 9:55 AM - 10:25 AM**

##### SESSION 2: 3D-PRINTED LIGHTING SYSTEMS I

22 August 2023 • 10:25 AM - 12:15 PM | Conv. Ctr. Room 18  
Session Chair: Govi Rao, Phase Change Solutions (United States)

12670-6

##### **Sparkle: laterally symmetric 3D-printed luminaire eco-system** (*Invited Paper*)

Author(s): Don Peifer, Smash the Bulb (United States)  
22 August 2023 • 10:25 AM - 10:55 AM | Conv. Ctr. Room 18

12670-7

##### **Almost limitless - a product designer's perspective on utilizing additive manufactured parts for decorative lighting fixtures.**

Author(s): Andrew M. Schinker, OCL Architectural Lighting (United States)  
22 August 2023 • 10:55 AM - 11:15 AM | Conv. Ctr. Room 18

12670-8

##### **Leveraging wood waste streams for additively manufactured shades**

Author(s): Meghan Rock, Desktop Metal, Inc. (United States)  
22 August 2023 • 11:15 AM - 11:35 AM | Conv. Ctr. Room 18

12670-9

##### **Ambience and functionality = lighting: why and how to add additive manufacturing to your business from a real-life adaptor**

Author(s): Paul J. Hearne, Limelite Lighting Australia (Australia)  
22 August 2023 • 11:35 AM - 11:55 AM | Conv. Ctr. Room 18

12670-31

##### **Future of lighting: generative design and advanced configurability enabled by additive manufacturing**

Author(s): Christopher Sorensen, Dominic Large, Acuity Brands Lighting, Inc. (United States)  
22 August 2023 • 11:55 AM - 12:15 PM | Conv. Ctr. Room 18

**Lunch/Exhibition Break 12:15 PM - 1:30 PM**

##### SESSION 3: 3D-PRINTED OPTICS AND CHARACTERIZATION

22 August 2023 • 1:30 PM - 3:10 PM | Conv. Ctr. Room 18  
Session Chair: Groot Gregory, Synopsys, Inc. (United States)

12670-10

##### **3D-printed refractive secondary optics for LED lighting**

Author(s): Indika U. Perera, Jean Paul Freyssonier, Nadarajah Narendran, Akila S. Udage, Sachintha De Vas Gunawardena, Rensselaer Polytechnic Institute (United States)  
22 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 18

# TECHNICAL CONFERENCES

## Conference 12670

12670-11

### Photobleaching of transparent photopolymer resins for use in LED lighting optical elements

Author(s): Jean Paul Freyssonier, Indika U. Perera, Nadarajah Narendran, Akila S. Udage, Rensselaer Polytechnic Institute (United States)

22 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 18

12670-12

### High-speed and high-resolution 3D printing of polycrystalline neodymium-doped yttrium aluminum garnet ceramics

Author(s): Luyang Liu, Xiangfan Chen, Arizona State Univ. (United States)

22 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 18

12670-13

### Kinematic multi-axis two-photon polymerization printer concept for the manufacturing of micro optics

Author(s): Daniel Kurth, Univ. Stuttgart (Germany)

22 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 18

12670-14

### Additive manufacture of structured freeform optics for solid state lighting

Author(s): George M. Williams, NanoVox LLC (United States)

22 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 18

Coffee Break 3:10 PM - 3:30 PM

## OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States) and Daewook Kim, Wyant College of Optical Sciences (United States)

### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

### Optic technologies enabling fusion ignition at the National Ignition Facility (*Plenary Presentation*)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (*Plenary Presentation*)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (*Plenary Presentation*)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

## CHARTING A ROADMAP FOR LIGHTING TRANSFORMATION: IMPACT OF 3D PRINTING ON LIGHTING AND ARCHITECTURE

22 August 2023 • 6:00 PM - 8:00 PM | Marriott Marquis, Catalina

Session Chair: Nadarajah Narendran, Rensselaer Polytechnic Institute (United States)

As the transition to LEDs continues at a steady pace, bolstered by the drive to decarbonize our built environment, the lighting industry continues to be redefined and reshaped. This is largely driven by a value chain in flux due to a confluence of market and technology forces.

Moderated by Govi Rao, this session is designed to discuss the evolution of additive manufacturing (AM) as one of the key drivers in transforming the lighting supply chain, specifically the impact of AM in the lighting and related ecosystems. The session will also focus on exploring opportunities to shape the future of lighting and to define a roadmap for lighting transformation.

Mr. Rao will summarize the findings from fireside chats with leaders and stakeholders from the AM, materials, and lighting industries, highlighting thought leaders' perspectives on market transformation of the lighting industry through technology innovation, workforce development, and road mapping of research and education needs.

Govi Rao is a visionary thought leader and seasoned business growth architect with more than 25 years of leadership experience globally—scaling businesses and transforming ecosystems across several industries including specialty chemicals, coatings, building materials, lighting, energy, and the rapidly evolving Fourth Industrial Revolution. In his current role as CEO of Phase Change Solutions, Govi leads a team of highly innovative and inspiring leaders, with a vision to decarbonize our footprint and enable human health with sustainable solutions to manage temperature in any environment.

## WEDNESDAY 23 AUGUST 2023

### SESSION 4: LIGHTING LAYOUT, OPTICS DESIGN, PRINT OPTIMIZATION, AND CHARACTERIZATION

23 August 2023 • 8:30 AM - 10:10 AM | Conv. Ctr. Room 18

Session Chair: Jean Paul Freyssonier, Rensselaer Polytechnic Institute (United States)

12670-15

### Could mass customization be a possibility for my business? How and where are people succeeding with design en masse? (*Invited Paper*)

Author(s): Dustin Kloempken, Wesley Kramer, HP, Inc. (United States)

23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 18

12670-16

### Designing freeform luminaire optics for additive manufacturing: lessons learned (*Invited Paper*)

Author(s): Michael W. Zollers, Synopsys, Inc. (United States); Indika U. Perera, Jean Paul Freyssonier, Rensselaer Polytechnic Institute (United States); Samuel T. Mills, Christopher Ring, Eaton Corp. (United States)

23 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 18



12670-17

### Long-term performance of 3D-printed optics when exposed to thermal and optical radiation

Author(s): Indika U. Perera, Akila S. Udage, Nadarajah Narendran, Jean Paul Freyssonier, Rensselaer Polytechnic Institute (United States)

23 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 18

12670-18

### Toward a fully-automated luminaire design and manufacturing solution utilizing freeform optics and additive manufacturing

Author(s): Michael W. Zollers, Simon Magarill, Synopsys, Inc. (United States)

23 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 18

Coffee Break 10:10 AM - 10:40 AM

#### SESSION 5: 3D-PRINTED THERMOMECHANICAL COMPONENTS

23 August 2023 • 10:40 AM - 11:40 AM | Conv. Ctr. Room 18

Session Chairs: Nadarajah Narendran, Rensselaer Polytechnic Institute (United States), Govi Rao, Phase Change Solutions (United States), Samuel T. Mills, Eaton Corp. (United States)

12670-19

### Phase change materials for thermal management of lighting systems

Author(s): Reyad Sawafta, Phase Change Solutions (United States)

23 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 18

12670-21

### Insulation properties of material for 3D-printed interior building panels

Author(s): Amatullah Kose, Nadarajah Narendran, Jean Paul Freyssonier, Rensselaer Polytechnic Institute (United States)

23 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 18

12670-22

### 3D-printed heat sinks for thermal management of LED lighting

Author(s): Indika U. Perera, Nadarajah Narendran, Jean Paul Freyssonier, Rensselaer Polytechnic Institute (United States)

23 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 18

Lunch/Exhibition Break 11:40 AM - 1:00 PM

#### SESSION 6: 3D-PRINTED ELECTRONICS

23 August 2023 • 1:00 PM - 2:40 PM | Conv. Ctr. Room 18

Session Chair: Indika U. Perera, Rensselaer Polytechnic Institute (United States)

12670-23

### Advanced luminaire using 3D-printed electronics

Author(s): Sai Guruva Reddy Avuthu, Samuel T. Mills, Nilay Mehta, Rajen Modi, Christopher Ring, Eaton Corp. (United States)

23 August 2023 • 1:00 PM - 1:20 PM | Conv. Ctr. Room 18

12670-25

### Carbon-nanotube ink and laser engraved lignin on fabrics for wearable electronics

Author(s): Nida Khattak, Nirmita Roy, Kat-Kim Phan, Bianca Seufert, Arash I. Takshi, Univ. of South Florida (United States)

23 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 18

12670-24

### Manufacturing wearable electronics by direct copper electrodeposition

Author(s): Nirmita Roy, Nida Khattak, Arash I. Takshi, Univ. of South Florida (United States)

23 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 18

12670-26

### Impact of ink deposition and trace path variations on 3D-printed antenna performance

Author(s): Akila S. Udage, Nadarajah Narendran, Hunter Heath, Max Destil, Rensselaer Polytechnic Institute (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 18

12670-27

### Current status on additively manufactured luminaires

Author(s): Martin Hedges, Neotech AMT GmbH (Germany)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 18

Coffee Break 2:40 PM - 3:10 PM

#### SESSION 7: 3D-PRINTED LIGHTING SYSTEMS II

23 August 2023 • 3:10 PM - 4:30 PM | Conv. Ctr. Room 18

Session Chair: Nadarajah Narendran, Rensselaer Polytechnic Institute (United States)

12670-28

### The benefits and challenges of additive manufacturing as it applies to custom lighting manufacturing today

Author(s): Chris Hartswick, Ideoli Group, Inc. (United States)

23 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 18

12670-30

### 3D printing: opportunities and challenges for custom, spec-grade architectural lighting

Author(s): Alejandro Guerrero, Amerlux LLC (United States); Dustin Kloempken, HP, Inc. (United States)

23 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 18

12670-32

### Additive manufacturing of efficient, custom, and cost-effective luminaires (*Keynote Presentation*)

Author(s): Samuel Mills, Christopher Ring, John Hana, Eaton Corp. (United States)

23 August 2023 • 3:50 PM - 4:30 PM | Conv. Ctr. Room 18

# TECHNICAL CONFERENCES

## Conference 12671

# Advances in Solar Energy: Heliostat Systems Design, Implementation, and Operation

20 - 22 August 2023 | Conv. Ctr. Room 11B

Conference Chairs: **Guangdong Zhu**, National Renewable Energy Lab. (United States); **Marc Röger**, German Aerospace Center (DLR) (Germany)

Conference Chairs: **Zhifeng Wang**, Institute of Electrical Engineering, Chinese Academy of Sciences (China); **Ali M. Khounsary**, Illinois Institute of Technology (United States)

Program Committee: **Andru J. Prescod**, ManTech International Corp. (United States); **David Haas**, U.S. Dept. of Energy (United States); **Roger Angel**, Steward Observatory (United States); **Paul François Ndione**, National Renewable Energy Lab. (United States); **Daewook Kim**, Wyant College of Optical Sciences (United States); **Kevin G. Harding**, Optical Metrology Solutions LLC (United States)

### SUNDAY 20 AUGUST 2023

#### PANEL ON INTERNATIONAL HELIOSTAT MARKET: EXPERIENCE AND FUTURE DEVELOPMENTS

20 August 2023 • 1:30 PM - 3:30 PM | Conv. Ctr. Room 11B

Moderator: Ali M. Khounsary,  
Illinois Institute of Technology (United States)

There is a growing interest in and an expanding market for heliostat solar power plants around the world. These plants, about 100 MWe each, are likely to dominate the Concentrated Solar Power (CSP) landscape and become a major source of renewable energy. To address the emerging opportunities and challenges, we have invited a panel of leaders and experts in the field to share their views, experience, and achievements. The panel includes presentations on the state-of-the-art heliostat technologies in US and around the world, and a discussion of the market developments and competitiveness as well as the technological challenges in providing low-cost and high-performance heliostats. This panel is followed by a networking event and informal discussion on the topic. Those interested in this topic, particularly students, are invited to attend. Refreshment is served.

#### HELIOSTAT NETWORKING EVENT

20 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 11B

This Networking Event which follows a panel discussion on Heliostats provides a platform for the SPIE research community and those interested in Concentrated Solar Power (CSP) and solar energy in general to socialize with US Energy Department representatives, industrial stakeholders, and subject-matter experts. Refreshment is served.

#### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### SESSION 1: HELIOSTAT METROLOGY

21 August 2023 • 8:00 AM - 9:50 AM | Conv. Ctr. Room 11B

Session Chair: Ali M. Khounsary,  
Illinois Institute of Technology (United States)

12671-1

#### Opportunities for metrology in solar thermal heliostat applications (*Invited Paper*)

Author(s): David Haas, U.S. Dept. of Energy (United States)

21 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 11B

12671-2

#### Challenges and solutions in heliostat optical metrology

Author(s): Randy C. Brost, Sandia National Labs. (United States)

21 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 11B

12671-3

#### Novel scanner-based methodology for a fast and complete high quality characterization of all solar field heliostats, their facets, and corresponding reflected beams

Author(s): Adrián Peña, Sonia Escorza, Amaia Mutuberria, Marcelino Sánchez, Javier García-Barberena, Ctr. Nacional de Energías Renovables (Spain); Carlos D. Heras, Univ. de Zaragoza (Spain); Asier Villafranca, ZEPREN Solutions S.L. (Spain)

21 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 11B

12671-4

### Grating-embedded mirrors for heliostat tracking error metrology

Author(s): Hayden J. Wisniewski, Ian J. Arnold, Daewook Kim, The Univ. of Arizona (United States); Heng E. Zuo, The Univ. of New Mexico (United States); Brandon D. Chalifoux, The Univ. of Arizona (United States)

21 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 11B

12671-5

### Tools for solar heliostat metrology adapted from the durable goods industry

Author(s): Kevin G. Harding, Optical Metrology Solutions LLC (United States)

21 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 11B

Coffee Break 9:50 AM - 10:20 AM

## SESSION 2: HELIOSTAT FIELDS

21 August 2023 • 10:20 AM - 11:50 AM | Conv. Ctr. Room 11B

Session Chair: Guangdong Zhu,  
National Renewable Energy Lab. (United States)

12671-6

### Guidelines for heliostat testing *(Invited Paper)*

Author(s): Marc Röger, Tim Schichting, Kristina Blume, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

21 August 2023 • 10:20 AM - 10:50 AM | Conv. Ctr. Room 11B

12671-7

### Spectrally-resolved solar radiation attenuation long-term monitoring results in a commercial central-receiver CSP plant

Author(s): Salvador Andres, ZEPREN Solutions S.L. (Spain); Carlos Heras, Univ. de Zaragoza (Spain); Javier García-Barberena, Ana Bernardos, Marcelino Sánchez, Ctr. Nacional de Energias Renovables (Spain); Asier Villafranca, ZEPREN Solutions S.L. (Spain)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 11B

12671-8

### Towards deep learning based airborne monitoring methods for heliostats in solar tower power plants

Author(s): Rafal Broda, Alexander Schnerring, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Spain), RWTH Aachen Univ. (Germany); Julian J. Krauth, Marc Röger, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Spain); Robert Pitz-Paal, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany), RWTH Aachen Univ. (Germany)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 11B

12671-9

### Operational experiences with the heliostat field at the Juelich solar towers

Author(s): Felix Göhring, Oliver Kaufhold, Daniel Maldonado Quinto, Marcel Sibum, Moritz Wirger, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 11B

Lunch Break 11:50 AM - 1:40 PM

## SESSION 3: METROLOGY IN HELIOSTAT MANUFACTURING

21 August 2023 • 1:40 PM - 3:10 PM | Conv. Ctr. Room 11B

Session Chair: David Haas, U.S. Dept. of Energy (United States)

12671-11

### Call for collaboration: an international heliostat consortium to advance next generation concentrating solar-thermal technologies (CSP) *(Invited Paper)*

Author(s): Guangdong Zhu, National Renewable Energy Lab. (United States)

21 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 11B

12671-12

### Simultaneous alignment of heliostat mirrors, using retro-reflectors

Author(s): Bernhard W. Adams, Quantum Optics Applied Research (United States)

21 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 11B

12671-13

### Measurement of heliostat mirrors using reflected targets

Author(s): Devon Kesseli, Guangdong Zhu, Rebecca Mitchell, Mojolaoluwa Keshiro, Tucker Farrell, National Renewable Energy Lab. (United States)

21 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 11B

12671-15

### Shape and position tolerance control of heliostat structure based on error transfer

Author(s): Jianhan Zhang, Zhifeng Wang, Institute of Electrical Engineering (China)

21 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 11B

Coffee Break 3:10 PM - 3:40 PM

## SESSION 4: HELIOSTAT DESIGN

21 August 2023 • 3:40 PM - 4:30 PM | Conv. Ctr. Room 11B

Session Chair: Guangdong Zhu,  
National Renewable Energy Lab. (United States)

12671-16

### Adjustable shape heliostats in fields for concentration > 3,000 at power > 1 MW *(Invited Paper)*

Author(s): J. Roger P. Angel, Matthew Rademacher, Nick Didato, The Univ. of Arizona (United States)

21 August 2023 • 3:40 PM - 4:10 PM | Conv. Ctr. Room 11B

12671-17

### Design, manufacture, and installation of a new 17.8m<sup>2</sup> heliostat

Author(s): Jianhan Zhang, Zhifeng Wang, Feihu Sun, Institute of Electrical Engineering (China); Jun Dong, China General Nuclear Power Corp. (China)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 11B

# TECHNICAL CONFERENCES

## Conference 12671

TUESDAY 22 AUGUST 2023

### SESSION 5: HELIOSTAT CALIBRATION

22 August 2023 • 8:00 AM - 9:50 AM | Conv. Ctr. Room 11B  
Session Chair: Marc Röger, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Spain)

12671-20

#### Scalable heliostat calibration system (SHORT): design, validation, and implementation analysis (*Invited Paper*)

Author(s): Cristobal Villasante, Tekniker (Spain); Javier García-Barberena, Marcelino Sánchez, Ctr. Nacional de Energías Renovables (Spain); Carlos Zuazo, David Olasolo, IK4 Tekniker (Spain); Iñigo Les, Adrián Peña, Amaia Mutuberria, Ctr. Nacional de Energías Renovables (Spain)

22 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 11B

12671-21

#### Data set sampling and its implications on the heliostat calibration

Author(s): Max Pargmann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Moritz Leibauer, Synhelion Germany GmbH (Germany); Daniel Maldonado Quinto, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Vincent Nettelroth, Synhelion Germany GmbH (Germany); Robert Pitz-Paal, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

22 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 11B

12671-22

#### Non-Intrusive Optical (NIO) technology for characterizing commercial heliostat optical errors

Author(s): Tucker Farrell, National Renewable Energy Lab. (United States)

22 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 11B

12671-24

#### Reliable neural network heliostat calibration on low data

Author(s): Max Pargmann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Moritz Leibauer, Synhelion Germany GmbH (Germany); Daniel Maldonado Quinto, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Vincent Nettelroth, Synhelion Germany GmbH (Germany); Robert Pitz-Paal, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

22 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 11B

12671-23

#### Heliostat aiming point calibration for the secondary-reflection CSP system based on a vision-based system and an artificial optical source

Author(s): Nan Sun, Hao Chen, Wentao Xie, Yuda Chen, Shanghai Parasol Renewable Energy Co. (China)

22 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 11B

Coffee/Exhibition Break 9:50 AM - 10:50 AM

### SESSION 6: OPTICAL MATERIALS FOR HELIOSTATS

22 August 2023 • 10:50 AM - 12:10 PM | Conv. Ctr. Room 11B  
Session Chair: Andru J. Prescod, ManTech International Corp. (United States)

12671-26

#### Reliability study of heliostats using CSP optical facilities at the National Renewable Energy Laboratory

Author(s): Paul F. Ndione, Matthew Young, Tucker Farrell, Rebecca Mitchell, Devon Kesseli, Judy Netter, Guangdong Zhu, National Renewable Energy Lab. (United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 11B

12671-27

#### Optical smart materials microencapsulated for solar energy efficiency and thermal storage management

Author(s): Abdullatif Hakami, Univ. of Bisha (Saudi Arabia); Daniil Ivannikov, Sessa Srinivasan, Florida Polytechnic Univ. (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 11B

12671-28

#### Innovative glass coating for improving the performance and durability of solar applications

Author(s): Jaione Bengoechea, Javier García-Barberena, Eugenia Zugasti, Cristina Leyre Pinto, Alicia Buceta, Iñaki Cornago, Marcelino Sánchez, Ctr. Nacional de Energías Renovables (Spain)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 11B

12671-29

#### Heat transfer analysis of special receivers/reactors to facilitate reciprocal redox thermochemical reactions for hydrogen production

Author(s): Peiwen Li, J. Roger P. Angel, Haomin Li, The Univ. of Arizona (United States)

22 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 11B

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A  
Session Chairs: Tony Hull, The Univ. of New Mexico (United States) and Daewook Kim, Wyant College of Optical Sciences (United States)

#### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

#### Optic technologies enabling fusion ignition at the National Ignition Facility (*Plenary Presentation*)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

#### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (*Plenary Presentation*)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

**Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems** (*Plenary Presentation*)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

### WEDNESDAY 23 AUGUST 2023

#### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

**Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12671-31

**Shape-adjustable heliostats: computational methods and preliminary results for designing individuals and fields**

Author(s): Nick Didato, Roger Angel, Matt Rademacher, The Univ. of Arizona (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12671-32

**Shape-adjusting mechanism for a heliostat reflector on a target-oriented mount**

Author(s): Matt Rademacher, J. Roger P. Angel, Nick Didato, The Univ. of Arizona (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12671-33

**Shrinkage study and optimization of multiplexed green holographic solar concentrators toward improved photovoltaic energy**

Author(s): Tomás Lloret López, Marta Morales-Vidal, Belén Nieto-Rodríguez, José Carlos García-Vázquez, Manuel G. Ramírez, Augusto Beléndez, Inmaculada Pascual, Univ. de Alicante (Spain)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12671-34

**Design, manufacturing, and performance comparison of 3D-printed solar concentrators based on Fresnel lenses**

Author(s): Perla M. Viera-González, Guillermo E. Sánchez-Guerrero, Maximiliano Solís-Perez, Univ. Autónoma de Nuevo León (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12671-35

**Design considerations for leaf-inspired luminescent solar concentrators based on two-stage photoconversion**

Author(s): Hiroto Nishimura, Kohei Okada, Atsuya Suzuki, Yuta Mizuno, Ichiro Fujieda, Ritsumeikan Univ. (Japan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12671-36

**Design and fabrication of a linear Fresnel-type reflector for solar concentration based on caustic surfaces by reflection**

Author(s): Martín Jiménez-Rodríguez, Maximino Avendaño-Alejo, Univ. Nacional Autónoma de México (Mexico); Edwin Román-Hernández, Estefanía López-Gómez, Gabriel Castillo-Santiago, Univ. del Istmo (Mexico); Ismael Velázquez-Gómez, Osvaldo Ponce-Hernández, Jesús DelOlmo-Márquez, Luis Castañeda, Univ. Nacional Autónoma de México (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12671-37

**Hartmann-type hybrid null screens for testing a fast plano-convex aspherical condenser**

Author(s): Gabriel Castillo-Santiago, Univ. del Istmo (Mexico); Jesús DelOlmo-Márquez, Maximino Avendaño-Alejo, Univ. Nacional Autónoma de México (Mexico); Víctor Moreno-Oliva, Edwin Román-Hernández, Univ. del Istmo (Mexico); Martín Jiménez-Rodríguez, Osvaldo Ponce-Hernández, Univ. Nacional Autónoma de México (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12672

### Applied Optical Metrology V

22 - 23 August 2023 | Conv. Ctr. Room 9

Conference Chairs: **Erik Nova**, 4D Technology Corp. (United States); **Christopher C. Wilcox**, Air Force Research Laboratory (United States)

Program Committee: **Angela D. Allen**, The Univ. of North Carolina at Charlotte (United States); **Anand Krishna Asundi**, d'Optron Pte Ltd. (Singapore); **Peter J. de Groot**, Zygo Corporation (United States); **Jacob George**, MetroLaser, Inc. (United States); **Carl Hall**, Arnold Engineering Development Complex (United States); **Sen Han**, Suzhou Graduate School of Nanjing Univ. (China); **Kevin G. Harding**, Optical Metrology Solutions LLC (United States); **Kate Medicus**, Ruda-Cardinal, Inc. (United States); **Daniel B. Millstone**, 4D Technology Corp. (United States); **James D. Trolinger**, MetroLaser, Inc. (United States)

#### TUESDAY 22 AUGUST 2023

Coffee Break 10:15 AM - 10:35 AM

##### SESSION 1: SURFACE METROLOGY I

##### SESSION 2: SURFACE METROLOGY II

22 August 2023 • 8:00 AM - 10:15 AM | Conv. Ctr. Room 9

22 August 2023 • 10:35 AM - 12:15 PM | Conv. Ctr. Room 9

Session Chair: Christopher C. Wilcox,  
Air Force Research Lab. (United States)

Session Chair: James Davis Trolinger, MetroLaser, Inc. (United States)

12672-1

#### **Before the laser: an optical metrology retrospective** (Keynote Presentation)

Author(s): James Mayo, Tau Technologies LLC (United States)

22 August 2023 • 8:00 AM - 8:45 AM | Conv. Ctr. Room 9

12672-6

#### **Fizeau interferometry-based, motion-free characterization of surface radius of curvature using actively-controlled varifocal optics**

Author(s): Minjae Kim, Arjent Imeri, Syed Azer Reza, Rose-Hulman Institute of Technology (United States)

22 August 2023 • 10:35 AM - 10:55 AM | Conv. Ctr. Room 9

12672-2

#### **Why you should pay attention to international standards in optical metrology** (Invited Paper)

Author(s): Peter J. de Groot, Zygo Corp. (United States); Han Haitjema, KU Leuven (Belgium); Mark Malburg, Digital Metrology Solutions, Inc. (United States)

22 August 2023 • 8:45 AM - 9:15 AM | Conv. Ctr. Room 9

12672-7

#### **On-machine metrology for diamond turning applications**

Author(s): Wenjun Kang, Yihan Wang, Hongzhang Ma, Daodang Wang, Rongguang Liang, The Univ. of Arizona (United States)

22 August 2023 • 10:55 AM - 11:15 AM | Conv. Ctr. Room 9

12672-3

#### **Nanoscale mass measurement using laser doppler vibrometry for nanocalorimetry studies of semiconductor materials**

Author(s): Lakshmi Ravi Narayan, Feng Yi, National Institute of Standards and Technology (United States); Isak McGieson, Oregon State Univ. (United States); William Alexander Osborn, David A. LaVan, National Institute of Standards and Technology (United States)

22 August 2023 • 9:15 AM - 9:35 AM | Conv. Ctr. Room 9

12672-8

#### **Exploring dynamic light scattering microscopy (MicroDLS): a study of key parameters**

Author(s): Oscar Urquidi, Johanna Brazard, Takuji Adachi, Univ. de Genève (Switzerland)

22 August 2023 • 11:15 AM - 11:35 AM | Conv. Ctr. Room 9

12672-4

#### **Absolute determination of a large mirror surface from spatial gradients using a coordinate measuring machine**

Author(s): Juan Sebastian Fischer Calderon, Rostyslav Mastlyo, Technische Univ. Ilmenau (Germany); Christian Schober, Christof Pruss, Universitaet Stuttgart (Germany); Ingo Ortlepp, Guido Straube, Eberhard Manske, Technische Univ. Ilmenau (Germany)

22 August 2023 • 9:35 AM - 9:55 AM | Conv. Ctr. Room 9

12672-9

#### **Line-scan, fiber-based surface characterization and temperature monitoring for laser material processing**

Author(s): Yujie Yang, Thomas Weyrauch, Univ. of Dayton (United States)

22 August 2023 • 11:35 AM - 11:55 AM | Conv. Ctr. Room 9

12672-5

#### **Deflectometry for ophthalmic optics measurements**

Author(s): Rebecca Su, James Schwiegerling, Wyant College of Optical Sciences (United States)

22 August 2023 • 9:55 AM - 10:15 AM | Conv. Ctr. Room 9

12672-10

#### **High throughput testing of the nanophotonic devices**

Author(s): Adarsh Ananthachar, Munster Technological Univ. (Ireland)

22 August 2023 • 11:55 AM - 12:15 PM | Conv. Ctr. Room 9

Lunch/Exhibition Break 12:15 PM - 1:45 PM

### SESSION 3: INTERFEROMETRIC TESTING AND ANALYSIS I

22 August 2023 • 1:45 PM - 2:55 PM | Conv. Ctr. Room 9  
Session Chair: Erik Novak, 4D Technology Corp. (United States)

12672-11

#### Light source options for optical metrology (*Invited Paper*)

Author(s): Kevin G. Harding, Optical Metrology Solutions LLC (United States)

22 August 2023 • 1:45 PM - 2:15 PM | Conv. Ctr. Room 9

12672-12

#### Digital holographic microscopy for bacterial species classification and motility characterization

Author(s): Jian Gao, Hadi Parsian, MetroLaser, Inc. (United States); Jarl Carnahan, Gladys Alexandre, The Univ. of Tennessee Knoxville (United States); James Trolinger, MetroLaser, Inc. (United States)

22 August 2023 • 2:15 PM - 2:35 PM | Conv. Ctr. Room 9

12672-13

#### Photothermal gas sensing with a custom-made, fiber-coupled Fabry-Pérot etalon

Author(s): Manuel Tanzer, Institute of Electrical Measurement and Sensor Systems (Austria); Benjamin Lang, Institut für Elektrische Messtechnik und Sensorik (Austria); Alexander Bergmann, Institut für Elektrische Messtechnik und Sensorik, Technische Univ. Graz (Austria)

22 August 2023 • 2:35 PM - 2:55 PM | Conv. Ctr. Room 9

Coffee Break 2:55 PM - 3:30 PM

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A  
Session Chairs: Tony Hull, The Univ. of New Mexico (United States)  
and Daewook Kim, Wyant College of Optical Sciences (United States)

#### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

#### Optic technologies enabling fusion ignition at the National Ignition Facility (*Plenary Presentation*)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

#### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (*Plenary Presentation*)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

#### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (*Plenary Presentation*)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

### LENS DESIGN TECHNICAL EVENT

22 August 2023 • 8:00 PM - 10:00 PM | Marriott Marquis, Marina Ballroom E

Session Chair: Scott Lerner

#### “Let’s Give ‘Em Something to Talk About!”

Lens designers! Join us for our annual gathering to meet and discuss... lens design! Let’s talk about what we’re designing, how we’re going about doing it (what materials, software, techniques, etc.), and which problems we’re encountering. We’ll also explore current technical and commercial trends in the marketplace.

This year’s invited speaker will be Breann Sitarski, NASA Goddard Space Flight Ctr. (United States), whose talk is entitled “Optical design throughout the project lifetime.” The optical design of a system is a significant contributor to the architecture and performance of a system. Through the lifetime of the project, the optical designer typically generates many redesigns until a solution is found that meets the often frequently changing requirements. This is particularly challenging if the domains and associated semantics (i.e., science vs. industry, etc.) between the designer and customer are not aligned. This talk will discuss some suggestions that could help the design process and more fluidly based on lessons learned from building some of the physically largest optics projects to date.

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### WEDNESDAY 23 AUGUST 2023

### SESSION 4: INTERFEROMETRIC TESTING AND ANALYSIS II

23 August 2023 • 10:00 AM - 11:00 AM | Conv. Ctr. Room 9

Session Chair: Christopher C. Wilcox,  
Air Force Research Lab. (United States)

12672-14

#### Full-aperture wavefront reconstruction method in Quadri-Wave Lateral Shearing Interferometry (QWLSI)

Author(s): In-Ung Song, Ho-Soon Yang, Yun-Woo Lee, Korea Research Institute of Standards and Science (Republic of Korea)

23 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 9

12672-15

#### Experimental results of an innovative dynamic low-coherent interferometer for characterizing a gravitational wave detector

Author(s): Jesús Vilaboa Pérez, Ctr. Spatial de Liège (Belgium); Jérôme Loicq, Technische Univ. Delft (Netherlands); Marc Georges, Ctr. Spatial de Liège (Belgium); Yuriy Hastanin, Liège Univ. (Belgium)

23 August 2023 • 10:20 AM - 10:40 AM | Conv. Ctr. Room 9

# TECHNICAL CONFERENCES

## Conference 12672

12672-16

### **Polarization phase shifting for thickness measurement of NiO material transport layer using Sagnac interferometer**

Author(s): Abdullahi Usman, King Mongkut's Univ. of Technology Thonburi (Thailand); Pachara Thonglim, Royal College of Chulabhorn (Thailand); Apichai Bhatranand, King Mongkut's Univ. of Technology Thonburi (Thailand); Samuk Pimanpang, Srinakharinwirot Univ. (Thailand); Prathan Buranasiri, King Mongkut's Institute of Technology Ladkrabang (Thailand)

23 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 9

Lunch/Exhibition Break 11:00 AM - 1:00 PM

### **SESSION 5: IMAGE PROCESSING ANALYSIS AND ACQUISITION**

23 August 2023 • 1:00 PM - 2:40 PM | Conv. Ctr. Room 9

Session Chair: Christopher C. Wilcox,  
Air Force Research Lab. (United States)

12672-18

### **Multimodal 3D sensor for object recognition in hospital settings**

Author(s): Stefan Heist, Kevin Srokos, Marco Blumenthal, Peter Kühmstedt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Gunther Notni, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Technische Univ. Ilmenau (Germany)

23 August 2023 • 1:00 PM - 1:20 PM | Conv. Ctr. Room 9

12672-20

### **Spatial circle localization method based on underwater binocular vision**

Author(s): Tao Wang, CGN Inspection Technology Co., Ltd. (China); Wenqi Liu, Longwang Wang, Mengjie Zhu, Chao Zhai, Univ. of Science and Technology of China (China)

23 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 9

12672-21

### **Position measurement of underwater pipe nozzles based monocular vision**

Author(s): Longwang Wang, Wenqi Liu, Univ. of Science and Technology of China (China); Tao Wang, CGN Inspection Technology Co., Ltd. (China); Mengjie Zhu, Chao Zhai, Univ. of Science and Technology of China (China)

23 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 9

12672-22

### **Practical considerations in using a binary pseudorandom array for instrument transfer function calibration**

Author(s): Peter Z. Takacs, Surface Metrology Solutions LLC (United States); Simon Rochester, Rochester Scientific, LLC (United States); Ian Lacey, Lawrence Berkeley National Lab. (United States); Keiko Munechika, HighRI Optics, Inc. (United States); Ulf Griesmann, National Institute of Standards and Technology (United States); Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 9

12672-24

### **A new approach to wavefront sensing: AI software with an autostigmatic microscope**

Author(s): Gaston Baudat, Innovations Foresight LLC (United States); Robert E. Parks, Optical Perspectives Group, LLC (United States); Benjamin Anjakos, Steward Observatory (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 9

Coffee Break 2:40 PM - 3:10 PM

### **SESSION 6: FIBER-OPTICAL METROLOGY AND MULTI-WAVELENGTH SENSING**

23 August 2023 • 3:10 PM - 4:30 PM | Conv. Ctr. Room 9

Session Chair: James Davis Trolinger, MetroLaser, Inc. (United States)

12672-26

### **The novel detection equipment of residual stress of PMMA**

Author(s): Yuekun Heng, Xiaoyu Yang, Institute of High Energy Physics (China)

23 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 9

12672-27

### **Simultaneous tomographic multi-component reconstructions using multispectral plenoptic cameras**

Author(s): Dustin Kelly, Auburn Univ. (United States); Jacob George, MetroLaser, Inc. (United States); Wayne Page, Jeff Sutton, The Ohio State University (United States); Thomas Jenkins, MetroLaser, Inc. (United States); Brian Thurow, Auburn Univ. (United States)

23 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 9

12672-28

### **Lossy mode resonance generation by using uncoated double cladding fiber**

Author(s): Sukanya Choudhary, Flavio Esposito, Stefania Campopiano, Agostino Iadicicco, Univ. degli Studi di Napoli Parthenope (Italy)

23 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 9

12672-29

### **Calibration method for high-resolution single mode fiber optic spectrometers for optical coherence tomography**

Author(s): Wojtek J. Walecki, Optoprofiler LLC (United States)

23 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 9



### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12672-30

#### Multiple distance in-fiber measurement system using Fourier-based frequency sweeping interferometry

Author(s): Mateusz Sosin, Leonard Watrelot, Helene Mainaud-Durand, CERN (Switzerland)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-31

#### Approaches for reproduction of three-dimensional structure of nanosurfaces

Author(s): Vladyslav M. Tkachuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine); Jun Zheng, Zhejiang Univ. (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-32

#### Shearing interferometry using a holographic reference surface

Author(s): Demetrious Dowdell, The Institute of Optics, Univ. of Rochester (United States); Isabella Feraca, The Institute of Optics (United States); Thomas Brown, The Institute of Optics, Univ. of Rochester (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-34

#### Lens center surface air gaps and thickness measurement in catadioptric telescope corrector lens using non-contact in situ low-coherence interferometry

Author(s): Yu-sheng Liu, Sheng-feng Lin, Taiwan Space Agency (TASA) (Taiwan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-36

#### Development of a table-top surface inspection system based on phase-measuring deflectometry

Author(s): Sangwon Hyun, Kye-Sung Lee, Korea Basic Science Institute (Republic of Korea); Mingab Bog, YnDK (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-37

#### Non-contact surface roughness measurement of round bars considering the effect of machining striations

Author(s): Yoshitaka Igarashi, Kazunori Yamazaki, Sumitomo Heavy Industries, Ltd. (Japan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-38

#### Parallel processing applications on biomedical images by means of CPUs

Author(s): Alex Aguirre, Maria Gonzalez, Joel Cervantes Lozano, David Ignacio Serrano-García, Univ. de Guadalajara (Mexico); Geliztle A. Parra Escamilla, Univ. de Guadalajara (Mexico), Univ. Panamericana (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12672-41

#### PyXsurf: an open-source library for analysis of surface metrology data

Author(s): Vincenzo Cotroneo, INAF - Osservatorio Astronomico di Brera (Italy)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12673

# Optics and Photonics for Information Processing XVII

23 August 2023 | Conv. Ctr. Room 14B

Conference Chairs: **Khan M. Iftekharuddin**, Old Dominion Univ. (United States); **Abdul A. S. Awwal**, Lawrence Livermore National Lab. (United States); **Victor Hugo Diaz-Ramirez**, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

Conference Co-Chair: **Andrés Márquez**, Univ. de Alicante (Spain)

Program Committee: **Juan Campos**, Univ. Autónoma de Barcelona (Spain); **Liangcai Cao**, Tsinghua Univ. (China); **Rigoberto Juarez-Salazar**, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico); **Richard R. Leach**, Lawrence Livermore National Lab. (United States); **Mohammad A. Matin**, Univ. of Denver (United States); **Nasser M. Nasrabadi**, West Virginia Univ. (United States); **Adriana Nava-Vega**, Univ. Autónoma de Baja California (Mexico); **Volker J. Sorger**, The George Washington Univ. (United States); **Toyohiko Yatagai**, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan); **María J. Yzuel**, Univ. Autónoma de Barcelona (Spain)

### TUESDAY 22 AUGUST 2023

#### SIGNAL, IMAGE, AND DATA PROCESSING PLENARY

22 August 2023 • 1:30 PM - 2:30 PM | Conv. Ctr. Room 6A

Session Chair: Khan Iftekharuddin,  
Old Dominion Univ. (United States)

#### Welcome and Opening Remarks

22 August 2023 • 1:30 PM - 1:35 PM | Conv. Ctr. Room 6A

12675-501

#### Lifelong context recognition via online deep clustering (Plenary Presentation)

Author(s): Donald C. Wunsch, Missouri Univ. of Science and Technology (United States)

22 August 2023 • 1:35 PM - 2:30 PM | Conv. Ctr. Room 6A

### WEDNESDAY 23 AUGUST 2023

#### SESSION 1: ARTIFICIAL INTELLIGENCE AND ALGORITHMS

23 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 14B

Session Chair: Khan M. Iftekharuddin,  
Old Dominion Univ. (United States)

12673-1

#### Image recoloring using generative adversarial neural networks

Author(s): Hector Osuna Medrano, Marcos Alberto Moroyoqui Olan, David Espina Lopez, Ulises Orozco-Rosas, Kenia Picos, CETYS Univ. (Mexico)

23 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 14B

12673-2

#### Fine-tuned deep convolutional neural network for hand segmentation in egocentric videos

Author(s): Eytomilayo Yemisi Babatope, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico); Miguel Ángel Camargo-Rojas, Instituto Politécnico Nacional (Mexico); Mireya Saraí García Vázquez, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico); Alejandro Álvaro Ramírez-Acosta, MIRAL R&D&I Multimedia (United States)

23 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 14B

12673-3

#### Performance evaluation of facial landmark detection methods

Author(s): Yuliet Brito-Muñoz, Víctor H. Diaz-Ramirez, Martin Gonzalez-Ruiz, Rigoberto Juarez-Salazar, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico)

23 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 14B

12673-4

#### Assessment of cognitive impairment using artificial intelligence from user-web-mobile interaction

Author(s): Arturo Del Bosque Díaz De León, Instituto Politécnico Nacional (Mexico); Alberto José Mimenza Alvarado, Sara Gloria Aguilar Navarro, Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán (Mexico); Mireya Saraí García Vázquez, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico); Alejandro Álvaro Ramírez Acosta, MIRAL R&D&I Multimedia (United States)

23 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 14B

12673-12

#### Intelligent traffic control system using computer vision algorithms

Author(s): Syed A. Anwar, Fatima T. Zohura, North South Univ. (Bangladesh); Joy Paul, Rajshahi Univ. of Engineering & Technology (Bangladesh); Kenia Picos, CETYS Univ. (Mexico)

23 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 14B

12673-5

### Performance analysis of intelligent reflecting surface aided cell-free communications

Author(s): Khushnub Anwar, Univ. of Denver (United States); Imtiaz Ahmed, Howard Univ. (United States); Mohammad Abdul Matin, Univ. of Denver (United States); Md Sahabul Alam, California State Univ. (United States); Kamrul Hasan, Tennessee State Univ. (United States)  
23 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 14B

Coffee Break 10:00 AM - 10:20 AM

### SESSION 2: IMAGE FORMING AND PROCESSING SYSTEMS

23 August 2023 • 10:20 AM - 12:20 PM | Conv. Ctr. Room 14B

Session Chair: Victor Hugo Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

12673-6

### Photonic-chip Fourier processor

Author(s): Nicola Peserico, The George Washington Univ. (United States); Behrouz Movahhed Nouri, Optelligence, LLC (United States); Aydin Babakhani, Puneet Gupta, Univ. of California, Los Angeles (United States); Hamed Dalir, Volker J. Sorger, Univ. of Florida (United States)  
23 August 2023 • 10:20 AM - 10:40 AM | Conv. Ctr. Room 14B

12673-7

### First-order spectrum filtering in Fourier transform profilometry: a method comparison

Author(s): Silvia Sofia Esquivel-Hernandez, Rigoberto Juarez-Salazar, Victor H. Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico)  
23 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 14B

12673-8

### Fringe projection profilometry without explicit projector calibration

Author(s): Rigoberto Juarez-Salazar, Consejo Nacional de Ciencia y Tecnología (Mexico), Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico); Silvia Sofia Esquivel-Hernandez, Juan Zheng Wu, Victor H. Diaz-Ramirez, Instituto Politécnico Nacional (Mexico); Andres G. Marrugo, Univ. Tecnológica de Bolívar (Colombia)  
23 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 14B

12673-9

### Absolute polarimetric calibration of the retardance of a liquid crystal on silicon microdisplay

Author(s): Adriana R. Sánchez-Montes, Andrés Márquez Ruiz, Jorge Francés, Francisco J. Martínez-Guardiola, Eva M. Calzado, Sergi Gallego Rico, Inmaculada Pascual, Augusto Beléndez Vázquez, Univ. de Alicante (Spain)  
23 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 14B

12673-10

### Three-dimensional object reconstruction using multi-ocular vision

Author(s): Martin Gonzalez-Ruiz, Victor H. Diaz-Ramirez, Rigoberto Juarez-Salazar, Instituto Politécnico Nacional (Mexico)  
23 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 14B

12673-11

### Exploring opto-electronic approaches for an accurate face reconstruction

Author(s): Leobardo Argüelles, Kenia Picos, Ulises Orozco-Rosas, CETYS Univ. (Mexico)  
23 August 2023 • 12:00 PM - 12:20 PM | Conv. Ctr. Room 14B

Lunch/Exhibition Break 12:20 PM - 1:30 PM

### SESSION 3: IMAGE FORMING AND ROBOT NAVIGATION

23 August 2023 • 1:30 PM - 3:10 PM | Conv. Ctr. Room 14B

Session Chair: Andrés Márquez Ruiz, Univ. de Alicante (Spain)

12673-13

### Performance evaluation of advanced correlation filters for printed character recognition

Author(s): Leopoldo N. Gaxiola, Tecnológico Nacional de México (Mexico), Instituto Tecnológico de Culiacán (Mexico); Victor H. Diaz-Ramirez, Rigoberto Juarez-Salazar, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico)  
23 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 14B

12673-14

### Shrinkage studies and optimization of multiplexed holographic lenses with high diffractive efficiency and wide angular response

Author(s): Tomás Lloret López, Marta Morales-Vidal, Belén Nieto-Rodríguez, José Carlos García-Vázquez, Manuel G. Ramírez, Augusto Beléndez, Inmaculada Pascual, Univ. de Alicante (Spain)  
23 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 14B

12673-15

### Map based localization using an RGB-D camera and a 2D LiDAR for autonomous mobile robot navigation

Author(s): Luis Rodolfo Macias, CETYS Univ. (Mexico); Jesús Alemán, Univ. de Girona (Spain); Ulises Orozco-Rosas, Kenia Picos, CETYS Univ. (Mexico)  
23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 14B

12673-16

### Lane detection and tracking algorithm implementation for an Ackermann-steering mobile robot

Author(s): Joaquín Pérez Beltrán, Leon VIII Aillaud Chávez, Rafael Astorga Tissot, Ulises Orozco-Rosas, Kenia Picos, CETYS Univ. (Mexico)  
23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 14B

12673-17

### Vision-based pose estimation for robot navigation in an uncontrolled environment

Author(s): Juan Zheng Wu, Rigoberto Juarez-Salazar, Victor H. Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico)  
23 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 14B

Coffee Break 3:10 PM - 3:30 PM

# TECHNICAL CONFERENCES

## Conference 12673

### SESSION 4: PHOTONICS IN INFORMATION PROCESSING

23 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 14B  
Session Chair: Kenia Picos, CETYS Univ. (Mexico)

12673-18

#### Overcoming inhomogeneous broadening from ensembles of quantum emitters in noisy environments with external control fields

Author(s): Herbert F. Fotso, Univ. at Buffalo, The State Univ. of New York (United States)

23 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 14B

12673-19

#### Quantum computing meets skin cancer diagnosis

Author(s): Daniel A. Lopez Montiel, Oscar H. Montiel, Miguel A. Lopez Montiel, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico); Oscar Castillo, Instituto Tecnológico de Tijuana (Mexico)

23 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 14B

12673-20

#### Low-loss broadband multiport optical splitters

Author(s): Paloma Vildoso, Rodrigo A. Vicencio, Univ. de Chile (Chile); Jovana Predrag Petrovic, Univ. of Belgrade (Serbia)

23 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 14B

12673-21

#### Scaling photonic integrated circuits with superconducting microwave kinetic inductance detectors

Author(s): Majid Mohammad, Miguel Daal, Univ. of California, Santa Barbara (United States); Gopi Meena, Renan Moreira, Ultra-Low Loss Technologies LLC (United States); Ben Mazin, Univ. of California, Santa Barbara (United States); Galan Moody, Univ. of California (United States)

23 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 14B

12673-22

#### All-optical switching with few photons using an electron avalanche multiplication

Author(s): Demid Sychev, Peigang Chen, Morris Yang, Colton B. Fruhling, Alexei Lagutchev, Alexandra Boltasseva, Vlad Shalaev, Purdue Univ. (United States)

23 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 14B

12673-28

#### On-chip modulation instability

Author(s): Amdad Chowdury, A Aadhi, Ju Won Choi, Singapore Univ. of Technology and Design (Singapore); Benjamin J. Eggleton, Institute of Microelectronics, A\*STAR, 2 Fusionopolis Way, #08-02, Innovis Tower (Singapore), Institute of Photonics and Optical Science, School of Physics, The University of Sydney, Sydney (Australia); Dawn T.H. Tan, Photonics Devices and Systems Group, Singapore University of Technology and Design (Singapore), The University of Sydney Nano Institute (Sydney Nano), The University of Sydney (Australia)

23 August 2023 • 5:10 PM - 5:30 PM | Conv. Ctr. Room 14B

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12673-23

#### 3D FDTD analysis of cross-talk in pixelated PA-LCOs devices: impact of fill factor and size pixel on S2 and S3 parameters

Author(s): Jorge Francés, Adriana Rosalía Sánchez, Andrés Márquez Ruiz, Sergi Gallego Rico, Mariela Lázara Álvarez López, Inmaculada Pascual, Augusto Beléndez, Univ. de Alicante (Spain)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12673-24

#### Transverse and longitudinal magnification of reconstructed images using inline digital holography with the double-sideband filter

Author(s): Claudio N. Ramírez, Luisa García-Canseco, Univ. Nacional Autónoma de México (Mexico); Ángel Lizana, Univ. Autònoma de Barcelona (Spain)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12673-26

#### Remote physiological monitoring of neck blood vessels

Author(s): Meiyun Cao, Lifelabs Medical Lab. Services (Canada); Gennadi Saiko, Timothy Burton, Alexandre Douplik, Toronto Metropolitan Univ. (Canada)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## Conference 12674

# Applications of Digital Image Processing XLVI

21 - 23 August 2023 | Conv. Ctr. Room 12

Conference Chairs: **Andrew G. Tescher**, AGT Associates (United States); **Touradj Ebrahimi**, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Program Committee: **Vasudev Bhaskaran**, Qualcomm Inc. (United States); **Antonin Descampe**, Univ. Catholique de Louvain (Belgium); **Dan Grois**, Comcast Corp. (Israel); **Ofer Hadar**, Ben-Gurion Univ. of the Negev (Israel); **Ioannis Katsavounidis**, Meta (United States); **C.-C. Jay Kuo**, The Univ. of Southern California (United States); **Shan Liu**, Tencent America, LLC (United States); **Andre J. Oosterlinck**, KU Leuven Association (Belgium); **Fernando Pereira**, Instituto de Telecomunicações (Portugal); **Yuriy A. Reznik**, Brightcove, Inc. (United States); **Thomas Richter**, Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany); **John A. Saghri**, California Polytechnic State Univ., San Luis Obispo (United States); **Gary J. Sullivan**; **David S. Taubman**, The Univ. of New South Wales (Australia); **Pankaj Topiwala**, FastVDO Inc. (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: IMAGING APPLICATIONS I

21 August 2023 • 9:00 AM - 10:00 AM | Conv. Ctr. Room 12  
Session Chair: Andrew G. Tescher, AGT Associates (United States)

12674-1

#### Improving deepfake detectors against real-world perturbations with Amplitude Phase Shift training scheme

Author(s): Yuhang Lu, Ruizhi Luo, Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)  
21 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 12

12674-3

#### Next-generation manufacturing: achieving scalable edge inference for image analytics solutions

Author(s): Ravneet Kaur, Joydeep Acharya, Hitachi America, Ltd. (United States)  
21 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 12

12674-4

#### A case for FPGA-based accelerators for energy-efficient motion picture video processing

Author(s): Jason Boyle, Shreejith Shanker, Trinity College Dublin (Ireland)  
21 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 12

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: IMAGING APPLICATIONS II

21 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 12  
Session Chair: Andrew G. Tescher, AGT Associates (United States)

12674-5

#### Hyperspectral anomaly detection via spectral difference extraction

Author(s): Zhuang Li, Ye Zhang, Harbin Institute of Technology (China)  
21 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 12

12674-6

#### Validation and assessment of a mixed reality solution for enhanced TV viewer engagement

Author(s): Øyvind Sørdal Klungre, Asim Hameed, Norwegian Univ. of Science and Technology (Norway); Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Andrew Perkis, Norwegian Univ. of Science and Technology (Norway)  
21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 12

12674-7

#### TV-watching enhancement and its medical trial for low vision people

Author(s): Jae Sung Park, YoungSu Moon, Younghoon Jeong, SAMSUNG Electronics Co., Ltd. (Republic of Korea)  
21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 12

12674-8

#### Thermal monitoring of heart state in mice with hypertensive heart disease

Author(s): Oshrit A. Hoffer, Afeka College of Engineering (Israel); Rafael Y. Brzezinski, Nir Lewis, Tel Aviv Univ. (Israel); Noam Moyal, Ben-Gurion Univ. of the Negev (Israel); Nili Naftali-Shani, Tal Caller, Tel Aviv Univ. (Israel); Yair Tamir, Zehava Ovadia-Blechman, Yair Zimmer, Afeka College of Engineering (Israel); Ofer Hadar, Ben-Gurion Univ. of the Negev (Israel); Jonathan Leor, Tel Aviv Univ. (Israel)  
21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 12

Lunch Break 11:50 AM - 2:50 PM

#### SESSION 3: IMAGING SYSTEMS I

21 August 2023 • 2:50 PM - 4:10 PM | Conv. Ctr. Room 12  
Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-9

#### Photon-counting x-ray computed tomography with high spatial resolutions

Author(s): Kazuki Ito, Toho Univ. (Japan); Eiichi Sato, Iwate Medical Univ. (Japan); Hodaka Moriyama, Toho Univ. (Japan); Sohei Yoshida, Kunihiro Yoshioka, Iwate Medical Univ. (Japan); Osahiko Hagiwara, Toshiyuki Enomoto, Manabu Watanabe, Toho Univ. (Japan); Hiroyuki Nitta, Iwate Medical Univ. (Japan)  
21 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 12

# TECHNICAL CONFERENCES

## Conference 12674

12674-10

### Red-ray computed tomography with high spatial resolutions

Author(s): Osahiko Hagiwara, Toho Univ. (Japan); Eiichi Sato, Iwate Medical Univ. (Japan); Kazuki Ito, Hodaka Moriyama, Toho Univ. (Japan); Sohei Yoshida, Kunihiro Yoshioka, Iwate Medical Univ. (Japan); Toshiyuki Enomoto, Manabu Watanabe, Toho Univ. (Japan); Hiroyuki Nitta, Iwate Medical Univ. (Japan)

21 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 12

12674-11

### A fast, simple, and parallelizable deconvolution algorithm for real-time applications

Author(s): Daniel Williams, Independent Researcher (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 12

12674-12

### Evaluation of the impact of lossy compression on event camera-based computer vision tasks

Author(s): Bowen Huang, Davi Lazzarotto, Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 12

Coffee Break 4:10 PM - 4:40 PM

#### SESSION 4: IMAGING SYSTEMS II

21 August 2023 • 4:40 PM - 5:40 PM | Conv. Ctr. Room 12

Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-13

### Energy-dispersive x-ray computed tomography utilizing beam hardening

Author(s): Eiichi Sato, Iwate Medical Univ. (Japan); Kazuki Ito, Hodaka Moriyama, Toho Univ. (Japan); Sohei Yoshida, Kunihiro Yoshioka, Iwate Medical Univ. (Japan); Osahiko Hagiwara, Toshiyuki Enomoto, Manabu Watanabe, Toho Univ. (Japan); Hiroyuki Nitta, Iwate Medical Univ. (Japan)

21 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 12

12674-14

### Automatic method for paradisiac muse classification by image processing and machine learning

Author(s): Heber I. Mejia Cabrera, Christian A. Cisnos Zapata, Manuel G. Forero, Univ. Señor de Sipán (Peru)

21 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 12

12674-15

### Automatic identification of water-stressed capsicum plants by image processing

Author(s): Heber I. Mejia Cabrera, Luis E. Vega Távora, Manuel G. Forero, Univ. Señor de Sipán (Peru)

21 August 2023 • 5:20 PM - 5:40 PM | Conv. Ctr. Room 12

TUESDAY 22 AUGUST 2023

#### SESSION 5: COMPRESSION I

22 August 2023 • 8:00 AM - 9:20 AM | Conv. Ctr. Room 12

Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-16

### Best practices of mixed-codec adaptive bitrate streaming

Author(s): Ryan Zhijun Lei, Chenguang Zhou, Haoteng Chen, Cheng Shi, Cosmin Stejerean, Haixia Shi, Juehui Zhang, Abhishek Gera, Meta (United States)

22 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 12

12674-17

### Super-resolution video coding with additional residual data coding

Author(s): Byeongdoo Choi, Andrew Segall, Kiran Misra, Amazon Prime Video (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 12

12674-18

### Switchable CNNs for in-loop restoration and super-resolution for AV2

Author(s): Urvang B. Joshi, Yue Chen, Debargha Mukherjee, Innfarn Yoo, Shan Li, Feng Yang, Google (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 12

12674-19

### Encoder-aware motion compensated temporal filtering for video compression

Author(s): Rahul Vanam, Sriram Sethuraman, Amazon Prime Video (United States)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 12

Coffee Break 9:20 AM - 9:50 AM

#### SESSION 6: COMPRESSION II

22 August 2023 • 9:50 AM - 11:30 AM | Conv. Ctr. Room 12

Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-20

### Advancements in intra prediction techniques beyond AV1 codec

Author(s): Jing Ye, Liang Zhao, Xin Zhao, Han Gao, Shan Liu, Tencent America, LLC (United States)

22 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 12

12674-21

### JPEG XS profiles and levels for screen content coding

Author(s): Thomas Richter, Siegfried Föbel, Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany)

22 August 2023 • 10:10 AM - 10:30 AM | Conv. Ctr. Room 12

12674-22

### Warped motion prediction beyond AV1

Author(s): Mohammed Golam Sarwer, Rachel Barker, Jianle Chen, Debargha Mukherjee, Google (United States)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 12

12674-23

### Wedge mode extensions beyond AV1 video codec

Author(s): Han Gao, Xin Zhao, Liang Zhao, Jing Ye, Shan Liu, Tencent America, LLC (United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 12

12674-24

### Sub-block-based motion vector refinement of AVM

Author(s): Mohammed Golam Sarwer, Jianle Chen, Debargha Mukherjee, Google (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 12

Lunch/Exhibition Break 11:30 AM - 1:30 PM

## SIGNAL, IMAGE, AND DATA PROCESSING PLENARY

22 August 2023 • 1:30 PM - 2:30 PM | Conv. Ctr. Room 6A

Session Chair: Khan Iftekharruddin,  
Old Dominion Univ. (United States)

### Welcome and Opening Remarks

22 August 2023 • 1:30 PM - 1:35 PM | Conv. Ctr. Room 6A

12675-501

### Lifelong context recognition via online deep clustering (Plenary Presentation)

Author(s): Donald C. Wunsch, Missouri Univ. of Science and Technology (United States)

22 August 2023 • 1:35 PM - 2:30 PM | Conv. Ctr. Room 6A

Coffee Break 2:30 PM - 3:00 PM

## SESSION 7: HVS AND QUALITY

22 August 2023 • 3:00 PM - 3:40 PM | Conv. Ctr. Room 12

Session Chair: Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-26

### Simulating the impact of cataract surgery and contact lenses on color perception

Author(s): Ben Cvach, Jim Schwiegerling, The Univ. of Arizona (United States)

22 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 12

12674-27

### On the assessment of high-quality images: advances on the JPEG AIC-3 activity

Author(s): Michela Testolina, Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

22 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 12

## SESSION 8: IMAGING SYSTEMS III

22 August 2023 • 3:40 PM - 4:40 PM | Conv. Ctr. Room 12

Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-28

### Custom precision accelerators for energy-efficient image-to-image transformations in motion picture workflows

Author(s): Emmet Murphy, Shashwat Khandelwal, Shreejith Shanker, Trinity College Dublin (Ireland)

22 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 12

12674-58

### JPEG Frequency domain-based Image steganography using iterative prediction and decision rules to improved data integration.

Author(s): Ron Shmueli, Afeka College of Engineering (Israel); Ofer Hadar, Divya Mishra, Ben-Gurion Univ. of the Negev (Israel); Amit Shmueli, Bar Ilan University (Israel)

22 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 12

12674-61

### Comparison of non-optical and optical non-destructive testing methods for inspection of curved carbon fibre-reinforced composite submitted to thermal-shock cycles and impact damage

Author(s): Henrique Fernandes, Faculty of Computing / Federal University of Uberlandia (Brazil); Hans-Georg Herrmann, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren IZFP (Germany), Univ. des Saarlandes (Germany); Jose Ricardo Tarpani, Marco Henrique Ferreira, Univ. de São Paulo (Brazil); Ute Rabe, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren IZFP (Germany); Michael Schwarz, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren IZFP (Germany), Univ. des Saarlandes (Germany); Dirk Koster, Christian Jungmann, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren IZFP (Germany)

22 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 12

## WEDNESDAY 23 AUGUST 2023

## SESSION 9: IMAGING APPLICATIONS III

23 August 2023 • 9:00 AM - 10:00 AM | Conv. Ctr. Room 12

Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-30

### Resolution adaptive margin for low-resolution face recognition

Author(s): Yuhang Lu, Arina Lozhkina, Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

23 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 12

12674-31

### Towards learning-based compression of images in DNA

Author(s): Sophie Strebel, Michela Testolina, Davi Lazzarotto, Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

23 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 12

# TECHNICAL CONFERENCES

## Conference 12674

12674-32

### Assessing objective video quality in multi-screen video delivery

Author(s): Nabajeet Barman, Brightcove UK Ltd. (United Kingdom); Yuriy Reznik, Brightcove, Inc. (United States); Maria Martini, Kingston Univ. (United Kingdom)

23 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 12

Coffee Break 10:00 AM - 10:30 AM

### SESSION 10: IMAGING APPLICATIONS IV

23 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 12

Session Chair: Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12674-33

### On the performance of video super-resolution algorithms for HTTP-based adaptive streaming applications

Author(s): Nabajeet Barman, Brightcove UK Ltd. (United Kingdom); Yuriy Reznik, Brightcove, Inc. (United States)

23 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 12

12674-34

### The encrypted image transmission system used the MPSoC platform with Python

Author(s): Roberto Herrera-Charles, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico); Opeyemi M. Afolabi, Jose C. Nuñez-Perez, Instituto Politécnico Nacional (Mexico)

23 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 12

12674-35

### Parity hiding for coefficients coding

Author(s): Luhang Xu, OPPO (China); Yue Yu, OPPO (United States)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 12

12674-59

### Unsupervised white matter lesion identification in multiple sclerosis (MS) using MRI segmentation and pattern classification: a novel approach with CVIPtools

Author(s): Hanieh Ajami, Southern Illinois University Edwardsville (United States); Mahsa Kargar Nigjeh, Scott E. Umbaugh, Southern Illinois Univ. Edwardsville (United States)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 12

12674-60

### Automated classification of white matter lesions in multiple sclerosis patients' MRI images using gray level enhancement and deep learning

Author(s): Mahsa Kargar Nigjeh, Hanieh Ajami, Scott E. Umbaugh, Southern Illinois Univ. Edwardsville (United States)

23 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 12

Lunch/Exhibition Break 12:10 PM - 2:00 PM

### SESSION 11: VIDEO IN DATACENTERS

23 August 2023 • 2:00 PM - 3:20 PM | Conv. Ctr. Room 12

Session Chair: Ryan Zhijun Lei, Meta (United States)

12674-36

### Custom ASICs for data center video processing: advancements in AI-ML integrated, high-performance VPU for hyper-scaled platforms

Author(s): Ernesto Andrade, NETINT Technologies Inc. (Canada); Ano Ndachena, Baknel Macz, Chris Tang, Mu Tong Wang, Shang En Yen, University of British Columbia (Canada); Pedram Mohammadi, Lin Xu, Jian Lou, Benson Tao, NETINT Technologies Inc. (Canada)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 12

12674-37

### Optimizing video solutions for cloud using Intel Data Center GPU Flex Series

Author(s): Sumit Mohan, Wen-Fu Kao, Charlie Wang, Intel Corp. (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 12

12674-38

### Efficient video processing at scale using MSVP

Author(s): Harikrishna M. Reddy, Yunqing Chen, Junqiang Lan, Ioannis Katsavounidis, Baheerathan Anandharengan, Hariharan G. Lalgudi, Srikanth Alaparathi, Guogang Hua, Hsiao-Chiang Chuang, Ping-Hao Wu, Zhijun Lei, Alex Mastro, Chris Petersen, Gaurang Chaudhari, Prasun Prakash, Shankar Regunathan, Srinath Reddy, Prahlad Venkatapuram, Vijay Rao, Krishna Noru, Alexis Bjorlin, Mike Zeile, Adrian Lewis, Anand Singh, Anil Sunil, Cheng-Chiang Chen, Chung-Fu Lin, Cindy Chen, Deepa Palamadai Sundar, Dheepak Jayaraman, Haluk Ucar, Handong Li, Jatinder Singh, Jeff Chien Cheng Liu, Karunakar Reddy Rachamreddy, Kishore Sriadibhatla, Krishna Datla, Leendert Van Den Berg, Lei Feng, Prasanth Jampani, Raghuvardhan Moola, Rohan Mallya, Shailendra Jha, Shiyuan Pan, Sujith Srinivasan, Visala Vaduganathan, Xianliang Zha, Zhao Wang, Arun Karthik Sengottuvel, Boye Oshin, Chak Kanumetta, Eda Sahin, Joanne Maria Athaide, Joyce Wu, Kalyan Chakravarthy Kurapati, Keerthi Manthathi, Krishna Thottempudi, Ramakoteswara Rao Chennamsetti, Satyanarayana Arvapalli, Teja Kala, Tuo Wang, Pritam Chopda, Kaushal Gandhi, Aarti Ramesh, Ram Gupta, Sandeep Fadnavis, Amin Qassoud, Chris Friedt, Fiona Li, Harry Gao, Jason Lee, Murali Dixit, Shivayogi Ugaji, Tarun Karuturi, Xin Xie, Ashwin Narasimha, Bhasker Jakka, Brian Dodds, Jeremy Yang, Krish Skandakumaran, Manish Modi, Pritesh Modi, Cosmin Stejerean, David Ronca, Haixiong Wang, Nam Pham, Louie Lu, Hao Shen, Jia Ning, Karthik Narayanan, Linda Chen, Nili Avidan, William Arnold, Fangran Xu, Gautam Patil, Vandana Balan, Sai Darshan Grandhi, Meta (United States)

23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 12

12674-39

### To be determined

Author(s): Sean Gardner, Advanced Micro Devices, Inc. (United States)

23 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 12



### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12674-29

#### OW-SLR: overlapping windows on semi-local region for image super-resolution

Author(s): Rishav Bhardwaj, Vasudevan Lakshminarayanan, Univ. of Waterloo (Canada); Janarthanam Jothi Balaji, Medical Research Foundation (India)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-40

#### Cataractous eye fundus image enhancement by using multi-scale tone decomposition

Author(s): Oscar Ramos-Soto, Diego Oliva, Univ. de Guadalajara (Mexico); Jesús E. Gómez-Correa, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Sandra Eloísa Balderas-Mata, Univ. de Guadalajara (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-41

#### UGC quality assessment: exploring the impact of saliency in deep feature-based quality assessment

Author(s): Xinyi Wang, Angeliki Katsenou, David Bull, Univ. of Bristol (United Kingdom)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-44

#### New acquisition protocol for rice grain quality evaluation

Author(s): Manuel G. Forero, Miguel A. Rivera, Univ. de Ibagué (Colombia); Christian S. Gonzalez, Adriana P. Noguera, Univ. Nacional Abierta y a Distancia (Colombia); Luis D. Duarte, Univ. de Ibagué (Colombia)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-45

#### Vein pattern classification using convolutional neuronal network and moment invariants

Author(s): Ana Teresa Vargas Barona, María Angelica Espejel Rivera, Raúl Castro-Ortega, Carina Toxqui-Quitl, Alfonso Padilla-Vivanco, Univ. Politécnica de Tulancingo (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-47

#### Comparison study of preprocessing techniques for breast density classification with deep convolutional neural networks

Author(s): Jose A. González-Fraga, Univ. Autónoma de Baja California (Mexico), Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Vitaly Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Everardo Gutiérrez López, Jose M. Valencia-Moreno, Jose Alejandro Gonzalez Sarabia, Univ. Autónoma de Baja California (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-49

#### Diffuse introscopy of thesiograms of fluctuations of phase and amplitude anisotropy of biological preparations of the human uterus

Author(s): Olexander V. Dubolazov, Oleksandr Ushenko, Yuriy Ushenko, Iryna Soltys, Chernivtsi National Univ. Y. Fedkovich (Ukraine); O. Bakun, Bukovinian State Medical Univ. (Ukraine); Jun Zheng, Taizhou Research Institute of Zhejiang Univ. (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-50

#### Mueller matrix polarization-singularity detection system for prostate cancer and endometriosis

Author(s): Olexander V. Dubolazov, Oleksandr Ushenko, Yuriy Ushenko, Iryna Soltys, Chernivtsi National Univ. Y. Fedkovich (Ukraine); O. Bakun, Bukovinian State Medical Univ. (Ukraine); Jun Zheng, Taizhou Research Institute of Zhejiang Univ. (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-51

#### Implementation of multi-spectral camera system for SpO<sub>2</sub> monitoring in wound model

Author(s): You-rim Park, Yoo-kyoung Shin, Heeju Hwang, Joo Beom Eom, Dankook Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-52

#### Quantitative imaging and analysis of pulmonary emphysema in mice using x-ray Talbot-Lau interferometer

Author(s): Zhao Wu, Qisi Lin, Univ. of Science and Technology of China (China); Meng Huang, Univ. of Science and Technology of China (China), The First Affiliated Hospital of Anhui Medical Univ. (China); Lijiao Tian, Yong Guan, Gang Liu, Yangchao Tian, Univ. of Science and Technology of China (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12674-55

#### Comparison study of 3D features for alignment of 3D models

Author(s): Jose Alejandro Gonzalez Sarabia, Jose A. González-Fraga, Univ. Autónoma de Baja California (Mexico); Vitaly Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12675

# Applications of Machine Learning 2023

23 - 24 August 2023 | Conv. Ctr. Room 15B (Wed); Room 7B (Thu)

Conference Chairs: **Michael E. Zelinski**, Lawrence Livermore National Lab. (United States); **Tarek M. Taha**, Univ. of Dayton (United States); **Barath Narayanan Narayanan**, Univ. of Dayton (United States)

Conference Co-Chairs: **Abdul A. S. Awwal**, Lawrence Livermore National Lab. (United States); **Khan M. Iftekharuddin**, Old Dominion Univ. (United States)

Program Committee: **Redha Ali**, Univ. of Dayton (United States); **Md. Zahangir Alom**, St. Jude Children's Research Hospital (United States); **Brent D. Bartlett**, BeamIO (United States); **May V. Casterline**, NVIDIA Corp. (United States); **Brian Giera**, Lawrence Livermore National Lab. (United States); **Cindy Gonzales**, Lawrence Livermore National Lab. (United States); **James Henrikson**, Lawrence Livermore National Lab. (United States); **Don Lahiru Nirmal M. Hettiarachchi**, Univ. of Dayton (United States); **Sachin Malhotra**, Etsy, Inc. (United States); **Nathan Mundhenk**, Lawrence Livermore National Lab. (United States); **Karl Song-Jeng Ni**, Etsy, Inc. (United States); **Priyadip Ray**, Lawrence Livermore National Lab. (United States); **Manar D. Samad**, Tennessee State Univ. (United States); **Amanda K. Ziemann**, Los Alamos National Lab. (United States)

## TUESDAY 22 AUGUST 2023

### SIGNAL, IMAGE, AND DATA PROCESSING PLENARY

22 August 2023 • 1:30 PM - 2:30 PM | Conv. Ctr. Room 6A

Session Chair: Khan Iftekharuddin,  
Old Dominion Univ. (United States)

#### Welcome and Opening Remarks

22 August 2023 • 1:30 PM - 1:35 PM | Conv. Ctr. Room 6A

12675-501

#### Lifelong context recognition via online deep clustering (Plenary Presentation)

Author(s): Donald C. Wunsch, Missouri Univ. of Science and Technology (United States)

22 August 2023 • 1:35 PM - 2:30 PM | Conv. Ctr. Room 6A

## WEDNESDAY 23 AUGUST 2023

### SESSION 1: REMOTE SENSING

23 August 2023 • 8:00 AM - 9:50 AM | Conv. Ctr. Room 15B

Session Chair: Michael E. Zelinski,  
Lawrence Livermore National Lab. (United States)

12675-1

#### Physics-guided neural networks for hyperspectral target identification (Invited Paper)

Author(s): Natalie Klein, Adra Carr, Zigfried Hampel-Arias, Amanda Ziemann, Eric Flynn, Los Alamos National Lab. (United States)

23 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 15B

12675-2

#### Maintaining original color when applying super-resolution to individual bands

Author(s): Bingcai Zhang, Yen Luu, BAE Systems (United States)

23 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 15B

12675-3

#### Estimating a seal population using automated counts of drone photographs

Author(s): Samuel Hawkins, Bradley Univ. (United States); Allister Lundberg, LivRobo (United States); Aiden Lundberg, Consultant (United States); Guy Oliver, Richard Condit, Univ. of California, Santa Cruz (United States)

23 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 15B

12675-4

#### Ensemble segmentation for improved background estimation and gas plume identification in hyperspectral images

Author(s): Scout C. Jarman, Los Alamos National Lab. (United States), Utah State Univ. (United States); Tory Carr, Zigfried Hampel-Arias, Eric Flynn, Los Alamos National Lab. (United States); Kevin Moon, Utah State Univ. (United States)

23 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 15B

12675-5

#### AI-powered automated landscape monitoring at global scale

Author(s): Mark Hannel, Erin Gennie, Brendan McAndrew, Steven P. Brumby, Amy E. Larson, Mark Mathis, Peter Kerins, Joseph Mazzariello, Megan Hansen, Gracie Ermi, Impact Observatory, Inc. (United States)

23 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 15B

Coffee Break 9:50 AM - 10:20 AM

### SESSION 2: IMAGE QUALITY

23 August 2023 • 10:20 AM - 11:20 AM | Conv. Ctr. Room 15B

Session Chair: Michael E. Zelinski,  
Lawrence Livermore National Lab. (United States)

12675-6

#### Impact of optical scatter on image classification with deep neural networks

Author(s): Page King, Lockheed Martin Corp. (United States); R. John Koshel, Wyant College of Optical Sciences (United States)

23 August 2023 • 10:20 AM - 10:40 AM | Conv. Ctr. Room 15B

12675-7

### Convolutional neural networks and the modulation transfer function

Author(s): Page King, Lockheed Martin Corp. (United States); R. John Koshel, Wyant College of Optical Sciences (United States)  
23 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 15B

12675-9

### Enhancing the quality of gauge images captured in smoke and haze scenes through deep learning

Author(s): Oscar Hernan Ramirez Agudelo, Akshay Narendra Shewatkar, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Edoardo Milana, University of Freiburg (Germany); Roland C. Aydin, Helmholtz Center Hereon (Germany); Franke Kai, German Aerospace Center (DLR), Institute for the Protection of Terrestrial Infrastructures (Germany)  
23 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 15B

Lunch/Exhibition Break 11:20 AM - 1:10 PM

### SESSION 3: OPTICS, PHOTONICS, PHYSICS

23 August 2023 • 1:10 PM - 2:10 PM | Conv. Ctr. Room 15B  
Session Chair: James S. Henrikson,  
Lawrence Livermore National Lab. (United States)

12675-10

### Attention mechanisms for broadband feature prediction for electromagnetic and photonic applications

Author(s): Ergun Simsek, Masoud Soroush, Univ. of Maryland, Baltimore County (United States); Gregory Moille, Kartik Srinivasan, National Institute of Standards and Technology (United States); Curtis R. Menyuk, Univ. of Maryland, Baltimore County (United States)  
23 August 2023 • 1:10 PM - 1:30 PM | Conv. Ctr. Room 15B

12675-12

### Reduction of cosmic-ray induced background in x-ray imaging detectors via image segmentation methods

Author(s): Artem Poliszczuk, Dan Wilkins, Steven Allen, Stanford Univ. (United States); Eric Miller, Massachusetts Institute of Technology (United States); Tanmoy Chattopadhyay, Stanford Univ. (United States); Benjamin Schneider, Marshall Bautz, Richard Foster, Catherine Grant, Massachusetts Institute of Technology (United States); Sven Herrmann, Peter Orel, Stanford Univ. (United States)  
23 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 15B

12675-14

### Searching for rare Ca II quasar absorption lines using deep learning

Author(s): Iona Xia, Stanford Univ. (United States); Jian Ge, Division of Science and Technology for Optical Astronomy, Shanghai Astronomical Observatory (China), Science Talent Training Center (United States); Kevin Willis, Science Talent Training Center (United States); Yinan Zhao, Department of Astronomy of the University of Geneva (Switzerland)  
23 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 15B

Coffee Break 2:10 PM - 2:40 PM

### SESSION 4: IMAGE, SIGNAL, AND TEXT PROCESSING

23 August 2023 • 2:40 PM - 4:20 PM | Conv. Ctr. Room 15B  
Session Chairs: Michael E. Zelinski, Lawrence Livermore National Lab. (United States), Tarek M. Taha, Univ. of Dayton (United States)

12675-15

### Reduction in sensor response time using long short-term memory network forecasting

Author(s): Simon J. Ward, Sharon M. Weiss, Vanderbilt Univ. (United States)  
23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 15B

12675-17

### Measuring transform invertibility with computational metrics

Author(s): Awroni Bhaduri, Purdue Univ. (United States); Hector Santos-Villalobos, Amazon.com, Inc. (United States); Suhas Sreehari, Oak Ridge National Lab. (United States)  
23 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 15B

12675-18

### KD-CLIP: multimodal contrastive learning with missing modality for vision-text recognition using knowledge distillation

Author(s): Zhiyuan Li, Univ. of Cincinnati (United States); Redha Ali, Cincinnati Children's Hospital Medical Ctr. (United States); Anna Zou, The National Science Foundation (United States); Anca L. Ralescu, Univ. of Cincinnati (United States)  
23 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 15B

12675-19

### Parking spot classification based on surround view camera system

Author(s): Andy Xinhua Xiao, Deep Doshi, Lihao Wang, Harsha Gorantla, Thomas Heitzmann, Peter Groth, Valeo (United States)  
23 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 15B

12675-20

### Comparison of deep learning-based compressive imaging from a practitioner's viewpoint

Author(s): Guy Hanzon, Or Nizhar, Vladislav Kravets, Adrian Stern, Ben-Gurion Univ. of the Negev (Israel)  
23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 15B

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12675-32

### Image-based atmospheric turbulence predictions using convolutional neural networks

Author(s): Shaun A. Comino, Townes Institute of Science and Technology Experimentation Facility (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12675

12675-33

### The path to carbon neutrality: a time series approach

Author(s): Haoran Zhang, Northeastern Univ. (United States); Yuchen Dong, The MathWorks, Inc. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-34

### Occlusion and edge aware transformer for tea shoot depth estimation based on light field camera

Author(s): Wenjie Dai, Rong Zou, Jiangsu Univ. (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-35

### Fault diagnosis in refrigerators using fan-induced acoustic signals

Author(s): Büsra Öz, Arçelik A.S. (Turkey), Sabanci Univ. (Turkey); Ergin Arslan, Arçelik A.S. (Turkey); Sinan Yildirim, Sabanci Univ. (Turkey)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-36

### Accelerating sparse convolutional neural networks with systolic arrays on FPGA

Author(s): Hemkant Nehete, Gaurav Verma, Shailendra Yadav, Brajesh Kumar Kaushik, Indian Institute of Technology Roorkee (India)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-37

### Model-based machine learning for computational reconstruction of opacity and missing information

Author(s): Keith Dillon, FormuLens (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-38

### Building a smarter surveillance system: real-time animal identification using deep learning

Author(s): Jordan Labio, The Harker School (United States); Atul Dubey, AI Club (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-39

### Unsupervised methods and ensemble learning to classify vibration sensor data

Author(s): Emily S. Teti, Rollin Lakis, Vlad Henzl, Los Alamos National Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-40

### LoLi-IEA: low-light image enhancement algorithm

Author(s): Ezequiel Perez-Zarate, Zhejiang Gongshang Univ. (China); Oscar Ramos-Soto, Univ. de Guadalajara (Mexico); Erick Rodríguez-Esparza, Univ. de Deusto (Spain); German Aguilar Acevedo, Zhejiang Gongshang Univ. (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-41

### Comparison between histogram of oriented gradients and convolutional features for keratoconus detection using corneal curvature maps

Author(s): Lucas Orlandi de Oliveira, Instituto de Física de São Carlos (Brazil); Felipe Marques de Carvalho Taguchi, Univ. Federal de São Paulo (Brazil); Renato Feijó Evangelista, Instituto de Física de São Carlos (Brazil); André Orlandi de Oliveira, JTAG Medical Equipment (Brazil); Edson Shizuo Mori, Univ. Federal de São Paulo (Brazil); Jarbas Caiado de Castro Neto, Instituto de Física de São Carlos (Brazil); Wallace Chamon, Univ. Federal de São Paulo (Brazil)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-42

### In-flight testing of wide-angle low-light dual camera for UAS automated navigation and object identification using deep learning

Author(s): Julie Buquet, Simon-Gabriel Beauvais, Patrice Roulet, Simon Thibault, ImmerVision (Canada)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-43

### Explainable machine learning approaches for understanding fire outcomes

Author(s): Megan Booher, James Ahrens, Ayan Biswas, Los Alamos National Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-45

### Chicken weight estimation using deep learning

Author(s): Boonsong Sutapun, Lawan Sampanporn, Suranaree Univ. of Technology (Thailand)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12675-46

### A frequency-driven deep learning technique for bird segmentation and detection from RGB video

Author(s): Shan Suthaharan, The Univ. of North Carolina at Greensboro (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

### SESSION 5: BIO AND HEALTH APPLICATIONS

24 August 2023 • 8:00 AM - 11:10 AM | Conv. Ctr. Room 7B

Session Chair: Tarek M. Taha, Univ. of Dayton (United States)

12675-21

### Machine learning-driven target-specific optimization of chiral energy redistribution in chiral plasmonic sensor

Author(s): Jeong Hyun Han, Yae-Chan Lim, Ryeong Myeong Kim, Ki Tae Nam, Seoul National Univ. (Republic of Korea)

24 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 7B

12675-23

### Bias-mitigated face ID using secure generative transforms

Author(s): Suhas Sreehari, Oak Ridge National Lab. (United States); Hector Santos-Villalobos, Amazon.com, Inc. (United States)

24 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 7B

12675-24

### **An automated retinal hemorrhages and exudates detection in a Mexican image set**

Author(s): Andres Echeveste-Vázquez, Julio Armas-Pérez, Arturo González-Vega, Univ. de Guanajuato (Mexico); Georgina Soto-Cruz, UNAM (Mexico); Carlos Villaseñor-Mora, Univ. de Guanajuato (Mexico)

24 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 7B

12675-25

### **A novel model of primary visual cortex based on biologically plausible sparse coding**

Author(s): Jocelyn Rego, Drexel Univ. (United States); Yijing Watkins, Pacific Northwest National Lab. (United States); Garrett Kenyon, Los Alamos National Lab. (United States); Edward Kim, Drexel Univ. (United States); Michael Teti, Los Alamos National Lab. (United States)

24 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 7B

12675-26

### **Batch effect detection and removal for human liver RNA-Seq with an unsupervised learning approach**

Author(s): Shamima Nasrin, Univ. of Dayton (United States); Md. Zahangir Alom, St. Jude Children's Research Hospital (United States); Tarek M. Taha, Univ. of Dayton (United States)

24 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 7B

12675-27

### **Performance analysis of deep learning architectures for skin lesion segmentation and improvements using polar image transformations on dermoscopy images**

Author(s): Redha Ali, Univ. of Dayton (United States); Zhiyuan Li, Univ. of Cincinnati (United States); Hussin Ragb, Christian Brother Univ. (United States); Almbrok Essa, Cleveland State Univ. (United States); Anna Zou, The National Science Foundation (United States); Huixian Zhang, Univ. of Cincinnati (United States); Russell C. Hardie, Univ. of Dayton (United States)

24 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 7B

### **Coffee Break 10:00 AM - 10:30 AM**

12675-28

### **Comparison of machine learning methods for classification of alexithymia in individuals with and without autism from eye-tracking data**

Author(s): Furkan Ilgin, Megan A. Witherow, Khan M. Iftekharuddin, Old Dominion Univ. (United States)

24 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 7B

12675-47

### **Histopathological image classification with unsupervised approaches using deep convolutional autoencoder and k-nearest neighbors**

Author(s): Shamima Nasrin, Univ. of Dayton (United States); Md. Zahangir Alom, St. Jude Children's Research Hospital (United States), Univ. of Dayton (United States); Tarek M. Taha, Univ. of Dayton (United States)

24 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 7B

### **SESSION 6: INDUSTRY**

24 August 2023 • 11:10 AM - 12:10 PM | Conv. Ctr. Room 7B

Session Chair: Michael E. Zelinski,  
Lawrence Livermore National Lab. (United States)

12675-29

### **Preliminary analysis of drone propeller signals using wingbeat-modulation lidar**

Author(s): John J. Fike, Trevor C. Vannoy, Nathaniel Sweeney, Joseph A. Shaw, Bradley M. Whitaker, Montana State Univ. (United States)

24 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 7B

12675-30

### **Real-time feedback for product inspection SOP on the edge**

Author(s): Carlos Rojas, Yunzhi Shi, Zhicheng Geng, Yanru Xiao, Diego Socolinsky, Amazon Machine Learning Solutions Lab. (United States); Theodore Bakanas, Srikanth Kodali, AWS Professional Services (United States); Rahul Katkar, Nelson Madrid, Flex Ltd. (United States)

24 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 7B

12675-31

### **Incorporating hardware metrics to model cards to evaluate utilization of machine learning models on IoT devices**

Author(s): Shageenth Sandrakumar, Nicholas Del Rio, Simon Khan, Air Force Research Lab. (United States)

24 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 7B

# TECHNICAL CONFERENCES

## Conference 12676

# UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts XI

20 - 21 August 2023 | Conv. Ctr. Room 16A

Conference Chairs: **Allison A. Barto**, Ball Aerospace (United States); **Fanny Keller**, European Space Research and Technology Ctr. (Netherlands); **H. Philip Stahl**, NASA Marshall Space Flight Ctr. (United States)

Program Committee: **Julien Archer**, Airbus Defence and Space (France); **Jonathan W. Arenberg**, Northrop Grumman Corp. (United States); **Sean Brennan**, L3Harris Technologies, Inc. (United States); **Lee D. Feinberg**, NASA Goddard Space Flight Ctr. (United States); **Jeong-Yeol Han**, Korea Astronomy and Space Science Institute (Republic of Korea); **James P. McGuire**, Jet Propulsion Lab. (United States); **Scott Richardson**, Lockheed Martin Corp. (United States); **Eric Ruch**, Safran Reosc (France); **Jeffrey Scott Smith**, NASA Goddard Space Flight Ctr. (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: ROMAN SPACE TELESCOPE

20 August 2023 • 8:40 AM - 10:00 AM | Conv. Ctr. Room 16A

Session Chairs: Allison A. Barto, Ball Aerospace (United States), Scott Richardson, Lockheed Martin Corp. (United States)

12676-1

#### The Roman Space Telescope optical system: status, test, and verification

Author(s): Matthew R. Bolcar, NASA Goddard Space Flight Ctr. (United States)

20 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 16A

12676-2

#### Roman Optical Telescope Assembly (OTA) integration and preparation for test

Author(s): Tony L. Whitman, Peter Miller, L3Harris Technologies, Inc. (United States); Joshua Abel, Bente Eegholm, Matthew R. Bolcar, Jeffrey S. Smith, NASA Goddard Space Flight Ctr. (United States); Brian Martens, Jesse Huguet, Stephen Mariconti, Pete McCarthy, Scott Paine, L3Harris Technologies, Inc. (United States); Joel Proebstle, NASA Goddard Space Flight Ctr. (United States); Brian Conrow, Erin Schiele, L3Harris Technologies, Inc. (United States)

20 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 16A

12676-3

#### Systems engineering integration and test of the wide field opto-mechanical assembly

Author(s): Colin T. Stewart, Julianne E. Foster, Benjamin M. Cromey, Thomas Delker, Ball Aerospace (United States)

20 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 16A

12676-4

#### Science filter performance summary for the Roman Space Telescope Wide Field Instrument

Author(s): Benjamin M. Cromey, Robert Von Handorf, John Pedroncelli, Thomas Delker, Derek Sabatke, Ball Aerospace (United States)

20 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 16A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: SMALL-MID MISSION CONCEPTS

20 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 16A

Session Chair: H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States)

12676-5

#### Opto-mechanical design, alignment, and test of the SPHEREx telescope: a cryogenic all-aluminum freeform system for the astrophysics medium explorer mission

Author(s): Eric H. Frater, Chris Seckar, Jeffrey Wedmore, Elliott Jenks, Owen Lincoln, Koby Smith, Ball Aerospace (United States)

20 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16A

12676-6

#### Europa Imaging System Wide Angle Camera (EIS WAC) design, fabrication, and test

Author(s): Joseph L. Centurelli, Kim Slack, Jeff Lees, Zibi Turtle, Jennifer McDermott, Edward Hawkins, James Mize, Heather Meyer, Alexandra Ocasio Milanes, Johns Hopkins Univ. Applied Physics Lab., LLC (United States); Pierce Morgan, Optimax Systems, Inc. (United States)

20 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16A

12676-7

#### Optical design and analysis of the ROKITS cameras

Author(s): Jihun Kim, Korea Astronomy and Space Science Institute (Republic of Korea); Youngju Kim, YunamOptics Inc. (Republic of Korea); Seonghwan Choi, Dukhang Lee, Korea Astronomy and Space Science Institute (Republic of Korea); Gwanghui Jeong, AntBridge Inc. (Republic of Korea); Jongyeob Park, Ji-Hye Baek, Yunjong Kim, Tae-Yong Yang, Jaeheung Park, Kyoung-min Roh, Young-Sil Kwak, Chanhaeng Lee, Jong-Kyun Chung, Woo Kyoung Lee, Korea Astronomy and Space Science Institute (Republic of Korea)

20 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16A

12676-8

#### The PICTURE-C exoplanetary imaging balloon mission: a refactored thermal model and framework for an end-to-end model for balloon borne coronagraphs

Author(s): Thaddeus Potter, Christopher Mendillo, Kuravi Hewawasam, Jason Martel, Supriya Chakrabarti, Timothy Cook, Univ. of Massachusetts Lowell (United States)

20 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 16A

Lunch Break 11:50 AM - 1:20 PM

### SESSION 3: SOLAR AND SPACE WEATHER MISSIONS

20 August 2023 • 1:20 PM - 3:00 PM | Conv. Ctr. Room 16A

Session Chairs: Fanny Keller, European Space Research and Technology Ctr. (Netherlands), Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Republic of Korea)

12676-9

#### **Development of multi-layer achromatic metasurface Risley prisms for a scanning coronal and heliospheric imager**

Author(s): Juliana T. Vievering, David Shrekenhamer, Angelos Vourlidis, Joseph L. Centurelli, Joseph Miragliotta, Chad Weiler, Nora Lane, Garret Bonnema, Lance Oh, Robert Bruce, Johns Hopkins Univ. Applied Physics Lab., LLC (United States)

20 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 16A

12676-10

#### **A new white-light coronagraph for solar observations**

Author(s): Natchimuthuk Gopalswamy, Qian Gong, Paul Nikulla, NASA Goddard Space Flight Ctr. (United States); Jie Zhang, George Mason Univ. (United States); Kyung-Suk Cho, Seonghwan Choi, Korea Astronomy and Space Science Institute (Republic of Korea); Nelson L. Reginald, The Catholic Univ. of America (United States)

20 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 16A

12676-11

#### **SwSCOR: a novel coronagraph instrument for space weather**

Author(s): Craig DeForest, Matthew Beasley, Stephen Osterman, Nicholas Erickson, Southwest Research Institute (United States)

20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16A

12676-12

#### **Testing of the SwSCOR coronagraph prototype**

Author(s): Nicholas F. Erickson, Matthew Beasley, Craig DeForest, Steven Osterman, Southwest Research Institute (United States)

20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16A

12676-13

#### **Unveiling new frontiers: conceptual design of optical and EUV telescopes with instruments for the L4 mission**

Author(s): Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Jongyeob Park, Sung-Hong Park, Korea Astronomy and Space Science Institute (Republic of Korea); Eun-Kyung Lim, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Donguk Song, Korea Astronomy and Space Science Institute (Republic of Korea); Kyung-Suk Cho, Junga Hwang, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Seonghwan Choi, Rok-Soon Kim, Jungjoon Seough, Korea Astronomy and Space Science Institute (Republic of Korea); JongDae Sohn, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Jihun Kim, Korea Astronomy and Space Science Institute (Republic of Korea)

20 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 16A

Coffee Break 3:00 PM - 3:30 PM

### SESSION 4: COATING TECHNOLOGIES

20 August 2023 • 3:30 PM - 5:30 PM | Conv. Ctr. Room 16A

Session Chairs: Lee D. Feinberg, NASA Goddard Space Flight Ctr. (United States), Eric Ruch, Safran Reosc (France)

12676-14

#### **Electron beam-generated plasmas in NF<sub>3</sub> environments for the passivation of UV/optical/IR mirrors**

Author(s): Luis V. Rodríguez-de Marcos, The Catholic Univ. of America (United States), NASA Goddard Space Flight Ctr. (United States); David R. Boris, Virginia D. Wheeler, U.S. Naval Research Lab. (United States); Mateo F. Batkis, Javier G. Del Hoyo, NASA Goddard Space Flight Ctr. (United States); Eric N. Jin, Scott G. Walton, U.S. Naval Research Lab. (United States); Edward J. Wollack, Manuel A. Quijada, NASA Goddard Space Flight Ctr. (United States)

20 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 16A

12676-15

#### **Environmental and polarization characterizations of E-beam plasma-based AIF<sub>3</sub>-passivated aluminum mirrors for astronomical telescopes**

Author(s): Manuel A. Quijada, NASA Goddard Space Flight Ctr. (United States); David R. Boris, U.S. Naval Research Lab. (United States); Luis V. Rodríguez-de Marcos, The Catholic Univ. of America (United States), NASA Goddard Space Flight Ctr. (United States); Virginia D. Wheeler, U.S. Naval Research Lab. (United States); Javier G. Del Hoyo, NASA Goddard Space Flight Ctr. (United States); Scott G. Walton, U.S. Naval Research Lab. (United States); Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States)

20 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 16A

12676-16

#### **Thermal evaporation enhanced atomic layer deposition for Al/AIF<sub>3</sub> UV mirror coatings**

Author(s): Robin E. Rodríguez, John Hennessy, Jet Propulsion Lab., Caltech (United States)

20 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 16A

12676-17

#### **UV to IR high-efficiency antireflective surface modification of freeform and cylindrical lenses for space platform optical instrumentation**

Author(s): Uma Subash, The Univ. of North Carolina at Charlotte (United States); Hanshin Lee, The Univ. of Texas at Austin (United States); Menelaos K. Poutous, The Univ. of North Carolina at Charlotte (United States)

20 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 16A

12676-18

#### **Cryolite overcoated aluminum reflectors for far-ultraviolet spectroscopy**

Author(s): Javier G. Del Hoyo, NASA Goddard Space Flight Ctr. (United States); Luis V. Rodríguez-de Marcos, The Catholic Univ. of America (United States); Mateo F. Batkis, Manuel A. Quijada, NASA Goddard Space Flight Ctr. (United States)

20 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 16A

# TECHNICAL CONFERENCES

## Conference 12676

12676-40

### Scalable microshutter focal plane masks for UV, visible, and infrared spectroscopy

Author(s): Alexander S. Kutyrev, Mathew Greenhouse, Paul Scowen, Meng-Ping Chang, Regis Brekosky, NASA Goddard Space Flight Ctr. (United States); Kyowon Kim, Science Systems and Applications, Inc. (United States); Nicholas Costen, Carl Kotecki, Ming Ke, NASA Goddard Space Flight Ctr. (United States); Gang Hu, Science Systems and Applications, Inc. (United States); Frederick Wang, NASA Goddard Space Flight Ctr. (United States); Beth Paquette, NASA Goddard Space Flight Ctr. (United States); Knute Ray, NASA Goddard Space Flight Ctr. (United States); Rainer Fettig, SSAI (United States); Stephan McCandliss, Johns Hopkins Univ. (United States)

20 August 2023 • 5:10 PM - 5:30 PM | Conv. Ctr. Room 16A

### SUNDAY EVENING PLenary

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### A perovskite paved pathway to multi-terawatt scale photovoltaics (Plenary Presentation)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (Plenary Presentation)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (Plenary Presentation)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

## MONDAY 21 AUGUST 2023

### SESSION 5: HABITABLE WORLDS EXPLORER I

#### Joint Session with Conferences 12676 and 12677

21 August 2023 • 8:40 AM - 10:00 AM | Conv. Ctr. Room 16A

Session Chairs: Allison A. Barto, Ball Aerospace (United States), Daewook Kim, Wyant College of Optical Sciences (United States)

12676-19

### Continued maturation of enabling component-level technologies for large, segmented ultra-stable telescopes

Author(s): Laura E. Coyle, John S. Knight, Ball Aerospace (United States); Laurent Pueyo, Space Telescope Science Institute (United States); Matthew East, L3Harris Technologies, Inc. (United States); Bob Hellekson, Jonathan W. Arenberg, Northrop Grumman Corp. (United States); Marcel Bluth, KBRwyle (United States); Sang Park, Harvard-Smithsonian Ctr. for Astrophysics (United States); James Tucker, Kratos Defense & Security Solutions, Inc. (United States); Brian Hicks, Benjamin M. Cromey, Jeremy Shugrue, Ball Aerospace (United States); Rémi Soummer, Ananya Sahoo, Space Telescope Science Institute (United States); Sean Brennan, L3Harris Technologies, Inc. (United States); Todd Lawton, Northrop Grumman Corp. (United States); Michael Eisenhower, Harvard-Smithsonian Ctr. for Astrophysics (United States)

21 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 16A

12676-20

### UVOIR to far-IR mirror technology development: year 1 status

Author(s): H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States)

21 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 16A

12677-1

### Habitable Worlds Observatory (HWO): realizable ZERODUR® mirror thermal characteristics for stability

Author(s): Tony B. Hull, The Univ. of New Mexico (United States); Janina Krieg, Clemens Kunisch, Ralf Jedamzik, Thomas Westerhoff, SCHOTT AG (Germany)

21 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 16A

12676-21

### ULTRASim: an integrated modeling environment for large, segmented telescopes with ultra-stable wavefronts

Author(s): Benjamin M. Cromey, Laura E. Coyle, John S. Knight, Ball Aerospace (United States)

21 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 16A

Coffee Break 10:00 AM - 10:30 AM



### SESSION 6: HABITABLE WORLDS EXPLORER II

#### *Joint Session with Conferences 12676 and 12677*

21 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 16A

Session Chairs: H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States), Pascal Hallibert, European Space Research and Technology Ctr. (Netherlands)

12676-22

#### **Visible and near-infrared detectors for space-based biosignature characterization**

Author(s): Bernard J. Rauscher, Emily Kan, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16A

12676-23

#### **Space Interferometer Imaging Limitations due to GPS Uncertainties and Parasitic Forces in LEO**

Author(s): Leonid Pogorelyuk, Mason Black, Nicholas Belsten, Eleonora Polini, Massachusetts Institute of Technology (United States); Jonah Hansen, Michael Ireland, The Australian National Univ. (Australia); John Monnier, Univ. of Michigan (United States); Kerri Cahoy, Massachusetts Institute of Technology (United States)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16A

12676-24

#### **Mitigation of micrometeoroid-induced disturbances to the Habitable Worlds Observer**

Author(s): Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16A

12676-25

#### **Assessment of near-angle scatter on exo-Earth coronagraphy**

Author(s): H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 16A

Lunch Break 11:50 AM - 1:20 PM

### SESSION 7: LARGE MISSIONS AND PROBES

#### *Joint Session with Conferences 12676 and 12677*

21 August 2023 • 1:20 PM - 3:00 PM | Conv. Ctr. Room 16A

Session Chairs: Fanny Keller, European Space Research and Technology Ctr. (Netherlands), Tony B. Hull, The Univ. of New Mexico (United States)

12676-26

#### **DUET: dual use space telescope**

Author(s): Thomas D. Ditto, 3DeWitt, LLC (United States); Mei-Li Hsieh, Rensselaer Polytechnic Institute (United States)

21 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 16A

12676-27

#### **OPA! The Original PolyOculus Array: a status update**

Author(s): Christina D. Moraitis, Stephen Eikenberry, Univ. of Central Florida (United States); Nicholas Law, The Univ. of North Carolina at Chapel Hill (United States); Robert Quimby, San Diego State Univ. (United States); Anthony Gonzalez, Univ. of Florida (United States); Sarik Jeram, Dunlap Institute for Astronomy & Astrophysics (Canada); Rodrigo Amezcua-Correa, Univ. of Central Florida (United States); Craig Warner, Univ. of Florida (United States); Amanda Townsend, Apache Point Observatory (United States); Stephanos Yerolatsitis, Joseph Harrington, Univ. of Central Florida (United States); Misty Bentz, Georgia State Univ. (United States); David Wright, Hailey Reale, Joseph Foran, Aiden Akers, Nathaniel Harmon, Kara Semmen, Vincent Pagliuca, Tyler Thomas, Vincent Miller, Madigan Roozen, Alexander Cingoranelli, Noor Salem, Univ. of Central Florida (United States)

21 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 16A

12676-28

#### **Optical design of telescope for PRIMA system**

Author(s): J. Michael Rodgers, Synopsys, Inc. (United States); James P. McGuire, Jet Propulsion Lab. (United States)

21 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16A

12676-29

#### **Optical design of spectrometers for PRIMA system**

Author(s): J. Michael Rodgers, Synopsys, Inc. (United States)

21 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16A

12676-30

#### **PHOENIX: a probe-class mission for cosmology**

Author(s): Alan J. Kogut, NASA Goddard Space Flight Ctr. (United States); Dale J. Fixsen, Univ. of Maryland, College Park (United States); Nabilah Aghanim, Institut d'Astrophysique Spatiale (France); Brandon Hensley, Princeton Univ. (United States); Jacques Delabrouille, CNRS-UCB International Research Lab. (United States); Bruno Maffei, Institut d'Astrophysique Spatiale (France); Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States); Ioana Zelko, Univ. of California, Los Angeles (United States)

21 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 16A

Coffee Break 3:00 PM - 3:30 PM

### SESSION 8: LARGE MISSIONS AND PROBES: SALTUS

#### *Joint Session with Conferences 12676 and 12677*

21 August 2023 • 3:30 PM - 5:10 PM | Conv. Ctr. Room 16A

Session Chairs: Allison A. Barto, Ball Aerospace (United States), Daewook Kim, Wyant College of Optical Sciences (United States)

12677-2

#### **SALTUS: Single Aperture Large Telescope for Universe Studies**

Author(s): Christopher K. Walker, The Univ. of Arizona (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States); Daniel Marrone, The Univ. of Arizona (United States); Gordon Chin, Carrie Anderson, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 16A

# TECHNICAL CONFERENCES

## Conference 12676

12677-3

### All reflective THz telescope design with an inflatable off-axis primary antenna for Single Aperture Large Telescope for Universe Studies (SALTUS) mission

Author(s): Yuzuru Takashima, Siddhartha Sirsi, Tianyao Zhang, Emil R. Varghese, Yefu Zhang, Heejoo Choi, Daewook Kim, Wyant College of Optical Sciences (United States); Arthur L. Palisoc, L'Garde, Inc. (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States); Christopher K. Walker, Steward Observatory (United States); Youngsik Kim, Wyant College of Optical Sciences (United States)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 16A

12677-4

### SALTUS optical design and performance

Author(s): Christopher K. Walker, Yuzuru Takashima, Daewook Kim, Heejoo Choi, The Univ. of Arizona (United States); Arthur L. Palisoc, L'Garde, Inc. (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 16A

12677-5

### SALTUS thermal architecture

Author(s): Christopher K. Walker, The Univ. of Arizona (United States); Michael Petach, Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 16A

12677-6

### Metrology in meter class inflatable antenna for a space observatory

Author(s): Heejoo Choi, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States); Daewook Kim, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States), Steward Observatory (United States); Yuzuru Takashima, Wyant College of Optical Sciences (United States); Arthur L. Palisoc, L'Garde, Inc. (United States); Christopher K. Walker, Steward Observatory (United States)

21 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 16A

## POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12676-31

### Optimizing design decision-making for remote sensing instrument specification via tolerance sensitivity analysis of Ritchey-Chrétien telescope

Author(s): Sheng-feng Lin, Taiwan Space Agency (TASA) (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-32

### Design of a visible and infrared common optical system with the same effective focal length

Author(s): Jeeyeon Yoon, Haeng Pal Heo, Gmsil Kang, Korea Aerospace Research Institute (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-33

### Development of a dual-camera terrain imager for increasing swath width in space exploration

Author(s): Youngchun Youk, Dongok Ryu, Jeeyeon Yoon, Korea Aerospace Research Institute (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-34

### Investigating the impact of ghost images on the accuracy of modulation transfer function measurement using knife-edge method

Author(s): Dongok Ryu, Korea Aerospace Research Institute (Republic of Korea); Seonghui Kim, Sehyun Seong, Telepix Co., Ltd. (Republic of Korea); Hyunju Seo, Hanwha Systems Co., Ltd. (Republic of Korea); Youngchun Youk, Goeun Kim, Shinwook Kim, Jeeyeon Yoon, Deog Gyu Lee, Haeng Pal Heo, Korea Aerospace Research Institute (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-35

### Optimizing the alignment of the Korsch telescope with consideration of gravitational effects

Author(s): Goeun Kim, Dongok Ryu, Youngchun Youk, Jeeyeon Yoon, Shinwook Kim, Korea Aerospace Research Institute (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-36

### On-orbit thermal control system design and analysis for space optical telescope ROKITS

Author(s): Jaegun Yoo, Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Republic of Korea); Hui-Kyung Kim, Korea Aerospace Research Institute (Republic of Korea); Woo Kyoung Lee, Seonghwan Choi, Dukhang Lee, Chanhaeng Lee, Korea Astronomy and Space Science Institute (Republic of Korea); Daewook Kim, The Univ. of Arizona (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-37

### Linear polarizer design for application in the far-ultraviolet spectral range

Author(s): Mateo F. Batkis, Manuel A. Quijada, Paul A. Scowen, NASA Goddard Space Flight Ctr. (United States); Robert Woodruff, Woodruff Consulting (United States); Luis V. Rodríguez-de Marcos, The Catholic Univ. of America (United States); Javier G. Del Hoyo, NASA Goddard Space Flight Ctr. (United States); Johnathan Gamaunt, Arizona State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-38

### **FPGA-based imaging camera platform for space missions**

Author(s): Seonghwan Choi, Korea Astronomy and Space Science Institute (Republic of Korea); Jungwong Kim, I-Trix Technology Co., Inc. (Republic of Korea); Gwanghui Jeong, Byungchae Bang, AntBridge Inc. (Republic of Korea); Jihun Kim, Jongyeob Park, Ji-Hye Baek, Yongwoo Kang, Korea Astronomy and Space Science Institute (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12676-39

### **Enhancing CubeSat capabilities with StarberrySense: a novel star camera payload**

Author(s): Shubham Ghatul, Bharat Chandra, Shubhangi Jain, Binukumar Nair, Rekhesh Mohan, Margarita Safonova, Jayant Murthy, Indian Institute of Astrophysics (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## WEDNESDAY 23 AUGUST 2023

### ASTRONOMICAL OPTICS AND INSTRUMENTATION PLENARY

23 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6A

Session Chair: Daewook Kim,  
Wyant College of Optical Sciences (United States)

### **Welcome and Opening Remarks**

23 August 2023 • 9:15 AM - 9:20 AM | Conv. Ctr. Room 6A

12677-502

### **Lessons from the development and servicing of HST for future astronomy missions** (*Plenary Presentation*)

Author(s): John W. MacKenty, Space Telescope Science Institute (United States)

23 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12677

# Astronomical Optics: Design, Manufacture, and Test of Space and Ground Systems IV

21 - 24 August 2023 | Conv. Ctr. Room 16A (Mon-Wed); Room 9 (Thu)

Conference Chairs: **Tony B. Hull**, The Univ. of New Mexico (United States); **Daewook Kim**, Wyant College of Optical Sciences (United States); **Pascal Hallibert**, European Space Research and Technology Ctr. (Netherlands)

Program Committee: **Jonathan W. Arenberg**, Northrop Grumman Aerospace Systems (United States); **Romain Auribault**, Thales Alenia Space (France); **Seunghyuk Chang**, Ctr. for Integrated Smart Sensors (Republic of Korea); **Alain J. Corso**, CNR-IFN Padova (Italy); **Laura E. Coyle**, Ball Aerospace (United States); **Matthew East**, L3Harris Technologies, Inc. (United States); **Bill A. Goodman**, Goodman Technologies, LLC (United States); **James P. Hamilton**, Photonic Cleaning Technologies (United States); **John M. Hill**, Large Binocular Telescope Observatory (United States); **Frank Stefan Höller**, Scantinel Photonics (Germany); **Pengda Hong**, Lehigh Univ. (United States); **Joseph M. Howard**, NASA Goddard Space Flight Ctr. (United States); **Fanny Keller**, European Space Research and Technology Ctr. (Netherlands); **Stephen E. Kendrick**, Kendrick Aerospace Consulting LLC (United States); **Janina Krieg**, SCHOTT AG (Germany); **Nisrine Louh**, Thales Alenia Space (France); **Steven A. Macenka**, Jet Propulsion Lab. (United States); **Luca Maresi**, European Space Research and Technology Ctr. (Netherlands); **Ted Mooney**, L3Harris Technologies, Inc. (United States); **Kashmira Nakhoda**, RayKi Consulting (United States); **Maria Guglielmina Pelizzo**, Univ. degli Studi di Padova (Italy); **Narasimha S. Prasad**, NASA Langley Research Ctr. (United States); **Eric Ruch**, Safran Reosc (France); **Stuart B. Shaklan**, Jet Propulsion Lab. (United States); **Greg A. Smith**, Wyant College of Optical Sciences (United States); **David Douglas Walker**, Univ. of Huddersfield (United Kingdom); **Thomas Westerhoff**, SCHOTT AG (Germany); **Grant Williams**, MMT Observatory (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: HABITABLE WORLDS EXPLORER I

*Joint Session with Conferences 12676 and 12677*

21 August 2023 • 8:40 AM - 10:00 AM | Conv. Ctr. Room 16A  
Session Chairs: Allison A. Barto, Ball Aerospace (United States),  
Daewook Kim, Wyant College of Optical Sciences (United States)

12676-19

#### Continued maturation of enabling component-level technologies for large, segmented ultra-stable telescopes

Author(s): Laura E. Coyle, John S. Knight, Ball Aerospace (United States); Laurent Pueyo, Space Telescope Science Institute (United States); Matthew East, L3Harris Technologies, Inc. (United States); Bob Hellekson, Jonathan W. Arenberg, Northrop Grumman Corp. (United States); Marcel Bluth, KBRwyle (United States); Sang Park, Harvard-Smithsonian Ctr. for Astrophysics (United States); James Tucker, Kratos Defense & Security Solutions, Inc. (United States); Brian Hicks, Benjamin M. Cromey, Jeremy Shugrue, Ball Aerospace (United States); Rémi Soummer, Ananya Sahoo, Space Telescope Science Institute (United States); Sean Brennan, L3Harris Technologies, Inc. (United States); Todd Lawton, Northrop Grumman Corp. (United States); Michael Eisenhower, Harvard-Smithsonian Ctr. for Astrophysics (United States)

21 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 16A

12676-20

#### UVOIR to far-IR mirror technology development: year 1 status

Author(s): H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States)

21 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 16A

12677-1

#### Habitable Worlds Observatory (HWO): realizable ZERODUR® mirror thermal characteristics for stability

Author(s): Tony B. Hull, The Univ. of New Mexico (United States); Janina Krieg, Clemens Kunisch, Ralf Jedamzik, Thomas Westerhoff, SCHOTT AG (Germany)

21 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 16A

12676-21

#### ULTRASim: an integrated modeling environment for large, segmented telescopes with ultra-stable wavefronts

Author(s): Benjamin M. Cromey, Laura E. Coyle, John S. Knight, Ball Aerospace (United States)

21 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 16A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: HABITABLE WORLDS EXPLORER II

*Joint Session with Conferences 12676 and 12677*

21 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 16A  
Session Chairs: H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States), Pascal Hallibert, European Space Research and Technology Ctr. (Netherlands)

12676-22

#### Visible and near-infrared detectors for space-based biosignature characterization

Author(s): Bernard J. Rauscher, Emily Kan, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16A

12676-23

### Space Interferometer Imaging Limitations due to GPS Uncertainties and Parasitic Forces in LEO

Author(s): Leonid Pogorelyuk, Mason Black, Nicholas Belsten, Eleonora Polini, Massachusetts Institute of Technology (United States); Jonah Hansen, Michael Ireland, The Australian National Univ. (Australia); John Monnier, Univ. of Michigan (United States); Kerri Cahoy, Massachusetts Institute of Technology (United States)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16A

12676-24

### Mitigation of micrometeoroid-induced disturbances to the Habitable Worlds Observer

Author(s): Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16A

12676-25

### Assessment of near-angle scatter on exo-Earth coronagraphy

Author(s): H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 16A

Lunch Break 11:50 AM - 1:20 PM

#### SESSION 3: LARGE MISSIONS AND PROBES

##### *Joint Session with Conferences 12676 and 12677*

21 August 2023 • 1:20 PM - 3:00 PM | Conv. Ctr. Room 16A

Session Chairs: Fanny Keller,

European Space Research and Technology Ctr. (Netherlands),  
Tony B. Hull, The Univ. of New Mexico (United States)

12676-26

### DUET: dual use space telescope

Author(s): Thomas D. Ditto, 3DeWitt, LLC (United States); Mei-Li Hsieh, Rensselaer Polytechnic Institute (United States)

21 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 16A

12676-27

### OPA! The Original PolyOculus Array: a status update

Author(s): Christina D. Moraitis, Stephen Eikenberry, Univ. of Central Florida (United States); Nicholas Law, The Univ. of North Carolina at Chapel Hill (United States); Robert Quimby, San Diego State Univ. (United States); Anthony Gonzalez, Univ. of Florida (United States); Sarik Jeram, Dunlap Institute for Astronomy & Astrophysics (Canada); Rodrigo Amezcua-Correa, Univ. of Central Florida (United States); Craig Warner, Univ. of Florida (United States); Amanda Townsend, Apache Point Observatory (United States); Stephanos Yerolatsitis, Joseph Harrington, Univ. of Central Florida (United States); Misty Bentz, Georgia State Univ. (United States); David Wright, Hailey Reale, Joseph Foran, Aiden Akers, Nathaniel Harmon, Kara Semmen, Vincent Pagliuca, Tyler Thomas, Vincent Miller, Madigan Roozen, Alexander Cingoranelli, Noor Salem, Univ. of Central Florida (United States)

21 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 16A

12676-28

### Optical design of telescope for PRIMA system

Author(s): J. Michael Rodgers, Synopsys, Inc. (United States); James P. McGuire, Jet Propulsion Lab. (United States)

21 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16A

12676-29

### Optical design of spectrometers for PRIMA system

Author(s): J. Michael Rodgers, Synopsys, Inc. (United States)

21 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16A

12676-30

### PHOENIX: a probe-class mission for cosmology

Author(s): Alan J. Kogut, NASA Goddard Space Flight Ctr. (United States); Dale J. Fixsen, Univ. of Maryland, College Park (United States); Nabilah Aghanim, Institut d'Astrophysique Spatiale (France); Brandon Hensley, Princeton Univ. (United States); Jacques Delabrouille, CNRS-UCB International Research Lab. (United States); Bruno Maffei, Institut d'Astrophysique Spatiale (France); Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States); Ioana Zelko, Univ. of California, Los Angeles (United States)

21 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 16A

Coffee Break 3:00 PM - 3:30 PM

#### SESSION 4: LARGE MISSIONS AND PROBES: SALTUS

##### *Joint Session with Conferences 12676 and 12677*

21 August 2023 • 3:30 PM - 5:10 PM | Conv. Ctr. Room 16A

Session Chairs: Allison A. Barto, Ball Aerospace (United States),  
Daewook Kim, Wyant College of Optical Sciences (United States)

12677-2

### SALTUS: Single Aperture Large Telescope for Universe Studies

Author(s): Christopher K. Walker, The Univ. of Arizona (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States); Daniel Marrone, The Univ. of Arizona (United States); Gordon Chin, Carrie Anderson, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 16A

12677-3

### All reflective THz telescope design with an inflatable off-axis primary antenna for Single Aperture Large Telescope for Universe Studies (SALTUS) mission

Author(s): Yuzuru Takashima, Siddhartha Sirsi, Tianyao Zhang, Emil R. Varghese, Yefu Zhang, Heejoo Choi, Daewook Kim, Wyant College of Optical Sciences (United States); Arthur L. Palisoc, L'Garde, Inc. (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States); Christopher K. Walker, Steward Observatory (United States); Youngsik Kim, Wyant College of Optical Sciences (United States)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 16A

12677-4

### SALTUS optical design and performance

Author(s): Christopher K. Walker, Yuzuru Takashima, Daewook Kim, Heejoo Choi, The Univ. of Arizona (United States); Arthur L. Palisoc, L'Garde, Inc. (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 16A

# TECHNICAL CONFERENCES

## Conference 12677

12677-5

### SALTUS thermal architecture

Author(s): Christopher K. Walker, The Univ. of Arizona (United States); Michael Petach, Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 16A

12677-6

### Metrology in meter class inflatable antenna for a space observatory

Author(s): Heejoo Choi, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States); Daewook Kim, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States), Steward Observatory (United States); Yuzuru Takashima, Wyant College of Optical Sciences (United States); Arthur L. Palisoc, L'Garde, Inc. (United States); Christopher K. Walker, Steward Observatory (United States)

21 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 16A

## TUESDAY 22 AUGUST 2023

### SESSION 5: OPTICAL MANUFACTURING I

22 August 2023 • 8:20 AM - 9:40 AM | Conv. Ctr. Room 16A

Session Chairs: Tony B. Hull, The Univ. of New Mexico (United States), Janina Krieg, SCHOTT AG (Germany)

12677-7

### Stress mitigation of replicated composite mirrors via multi-layer replication

Author(s): Geena L. Ferrelli, Hyun I. Kim, Rafael J. Zaldivar, The Aerospace Corp. (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 16A

12677-8

### Reflective engineered diffusers on the Roman Space Telescope Wide Field Instrument

Author(s): Benjamin M. Cromey, Eric Frater, Timothy Finch, Genaro Montoya, Raymond Wright, Gregory Wirth, Derek Sabatke, Thomas Delker, Ball Aerospace (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 16A

12677-10

### Radio telescope manufacturing with adaptive aluminum thermoforming and fringe projection metrology

Author(s): Wyatt K. Ellis, The Univ. of Arizona (United States); Daewook Kim, Wyant College of Optical Sciences, The Univ. of Arizona (United States), Steward Observatory (United States); Justin Hyatt, Christian Davila-Peralta, Steward Observatory, The Univ. of Arizona (United States); Joel Berkson, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Rachel Ball, The Univ. of Arizona (United States); Byeongjoon Jeong, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Ryan Pecha, Nathan Julicher, Isaac Pimienta, Jason Voris, Sue Kwon, Collin Garard, Diego Torres, The Univ. of Arizona (United States)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 16A

12677-11

### Pinhole elimination and progress towards zero defect coatings using first contact polymer peelable coatings as a surface prep

Author(s): James P. Hamilton, Photonic Cleaning Technologies (United States); Noah P. Milder, Nick Baker, Mary Ellen Moran, Univ. of Wisconsin-Platteville (United States)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 16A

Coffee Break 9:40 AM - 10:10 AM

### SESSION 6: OPTICAL MANUFACTURING II

22 August 2023 • 10:10 AM - 11:50 AM | Conv. Ctr. Room 16A

Session Chair: Pascal Hallibert, European Space Research and Technology Ctr. (Netherlands)

12677-12

### Optical performance of additive manufactured aluminum, aluminum metal matrix composite, and lightweighted aluminum alloy mirrors at cryogenic temperature

Author(s): Ron Eng, NASA Marshall Space Flight Ctr. (United States); John Casstevens, Dallas Optical Systems, Inc. (United States); Alex Few, Outpost Technologies, Inc. (United States); Christopher Hopkins, Tomasz M. Lis, Jaganathan Ranganathan, H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States)

22 August 2023 • 10:10 AM - 10:30 AM | Conv. Ctr. Room 16A

12677-41

### From design to evaluation of an additively manufactured, lightweight, deployable mirror for Earth observation

Author(s): Marcell Westsik, UK Astronomy Technology Ctr. (United Kingdom), The Univ. of Manchester (United Kingdom); Younes Chahid, UK Astronomy Technology Ctr. (United Kingdom); James T. Wells, UK Astronomy Technology Ctr. (United Kingdom), The Univ. of Sheffield (United Kingdom); Katherine Morris, UK Astronomy Technology Ctr. (United Kingdom); Mat Beardsley, Michael Harris, RAL Space (United Kingdom); Simon G. Alcock, Ioana-Theodora Nistea, Diamond Light Source Ltd. (United Kingdom); Carolyn Atkins, UK Astronomy Technology Ctr. (United Kingdom)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16A

12677-14

### Fabrication of freeform mirrors for the KASI-Deep Rolling Imaging Fast Telescope

Author(s): Dohoon Kim, Changhee Lee, JaeYeong Jo, Hong Ki Kim, Taejong Kim, Minhoo Seo, Byoung-hyun Park, Hyun-il Cho, Green Optics Co., Ltd. (Republic of Korea); Yunjong Kim, Korea Astronomy and Space Science Institute (Republic of Korea); Jongwan Ko, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Young-Soo Kim, Korea Astronomy and Space Science Institute (Republic of Korea)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16A

12677-15

### Aluminum metal matrix composites: a capable low-cost mirror substrate

Author(s): Alex Few, Jason Echols, Outpost Technologies, Inc. (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16A

12677-16

### Compact deformable mirror driver electronics for risk tolerant astrophysics missions

Author(s): Christian Haughwout, Massachusetts Institute of Technology (United States); Kyle Van Gorkom, Stephen Kaye, The Univ. of Arizona (United States); Kerri Cahoy, Massachusetts Institute of Technology (United States); Daewook Kim, Ewan S. Douglas, The Univ. of Arizona (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 16A

Lunch/Exhibition Break 11:50 AM - 1:00 PM

### SESSION 7: OPTICAL TESTING

22 August 2023 • 1:00 PM - 3:00 PM | Conv. Ctr. Room 16A

Session Chair: Daewook Kim,  
Wyant College of Optical Sciences (United States)

12677-17

### Tolerance and alignment study of two-channel telescope spectroscopy for Aspera

Author(s): Heejoo Choi, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States); Haeun Chung, Carlos Vargas, Afaque R. Khan, Steward Observatory (United States); Jason Corliss, Lunar & Planetary Lab., The Univ. of Arizona (United States); Daewook Kim, Wyant College of Optical Sciences (United States), Steward Observatory (United States), Large Binocular Telescope Observatory (United States)

22 August 2023 • 1:00 PM - 1:20 PM | Conv. Ctr. Room 16A

12677-18

### Whole-field laser Doppler vibrometer (WF-LDV) for real time characterization of space optics

Author(s): Vladimir Markov, Advanced Systems & Technologies, Inc. (United States); Ron Eng, NASA Marshall Space Flight Ctr. (United States); Stephen Kupiec, Juan Abejar, Advanced Systems & Technologies, Inc. (United States)

22 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 16A

12677-19

### Phase retrieval by pattern classification and circular mean for robust optical testing

Author(s): Ohgan Kim, Telepix Co., Ltd. (Republic of Korea); Yun-woo Lee, Ho-Soon Yang, Korea Research Institute of Standards and Science (Republic of Korea)

22 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 16A

12677-20

### Binary Pseudo Random Array (BPRA) for inspection and calibration for cylindrical wavefront interferometry

Author(s): Keiko Munechika, HighRI Optics, Inc. (United States); Simon Rochester, Rochester Scientific, LLC (United States); Michael Biskach, NASA Goddard Space Flight Ctr. (United States); Weilun Chao, Ctr. for X-ray Optics, Lawrence Berkeley National Lab. (United States); Ulf Griesmann, National Institute of Standards and Technology (United States); Ian Lacey, Advanced Light Source, Lawrence Berkeley National Lab. (United States); Carlos Pina-Hernandez, HighRI Optics, Inc. (United States); Ai Numata, KBR, Inc. (United States); Peter Z. Takacs, Surface Metrology Solutions LLC (United States); Kaito Yamada, HighRI Optics, Inc. (United States); William W. Zhang, NASA Goddard Space Flight Ctr. (United States); Valeriy Yashchuk, Advanced Light Source, Lawrence Berkeley National Lab. (United States)

22 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16A

12677-21

### Shadowgram technique for recovering pupil mask alignment in the Wide Field Instrument of the Nancy Grace Roman Space Telescope

Author(s): Scott O. Rohrbach, Samuel N. Nissim, NASA (United States)

22 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16A

12677-46

### Optimizing deflectometry to suppress ghost signal noise

Author(s): Byeongjoon Jeong, The Univ. of Arizona (United States); Heejoo Choi, The Univ. of Arizona (United States), Large Binocular Telescope Observatory (United States); Sotero Ordoñez, The Univ. of Arizona (United States); Daewook Kim, The Univ. of Arizona (United States), Large Binocular Telescope Observatory (United States), Steward Observatory (United States)

22 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 16A

Coffee Break 3:00 PM - 3:30 PM

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States)  
and Daewook Kim, Wyant College of Optical Sciences  
(United States)

### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

### Optic technologies enabling fusion ignition at the National Ignition Facility (Plenary Presentation)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (Plenary Presentation)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (Plenary Presentation)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12677

WEDNESDAY 23 AUGUST 2023

### ASTRONOMICAL OPTICS AND INSTRUMENTATION PLENARY

23 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6A

Session Chair: Daewook Kim,  
Wyant College of Optical Sciences (United States)

#### Welcome and Opening Remarks

23 August 2023 • 9:15 AM - 9:20 AM | Conv. Ctr. Room 6A

12677-502

#### Lessons from the development and servicing of HST for future astronomy missions (*Plenary Presentation*)

Author(s): John W. MacKenty, Space Telescope Science Institute (United States)

23 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

#### Coffee Break 10:00 AM - 10:30 AM

### SESSION 8: OPTICAL DESIGN

23 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 16A

Session Chair: James P. Hamilton,  
Photonic Cleaning Technologies (United States)

12677-22

#### Ultralightweight hybrid refractive/diffractive MODE telescopes for space applications

Author(s): Thomas D. Milster, Nick Brar, Yingying Zhang, Young-Sik Kim, Heejoo Choi, Marcos Esparza, Daewook Kim, Wyant College of Optical Sciences (United States); Allen Yi, Yuxin Cai, The Ohio State Univ. (United States); Geonhee Kim, Hanbat National Univ. (Republic of Korea); Daniel Apai, Wyant College of Optical Sciences (United States)

23 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16A

12677-25

#### MOIS: a configurable slit multi-object infrared spectrograph

Author(s): Arun Surya, Manoj Puravankara, Bhaswati Mookerjee, Sateesh Poojary, Savio L. A. Dcosta, Tata Institute of Fundamental Research (India); Mayanak Narang, Institute of Astronomy and Astrophysics, Academia Sinica (Taiwan); Pankaj Madhwani, Krishnan Kutty, Shailesh Bhagat, Harshit Shah, Bihan Banerjee, Sanjay Gharat, Rajesh Jadhav, Himanshu Tyagi, Tata Institute of Fundamental Research (India)

23 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16A

12677-26

#### Scattering properties of black pigments: implications for detecting faint sources near the moon using ground-based telescopes

Author(s): Luke Mayer, Byeongjoon Jeong, Trenton Brendel, Daewook Kim, Wyant College of Optical Sciences (United States); Roberto Furfaro, Vishnu Reddy, The Univ. of Arizona (United States)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16A

12677-27

#### Freeform wide-field-of-view near-infrared imaging spectrometer for spaceborne climate monitoring

Author(s): Lien Smeesters, Vrije Univ. Brussel (Belgium), Flanders Make (Belgium); Luca Schifano, Vrije Univ. Brussel (Belgium), Royal Meteorological Institute of Belgium (Belgium); Dries Rosseel, Jef Verbaenen, Hugo Thienpont, Francis Berghmans, Vrije Univ. Brussel (Belgium), Flanders Make (Belgium); Steven Dewitte, Royal Observatory of Belgium (Belgium); Michael Vervaeke, Vrije Univ. Brussel (Belgium), Flanders Make (Belgium)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 16A

12677-24

#### Optical design and analysis of calibration system for the Wide Field Optical Spectrograph on the Thirty Meter Telescope (TMT)

Author(s): Amirul Hasan, Devika K. Divakar, Sriram S., Thirupathi Sivarani, Indian Institute of Astrophysics (India); Bernard Delabre, TMT International Observatory, LLC (United States); Jason Fucik, Caltech (United States); Sudharsan Kambhala, Ajin Prakash, Govinda K.V., Ramya Sethuram, Indian Institute of Astrophysics (India); Charles Steidel, Caltech (United States); Alastair Heptonstall, TMT International Observatory, LLC (United States); Reston Nash, Caltech (United States)

23 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 16A

#### Lunch/Exhibition Break 12:10 PM - 1:40 PM

### SESSION 9: LARGE MONOLITHIC SPACE OPTICAL SYSTEMS I

23 August 2023 • 1:40 PM - 2:50 PM | Conv. Ctr. Room 16A

Session Chair: Tony B. Hull, The Univ. of New Mexico (United States)

12677-28

#### Taking big risks for big science: approaches to lowering the cost of large space telescopes (*Invited Paper*)

Author(s): Ewan S. Douglas, Buddy Martin, Jared R. Males, The Univ. of Arizona (United States); Greg Aldering, Univ. of California, Berkeley (United States); Daewook Kim, The Univ. of Arizona (United States); Saul Perlmutter, Univ. of California, Berkeley (United States); Buell Jannuzi, The Univ. of Arizona (United States)

23 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 16A

12677-29

#### Compact three mirror anastigmat telescope design using 6.5m monolithic primary mirror

Author(s): Daewook Kim, Heejoo Choi, Wyant College of Optical Sciences (United States); Ewan S. Douglas, Steward Observatory (United States)

23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 16A

12677-30

#### Approaches to developing tolerance and error budgets for active space telescopes

Author(s): Heejoo Choi, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States); Young-Sik Kim, Hyukmo Kang, Solvay A. Blomquist, Hill Tailor, Wyant College of Optical Sciences (United States); Douglas Kelly, Ewan S. Douglas, The Univ. of Arizona (United States); Daewook Kim, Wyant College of Optical Sciences, The Univ. of Arizona (United States), Large Binocular Telescope Observatory (United States)

23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 16A

#### Coffee Break 2:50 PM - 3:20 PM



### SESSION 10: LARGE MONOLITHIC SPACE OPTICAL SYSTEMS II

23 August 2023 • 3:20 PM - 4:40 PM | Conv. Ctr. Room 16A

Session Chair: Pascal Hallibert, European Space Research and  
Technology Ctr. (Netherlands)

12677-31

#### Focus diverse phase retrieval testbed development of continuous wavefront sensing for space telescope applications

Author(s): Hyukmo Kang, Wyant College of Optical Sciences  
(United States); Kyle Van Gorkom, Jess Johnson, Aaron Goldtooth,  
Steward Observatory (United States); Daewook Kim, Wyant College  
of Optical Sciences (United States), Steward Observatory (United  
States), Large Binocular Telescope Observatory (United States);  
Ewan S. Douglas, Steward Observatory (United States)

23 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 16A

12677-32

#### Analysis of active optics correction for a 6.5m honeycomb mirror in a space observatory

Author(s): Solvay A. Blomquist, Hubert M. Martin, Hyukmo Kang,  
Rebecca Whitsitt, Kevin Z. Derby, Ewan S. Douglas, Daewook Kim,  
The Univ. of Arizona (United States)

23 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 16A

12677-33

#### Integrated modeling of wavefront sensing and control for space telescopes utilizing active and adaptive optics

Author(s): Kevin Z. Derby, Kian Milani, Hill Taylor, Solvay A. Blomquist,  
Kyle Van Gorkom, Hyukmo Kang, Sebastiaan Haffert, Heejoo Choi,  
The Univ. of Arizona (United States); Christopher Mendillo, Univ. of  
Massachusetts Lowell (United States); Ewan S. Douglas, Daewook  
Kim, The Univ. of Arizona (United States)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 16A

12677-34

#### Optical characterization of a low-noise, high-resolution controller for MEMS deformable mirrors for space applications

Author(s): Kyle Van Gorkom, Ewan S. Douglas, The Univ. of Arizona  
(United States); Christian Haughwout, Massachusetts Institute of  
Technology (United States); Daewook Kim, Wyant College of Optical  
Sciences (United States); Cameron Ard, The Univ. of Arizona (United  
States); Kerri Cahoy, Massachusetts Institute of Technology (United  
States)

23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 16A

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on  
Wednesday evening. Come view the posters, enjoy light refreshments,  
ask questions, and network with colleagues in your field. Authors of  
poster papers will be present to answer questions concerning their  
papers. Attendees are required to wear their conference registration  
badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up in-  
structions at <https://spie.org/OP/poster-presentation-guidelines>

12677-39

#### New method of polishing and fabrication for optical substrates using gas cluster ion beam

Author(s): Aram Hong, Sangwon Hyun, Korea Basic Science Institute  
(Republic of Korea); Dong Jin Ku, Y&DK Co., Ltd. (Republic of  
Korea); Myoung Choul Choi, Korea Basic Science Institute (Republic  
of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-40

#### Flat surface measurement using laser trackers and SMRs on motorized stages

Author(s): Dongok Ryu, Jongguk Choe, Youngchun Youk, Go Eun  
Kim, EungShik Lee, Korea Aerospace Research Institute (Republic of  
Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-42

#### Tolerance analysis of off-axis freeform three-mirror KASI-deep rolling imaging fast telescope

Author(s): Yunjong Kim, Korea Astronomy and Space Science  
Institute (Republic of Korea); Gayoung Lee, Kyungpook National  
Univ. (Republic of Korea), Korea Astronomy and Space Science  
Institute (Republic of Korea); Jihun Kim, Korea Astronomy and Space  
Science Institute (Republic of Korea); Seunghyuk Chang, Ctr. for  
Integrated Smart Sensors (Republic of Korea); Dohoon Kim, Green  
Optics Co., Ltd. (Republic of Korea); Il Kweon Moon, Korea Research  
Institute of Standards and Science (Republic of Korea); Daewook  
Kim, Wyant College of Optical Sciences, The Univ. of Arizona (United  
States); Jongwan Ko, Korea Astronomy and Space Science Institute  
(Republic of Korea), Univ. of Science and Technology (Republic of  
Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-43

#### Low-to-mid spatial frequency wavefront error control for off-axis freeform three-mirror KASI-deep rolling imaging fast telescope

Author(s): Gayoung Lee, Kyungpook National Univ. (Republic of  
Korea), Korea Astronomy and Space Science Institute (Republic  
of Korea); Yunjong Kim, Korea Astronomy and Space Science  
Institute (Republic of Korea); Daewook Kim, Wyant College of  
Optical Sciences, The Univ. of Arizona (United States); Woowon  
Byun, Changsu Choi, Korea Astronomy and Space Science Institute  
(Republic of Korea); Yongseok Lee, Korea Astronomy and Space  
Science Institute (Republic of Korea), Kyung Hee Univ. (Republic  
of Korea); Dohoon Kim, Green Optics Co., Ltd. (Republic of Korea);  
Seunghyuk Chang, Ctr. for Integrated Smart Sensors (Republic of  
Korea); Jongwan Ko, Korea Astronomy and Space Science Institute  
(Republic of Korea), Univ. of Science and Technology (Republic of  
Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-44

#### Atmospheric dispersion corrector for a multi-object spectroscopic mode of HROS-TMT

Author(s): Manjunath Bestha, Amirul Hasan, Devika K. Divakar,  
Indian Institute of Astrophysics (India); Arun Surya, Tata Institute  
of Fundamental Research (India); Sriram S., Thirupathi Sivarani,  
Ajin Prakash, Parvathy M., Sudharshan Yadav, Indian Institute of  
Astrophysics (India)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12677

12677-45

### Application of the polarization-holographic imaging Stokes spectropolarimeter in astronomy

Author(s): Barbara N. Kilosanidze, George Kakauridze, Irakli Chaganava, Institute of Cybernetics of Georgian Technical Univ. (Georgia); Teimuraz Kvernadze, Georgi Kurkhuli, E. Kharadze Abastumani Astrophysical Observatory (Georgia); Luis Oriol, Instituto de Nanociencia y Materiales de Aragón, Consejo Superior de Investigaciones Científicas, Univ. de Zaragoza (Spain); Milagros Piñol, Instituto de Nanociencia y Materiales de Aragón, Univ. de Zaragoza (Spain); Qi-Huo Wei, Southern University of Science & Technology of China (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-47

### Plano and convex surface analysis by using sub-aperture stitching interferometry

Author(s): Fernando Quiñones Colin, Omar Palillero Sandoval, Univ. Autónoma del Estado de Morelos (Mexico); Rafael Izazaga-Pérez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-48

### Preliminary mechanical design of GrainCams payload for the CLPS lunar rover

Author(s): Woojin Kim, Bongkon Moon, Dukhang Lee, Min Bae Kim, Minsup Jeong, Jihun Kim, Seonghwan Choi, Jehyuck Shin, Mingyeong Lee, Chae Kyung Sim, Young-Jun Choi, Korea Astronomy and Space Science Institute (Republic of Korea); Sungsoo S. Kim, Kyung Hee Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-49

### High reliability devices require photonic and optical components to be free from contaminants prior to final assembly

Author(s): Raj Varma, Gel-Pak (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-50

### ZernikeNet: a deep learning-based approach for accurate Zernike coefficients calculation in aspheric optical components

Author(s): Shinwook Kim, Youngchun Youk, Goeun Kim, Dongok Ryu, Jeeyeon Yoon, Korea Aerospace Research Institute (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-51

### Dynamic tool influence function on SiC mirror surfaces for space optical telescopes using orthogonal velocity tool

Author(s): Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Republic of Korea), Univ. of Science and Technology (Republic of Korea); Mingab Bog, Y&DK Co., Ltd. (Republic of Korea); Jiwoo Lee, Ju Hyun Suk, Cheongju Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12677-52

### Manufacturing thin shell mirrors for adaptive optics

Author(s): Bart Snijders, Nagihan Sezgin, Stefan Kuiper, Arjo Bos, Jan De Vreugd, Wouter Jonker, TNO (Netherlands); Mark Chun, University of Hawaii (United States); Philip Hinz, University of California Santa Cruz (United States); Bert Dekker, Bart van Venrooy, TNO (Netherlands); Constantin Meiners, Fraunhofer IPT (Germany)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

### SESSION 11: OPTO-MECHANICAL ENGINEERING

24 August 2023 • 10:00 AM - 11:30 AM | Conv. Ctr. Room 9

#### NOTE ROOM CHANGE

Session Chair: Julien Archer, Airbus Defence and Space (France)

12677-35

### Dos and don'ts in mounting ZERODUR (*Invited Paper*)

Author(s): Ralf Jedamzik, Hauke Esemann, Clemens Kunisch, Janina Krieg, Thomas Westerhoff, SCHOTT AG (Germany)

24 August 2023 • 10:00 AM - 10:30 AM | Conv. Ctr. Room 9

12677-36

### Understanding the role of additive manufacturing in the development of astronomical hardware

Author(s): Carolyn Atkins, Younes Chahid, UK Astronomy Technology Ctr. (United Kingdom); James T. Wells, UK Astronomy Technology Ctr. (United Kingdom), The Univ. of Sheffield (United Kingdom); Marcell Westsik, UK Astronomy Technology Ctr. (United Kingdom), The Univ. of Manchester (United Kingdom); Richard Kotlewski, Scott McPhee, Katherine Morris, UK Astronomy Technology Ctr. (United Kingdom); Robert M. Snell, Iain Todd, The Univ. of Sheffield (United Kingdom); Mat Beardsley, Michael Harris, RAL Space (United Kingdom); Jonathan Orr, Misael Pimentel, Scott McKegney, National Manufacturing Institute Scotland (United Kingdom); Simon G. Alcock, Ioana-Theodora Nistea, Diamond Light Source Ltd. (United Kingdom); Samuel Tammis-Williams, The Univ. of Edinburgh (United Kingdom)

24 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 9

12677-37

### Thermo-elastic analysis of various lateral flexure bonding applications

Author(s): Youna Jun, LeO SPACE Inc. (Republic of Korea); Myung Cho, NSF's National Optical-Infrared Astronomy Research Lab. (United States); Il Kweon Moon, Korea Research Institute of Standards and Science (Republic of Korea)

24 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 9

12677-38

### Multiple methods of determining the gravity-sag of light-weighted optics

Author(s): Tomasz M. Lis, H. Philip Stahl, Stephen Cheney, NASA Marshall Space Flight Ctr. (United States)

24 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 9

## Conference 12678

# UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII

20 - 22 August 2023 | Conv. Ctr. Room 17B

Conference Chairs: **Oswald H. Siegmund**, Space Sciences Lab. (United States); **Keri Hoadley**, The Univ. of Iowa (United States)

Program Committee: **Camden D. Ertley**, Southwest Research Institute (United States); **Brian T. Fleming**, Lab. for Atmospheric and Space Physics (United States); **Kevin C. France**, Univ. of Colorado Boulder (United States); **Stephan R. McCandliss**, Johns Hopkins Univ. (United States); **Sarah E. Tuttle**, Univ. of Washington (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: SPACEBORNE EXPERIMENTS AND MISSIONS I

20 August 2023 • 1:20 PM - 2:20 PM | Conv. Ctr. Room 17B

Session Chair: Camden D. Ertley,  
Southwest Research Institute (United States)

12678-1

#### The Imaging X-ray Polarimetry Explorer (IXPE) at last!

Author(s): Paolo Soffitta, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Luca Baldini, Univ. di Pisa (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Wayne H. Baumgartner, NASA Marshall Space Flight Ctr. (United States); Ronaldo Bellazzini, Istituto Nazionale di Fisica Nucleare (Italy); Stephen D. Bongiorno, NASA Marshall Space Flight Ctr. (United States); Niccolò Bucciantini, INAF - Osservatorio Astrofisico di Arcetri (Italy); Enrico Costa, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Michal Dovciak, Czech Academy of Sciences (Czech Republic); Steven R. Ehlert, Philip E. Kaaret, Jeffery Kolodziejczak, NASA Marshall Space Flight Ctr. (United States); Luca Latronico, Istituto Nazionale di Fisica Nucleare (Italy); Frédéric Marin, Observatoire astronomique de Strasbourg (United States); Herman L. Marshall, Massachusetts Institute of Technology (United States); Alan Marsher, Boston Univ. (United States); Giorgio Matt, Univ. degli Studi di Roma Tre (Italy); Fabio Muleri, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Stephen L. O'Dell, NASA Marshall Space Flight Ctr. (United States); Juri Poutanen, Univ. of Turku (Finland); Brian D. Ramsey, NASA Marshall Space Flight Ctr. (United States); Roger W. Romani, Stanford Univ. (United States); Patrick Slane, Harvard-Smithsonian Ctr. for Astrophysics (United States); Allyn F. Tennant, NASA Marshall Space Flight Ctr. (United States); Roberto Turolla, Univ. degli Studi di Padova (Italy); Martin C. Weisskopf, NASA Marshall Space Flight Ctr. (United States)

20 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 17B

12678-2

#### In-flight monitoring and calibration of the x-ray polarimeters on board IXPE

Author(s): John Rankin, Fabio Muleri, Riccardo Ferrazzoli, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Luca Baldini, Univ. di Pisa (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Wayne H. Baumgartner, NASA Marshall Space Flight Ctr. (United States); Enrico Costa, Ettore Del Monte, Alessandro Di Marco, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Kurtis L. Dietz, Steven R. Ehlert, NASA Marshall Space Flight Ctr. (United States); Sergio Fabiani, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Philip E. Kaaret, NASA Marshall Space Flight Ctr. (United States); Dawoon E. Kim, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Jeffery Kolodziejczak, NASA Marshall Space Flight Ctr. (United States); Fabio La Monaca, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Luca Latronico, Istituto Nazionale di Fisica Nucleare (Italy); Carlo Lefevre, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Alberto Manfreda, Istituto Nazionale di Fisica Nucleare (Italy); Stephen L. O'Dell, Brian D. Ramsey, NASA Marshall Space Flight Ctr. (United States); Ajay Ratheesh, Alda Rubini, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Carmelo Sgrò, Istituto Nazionale di Fisica Nucleare (Italy); Paolo Soffitta, INAF - Istituto di Astrofisica e Planetologia Spaziali (Italy); Douglas A. Swartz, Allyn F. Tennant, NASA Marshall Space Flight Ctr. (United States); Alessio Trois, INAF - Osservatorio Astronomico di Cagliari (Italy); Martin C. Weisskopf, NASA Marshall Space Flight Ctr. (United States)

20 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 17B

12678-3

#### On-orbit results of the GAGG radiation instruments

Author(s): Lee J. Mitchell, Bernard F. Philips, Richard S. Woolf, Anthony L. Hutcheson, U.S. Naval Research Lab. (United States); Wiley N. Johnson, Technology Service Corp. (United States); Mary Johnson-Rambert, U.S. Naval Research Lab. (United States)

20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 17B

# TECHNICAL CONFERENCES

## Conference 12678

### SESSION 2: HARD X-RAY AND GAMMA RAY INSTRUMENTATION

20 August 2023 • 2:20 PM - 3:20 PM | Conv. Ctr. Room 17B

Session Chair: Camden D. Ertley,  
Southwest Research Institute (United States)

12678-4

#### Probing the sun with imaging spectrographs

Author(s): Amy Winebarger, NASA Marshall Space Flight Ctr. (United States); P. S. Athiray, The Univ. of Alabama in Huntsville (United States); Amir Caspi, Southwest Research Institute (United States); Patrick R. Champey, Ken Kobayashi, NASA Marshall Space Flight Ctr. (United States); Charles Kankelborg, Montana State Univ. (United States); Katharine Reeves, Smithsonian Astrophysical Observatory (United States)

20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 17B

12678-5

#### Trigger-output, event-driven x-ray astronomy SOI pixel sensors: development of large sensors with PDD structure and recent progress in digitization

Author(s): Takeshi Go Tsuru, Hiroyuki Uchida, Mizuki Uenomachi, Tomonori Ikeda, Yuki Amano, Kazuho Kayama, Kyoto Univ. (Japan); Koji Mori, Ayaki Takeda, Yusuke Nishioka, Masataka Yukumoto, Tatsunori Ishida, Uzuki Iwakiri, Daisuke Izumi, Miraku Kimura, Rikuto Kawashima, Koyo Magata, Asahi Shiokawa, Hikaru Mitani, Univ. of Miyazaki (Japan); Takaaki Tanaka, Hiromasa Suzuki, Konan Univ. (Japan); Takayoshi Kohmura, Yuusuke Uchida, Shion Abe, Naoki Ito, Makoto Shimizu, Shun Tsunomachi, Toshiaki Doi, Daiki Aoki, Yasuyuki Shimizu, Yuuki Takesue, Kaito Fujisawa, Tokyo Univ. of Science (Japan); Kumiko K. Nobukawa, Takumi Kishimoto, Yoshihisa Kawabe, Kindai Univ. (Japan); Kouichi Hagino, The Univ. of Tokyo (Japan); Yasuo Arai, High Energy Accelerator Research Organization, KEK (Japan); Ikuo Kurachi, D&S Inc. (Japan); Kenji Shimazoe, The Univ. of Tokyo (Japan); Shoji Kawahito, Keita Yasutomi, Shizuoka Univ. (Japan)

20 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 17B

12678-6

#### Development of small pixel CZT detectors for future hard x-ray missions

Author(s): Giovanni Pinaroli, Brookhaven National Lab. (United States)

20 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 17B

Coffee Break 3:20 PM - 3:50 PM

### SESSION 3: SOLID STATE AND CRYOGENIC SENSORS AND TECHNIQUES

20 August 2023 • 3:50 PM - 5:10 PM | Conv. Ctr. Room 17B

Session Chair: Sarah E. Tuttle, Univ. of Washington (United States)

12678-7

#### XPOL-III a new generation low noise readout ASIC for x-ray single photon detection

Author(s): Massimo Minuti, Luca Baldini, Alessandro Brez, Ronaldo Bellazzini, Melissa Pesce-Rollins, Michele Pinchera, Luca Latronico, Leonardo Lucchesi, Alberto Manfreda, Leonardo Orsini, Carmelo Sgrò, Gloria Spandre, Istituto Nazionale di Fisica Nucleare (Italy)

20 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 17B

12678-8

#### The high-speed x-ray camera on AXIS

Author(s): Eric D. Miller, Marshall W. Bautz, Catherine E. Grant, Richard Foster, Beverly LaMarr, Andrew Malonis, Gregory Y. Prigozhin, MIT Kavli Institute for Astrophysics and Space Research (United States); Christopher Leitz, MIT Lincoln Lab. (United States); Sven Herrmann, Steven W. Allen, Peter Orel, Tanmoy Chattopadhyay, Glenn R. Morris, Stanford Univ. (United States); Abraham Falcone, The Pennsylvania State Univ. (United States)

20 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 17B

12678-9

#### Status of testing and characterization of the Speedster-EXD550 x-ray hybrid CMOS detector

Author(s): Lukas R. Stone, Abraham Falcone, Joseph Colosimo, Timothy Emeigh, Mitchell Wages, Jacob C. Buffington, David N. Burrows, Zachary E. Catlin, Hannah M. Grzybowski, Frederic Hancock, Evan C. Jennerjahn, Jordan Josties, Ian Thornton, Ana Cristina Scigliani, Collin Reichard, The Pennsylvania State Univ. (United States)

20 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 17B

12678-11

#### Development of TES microcalorimeters for the HUBS Mission

Author(s): Wei Cui, Tsinghua Univ. (China)

20 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 17B

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

#### SESSION 4: SUB-ORBITAL AND CUBESAT INSTRUMENTS I

21 August 2023 • 8:30 AM - 10:10 AM | Conv. Ctr. Room 17B  
Session Chair: Keri Hoadley, The Univ. of Iowa (United States)

12678-12

#### **FIREBall-2 UV balloon telescope in-flight calibration system**

Author(s): Jessica S. Li, Nazende I. Kerkeser, Aafaque R. Khan, Simran Agarwal, Erika Hamden, The Univ. of Arizona (United States); David Schiminovich, Columbia Univ. (United States); Haeun Chung, The Univ. of Arizona (United States); Vincent Picouet, Columbia Univ. (United States); Drew Miles, Caltech (United States); Keri Hoadley, The Univ. of Iowa (United States); Ignacio Cevallos-Aleman, Columbia Univ. (United States); Harrison Bradley, Olivia Jones, The Univ. of Arizona (United States); D. Christopher Martin, Marty Crabill, Caltech (United States); Trenton Brendel, The Univ. of Arizona (United States); Shouleh Nikzad, Jet Propulsion Lab. (United States); Nicolas Bray, Johan Montel, Ctr. National d'Études Spatiales (France); Gillian Kyne, Jet Propulsion Lab. (United States); Zeren Lin, Caltech (United States); Philippe Balard, Patrick Blanchard, Lab. d'Astrophysique de Marseille (France); Charles-Antoine Chevrier, Alain Peus, Ctr. National d'Études Spatiales (France); Didier Vibert, Lab. d'Astrophysique de Marseille (France); Nicole Melso, The Univ. of Arizona (United States); David Valls-Gabaud, Observatoire de Paris (France)

21 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 17B

12678-13

#### **The SISTINE-3 sounding rocket payload: calibration and in-flight performance**

Author(s): Patrick Behr, Nicholas Nell, Univ. of Colorado Boulder (United States), Lab. for Atmospheric and Space Physics (United States); Nicholas E. Kruczek, Stefan Ulrich, Lab. for Atmospheric and Space Physics (United States); Kevin France, Univ. of Colorado Boulder (United States), Lab. for Atmospheric and Space Physics (United States); Brian Fleming, Lab. for Atmospheric and Space Physics (United States), Univ. of Colorado Boulder (United States)

21 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 17B

12678-14

#### **Status and mission operations of the SPRITE 12U CubeSat: a probe of star formation feedback from stellar to galactic scales with far-UV imaging spectroscopy**

Author(s): Briana Indahl, Brian Fleming, Dmitry Vorobiev, Dana Chafetz, Jack Williams, Maitland Bowen, Diane Brening, Stefan Ulrich, Michael J. Kaiser, Alex Sico, Ben Foehr, Abigail Durell, Daniel Szweczyk, Adriana Diaz, Sydney Koehler, Destry DeWitt, Sreejith Gopinathan, Kevin France, Lab. for Atmospheric and Space Physics (United States); John J. Hennessy, Jet Propulsion Lab. (United States); Manuel A. Quijada, NASA Goddard Space Flight Ctr. (United States); Luis V. Rodríguez-de Marcos, NASA Goddard Space Flight Ctr. (United States), The Catholic Univ. of America (United States); Javier G. Del Hoyo, NASA Goddard Space Flight Ctr. (United States); Oswald H. W. Siegmund, Sensor Sciences, LLC (United States); Adam Magruder, Nu-Tek Precision Optical Corp. (United States); Sanchayeeta Borthakur, Arizona State Univ. (United States); Anne Jaskot, Williams College (United States); Stephan R. McCandliss, Johns Hopkins Univ. (United States); John O'Meara, W. M. Keck Observatory (United States); Michael Rutkowski, Minnesota State Univ., Mankato (United States); Ravi Sankrit, Jason Tumlinson, Space Telescope Science Institute (United States)

21 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 17B

12678-15

#### **FLUID: a rocket-borne pathfinder instrument for high efficiency UV band selection imaging**

Author(s): Nicholas Nell, Nicholas E. Kruczek, Kevin France, Stefan Ulrich, Patrick Behr, Emily Farr, Lab. for Atmospheric and Space Physics (United States)

21 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 17B

12678-16

#### **INFUSE: preflight performance of a rocket-borne FUV integral field spectrograph**

Author(s): Emily M. Witt, Brian Fleming, James C. Green, Kevin France, Univ. of Colorado Boulder (United States); Oswald H. W. Siegmund, Sensor Sciences, LLC (United States); Takashi Sukegawa, Canon Inc. (Japan); Dana Chafetz, Jack Williams, Univ. of Colorado Boulder (United States); Matthias Tecza, Univ. of Oxford (United Kingdom); Alex Houghton, Univ. of Colorado Boulder (United States)

21 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 17B

#### **Coffee Break 10:10 AM - 10:40 AM**

#### SESSION 5: SPACEBORNE EXPERIMENTS AND MISSIONS II

21 August 2023 • 10:40 AM - 12:00 PM | Conv. Ctr. Room 17B

Session Chair: Kevin C. France,  
Univ. of Colorado Boulder (United States)

12678-17

#### **Characterizing the efficiency and optical requirements of optics on the first 12U NASA astrophysics CubeSat, SPRITE: Supernova Remnants and Proxies for Re-ionization Testbed Experiment**

Author(s): Daniel Szweczyk, Maitland Bowen, Briana Indahl, Dmitry Vorobiev, Abigail Durell, Lab. for Atmospheric and Space Physics (United States); Luis V. Rodríguez-de Marcos, NASA Goddard Space Flight Ctr. (United States); John J. Hennessy, Jet Propulsion Lab. (United States); Brian Fleming, Lab. for Atmospheric and Space Physics (United States)

21 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 17B

12678-18

#### **Characterization of the SPRITE telescope optics and performance**

Author(s): Maitland Bowen, Briana Indahl, Dmitry Vorobiev, Daniel Szweczyk, Kevin France, Lab. for Atmospheric and Space Physics (United States); John J. Hennessy, Jet Propulsion Lab. (United States); Luis V. Rodríguez-de Marcos, Manuel A. Quijada, NASA Goddard Space Flight Ctr. (United States); Brian Fleming, Lab. for Atmospheric and Space Physics (United States)

21 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 17B

12678-19

#### **Design of the Spectroscopic Ultraviolet Multi-object Observatory (SUMO) prototype for deployment on the NASA sounding rocket INFUSE**

Author(s): Grace Halferty, Dmitry Vorobiev, Brian Fleming, Dana Chafetz, Jack Williams, Lab. for Atmospheric and Space Physics (United States)

21 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 17B

# TECHNICAL CONFERENCES

## Conference 12678

12678-20

### **Payload design and development of Aspera: the UV SmallSat mission for mapping warm-hot phase gas in nearby galaxy halos**

Author(s): Haeun Chung, Carlos J. Vargas, Erika Hamden, Thomas McMahon, Hannah Tanquary, Peter Behroozi, Ewan S. Douglas, Miriam Keppler, Nicole Melso, Simran Agarwal, Aafaque R. Khan, Jessica S. Li, Sumedha Uppnor, Jacob Chambers, Giulia Ghidoli, Gabe G. Noriega, Ryan Pecha, Ellie M. Wolcott, Fernando Coronado, Steward Observatory (United States); Elijah Garcia, Daniel Truong, Naomi Yescas, The Univ. of Arizona (United States); Heejoo Choi, Wyant College of Optical Sciences (United States); Tom Connors, Steward Observatory (United States); Jason Corliss, Dave Hamara, Walter M. Harris, Karl Harshman, The Univ. of Arizona (United States); Daewook Kim, Wyant College of Optical Sciences (United States); Corwynn Sauve, Steward Observatory (United States); Bill Verts, The Univ. of Arizona (United States); Michael Ward, Dennis Zaritsky, Steward Observatory (United States); Carl Hergenrother, John Kidd, Sanford Selznick, Ascending Node Technologies, LLC (United States); Oswald H. W. Siegmund, Sensor Sciences, LLC (United States); Simon Grocott, Space Flight Lab. (Canada); David Schiminovich, Columbia Univ. (United States); Keri Hoadley, The Univ. of Iowa (United States)

21 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 17B

**Lunch Break 12:00 PM - 1:30 PM**

### **SESSION 6: SPACEBORNE EXPERIMENTS AND MISSIONS III**

21 August 2023 • 1:30 PM - 2:50 PM | Conv. Ctr. Room 17B  
Session Chair: Keri Hoadley, The Univ. of Iowa (United States)

12678-21

### **The Arcus probe mission**

Author(s): Randall K. Smith, Harvard-Smithsonian Ctr. for Astrophysics (United States)

21 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 17B

12678-22

### **Far-ultraviolet spectroscopy on the Arcus x-ray probe**

Author(s): Kevin France, Brian Fleming, Univ. of Colorado Boulder (United States); Laura Brenneman, Randall K. Smith, Smithsonian Astrophysical Observatory (United States); Joel Bregman, Univ. of Michigan (United States); Nancy Brickhouse, Smithsonian Astrophysical Observatory (United States); Hans Moritz Günther, MIT Kavli Institute for Astrophysics and Space Research (United States); Todd Tripp, University of Massachusetts (United States); Dolon Bhattacharyya, Timothy Hellickson, Nicholas Nell, Thomas Patton, Univ. of Colorado Boulder (United States); Katja Poppenhaeger, Leibniz-Institut für Astrophysik Potsdam (Germany); Pasquale Temi, NASA Ames Research Ctr. (United States)

21 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 17B

12678-23

### **The Arcus Ultraviolet Spectrograph (TAUS): technical design of the far-ultraviolet spectrograph on the Arcus x-ray probe**

Author(s): Brian Fleming, Kevin France, Tom Patton, Timothy Hellickson, Nicholas Nell, Lab. for Atmospheric and Space Physics (United States); Randall K. Smith, Smithsonian Astrophysical Observatory (United States)

21 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 17B

12678-24

### **The High Energy X-ray Probe (HEX-P)**

Author(s): Patrick Morrissey, Jet Propulsion Lab. (United States); Kristin K. Madsen, NASA Goddard Space Flight Ctr. (United States); Rashied Amini, Sharon Kedar, Marc Lane, Karen Lee, Miles Smith, Daniel Stern, Steven Zusack, Jet Propulsion Lab. (United States); Jonathan Arenberg, Northrop Grumman Corp. (United States); Alex Abramovici, Jet Propulsion Lab. (United States)

21 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 17B

**Coffee Break 2:50 PM - 3:20 PM**

### **SESSION 7: SOLID STATE SENSORS AND TECHNIQUES**

21 August 2023 • 3:20 PM - 4:40 PM | Conv. Ctr. Room 17B  
Session Chair: Oswald H. W. Siegmund, Space Sciences Lab. (United States)

12678-25

### **Characterization, quantum efficiency, and radiation hardness of a CMOS image sensor optimized for soft x-ray astronomy**

Author(s): Charles Townsend-Rose, Thomas Buggiey, James Ivory, Konstantin D. Stefanov, Ctr. for Electronic Imaging, The Open Univ. (United Kingdom); Lawrence Jones, Oliver Hetherington, Ctr. for Electronic Imaging (United Kingdom); Andrew D. Holland, Ctr. for Electronic Imaging, The Open Univ. (United Kingdom)

21 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 17B

12678-26

### **Development of large, fast, low noise x-ray CCD for future space missions**

Author(s): Gregory Y. Prigozhin, Beverly LaMarr, Eric D. Miller, Andrew Malonis, Richard Foster, Massachusetts Institute of Technology (United States); Kevan Donlon, Michael Cooper, Christopher Leitz, MIT Lincoln Lab. (United States); Marshall W. Bautz, Massachusetts Institute of Technology (United States)

21 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 17B

12678-27

### **Ultraviolet CMOS sensors with integrated filter coatings for the UVEX mission**

Author(s): John J. Hennessy, Robin E. Rodríguez, April D. Jewell, Michael E. Hoenk, Shouleh Nikzad, Jet Propulsion Lab. (United States); Brian W. Grefenstette, Timothee Greffe, Roger M. Smith, Hannah P. Earnshaw, Fiona A. Harrison, Caltech (United States)

21 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 17B

12678-28

### **Advanced detector coatings for UV spectroscopy applications**

Author(s): April D. Jewell, John J. Hennessy, Robin E. Rodríguez, Jet Propulsion Lab. (United States); Erika Hamden, Aafaque R. Khan, The Univ. of Arizona (United States)

21 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 17B

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12678-42

#### Polarization effects in 22-ring tapered hollow-core optical fibers for far-UV instrumentation

Author(s): Thomas Livingston, Dmitry Vorobiev, Brian Fleming, Emily Farr, Lab. for Atmospheric and Space Physics (United States); Bartłomiej Winter, Kerriane Harrington, Tim A. Birks, William J. Wadsworth, Univ. of Bath (United Kingdom)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-43

#### Designing and characterizing UV gratings for exoplanet habitability studies

Author(s): Jared A. Termini, Keri Hoadley, Casey DeRoo, Cecilia R. Fasano, The Univ. of Iowa (United States); Erika Hamden, Jessica S. Li, The Univ. of Arizona (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-44

#### Development and fabrication of a custom vacuum bakeout system for the Far-UV CubeSat SPRITE

Author(s): Sydney Koehler, Briana Indahl, Daniel Szewczyk, Dmitry Vorobiev, Brian Fleming, Lab. for Atmospheric and Space Physics (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-45

#### Advances in gas pixel detectors for x-ray polarimetry: development of the bake and fill system (BFS)

Author(s): Leonardo Lucchesi, Massimo Minuti, Istituto Nazionale di Fisica Nucleare (Italy); Alessio Nuti, INAF (Italy); Leonardo Orsini, Michele Pinchera, Carmelo Sgrò, Istituto Nazionale di Fisica Nucleare (Italy)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-46

#### Background simulations for the High Energy X-ray Probe (HEX-P)

Author(s): Kristin K. Madsen, Henrike Fleischhack, NASA Goddard Space Flight Ctr. (United States); Andreas Zoglauer, Space Sciences Lab. (United States); Brian W. Grefenstette, Caltech (United States); Patrick Morrissey, Daniel Stern, Jet Propulsion Lab. (United States); Jonathan Arenberg, Benjamin Donovan, Northrop Grumman Corp. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-47

#### ALD-GCA-MCPs: Lifetime Performance

Author(s): Cole Hamel, Stefan Cwik, Melvin Aviles, Stephen Clarke, Michael Foley, Alexey Lyashenko, Mark Popecki, Derrick Mensah, Michael Stochaj, Michael Minot, Incom, Inc. (United States); Vincenzo Vagnoni, Istituto Nazionale di Fisica Nucleare (Italy); Jeffrey Elam, Argonne National Laboratory (United States); Anil Mane, Argonne National Laboratory (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-48

#### Ray-tracing Arcus for performance and alignment tolerances

Author(s): Hans Moritz Günther, MIT Kavli Institute for Astrophysics and Space Research (United States); Casey DeRoo, The Univ. of Iowa (United States); Randall K. Smith, Smithsonian Astrophysical Observatory (United States); Eric D. Miller, MIT Kavli Institute for Astrophysics and Space Research (United States); Andrew Ptak, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-49

#### The advanced x-ray imaging satellite (AXIS): an overview

Author(s): Christopher Reynolds, Univ. of Maryland, College Park (United States); Erin Kara, Massachusetts Institute of Technology (United States); Richard F. Mushotzky, Univ. of Maryland, College Park (United States); Andrew Ptak, NASA Goddard Space Flight Ctr. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-50

#### The Advanced X-ray Imaging Satellite (AXIS): operations simulation

Author(s): Eileen T. Meyer, Univ. of Maryland, Baltimore County (United States); Andrew Ptak, NASA Goddard Space Flight Ctr. (United States); Shreyansh Kumar, Olivia Chiarini, Univ. of Maryland, Baltimore County (United States); Christopher Reynolds, Univ. of Maryland, College Park (United States); Erin Kara, Massachusetts Institute of Technology (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-51

#### Fabrication and testing of high fill-factor solar panels for SPRITE CubeSat

Author(s): Adriana Diaz, Dmitry Vorobiev, Briana Indahl, Dana Chafetz, Jack Williams, Brian Fleming, Lab. for Atmospheric and Space Physics (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-52

#### The extendible boom and laser metrology design for the High Energy X-Ray Probe (HEX-P)

Author(s): Kristin K. Madsen, NASA Goddard Space Flight Ctr. (United States); Sharon Kedar, Jet Propulsion Lab. (United States), Caltech (United States); Patrick Morrissey, Miles Smith, Daniel Stern, Jet Propulsion Lab. (United States); Mike McEachen, Northrop Grumman Corp. (United States); Marc Lane, Alex Abramovici, Jet Propulsion Lab. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12678

12678-53

### The arcus operations simulator: a general tool for observation planning

Author(s): Adam R. Foster, Harvard-Smithsonian Ctr. for Astrophysics (United States); Stephen M. Walker, NASA Ames Research Ctr. (United States); Randall K. Smith, Harvard-Smithsonian Ctr. for Astrophysics (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-54

### A monte carlo based ray tracing tool for evaluating Wolter-type prescriptions

Author(s): Aidan Puno, Patrick Champey, NASA Marshall Space Flight Ctr. (United States); Singam Panini, Oak Ridge Associated Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12678-55

### Testing and development of hydrogen absorption cell technology

Author(s): Isu Ravi, Johns Hopkins Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 8: OPTICAL COMPONENTS FOR UV AND X-RAY INSTRUMENTS

22 August 2023 • 8:20 AM - 10:00 AM | Conv. Ctr. Room 17B

Session Chair: Stephan R. McCandliss, Johns Hopkins Univ. (United States)

12678-29

### Aberration corrected ultraviolet Echelle spectrographs: straw man designs and performance

Author(s): James C. Green, Univ. of Colorado Boulder (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 17B

12678-30

### Informing the fabrication of ultraviolet reflection gratings with interferometric measurements

Author(s): Cecilia R. Fasano, Casey DeRoo, Keri Hoadley, Jared A. Termini, The Univ. of Iowa (United States); Fabien Gris , The Pennsylvania State Univ. (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 17B

12678-31

### Lyman-ultraviolet imaging filter development on the FLUID rocket payload

Author(s): Emily Farr, Kevin France, Nicholas E. Kruczek, Nicholas Nell, Patrick Behr, Stefan Ulrich, Univ. of Colorado Boulder (United States); Juan Larruquert, Carlos Honrado, Paloma Reyes, Consejo Superior de Investigaciones Cientificas (Spain)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 17B

12678-32

### Transmission and bend loss in far ultraviolet hollow-core fibers for compact fiber-fed, multi-object spectrographs and reflectometers

Author(s): Destry DeWitt, Dmitry Vorobiev, Brian Fleming, Emily Farr, Lab. for Atmospheric and Space Physics (United States); Tim A. Birks, Bartlomiej Winter, Kerriane Harrington, William J. Wadsworth, Univ. of Bath (United Kingdom)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 17B

12678-33

### An enhanced contrast evaluation testbed for next-generation microshutter arrays

Author(s): Owen H. Mitchell, Stephan R. McCandliss, Russell Pelton, Johns Hopkins Univ. (United States); Alexander S. Kutyrev, Matthew Greenhouse, Meng-Ping Chang, Kyowon Kim, Carl A. Kotecki, Paul Scowen, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 17B

Coffee Break 10:00 AM - 10:30 AM

### SESSION 9: MICROCHANNEL PLATE DETECTORS

22 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 17B

Session Chair: Stephan R. McCandliss, Johns Hopkins Univ. (United States)

12678-34

### Improved characterization of pulse height changes in the far ultraviolet detector of the Cosmic Origins Explorer (COS)

Author(s): David J. Sahnou, Christian Johnson, Space Telescope Science Institute (United States)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 17B

12678-35

### Post-delivery calibration of the JUICE ultraviolet spectrograph (JUICE-UVS)

Author(s): Michael W. Davis, Maarten H. Versteeg, G. R. Gladstone, Sue Ferrell, Philippa M. Molyneux, Steven C. Persyn, Kurt D. Retherford, Southwest Research Institute (United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 17B

12678-36

### Cross strip readout imaging detectors with atomic layer deposited microchannel plates

Author(s): Oswald H. W. Siegmund, Jason McPhate, Travis Curtis, John V. Vallerga, Anton Tremsin, Space Sciences Lab. (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 17B

12678-37

### Production of microchannel plates using nano-scale additive manufacturing

Author(s): Camden D. Ertley, Southwest Research Institute (United States); Ashley Bielinski, Jeffrey Elam, Anil Mane, Alex Martinson, Argonne National Lab. (United States); Kevin Mello, Southwest Research Institute (United States); Prabhjot M. Menon, Argonne National Lab. (United States); Jerome Moore, Robot Nose Corp. (United States); Michael Pellin, Robert Wagner, Argonne National Lab. (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 17B

Lunch/Exhibition Break 11:50 AM - 1:20 PM



### SESSION 10: SUB-ORBITAL AND CUBESAT INSTRUMENTS II

22 August 2023 • 1:20 PM - 2:40 PM | Conv. Ctr. Room 17B  
Session Chair: Brian T. Fleming, Lab. for Atmospheric and Space  
Physics (United States)

12678-38

#### Current status of the BlackCAT CubeSat

Author(s): Joseph M. Colosimo, Abraham D. Falcone, Mitchell  
Wages, Michael Betts, Jacob C. Buffington, David N. Burrows,  
Zachary E. Catlin, Timothy Emeigh, Derek B. Fox, Hannah M.  
Grzybowski, Frederic Hancock, Evan C. Jennerjahn, Jordan Josties,  
The Pennsylvania State Univ. (United States); David M. Palmer, Los  
Alamos National Lab. (United States); Lukas R. Stone, Ian Thornton,  
Daniel Washington, Michael E. Zugger, The Pennsylvania State Univ.  
(United States)

22 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 17B

12678-39

#### The mini astrophysical MeV background observatory (MAMBO) CubeSat mission for gamma-ray astronomy

Author(s): Peter F. Bloser, W. Thomas Vestrand, Markus Hehlen, Kim  
Katko, Lucas Parker, Darrel Beckman, James Sedillo, Justin McGlown,  
John Michel, Rory Scobie, Tony Nelson, Dan Poulson, Tyler Roth,  
Christopher Fryer, Aimee Hungerford, Matthew Mumpower, Melissa  
Rasmussen, Los Alamos National Lab. (United States); Samalka  
Anandagoda, Dieter Hartmann, Marco Ajello, Clemson Univ. (United  
States)

22 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 17B

12678-40

#### Status of the rocket experiment demonstration of a soft x-ray polarimeter (REDSOx)

Author(s): Herman L. Marshall, Sarah Heine, Alan Garner, Rebecca  
Masterson, Ralf Heilmann, MIT Kavli Institute for Astrophysics and  
Space Research (United States)

22 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 17B

12678-41

#### An overview of MaGIXS-2: the second flight of the Marshall Grazing Incidence X-ray Spectrometer

Author(s): Patrick R. Champey, Amy Winebarger, Sabrina Savage,  
Ken Kobayashi, NASA Marshall Space Flight Ctr. (United States); P.  
S. Athiray, The Univ. of Alabama in Huntsville (United States); Adam  
Kobelski, Genevieve Vigil, Brent Beabout, Dyana Beabout, NASA  
Marshall Space Flight Ctr. (United States); Edward Hertz, Peter  
Cheimets, Leon Golub, Smithsonian Astrophysical Observatory  
(United States); Jagan Ranganathan, NASA Marshall Space Flight  
Ctr. (United States); Bruce Weddendorf, Weddendorf Design, Inc.  
(United States)

22 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 17B

Coffee/Exhibition Break 2:40 PM - 3:30 PM

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A  
Session Chairs: Tony Hull, The Univ. of New Mexico (United States)  
and Daewook Kim, Wyant College of Optical Sciences  
(United States)

#### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

#### Optic technologies enabling fusion ignition at the National Ignition Facility (Plenary Presentation)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab.  
(United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

#### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (Plenary Presentation)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

#### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (Plenary Presentation)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

## WEDNESDAY 23 AUGUST 2023

### ASTRONOMICAL OPTICS AND INSTRUMENTATION PLENARY

23 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6A

Session Chair: Daewook Kim,  
Wyant College of Optical Sciences (United States)

#### Welcome and Opening Remarks

23 August 2023 • 9:15 AM - 9:20 AM | Conv. Ctr. Room 6A

12677-502

#### Lessons from the development and servicing of HST for future astronomy missions (Plenary Presentation)

Author(s): John W. MacKenty, Space Telescope Science Institute  
(United States)

23 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12679

# Optics for EUV, X-Ray, and Gamma-Ray Astronomy XI

22 - 24 August 2023 | Conv. Ctr. Room 17A (Tues-Wed); Room 11B (Thu)

Conference Chairs: **Stephen L. O'Dell**, NASA Marshall Space Flight Ctr. (United States); **Jessica A. Gaskin**, NASA Marshall Space Flight Ctr. (United States); **Giovanni Pareschi**, INAF - Osservatorio Astronomico di Brera (Italy)

Conference Co-Chair: **Daniele Spiga**, INAF - Osservatorio Astronomico di Brera (Italy)

Program Committee: **Hisamitsu Awaki**, Ehime Univ. (Japan); **Nicolas M. Barrière**, cosine measurement systems (Netherlands); **Wayne H. Baumgartner**, NASA Marshall Space Flight Ctr. (United States); **Marcos Bavdaz**, European Space Agency (Netherlands); **Vadim Burwitz**, Max-Planck-Institut für extraterrestrische Physik (Germany); **Marta M. Civitani**, INAF - Osservatorio Astronomico di Brera (Italy); **Desiree Della Monica Ferreira**, DTU Space (Denmark); **Casey T. DeRoo**, The Univ. of Iowa (United States); **Charlotte Feldman**, Univ. of Leicester (United Kingdom); **Ivo Ferreira**, European Space Agency (Netherlands); **Peter Friedrich**, Max-Planck-Institut für extraterrestrische Physik (Germany); **René Hudec**, Czech Technical Univ. in Prague (Czech Republic); **Alexander A. Lutovinov**, Space Research Institute of the RAS (Russian Federation); **Kristin Madsen**, NASA Goddard Space Flight Ctr. (United States); **Hironori Matsumoto**, Osaka Univ. (Japan); **Randall L. McEntaffer**, The Pennsylvania State Univ. (United States); **Noriyuki Narukage**, National Astronomical Observatory of Japan (Japan); **Andrew F. Ptak**, NASA Goddard Space Flight Ctr. (United States); **Suzanne E. Romaine**, Harvard-Smithsonian Ctr. for Astrophysics (United States); **Mark L. Schattenburg**, MIT Kavli Institute for Astrophysics and Space Research (United States); **Zhanshan Wang**, Tongji Univ. (China); **David L. Windt**, Reflective X-Ray Optics LLC (United States); **Roberta Zanin**, Cherenkov Telescope Array Observatory gGmbH (Italy); **William W. Zhang**, NASA Goddard Space Flight Ctr. (United States)

## TUESDAY 22 AUGUST 2023

### SESSION 1: NEWATHENA

22 August 2023 • 1:30 PM - 3:10 PM | Conv. Ctr. Room 17A  
Session Chairs: Mark L. Schattenburg, MIT Kavli Institute for Astrophysics and Space Research (United States), Desiree Della Monica Ferreira, DTU Space (Denmark)

12679-1

#### NewATHENA optics technology (*Invited Paper*)

Author(s): Marcos Bavdaz, Eric Wille, Mark Ayre, Ivo Ferreira, Brian Shortt, Sebastiaan Franssen, European Space Agency (Netherlands); Maximilien J. Collon, Giuseppe Vacanti, Nicolas Barrière, Boris Landgraf, David Girou, cosine measurement systems (Netherlands); Mark Olde Riekerink, Jeroen Haneveld, Ronald Start, Bart Schurink, Micronit B.V. (Netherlands); Coen van Baren, SRON Netherlands Institute for Space Research (Netherlands); Desiree Della Monica Ferreira, Sonny Massahi, Sara Svendsen, Finn Erland Christensen, DTU Space (Denmark); Michael Krumrey, Dieter Skroblin, Physikalisch-Technische Bundesanstalt (Germany); Vadim Burwitz, Max-Planck-Institut für extraterrestrische Physik (Germany); Giovanni Pareschi, Bianca Salmaso, Alberto Moretti, Daniele Spiga, Stefano Basso, INAF - Osservatorio Astronomico di Brera (Italy); Giuseppe Valsecchi, Dervis Vernani, Media Lario S.r.l. (Italy); Paul Lupton, William Mundon, Ethan Dunnell, Teledyne e2v UK Ltd. (United Kingdom); Mirko Riede, Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS (Germany); Tapio Korhonen, Mikko Pasanen, Opteon Oy (Finland); Alejandro Sanchez, Dominique Heinis, Carles Colldelram, ALBA Synchrotron (Spain); Massimiliano Tordi, EIE S.r.l. (Italy); Norman Niewrzella, ZEISS SMO GmbH (Germany); Richard Willingale, Univ. of Leicester (United Kingdom)

22 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 17A

12679-2

#### High-resolution and light-weight silicon pore x-ray optics

Author(s): Boris Landgraf, Maximilien J. Collon, Luis Abalo, Nicolas M. Barrière, Alex Bayerle, Donny de Borst, Luigi Castiglione, Loes Crama, Abdelhakim Chatbi, Noë Eenkhoorn, David A. Girou, Ramses Günther, Enrico Hauser, Roy van der Hoeven, Jasper den Hollander, Yvette Jenkins, Adam Lassise, Laurens Keek, Christian Körnig, Sebastian Obwaller, Ben Okma, Paulo da Silva Ribeiro, Chris Rizos, Aniket Thete, Giuseppe Vacanti, Sjoerd Verhoeckx, Mark Vervest, Roel Visser, Luc Voruz, cosine measurement systems (Netherlands); Marcos Bavdaz, Ivo Ferreira, Eric Wille, European Space Agency (Netherlands); Jeroen Haneveld, Arenda Koelewijn, Jan-Joost Lankwarden, Mark Olde Riekerink, Bart Schurink, Ronald Start, Maurice Wijnperlé, Micronit B.V. (Netherlands); Coen van Baren, SRON Netherlands Institute for Space Research (Netherlands); Levent Cibik, Michael Krumrey, Physikalisch-Technische Bundesanstalt (Germany); Vadim Burwitz, Max-Planck-Institut für extraterrestrische Physik (Germany); Finn Erland Christensen, CHEXS ApS (Denmark), DTU Space (Denmark); Desiree Della Monica Ferreira, Sonny Massahi, DTU Space (Denmark), CHEXS ApS (Denmark); Sara Svendsen, DTU Space (Denmark); Ethan Dunnell, Paul Lupton, William Mundon, Andrew Rees, Teledyne e2v UK Ltd. (United Kingdom); Dieter Skroblin, Physikalisch-Technische Bundesanstalt (Germany); Diego Paredes Sanz, DTU Space (Denmark); Mathijs Bosman, Micronit B.V. (Netherlands)

22 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 17A

12679-3

#### Analytical treatment of the stray-light in the ATHENA x-ray telescope: numerical validation

Author(s): Daniele Spiga, Giorgia Sironi, Alberto Moretti, INAF - Osservatorio Astronomico di Brera (Italy); Desiree Della Monica Ferreira, Arne S. Jegers, DTU Space (Denmark); Erik Bergback Knudsen, DTU Physik (Denmark); Marcos Bavdaz, Ivo Ferreira, European Space Agency (Netherlands)

22 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 17A

12679-4

### Silicon pore optics: a mature and adaptable x-ray mirror technology

Author(s): David A. Girou, Laurens Keek, Luis Abalo, Nicolas M. Barrière, Maximilien J. Collon, Boris Landgraf, Giuseppe Vacanti, cosine measurement systems (Netherlands)

22 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 17A

Coffee Break 3:10 PM - 3:30 PM

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States)  
and Daewook Kim, Wyant College of Optical Sciences  
(United States)

### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

### Optic technologies enabling fusion ignition at the National Ignition Facility (*Plenary Presentation*)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (*Plenary Presentation*)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (*Plenary Presentation*)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

## WEDNESDAY 23 AUGUST 2023

### ASTRONOMICAL OPTICS AND INSTRUMENTATION PLENARY

23 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6A

Session Chair: Daewook Kim,  
Wyant College of Optical Sciences (United States)

### Welcome and Opening Remarks

23 August 2023 • 9:15 AM - 9:20 AM | Conv. Ctr. Room 6A

12677-502

### Lessons from the development and servicing of HST for future astronomy missions (*Plenary Presentation*)

Author(s): John W. MacKenty, Space Telescope Science Institute (United States)

23 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

Coffee Break 10:00 AM - 10:30 AM

### SESSION 2: MONOLITHIC AND ADJUSTABLE OPTICS

23 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 17A

Session Chairs: Vadim Burwitz, Max-Planck-Institut für  
extraterrestrische Physik (Germany), Kristin K. Madsen, NASA  
Goddard Space Flight Ctr. (United States)

12679-5

### Moving toward a fast, deterministic, and reliable process for high resolution thin monolithic shells

Author(s): Marta M. Civitani, Gabriele Vecchi, Mauro Ghigo, Stefano Basso, Vincenzo Cotroneo, Mauro Fiorini, Salvatore Incorvaia, Luigi Lessio, Giovanni Pareschi, Daniele Spiga, Giorgio Toso, INAF - Osservatorio Astronomico di Brera (Italy)

23 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 17A

12679-6

### Facing the manufacturing challenge for modern x-ray missions

Author(s): Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

23 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 17A

12679-7

### The focusing mirrors of the MUSE extreme-ultraviolet solar telescope

Author(s): Daniele Spiga, Stefano Basso, Vincenzo Cotroneo, Mauro Ghigo, Gabriele Vecchi, Giovanni Pareschi, INAF - Osservatorio Astronomico di Brera (Italy); Davide Sisana, INAF - Osservatorio Astronomico di Brera (Italy), Politecnico di Milano (Italy); Bart W. De Pontieu, Paul Boerner, Gary D. Kushner, Mark T. Sullivan, Lockheed Martin Solar and Astrophysics Lab. (United States); Edward Hertz, Peter Cheimets, Elias Aguirre Contreras, Harvard-Smithsonian Ctr. for Astrophysics (United States); Marco Stangalini, Denise Perrone, Agenzia Spaziale Italiana (Italy); Fabio Reale, Univ. degli Studi di Palermo (Italy)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 17A

12679-8

### Fabrication and characterization of electroactive polymer actuators for high-resolution adjustable x-ray optics

Author(s): Banafsheh Beheshtipour, Manel Errando, Washington Univ. in St. Louis (United States); Casey T. DeRoo, Kenneth Buffo, The Univ. of Iowa (United States)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 17A

12679-9

### Further progress toward enabling a deployable shape memory alloy normal incidence space telescope for the extreme ultraviolet

Author(s): Melville P. Ulmer, Daniel Quispe, Northwestern Univ. (United States); Len Seals, NASA-GSFC (United States); Stephen Stagon, Univ. of North Florida (United States); Donald B. Buchholz, Jian Cao, Yip-Wah Chung, Northwestern Univ. (United States); Raj Vaidyanathan, Univ. of Central Florida (United States)

23 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 17A

Lunch/Exhibition Break 12:10 PM - 2:00 PM

# TECHNICAL CONFERENCES

## Conference 12679

### SESSION 3: REPLICATED OPTICS

23 August 2023 • 2:00 PM - 3:20 PM | Conv. Ctr. Room 17A

Session Chairs: Nicolas M. Barrière, cosine measurement systems (Netherlands), Daniele Spiga, INAF - Osservatorio Astronomico di Brera (Italy)

12679-10

#### Optimizing the electroforming process to enhance the thickness uniformity of full shell x-ray optics

Author(s): Srikanth Panini Singam, Oak Ridge Associated Univs. (United States), NASA Marshall Space Flight Ctr. (United States); Chet Speegle, Amy Meekham, NASA Marshall Space Flight Ctr. (United States); Grant Davis, The Univ. of Alabama in Huntsville (United States); Jeffery J. Kolodziejczak, Wayne Baumgartner, David Banks, Jessica A. Gaskin, Stephen D. Bongiorno, Brian D. Ramsey, NASA Marshall Space Flight Ctr. (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 17A

12679-11

#### High resolution full shell replicated x-ray optics for FOXSI-4

Author(s): Wayne H. Baumgartner, Stephen D. Bongiorno, Jeffery J. Kolodziejczak, Srikanth Singam, Danielle N. Gurgew, Chet Speegle, David Banks, Patrick Champey, Nicholas E. Thomas, NASA Marshall Space Flight Ctr. (United States); C. Grant Davis, The Univ. of Alabama in Huntsville (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 17A

12679-12

#### Assembly of the FOXSI-4 mirror modules

Author(s): Stephen D. Bongiorno, Wayne H. Baumgartner, Jeffery J. Kolodziejczak, NASA Marshall Space Flight Ctr. (United States)

23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 17A

12679-13

#### Development of replicated Wolter x-ray optics for SmallSats

Author(s): Suzanne Romaine, Ricardo Bruni, Jae Sub Hong, Harvard-Smithsonian Ctr. for Astrophysics (United States)

23 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 17A

Coffee Break 3:20 PM - 3:50 PM

### SESSION 4: SEGMENTED OPTICS

23 August 2023 • 3:50 PM - 5:10 PM | Conv. Ctr. Room 17A

Session Chairs: Charlotte Feldman, Univ. of Leicester (United Kingdom), Suzanne Romaine, Harvard-Smithsonian Ctr. for Astrophysics (United States)

12679-14

#### Silicon x-Ray mirror technology for astronomy: high resolution, light weight, and low cost

Author(s): William W. Zhang, NASA Goddard Space Flight Ctr. (United States)

23 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 17A

12679-16

#### Fabrication of high-resolution, lightweight silicon mirror segments

Author(s): Raul E. Riveros, NASA Goddard Space Flight Ctr. (United States), Univ. of Maryland, Baltimore County (United States); Michael P. Biskach, NASA Goddard Space Flight Ctr. (United States); Kim D. Allgood, John D. Kearney, Michal Hlinka, Tabatha A. DeVita, Ai Numata, Peter M. Solly, KBR, Inc. (United States); William W. Zhang, NASA Goddard Space Flight Ctr. (United States)

23 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 17A

12679-17

#### Development of thin glass mirrors via cold shaping replication for future x-ray telescopes

Author(s): Stefano Basso, Marta M. Civitani, Giovanni Pareschi, INAF - Osservatorio Astronomico di Brera (Italy); Vadim Burwitz, Max-Planck-Institut für extraterrestrische Physik (Germany); Vincenzo Cotroneo, INAF - Osservatorio Astronomico di Brera (Italy); Thomas Schmidt, Thomas Müller, Gisela D. Hartner, Surangkha Rukdee, Andreas Langmeier, Max-Planck-Institut für extraterrestrische Physik (Germany)

23 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 17A

12679-18

#### KB silicon pore optics for arc-second angular resolution hard x-ray telescope

Author(s): Nicolas M. Barrière, Maximilien J. Collon, David A. Girou, Laurens Keek, Boris Landgraf, Giuseppe Vacanti, Mark Vervest, Marco W. Beijersbergen, cosine measurement systems (Netherlands)

23 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 17A

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12679-29

#### EUV and SXR multilayer coatings in solar physics: from the current aspects to the future perspectives

Author(s): Alain Jody Corso, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Maria Guglielmina Pelizzo, Univ. degli Studi di Padova (Italy); Daniele Spiga, INAF - Osservatorio Astronomico di Brera (Italy)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-40

#### Characterization of carbon thin films as an overcoating candidate material for the optics of NewATHENA

Author(s): Diego Paredes Sanz, Sara Svendsen, Sonny Massahi, Desiree Della Monica Ferreira, Nis Christian Gellert, DTU Space (Denmark); Arne S. Jegers, Technical Univ. of Denmark (Denmark); Peter Lindquist Henriksen, CERN (Switzerland); Boris Landgraf, Aniket Thete, cosine measurement systems (Netherlands); Ivo Ferreira, Marcos Bavdaz, European Space Research and Technology Ctr. (Netherlands); Maximilien J. Collon, cosine measurement systems (Netherlands); Michael Krumbrey, Dieter Skroblin, Physikalisch-Technische Bundesanstalt (Germany); Finn Erland Christensen, DTU Space (Denmark)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-41

### **Silicon carbide grids for x-ray telescopes**

Author(s): Bruce Lairson, PhotonFoil (United States); James Tutt, The Pennsylvania State Univ. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-42

### **Metrology of an adjustable x-ray optic segment**

Author(s): Kenneth Buffo, Casey T. DeRoo, The Univ. of Iowa (United States); Paul Reid, Vladimir Kradinov, Vanessa Marquez, Harvard-Smithsonian Ctr. for Astrophysics (United States); Susan Trolrier-McKinstry, Nathan Bishop, Materials Research Institute, The Pennsylvania State Univ. (United States); Thomas N. Jackson, Quyen Tran, Hanyuan Liang, Mohit Tendulkar, Tianning Liu, Ctr. for Thin Film Devices, The Pennsylvania State Univ. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-43

### **X-ray space technology transfer for improved mammography screening**

Author(s): Francesco Nardo, Irfan Kuvvetli, Desiree Della Monica Ferreira, Sonny Massahi, Finn Erland Christensen, Technical Univ. of Denmark (Denmark)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-44

### **Capabilities of a lobster eye telescope in the outer solar system**

Author(s): Charlotte Feldman, Univ. of Leicester (United Kingdom); William Dunn, Univ. College London (United Kingdom); Simon Lindsay, Adrian Martindale, Univ. of Leicester (United Kingdom)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-45

### **Characterization of the x-ray beam at PANTER**

Author(s): Gisela Hartner, Vadim Burwitz, Thomas Müller, Surangkhan Rukdee, Thomas Schmidt, Andreas Langmeier, Konrad Dennerl, Norbert Meidinger, Max-Planck-Institut für extraterrestrische Physik (Germany)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-46

### **Assembly and alignment of thin mirrors using ultrafast laser generated strain**

Author(s): Brody D. McElwain, Tyler M. Wilson, Ian J. Arnold, Brandon D. Chalifoux, The Univ. of Arizona (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-47

### **Alignment, focusing, and metrology of the optical system for the Advanced X-ray Imaging Satellite (AXIS)**

Author(s): Christopher Reynolds, Univ. of Maryland, College Park (United States); Erin Kara, Massachusetts Institute of Technology (United States); Richard F. Mushotzky, Univ. of Maryland, College Park (United States); Andrew Ptak, NASA Goddard Space Flight Ctr. (United States); Jonathan W. Arenberg, Northrop Grumman Corp. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-48

### **Characterization of the x-ray telescope after the first flight of XL-Calibur**

Author(s): Haruki Kuramoto, Hironori Matsumoto, Osaka Univ. (Japan); Hisamitsu Awaki, Ehime Univ. (Japan); Richard Bose, Dana Braun, Sohee Chun, Washington Univ. in St. Louis (United States); Gianluigi De Geronimo, Stony Brook Univ. (United States), DG Circuits (United States); Eric A. Wulf, U.S. Naval Research Lab. (United States); Manel Errando, Washington Univ. in St. Louis (United States); Yasushi Fukazawa, Hiroshima Univ. (Japan); Akihiro Furuzawa, Fujita Health Univ. (Japan); Thomas Gadson, NASA Wallops Flight Facility (United States); Ephraim Gau, Washington Univ. in St. Louis (United States); Victor Guarino, Guarino Engineering (United States); Shuichi Gunji, Yamagata Univ. (Japan); Keon Harmon, Scott Heatwole, NASA Wallops Flight Facility (United States); Arman Hossen, Washington Univ. in St. Louis (United States); Kazunori Ishibashi, Nagoya Univ. (Japan); Manabu Ishida, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency (Japan); Wataru Kamogawa, Osaka Univ. (Japan); Nirmal Kumar Iyer, KTH Royal Institute of Technology (Sweden), The Oskar Klein Ctr. for Cosmoparticle Physics (Sweden); Fabian Kislak, The Univ. of New Hampshire (United States); Mózsi Kiss, KTH Royal Institute of Technology (Sweden), The Oskar Klein Ctr. for Cosmoparticle Physics (Sweden); Henric Krawczynski, McDonnell Ctr. for the Space Sciences, Washington Univ. in St. Louis (United States); James Lanzi, NASA Wallops Flight Facility (United States); Lindsey Lisalda, Washington Univ. in St. Louis (United States); Yoshitomo Maeda, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency (Japan); Asuka Miyamoto, Tokyo Metropolitan Univ. (Japan); Takuya Miyazawa, Okinawa Institute of Science and Technology Graduate Univ. (Japan); Takashi Okajima, NASA Goddard Space Flight Ctr. (United States); Mark Pearce, KTH Royal Institute of Technology (Sweden); Zachary Peterson, NASA Wallops Flight Facility (United States); Brian Rauch, Nicole Rodriguez Cavero, Washington Univ. in St. Louis (United States); Felix Ryde, KTH Royal Institute of Technology (Sweden); Garry Simburger, Washington Univ. in St. Louis (United States); Sean Spooner, The Univ. of New Hampshire (United States); Theodor-Adrian Stana, KTH Royal Institute of Technology (Sweden); David Stuchlik, NASA Wallops Flight Facility (United States); Hiromitsu Takahashi, Hiroshima Univ. (Japan); Mai Takeo, Tokyo Metropolitan Univ. (Japan); Toru Tamagawa, RIKEN (Japan); Yuusuke Uchida, Tokyo Univ. of Science (Japan); Andrew West, Washington Univ. in St. Louis (United States); Kassi Klepper, KTH Royal Institute of Technology (Sweden), The Oskar Klein Ctr. for Cosmoparticle Physics (Sweden)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-49

### **The encircled energy function of the IXPE determined from data of the crab pulsar**

Author(s): Masaki Kamikobayashi, Shuichi Gunji, Yamagata Univ. (Japan); Luca Baldini, Istituto Nazionale di Fisica Nucleare (Italy), Univ. di Pisa (Italy); Brian D. Ramsey, NASA Marshall Space Flight Ctr. (United States); Eri Watanabe, Masanobu Terashima, Yuuma Kan, Manato Mori, Yamagata Univ. (Japan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12679-50

### **Achieving large-scale, high-resolution, full-shell replicated x-ray optics: budgeting for sources of angular-resolution errors**

Author(s): Jessica A. Gaskin, Jeffery J. Kolodziejczak, NASA Marshall Space Flight Ctr. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12679

12679-51

### Mirror design for the High-Energy X-ray Probe (HEX-P)

Author(s): Kristin K. Madsen, Takashi Okajima, Keisuke Tamura, William W. Zhang, James Corsetti, Scott Rohrback, NASA Goddard Space Flight Ctr. (United States); Sonny Massahi, Nis Christian Gellert, Desiree Della Monica Ferreira, Finn Erland Christensen, DTU Space (Denmark); Danielle N. Gurgew, NASA Marshall Space Flight Ctr. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

### SESSION 5: GRATINGS AND DIFFRACTIVE OPTICS

24 August 2023 • 8:30 AM - 9:50 AM | Conv. Ctr. Room 11B

Session Chairs: Marcos Bavdaz, European Space Agency (Netherlands), Jessica A. Gaskin, NASA Marshall Space Flight Ctr. (United States)

12679-19

### Laue lens made of SiLCs for hard x-ray polarimetry

Author(s): Nicolas M. Barrière, Luis Abalo, Maximilien J. Collon, David A. Girou, Ramses Günther, Boris Landgraf, cosine measurement systems (Netherlands); John Tomsick, Space Sciences Lab., Univ. of California, Berkeley (United States); Giuseppe Vacanti, Marco W. Beijersbergen, cosine measurement systems (Netherlands)

24 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 11B

12679-20

### Fabrication of gratings on curved substrates using electron-beam lithography

Author(s): Fabien Grisé, The Pennsylvania State Univ. (United States); Casey T. DeRoo, The Univ. of Iowa (United States); Jake McCoy, The Pennsylvania State Univ. (United States); Cecilia Fasano, The Univ. of Iowa (United States); Randall L. McEntaffer, The Pennsylvania State Univ. (United States)

24 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 11B

12679-21

### Soft x-ray performance of flight-like blazed transmission gratings for Arcus-Probe

Author(s): Ralf K. Heilmann, MIT Kavli Institute for Astrophysics and Space Research (United States); Alexander R. Bruccoleri, Izentis LLC (United States); Mark L. Schattenburg, MIT Kavli Institute for Astrophysics and Space Research (United States)

24 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 11B

12679-22

### Characterization of customized curved gratings made with electron-beam lithography

Author(s): Casey T. DeRoo, Cecilia Fasano, The Univ. of Iowa (United States); Fabien Grisé, Randall L. McEntaffer, The Pennsylvania State Univ. (United States)

24 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 11B

Coffee Break 9:50 AM - 10:20 AM

### SESSION 6: COATINGS I

24 August 2023 • 10:20 AM - 12:00 PM | Conv. Ctr. Room 11B  
Session Chairs: William W. Zhang, NASA Goddard Space Flight Ctr. (United States), Stephen D. Bongiorno, NASA Marshall Space Flight Ctr. (United States)

12679-23

### Characterization of Ni/C multilayer coating stress for x-ray optic applications

Author(s): Danielle N. Gurgew, Universities Space Research Association (United States), NASA Marshall Space Flight Ctr. (United States); Srikanth Panini Singam, NASA (United States), Oak Ridge Associated Univs. (United States)

24 August 2023 • 10:20 AM - 10:40 AM | Conv. Ctr. Room 11B

12679-24

### Characterizing nanoscale thin-film residual stresses for stress mitigation and engineering in next-generation x-ray optics

Author(s): Taylor Wood, The Pennsylvania State Univ. (United States); Hazar Seren, ASML (United States); Arthur Woll, Louisa Smieska, Kirt Page, Cornell High Energy Synchrotron Source, Cornell Univ. (United States); Darren Pagan, Randall L. McEntaffer, The Pennsylvania State Univ. (United States)

24 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 11B

12679-25

### Device for measuring stress stability in reflective coatings for thin x-ray mirrors

Author(s): Mallory Whalen, Mark L. Schattenburg, Ralf K. Heilmann, MIT Kavli Institute for Astrophysics and Space Research (United States)

24 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 11B

12679-26

### Absolute surface metrology of x-ray telescope mirrors through axial shift mapping

Author(s): Hayden J. Wisniewski, The Univ. of Arizona (United States); Ralf K. Heilmann, Mark L. Schattenburg, Massachusetts Institute of Technology (United States); Brandon D. Chalifoux, The Univ. of Arizona (United States)

24 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 11B

12679-27

### Enhancing x-ray mirror performance with dip-liquid deposited carbon coatings

Author(s): Vincenzo Cotroneo, Stefano Basso, Marta M. Civitani, INAF - Osservatorio Astronomico di Brera (Italy); Thorsten Döhring, Technische Hochschule Aschaffenburg (Germany); Eugenio Gibertini, Politecnico di Milano (Italy); Christian Gollwitzer, Physikalisch-Technische Bundesanstalt (Germany); Simone Iovenitti, INAF - Osservatorio Astronomico di Brera (Italy); Michael Krumbrey, Physikalisch-Technische Bundesanstalt (Germany); Luca Magagnin, Politecnico di Milano (Italy); Giovanni Pareschi, INAF - Osservatorio Astronomico di Brera (Italy); Suzanne Romaine, Harvard-Smithsonian Ctr. for Astrophysics (United States); Dieter Skroblin, Physikalisch-Technische Bundesanstalt (Germany); Gianpiero Tagliaferri, INAF - Osservatorio Astronomico di Brera (Italy); Giuseppe Valsecchi, Media Lario S.r.l. (Italy)

24 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 11B

Lunch/Exhibition Break 12:00 PM - 1:30 PM

### SESSION 7: COATINGS II

24 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 11B

Session Chairs: Randall L. McEntaffer, The Pennsylvania State Univ. (United States), Stephen L. O'Dell, NASA Marshall Space Flight Ctr. (United States)

12679-28

#### **X-ray mirror coatings for NewAthena: updated design, development status, and performance**

Author(s): Desiree Della Monica Ferreira, Sonny Massahi, Diego Paredes Sanz, Sara Svendsen, Nis Christian Gellert, Arne S. Jegers, Finn Erland Christensen, DTU Space (Denmark); Boris Landgraf, Maximilien J. Collon, cosine measurement systems (Netherlands); Ivo Ferreira, Marcos Bavdaz, European Space Research and Technology Ctr. (Netherlands)

24 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 11B

12679-30

#### **Design and testing of reflective mirrors for EUV polarimetry**

Author(s): Raveena Khan, K. Nagaraju, Indian Institute of Astrophysics (India)

24 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 11B

### SESSION 8: TEST AND CALIBRATION FACILITIES

24 August 2023 • 2:10 PM - 5:20 PM | Conv. Ctr. Room 11B

Session Chairs: Casey T. DeRoo, The Univ. of Iowa (United States), Marta Maria Civitani, INAF - Osservatorio Astronomico di Brera (Italy)

12679-32

#### **The Marshall 100-meter x-ray beamline: description and update**

Author(s): Nicholas E. Thomas, NASA Marshall Space Flight Ctr. (United States)

24 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 11B

12679-33

#### **Characterising x-ray optics at PANTER for the NewATHENA mission and x-ray optic test facilities**

Author(s): Vadim Burwitz, Gisela Hartner, Thomas Müller, Surangkhan Rukdee, Thomas Schmidt, Andreas Langmeier, Max-Planck-Institut für extraterrestrische Physik (Germany); Marcos Bavdaz, Ivo Ferreira, European Space Research and Technology Ctr., European Space Agency (Netherlands); Maximilien J. Collon, Giuseppe Vacanti, Nicolas M. Barrière, cosine measurement systems (Netherlands); Bianca Salmaso, Alberto Moretti, Daniele Spiga, Giorgia Sironi, INAF - Osservatorio Astronomico di Brera (Italy)

24 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 11B

12679-34

#### **The BEaTriX x-ray facility at work: activities and future development**

Author(s): Bianca Salmaso, Daniele Spiga, Stefano Basso, INAF - Osservatorio Astronomico di Brera (Italy); Davide Sisana, INAF - Osservatorio Astronomico di Brera (Italy), Politecnico di Milano (Italy); Mauro Ghigo, Gabriele Vecchi, Giorgia Sironi, Vincenzo Cotroneo, Giovanni Pareschi, Gianpiero Tagliaferri, INAF - Osservatorio Astronomico di Brera (Italy); Claudio Ferrari, Istituto dei Materiali per l'Elettronica ed il Magnetismo, Consiglio Nazionale delle Ricerche (Italy), INAF - Osservatorio Astronomico di Brera (Italy); Giancarlo Parodi, BCV Progetti S.r.l. (Italy); Vadim Burwitz, Röntgentestanlage PANTER, Max-Planck-Institut für extraterrestrische Physik (Germany); Desiree Della Monica Ferreira, DTU Space (Denmark); Marcos Bavdaz, Ivo Ferreira, European Space Research and Technology Ctr., European Space Agency (Netherlands); Maximilien J. Collon, Giuseppe Vacanti, Sjoerd Verhoeckx, cosine measurement systems (Netherlands)

24 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 11B

12679-35

#### **The VERT-X calibration facility: development of the most critical parts**

Author(s): Alberto Moretti, Daniele Spiga, Stefano Basso, Giorgia Sironi, Giovanni Pareschi, Vincenzo Cotroneo, Marta M. Civitani, Mauro Ghigo, INAF - Osservatorio Astronomico di Brera (Italy); Nicola La Palombara, Michela Uslenghi, INAF - Istituto di Astrofisica Spaziale e Fisica cosmica Milano (Italy); Giuseppe Valsecchi, Fabio Marioni, Dervis Vernani, Fabio Zocchi, Media Lario S.r.l. (Italy); Giancarlo Parodi, Matteo Ottolini, BCV Progetti S.r.l. (Italy); Massimiliano Tordi, EIE S.r.l. (Italy); Simone De Lorenzi, EIE Group S.r.l. (Italy); Vadim Burwitz, Röntgentestanlage PANTER, Max-Planck-Institut für extraterrestrische Physik (Germany); Desiree Della Monica Ferreira, Technical Univ. of Denmark (Denmark); Paolo Corradi, Marcos Bavdaz, Ivo Ferreira, European Space Agency (Netherlands)

24 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 11B

#### **Coffee Break 3:30 PM - 4:00 PM**

12679-36

#### **Capability improvements at the Marshall Space Flight Center's x-ray and cryogenic facility**

Author(s): Jeffrey R. Kegley, NASA Marshall Space Flight Ctr. (United States); William Abbot, Kratos SRE (United States); Wayne H. Baumgartner, Mark Baker, NASA Marshall Space Flight Ctr. (United States); Gregory Daspit, Kratos SRE (United States); William Hogue, Steven Johnson, NASA Marshall Space Flight Ctr. (United States); Kristin Madsen, NASA Goddard Space Flight Center (United States); Mark Mimovich, Moog, Inc (United States); James Tucker, Kratos SRE (United States); Ernie Wright, NASA Marshall Space Flight Ctr. (United States)

24 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 11B

12679-37

#### **X-ray testing of an Athena SPO module at the NASA/MSFC X-ray and Cryogenic Facility (XRCF)**

Author(s): Wayne H. Baumgartner, NASA Marshall Space Flight Ctr. (United States); Kristin K. Madsen, NASA Goddard Space Flight Ctr. (United States); Vadim Burwitz, Max-Planck-Institut für extraterrestrische Physik (Germany); Ernie Wright, Steven Johnson, Jeffrey R. Kegley, Nicholas E. Thomas, NASA Marshall Space Flight Ctr. (United States); James Tucker, Gregory Daspit, Kratos SRE (United States)

24 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 11B

# TECHNICAL CONFERENCES

## Conference 12679

12679-38

### **Einstein probe wide field telescope flight mirror module characterization at PANTER test facility**

Author(s): Surangkha Rukdee, Vadim Burwitz, Gisela Hartner, Thomas Schmidt, Andreas Langmeier, Thomas Müller, Peter Friedrich, Max-Planck-Institut für extraterrestrische Physik (Germany); Charlotte Feldman, Paul O'Brien, Gillian Butcher, Richard Willingale, Univ. of Leicester (United Kingdom); Chen Zhang, Zhixing Ling, Yanfeng Dai, Weimin Yuan, National Astronomical Observatories (China)

24 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 11B

12679-39

### **X-ray beam diagnostics at the BEaTriX facility**

Author(s): Davide Sisana, Politecnico di Milano (Italy), INAF - Osservatorio Astronomico di Brera (Italy); Daniele Spiga, Bianca Salmaso, Stefano Basso, INAF - Osservatorio Astronomico di Brera (Italy); Michèle Roberta Lavagna, Politecnico di Milano (Italy); Mauro Ghigo, Gabriele Vecchi, Giorgia Sironi, Vincenzo Cotroneo, Giovanni Pareschi, Gianpiero Tagliaferri, INAF - Osservatorio Astronomico di Brera (Italy)

24 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 11B



## Conference 12680

# Techniques and Instrumentation for Detection of Exoplanets XI

21 - 24 August 2023 | Conv. Ctr. Room 16B (Mon-Wed); Room 11A (Thu)

Conference Chair: **Garreth J. Ruane**, Jet Propulsion Lab. (United States)

Program Committee: **Tyler D. Groff**, NASA Goddard Space Flight Ctr. (United States); **Olivier Guyon**, Subaru Telescope, National Astronomical Observatory of Japan (United States); **Quinn M. Konopacky**, Univ. of California, San Diego (United States); **Maxwell A. Millar-Blanchaer**, Univ. of California, Santa Barbara (United States); **Stephanie Sallum**, Univ. of California, Irvine (United States); **Stuart B. Shaklan**, Jet Propulsion Lab. (United States); **Rémi Soummer**, Space Telescope Science Institute (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: GROUND-BASED INSTRUMENTS AND RESULTS I

21 August 2023 • 9:00 AM - 12:00 PM | Conv. Ctr. Room 16B

Session Chair: Garreth J. Ruane, Jet Propulsion Lab. (United States)

12680-1

#### Upgrading the Gemini Planet Imager to GPI 2.0 (*Invited Paper*)

Author(s): Saavidra Perera, Univ. of California, San Diego (United States); Jeffrey K. Chilcote, Univ. of Notre Dame (United States); Quinn Konopacky, Univ. of California, San Diego (United States); Joeleff Fitzsimmons, NRC-Herzberg Astronomy & Astrophysics (Canada); Randall Hamper, Univ. of Notre Dame (United States); Bruce Macintosh, Univ. of California, Santa Cruz (United States); Christian Marois, NRC-Herzberg Astronomy & Astrophysics (Canada), Univ. of Victoria (Canada); Dmitry Savransky, Cornell Univ. (United States); Rémi Soummer, Space Telescope Science Institute (United States); Jean-Pierre Véran, NRC-Herzberg Astronomy & Astrophysics (Canada); Guido Agapito, INAF - Osservatorio Astrofisico di Arcetri (Italy); Arlene Aleman, Kavli Institute for Particle Astrophysics & Cosmology, Stanford Univ. (United States); S. Mark Ammons, Lawrence Livermore National Lab. (United States); Marco Bonaglia, INAF - Osservatorio Astrofisico di Arcetri (Italy); Marc-André Boucher, OMP Inc. (Canada); Vincent Chambouleyron, Univ. of California, Santa Cruz (United States); Maeve Curliss, Texas A&M Univ. (United States); Robert J. De Rosa, European Southern Observatory (Chile); Clarissa Do Ó, Univ. of California, San Diego (United States); Jennifer Dunn, NRC-Herzberg Astronomy & Astrophysics (Canada); Simone Esposito, INAF - Osservatorio Astrofisico di Arcetri (Italy); Guillaume Fillion, OMP Inc. (Canada); Dan Kerley, NRC-Herzberg Astronomy & Astrophysics (Canada); Jean-Thomas Landry, OMP Inc. (Canada); Olivier Lardiére, NRC-Herzberg Astronomy & Astrophysics (Canada); Daniel Levinstein, Univ. of California, San Diego (United States); Duan Li, Cornell Univ. (United States); Mary Anne Limbach, Texas A&M Univ. (United States); Alex Madurowicz, Kavli Institute for Particle Astrophysics & Cosmology, Stanford Univ. (United States); Jérôme Maire, Univ. of California, San Diego (United States); Maxwell Millar-Blanchaer, Univ. of California, Santa Barbara (United States); Bryony Nickson, Space Telescope Science Institute (United States); Eric L. Nielsen, New Mexico State Univ. (United States); Jayke Nguyen, Univ. of California, San Diego (United States); Meiji Nguyen, Space Telescope Science Institute (United States); Dillon Peng, Univ. of Notre Dame (United States); Marshall D. Perrin, Emiel Por, Space Telescope Science Institute (United States); Lisa Poyneer, Lawrence Livermore National Lab. (United States); Laurent Pueyo, Space Telescope Science Institute (United States); Fredrik Rantakyro, Gemini Observatory

(United States); Brian Sands, Univ. of Notre Dame (United States); Eckhart Spalding, The Univ. of Sydney (Australia); Kaitlyn Summey, Cornell Univ. (United States)

21 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 16B

12680-2

#### Gemini Planet Imager 2.0: implementing a Zernike wavefront sensor for non-common path aberrations measurement

Author(s): Vincent Chambouleyron, Maissa Salama, Univ. of California, Santa Cruz (United States); Charlotte Guthery, W. M. Keck Observatory (United States); Saavi Perera, Quinn Konopacky, Univ. of California, San Diego (United States); Jean-Pierre Véran, NRC-Herzberg Astronomy & Astrophysics (Canada); Dmitry Savransky, Cornell Univ. (United States); Jeffrey K. Chilcote, Univ. of Notre Dame (United States); Kent Wallace, Jet Propulsion Lab. (United States); Daren Dillon, Rebecca Jensen-Clem, Bruce Macintosh, Univ. of California, Santa Cruz (United States)

21 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 16B

12680-4

#### SCALES: driving science cases and expected outcomes

Author(s): Stephanie Sallum, Univ. of California, Irvine (United States)

21 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 16B

#### Coffee Break 10:10 AM - 10:40 AM

12680-5

#### The SCALES slenslit: a unique exoplanet spectrograph

Author(s): Richard D. Stelter, Renate Kupke, Univ. of California Observatories (United States); Andrew J. Skemer, Univ. of California, Santa Cruz (United States); Stephanie Sallum, Univ. of California, Irvine (United States); Cyril Bourgenot, Durham Univ. (United Kingdom)

21 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 16B

12680-6

#### End to end modeling of SCALES spectrograph for Keck Observatory

Author(s): Arun Surya, Tata Institute of Fundamental Research (India); Renate Kupke, Deno Stelter, Univ. of California Observatories (United States); Philip Hinz, Univ. of California, Santa Cruz (United States); Amirul Hasan, Indian Institute of Astrophysics (India); Andrew Skemer, Univ. of California, Santa Cruz (United States); Stephanie Sallum, Univ. of California, Irvine (United States); Thirupathi Sivarani, Ravinder Banyal, Indian Institute of Astrophysics (India)

21 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 16B

# TECHNICAL CONFERENCES

## Conference 12680

12680-7

### Characterization of hot Jupiter atmospheres with Keck/KPIC

Author(s): Luke Finnerty, Univ. of California, Los Angeles (United States); Tobias Schofield, Caltech (United States); Ben Sappé, Univ. of California, San Diego (United States); Jerry W. Xuan, Caltech (United States); Jean-Baptiste Ruffio, Univ. of California, San Diego (United States); Jason J. Wang, Northwestern Univ. (United States); Jacques-Robert Delorme, W. M. Keck Observatory (United States); Geoffrey A. Blake, Caltech (United States); Michael P. Fitzgerald, Univ. of California, Los Angeles (United States)

21 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 16B

12680-8

### The development of HISPEC for Keck and MODHIS for TMT

Author(s): Quinn M. Konopacky, Univ. of California, San Diego (United States); Dimitri Mawet, Caltech (United States); Michael Fitzgerald, Univ. of California, Los Angeles (United States); Nemanja Jovanovic, Ashley Baker, Charles Beichman, Robert Bertz, Richard Dekany, Jason Fucik, Mitsuko Roberts, Michael Porter, Rishi Pahuja, Caltech (United States); Garreth Ruane, Jet Propulsion Lab. (United States); Stephanie Leifer, The Aerospace Corp. (United States); Samuel Halverson, Jet Propulsion Lab. (United States); Aidan Gibbs, Chris Johnson, Evan Kress, Kenneth Magnone, Eric Wang, Univ. of California, Los Angeles (United States); Aaron Brown, Jerome Maire, Ben Sappé, Univ. of California, San Diego (United States); David Andersen, Hiroshi Terada, Thirty Meter Telescope (United States); Marc Kassis, W. M. Keck Observatory (United States); Jean-Baptiste Ruffio, Univ. of California, San Diego (United States); Rose Gibson, Univ. of California, Los Angeles (United States); Robert Weber, Alberto Franco-Ordovás, Caltech (United States); Étienne Artigau, Bjorn Benneke, Rene Doyon, Univ. de Montréal (Canada); Takayuki Kotani, National Astronomical Observatory of Japan (Japan); Motohide Tamura, The Univ. of Tokyo (Japan); Thomas Beatty, Univ. of Wisconsin-Madison (United States); Peter Plavchan, George Mason Univ. (United States); Tuan Do, Univ. of California, Los Angeles (United States); Shogo Nishiyama, Miyagi Univ. of Education (Japan); Jason Wang, Northwestern Univ. (United States); Ji Wang, The Ohio State Univ. (United States)

21 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 16B

Lunch Break 12:00 PM - 1:30 PM

### SESSION 2: GROUND-BASED INSTRUMENTS AND RESULTS II

21 August 2023 • 1:30 PM - 2:20 PM | Conv. Ctr. Room 16B

Session Chair: Quinn M. Konopacky, Univ. of California, San Diego (United States)

12680-9

### MagAO-X: a pathfinder for GMT to operate extreme adaptive optics at the photon noise limit (*Invited Paper*)

Author(s): Sebastiaan Y. Haffert, Jared R. Males, Laird M. Close, Olivier Guyon, Joseph D. Long, Steward Observatory (United States); Alexander D. Hedglen, Maggie Kautz, Wyant College of Optical Sciences (United States); Kyle Van Gorkom, Steward Observatory (United States); Avalon L. McLeod, Warren B. Foster, Eden A. McEwen, Wyant College of Optical Sciences (United States); Logan Pearce, Jialin Li, Steward Observatory (United States); Jay Kueny, Wyant College of Optical Sciences (United States); Ben Mazin, Noah Swimmer, Jeb Bailey, Sarah Steiger, Univ. of California, Santa Barbara (United States)

21 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 16B

12680-10

### Low order wavefront sensing and control on MagAO-X

Author(s): Avalon McLeod, Wyant College of Optical Sciences (United States); Jared R. Males, Laird M. Close, Steward Observatory (United States); Olivier Guyon, Wyant College of Optical Sciences (United States)

21 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16B

### SESSION 3: ADAPTIVE OPTICS METHODS

21 August 2023 • 2:20 PM - 4:30 PM | Conv. Ctr. Room 16B

Session Chair: Quinn M. Konopacky, Univ. of California, San Diego (United States)

12680-11

### Design and development of compact adaptive optics instrumentation for extreme precision radial velocity

Author(s): James Kent Wallace, Matthew Noyes, Alex Walter, Lewis Roberts, Jet Propulsion Lab. (United States)

21 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16B

12680-12

### A non-linear curvature wavefront sensor for the Subaru Telescope's AO3k system

Author(s): Kyohoon Ahn, Subaru Telescope, NAOJ (United States); Olivier Guyon, Subaru Telescope, NAOJ (United States), AstroBiology Ctr., NINS (Japan), Wyant College of Optical Sciences, The Univ. of Arizona (United States); Julien Lozi, Subaru Telescope, NAOJ (United States); Sébastien Vievard, Subaru Telescope, NAOJ (United States), Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris, CNRS (France), Univ. PSL (France); Vincent Deo, Subaru Telescope, NAOJ (United States); Nour Skaf, Subaru Telescope, NAOJ (United States), Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France), Univ. College London (United Kingdom); Jennifer C. Bragg, Subaru Telescope, NAOJ (United States), Wyant College of Optical Sciences, The Univ. of Arizona (United States)

21 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 16B

Coffee Break 3:00 PM - 3:30 PM

12680-13

### Simultaneous control of the segmented primary mirror and SCAO system with a pyramid wavefront sensor

Author(s): Benjamin Calvin, Michael P. Fitzgerald, Univ. of California, Los Angeles (United States); Sam Ragland, W. M. Keck Observatory (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 16B

12680-14

### Development of the coherent differential imaging on speckle area nulling (CDI-SAN) method

Author(s): Kenta Yoneta, National Astronomical Observatory of Japan (Japan); Jun Nishikawa, National Astronomical Observatory of Japan (Japan), The Graduate Univ. for Advanced Studies (Japan), AstroBiology Ctr., NINS (Japan); Yutaka Hayano, National Astronomical Observatory of Japan (United States), The Graduate Univ. for Advanced Studies (Japan); Masatsugu Iribe, Osaka Electro-Communication Univ. (Japan); Kodai Yamamoto, Ryo Tsukui, Kyoto Univ. (Japan); Naoshi Murakami, Mizuki Asano, Hokkaido Univ. (Japan); Hiromi Muramatsu, Tokyo Univ. of Agriculture and Technology (Japan), National Astronomical Observatory of Japan (Japan); Yosuke Tanaka, Tokyo Univ. of Agriculture and Technology (Japan), AstroBiology Ctr., NINS (Japan); Motohide Tamura, The Univ. of Tokyo (Japan), AstroBiology Ctr., NINS (Japan), National Astronomical Observatory of Japan (Japan); Takahiro Sumi, Osaka Univ. (Japan); Toru Yamada, Japan Aerospace Exploration Agency

(Japan); Olivier Guyon, National Astronomical Observatory of Japan (United States), The Univ. of Arizona (United States), AstroBiology Ctr., NINS (Japan); Julien Lozi, Vincent Deo, Sébastien Vievard, Kyohoon Ahn, National Astronomical Observatory of Japan (United States)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 16B

12680-15

### **Tempestas ex machina: machine learning approaches to wavefront control**

Author(s): Jules Fowler, Univ. of California, Santa Cruz (United States)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 16B

#### **SESSION 4: HIGH-ALTITUDE BALLOON MISSIONS**

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 16B

Session Chair: Quinn M. Konopacky, Univ. of California, San Diego (United States)

12680-16

### **The PICTURE-C exoplanetary imaging balloon mission: second flight results and the transition to a new mission, PICTURE-D**

Author(s): Christopher B. Mendillo, Kuravi Hewawasam, Thaddeus Potter, Jason Martel, Supriya Chakrabarti, Timothy A. Cook, Univ. of Massachusetts Lowell (United States)

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 16B

#### **POSTERS-MONDAY**

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12680-61

### **Modeling of MagAO-X for speckle reconstruction**

Author(s): Richard A. Frazin, Univ. of Michigan (United States); Jared R. Males, Sebastiaan Haffert, Laird Close, Steward Observatory (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-62

### **Deformable mirror-based pupil chopping for exoplanet imaging and adaptive optics**

Author(s): Benjamin L. Gerard, Cesar Laguna, Lawrence Livermore National Lab. (United States); Javier I. Perez Soto, Univ. of California (United States); Rebecca Jensen-Clem, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-63

### **First laboratory demonstration of real-time multi-wavefront sensor adaptive optics**

Author(s): Benjamin L. Gerard, Lawrence Livermore National Lab. (United States); Daren Dillon, Univ. of California, Santa Cruz (United States); Sylvain Cetre, Wakea Consulting (France); Rebecca Jensen-Clem, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-64

### **The telescope simulator for the Fraunhofer telescope Wendelstein**

Author(s): Frank U. Grupp, Hanna Kellermann, Univ.-Sternwarte München (Germany); Florian Lang, Max-Planck-Institut für extraterrestrische Physik (Germany); Claus Gössl, Felix Kummer, Felix Langgäßner, Ulrich Hopp, Ralf Bender, Juliana F. Erhardt, Univ.-Sternwarte München (Germany)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-65

### **Integrated Photonic-Based Coronagraphic Systems for Future Space Telescopes**

Author(s): Niyati Desai, Caltech (United States); Emiel H. Por, Space Telescope Science Institute (United States); Roser Juanola-Parramon, NASA Goddard Space Flight Ctr. (United States); Lorenzo König, STAR Institute, Liège Univ. (Belgium); Iva Laginja, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris (France); Ruslan Belikov, NASA Ames Research Ctr. (United States); Olivier Guyon, Subaru Telescope, NAOJ (United States); Kevin Fogarty, NASA Ames Research Ctr. (United States); Laurent Pueyo, Space Telescope Science Institute (United States); Olivier Absil, STAR Institute, Liège Univ. (Belgium); Lisa Altinier, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ., CNRS (France), Ctr. National d'Études Spatiales (France); Pierre Baudoz, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Kimberly Bott, Univ. of California, Riverside (United States); Alexis Carlotti, Univ. Grenoble Alpes, CNRS (France); Bernhard Brandl, Leiden Observatory, Leiden Univ. (Netherlands); Markus Bonse, ETH Zurich (Switzerland); Sarah L. Casewell, Univ. of Leicester (United Kingdom); Élodie Choquet, Aix-Marseille Univ. (France); Nicolas B. Cowan, McGill Univ. (Canada); David Doelman, Leiden Observatory (Netherlands); Jules Fowler, Univ. of California, Santa Cruz (United States); Timothy Gebhard, Max-Planck-Institut für Intelligente Systeme (Germany); Yann Gutierrez, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Sebastiaan Haffert, Steward Observatory, The Univ. of Arizona (United States); Olivier Herscovici-Schiller, ONERA, Univ. Paris-Saclay (France); Adrien Hours, Univ. Grenoble Alpes (France); Rebecca Jensen-Clem, Univ. of California, Santa Cruz (United States); Matthew Kenworthy, Elina Kleisioti, Rico Landman, Leiden Observatory (Netherlands); Johan Mazoyer, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Maxwell Millar-Blanchaer, Univ. of California, Santa Barbara (United States); David Mouillet, Univ. Grenoble Alpes (France); Mamadou N'Diaye, Observatoire de la Côte d'Azur, Univ. Côte d'Azur, CNRS (France); Frans Snik, Dirk van Dam, Kyle van Gorkom, Leiden Observatory (Netherlands); Maaikje van Kooten, Univ. of California, Santa Cruz (United States); Sophia Vaughan, Univ. of Oxford (United Kingdom)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12680

12680-66

### Harvesting lost photons in stellar coronagraphs

Author(s): Lisa Altinier, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ., CNRS (France), Ctr. National d'Études Spatiales (France); Yann Gutierrez, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris, Univ. PSL, CNRS (France), Sorbonne Univ. (France), ONERA, Univ. Paris-Saclay (France); Olivier Absil, STAR Institute, Liège Univ. (Belgium); Alexis Carlotti, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); Olivier Herscovici-Schiller, ONERA, Univ. Paris-Saclay (France); Lucie Leboulleux, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); Emiel H. Por, Space Telescope Science Institute (United States); Pierre Baudoz, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris, Univ. PSL, CNRS (France), Sorbonne Univ. (France), Univ. de Paris (France); Alexis Bidot, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); Kimberly Bott, Univ. of California, Riverside (United States); Bernhard Brandl, Leiden Observatory, Leiden Univ. (Netherlands); Sarah L. Casewell, Univ. of Leicester (United Kingdom); Élodie Choquet, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ., CNRS (France), Ctr. National d'Études Spatiales (France); Nicolas B. Cowan, McGill Univ. (Canada); Niyati Desai, Caltech (United States); David Doelman, Leiden Observatory, Leiden Univ. (Netherlands); SRON Netherlands Institute for Space Research (Netherlands); Jules Fowler, Univ. of California, Santa Cruz (United States); Timothy D. Gebhard, Max-Planck-Institut für Intelligente Systeme (Germany), ETH Zurich (Switzerland); Sebastiaan Y. Haffert, Steward Observatory, The Univ. of Arizona (United States); Adrien Hours, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); Roser Juanola-Parramon, NASA Goddard Space Flight Ctr. (United States), Univ. of Maryland, Baltimore County (United States); Matthew Kenworthy, Elina Kleisioti, Leiden Observatory, Leiden Univ. (Netherlands); Lorenzo König, STAR Institute, Liège Univ. (Belgium); Mariya Krasteva, European Space Research and Technology Ctr., European Space Agency (Netherlands); Iva Laginja, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris, Univ. PSL, CNRS (France), Sorbonne Univ. (France), Univ. de Paris (France); Rico Landman, Leiden Observatory, Leiden Univ. (Netherlands); Johan Mazoyer, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris, Univ. PSL, CNRS (France), Sorbonne Univ. (France), Univ. de Paris (France); Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States); David Mouillet, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); Mamadou N'Diaye, Observatoire de la Côte d'Azur, Univ. Côte d'Azur, CNRS (France); Frans Snik, Dirk van Dam, Leiden Observatory, Leiden Univ. (Netherlands); Kyle Van Gorkom, Steward Observatory, The Univ. of Arizona (United States); Maaïke van Kooten, NRC-Herzberg Astronomy & Astrophysics, National Research Council Canada (Canada); Sophia R. Vaughan, Univ. of Oxford (United Kingdom); Arthur Vigan, Lab. d'Astrophysique de Marseille, Aix-Marseille Univ., CNRS (France)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-67

### Visible extreme adaptive optics on extremely large telescopes: towards detecting oxygen in Proxima b and analogs

Author(s): Jules Fowler, Univ. of California, Santa Cruz (United States); Sebastiaan Haffert, Steward Observatory (United States); Rico Landman, Leiden Observatory (Netherlands); Maaïke van Kooten, National Research Council Canada (Canada); Adrien Hours, Alexis Bidot, Univ. Grenoble Alpes (France); Mamadou N'Diaye, Univ. Côte d'Azur (France); Olivier Absil, STAR Institute, Liège Univ. (Belgium); Lisa Altinier, Aix-Marseille Univ. (France); Pierre Baudoz, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique (France); Ruslan Belikov, NASA Ames Research Ctr. (United States); Markus Bonse, ETH Zurich (Switzerland); Kimberly Bott, Univ. of California, Riverside (United States); Bernhard Brandl, Leiden Observatory (Netherlands); Alexis Carlotti, Univ. Grenoble Alpes (France); Sarah L. Casewell, Univ. of Leicester (United Kingdom); Élodie Choquet, Aix-Marseille Univ. (France); Nicolas B. Cowan, McGill Univ. (Canada); Niyati Desai, Caltech (United States); David Doelman, SRON Netherlands Institute for Space Research (Netherlands); Kevin Fogarty, NASA Ames Research Ctr. (United States); Timothy D. Gebhard, Max-Planck-Institut für Intelligente Systeme (Germany); Yann Gutierrez, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique (France); Olivier Guyon, Steward Observatory (United States); Olivier Herscovici-Schiller, ONERA (France); Roser Juanola-Parramon, NASA Goddard Space Flight Ctr. (United States); Matthew Kenworthy, Elina Kleisioti, Leiden Observatory (Netherlands); Lorenzo König, STAR Institute, Liège Univ. (Belgium); Iva Laginja, Johan Mazoyer, Lab. d'Études Spatiales et d'Instrumentation en Astrophysique (France); Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States); David Mouillet, Univ. Grenoble Alpes (France); Emiel H. Por, Laurent Pueyo, Space Telescope Science Institute (United States); Frans Snik, Dirk van Dam, Leiden Observatory (Netherlands); Kyle Van Gorkom, Steward Observatory (United States); Sophia R. Vaughan, Univ. of Oxford (United Kingdom)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-68

### SHIMM as an atmospheric profiler on the Nickel telescope

Author(s): Ollie Jackson, Univ. of California, Santa Cruz (United States); Maaïke van Kooten, NRC-Herzberg Astronomy & Astrophysics, National Research Council Canada (Canada); Saavidra Perera, Univ. of California, San Diego (United States); Rebecca Jensen-Clem, Phil Hinz, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-69

### Designing custom medium resolution observing modes to trace planet accretion with SCALES

Author(s): Raquel A. Martinez, Steph Sallum, Univ. of California, Irvine (United States); Andrew J. Skemer, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-70

### Flexible exoplanet observation simulations with psisim

Author(s): Connor Vancil, Max Millar-Blanchaer, Univ. of California, Santa Barbara (United States); Jason Wang, Northwestern Univ. (United States); Michael Fitzgerald, Aidan Gibbs, Univ. of California, Los Angeles (United States); Sofia Hillman, Univ. of California, Santa Barbara (United States); Dimitri Mawet, Caltech (United States); Jean-Baptiste Ruffio, Univ. of California, San Diego (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-71

### Testing and performance of IFS upgrades for GPI 2.0

Author(s): Dillon H. Peng, Jeffrey K. Chilcote, Univ. of Notre Dame (United States); Quinn Konopacky, Univ. of California, San Diego (United States); Randall Hamper, Brian Sands, Joel Burke, Abigail Karaszewski, Rebecca Boyle, Univ. of Notre Dame (United States); Mary Anne Limbach, Texas A&M Univ. (United States); Alexa Rizika, Univ. of Notre Dame (United States); Saavidra Perera, Clarissa Do Ó, Jayke Nguyen, Univ. of California, San Diego (United States); Bruce Macintosh, Univ. of California Observatories (United States); Joeleff Fitzsimmons, National Research Council Canada (Canada); Christian Marois, NRC-Herzberg Astronomy & Astrophysics (Canada); Fredrik Rantakyö, Gemini Observatory (United States); Arlene Aleman, Stanford Univ. (United States); Jérôme Maire, Univ. of California, San Diego (United States); Robert J. De Rosa, European Southern Observatory (Germany); Emiel Por, Space Telescope Science Institute (United States); Dmitry Savransky, Cornell Univ. (United States); Meiji Nguyen, Marshall Perrin, Rémi Soummer, Laurent Pueyo, Bryony Nickson, Space Telescope Science Institute (United States); Eckhart Spalding, The Univ. of Sydney (Australia)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-72

### Compact adaptive optics real-time system design for extreme precision radial velocity measurements at Palomar telescope

Author(s): Alex B. Walter, J. Kent Wallace, Matthew Noyes, Lewis C. Roberts, Jet Propulsion Lab., Caltech (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-73

### Measured performance of diamond-turned optics for the SCALES high-contrast imager

Author(s): Isabel J. Kain, Univ. of California, Santa Cruz (United States); Philip M. Hinz, Univ. of California, Santa Cruz (United States), Univ. of California Observatories (United States); Renate Kupke, Univ. of California Observatories (United States); R. Deno Stelter, Univ. of California, Santa Cruz (United States), Univ. of California Observatories (United States); Benjamin Bulla, Marius Doetz, son-x GmbH (Germany); Christopher Ratliff, Univ. of California Observatories (United States); Michael Gonzales, Univ. of California Observatories (United States), Univ. of California, Santa Cruz (United States); Cristian A. Rodriguez, Nicholas MacDonald, Daren Dillon, Univ. of California Observatories (United States); Aditi Gangadharan, Andrew J. Skemer, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-74

### NMF-based GPU accelerated coronagraphy pipeline

Author(s): Sai Krishanth Puiikesi Mannan, Steward Observatory, The Univ. of Arizona (United States); Ewan Douglas, Ramya M. Anche, Steward Observatory (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-75

### Optics testing for SCALES

Author(s): Aditi Gangadharan, Univ. of California, Santa Cruz (United States); Daren Dillon, Univ. of California Observatories (United States); Isabel Kain, Andrew Skemer, Univ. of California, Santa Cruz (United States); Renate Kupke, Deno Stelter, Univ. of California Observatories (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-76

### Simulating medium-spectral-resolution exoplanet characterization with SCALES angular/spectral differential imaging

Author(s): Aditi Desai, Stephanie E. Sallum, Raquel A. Martinez, Univ. of California, Irvine (United States); Andrew J. Skemer, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-77

### Recovering simulated planet and disk signals using SCALES aperture masking

Author(s): Mackenzie Lach, Stephanie Sallum, Univ. of California, Irvine (United States); Andrew Skemer, Univ. of California, Santa Cruz (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

### SESSION 5: PHOTONICS

22 August 2023 • 8:30 AM - 11:10 AM | Conv. Ctr. Room 16B

Session Chair: Stephanie E. Sallum,  
Univ. of California, Irvine (United States)

12680-17

### The path to detecting extraterrestrial life with astrophotonics (*Invited Paper*)

Author(s): Nemanja Jovanovic, Caltech (United States)

22 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 16B

12680-18

### Photonic spectro-interferometry with SCExAO/FIRST at the Subaru Telescope: towards H $\alpha$ imaging of protoplanets

Author(s): Sébastien B. Vievard, Subaru Telescope, NAOJ (United States); Manon Lallement, Subaru Telescope, NAOJ (United States), Observatoire de Paris (France); Elsa Huby, Sylvestre Lacour, Observatoire de Paris (France); Olivier Guyon, Subaru Telescope, NAOJ (United States), AstroBiology Ctr., NINS (Japan), The Univ. of Arizona (United States); Nemanja Jovanovic, Caltech (United States); Sergio Leon-Saval, Sydney Astrophotonic Instrumentation Laboratory, School of Physics, The University of Sydney, (Australia); Julien Lozi, Subaru Telescope, NAOJ (United States); Guillermo Martin, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); Nick Cvetojevic, Observatoire de la Côte d'Azur (France); Takayuki Kotani, AstroBiology Ctr., NINS (Japan); Gaspard Duchêne, Univ. of California, Berkeley (United States); Kevin Barjot, Observatoire de Paris (France); Cécil Pham, Cédric Cassagnettes, Adrien Billat, Teem Photonics (France); Franck Marchis, Carl Sagan Ctr. for Research, SETI Institute (United States); Motohide Tamura, AstroBiology Ctr., NINS (Japan); Daniel Rouan, Observatoire de Paris (France); Vincent Deo, Kyohoon Ahn, Subaru Telescope, NAOJ (United States); Guy Perrin, Observatoire de Paris (France)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 16B

# TECHNICAL CONFERENCES

## Conference 12680

12680-19

### Laboratory characterization of a mode-selective photonic lantern for exoplanet characterization

Author(s): Yinzi Xin, Nemanja Jovanovic, Dimitri Mawet, Daniel Echeverri, Caltech (United States); Michael P. Fitzgerald, Univ. of California, Los Angeles (United States); Pradip Gatkine, Caltech (United States); Yoo Jung Kim, Univ. of California, Los Angeles (United States); Sergio Leon-Saval, The Univ. of Sydney (Australia); Jonathan Lin, Univ. of California, Los Angeles (United States); Barnaby Norris, The Univ. of Sydney (Australia); Garreth Ruane, Jet Propulsion Lab. (United States); Steph Sallum, Univ. of California, Irvine (United States)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 16B

12680-20

### Spectro-astrometry of embedded accreting protoplanets using photonic lanterns

Author(s): Daniel M. Levinstein, Steph Sallum, Univ. of California, Irvine (United States); Yoo Jung Kim, Jonathan Lin, Michael P. Fitzgerald, Univ. of California, Los Angeles (United States); Julien Lozi, Subaru Telescope, NAOJ (United States); Nemanja Jovanovic, Caltech (United States); Barnaby Norris, The Univ. of Sydney (Australia)

22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 16B

### Coffee Break 10:00 AM - 10:30 AM

12680-21

### Exploring the potential of coherent imaging using photonic lanterns with beam combiners

Author(s): Yoo Jung Kim, Univ. of California, Los Angeles (United States); Steph Sallum, Univ. of California, Irvine (United States); Jonathan Lin, Univ. of California, Los Angeles (United States); Yinzi Xin, Caltech (United States); Barnaby Norris, Christopher Betters, Sergio Leon-Saval, The Univ. of Sydney (Australia); Julien Lozi, Sébastien Vievard, Subaru Telescope, NAOJ (United States); Pradip Gatkine, Caltech (United States); Olivier Guyon, Subaru Telescope, NAOJ (United States); Nemanja Jovanovic, Dimitri Mawet, Caltech (United States); Michael Fitzgerald, Univ. of California, Los Angeles (United States)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 16B

12680-22

### Demonstration of linear and neural net closed-loop control with a photonic lantern focal-plane wavefront sensor

Author(s): Jonathan Lin, Univ. of California, Los Angeles (United States); Barnaby Norris, Sydney Institute for Astronomy, The Univ. of Sydney (Australia); Olivier Guyon, Subaru Telescope, NAOJ (United States); Michael Fitzgerald, Univ. of California, Los Angeles (United States); Yinzi Xin, Caltech (United States); Yoo Jung Kim, Univ. of California, Los Angeles (United States); Sébastien Vievard, Julien Lozi, Subaru Telescope, NAOJ (United States); Sergio Leon-Saval, Christopher Betters, Sydney Astrophotonic Instrumentation Lab., The Univ. of Sydney (Australia); Steph Sallum, Univ. of California, Irvine (United States); Pradip Gatkine, Dimitri Mawet, Nemanja Jovanovic, Caltech (United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 16B

## SESSION 6: INTERFEROMETRY TECHNIQUES

22 August 2023 • 11:10 AM - 12:10 PM | Conv. Ctr. Room 16B

Session Chair: Stephanie E. Sallum,  
Univ. of California, Irvine (United States)

12680-23

### First light of the vortex fiber nulling mode on the Keck Planet Imager and Characterizer

Author(s): Daniel Echeverri, Jerry W. Xuan, Nemanja Jovanovic, Caltech (United States); Jacques-Robert Delorme, W. M. Keck Observatory (United States); Garreth Ruane, Jet Propulsion Lab. (United States); Sofia Hillman, Univ. of California, Santa Barbara (United States); Dimitri Mawet, Caltech (United States); J. Kent Wallace, Bertrand Mennesson, Jet Propulsion Lab. (United States); Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 16B

12680-24

### Exploring calibration algorithms to maximize the null depth in KPIC's vortex fiber nulling mode

Author(s): Sofia Hillman, Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States); Daniel Echeverri, Dimitri Mawet, Jerry Xuan, Garreth Ruane, Caltech (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 16B

12680-25

### Performance of kernel phase interferometry for detecting and characterizing protoplanets using SCEXAO/CHARIS

Author(s): Alexander Chaushev, Stephanie Sallum, Univ. of California, Irvine (United States); Julien Lozi, Subaru Telescope, NAOJ (United States); Frantz Martinache, Observatoire de la Côte d'Azur (France); Jeffrey K. Chilcote, Univ. of Notre Dame (United States); Tyler Groff, NASA Goddard Space Flight Ctr. (United States); Olivier Guyon, Subaru Telescope, NAOJ (United States); N. Jeremy Kasdin, Univ. of San Francisco (United States); Barnaby Norris, Sydney Institute for Astronomy, The Univ. of Sydney (Australia); Andy Skemer, Univ. of California, Santa Cruz (United States)

22 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 16B

Lunch/Exhibition Break 12:10 PM - 1:40 PM

## SESSION 7: METASURFACES

22 August 2023 • 1:40 PM - 2:20 PM | Conv. Ctr. Room 16B

Session Chair: Garreth J. Ruane, Jet Propulsion Lab. (United States)

12680-26

### Imaging exoplanets with metasurfaces: current prospects and the road to terrestrial planet contrasts

Author(s): Skyler Palatnick, Univ. of California, Santa Barbara (United States); Lorenzo König, Liège Univ. (Belgium); Maxwell Millar-Blanchaer, Univ. of California, Santa Barbara (United States); James K. Wallace, Jet Propulsion Lab. (United States); Daniel Echeverri, Niyati Desai, Caltech (United States); Olivier Absil, Liège Univ. (Belgium); Dimitri Mawet, Caltech (United States)

22 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 16B

12680-27

### Metasurface-based scalar vortex phase mask in pursuit of 1e-10 contrast

Author(s): Lorenzo König, Liège Univ. (Belgium); Skyler Palatnick, Univ. of California, Santa Barbara (United States); Niyati Desai, Caltech (United States); Olivier Absil, Liège Univ. (Belgium); Maxwell Millar-Blanchaer, Univ. of California, Santa Barbara (United States); Dimitri Mawet, Caltech (United States)

22 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 16B

### SESSION 8: POLARIZATION ABERRATIONS

22 August 2023 • 2:20 PM - 3:00 PM | Conv. Ctr. Room 16B

Session Chair: Garreth J. Ruane, Jet Propulsion Lab. (United States)

12680-28

### Estimation of polarization aberrations and their effect on the coronagraphic performance for future space telescopes

Author(s): Ramya M. Anche, The Univ. of Arizona (United States); Sebastiaan Y. Haffert, Steward Observatory, The Univ. of Arizona (United States); Jaren N. Ashcraft, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Kyle Van Gorkom, Steward Observatory (United States); Kevin Derby, Wyant College of Optical Sciences, The Univ. of Arizona (United States); Ewan S. Douglas, Steward Observatory (United States); Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States)

22 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 16B

12680-29

### Characterizing the instrumental polarization of SCEXAO VAMPIRES

Author(s): Manxuan Zhang, Maxwell Millar-Blanchaer, Univ. of California, Santa Barbara (United States); Boris Safonov, Sternberg Astronomical Institute, M. V. Lomonosov Moscow State Univ. (Russian Federation); Miles Lucas, Institute for Astronomy, Univ. of Hawai'i (United States); Barnaby Norris, Sydney Institute for Astronomy, The Univ. of Sydney (Australia), Sydney Astrophotonic Instrumentation Lab. (Australia), Australian Astronomical Observatory (Australia); Julien Lozi, Subaru Telescope, NAOJ (United States); Olivier Guyon, Subaru Telescope, NAOJ (United States), Steward Observatory (United States), Wyant College of Optical Sciences, The Univ. of Arizona (United States); Michael Bottom, Institute for Astronomy, Univ. of Hawai'i (United States)

22 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 16B

Coffee Break 3:00 PM - 3:30 PM

### OPTICAL ENGINEERING PLENARY

22 August 2023 • 3:30 PM - 5:35 PM | Conv. Ctr. Room 6A

Session Chairs: Tony Hull, The Univ. of New Mexico (United States) and Daewook Kim, Wyant College of Optical Sciences (United States)

### Welcome and Opening Remarks

22 August 2023 • 3:30 PM - 3:35 PM | Conv. Ctr. Room 6A

12667-501

### Optic technologies enabling fusion ignition at the National Ignition Facility (Plenary Presentation)

Author(s): Tayyab I. Suratwala, Lawrence Livermore National Lab. (United States)

22 August 2023 • 3:35 PM - 4:15 PM | Conv. Ctr. Room 6A

12677-501

### The Habitable Worlds Observatory: progress, future plans, and opportunities for community participation (Plenary Presentation)

Author(s): Julie A. Crooke, NASA (United States)

22 August 2023 • 4:15 PM - 4:55 PM | Conv. Ctr. Room 6A

12677-503

### Enabling the Habitable Worlds Observatory: using systems engineering, integrated modeling and technology development to achieve ultra-stable optical systems (Plenary Presentation)

Author(s): Laura E. Coyle, Ball Aerospace (United States)

22 August 2023 • 4:55 PM - 5:35 PM | Conv. Ctr. Room 6A

## WEDNESDAY 23 AUGUST 2023

### ASTRONOMICAL OPTICS AND INSTRUMENTATION PLENARY

23 August 2023 • 9:15 AM - 10:00 AM | Conv. Ctr. Room 6A

Session Chair: Daewook Kim, Wyant College of Optical Sciences (United States)

### Welcome and Opening Remarks

23 August 2023 • 9:15 AM - 9:20 AM | Conv. Ctr. Room 6A

12677-502

### Lessons from the development and servicing of HST for future astronomy missions (Plenary Presentation)

Author(s): John W. MacKenty, Space Telescope Science Institute (United States)

23 August 2023 • 9:20 AM - 10:00 AM | Conv. Ctr. Room 6A

Coffee Break 10:00 AM - 10:30 AM

# TECHNICAL CONFERENCES

## Conference 12680

### SESSION 9: ROMAN CORONAGRAPH I

23 August 2023 • 10:30 AM - 12:20 PM | Conv. Ctr. Room 16B

Session Chair: Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States)

12680-30

#### Overview and status of the Roman Coronagraph Instrument (*Invited Paper*)

Author(s): Vanessa P. Bailey, Bertrand Mennesson, Feng Zhao, Thomas Luchik, Jet Propulsion Lab. (United States)

23 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 16B

12680-31

#### End-to-end numerical modeling of the Roman Space Telescope Coronagraphic Instrument

Author(s): John E. Krist, John Steeves, Navtej Saini, Brandon Dube, David P. Arndt, Jet Propulsion Lab. (United States)

23 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 16B

12680-32

#### FALCO simulations of high-contrast polarimetry with the Nancy Grace Roman Space Telescope Coronagraph Instrument

Author(s): David S. Doelman, Leiden Observatory (Netherlands), SRON Netherlands Institute for Space Research (Netherlands); Hanae Belaouchi, Institut de Planétologie et d'Astrophysique de Grenoble, Univ. Grenoble Alpes, CNRS (France); A.J. Eldorado Riggs, Bertrand Mennesson, Jet Propulsion Lab., NASA (United States); Mireille Ouellet, Leiden Observatory (Netherlands); Jeroen Rietjens, Henk Hoovers, SRON Netherlands Institute for Space Research (Netherlands); Frans Snik, Leiden Observatory (Netherlands)

23 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 16B

12680-33

#### RST CGI: final verification and calibration of prism and polarizer flight units

Author(s): Tyler D. Groff, Neil Zimmerman, Hari Subedi, John Titus, Dylan Bell, Guangjun Gao, Samuel Gaylin, Nicholas Nicolaeff, NASA Goddard Space Flight Ctr. (United States); Toru Yamada, Japan Aerospace Exploration Agency (Japan); Motohide Tamura, AstroBiology Ctr., NINS (Japan)

23 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 16B

12680-34

#### Flight photon counting camera development for the Roman Space Telescope Coronagraph Instrument

Author(s): Patrick Morrissey, Nathan Bush, Michael Hoenk, Gillian Kyne, Andrew Lamborn, Jocelyn Letona, Jet Propulsion Lab. (United States)

23 August 2023 • 12:00 PM - 12:20 PM | Conv. Ctr. Room 16B

Lunch/Exhibition Break 12:20 PM - 1:50 PM

### SESSION 10: ROMAN CORONAGRAPH II

23 August 2023 • 1:50 PM - 2:30 PM | Conv. Ctr. Room 16B

Session Chair: Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States)

12680-35

#### Multi-star wavefront control at the occulting mask coronagraph testbed: monochromatic laboratory demonstration for the Roman Coronagraph Instrument

Author(s): Dan Sirbu, Ruslan Belikov, NASA Ames Research Ctr. (United States); Eduardo A. Bendek, David Marx, Camilo Mejia Prada, A.J. Eldorado Riggs, Hanying Zhou, Jet Propulsion Lab., Caltech (United States)

23 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 16B

12680-36

#### Simulating the efficacy of the implicit-electric-field-conjugation algorithm for the Roman Coronagraph with noise

Author(s): Kian Milani, Ewan S. Douglas, Sebastiaan Haffert, Kyle van Gorkom, Steward Observatory (United States)

23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 16B

### SESSION 11: STARSHADES

23 August 2023 • 2:30 PM - 3:10 PM | Conv. Ctr. Room 16B

Session Chair: Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States)

12680-37

#### A starshade for NASA's Habitable Worlds Observatory: exoplanet characterization from the UV to the NIR

Author(s): Stuart B. Shaklan, Dylan M. McKeithen, Doug Lisman, Jet Propulsion Lab. (United States)

23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 16B

12680-38

#### Particulate contamination on starshade optical edges

Author(s): Dylan McKeithen, Stuart B. Shaklan, Jet Propulsion Lab. (United States); Joshua Vawdrey, Brigham Young Univ. (United States)

23 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 16B

Coffee Break 3:10 PM - 3:40 PM

### SESSION 12: DEFORMABLE MIRRORS

23 August 2023 • 3:40 PM - 4:20 PM | Conv. Ctr. Room 16B

Session Chair: Garreth J. Ruane, Jet Propulsion Lab. (United States)

12680-39

#### Development of a multiplex application specific integrated circuit driver for deformable mirrors

Author(s): Camilo A. Prada, Chris Shelton, Lewis Roberts, Alex Walter, Jet Propulsion Lab. (United States); Xingtao Wu, Yuqian Wu, Microscale, Inc. (United States)

23 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 16B



12680-40

### First generation parabolic deformable mirror for the ExoSpec project

Author(s): Hari B. Subedi, Tyler Groff, Roser Juanola-Parramon, Scott Will, NASA Goddard Space Flight Ctr. (United States)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 16B

### SESSION 13: FOCAL PLANE WAVEFRONT SENSING AND CONTROL

23 August 2023 • 4:20 PM - 5:20 PM | Conv. Ctr. Room 16B

Session Chair: Garreth J. Ruane, Jet Propulsion Lab. (United States)

12680-41

### Focal plane wavefront control for the Gemini Planet Imager 2.0 calibration system

Author(s): Duan Li, Dmitry Savransky, Cornell Univ. (United States); Christian Marois, William Thompson, NRC-Herzberg Astronomy & Astrophysics, National Research Council Canada (Canada), Univ. of Victoria (Canada)

23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 16B

12680-42

### Experimental comparison of model-free and model-based dark hole algorithms for future space telescopes

Author(s): Niyati Desai, Caltech (United States); Axel Potier, Phillip K. Poon, Garreth Ruane, A.J. Riggs, Matthew Noyes, Camilo Mejia Prada, Jet Propulsion Lab. (United States)

23 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 16B

12680-43

### Revisiting the Borde-Traub focal plane wavefront estimation technique

Author(s): Axel Potier, A.J. Eldorado Riggs, Garreth Ruane, Phillip K. Poon, Matthew Noyes, Greg W. Allan, Alexander Walter, Camilo Mejia Prada, Jet Propulsion Lab. (United States)

23 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 16B

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12680-79

### Apodized vortex coronagraph using homothety AIH: simulation results

Author(s): Chafi Jamal, Youssef El Azhari, Ossama Azagroue, Abdelhadi Jabiri, Zouhair Benkhaldoun, Univ. Cadi Ayyad (Morocco)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-80

### Testbed multi-star wavefront control experiment modeling analysis

Author(s): Hanying Zhou, David Marx, Camilo Prada, Jet Propulsion Lab. (United States); Dan Sirbu, Ruslan Belikov, NASA Ames Research Ctr. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-81

### Roman coronagraph HOWFSC modeling: case study and raw contrast performance prediction

Author(s): Hanying Zhou, Brian D. Kern, Nathan Bush, John E. Krist, Ilya Y. Poberezhskiy, Jet Propulsion Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-82

### Exoplanet detection from starshade images using convolutional neural networks

Author(s): Zahra Ahmed, Simone D'Amico, Stanford Univ. (United States); Renyu Hu, Mario Damiano, Jet Propulsion Laboratory, California Institute of Technology (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-83

### BLOCT: the bifurcated light optical coronagraphic telescope

Author(s): Thomas D. Ditto, 3DeWitt, LLC (United States); Heidi J. Newberg, Leaf A. Swordy, Rensselaer Polytechnic Institute (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-84

### Advances in the control of Si substrates with magnetic smart materials to provide low-power surface control on the sub-nanometer level for space deformable mirrors

Author(s): Daniel Quispe, Melville P. Ulmer, Donald B. Buchholz, Yip-Wah Chung, Jian Cao, Northwestern Univ. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-85

### Achromatizing scalar vortex coronagraphs with radial phase mask dimples

Author(s): Niyati Desai, Arielle Bertrou-Cantou, Jorge Llop-Sayson, Caltech (United States); Garreth Ruane, A.J. Riggs, Eugene Serabyn, Jet Propulsion Lab. (United States); Dimitri Mawet, Caltech (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-86

### Laboratory demonstration of the triple-grating vector vortex coronagraph

Author(s): David S. Doelman, Leiden Observatory (Netherlands), SRON Netherlands Institute for Space Research (Netherlands); Mireille Ouellet, Leiden Observatory (Netherlands); Garreth Ruane, Jet Propulsion Lab., NASA (United States); Sebastiaan Haffert, Kyle Van Gorkom, The Univ. of Arizona (United States); Frans Snik, Leiden Observatory (Netherlands); Axel Potier, Jet Propulsion Lab., NASA (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12680

12680-87

### **Implicit electric field conjugation for improved starlight rejection through a single-mode fiber**

Author(s): Joshua Liberman, Jorge Llop-Sayson, Arielle Bertrou-Cantou, California Institute of Technology (United States); Dimitri Mawet, California Institute of Technology (United States), Jet Propulsion Lab., California Institute of Technology (United States); Niyati Desai, California Institute of Technology (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-88

### **Reflective Lyot-stop low-order wavefront control for future large space telescope coronagraphs**

Author(s): Christopher B. Mendillo, Univ. of Massachusetts Lowell (United States); Jaren N. Ashcraft, Kevin Zhang Derby, Ewan Douglas, Daewook Kim, Jared R. Males, The Univ. of Arizona (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-89

### **Coralign: a software package for coronagraphic alignment and calibration**

Author(s): A.J. Eldorado Riggs, Eric J. Cady, Jet Propulsion Lab. (United States); Michael A. Bertagna, Chapman Univ. (United States); Garreth Ruane, David S. Marx, Samuel P. Halverson, Jet Propulsion Lab. (United States); Samuel Miller, The Univ. of Alabama in Huntsville (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-90

### **Coronagraph survey for future exoplanet direct imaging space missions: interim update**

Author(s): Ruslan Belikov, NASA Ames Research Ctr. (United States); Christopher C. Stark, NASA Goddard Space Flight Ctr. (United States); Pin Chen, Jet Propulsion Lab., NASA (United States); Kevin W. Fogarty, NASA Ames Research Ctr. (United States); Olivier Guyon, The Univ. of Arizona (United States); Roser Juanola-Parramon, NASA Goddard Space Flight Ctr. (United States); John E. Krist, Jet Propulsion Lab., NASA (United States); Dimitri P. Mawet, Caltech (United States); Camilo Mejia Prada, Jet Propulsion Lab., NASA (United States); N. Jeremy Kasdin, Princeton Univ. (United States); Emiel H. Por, Laurent Pueyo, Space Telescope Science Institute (United States); Susan Redmond, Princeton Univ. (United States); Garreth J. Ruane, Jet Propulsion Lab., NASA (United States); Dan Sirbu, NASA Ames Research Ctr. (United States); Rémi Soummer, Space Telescope Science Institute (United States); Karl R. Stapelfeldt, John T. Trauger, Jet Propulsion Lab., NASA (United States); Neil T. Zimmerman, NASA Goddard Space Flight Ctr. (United States); Nick Siegler, Jet Propulsion Lab., NASA (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-91

### **Differential optical transfer function wavefront sensing and pupil calibration with the HiCAT testbed**

Author(s): Meiji M. Nguyen, Emiel H. Por, Ananya Sahoo, Bryony F. Nickson, Raphaël Pourcelot, Space Telescope Science Institute (United States); Iva Laginja, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Laurent Pueyo, Rémi Soummer, Space Telescope Science Institute (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-92

### **High-contrast imager for complex aperture telescopes (HiCAT): 9. Broadband dark zone demonstration with the APLC coronagraph**

Author(s): Ananya Sahoo, Emiel H. Por, Meiji M. Nguyen, Space Telescope Science Institute (United States); Iva Laginja, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris (France); Raphaël Pourcelot, Space Telescope Science Institute (United States); Susan F. Redmond, Princeton Univ. (United States); Bryony Nickson, Space Telescope Science Institute (United States); Sylvain Egron, Iridescence (France); Laurent Pueyo, Marshall D. Perrin, Space Telescope Science Institute (United States); Peter Petrone, NASA Goddard Space Flight Ctr. (United States); Rachel Fox, Space Telescope Science Institute (United States); Marc Ferrari, Lab. d'Astrophysique de Marseille (France); Rob Gontrum, Space Telescope Science Institute (United States); John Hagopian, Advanced NanoPhotonics, Inc. (United States); Mamadou N'Diaye, Observatoire de la Côte d'Azur (France); Anand Sivaramakrishnan, Space Telescope Science Institute (United States); Hari B. Subedi, NASA Goddard Space Flight Ctr. (United States); Sam Weinstock, Scott D. Will, Rémi Soummer, Space Telescope Science Institute (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-93

### **Integrated coronagraphy and wavefront sensing with the PIAACMC**

Author(s): Sebastiaan Y. Haffert, Jared R. Males, Steward Observatory, The Univ. of Arizona (United States); Olivier Guyon, Steward Observatory, The Univ. of Arizona (United States), Wyatt College of Optical Sciences (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-94

### **The diffractive interfero coronagraph exoplanet resolver (DICER)**

Author(s): Heidi Jo Newberg, Leaf Swordy, Rensselaer Polytechnic Institute (United States); Thomas D. Ditto, 3DeWitt, LLC (United States); Richard K. Barry, Goddard Space Flight Center (United States); L. Drake Deming, University of Maryland (United States); Frank Ravizza, Lawrence Livermore National Laboratory (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-95

### **The dispersion leverage coronagraph (DLC): an achromatic nulling coronagraph for use on primary objective grating telescopes**

Author(s): Leaf A. Swordy, Becket Hill, Heidi Jo Newberg, Rensselaer Polytechnic Institute (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-96

### **A new method for the discovery of the distant exoplanets**

Author(s): Peter B. Lerner, Device Consultants (United States); Alex Mayer, University of Namur (Belgium); Thomas E. Sullivan, Temple University (emeritus; deceased) (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-97

### **Antireflection coatings on starshade light-blocking membranes for straylight suppression**

Author(s): David A. Sheikh, ZeCoat Corp. (United States); Siena Lum, Juliet Whitehead, Washington Univ. in St. Louis (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12680-98

### **PRIME project large format near infrared camera for the microlensing events survey**

Author(s): Alexander S. Kutryev, NASA Goddard Space Flight Ctr. (United States); Takahiro Sumi, Osaka Univ. (Japan); Joseph Durbak, Univ. of Maryland, College Park (United States); Giuseppe Cataldo, Dale Fixsen, NASA Goddard Space Flight Ctr. (United States); Yuki Hirao, Osaka Univ. (Japan); Gennadiy Lotkin, BGE Technology (United States); Eric Lyness, Microtel LLC (United States); Steve Maher, Science Systems and Applications, Inc. (United States); Shota Miyazaki, Japan Aerospace Exploration Agency (Japan), Institute of Space and Astronautical Science (Japan); Gregory Mosby, NASA Goddard Space Flight Ctr. (United States); Samuel Moseley, ADNET Systems, Inc. (United States); Elmer Sharp, NASA Goddard Space Flight Ctr. (United States); Daisuke Suzuki, Osaka University (Japan)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

### SESSION 14: CORONAGRAPH TESTBEDS AND RESULTS I

24 August 2023 • 9:00 AM - 12:10 PM | Conv. Ctr. Room 11A

Session Chair: Tyler D. Groff,  
NASA Goddard Space Flight Ctr. (United States)

12680-44

### **The decadal survey testbed 2 commissioning report**

Author(s): Matthew R. Noyes, Greg W. Allan, Alex Walter, Garreth Ruane, A.J. El Dorado Riggs, Jet Propulsion Lab. (United States)  
24 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 11A

12680-45

### **Dual purpose Lyot coronagraph masks for simultaneous high-contrast imaging and high-resolution wavefront sensing**

Author(s): Garreth J. Ruane, J. Kent Wallace, Tobias S. Wenger, Camilo Mejia Prada, Nasrat A. Raouf, A.J. Eldorado Riggs, Mahmood Bagheri, Jeffrey B. Jewell, Gregory W. Allan, Matthew R. Noyes, Alexander B. Walter, Jet Propulsion Lab. (United States)  
24 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 11A

12680-46

### **Demonstration of coronagraph technology for high-contrast point spectroscopy of ExoEarths**

Author(s): Gregory W. Allan, A.J. E. Riggs, Garreth Ruane, Camilo Mejia Prada, Matthew Noyes, Phillip K. Poon, Jet Propulsion Lab., Caltech (United States); Nemanja Jovanovic, Jorge D. Llop-Sayson, Caltech (United States); Carl Coker, Northrop Grumman Corp. (United States); Christopher C. Stark, NASA Goddard Space Flight Ctr. (United States); Bertrand Mennesson, Jet Propulsion Lab., Caltech (United States); Dimitri Mawet, Caltech (United States)  
24 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 11A

12680-47

### **Microfabricated pinholes for high contrast imaging testbeds**

Author(s): Emory L. Jenkins, The Univ. of Arizona (United States)  
24 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 11A

Coffee Break 10:20 AM - 10:50 AM

12680-48

### **Experimental results of an apodized vortex coronagraph using carbon nanotubes**

Author(s): Arielle Bertrou-Cantou, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Jorge Llop-Sayson, Joshua Liberman, Dimitri Mawet, Caltech (United States)  
24 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 11A

12680-49

### **Broadband wavefront control experiments with a single mode fiber**

Author(s): Jorge Llop-Sayson, Arielle Bertrou-Cantou, Joshua Liberman, Dimitri Mawet, Caltech (United States)  
24 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 11A

12680-50

### **Broadband performance of the PAPLC coronagraph on the HiCAT testbed**

Author(s): Emiel H. Por, Raphaël Pourcelot, Ananya Sahoo, Meiji M. Nguyen, Bryony F. Nickson, Space Telescope Science Institute (United States); Alex Klein, Johns Hopkins Univ. (United States); Peter Petrone, Space Telescope Science Institute (United States); Iva Laginja, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris (France); Laurent Pueyo, Rémi Soummer, Space Telescope Science Institute (United States)  
24 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 11A

12680-51

### **High-contrast Jacobian-free wavefront control: simulations, experimental results, and extensions to adaptive control**

Author(s): Scott D. Will, Tyler D. Groff, Hari B. Subedi, NASA Goddard Space Flight Ctr. (United States); Rémi Soummer, Space Telescope Science Institute (United States); Roser Juanola-Parramon, Neil T. Zimmerman, NASA Goddard Space Flight Ctr. (United States); Emiel H. Por, Laurent Pueyo, Marshall D. Perrin, Space Telescope Science Institute (United States); Christopher C. Stark, Michael W. McElwain, NASA Goddard Space Flight Ctr. (United States)  
24 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 11A

Lunch/Exhibition Break 12:10 PM - 1:40 PM

# TECHNICAL CONFERENCES

## Conference 12680

### SESSION 15: CORONAGRAPH TESTBEDS AND RESULTS II

24 August 2023 • 1:40 PM - 2:20 PM | Conv. Ctr. Room 11A  
Session Chair: Stuart B. Shaklan, Jet Propulsion Lab. (United States)

12680-52

#### High-contrast imager for complex aperture telescopes (HiCAT): 10. Broadband Zernike wavefront sensor under natural and artificial drifts

Author(s): Raphaël Pourcelot, Emiel H. Por, Space Telescope Science Institute (United States); Mamadou N'Diaye, Benjamin Buralli, Observatoire de la Côte d'Azur (France); Marcel Carbillat, Observatoire de la Côte d'Azur (France); Kjetil Dohlen, Lab. d'Astrophysique de Marseille (France); Sylvain Egron, Iridescence (France); Marc Ferrari, Lab. d'Astrophysique de Marseille (France); Rachel Fox, Johns Hopkins Univ. (United States); Rob Gontrum, Space Telescope Science Institute (United States); Iva Luginja, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Meiji M. Nguyen, Bryony Nickson, Marshall D. Perrin, Peter Petrone, Laurent Pueyo, Space Telescope Science Institute (United States); Susan F. Redmond, Princeton Univ. (United States); Ananya Sahoo, Anand Sivaramakrishnan, Space Telescope Science Institute (United States); Hari B. Subedi, NASA Goddard Space Flight Ctr. (United States); Sam Weinstock, Space Telescope Science Institute (United States); Scott D. Will, NASA Goddard Space Flight Ctr. (United States); Rémi Soummer, Space Telescope Science Institute (United States); John G. Hagopian, Advanced NanoPhotonics LLC (United States), Lambda Consulting LLC (United States)

24 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 11A

12680-53

#### Demonstration of spectral linear dark field control on NASA's high contrast imaging testbeds

Author(s): Phillip K. Poon, Axel Potier, Garreth Ruane, A.J. E. Riggs, Alex B. Walter, Matthew Noyes, Jet Propulsion Lab., NASA (United States); Kyohoon Ahn, Subaru Telescope, NAOJ (United States); Olivier Guyon, Subaru Telescope, NAOJ (United States), Steward Observatory, The Univ. of Arizona (United States)

24 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 11A

### SESSION 16: FUTURE SPACE MISSIONS

24 August 2023 • 2:20 PM - 5:10 PM | Conv. Ctr. Room 11A  
Session Chair: Stuart B. Shaklan, Jet Propulsion Lab. (United States)

12680-54

#### Overview of NASA's astrometry testbeds for exoplanet detection around single and binary star systems

Author(s): Eduardo A. Bendek, Matt Noyes, Alex Walter, Olivier Guyon, Jet Propulsion Lab. (United States); Peter Tuthill, The Univ. of Sydney (Australia); Ruslan Belikov, Dan Sirbu, NASA Ames Research Ctr. (United States); Gautam Vasishet, Camilo Mejia Prada, Jet Propulsion Lab. (United States)

24 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 11A

12680-55

#### Performance of the active wide-field sky simulator in JPL's astrometry testbed

Author(s): Alex B. Walter, Eduardo A. Bendek, Matthew Noyes, Jet Propulsion Lab., Caltech (United States)

24 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 11A

Coffee Break 3:00 PM - 3:30 PM

12680-56

#### The inner working angle you need to detect ocean glints with HabWorlds

Author(s): Maxwell A. Millar-Blanchaer, Univ. of California, Santa Barbara (United States); Sophia R. Vaughan, Univ. of Oxford (United Kingdom); Kimberly Bott, Univ. of California, Riverside (United States); Sarah L. Casewell, Univ. of Leicester (United Kingdom); Nicolas B. Cowan, McGill Univ. (Canada); David S. Doelman, Leiden Observatory (Netherlands); Timothy D. Gebhard, Max-Planck-Institut für Intelligente Systeme (Switzerland); Matthew Kenworthy, Leiden Observatory (Netherlands); Johan Mazoyer, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France)

24 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 11A

12680-57

#### Quantifying the impacts of schedulability on science yield of exoplanet imaging missions

Author(s): Dmitry Savransky, Cornell Univ. (United States); Rhonda Morgan, Michael Turmon, Mario Damiano, Jet Propulsion Lab. (United States); Jackson Kulik, Corey Spohn, Grace Genszler, Cornell Univ. (United States)

24 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 11A

12680-58

#### Exo-Earth yield of a 6 m space telescope in the near-infrared and near-ultraviolet

Author(s): Rhonda M. Morgan, Jet Propulsion Lab. (United States); Dmitry Savransky, Cornell Univ. (United States); Mario Damiano, Renyu Hu, Bertrand Mennesson, Eric Mamajek, Karl Stapelfeldt, Michael J. Turmon, Jet Propulsion Lab. (United States); Tyler Robinson, The Univ. of Arizona (United States)

24 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 11A

12680-59

#### Integrated active control of coronagraph and telescope for high contrast imaging

Author(s): David C. Redding, Erkin Sidick, John Lou, Scott Basinger, Jet Propulsion Lab. (United States); Michael Rodgers, Jet Propulsion Lab. (United States), Synopsys, Inc. (United States); Brandon Dube, Jet Propulsion Lab. (United States)

24 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 11A

12680-60

#### Evaluating embedded hardware for high-order wavefront sensing and control

Author(s): Nicholas Belsten, Massachusetts Institute of Technology (United States); Kian Milani, The Univ. of Arizona (United States); Leonid Pogorelyuk, Massachusetts Institute of Technology (United States); Shanti Rao, Independent Researcher (United States); Ewan S. Douglas, The Univ. of Arizona (United States); Kerri Cahoy, Massachusetts Institute of Technology (United States)

24 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 11A

## Conference 12681

# Ultrafast Nonlinear Imaging and Spectroscopy XI

20 - 21 August 2023 | Conv. Ctr. Room 18

Conference Chairs: **Zhiwen Liu**, The Pennsylvania State Univ. (United States); **Demetri Psaltis**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Kebin Shi**, Peking Univ. (China)

Program Committee: **Randy A. Bartels**, Colorado State Univ. (United States); **Martin Centurion**, Univ. of Nebraska-Lincoln (United States); **Jason M. Eichenholz**, Lumina Technologies, Inc. (United States); **Kenan Gundogdu**, North Carolina State Univ. (United States); **Hans D. Hallen**, North Carolina State Univ. (United States); **Iam Choon Khoo**, The Pennsylvania State Univ. (United States); **Michelle Y. Sander**, Boston Univ. (United States); **Jigang Wang**, Iowa State Univ. of Science and Technology (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: ULTRAFAST NONLINEAR IMAGING

20 August 2023 • 8:40 AM - 10:45 AM | Conv. Ctr. Room 18

Session Chair: Hans D. Hallen,  
North Carolina State Univ. (United States)

12681-2

#### **Super-resolution imaging from ultrafast Fourier transform nonlinear optical microscopy** (*Invited Paper*)

Author(s): Kenneth L. Knappenberger, The Pennsylvania State Univ. (United States)

20 August 2023 • 8:40 AM - 9:05 AM | Conv. Ctr. Room 18

12681-3

#### **Rapid hyperspectral mid-IR imaging with non-degenerate two-photon absorption** (*Invited Paper*)

Author(s): Eric O. Potma, David Knez, Dmitry A. Fishman, Univ. of California, Irvine (United States)

20 August 2023 • 9:05 AM - 9:30 AM | Conv. Ctr. Room 18

12681-4

#### **Multi-dimensional widefield infrared-encoded spontaneous emission microscopy: distinguishing chromophores by ultrashort infrared pulses** (*Invited Paper*)

Author(s): Chang Yan, Wei Xiong, Univ. of California, San Diego (United States)

20 August 2023 • 9:30 AM - 9:55 AM | Conv. Ctr. Room 18

12681-5

#### **Harnessing the power of coherent computational microscopy to image ultrafast nonlinear dynamics** (*Invited Paper*)

Author(s): Daniel Adams, Jonathan Barolak, David Goldberger, Bojana Ivanic, Christopher Car, Charles Durfee, Jeff A. Squier, Colorado School of Mines (United States)

20 August 2023 • 9:55 AM - 10:20 AM | Conv. Ctr. Room 18

12681-6

#### **On the use of non-linear microscopy methods to observe and identify ultrafast laser-induced functional modifications of materials** (*Invited Paper*)

Author(s): Yves Bellouard, Olivier Bernard, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Jeff A. Squier, Colorado School of Mines (United States)

20 August 2023 • 10:20 AM - 10:45 AM | Conv. Ctr. Room 18

#### Coffee Break 10:45 AM - 11:10 AM

#### SESSION 2: NANOSCALE PHENOMENA

20 August 2023 • 11:10 AM - 12:15 PM | Conv. Ctr. Room 18

Session Chair: Eric O. Potma,  
Univ. of California, Irvine (United States)

12681-7

#### **Superfluorescence in microrods and microfibers** (*Invited Paper*)

Author(s): Shuang Fang Lim, Rene Ganoë, Hans D. Hallen, North Carolina State Univ. (United States); Kai Huang, Gang Han, Univ. of Massachusetts Chan Medical School (United States)

20 August 2023 • 11:10 AM - 11:35 AM | Conv. Ctr. Room 18

12681-8

#### **Robust, reversible electron quantum level transitions in single crystal nanoparticles under uniaxial pressure** (*Invited Paper*)

Author(s): Eunseong Jun, Shuang Fang Lim, Hans D. Hallen, North Carolina State Univ. (United States)

20 August 2023 • 11:35 AM - 12:00 PM | Conv. Ctr. Room 18

12681-9

#### **A multimodal optical characterization of monolayer WS<sub>2</sub>**

Author(s): Landon Hernandez, Da Zhou, William T. Murray, The Pennsylvania State Univ. (United States); Hans D. Hallen, North Carolina State Univ. (United States); Zhiwen Liu, The Pennsylvania State Univ. (United States)

20 August 2023 • 12:00 PM - 12:15 PM | Conv. Ctr. Room 18

#### Lunch Break 12:15 PM - 1:45 PM

#### SESSION 3: ULTRAFAST NONLINEAR SPECTROSCOPY

20 August 2023 • 1:45 PM - 3:30 PM | Conv. Ctr. Room 18

Session Chair: Lingyan Shi,  
Univ. of California, San Diego (United States)

12681-10

#### **Understanding the critical conditions for superfluorescence in lead halide perovskites** (*Invited Paper*)

Author(s): Kenan Gundogdu, North Carolina State Univ. (United States)

20 August 2023 • 1:45 PM - 2:10 PM | Conv. Ctr. Room 18

# TECHNICAL CONFERENCES

## Conference 12681

12681-11

### Environmental ionic-strength sensing using donor-linker-acceptor construct: from single-molecule to ensemble studies (*Invited Paper*)

Author(s): Clint McCue, Sarah A. Mersch, Erin D. Sheets, Ahmed A. Heikal, Univ. of Minnesota Duluth (United States)

20 August 2023 • 2:10 PM - 2:35 PM | Conv. Ctr. Room 18

12681-12

### Coherence transfer and rotation-to-vibration energy transfer among CO<sub>2</sub> super-rotors (*Invited Paper*)

Author(s): Christopher Kliewer, Sandia National Labs. (United States)

20 August 2023 • 2:35 PM - 3:00 PM | Conv. Ctr. Room 18

12681-13

### Harmonic Light Scattering probes the formation of defects during the fast crystallization of ZIF-8

Author(s): Ahmet Dok, Yovan de Coene, Olivier Deschaume, Carmen Bartic, Eric Breynaert, Christine Kirschhock, Koen Clays, KU Leuven (Belgium); Monique A. van der Veen, Technische Univ. Delft (Netherlands); Thierry Verbiest, Stijn J. van Cleuvenbergen, KU Leuven (Belgium)

20 August 2023 • 3:00 PM - 3:15 PM | Conv. Ctr. Room 18

12681-36

### All-optical control of coherent phonons in the candidate type-II Weyl semimetal WTe<sub>2</sub>

Author(s): Sergio I. Rey, Martin J. Cross, Malte L. Welsch, Tobias Buchmann, Binbin Zhou, Peter Uhd Jepsen, Edmund J. R. Kelleher, Technical Univ. of Denmark (Denmark)

20 August 2023 • 3:15 PM - 3:30 PM | Conv. Ctr. Room 18

Coffee Break 3:30 PM - 4:00 PM

#### SESSION 4: NOVEL VIBRATIONAL IMAGING/SPECTROSCOPY TECHNIQUES AND APPLICATIONS

20 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 18

Session Chair: Christopher Kliewer, Sandia National Labs. (United States)

12681-14

### Super resolution multimodal microscopy for studying spatially correlated metabolism in aging and diseases (*Invited Paper*)

Author(s): Hongje Jang, Zhi Li, Yajuan Li, Pegah Bagheri, Zhenxing Fu, Kevin King, Univ. of California, San Diego (United States); Ellen Ackerstaff, Jason A. Koutcher, Memorial Sloan-Kettering Cancer Ctr. (United States); Lingyan Shi, Univ. of California, San Diego (United States)

20 August 2023 • 4:00 PM - 4:25 PM | Conv. Ctr. Room 18

12681-15

### Temporal characterization of mid-infrared photothermal signals at aqueous interfaces (*Invited Paper*)

Author(s): Panagis D. Samolis, Michelle Y. Sander, Boston Univ. (United States)

20 August 2023 • 4:25 PM - 4:50 PM | Conv. Ctr. Room 18

12681-16

### High speed multiplex SRS microscopy for biomedical studies (*Invited Paper*)

Author(s): Lingyan Shi, Univ. of California, San Diego (United States)

20 August 2023 • 4:50 PM - 5:15 PM | Conv. Ctr. Room 18

12681-17

### Cell viability studies of HIV- infected TZM-bl cells using Raman microscopy

Author(s): Setumo Lebogang S. Thobakgale, Lungile Thwala, Saturnin Ombinda-Lemboumba, Patience T. Mthunzi-Kufa, CSIR Photonics Ctr. (South Africa)

20 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 18

#### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

#### MONDAY 21 AUGUST 2023

#### SESSION 5: NOVEL ULTRAFAST/NONLINEAR DEVICES AND TECHNIQUES

21 August 2023 • 8:00 AM - 9:05 AM | Conv. Ctr. Room 18

Session Chair: Ye Pu, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

12681-18

### Dispersive effects in ultrafast non-linear phenomena (*Invited Paper*)

Author(s): Zhanybek Alpichshev, Dusan Lorenc, Institute of Science and Technology Austria (Austria)

21 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 18

12681-19

### **Tunable stimulated Brillouin interactions with guided and surface acoustic waves** (*Invited Paper*)

Author(s): William Renninger, The Institute of Optics, Univ. of Rochester (United States)

21 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 18

12681-20

### **High repetition rate supercontinuum generation in undoped KGW and YVO4 crystals**

Author(s): Vaida Marciulionyte, Jonas Banys, Julius Vengelis, Robertas Grigutis, Gintaras Tamošauskas, Audrius Dubietis, Vilnius Univ. (Lithuania)

21 August 2023 • 8:50 AM - 9:05 AM | Conv. Ctr. Room 18

#### **SESSION 6: MACHINE LEARNING IN NONLINEAR OPTICS**

21 August 2023 • 9:05 AM - 10:20 AM | Conv. Ctr. Room 18

Session Chair: William Renninger, The Institute of Optics, Univ. of Rochester (United States)

12681-21

### **Reservoir computing with optofluidic nonlinearity and short-term memory** (*Invited Paper*)

Author(s): Chengkuan Gao, Prabhav Gaur, Shimon Rubin, Yeshaiahu Fainman, Univ. of California, San Diego (United States)

21 August 2023 • 9:05 AM - 9:30 AM | Conv. Ctr. Room 18

12681-22

### **Ultrafast pulse retrieval with one-shot unsupervised deep learning** (*Invited Paper*)

Author(s): Jesse W. Wilson, Colorado State Univ. (United States)

21 August 2023 • 9:30 AM - 9:55 AM | Conv. Ctr. Room 18

12681-23

### **Nonlinear optical computing using multiple linear scattering** (*Invited Paper*)

Author(s): Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

21 August 2023 • 9:55 AM - 10:20 AM | Conv. Ctr. Room 18

Coffee Break 10:20 AM - 10:50 AM

#### **SESSION 7: SFG/SHG SPECTROSCOPY AND IMAGING**

21 August 2023 • 10:50 AM - 12:20 PM | Conv. Ctr. Room 18

Session Chair: Jesse W. Wilson, Colorado State Univ. (United States)

12681-24

### **Generalized Analytical and Numerical Modeling of Optical Second Harmonic Generation in Anisotropic Crystals and Complex Heterostructures Using #SHAARP Package** (*Invited Paper*)

Author(s): Rui Zu, Bo Wang, Jingyang He, Lincoln Weber, Jianjun Wang, Long-Qing Chen, Venkatraman Gopalan, The Pennsylvania State Univ. (United States)

21 August 2023 • 10:50 AM - 11:15 AM | Conv. Ctr. Room 18

12681-25

### **Probing liquid/liquid interfaces at and away from equilibrium using vibrational sum frequency generation** (*Invited Paper*)

Author(s): Benjamin Doughty, Uvinduni I. Premadasa, Lu Lin, Ying-Zhong Ma, Robert L. Sacci, Vera Bocharova, Nikki A. Thiele, Oak Ridge National Lab. (United States)

21 August 2023 • 11:15 AM - 11:40 AM | Conv. Ctr. Room 18

12681-26

### **Wide-field three-dimensional holographic microscopy with plasmon-enhanced second harmonic radiation imaging probes** (*Invited Paper*)

Author(s): Ye Pu, Amirhossein Saba, Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

21 August 2023 • 11:40 AM - 12:05 PM | Conv. Ctr. Room 18

12681-27

### **Label-free imaging of cellular activity through second-harmonic generation**

Author(s): Yovan de Coene, Carmen Bartic, Koen Clays, Thierry Verbiest, Stijn Jooker, Stijn J. van Cleuvenbergen, Pieter Vanden Berghe, KU Leuven (Belgium)

21 August 2023 • 12:05 PM - 12:20 PM | Conv. Ctr. Room 18

Lunch Break 12:20 PM - 2:00 PM

#### **SESSION 8: ULTRAFAST ELECTRON DIFFRACTION AND IMAGING**

21 August 2023 • 2:00 PM - 2:50 PM | Conv. Ctr. Room 18

Session Chair: Xingjie Ni,  
The Pennsylvania State Univ. (United States)

12681-28

### **Laser control of isolated molecules for 3D imaging with atomic resolution** (*Invited Paper*)

Author(s): Martin Centurion, Univ. of Nebraska-Lincoln (United States)

21 August 2023 • 2:00 PM - 2:25 PM | Conv. Ctr. Room 18

12681-29

### **Coulomb explosion imaging: a robust method for distinguishing molecular structures and tracking structural changes in photochemical reactions** (*Invited Paper*)

Author(s): Huynh Van Sa Lam, Kansas State Univ. (United States)

21 August 2023 • 2:25 PM - 2:50 PM | Conv. Ctr. Room 18

Coffee Break 2:50 PM - 3:20 PM

# TECHNICAL CONFERENCES

## Conference 12681

### SESSION 9: ADVANCED IMAGING TECHNOLOGIES

21 August 2023 • 3:20 PM - 5:00 PM | Conv. Ctr. Room 18

Session Chair: Zhiwen Liu,  
The Pennsylvania State Univ. (United States)

12681-30

#### **Single-shot compressed ultrahigh-speed imaging for fast wide-field upconversion luminescence lifetime thermometry** (*Invited Paper*)

Author(s): Jinyang Liang, Institut National de la Recherche Scientifique, Univ. du Québec à Montréal (Canada)

21 August 2023 • 3:20 PM - 3:45 PM | Conv. Ctr. Room 18

12681-31

#### **Multi-dimensional snapshot imaging with encoding metasurfaces** (*Invited Paper*)

Author(s): Xingjie Ni, Lidan Zhang, Chen Zhou, Yimin Ding, Hyun-Ju Ahn, Shengyuan Chang, Yao Duan, Xi Chen, Md Tarek Rahman, Tunan Xia, Cheng-Yu Wang, Zhiwen Liu, The Pennsylvania State Univ. (United States)

21 August 2023 • 3:45 PM - 4:10 PM | Conv. Ctr. Room 18

12681-32

#### **Computational 3D fluorescence lifetime imaging microscopy** (*Invited Paper*)

Author(s): Liang Gao, UCLA Samueli School of Engineering (United States)

21 August 2023 • 4:10 PM - 4:35 PM | Conv. Ctr. Room 18

12681-33

#### **Spatial frequency modulation imaging (SPIFI): an optical metrology tool for measuring ultrafast dynamics to thermodynamics** (*Invited Paper*)

Author(s): Jeffrey A. Squier, Seth Cottrell, Scott Hunter, Daniel Scarbrough, Anna Thomas, Colorado School of Mines (United States); Randy A. Bartels, Colorado State Univ. (United States)

21 August 2023 • 4:35 PM - 5:00 PM | Conv. Ctr. Room 18

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12681-34

#### **A novel benchtop multimodal optical setup for synergistic crystallization dynamics of poly-3-hexylthiophene**

Author(s): Karen Aerts, Thierry Verbiest, Yovan de Coene, Guy Koeckelberghs, KU Leuven (Belgium)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12681-35

#### **Ultrafast imaging using spatiotemporal encoding and deep learning**

Author(s): Chen Zhou, Lidan Zhang, Tunan Xia, Cheng-Yu Wang, Xingjie Ni, Zhiwen Liu, The Pennsylvania State Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A



## Conference 12682

# Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XVII

20 August 2023 | Conv. Ctr. Room 11A

Conference Chairs: **Shizhuo Yin**, The Pennsylvania State Univ. (United States); **Ruyan Guo**, The Univ. of Texas at San Antonio (United States)

Program Committee: **Manmohan D. Aggarwal**, Alabama A&M Univ. (United States); **Partha P. Banerjee**, Univ. of Dayton (United States); **Liangcai Cao**, Tsinghua Univ. (China); **Amol Choudhary**, Indian Institute of Technology Delhi (India); **Abdalla M. Darwish**, Dillard Univ. (United States); **Ken-Yuh Hsu**, National Yang Ming Chiao Tung Univ. (Taiwan); **Carl M. Liebig**, Air Force Research Lab. (United States); **Paul B. Ruffin**, Alabama A&M Univ. (United States); **Narsingh B. Singh**, Univ. of Maryland, Baltimore County (United States); **Wei-Hung Su**, National Sun Yat-sen Univ. (Taiwan); **Ching-Cherng Sun**, National Central Univ. (Taiwan); **Jun Zhang**, DEVCOM Army Research Lab. (United States); **Xiang Zhang**, Univ. of California, Berkeley (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: MATERIALS AND PROPERTIES I

20 August 2023 • 8:30 AM - 9:40 AM | Conv. Ctr. Room 11A

Session Chairs: Abdalla M. Darwish, Dillard Univ. (United States),  
Ruyan Guo, The Univ. of Texas at San Antonio (United States)

12682-1

#### **PT-symmetry-breaking optical limiters** (*Invited Paper*)

Author(s): Andrey A. Chabanov, The Univ. of Texas at San Antonio (United States); Rodion Kononchuk, The Univ. of Texas at San Antonio (United States), Wesleyan Univ. (United States); Suwun Suwunnarat, Tsampikos Kottos, Wesleyan Univ. (United States); Igor Anisimov, Ilya Vitebskiy, Air Force Research Lab. (United States); Stefano Cavalieri, Federico Tommasi, Univ. degli Studi di Firenze (Italy); Alice Boschetti, Francesco Riboli, Diederik S. Wiersma, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

20 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 11A

12682-3

#### **Integrated-optic chromatic dispersion slope compensator with wide operational bandwidth**

Author(s): Koichi Takiguchi, Ritsumeikan Univ. (Japan)

20 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 11A

12682-4

#### **Removal of negative-first-order diffraction of a VHOE of limited thickness**

Author(s): Chi Sun, National Taiwan Univ. (Taiwan); Chih-Yuan Cheng, Chung-Kuan Lin, National Central Univ. (Taiwan); Shiuian-Huei Lin, National Yang Ming Chiao Tung Univ. (Taiwan); Yeh-Wei Yu, Tsung-Hsun Yang, Ching-Cherng Sun, National Central Univ. (Taiwan)

20 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 11A

Coffee Break 9:40 AM - 10:10 AM

#### SESSION 2: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: MATERIALS AND PROPERTIES II

20 August 2023 • 10:10 AM - 11:40 AM | Conv. Ctr. Room 11A

Session Chairs: Partha P. Banerjee, Univ. of Dayton (United States),  
Ruyan Guo, The Univ. of Texas at San Antonio (United States)

12682-5

#### **Ultraviolet spectrum downshifting in polymer nanocomposite films for the enhancement of optoelectronic devices** (*Invited Paper*)

Author(s): Abdalla M. Darwish, Dillard Univ. (United States); Sergey S. Sarkisov, SSS Optical Technologies, LLC (United States); Darayas N. Patel, Oakwood Univ. (United States); Brandon Grayol, Anja Hirbljan, Dillard Univ. (United States); Brent Koplitz, Tulane Univ. (United States); Brent Koplitz, Tulane University (United States)

20 August 2023 • 10:10 AM - 10:40 AM | Conv. Ctr. Room 11A

12682-7

#### **Passive polarization filtering in negative curvature hollow-core fibers**

Author(s): Muhammed Zain Siddiqui, Bilkent Univ. (Turkey); Ahmet Emin Akosman, Roger Williams Univ. (United States); Mustafa Ordu, Bilkent Univ. (Turkey)

20 August 2023 • 10:40 AM - 11:00 AM | Conv. Ctr. Room 11A

12682-8

#### **Inline photonic curing of inkjet printed cobalt ferrite-barium titanate nanocomposites**

Author(s): William P. Flynn, Sean Garnsey, Maria Basurto Armijo, Amar S. Bhalla, Ruyan Guo, The Univ. of Texas at San Antonio (United States)

20 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 11A

12682-9

#### **In-situ reactive inkjet synthesis of Zinc Oxide nanostructures processed via UV irradiation**

Author(s): Sean Garnsey, William P. Flynn, Amar S. Bhalla, Ruyan Guo, The Univ. of Texas at San Antonio (United States)

20 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 11A

Lunch Break 11:40 AM - 1:30 PM

# TECHNICAL CONFERENCES

## Conference 12682

### SESSION 3: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: DEVICES AND APPLICATIONS I

20 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 11A  
Session Chair: Paul B. Ruffin, Alabama A&M Univ. (United States)

12682-10

#### Zoomable lensless digital holographic microscope using volume holographic optical waveguides (*Invited Paper*)

Author(s): Yeh-Wei Yu, Pin-duan Huang, Wen-Li Wang, Ching-Cherng Sun, National Central Univ. (Taiwan)

20 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 11A

12682-11

#### Efficiency coefficient of holographic data storage system

Author(s): Yeh-Wei Yu, Ching-Cherng Sun, Pin-duan Huang, Tsung-Hsun Yang, National Central Univ. (Taiwan)

20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 11A

12682-12

#### Erbium doped fibers for improved radiation resistance

Author(s): Woohong R. Kim, Colin Baker, Shyam Bayya, U.S. Naval Research Lab. (United States); Tony Zhou, Univ. Research Foundation (United States); Daniel L. Rhonehouse, U.S. Naval Research Lab. (United States); Fred Kung, Geoffrey D. Chin, Univ. Research Foundation (United States); Bryan Sadowski, Joseph Friebele, Jacobs Engineering Group Inc. (United States); Jasbinder S. Sanghera, U.S. Naval Research Lab. (United States)

20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 11A

12682-13

#### Color near-eye display with dual-layer volume holographic light-guide

Author(s): Wen-Kai Lin, Wei-Chia Su, National Changhua Univ. of Education (Taiwan); Shao-Kui Zhou, National Yang Ming Chiao Tung Univ. (Taiwan), National Changhua Univ. of Education (Taiwan); Xiao-Ching Lin, Yuan-Yan Liang, National Changhua Univ. of Education (Taiwan); Ching-Cherng Sun, National Central Univ. (Taiwan)

20 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 11A

Coffee Break 3:00 PM - 3:30 PM

### SESSION 4: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: DEVICES AND APPLICATIONS II

20 August 2023 • 3:30 PM - 4:50 PM | Conv. Ctr. Room 11A  
Session Chairs: Ching-Cherng Sun, National Central Univ. (Taiwan), Wei-Hung Su, National Sun Yat-sen Univ. (Taiwan)

12682-15

#### Study of the high-speed imaging communication system

Author(s): Pin-duan Huang, Ruey-Yi Wei, Chih-Wei Huang, Chii-Chang Chen, Tsung-Hsun Yang, Yeh-Wei Yu, Ching-Cherng Sun, National Central Univ. (Taiwan)

20 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 11A

12682-16

#### Color drifts due to dispersion of VHOEs in MR displays

Author(s): Wan-Jhen Wu, Yu-Chien Wang, National Central Univ. (Taiwan); Wen-Kai Lin, National Changhua Univ. of Education (Taiwan); Tsung-Hsun Yang, Yeh-Wei Yu, National Central Univ. (Taiwan); Wei-Chia Su, National Changhua Univ. of Education (Taiwan); Ching-Cherng Sun, National Central Univ. (Taiwan), National Yang Ming Chiao Tung Univ. (Taiwan)

20 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 11A

12682-17

#### Recent advance of high speed, high transmittance KTN deflectors for femtosecond laser beam steering

Author(s): Shizhuo Yin, The Pennsylvania State Univ. (United States)

20 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 11A

12682-18

#### Modelling color breaking in a holographic-optical-element based augmented reality display: effects on waveguide thickness

Author(s): Zih-Fan Chen, Shiuan-Huei Lin, Vera Marinova, Ken Y. Hsu, National Yang Ming Chiao Tung Univ. (Taiwan)

20 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 11A

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12682-20

#### Phase transition induced color shift of vanadium oxide thin films on glass substrate prepared by sputtering

Author(s): Byeongdae Choi, Soo-keun Lee, Sanghun Yun, Bunyod Allabergenov, DGIST (Republic of Korea)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-21

#### Expanded FOV in Maxwellian-view display based on volume holographic light-guide

Author(s): Wen-Kai Lin, Wei-Chia Su, National Changhua Univ. of Education (Taiwan); Shao-Kui Zhou, National Yang Ming Chiao Tung Univ. (Taiwan), National Changhua Univ. of Education (Taiwan); Yuan-Yan Liang, National Changhua Univ. of Education (Taiwan); Ching-Cherng Sun, National Central Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-22

#### Analysis of surface relief grating waveguide based on finite element method

Author(s): Fu-Li Hsiao, Pin-Chieh Chen, Yi-Xiang Peng, Wei-Chia Su, Wen-Kai Lin, National Changhua Univ. of Education (Taiwan); Ying-Pin Tsai, National Yang Ming Chiao Tung Univ. (Taiwan), National Changhua Univ. of Education (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-24

#### The moderating effect of flexible curved radius gratings to vergence-accommodation conflict in near-eye display system

Author(s): Tong Shen, Yourong Liu, Jihong Zheng, Univ. of Shanghai for Science and Technology (China)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-25

#### Error-controlled decoding in phase unwrapping for phase-shifting projected fringe profilometry

Author(s): Wei-Hung Su, Pei-Chi Li, Sih-Yue Chen, National Sun Yat-sen Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-26

#### 3D profile measurements using 2D fringe projections in the tele-centric system

Author(s): Wei-Hung Su, Zhi-Hsiang Liu, National Sun Yat-sen Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-27

#### Phase-shifting projected fringe profilometry using the pulsed phase-encoding algorithm

Author(s): Ching-Cherng Sun, Yeh-Wei Yu, National Central Univ. (Taiwan); Wei-Hung Su, National Sun Yat-sen Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-28

#### 3D profile measurements by coaxial fringe projections and image acquisitions

Author(s): Nai-Jen Cheng, Hsin-Jen Hsu, National Kaohsiung Univ. of Science and Technology (Taiwan); Wei-Hung Su, National Sun Yat-sen Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-29

#### Tunable pressure sensor based on two-dimensional silicon photonic crystal

Author(s): Varnam Sherawat, Renuka Bokolia, Ravindra Kumar Sinha, Delhi Technological Univ. (India)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-31

#### Geometric phase device writing on a nematic LC cell by using polarization holography

Author(s): Chau Nguyen Hong Minh, Stefan Petrov, National Yang Ming Chiao Tung Univ. (Taiwan); Vera Marinova, Bulgarian Academy of Sciences (Bulgaria); Shiuian-Huei Lin, National Yang Ming Chiao Tung Univ. (Taiwan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-32

#### Optically reconstructed digital volume reflection holograms using a spatial light modulator

Author(s): Saleha Abdullah M. Qissi, Partha P. Banerjee, Univ. of Dayton (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12682-33

#### Application of dispersion relations for prediction of frequency response of multilayer metallo-dielectric structures

Author(s): Guo Chen, Hammid Jwaid Hemmdan Al-Ghezi, Partha P. Banerjee, Univ. of Dayton (United States); Mariacristina Rumi, Air Force Research Lab. (United States); Lirong Sun, Air Force Research Lab. (United States), Azimuth Corp. (United States); Peter Stevenson, Jonathan Slagle, Air Force Research Lab. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12683

# Terahertz Emitters, Receivers, and Applications XIV

20 - 22 August 2023 | Conv. Ctr. Room 14B

Conference Chairs: **Manijeh Razeghi**, Northwestern Univ. (United States); **Mona Jarrahi**, UCLA Samueli School of Engineering (United States)

Program Committee: **Shaghik Atakaramians**, The Univ. of New South Wales (Australia); **Igal Brener**, Sandia National Labs. (United States); **David Burghoff**, Univ. of Notre Dame (United States); **Enrique Castro-Camus**, Philipps-Univ. Marburg (Germany); **Sukhdeep S. Dhillon**, Lab. de Physique de l'Ecole Normale Supérieure (France); **Jean-Paul Guillet**, Institut des Sciences Moléculaires (France); **Pernille Klarskov**, Aarhus Univ. (Denmark); **Quanyong Lu**, Beijing Academy of Quantum Information Sciences (China); **Hiroaki Minamide**, RIKEN (Japan); **Oleg Mitrofanov**, Univ. College London (United Kingdom); **Taiichi Otsuji**, Tohoku Univ. (Japan); **Sascha Preu**, Technische Univ. Darmstadt (Germany); **Marco Rahm**, Technische Univ. Kaiserslautern (Germany); **Clara J. Saraceno**, Ruhr-Univ. Bochum (Germany); **Andreas Stöhr**, Univ. Duisburg-Essen (Germany); **Feihu Wang**, Southern Univ. of Science and Technology (China); **Jigang Wang**, Iowa State Univ. of Science and Technology (United States); **Stephan F. Winnerl**, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); **Withawat Withayachumnankul**, The Univ. of Adelaide (Australia); **Shang Hua Yang**, National Tsing Hua Univ. (Taiwan)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: TERAHERTZ IMAGING AND SENSING

20 August 2023 • 8:00 AM - 10:05 AM | Conv. Ctr. Room 14B  
Session Chair: Hiroaki Minamide, RIKEN (Japan)

12683-1

#### **Non-destructive identification through thick materials using a terahertz parametric generator and detector** *(Invited Paper)*

Author(s): Kosuke Murate, Sota Mine, Kodo Kawase, Nagoya Univ. (Japan)  
20 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 14B

12683-2

#### **Terahertz focal plane arrays for high-speed and large field-of-view terahertz imaging** *(Invited Paper)*

Author(s): Nezhil Yardimci, Lookin, Inc. (United States); Deniz Turan, Univ. of California, Los Angeles (United States); Ali Charkhesht, Lookin, Inc. (United States); Mona Jarrahi, Univ. of California, Los Angeles (United States)  
20 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 14B

12683-3

#### **Blackbody source-based terahertz nondestructive testing with augmented reality** *(Invited Paper)*

Author(s): Jean-Paul Guillet, Lab. d'Intégration du Matériau au Système, Univ. de Bordeaux (France); Jean Rioult, Univ. Gustave Eiffel (France); Christophe Gaquiere, Institut d'Electronique de Microélectronique et de Nanotechnologie (France)  
20 August 2023 • 8:50 AM - 9:15 AM | Conv. Ctr. Room 14B

12683-4

#### **Non-line-of-sight imaging using terahertz waves: system architecture and applications** *(Invited Paper)*

Author(s): Georgios Trichopoulos, Yiran Cui, Daniel Lu, Arizona State Univ. (United States)  
20 August 2023 • 9:15 AM - 9:40 AM | Conv. Ctr. Room 14B

12683-5

#### **THz electronics for sensing and communication applications** *(Invited Paper)*

Author(s): Chun-Hsing Li, Wei-Zhe Su, Yu-Kai Chen, National Taiwan Univ. (Taiwan)  
20 August 2023 • 9:40 AM - 10:05 AM | Conv. Ctr. Room 14B

Coffee Break 10:05 AM - 10:35 AM

#### SESSION 2: TERAHERTZ SPECTROSCOPY

20 August 2023 • 10:35 AM - 12:40 PM | Conv. Ctr. Room 14B  
Session Chair: Jean-Paul Guillet, Institut des Sciences Moléculaires (France)

12683-6

#### **How to use terahertz emission spectroscopy for wide bandgap semiconductor evaluation** *(Invited Paper)*

Author(s): Masayoshi Tonouchi, Osaka Univ. (Japan)  
20 August 2023 • 10:35 AM - 11:00 AM | Conv. Ctr. Room 14B

12683-7

#### **A protocol for THz-ATR spectroscopy-based detection of mimicked interstitial fluid in ex vivo skin: towards ML-reinforced THz biosensing** *(Invited Paper)*

Author(s): Lorenza P. Foglia, Bjørn H. Mølvig, Mads Erhorn, Miriam Galbiati, Simon J. Lange, Peter Uhd Jepsen, Technical Univ. of Denmark (Denmark)  
20 August 2023 • 11:00 AM - 11:25 AM | Conv. Ctr. Room 14B

12683-8

#### **Exploring dynamics, disorder, and anharmonicity in THz spectra of crystalline materials** *(Invited Paper)*

Author(s): Andrew D. Burnett, John Kendrick, Craig S. Knox, Matthew T. Vaughan, Calum N. A. Towler, Mannan Ali, Satoshi Sasaki, Edmund H. Linfield, A. Giles Davies, Joshua R. Freeman, Univ. of Leeds (United Kingdom)  
20 August 2023 • 11:25 AM - 11:50 AM | Conv. Ctr. Room 14B

12683-9

### Analysis of terahertz spectra of water and NaCl solutions obtained in attenuated total reflectance configuration *(Invited Paper)*

Author(s): Arturo Mendoz Galván, Manuel Alejandro Justo Guerrero, Ctr. de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico); Elodie Strupiechonski, Ctr. de Ingeniería y Desarrollo Industrial (Mexico)

20 August 2023 • 11:50 AM - 12:15 PM | Conv. Ctr. Room 14B

12683-10

### Platform for next-generation terahertz application studies *(Invited Paper)*

Author(s): John F. O'Hara, Oklahoma State Univ. (United States); Rajind Mendis, Riverside Research (United States); Karl L. Strecker, Oklahoma State Univ. (United States)

20 August 2023 • 12:15 PM - 12:40 PM | Conv. Ctr. Room 14B

Lunch Break 12:40 PM - 2:10 PM

### SESSION 3: HIGH-INTENSITY TERAHERTZ EMITTERS

20 August 2023 • 2:10 PM - 5:25 PM | Conv. Ctr. Room 14B

Session Chair: Masayoshi Tonouchi, Osaka Univ. (Japan)

12683-15

### Advanced ultrafast laser technology for conversion into the THz region *(Invited Paper)*

Author(s): Clara J. Saraceno, Tim Vogel, Samira Mansourzadeh, Mohsen Khalili, Celia Millon, Ruhr-Univ. Bochum (Germany)

20 August 2023 • 2:10 PM - 2:35 PM | Conv. Ctr. Room 14B

12683-11

### High efficiency THz FEL generation *(Invited Paper)*

Author(s): Pietro Musumeci, Univ. of California, Los Angeles (United States)

20 August 2023 • 2:35 PM - 3:00 PM | Conv. Ctr. Room 14B

12683-12

### High-brightness backward THz-wave parametric oscillator for ubiquitous applications *(Invited Paper)*

Author(s): Hiroaki Minamide, RIKEN (Japan)

20 August 2023 • 3:00 PM - 3:25 PM | Conv. Ctr. Room 14B

Coffee Break 3:25 PM - 3:55 PM

12683-13

### Multi-cycle multi-hundred-kW-peak-power far-infrared parametric source at 53 $\mu$ m *(Invited Paper)*

Author(s): Ming-Hsiung Wu, Yen-Chieh Huang, National Tsing Hua Univ. (Taiwan)

20 August 2023 • 3:55 PM - 4:20 PM | Conv. Ctr. Room 14B

12683-14

### THz dual-pulse generation and manipulation with high degrees of freedom *(Invited Paper)*

Author(s): Chih Wei Luo, Hao-Keng Wei, National Yang Ming Chiao Tung Univ. (Taiwan)

20 August 2023 • 4:20 PM - 4:45 PM | Conv. Ctr. Room 14B

12683-16

### Controllable narrowband terahertz generation from air plasma induced by two-color laser pulse train

Author(s): Xiaoyue Zhou, Yuchen Lin, Yi Chan, Fu Deng, Jingdi Zhang, Hong Kong Univ. of Science and Technology (Hong Kong, China)

20 August 2023 • 4:45 PM - 5:05 PM | Conv. Ctr. Room 14B

12683-17

### High-energy multicycle THz pulse generation in artificial PPLN crystal

Author(s): Yuri H. Avetisyan, Armen Makaryan, Yerevan State Univ. (Armenia); Michael Bakunov, Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation)

20 August 2023 • 5:05 PM - 5:25 PM | Conv. Ctr. Room 14B

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

### A perovskite paved pathway to multi-terawatt scale photovoltaics *(Plenary Presentation)*

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems *(Plenary Presentation)*

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs *(Plenary Presentation)*

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### MONDAY 21 AUGUST 2023

### SESSION 4: TERAHERTZ EMITTERS

21 August 2023 • 8:00 AM - 10:05 AM | Conv. Ctr. Room 14B

Session Chair: Marco Rahm, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

12683-18

### Precision measurements in terahertz laser frequency combs and photomixers *(Invited Paper)*

Author(s): Chee-Wei Wong, UCLA Samueli School of Engineering (United States)

21 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 14B

# TECHNICAL CONFERENCES

## Conference 12683

12683-19

### Topological materials as promising candidates for tuneable helicity-dependent terahertz emitters (*Invited Paper*)

Author(s): Jessica L. Boland, The Univ. of Manchester (United Kingdom)

21 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 14B

12683-20

### Optimization of terahertz emission from spintronic Fe/Pt hetero-structures (*Invited Paper*)

Author(s): Masahiko Tani, Miezel Talara, Univ. of Fukui (Japan); Dmitry Bulgarevich, National Institute for Materials Science (Japan); Valynn K. Mag-usara, Osaka Univ. (Japan); Mary C. Escaño, Hideaki Kitahara, Takashi Furuya, Univ. of Fukui (Japan); Makoto Nakajima, Osaka Univ. (Japan); Makoto Watanabe, National Institute for Materials Science (Japan); Garik Torosyan, Photonik-Zentrum Kaiserslautern e.V. (Germany); René Beigang, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

21 August 2023 • 8:50 AM - 9:15 AM | Conv. Ctr. Room 14B

12683-21

### High power hybrid-quantum-design based terahertz quantum cascade laser (*Invited Paper*)

Author(s): Quanyong Lu, Beijing Academy of Quantum Information Sciences (China)

21 August 2023 • 9:15 AM - 9:40 AM | Conv. Ctr. Room 14B

12683-22

### Single-mode quantum cascade laser at above 5 THz based on graded sampled grating design (*Invited Paper*)

Author(s): Junqi Liu, Institute of Semiconductors, Chinese Academy of Sciences (China)

21 August 2023 • 9:40 AM - 10:05 AM | Conv. Ctr. Room 14B

Coffee Break 10:05 AM - 10:35 AM

#### SESSION 5: TERAHERTZ IMAGING AND MANIPULATION

21 August 2023 • 10:35 AM - 12:40 PM | Conv. Ctr. Room 14B

Session Chair: Jessica Louise Boland,  
The Univ. of Manchester (United Kingdom)

12683-23

### Diffraction optical networks & computational imaging without a computer (*Invited Paper*)

Author(s): Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

21 August 2023 • 10:35 AM - 11:00 AM | Conv. Ctr. Room 14B

12683-24

### Active multipixel photoconductive emitter technology for THz beam shaping and steering (*Invited Paper*)

Author(s): Nishtha Chopra, Justas Deveikis, James Lloyd-Hughes, The Univ. of Warwick (United Kingdom)

21 August 2023 • 11:00 AM - 11:25 AM | Conv. Ctr. Room 14B

12683-25

### Plasmonic photoconductive terahertz focal-plane array for super-resolution and high-speed imaging (*Invited Paper*)

Author(s): Xurong Li, Deniz Mengü, Aydogan Ozcan, Mona Jarrahi, UCLA Samueli School of Engineering (United States)

21 August 2023 • 11:25 AM - 11:50 AM | Conv. Ctr. Room 14B

12683-26

### Subwavelength waveguide arrays and metasurfaces for spatial phase manipulation of electromagnetic waves (*Invited Paper*)

Author(s): Marco Rahm, Alexander Wolff, Dominic Palm, Steffen Klingel, Janis Krieger, Lukas Mueller, Lars Franke, Jan Kappa, Ralf Stemler, Rheinland-Pfälzische Technische Univ. Kaiserslautern-Landau (Germany)

21 August 2023 • 11:50 AM - 12:15 PM | Conv. Ctr. Room 14B

12683-27

### Terahertz broadband anti-reflection moth-eye structures and its applications (*Invited Paper*)

Author(s): Kuniaki Konishi, The Univ. of Tokyo (Japan)

21 August 2023 • 12:15 PM - 12:40 PM | Conv. Ctr. Room 14B

Lunch Break 12:40 PM - 2:10 PM

#### SESSION 6: TERAHERTZ SCANNING OF ULTRAFAST PHENOMENA

21 August 2023 • 2:10 PM - 5:10 PM | Conv. Ctr. Room 14B

Session Chair: Xurong Li,  
UCLA Samueli School of Engineering (United States)

12683-28

### Visualizing ultrafast charge transfer dynamics in twisted bilayer heterostructures via THz emission spectroscopy (*Invited Paper*)

Author(s): Aaron M. Lindenberg, Stanford Univ. (United States)

21 August 2023 • 2:10 PM - 2:35 PM | Conv. Ctr. Room 14B

12683-29

### Enabling technologies and applications of strong-field THz radiation in ultrafast and nonequilibrium dynamics (*Invited Paper*)

Author(s): Sergio Carbajo Garcia, Univ. of California, Los Angeles (United States)

21 August 2023 • 2:35 PM - 3:00 PM | Conv. Ctr. Room 14B

12683-30

### Controlling and videotaping single-molecule dynamics with atomically confined terahertz transients (*Invited Paper*)

Author(s): Carmen Roelcke, Lukas Kastner, Dominik Peller, Yaroslav A. Gerasimenko, Jascha Repp, Rupert Huber, Univ. Regensburg (Germany)

21 August 2023 • 3:00 PM - 3:25 PM | Conv. Ctr. Room 14B

Coffee Break 3:25 PM - 3:55 PM

12683-31

### Ultrafast photocurrents in layered PtSe<sub>2</sub> (*Invited Paper*)

Author(s): Martin Micica, Sukhdeep Dhillon, Lab. de Physique de l'École Normale Supérieure (France)

21 August 2023 • 3:55 PM - 4:20 PM | Conv. Ctr. Room 14B

12683-32

### THz driven soft mode dynamics in quantum paraelectrics (*Invited Paper*)

Author(s): Matthias C. Hoffmann, SLAC National Accelerator Lab. (United States)

21 August 2023 • 4:20 PM - 4:45 PM | Conv. Ctr. Room 14B

12683-33

### **Terahertz scanning tunneling microscopy and spectroscopy at the atomic scale** (*Invited Paper*)

Author(s): Vedran Jelic, Spencer E. Ammerman, Mohamed Hassan, Stephanie Adams, Sheng Lee, Kaedon Cleland-Host, Yajing Wei, Michigan State Univ. (United States); Vivian N. Breslin, EMPA (Switzerland); Nathan Everett, Michigan State Univ. (United States); Qiang Sun, Carlo A. Pignedoli, Pascal Ruffieux, EMPA (Switzerland); Roman Fasel, EMPA (Switzerland), Univ. Bern (Switzerland); Tyler L. Cocker, Michigan State Univ. (United States)

21 August 2023 • 4:45 PM - 5:10 PM | Conv. Ctr. Room 14B

#### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Monday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12683-43

### **3D printing compatible multimode terahertz negative curvature hollow-core fibers**

Author(s): Santiago Armas, Joseph Lombardo, Ian Ramirez, Faisal Algethmi, Allison M. Marn, Ahmet Emin Akosman, Roger Williams Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12683-44

### **Investigation of 3D printing compatible THz chemical sensing platform using negative curvature fibers with elliptical cladding elements**

Author(s): Venus Fu, Viannely Francisco, Ahmet Emin Akosman, Roger Williams Univ. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## TUESDAY 22 AUGUST 2023

#### SESSION 7: PHOTOCONDUCTIVE TERAHERTZ EMITTERS AND DETECTORS

22 August 2023 • 8:00 AM - 10:05 AM | Conv. Ctr. Room 14B

Session Chair: Taiichi Otsuji, Tohoku Univ. (Japan)

12683-34

### **Photonic double-mixing by UTC-PD-integrated HEMT for optical-to-sub-THz/THz carrier frequency down-conversion** (*Invited Paper*)

Author(s): Akira Satou, Taiichi Otsuji, Tohoku Univ. (Japan)

22 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 14B

12683-35

### **Group IV terahertz photoconductive emitter** (*Invited Paper*)

Author(s): Pin-Han Lee, Wang-Chien Chen, Institute of Electronics Engineering, National Tsing Hua Univ. (Taiwan); Shang Hua Yang, National Tsing Hua Univ. (Taiwan)

22 August 2023 • 8:25 AM - 8:50 AM | Conv. Ctr. Room 14B

12683-36

### **All-dielectric metasurfaces for terahertz generation, detection, and manipulation** (*Invited Paper*)

Author(s): Hyunseung Jung, Sandia National Labs. (United States); Lucy L. Hale, Univ. College London (United Kingdom); Jayson Briscoe, Ting Shan Luk, Sadhvikas J. Addamane, Igal Brener, Sandia National Labs. (United States); Oleg Mitrofanov, Univ. College London (United Kingdom)

22 August 2023 • 8:50 AM - 9:15 AM | Conv. Ctr. Room 14B

12683-37

### **Tailoring ultrafast photoconductive response in GeS and GeSe by zero-valent Cu intercalation** (*Invited Paper*)

Author(s): Lyubov V. Titova, Kateryna Kushnir, Sepideh Khanmohammadi, Worcester Polytechnic Institute (United States); Catherine Tran, Univ. of California, Davis (United States); Srihari M. Kastuar, Lehigh Univ. (United States); Erika Colin-Ulloa, Worcester Polytechnic Institute (United States); Chinedu Ekuma, Lehigh Univ. (United States); Kristie Koski, Univ. of California, Davis (United States)

22 August 2023 • 9:15 AM - 9:40 AM | Conv. Ctr. Room 14B

12683-38

### **Photoconductive metasurfaces for near-field terahertz sources and detectors** (*Invited Paper*)

Author(s): Lucy L. Hale, Univ. College London (United Kingdom), ETH Zurich (Switzerland); Hyunseung Jung, Sandia National Labs. (United States), The Ctr. for Integrated Nanotechnologies (United States); James Seddon, Univ. College London (United Kingdom); Raktim Sarma, The Ctr. for Integrated Nanotechnologies (United Kingdom); Sylvain D. Gennaro, Jayson Briscoe, C. Thomas Harris, Ting Shan Luk, Prasad P. Iyer, Sadhvikas J. Addamane, John L. Reno, Igal Brener, The Ctr. for Integrated Nanotechnologies (United States); Oleg Mitrofanov, Univ. College London (United Kingdom)

22 August 2023 • 9:40 AM - 10:05 AM | Conv. Ctr. Room 14B

Coffee Break 10:05 AM - 10:35 AM

#### SESSION 8: TERAHERTZ DEVICES BASED ON GRAPHENE AND VACUUM ELECTRONICS

22 August 2023 • 10:35 AM - 12:15 PM | Conv. Ctr. Room 14B

Session Chair: Shang Hua Yang, National Tsing Hua Univ. (Taiwan)

12683-39

### **Recent advances in the research of graphene-based plasmonic metamaterial for terahertz laser transistors** (*Invited Paper*)

Author(s): Taiichi Otsuji, Victor Ryzhii, Tohoku Univ. (Japan)

22 August 2023 • 10:35 AM - 11:00 AM | Conv. Ctr. Room 14B

12683-40

### **Graphene plasmonics for non-linear terahertz applications** (*Invited Paper*)

Author(s): Martin Mittendorff, Jeong Woo Han, Univ. Duisburg-Essen (Germany); Stephan Winnerl, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); Thomas E. Murphy, Univ. of Maryland, College Park (United States)

22 August 2023 • 11:00 AM - 11:25 AM | Conv. Ctr. Room 14B

# TECHNICAL CONFERENCES

## Conference 12683

12683-41

**Fast and sensitive THz detection by an asymmetric-dual-grating-gate epitaxial-graphene-channel FET based on plasmonic and photothermoelectric rectification effects** *(Invited Paper)*

Author(s): Koichi Tamura, Chao Tang, Daichi Ogiura, Kento Suwa, Hirokazu Fukidome, Research Institute of Electrical Communication, Tohoku Univ. (Japan); Yuma Takida, Hiroaki Minamide, RIKEN (Japan); Tetsuya Suemitsu, New Industry Creation Hatchery Ctr., Tohoku Univ. (Japan); Taiichi Otsuji, Akira Satou, Research Institute of Electrical Communication, Tohoku Univ. (Japan)

22 August 2023 • 11:25 AM - 11:50 AM | Conv. Ctr. Room 14B

12683-42

**Terahertz detectors based on vacuum electronics** *(Invited Paper)*

Author(s): Tobias Buchmann, Matej Sebek, Technical Univ. of Denmark (Denmark); Naoya Kawai, Kota Katsuyama, Hamamatsu Photonics K.K. (Japan); Simon J. Lange, Peter Uhd Jepsen, Technical Univ. of Denmark (Denmark)

22 August 2023 • 11:50 AM - 12:15 PM | Conv. Ctr. Room 14B



## Conference 12684

# ODS 2023: Industrial Optical Devices and Systems

20 August 2023 | Conv. Ctr. Room 14A

Conference Chairs: **Ryuichi Katayama**, Fukuoka Institute of Technology (Japan); **Yuzuru Takashima**, Wyant College of Optical Sciences (United States)

Program Committee: **Pierre-Alexandre J. Blanche**, Independent Contractor (United States); **Min Gu**, Univ. of Shanghai for Science and Technology (China); **Thomas D. Milster**, Wyant College of Optical Sciences (United States); **Kimihiro Saito**, Kindai Univ. Technical College (Japan); **Xiaodi Tan**, Fujian Normal Univ. (China); **Din Ping Tsai**, City Univ. of Hong Kong (Hong Kong, China); **Kazuyoshi Yamazaki**, Hitachi, Ltd. (Japan)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: HOLOGRAPHY AND QUANTUM PHOTONICS

20 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 14A

Session Chair: Ryuichi Katayama,  
Fukuoka Institute of Technology (Japan)

12684-1

#### **Nonlinear holography in 3D nonlinear photonic crystals** *(Invited Paper)*

Author(s): Yong Zhang, Nanjing Univ. (China)

20 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 14A

12684-2

#### **Highly concentrated Phenanthraquinone-doped co-monomer photopolymer for holographic data storage**

Author(s): Zeyi Zeng, Po Hu, Jinhong Li, Junchao Jin, Qingdong Li, Junhui Wu, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

20 August 2023 • 8:30 AM - 8:45 AM | Conv. Ctr. Room 14A

12684-3

#### **Produce holographic data storage material automatically**

Author(s): Rupeng Yang, Yongkun Lin, Yiping Liu, Junchao Jin, Linlin Fan, Xiaodi Tan, Xiao Lin, Junhui Wu, Po Hu, Fujian Normal Univ. (China)

20 August 2023 • 8:45 AM - 9:00 AM | Conv. Ctr. Room 14A

12684-4

#### **Phase retrieval based on deep learning in PQ/PMMA material**

Author(s): Jie Zheng, Xiaoqing Zheng, Yongkun Lin, Jianying Hao, Po Hu, Junchao Jin, Sheng Lin, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

20 August 2023 • 9:00 AM - 9:15 AM | Conv. Ctr. Room 14A

12684-5

#### **Phase retrieval based on deep learning with band pass filtering for holographic data storage**

Author(s): Rongquan Fan, Jianying Hao, Ruixian Chen, Jinyu Wang, Yongkun Lin, Rupeng Yang, Xiaoqing Zheng, Di Zhang, Kun Wang, Dakui Lin, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

20 August 2023 • 9:15 AM - 9:30 AM | Conv. Ctr. Room 14A

12684-6

#### **Photonic chips bring quantum computers and communications one step closer** *(Invited Paper)*

Author(s): Ai Qun Liu, The Hong Kong Polytechnic Univ. (Hong Kong, China)

20 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 14A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: BIO- AND NANOPHOTONICS

20 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 14A

Session Chair: Xiaodi Tan, Fujian Normal Univ. (China)

12684-7

#### **Metasurface for bio-imaging applications** *(Invited Paper)*

Author(s): Cheng Hung Chu, Sunil Vyas, Yuan Luo, National Taiwan Univ. (Taiwan)

20 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 14A

12684-8

#### **Laser induced refractive index change writing in dehydrated ophthalmic materials: feasibility study**

Author(s): Quazi Rushnan Islam, Wayne H. Knox, Univ. of Rochester (United States)

20 August 2023 • 11:00 AM - 11:15 AM | Conv. Ctr. Room 14A

12684-9

#### **Optical data encoding by tuning up-conversion emission with high-energy light**

Author(s): Weizhao Gu, Simone Lamon, Min Gu, Qiming Zhang, Univ. of Shanghai for Science and Technology (China)

20 August 2023 • 11:15 AM - 11:30 AM | Conv. Ctr. Room 14A

12684-10

#### **Low-power super-resolution optical data storage enabled by high-order upconversion**

Author(s): Simone Lamon, Hui Zhang, Qiming Zhang, Min Gu, Univ. of Shanghai for Science and Technology (China)

20 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 14A

12684-12

#### **Simulation on split-ring-resonator-type device for heat-assisted magnetic recording**

Author(s): Ryuichi Katayama, Fukuoka Institute of Technology (Japan); Satoshi Sugiura, Innova Stella Co., Ltd. (Japan)

20 August 2023 • 11:45 AM - 12:00 PM | Conv. Ctr. Room 14A

# TECHNICAL CONFERENCES

## Conference 12684

Lunch Break 12:00 PM - 1:45 PM

### SESSION 3: OPTICAL TECHNOLOGIES AND DEVICES

20 August 2023 • 1:45 PM - 3:30 PM | Conv. Ctr. Room 14A  
Session Chair: Yuzuru Takashima,  
Wyant College of Optical Sciences (United States)

12684-13

#### Advanced deflectometry methods for industrial application *(Invited Paper)*

Author(s): Heejoo Choi, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States); Hyukmo Kang, Yiyang Huang, Mina Yoo, Wyant College of Optical Sciences (United States); Henry Quach, ASML (United States); John Kam, Microsoft Corp. (United States); Daewook Kim, Wyant College of Optical Sciences (United States), Large Binocular Telescope Observatory (United States)

20 August 2023 • 1:45 PM - 2:15 PM | Conv. Ctr. Room 14A

12684-14

#### Industrial solution for 12-in. wafer high speed quality inspection: FSS 310

Author(s): Markus Kogel-Hollacher, Stephan Weiss, Simon Mieth, Oliver Schulz, Precitec Optronik GmbH (Germany)

20 August 2023 • 2:15 PM - 2:30 PM | Conv. Ctr. Room 14A

12684-15

#### Measuring inhomogeneous polarization distribution of vector vortex beam with polarization holography

Author(s): Yi Yang, Peiliang Qi, Jinyu Wang, Xinyi Yuan, Xianmiao Xu, Shenghui Ke, Shujun Zheng, Zhiyun Huang, Xiaodi Tan, Fujian Normal Univ. (China)

20 August 2023 • 2:30 PM - 2:45 PM | Conv. Ctr. Room 14A

12684-16

#### A grid disrupted: how optical sensing manages the chaos of renewable integration on the electric grid

Author(s): Michael Oshetski, Micatu Inc. (United States)

20 August 2023 • 2:45 PM - 3:00 PM | Conv. Ctr. Room 14A

12684-17

#### Theory and practice of high-harmonic diffractive surfaces *(Invited Paper)*

Author(s): Thomas D. Milster, Young-Sik Kim, Nick Brar, Zichan Wang, Wyant College of Optical Sciences (United States)

20 August 2023 • 3:00 PM - 3:30 PM | Conv. Ctr. Room 14A

Coffee Break 3:30 PM - 4:00 PM

### SESSION 4: DISPLAY, AUTOMOTIVE, AND IMAGING

20 August 2023 • 4:00 PM - 5:30 PM | Conv. Ctr. Room 14A  
Session Chair: Thomas D. Milster,  
Wyant College of Optical Sciences (United States)

12684-18

#### Aerial display technology based on dynamic projection mapping and flying screens *(Invited Paper)*

Author(s): Hiromasa Oku, Gunma Univ. (Japan)

20 August 2023 • 4:00 PM - 4:30 PM | Conv. Ctr. Room 14A

12684-19

#### Multi-domain multiplexing for large field of view in near-to-eye displays

Author(s): Ted Liang-Tai L. Lee, Pengyu Liu, Yexin Pei, Yuzuru Takashima, The Univ. of Arizona (United States)

20 August 2023 • 4:30 PM - 4:45 PM | Conv. Ctr. Room 14A

12684-20

#### A new scheme of microlens array for laser light shaping in laser scanning smart headlight

Author(s): Kuo-Yin Huang, Ke-Peng Chang, National Chung Hsing Univ. (Taiwan), Taiwan Color Optics, Inc. (Taiwan); Yung-Peng Chang, Taiwan Color Optics, Inc. (Taiwan); Chun-Nien Liu, National Chung Hsing Univ. (Taiwan); Wood-Hi Cheng, Graduate Institute of Optoelectronic Engineering, National Chung Hsing Univ. (Taiwan)

20 August 2023 • 4:45 PM - 5:00 PM | Conv. Ctr. Room 14A

12684-21

#### 550 m low-power outdoor visible light communication system using polarized light

Author(s): Don Barber, Christopher Pickle, Naval Postgraduate School (United States); Charles Nelson, Owens Walker, U.S. Naval Academy (United States); John McEachen, Naval Postgraduate School (United States)

20 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 14A

12684-22

#### LDLS-powered spectrum-simulating light source for the application of hyperspectral imaging

Author(s): Xiaohua Ye, Energetiq Technology, Inc. (United States); William Grube, Jing Zhou, Alex Cutler, Huiling Zhu, Debbie Gustafson, Megan Dube, Energetiq Technology (United States)

20 August 2023 • 5:15 PM - 5:30 PM | Conv. Ctr. Room 14A

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics *(Plenary Presentation)*

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems *(Plenary Presentation)*

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs *(Plenary Presentation)*

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12684-23

#### Distance measurement error sources in Fourier-based frequency sweeping interferometry using a gas cell for laser frequency sweep speed determination

Author(s): Mateusz Sosin, Juan David Gonzalez Cobas, CERN (Switzerland); Mohammed Isa, Richard Leach, The Univ. of Nottingham (United Kingdom); Helene Mainaud Durand, CERN (Switzerland)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12684-24

#### Complex amplitude measurement with off-axis and phase-shifting methods for characterizing and evaluating metasurfaces

Author(s): Teruyoshi Nobukawa, Ryo Higashida, Kei Hagiwara, NHK Japan Broadcasting Corp. (Japan)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12684-26

#### Improved bending loss of a single-mode fiber embedded in silicone in a circular shape for industrial applications

Author(s): Andrea Scarlett Herrera García, Romeo de Jesus Selvas-Aguilar, Leonardo Jahir Arévalo Bautista, Brayan Aldhair Alvarez Duran, Raymundo Garza Garza, Univ. Autónoma de Nuevo León (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12684-27

#### Measurement of curvature and displacement on in-line Mach-Zehnder interferometer sensor based on a special single-mode fiber

Author(s): Leonardo Jahir Arevalo-Bautista, Univ. Autónoma de Nuevo León (Mexico); Juan Manuel Sierra-Hernandez, Eloisa Gallegos-Arellano, Univ. de Guanajuato (Mexico); Mario Angel Rico-Mendez, Romeo de Jesus Selvas-Aguilar, Manuel Garcia-Mendez, Univ. Autónoma de Nuevo León (Mexico)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12685

### Earth Observing Systems XXVIII

22 - 24 August 2023 | Conv. Ctr. Room 6F

Conference Chairs: **Xiaoxiong (Jack) Xiong**, NASA Goddard Space Flight Ctr. (United States); **Xingfa Gu**, Institute of Remote Sensing and Digital Earth, CAS (China); **Jeffrey S. Czupla-Myers**, Wyant College of Optical Sciences (United States)

Program Committee: **Amit Angal**, Science Systems and Applications, Inc. (United States); **Armin Doerry**, Sandia National Labs. (United States); **Christopher N. Durell**, Labsphere, Inc. (United States); **Bertrand Fougnie**, EUMETSAT (Germany); **Joel McCorkel**, NASA Goddard Space Flight Ctr. (United States); **Vijay Murgai**, Raytheon Intelligence & Space (United States); **Thomas S. Pagano**, Jet Propulsion Lab. (United States); **Jeffery J. Puschell**, Northrop Grumman Corp. (United States)

#### TUESDAY 22 AUGUST 2023

##### SESSION 1: NEW INSTRUMENTS AND TECHNOLOGIES

22 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 6F

Session Chair: Armin W. Doerry,  
Sandia National Labs. (United States)

12685-1

#### Geostationary littoral imaging and monitoring radiometer (GLIMR): instrument capability and overview

Author(s): John Bloomer, Christopher Koontz, Raytheon Intelligence & Space (United States)

22 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6F

12685-2

#### Compact Jones calibration source for next generation Earth observation imaging satellites in the VNIR, SWIR, and MWIR: the improved radiometric calibration of imaging systems (IRIS) high-performance integrated flat illuminator (HIFI)

Author(s): Brandon J. Russell, Dan Scharpf, Christopher N. Durell, Luke Dobrowski, Labsphere, Inc. (United States); John B. Schlaerth, Raytheon Intelligence & Space (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6F

12685-3

#### Design of an ultra-portable field-capable short wave infrared transfer radiometer supporting Earth-observing sensor calibration

Author(s): Nikolaus J. Anderson, Wyant College of Optical Sciences (United States); Kurtis J. Thome, NASA Goddard Space Flight Ctr. (United States); Stuart F. Biggar, Wyant College of Optical Sciences (United States); Brian N. Wenny, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6F

12685-4

#### Corrected recursive equations for vane aperture sizes and locations in one- and two-stage stray light baffle systems

Author(s): Scott O. Rohrbach, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 6F

12685-5

#### Multi-band lightning optical emission from tropical storms recorded during the Airborne Lightning Observatory for Fly's Eye GLM Simulator and Terrestrial Gamma-Ray Flashes Flight Campaign

Author(s): Mason Quick, Patrick Gatlin, NASA Marshall Space Flight Ctr. (United States); Phillip Bitzer, The Univ. of Alabama in Huntsville (United States); Timothy Lang, NASA Marshall Space Flight Ctr. (United States); Nikolai Ostgaard, Univ. of Bergen (Norway)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 6F

12685-6

#### CLARREO Pathfinder as a SI-traceable reference for satellite intercalibration

Author(s): Rajendra Bhatt, Science Systems and Applications, Inc. (United States); Yolanda Shea, Wan Wu, NASA Langley Research Ctr. (United States); Qiguang Yang, Daniel Goldin, Wenbo Sun, Matthew Little, Science Systems and Applications, Inc. (United States); Xu Liu, NASA Langley Research Ctr. (United States); Nitchie Smith, Science Systems and Applications, Inc. (United States); Constantine Lukashin, NASA Langley Research Ctr. (United States)

22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 6F

Coffee Break 10:00 AM - 10:30 AM

##### SESSION 2: PRELAUNCH CALIBRATION

22 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 6F

Session Chair: Christopher N. Durell, Labsphere, Inc. (United States)

12685-7

#### JPSS J2 Spectralon® Performance pre Launch

Author(s): Vijay Murgai, Raytheon Intelligence & Space (United States); Xiaoxiong Xiong, James J. Butler, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6F

12685-8

#### Prelaunch radiometric calibration of the thermal response of the PACE Ocean Color Instrument

Author(s): Robert E. Eplee, Gerhard Meister, Shihyan Lee, NASA Goddard Space Flight Ctr. (United States); Kenny Squire, Space Dynamics Lab., Utah State Univ. (United States); Ulrik Gliese, Joseph J. Knuble, Deepak Patel, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6F

12685-9

### **Spectral and radiometric performance of the Goddard Laser for absolute measurement of radiance**

Author(s): Julia A. Barsi, Science Systems and Applications, Inc. (United States); Joel T. McCorkel, Brendan McAndrew, NASA Goddard Space Flight Ctr. (United States); Timothy M. Shuman, Fibertek, Inc. (United States); Andrei B. Sushkov, Genesis Engineering Solutions, Inc. (United States); Michael R. Rodriguez, Hexagon US Federal (United States); Nicholas G. Reed, Global Science & Technology, Inc. (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6F

12685-10

### **GSFC Calibration Laboratory capabilities and future plans overview**

Author(s): Nathan E. Kelley, NASA Goddard Space Flight Ctr. (United States), Science Systems and Applications, Inc. (United States); Joel McCorkel, NASA Goddard Space Flight Ctr. (United States); Erich Wanzek, Science Systems and Applications, Inc. (United States); Georgi Georgiev, NASA Goddard Space Flight Ctr. (United States); Julia Barsi, Science Systems and Applications, Inc. (United States); Brendan McAndrew, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6F

Lunch/Exhibition Break 11:50 AM - 1:40 PM

## SESSION 3: POLARIZATION IN EARTH REMOTE SENSING I

### *Joint Session with Conferences 12685 and 12690*

22 August 2023 • 1:40 PM - 3:10 PM | Conv. Ctr. Room 6F

Session Chair: Joseph A. Shaw, Montana State Univ. (United States)

12690-28

### **Advanced light-scattering computational capability for solving the optical properties of nonspherical particles** *(Invited Paper)*

Author(s): Ping Yang, Jiachen Ding, Texas A&M Univ. (United States)

22 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 6F

12685-11

### **PACE OCI polarization sensitivity based on pre-launch testing**

Author(s): Jeffrey W. McIntire, Science Systems and Applications, Inc. (United States); Eugene Waluschka, Stellar Solutions Inc. (United States); Gerhard Meister, Joseph Knuble, William B. Cook, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 6F

12685-12

### **Cloud thermodynamic phase retrievals with a low-cost, division-of-focal-plane polarization camera**

Author(s): Erica Venkatesulu, Joseph A. Shaw, Montana State Univ. (United States)

22 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 6F

12690-29

### **Spectral LWIR polarimetry of ice and water**

Author(s): Jaclyn John, Jeremy Parkinson, Meredith Kupinski, The Univ. of Arizona (United States)

22 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 6F

Coffee Break 3:10 PM - 3:40 PM

## SESSION 4: POLARIZATION IN EARTH REMOTE SENSING II

### *Joint Session with Conferences 12685 and 12690*

22 August 2023 • 3:40 PM - 5:00 PM | Conv. Ctr. Room 6F

Session Chair: Meredith K. Kupinski, Wyant College of Optical Sciences (United States)

12690-30

### **GRASP Aerosol Retrievals of AirMSPI Observations from the FIREX-AQ Campaign**

Author(s): Clarissa M. DeLeon, The Univ. of Arizona (United States); Michael Garay, Olga Kalashnikova, Jet Propulsion Lab. (United States); Meredith Kupinski, The Univ. of Arizona (United States)

22 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 6F

12690-31

### **Disk-resolved and disk-integrated polarization state of moonlight as a function of lunar phase**

Author(s): Erica Venkatesulu, Montana State Univ. (United States); Sierra L. J. Dabby, Univ. of California, Berkeley (United States); Joseph A. Shaw, Montana State Univ. (United States)

22 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 6F

12690-32

### **Mitigating illumination-, leaf-, and view-angle dependencies in hyperspectral imaging using polarimetry**

Author(s): Danny Krafft, Grant Scarboro, Peter Balint-Kurti, Colleen Doherty, Michael W. Kudenov, North Carolina State Univ. (United States)

22 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 6F

12690-33

### **A radiative transfer model with Jacobian computational capabilities for polarimetric remote sensing of the earth system**

Author(s): Jiachen Ding, Ping Yang, Texas A&M Univ. (United States)

22 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 6F

## WEDNESDAY 23 AUGUST 2023

## SESSION 5: GOES MISSIONS

23 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 6F

Session Chair: Joel T. McCorkel, NASA Goddard Space Flight Ctr. (United States)

12685-13

### **Calibration of GOES-18 ABI solar channels**

Author(s): Haifeng Qian, National Oceanic and Atmospheric Administration (United States), Global Science & Technology, Inc. (United States)

23 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6F

# TECHNICAL CONFERENCES

## Conference 12685

12685-14

### Evaluation of two lunar irradiance models using ABI data

Author(s): Bikash Basnet, Global Science & Technology, Inc. (United States); Fangfang Yu, Univ. of Maryland, College Park (United States); Xiangqian Wu, NOAA National Environmental Satellite, Data, and Information Service (United States), NOAA Ctr. for Satellite Applications and Research (United States); Hugh H. Kieffer, Celestial Reasonings (United States)

23 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6F

12685-15

### Straylight rejection of ABI, AHI, and AMI

Author(s): Hui Xu, Global Science & Technology, Inc. (United States); Xiangqian Wu, NOAA National Environmental Satellite, Data, and Information Service (United States), NOAA Ctr. for Satellite Applications and Research (United States); Fangfang Yu, Univ. of Maryland, College Park (United States); Arata Okuyama, Meteorological Satellite Ctr., Japan Meteorological Agency (Japan); Jiyoung Kim, Tae-Hyeong Oh, Korea Meteorological Administration (Republic of Korea)

23 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6F

12685-16

### Comparison of ABI INR using the operational and GRATDAT-generated L1B images

Author(s): Song Guo, Global Science & Technology, Inc. (United States)

23 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 6F

12685-17

### Improving IPATS channel-to-channel registration assessment

Author(s): Bin Tan, NASA Goddard Space Flight Ctr. (United States), Science Systems and Applications, Inc. (United Kingdom); Alan Reth, NASA Goddard Space Flight Ctr. (United States), Chesapeake Aerospace, LLC (United States); Joseph C. Criscione, NASA Goddard Space Flight Ctr. (United States), Stellar Solutions Inc. (United States); John Dellomo, NASA Goddard Space Flight Ctr. (United States), Global Science & Technology, Inc. (United States)

23 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 6F

12685-18

### Planning and prototyping for GOES-R ABI reprocessing toward climate-quality data sets

Author(s): Joel T. McCorkel, Xiaoxiong Xiong, Robert Wolfe, Guoqing Lin, NASA Goddard Space Flight Ctr. (United States); Francis Padula, Boryana Efremova, GeoThinkTank, LLC (United States); Bin Tan, Science Systems and Applications, Inc. (United States); Emery Bacon, Aaron Pearlman, GeoThinkTank, LLC (United States); John Dellomo, Global Science & Technology, Inc. (United States)

23 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 6F

Coffee Break 10:00 AM - 10:30 AM

## SESSION 6: AIRS, MODIS, AND LANDSAT I

23 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 6F

Session Chair: Jeffery J. Puschell,  
Northrop Grumman Corp. (United States)

12685-19

### Updates to the radiometric calibration of the Atmospheric Infrared Sounder (AIRS)

Author(s): Thomas S. Pagano, Evan M. Manning, Steven E. Broberg, Hartmut H. Aumann, Robert C. Wilson, Jet Propulsion Lab. (United States); Ken Overoye, BAE Systems (United States)

23 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6F

12685-20

### 20 years of Atmospheric Infrared Sounder (AIRS) data: data products, climate trends, and future data continuity

Author(s): Hartmut H. Aumann, Evan M. Manning, Steven E. Broberg, Thomas S. Pagano, Robert C. Wilson, Jet Propulsion Lab. (United States)

23 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6F

12685-21

### AIRS visible light channels: calibration using deep convective clouds

Author(s): Steven E. Broberg, Hartmut Aumann, Evan Manning, Thomas S. Pagano, Jet Propulsion Lab. (United States)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6F

12685-22

### An empirical approach for the AIRS scene mirror contamination from adjacent footprints

Author(s): Robert Chris Wilson, Evan M. Manning, Thomas S. Pagano, Hartmut H. Aumann, Steven E. Broberg, Jet Propulsion Lab. (United States)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6F

Lunch/Exhibition Break 11:50 AM - 1:30 PM

## SESSION 7: AIRS, MODIS, AND LANDSAT II

23 August 2023 • 1:30 PM - 2:50 PM | Conv. Ctr. Room 6F

Session Chair: Thomas S. Pagano, Jet Propulsion Lab. (United States)

12685-24

### Impact of satellite orbit drift on MODIS Earth scene observations used in calibration of the reflective solar bands

Author(s): Kevin A. Twedt, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Xu Geng, Truman Wilson, Qiaozhen Mu, Science Systems and Applications, Inc. (United States)

23 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 6F

12685-25

### An update on the MODIS thermal emissive bands on-orbit performance

Author(s): Carlos L. Pérez Díaz, Tiejun Chang, Hanzhi Lin, Aisheng Wu, Gal Sarid, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States)

23 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 6F

12685-26

### **Landsat 8 decade of on-orbit operation summary of events and current state**

Author(s): Raviv Levy, Science Systems and Applications, Inc. (United States)

23 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 6F

12685-27

### **Ten years of Landsat 8 product calibration**

Author(s): Esad Micijevic, Cody Anderson, Michael Choate, U.S. Geological Survey (United States)

23 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 6F

Coffee Break 2:50 PM - 3:20 PM

### **SESSION 8: DATA PROCESSING AND ANALYTICAL TECHNIQUES**

23 August 2023 • 3:20 PM - 5:20 PM | Conv. Ctr. Room 6F

Session Chair: Xingfa Gu,  
Institute of Remote Sensing and Digital Earth, CAS (China)

12685-28

### **Nighttime imagery: Can Zipf's Law identify urban systems?**

Author(s): Blanca Arellano, Josep Roca, Univ. Politècnica de Catalunya (Spain)

23 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 6F

12685-29

### **UAV for "safe" emergency management of NaTech events in major hazard industrial plants**

Author(s): Alessandra Marino, Mariano Ciucci, Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro (Italy)

23 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 6F

12685-30

### **Burn severity assessment with different remote sensing products for wildfire damage analysis**

Author(s): Irem Ismailoglu, Nebiye Musaoglu, Istanbul Technical Univ. (Turkey)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 6F

12685-31

### **The comparison of ARIMA and LSTM in forecasting of long-term surface movements derived from PSINSAR**

Author(s): Nur Yagmur, Nebiye Musaoglu, Istanbul Technical Univ. (Turkey)

23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 6F

12685-32

### **About remote sensing technologies for assessment of the state of water systems**

Author(s): Ferdenant A. Mkrtychyan, Kotelnikov Institute of Radio Engineering and Electronics (Russian Federation)

23 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 6F

12685-33

### **Remote monitoring opportunities for natural disaster forecasting**

Author(s): Ferdenant A. Mkrtychyan, Kotelnikov Institute of Radio Engineering and Electronics (Russian Federation)

23 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 6F

### **POSTERS-WEDNESDAY**

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12685-46

### **Retrieval of atmospheric variables using geostationary satellite image over East Asia**

Author(s): Jong-Sung Ha, Korea Aerospace Research Institute (Republic of Korea); Jong-Min Yeom, Jeonbuk National Univ. (Republic of Korea); Kwon-Ho Lee, Gangneung-Wonju National Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12685-50

### **Evaluating commercial tablet screens for use as portable spectral radiance calibration assessment sources, specifically in support of field-deployed ground viewing radiometers**

Author(s): Nikolaus J. Anderson, Carolina Corella Velarde, Jason Dylla, Jeffrey S. Czaplak-Myers, Wyant College of Optical Sciences (United States); Kurtis J. Thome, NASA Goddard Space Flight Ctr. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12685-51

### **Using Dome Concordia to characterize the long-term stability of VIIRS thermal emissive bands**

Author(s): Amit Angal, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Ashish Shrestha, Aisheng Wu, Science Systems and Applications, Inc. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12685-52

### **Using scattered light from nadir port to aid the Terra and Aqua MODIS reflective solar band calibration**

Author(s): Amit Angal, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Kevin Twedt, Junqiang Sun, Science Systems and Applications, Inc. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12685-53

### **Aqua MODIS TEB crosstalk correction improvement and image quality enhancement**

Author(s): Tiejun Chang, Hanzhi Lin, Carlos Diaz, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12685

12685-54

### The JPSS-3 VIIRS version 2 at-launch relative spectral response characterization

Author(s): Christopher C. Moeller, Univ. of Wisconsin-Madison (United States); Tom Schwarting, Science Systems and Applications, Inc. (United States); David Moyer, The Aerospace Corp. (United States); Julia Barsi, Science Systems and Applications, Inc. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

### SESSION 9: SNPP AND JPSS MISSIONS

24 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 6F

Session Chair: Vijay Murgai,  
Raytheon Intelligence & Space (United States)

12685-34

### Early mission performance of NOAA-21 VIIRS reflective solar bands

Author(s): Ning Lei, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Kevin Twedt, Amit Angal, Sherry Li, Junqiang Sun, Science Systems and Applications, Inc. (United States)

24 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6F

12685-35

### Preliminary assessment of the NOAA-21 VIIRS on-orbit reflective solar band calibration and performance

Author(s): Taeyoung J. Choi, Slawomir Blonski, Global Science & Technology, Inc. (United States), NOAA National Environmental Satellite, Data, and Information Service (United States), NOAA Ctr. for Satellite Applications and Research (United States); Xi Shao, Wenhui Wang, Univ. of Maryland, College Park (United States)

24 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6F

12685-36

### On-orbit characterization of the VIIRS solar diffuser and attenuation screens for NOAA-21 using yaw measurements

Author(s): Junqiang Sun, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Ning Lei, Kevin Twedt, Sherry Li, Science Systems and Applications, Inc. (United States)

24 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6F

12685-37

### Evaluation of NOAA-21 VIIRS thermal emissive bands early on-orbit calibration performance

Author(s): Wenhui Wang, Univ. of Maryland, College Park (United States); Slawomir Blonski, Taeyoung Choi, Global Science & Technology, Inc. (United States)

24 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 6F

12685-38

### JPSS-2/NOAA-21 VIIRS early on-orbit geometric performance

Author(s): Ping Zhang, Guoqing Lin, John Dellomo, Bin Tan, Robert Wolfe, NASA Goddard Space Flight Ctr. (United States)

24 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 6F

12685-39

### Evaluation and correction of NOAA-21 VIIRS day night band stray light and comparison with SNPP and NOAA-20

Author(s): Xi Shao, Tung-Chang Liu, Univ. of Maryland, College Park (United States); Slawomir Blonski, Global Science & Technology, Inc. (United States); Sirish Uprety, Univ. of Maryland, College Park (United States); Taeyoung Choi, Global Science & Technology, Inc. (United States)

24 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 6F

Coffee Break 10:00 AM - 10:30 AM

### SESSION 10: VICARIOUS CALIBRATION

24 August 2023 • 10:30 AM - 12:30 PM | Conv. Ctr. Room 6F

Session Chair: Bertrand Fougnie, EUMETSAT (Germany)

12685-40

### Radiance-based and reflectance-based retrievals of surface reflectance for vicarious calibration

Author(s): Mohammad H. Tahersima, Science Systems and Applications, Inc. (United States), NASA (United States); Kurtis Thome, NASA Goddard Space Flight Ctr. (United States); Brian N. Wenny, Science Systems and Applications, Inc. (United States), NASA (United States); Nikolaus Anderson, Jeffrey Czaplak-Myers, Wyant College of Optical Sciences (United States)

24 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6F

12685-41

### Intercomparison of Landsat OLI and Terra ASTER solar reflective calibrations using the Radiometric Calibration Network data from Railroad Valley, Nevada

Author(s): Mehran Yarahmadi, Science Systems and Applications, Inc. (United States); Kurtis J. Thome, NASA Goddard Space Flight Ctr. (United States); Brian N. Wenny, Mohammad Tahersima, Norvik Voskanian, Sarah Eftekharzadeh, Science Systems and Applications, Inc. (United States)

24 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6F

12685-42

### Twenty years of the Clouds and the Earth's Radiant Energy System (CERES) calibration/validation data on Terra and Aqua

Author(s): Nathaniel P. Smith, Science Systems and Applications, Inc. (United States); Mohan Shankar, NASA Langley Research Ctr. (United States); Natividad Smith, Dale Walikainen, Janet Daniels, Susan Thomas, Science Systems and Applications, Inc. (United States)

24 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6F

12685-43

### Estimating bidirectional reflectance and monitoring stability of SNPP-VIIRS reflective solar bands using a deep neural network

Author(s): Benjamin Scarino, David Doelling, Rajendra Bhatt, NASA Langley Research Ctr. (United States); Conor Haney, Prathana Khakurel, Arun Gopalan, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Center (United States)

24 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6F



12685-44

### **The impact of pixel size on the characterization of deep convective clouds for calibration**

Author(s): Conor O. Haney, Science Systems and Applications, Inc. (United States); David R. Doelling, Rajendra Bhatt, NASA Langley Research Ctr. (United States); Prathana Khakurel, Benjamin Scarino, Arun Gopalan, Science Systems and Applications, Inc. (United States)

24 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 6F

12685-45

### **Improved characterization of Libya-4 and Dome-C for consistent radiometric scaling between VIIRS sensors**

Author(s): David R. Doelling, NASA Langley Research Ctr. (United States); Prathana Khakurel, Conor Haney, Science Systems and Applications, Inc. (United States); Rajendra Bhatt, NASA Langley Research Ctr. (United States); Benjamin Scarino, Arun Gopalan, Science Systems and Applications, Inc. (United States)

24 August 2023 • 12:10 PM - 12:30 PM | Conv. Ctr. Room 6F

# TECHNICAL CONFERENCES

## Conference 12686

# Infrared Remote Sensing and Instrumentation XXXI

21 August 2023 | Conv. Ctr. Room 14A

Conference Chairs: **Marija Strojnik**, Centro de Investigaciones en Óptica, A.C. (Mexico); **Jörn Helbert**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

Program Committee: **Gabriele E. Arnold**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Guillermo García-Torales**, Univ. de Guadalajara (Mexico); **Sarath D. Gunapala**, Jet Propulsion Lab. (United States); **Sven Höfling**, Julius-Maximilians-Univ. Würzburg (Germany)

### MONDAY 21 AUGUST 2023

#### WELCOME

21 August 2023 • 8:25 AM - 8:30 AM | Conv. Ctr. Room 14A  
Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)

#### SESSION 1: CALIBRATION AND SIMULATION OF REMOTE, IN TIME AND DISTANCE, PROCESSES

21 August 2023 • 8:30 AM - 10:10 AM | Conv. Ctr. Room 14A  
Session Chair: Marija Strojnik,  
Centro de Investigaciones en Óptica, A.C. (Mexico)

12686-1

#### Thermal band observations of the May 2022 total lunar eclipse by the Landsat thermal infrared sensors

Author(s): Matthew Montanaro, Dennis Reuter, Allen Lunsford, James Briscoe, NASA Goddard Space Flight Ctr. (United States)  
21 August 2023 • 8:30 AM - 8:45 AM | Conv. Ctr. Room 14A

12686-2

#### On-orbit spatial calibration performance of Landsat 8 and 9 thermal infrared sensors

Author(s): Sarah Eftekharzadeh, Brian N. Wenny, Science Systems and Applications, Inc. (United States); Kurtis J. Thome, NASA Goddard Space Flight Ctr. (United States)  
21 August 2023 • 8:45 AM - 9:00 AM | Conv. Ctr. Room 14A

12686-3

#### Towards shared fiber dissemination infrastructure for precise time, coherent optical frequency and entanglement transfers with sensing option (*Invited Paper*)

Author(s): Josef Vojtech, Rudolf Vohnout, Ondrej Havlis, Martin Slapak, Elisabeth Andriantsarazo, Tomáš Novák, Lada Altmannová, Vladimír Smotlacha, Jan Kundrat, CESNET z.s.p.o. (Czech Republic); Martin Cizek, Jan Hrabina, Simon Rerucha, Lenka Pravdova, Josef Lazar, Ondrej Cip, Institute of Scientific Instruments of the CAS, v.v.i. (Czech Republic); Michal Spacek, Jaroslav Roztocil, Czech Technical Univ. in Prague (Czech Republic); Alexander Kuna, Institute of Photonics and Electronics of the CAS, v.v.i. (Czech Republic)  
21 August 2023 • 9:00 AM - 9:25 AM | Conv. Ctr. Room 14A

12686-4

#### The new Venus spectral facility at the DLR Planetary Spectroscopy Laboratory to support the ESA EnVision and NASA DACINCI and VERITAS missions

Author(s): Jörn Helbert, Giulia Alemanno, Alessandro Maturilli, Solmaz Adeli, Aurelie Van Den Neucker, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Melinda D. Dyar, Planetary Science Institute (United States)  
21 August 2023 • 9:25 AM - 9:40 AM | Conv. Ctr. Room 14A

12686-5

#### Laboratory VNIR emissivity of Venus analog rocks and the VEM on VERITAS and the VenSpec-M on EnVision calibration and data verification plan

Author(s): Giulia Alemanno, Jörn Helbert, Alessandro Maturilli, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Melinda D. Dyar, Mount Holyoke College (United States), Planetary Science Institute (United States); Martin Pertenais, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Thomas Säuberlich, Deutsches Zentrum für Luft- und Raumfahrt (DLR) (Germany); Till Hagelschuer, Gisbert Peter, Denis Griessbach, Solmaz Adeli, Oceane Barraud, Aurelie Van Den Neucker, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Cai Ytsma, Cai Consulting (United Kingdom); Suzanne E. Smrekar, Jet Propulsion Lab. (United States)  
21 August 2023 • 9:40 AM - 9:55 AM | Conv. Ctr. Room 14A

12686-6

#### Radiation qualification and optical performance of the InGaAs type imaging sensor for the vSWIR spectral range in the VEM instrument on the VERITAS mission

Author(s): Andreas Pohl, Simone del Togno, Yaquelin Miriam Rosas Ortiz, Karsten Westerdorff, Carlos Arcos Carrasco, Dennis Wendler, Jörn Helbert, Gisbert Peter, Ingo Walter, Patrick Dern, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)  
21 August 2023 • 9:55 AM - 10:10 AM | Conv. Ctr. Room 14A

Coffee Break 10:10 AM - 10:40 AM

#### SESSION 2: INSTRUMENTS: SCIENTIFIC RETURNS AND

### CONCEPTUAL DESIGNS

21 August 2023 • 10:40 AM - 12:00 PM | Conv. Ctr. Room 14A  
Session Chairs: Hiroki Hihara, NEC Space Technologies Ltd. (Japan),  
Jörn Helbert, Deutsches Zentrum für Luft- und Raumfahrt e.V.  
(Germany)

12686-7

#### **New results in exploration of Venusian mesosphere by MERTIS MIR measurements during the two Venus flybys of the BepiColombo spacecraft** *(Invited Paper)*

Author(s): Gabriele E. Arnold, Rainer Haus, Jörn Helbert, Mario D'Amore, Alessandro Maturilli, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Harry Hiesinger, Westfälische Wilhelms- Univ. Münster (Germany)

21 August 2023 • 10:40 AM - 11:05 AM | Conv. Ctr. Room 14A

12686-8

#### **The science case for a far-infrared interferometer in the era of JWST and ALMA** *(Invited Paper)*

Author(s): David T. Leisawitz, NASA Goddard Space Flight Ctr. (United States); Matteo Bonato, INAF - Osservatorio Astronomico di Padova (Italy), Italian ALMA Regional Ctr. (Italy); Duncan Farrah, Univ. of Hawai'i (United States); T. Tupper Hyde, NASA Goddard Space Flight Ctr. (United States); Alaine Lee, Univ. of Hawai'i (United States); Lee G. Mundy, Univ. of Maryland, College Park (United States); Conor Nixon, NASA Goddard Space Flight Ctr. (United States); Berke V. Ricketti, Univ. of Lethbridge (Canada); Giorgio Savini, Univ. College London (United Kingdom); Jeremy Scott, Univ. of Lethbridge (Canada); Irene Shivaie, The Univ. of Arizona (United States); Locke Spencer, Univ. of Lethbridge (Canada); Kate Su, The Univ. of Arizona (United States); C. Megan Urry, Yale Univ. (United States); David Wilner, Harvard-Smithsonian Ctr. for Astrophysics (United States)

21 August 2023 • 11:05 AM - 11:30 AM | Conv. Ctr. Room 14A

12686-10

#### **Cryogenic reflectance spectroscopy under high vacuum conditions for outer planets exploration**

Author(s): Jörn Helbert, Andreas Lorek, Alessandro Maturilli, Stephen P. Garland, Giulia Alemanno, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

21 August 2023 • 11:30 AM - 11:45 AM | Conv. Ctr. Room 14A

12686-11

#### **Colored digital Moire technique for self-occluding shading in fringe projection profilometry**

Author(s): Jorge Luis Flores Nuñez, Sotero Ordoñez, Univ. de Guadalajara (Mexico); Geliztle Alejandra Parra Escamilla, Univ. de Guadalajara (Mexico), Universidad Panamericana, campus Guadalajara (Mexico)

21 August 2023 • 11:45 AM - 12:00 PM | Conv. Ctr. Room 14A

**Lunch Break 12:00 PM - 1:30 PM**

### SESSION 3: ENABLING TECHNOLOGIES

21 August 2023 • 1:30 PM - 2:50 PM | Conv. Ctr. Room 14A  
Session Chairs: Josef Vojtech, CESNET z.s.p.o. (Czech Republic),  
Jörn Helbert, Deutsches Zentrum für Luft- und  
Raumfahrt e.V. (Germany)

12686-12

#### **Research and development of short-range quantum infrared detector**

Author(s): Siwen Bi, Institute of Remote Sensing and Digital Earth, CAS (China); Bo Zhang, Cheng Long, State Key Laboratory of Remote Sensing Science, Aerospace Information Research Institute, Chinese Academy of Sciences (China)

21 August 2023 • 1:30 PM - 1:45 PM | Conv. Ctr. Room 14A

12686-13

#### **Sensor electronics design framework with heterogeneous computing edge nodes** *(Invited Paper)*

Author(s): Hiroki Hihara, Daichi Imazato, Mitsuhsa Yamaji, NEC Space Technologies Ltd. (Japan); Kuniyuki Omagari, Tadateru Takahashi, Kyosuke Kuze, Kazuyo Mizushima, NEC Corp. (Japan); Takeshi Takashima, Japan Aerospace Exploration Agency (Japan)

21 August 2023 • 1:45 PM - 2:10 PM | Conv. Ctr. Room 14A

12686-14

#### **Infrared detector applications for safety and health** *(Invited Paper)*

Author(s): A. G. Unil Perera, Georgia State Univ. (United States)

21 August 2023 • 2:10 PM - 2:35 PM | Conv. Ctr. Room 14A

12686-15

#### **A detector characterization setup for testing performance under space environmental conditions**

Author(s): Matthias Grott, Thomas Behnke, Harald Michaelis, Christian Althaus, Simone del Togno, David Wolter, Jörg Knollenberg, Jörn Helbert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

21 August 2023 • 2:35 PM - 2:50 PM | Conv. Ctr. Room 14A

**Coffee Break 2:50 PM - 3:20 PM**

### SESSION 4: DEVICES AND COMPONENTS

21 August 2023 • 3:20 PM - 5:15 PM | Conv. Ctr. Room 14A  
Session Chair: Jörn Helbert, Deutsches Zentrum für Luft- und  
Raumfahrt e.V. (Germany)

12686-16

#### **Two-wavelength imaging pyrometer for ultrafast temperature monitoring of nanocrystalline diamond foils** *(Invited Paper)*

Author(s): Abdurahim Rakhman Oguz, Oak Ridge National Lab. (United States)

21 August 2023 • 3:20 PM - 3:45 PM | Conv. Ctr. Room 14A

12686-17

#### **Secondary scan patterns and symmetries produced by a pair of rotational Risley prisms** *(Invited Paper)*

Author(s): Virgil-Florin Duma, Univ. "Aurel Vlaicu" din Arad (Romania), Univ. Politehnica Timisoara (Romania); Alexandru-Lucian Dîmb, Univ. Politehnica Timisoara (Romania); Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)

21 August 2023 • 3:45 PM - 4:10 PM | Conv. Ctr. Room 14A

# TECHNICAL CONFERENCES

## Conference 12686

12686-18

### **Novel laser pulse shaping technique using self-induced plasma in gases** (*Invited Paper*)

Author(s): Taieb Gasmí, Saint Louis Univ. - Madrid Campus (Spain)  
21 August 2023 • 4:10 PM - 4:35 PM | Conv. Ctr. Room 14A

12686-19

### **Sensing via digital Stokes polarimetry and transport-of-intensity** (*Invited Paper*)

Author(s): Angela L. Dudley, Keshaan Singh, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)  
21 August 2023 • 4:35 PM - 5:00 PM | Conv. Ctr. Room 14A

12686-20

### **Designing iterations of the Venus Emissivity Mapper Emulator: making a space instrument suitable for field campaigns**

Author(s): Solmaz Adeli, Stephen P. Garland, Mario D'Amore, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Juniper Gillespie, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany), Constructor Univ. (Germany); Giulia Alemanno, Alessandro Maturilli, Dennis Wendler, Frank Trauthan, Mickael Baque, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Vikram Unnithan, Constructor Univ. (Germany); Enrica Bonato, Jörn Helbert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)  
21 August 2023 • 5:00 PM - 5:15 PM | Conv. Ctr. Room 14A

## POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12686-21

### **Technology research of 1 km quantum lidar system**

Author(s): Siwen Bi, Institute of Remote Sensing and Digital Earth, CAS (China)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-22

### **Design of broadband detector based on optical detectors to characterize transparent samples**

Author(s): Armando Villalpando, Francisco J. Cervantes Lozano, David I. Serrano-García, Univ. de Guadalajara (Mexico); Geliztle A. Parra-Escamilla, Univ. de Guadalajara (Mexico), Univ. Panamericana (Mexico)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-23

### **Faint signal detection from two superposed signals in a rotationally shearing interferometer using a 4f optical processor**

Author(s): Manuel Alejandro Montes-Flores, Guillermo García-Torales, Univ. de Guadalajara (Mexico); Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-24

### **Thermal detection of thyroid pathologies using artificial neural networks**

Author(s): Jorge Luis Flores Nuñez, Univ. de Guadalajara (Mexico); Miguel Angel Jurado-Aguirre, Hospital General Regional 1, Instituto Mexicano del Seguro Social (Mexico); Alfredo Pérez-Nájera, Centro Médico Nacional de Occidente, Instituto Mexicano del Seguro Social (Mexico); Adan Cruz, Univ. de Granada (Spain); Francisco J. Gonzalez, Univ. of Central Florida (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-25

### **Single spectral band of health vegetation detection using a conventional camera**

Author(s): Roberto Carlos Barragán Campos, Guillermo García-Torales, Jaime Ricardo González Romero, Univ. de Guadalajara (Mexico); Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-26

### **Finite element analysis of a thickness meter based on laser shock waves**

Author(s): Jaime Ricardo González Romero, Roberto Carlos Barragán Campos, Gilberto Gomez-Rosas, Guillermo García-Torales, Univ. de Guadalajara (Mexico); Marija Strojnik, Centro de Investigaciones en Óptica AC (Mexico)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-27

### **Three-mirror optical system designs using y-y-bar diagram**

Author(s): Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico); Yaujen Wang, Consultant (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-28

### **Optical centroidal efficiency and energy on rectangular pixel**

Author(s): Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico); Yaujen Wang, Consultant (United States)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12686-29

### **System for continuous evaluation of optical path asymmetry**

Author(s): Michal Spacek, Czech Technical Univ. in Prague (Czech Republic); Josef Vojtech, CESNET z.s.p.o. (Czech Republic); Jaroslav Róztocil, Czech Technical Univ. in Prague (Czech Republic)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## Conference 12687

# Infrared Sensors, Devices, and Applications XIII

22 - 23 August 2023 | Conv. Ctr. Room 7A

Conference Chairs: **Priyalal Wijewarnasuriya**, Teledyne Imaging Sensors (United States); **Arvind I. D'Souza**, Leonardo DRS (United States); **Ashok K. Sood**, Magnolia Optical Technologies, Inc. (United States)

Program Committee: **Sachidananda R. Babu**, NASA Earth Science Technology Office (United States); **Vincent M. Cowan**, Air Force Research Lab. (United States); **Nibir K. Dhar**, Virginia Commonwealth Univ. (United States); **Sarath D. Gunapala**, Jet Propulsion Lab. (United States); **Vaikunth Khalap**, Leonardo DRS (United States); **Paul D. LeVan**, Air Force Research Lab. (Retired) (United States); **Sushant Sonde**, EPIR Technologies, Inc. (United States); **Athanasios J. Syllaios**, L3Harris Technologies, Inc. (United States); **Gananath Wijeratne**, HRL Labs., LLC (United States)

### TUESDAY 22 AUGUST 2023

#### SESSION 1: INFRARED TECHNOLOGY OVERVIEW

22 August 2023 • 8:00 AM - 10:35 AM | Conv. Ctr. Room 7A

Session Chairs: Priyalal S. Wijewarnasuriya, Teledyne Imaging Sensors (United States), Arvind I. D'Souza, Leonardo DRS (United States)

12687-1

#### **A comparison of mesa and planar infrared detector architectures** (*Keynote Presentation*)

Author(s): Chad Fulk, Jamal Mustafa, Raytheon Technologies Corp. (United States)

22 August 2023 • 8:00 AM - 8:45 AM | Conv. Ctr. Room 7A

12687-2

#### **Leonardo UK high performance shortwave APDs for astronomy** (*Invited Paper*)

Author(s): Ian Baker, Matthew Hicks, Chris Maxey, Daniel Owton, Leonardo UK Ltd. (United Kingdom)

22 August 2023 • 8:45 AM - 9:15 AM | Conv. Ctr. Room 7A

12687-3

#### **The Convergence Laboratory Program at Virginia Commonwealth University** (*Invited Paper*)

Author(s): Nibir K. Dhar, Virginia Commonwealth Univ. (United States)

22 August 2023 • 9:15 AM - 9:45 AM | Conv. Ctr. Room 7A

12687-4

#### **Calibration system for mid-infrared superconducting nanowire single photon detectors**

Author(s): Michelle Brann, Varun Verma, Solomon Woods, National Institute of Standards and Technology (United States)

22 August 2023 • 9:45 AM - 10:05 AM | Conv. Ctr. Room 7A

12687-5

#### **Advanced MWIR and LWIR band detection and imaging with nanostructured antireflection coating technology** (*Invited Paper*)

Author(s): Ashok K. Sood, John W. Zeller, Magnolia Optical Technologies, Inc. (United States); Parminder Ghuman, Sachidananda Babu, NASA Earth Science Technology Office (United States); Sarath Gunapala, David Ting, Alexander Soibel, Jet Propulsion Lab. (United States); Latika S. Chaudhary, Harry Efstathiadis, SUNY Polytechnic Institute (United States)

22 August 2023 • 10:05 AM - 10:35 AM | Conv. Ctr. Room 7A

Coffee Break 10:35 AM - 11:05 AM

#### SESSION 2: SPACE-BASED INFRARED TECHNOLOGY

22 August 2023 • 11:05 AM - 12:15 PM | Conv. Ctr. Room 7A

Session Chairs: Ashok K. Sood, Magnolia Optical Technologies, Inc. (United States), Arvind I. D'Souza, Leonardo DRS (United States)

12687-6

#### **PRIMA space telescope cryocooling system**

Author(s): Weibo Chen, Bradley D. Moore, Jet Propulsion Lab. (United States); Michael J. DiPirro, Peter J. Shirron, NASA Goddard Space Flight Ctr. (United States); Michael B. Petach, Northrop Grumman Corp. (United States)

22 August 2023 • 11:05 AM - 11:25 AM | Conv. Ctr. Room 7A

12687-7

#### **Review of current Leonardo space and astronomy projects**

Author(s): Daniel Owton, Jordan Ash, Ian Baker, Jim Gordon, Matthew Hicks, Chris Maxey, Asim Malik, Raman Mistry, Leonardo UK Ltd. (United Kingdom)

22 August 2023 • 11:25 AM - 11:45 AM | Conv. Ctr. Room 7A

12687-8

#### **Compact fire infrared radiance spectral tracker (c-FIRST)** (*Invited Paper*)

Author(s): Sarath D. Gunapala, David Z. Ting, Alexander Soibel, William R. Johnson, Olga Kalashnikova, Michael J. Garay, Ashley G. Davies, Sir B. Rafol, Sam A. Keo, Brian J. Pepper, Cory J. Hill, Jet Propulsion Lab. (United States); Christopher David, Anduril Industries, Inc. (United States); Ashok Sood, John Zeller, Magnolia Optical Technologies, Inc. (United States); Sachidananda R. Babu, Parminder Ghuman, NASA Earth Science Technology Office (United States)

22 August 2023 • 11:45 AM - 12:15 PM | Conv. Ctr. Room 7A

Lunch/Exhibition Break 12:15 PM - 1:45 PM

# TECHNICAL CONFERENCES

## Conference 12687

### SESSION 3: III-V INFRARED MATERIALS AND DETECTORS

22 August 2023 • 1:45 PM - 2:25 PM | Conv. Ctr. Room 7A  
Session Chairs: Sarath D. Gunapala, Jet Propulsion Lab. (United States), Gan Wijeratne, HRL Labs., LLC (United States)

12687-10

#### InGaSb MQW LEDs on Si with various dislocation filter layers grown by molecular beam epitaxy

Author(s): Eungbeom Yeon, Seungwan Woo, Rafael Jumar Chu, Korea Institute of Science and Technology (Republic of Korea); In-Hwan Lee, Korea Univ. (Republic of Korea); Daehwan Jung, Won Jun Choi, Korea Institute of Science and Technology (Republic of Korea)  
22 August 2023 • 1:45 PM - 2:05 PM | Conv. Ctr. Room 7A

12687-11

#### Growth of bulk 0.1 eV InAsSb on GaAs substrate with InAs-based intermediate buffer layer

Author(s): Seungwan Woo, Korea Institute of Science and Technology (Republic of Korea), Seoul National Univ. (Republic of Korea); Eungbeom Yeon, Korea Institute of Science and Technology (Republic of Korea); Ho Won Jang, Seoul National Univ. (Republic of Korea); Daehwan Jung, Won Jun Choi, Korea Institute of Science and Technology (Republic of Korea)  
22 August 2023 • 2:05 PM - 2:25 PM | Conv. Ctr. Room 7A

Coffee Break 2:25 PM - 2:55 PM

### SESSION 4: NOVEL DETECTOR CONCEPTS AND APPLICATIONS

22 August 2023 • 2:55 PM - 4:35 PM | Conv. Ctr. Room 7A  
Session Chairs: Gan Wijeratne, HRL Labs., LLC (United States), Ashok K. Sood, Magnolia Optical Technologies, Inc. (United States)

12687-12

#### Near-infrared imager based on high performance organic photodetector using a-IGZO as electron transport layer

Author(s): Abu Bakar Siddik, imec (Belgium), KU Leuven (Belgium); Epimitheas Georgitzikis, imec (Belgium); Jubin Kang, imec (Belgium), Ulsan National Institute of Science and Technology (Republic of Korea); Pawel E. Malinowski, Joo Hyoung Kim, Yannick Hermans, Vladimir Pejovic, Itai Lieberman, imec (Belgium); Andriy Kadashchuk, imec (Belgium), The National Academy of Sciences of Ukraine (Ukraine); Jan Genoe, imec (Belgium), KU Leuven (Belgium); Thierry Conard, David Cheyns, imec (Belgium); Paul Heremans, imec (Belgium), KU Leuven (Belgium)  
22 August 2023 • 2:55 PM - 3:15 PM | Conv. Ctr. Room 7A

12687-14

#### Physics-based adaptive learning to resolve overlapping molecular line transitions for mid-infrared sensing applications

Author(s): Al R. Alexis, Zayna Juracka, Ryan T. Bischoff, Mohammad A. Khan, Delaware State Univ. (United States)  
22 August 2023 • 3:15 PM - 3:35 PM | Conv. Ctr. Room 7A

12687-15

#### Multispectral imaging in defense applications

Author(s): Martin Gerken, HENSOLDT Optronics GmbH (Germany)  
22 August 2023 • 3:35 PM - 3:55 PM | Conv. Ctr. Room 7A

12687-16

#### Meta-surface lens and deep learning process toward practical LWIR imaging devices

Author(s): Wontaek Seo, Duhyun Lee, Yongseop Yoon, Soonkeun Chang, Jangwoo You, Byungkyu Lee, Seyoon Kim, SAMSUNG Advanced Institute of Technology (Republic of Korea)  
22 August 2023 • 3:55 PM - 4:15 PM | Conv. Ctr. Room 7A

12687-17

#### Infrared thermography based smart irrigation scheduling for horticulture plants

Author(s): Lalat Indu Giri, National Institute of Technology, Goa (India)  
22 August 2023 • 4:15 PM - 4:35 PM | Conv. Ctr. Room 7A

## WEDNESDAY 23 AUGUST 2023

### SESSION 5: NOVEL IR DETECTORS AND MATERIALS

23 August 2023 • 8:00 AM - 10:20 AM | Conv. Ctr. Room 7A  
Session Chairs: Vaikunth Khalap, Leonardo DRS (United States), Sarath D. Gunapala, Jet Propulsion Lab. (United States)

12687-18

#### High-performance graphene-enhanced HgCdTe photodetectors for uncooled extended infrared band sensing and imaging (*Invited Paper*)

Author(s): Ashok K. Sood, John W. Zeller, Magnolia Optical Technologies, Inc. (United States); Parminder Ghuman, Sachidananda R. Babu, NASA Earth Science Technology Office (United States); Nibir K. Dhar, Samiran Ganguly, Virginia Commonwealth Univ. (United States); Latika S. Chaudhary, Harry Efstathiadis, SUNY Polytechnic Institute (United States)  
23 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 7A

12687-19

#### Optimizing advanced integration technology for large format, small pixel IRFPAs (*Invited Paper*)

Author(s): Sushant Sonde, EPIR Technologies, Inc. (United States); Kiran Sasikumar, Argonne National Lab. (United States); Yong Chang, EPIR Technologies, Inc. (United States); Subramanian KRS Sankaranarayanan, Argonne National Lab. (United States), Univ. of Illinois (United States); Silviu Velicu, EPIR Technologies, Inc. (United States)  
23 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 7A

12687-20

#### fabrication and modeling study to reduce valence band offset in HgCdTe MWIR nBn photodetectors grown on silicon using superlattice barrier

Author(s): Ryan Sellers, Univ. of Illinois at Chicago (United States); Sushant Sonde, EPIR Technologies, Inc. (United States); Peihong Man, Zahira El Khalidi, Univ. of Illinois at Chicago (United States); Zaheer Ahmad, Silviu Velicu, EPIR Technologies, Inc. (United States)  
23 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 7A

12687-21

#### 2D high temperature sensor development using LWIR borescope

Author(s): Trevor Chen, Andy Zhang, Awnik Roy, Paul S. Hsu, Spectral Energies, LLC (United States); Oleksandr Bibik, Subodh Adhikari, Georgia Institute of Technology (United States), Ben T. Zinn Combustion Lab. (United States)  
23 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 7A

12687-22

### Development of voltage-tunable IR photodetector

Author(s): Gyana R. Biswal, Michael Yakimov, Vadim Tokranov, SUNY Polytechnic Institute (United States); Kimberly A. Sablon, Texas A&M Univ. (United States), Office of the Under Secretary of Defense for Research and Engineering (United States); Sergey Tulyakov, Vladimir Mitin, Univ. at Buffalo, The State Univ. of New York (United States); Serge Oktyabrsky, SUNY Polytechnic Institute (United States)

23 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 7A

12687-23

### Viability of HgCdTe based two color nBn infrared detectors

Author(s): Zahira El Khalidi, Univ. of Illinois at Chicago (United States); Sushant Sonde, EPIR Technologies, Inc. (United States); Ryan Sellers, Peihong Man, Univ. of Illinois at Chicago (United States); Silviu Velicu, EPIR Technologies, Inc. (United States); Sivalingam Sivananthan, Sivananthan Labs. (United States)

23 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 7A

Coffee Break 10:20 AM - 10:50 AM

#### SESSION 6: MODELING OF ADVANCED INFRARED DEVICES

23 August 2023 • 10:50 AM - 12:10 PM | Conv. Ctr. Room 7A

Session Chairs: Sushant Sonde, EPIR Technologies, Inc. (United States), Vaikunth Khalap, Leonardo DRS (United States)

12687-24

### Modeling novel radiation hardened avalanche photodiode architectures

Author(s): Caroline Tally, Abigail S. Licht, Denis Nothorn, Christopher O'Connell, Michael Myszk, Joseph Donnelly, Alex McIntosh, Christopher Heidelberger, Erik Duerr, MIT Lincoln Lab. (United States)

23 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 7A

12687-25

### Monte Carlo modeling of HgCdTe avalanche photodiodes

Author(s): Mike Zhu, Ilya Prigozhin, Boston Univ. (United States); Pradip Mitra, Chris Schaake, Richard Scritchfield, Leonardo DRS Dallas (United States); Enrico Bellotti, Boston Univ. (United States)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 7A

12687-26

### Modeling the effects of graded and abrupt mole fraction profiles in pBn and nBn HgCdTe barrier detectors

Author(s): Matteo Alasio, Politecnico di Torino (Italy), Boston Univ. (United States); Marco Vallone, Paolo Molino, Luca Errico, Politecnico di Torino (Italy); Stefan Hanna, Heinrich Figgemeier, AIM INFRAROT-MODULE GmbH (Germany); Alberto Tibaldi, Francesco Bertazzi, Politecnico di Torino (Italy), Istituto di Elettronica e di Ingegneria dell'Informazione e delle Telecomunicazioni (Italy); Giovanni Ghione, Politecnico di Torino (Italy); Michele Goano, Politecnico di Torino (Italy), Istituto di Elettronica e di Ingegneria dell'Informazione e delle Telecomunicazioni (Italy)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 7A

12687-27

### Quantum transport simulation of a mid-wave Ga-based type-II superlattice for curved focal-plane arrays

Author(s): John Glennon, Enrico Bellotti, Boston Univ. (United States)

23 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 7A

#### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12687-9

### Growth of 6.2 Å semiconductor topological materials on lattice engineered virtual substrates

Author(s): Heather J. Haugan, Air Force Research Lab. (United States); Albert M. Hilton, KBRwyle (United States); Krishnamurthy Mahalingam, Adam T. Neal, Air Force Research Lab. (United States); Said Elhamri, Univ. of Dayton (United States); Robert G. Bedford, Kurt G. Eyink, Air Force Research Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-28

### Case studies on sensitivity of diffuse reflectance spectra for IR absorbing materials on substrates

Author(s): Jesse Duncan, Rachel Viger, Scott Ramsey, Troy Mayo, Samuel G. Lambrakos, U.S. Naval Research Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-29

### Multipolarized gold dipole nanoantennas for IR focal plane arrays: an infrared detection approach

Author(s): Juan R. Moreno García, Univ. Autónoma de San Luis Potosí (Mexico); Javier Méndez-Lozoya, Instituto Tecnológico de San Luis Potosí (Mexico); Fernando S. Chiwo González, Ctr. de Tecnología Avanzada A.C. (Mexico); Miguel G. Ramírez-Eliás, Univ. Autónoma de San Luis Potosí (Mexico); Francisco J. González Contreras, Univ. of Central Florida (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-30

### Growth of p-CuInSe<sub>2</sub>/n-Si heterojunction for near-infrared photodetection

Author(s): Sungtae Kim, Gwangju Institute of Science and Technology (Republic of Korea), Korea Institute of Energy Technology (Republic of Korea); Temujin Enkhbat, Korea Institute of Energy Technology (Republic of Korea); Sang-Hun Lee, Gwangju Institute of Science and Technology (Republic of Korea), Korea Institute of Energy Technology (Republic of Korea); Jae-Hyung Jang, Korea Institute of Energy Technology (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12687

12687-31

### **Exploring the crystal field effect in magnetoplumbite phosphor for diverse emission wavelengths from red to SWIR**

Author(s): Yong Min Park, Ha Jun Kim, Won-Bin Im, Hanyang Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-32

### **Characterization of a Shack-Hartmann type wavefront sensor for its use in an experimental aberrometer**

Author(s): Cristian M. Medina Coca, Brandon D. Sánchez Valencia, Emerson A. Diaz Gonzalez, Citlalli Almaguer Gomez, José L. Magaña-Chávez, Univ. de Guadalajara (Mexico); Juana Medina-Márquez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Sandra E. Balderas-Mata, Univ. de Guadalajara (Mexico)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-33

### **Analysis of optical properties and reduced stain estimation in InAs/InGaAsSb quantum dot heterostructure with the variation of growth rate**

Author(s): Rajib Saha, Farheen Shamim Ahmed Sabiha, Raveesh Gourishetty, Manas Ranjan Mantri, Ajay Kumar, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-34

### **Investigation of strain profile and band-alignment study in InAs/GaAsSb quantum dot heterostructure with varying Sb content**

Author(s): Farheen Shamim Ahmed Sabiha, Ravindra Kumar, Raveesh Gourishetty, Rajib Saha, Manas Ranjan Mantri, Ajay Kumar, Subhananda Chakrabarti, Indian Institute of Technology Bombay (India)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12687-35

### **Development of the receiver of laser leveling machine using neighboring pixels sampling algorithm and filter design**

Author(s): Sangyoo Kim, Korea Photonics Technology Institute (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A



## Conference 12688

# Imaging Spectrometry XXVI: Applications, Sensors, and Processing

20 August 2023 | Conv. Ctr. Room 6E

Conference Chairs: **Emmett J. Ientilucci**, Rochester Institute of Technology (United States); **Christine L. Bradley**, Jet Propulsion Lab. (United States)

Program Committee: **Robert Arlen**, Spectral Solutions LLC (United States); **Robert D. Fiete**, L3Harris Technologies, Inc. (United States); **Ronald B. Lockwood**, MIT Lincoln Lab. (United States); **Torbjørn Skauli**, Univ. of Oslo (Norway); **Robert Sundberg**, Spectral Sciences, Inc. (United States); **Melina Maria Zempila**, STFC Rutherford Appleton Lab. (United Kingdom)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: ALGORITHMS AND DETECTION

20 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 6E

Session Chair: Robert Sundberg,  
Spectral Sciences, Inc. (United States)

12688-3

#### Diffusion learning for atmospheric correction

Author(s): David Stelter, Robert Sundberg, Spectral Sciences, Inc. (United States)

20 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 6E

#### SESSION 2: STANDARDS, WORKFLOWS, AND SIMULATIONS

20 August 2023 • 9:30 AM - 10:30 AM | Conv. Ctr. Room 6E

Session Chair: Robert Arlen, Spectral Solutions LLC (United States)

12688-4

#### The impact of topographic shadows on subpixel target detection

Author(s): Robert Sundberg, Spectral Sciences, Inc. (United States)

20 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 6E

12688-5

#### Imaging the point spread function of hyperspectral cameras; the full truth about coregistration error and resolution

Author(s): Torbjørn Skauli, Univ. of Oslo (Norway); Marie Bøe Henriksen, Norwegian Univ. of Science and Technology (Norway); Gard Momrak Selnesaunet, Univ. of Oslo (Norway)

20 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 6E

12688-6

#### CUVIS.AI: a new open source platform and three state-of-the-art applications of machine learning in hyperspectral imaging

Author(s): René Michels, Robert Briegel, Arnd Brandes, Barbara A. Darnell, Cubert GmbH (Germany)

20 August 2023 • 10:10 AM - 10:30 AM | Conv. Ctr. Room 6E

Coffee Break 10:30 AM - 11:00 AM

#### SESSION 3: REMOTE SENSING, SOIL, AND GAS DETECTION

20 August 2023 • 11:00 AM - 12:00 PM | Conv. Ctr. Room 6E

Session Chair: Robert Arlen, Spectral Solutions LLC (United States)

12688-7

#### Unmixing PRISMA hyperspectral images by Multiple Endmember Spectral Mixture Analysis (MESMA) to assess fire severity in Mediterranean forest ecosystems

Author(s): María del Carmen Quintano, Univ. de Valladolid (Spain); Alfonso Fernández-Manso, José Manuel Fernández-Guisuraga, Leonor Calvo, Univ. de León (Spain)

20 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 6E

12688-8

#### Using geometric and radiative transfer models to estimate vegetation properties for wildfire prevention and mitigation

Author(s): Glenn E. Healey, Kunchao Xu, Univ. of California, Irvine (United States)

20 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 6E

12688-9

#### Spectral reflectance separation using physics-based constraints on atmospheric and illumination functions in frequent revisit hyperspectral data

Author(s): Glenn E. Healey, Weishi Li, Univ. of California, Irvine (United States)

20 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 6E

Lunch Break 12:00 PM - 1:30 PM

#### SESSION 4: NOVEL DESIGNS AND TECHNOLOGIES I

20 August 2023 • 1:30 PM - 3:10 PM | Conv. Ctr. Room 6E

Session Chair: Ronald B. Lockwood, MIT Lincoln Lab. (United States)

12688-10

#### Mosaic-pixelated Fabry-Pérot filters for snapshot spectral imagers

Author(s): Teddy C. Cheung, Marc Christophersen, U.S. Naval Research Lab. (United States)

20 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 6E

# TECHNICAL CONFERENCES

## Conference 12688

12688-11

### The Global Hyperspectral Observation Satellite (GHOST) Constellation

Author(s): Alvin Spivey, Kaushik Bangalore, Orbital Sidekick (United States)

20 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 6E

12688-12

### Optomechanical design of a next generation carbon mapping hyperspectral imaging spectrometer

Author(s): Lucas Shaw, Sander Zandbergen, Clifford Klein, Nathan Kinkaid, Riley Duren, Jet Propulsion Lab. (United States); Dustin Crumb, Megan Gibson, Eric Olds, Christopher Smith, Sierra Lobo, Inc. (United States); Paul Giuliano, Justin Haag, Planet Labs, Inc. (United States)

20 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 6E

12688-13

### Preliminary alignment, characterization, and comparison of next generation carbon mapping hyperspectral imaging spectrometers

Author(s): Sander R. Zandbergen, Lucas Shaw, Clifford Klein, Robert O. Green, Riley Duren, Jet Propulsion Lab. (United States); Megan Gibson, Hovik Nazaryan, Christopher Smith, Sierra Lobo, Inc. (United States); Paul Giuliano, Justin Haag, Caroline Pritchett, Planet Labs, Inc. (United States)

20 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 6E

12688-21

### The Carbon Balance Observatory (CARBO) prototype: design and first tests

Author(s): Yuri Beregovski, Luis Diego Fonseca, Jet Propulsion Lab. (United States); Myrtle F. Lin, Violeta Malyan, Sierra Lobo, Inc. (United States); Robert A. Rosenberg, Robert Glenn Sellar, Kent Wallace, Charles E. Miller, Jet Propulsion Lab. (United States)

20 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 6E

Coffee Break 3:10 PM - 3:40 PM

## SESSION 5: NOVEL DESIGNS AND TECHNOLOGIES II

20 August 2023 • 3:40 PM - 5:20 PM | Conv. Ctr. Room 6E

Session Chair: Christine L. Bradley,  
Jet Propulsion Lab. (United States)

12688-15

### Ultra-compact imaging spectrometer for the lunar surface (UCIS-Moon): instrument alignment and laboratory optical performance

Author(s): Holly A. Bender, Abigail A. Fraeman, Jet Propulsion Lab. (United States); Christopher D. Smith, Megan S. Gibson, Sierra Lobo, Inc. (United States); Robert O. Green, David R. Thompson, Michael L. Eastwood, Quentin P. Vinckier, Mark C. Helmlinger, Byron E. Van Gorp, Ian M. McKinley, Charles M. Sarture, Pantazis Mouroulis, Jet Propulsion Lab. (United States)

20 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 6E

12688-16

### Aquatic ecosystems science using an imaging spectrometer

Author(s): Ronald B. Lockwood, MIT Lincoln Lab. (United States); Charles Bachmann, Rochester Institute of Technology (United States); Michael Chrisp, Corrie Smeaton, MIT Lincoln Lab. (United States); Nima Pahlaven, NASA Goddard Space Flight Ctr. (United States); Eric Hochberg, Bermuda Institute of Ocean Sciences, 17 Biological Station (Bermuda); Marcos J. Montes, Remote Sensing Division, Naval Research Laboratory, Code 7231, 4555 Overlook Avenue, SW, (United States); Bo-Cai Gao, Remote Sensing Division, Naval Research Laboratory (United States); Robert Frouin, Scripps Institution of Oceanography, University of California, San Diego (United States); Anthony Vodacek, Rochester Institute of Technology (United States); Cedric Fichot, Department of Earth and Environment, Boston University (United States); Tom W. Bell, Woods Hole Oceanographic Institution (United States); Roy A. Armstrong, Department of Marine Sciences, University of Puerto Rico (United States); Chunyan Li, Department of Oceanography and Coastal Sciences, Louisiana State University (United States); Laura Kennedy, Steven Gillmer, Linda Fuhrman, Derrick Brouhard, Jade Wang, MIT Lincoln Lab. (United States); Kurtis Thome, NASA Goddard Space Flight Ctr. (United States)

20 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 6E

12688-17

### Development of a pre-launch absolute radiometric calibration test plan for CLARREO Pathfinder

Author(s): Zhipeng Wang, Science Systems and Applications, Inc. (United States); Kurtis Thome, NASA Goddard Space Flight Ctr. (United States); Ronald Lockwood, MIT Lincoln Lab. (United States); Brian Wenny, Science Systems and Applications, Inc. (United States)

20 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 6E

12688-18

### Hyperspectral SWIR sensor parameterization for optimal methane detection

Author(s): Michael Pieper, Ronald B. Lockwood, Michael Chrisp, MIT Lincoln Lab. (United States)

20 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 6E

12688-19

### Application of polarization spectroellipsometric measurements for monitoring the aquatic environment

Author(s): Ferdenant A. Mkrtychyan, Kotelnikov Institute of Radio Engineering and Electronics (Russian Federation)

20 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 6E

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### POSTERS-MONDAY

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Monday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12688-22

#### Measured efficiency of diffraction gratings for Carbon Plume Mapper (CPM)

Author(s): Carey L. Weisberg, Pantazis Mouroulis, Daniel J. Preston, Daniel W. Wilson, David R. Ardila, Sander R. Zandbergen, Robert O. Green, Christine L. Bradley, Jet Propulsion Lab. (United States)

21 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12689

# CubeSats, SmallSats, and Hosted Payloads for Remote Sensing VII

20 August 2023 | Conv. Ctr. Room 8

Conference Chairs: **Sachidananda R. Babu**, NASA Earth Science Technology Office (United States); **Thomas S. Pagano**, Jet Propulsion Lab. (United States); **Jeffery J. Puschell**, Northrop Grumman Corp. (United States)

Program Committee: **William J. Blackwell**, MIT Lincoln Lab. (United States); **Pamela E. Clark**, Morehead State Univ. (United States); **Marco Esposito**, cosine Remote Sensing B.V. (Netherlands); **Martin Kaufmann**, Forschungszentrum Jülich GmbH (Germany); **Young H. Lee**, Jet Propulsion Lab. (United States); **Charles D. Norton**, Jet Propulsion Lab. (United States); **Massimiliano Pastena**, European Space Research and Technology Ctr. (Netherlands); **Steven C. Reising**, Colorado State Univ. (United States); **Roger Walker**, European Space Research and Technology Ctr. (Netherlands)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: FLYING OR PLANNED EARTH FLIGHT INSTRUMENTS AND MISSIONS

20 August 2023 • 9:00 AM - 10:40 AM | Conv. Ctr. Room 8

Session Chairs: Thomas S. Pagano, Jet Propulsion Lab. (United States), Jeffery J. Puschell, Northrop Grumman Corp. (United States)

12689-1

#### **On-orbit assessment of the NASA TROPICS mission** (*Invited Paper*)

Author(s): William J. Blackwell, Robert V. Leslie, MIT Lincoln Lab. (United States)

20 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 8

12689-2

#### **Recent advances in atmospheric remote sensing enabled by CubeSats and SmallSats: Results and opportunities from the Temporal Experiment for Storms and Tropical Systems (TEMPEST) missions** (*Invited Paper*)

Author(s): Steven C. Reising, Christian D. Kummerow, V. Chandrasekar, Chandrasekar Radhakrishnan, Colorado State Univ. (United States); Shannon T. Brown, Jet Propulsion Lab. (United States), NASA (United States), Caltech (United States); Richard Schulte, Chia-Pang Kuo, Colorado State Univ. (United States); Todd C. Gaier, Sharmila Padmanabhan, Jet Propulsion Lab. (United States), NASA (United States), Caltech (United States)

20 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 8

12689-4

#### **Investigation of convective updrafts (INCUS): status after phase A**

Author(s): Simone Tanelli, Ziad Haddad, Jet Propulsion Lab. (United States); Susan van den Heever, Colorado State Univ. (United States)

20 August 2023 • 10:00 AM - 10:20 AM | Conv. Ctr. Room 8

12689-5

#### **Development of a mirror mounting flexure for the MUVI instrument**

Author(s): Colin Harrop, Eltahry Elghandour, California Polytechnic State Univ., San Luis Obispo (United States); Kodi Rider, Space Sciences Lab. (United States)

20 August 2023 • 10:20 AM - 10:40 AM | Conv. Ctr. Room 8

Coffee Break 10:40 AM - 11:10 AM

#### SESSION 2: FUTURE EARTH INSTRUMENTS AND MISSION CONCEPTS

20 August 2023 • 11:10 AM - 12:10 PM | Conv. Ctr. Room 8

Session Chair: Martin Kaufmann, Forschungszentrum Jülich GmbH (Germany)

12689-7

#### **Optical design and straylight analyses of a spatial heterodyne interferometer for the measurement of atmospheric temperature from space**

Author(s): Martin Kaufmann, Konstantin Ntokas, Forschungszentrum Jülich GmbH (Germany); Davit Sivil, Bernhard Michel, Hembach Photonik GmbH (Germany); Qiuyu Chen, Friedhelm Olschewski, Forschungszentrum Jülich GmbH (Germany); Oliver Wroblowski, Physikalisch-Technische Bundesanstalt (Germany); Tobias Augspurger, Marco Miebach, Jörn Ungermann, Tom Neubert, Forschungszentrum Jülich GmbH (Germany); Klaus Mantel, Max-Planck-Institut für die Physik des Lichts (Germany); Martin Riese, Forschungszentrum Jülich GmbH (Germany)

20 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 8

12689-8

#### **Thermal vacuum performance testing of the CubeSat Infrared Atmospheric Sounder (CIRAS)**

Author(s): Thomas S. Pagano, Hyung J. Cho, Timothy J. Crawford, Patricia A. Hansen, Dean L. Johnson, Yuki Maruyama, Brian Monacelli, Sir B. Rafol, Alex Soibel, Keeyoon Sung, Nicholas R. Tallarida, Mark Schwochert, Robert C. Wilson, Jet Propulsion Lab. (United States); Megan Gibson, Chris D. Smith, Sierra Lobo (United States); Thomas U. Kampe, Ball Aerospace (United States)

20 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 8

12689-9

#### **Design and integration of a SWIR objective lens for the space-borne DRAGO-2 optical system**

Author(s): Paloma Matia-Hernando, Zaira Modroño Berdiñas, ASE Optics Europe (Spain); Alfonso Ynigo, Pablo González de Chaves, Instituto de Astrofísica de Canarias (Spain); Carlos Sánchez, Adrián Vizueté, Jorge Oriol, Thomas Siegel, Marta de la Fuente, ASE Optics Europe (Spain)

20 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 8

Lunch Break 12:10 PM - 2:00 PM

### SESSION 3: BEYOND EARTH MEASUREMENTS AND MISSIONS

20 August 2023 • 2:00 PM - 3:00 PM | Conv. Ctr. Room 8  
Session Chair: Pamela E. Clark, Morehead State Univ. (United States)

12689-12

#### CubeSat Polarimeter for oxygen 135.6 nm ionospheric emissions

Author(s): John F. Seely, National Institute of Standards and Technology (United States)

20 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 8

12689-13

#### Optical evaluation of the Tiny Remote-sensing Instrument for Thermospheric Oxygen and Nitrogen (TRITON) CubeSat payload

Author(s): Bruce A. Fritz, Kenneth Dymond, Charles Brown, Joshua Wolf, Ted Finne, Andrew Nicholas, Scott Budzien, Andrew Stephan, U.S. Naval Research Lab. (United States); Kenneth D. Wolfram, Technology Services Corporation (United States)

20 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 8

12689-14

#### Next generation compact IR spectrometers for the Moon

Author(s): Pamela E. Clark, Morehead State Univ. (United States); Tilak Hewagama, Clifford Brambora, Eric Kan, Timothy Livengood, NASA Goddard Space Flight Ctr. (United States)

20 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 8

Coffee Break 3:00 PM - 3:30 PM

### SESSION 4: ENABLING TECHNOLOGIES

20 August 2023 • 3:30 PM - 4:10 PM | Conv. Ctr. Room 8

Session Chair: Sachidananda R. Babu, NASA Earth Science Technology Office (United States)

12689-18

#### S-band communications subsystem for a CubeSat-type hyperspectral mission

Author(s): Joe Salas, Univ. Industrial de Santander (Colombia)

20 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 8

12689-19

#### A small formfactor, fiber-amplified optical system for precision timing and navigation applications

Author(s): Tyler Ritz, Patrick Kelly, Millennium Space Systems, Inc. (United States)

20 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 8

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### Welcome and Opening Remarks

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### A perovskite paved pathway to multi-terawatt scale photovoltaics (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12689-10

#### STOP analysis of gravitational distortion in earth-observing optical payload SOP-1 through vertical AIT setup

Author(s): Ji Nyeong Choi, Gyeongbok Jo, Bo Hye Kim, Sehyun Seong, Seonghui Kim, Telepix Co., Ltd. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12689-11

#### NOAA's Space Weather Follow On program to provide continuous operational measurements of coronal mass ejections and solar wind

Author(s): Marco Vargas, National Oceanic and Atmospheric Administration (United States); Eugene Guerrero-Martin, NASA Goddard Space Flight Ctr. (United States); Dimitrios Vassiliadis, John Vollmer, Gustave Comeyne, Elsayed Talaat, National Oceanic and Atmospheric Administration (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12690

# Polarization Science and Remote Sensing XI

21 - 22 August 2023 | Conv. Ctr. Room 8 (Mon-TueAM) and Room 6F (TuePM)

Conference Chairs: **Meredith K. Kupinski**, Wyant College of Optical Sciences (United States); **Joseph A. Shaw**, Montana State Univ. (United States); **Frans Snik**, Leiden Observatory (Netherlands)

Program Committee: **Andrey Alenin**, UNSW Canberra (Australia); **David B. Chenault**, Polaris Sensor Technologies, Inc. (United States); **Russell A. Chipman**, Meta (United States); **Dennis Goldstein**, Polaris Sensor Technologies, Inc. (United States); **Michael Kudenov**, North Carolina State Univ. (United States); **Charles F. LaCasse**, Riverside Research (United States); **Tatiana Novikova**, Lab. de Physique des Interfaces et des Couches Minces (France); **Yukitoshi Otani**, Utsunomiya Univ. (Japan); **Bradley M. Ratliff**, Univ. of Dayton (United States); **Yoav Yosef Schechner**, Technion-Israel Institute of Technology (Israel); **Stacey R. Sueoka**, National Solar Observatory (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: POLARIMETRIC REMOTE SENSING

21 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 8

Session Chair: Meredith K. Kupinski,  
Wyant College of Optical Sciences (United States)

12690-1

#### Remote sensing solar simulation laboratory for polarimetric scene simulation

Author(s): Bradley M. Ratliff, Univ. of Dayton (United States)

21 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 8

12690-2

#### A validation of measured pBRDFs from physics-based renderings and Mueller imaging

Author(s): Khalid Omer, Meta (United States); Quinn Jarecki, Stefan Forschner, Meredith Kupinski, The Univ. of Arizona (United States)

21 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 8

12690-3

#### A laboratory-aided empirically driven polarimetric bidirectional reflectance distribution function model

Author(s): Sultan S. Aldkeelalah, Bradley M. Ratliff, David L. Perry, Univ. of Dayton (United States)

21 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 8

12690-4

#### Analytic shape from polarization for depolarization-dominated objects

Author(s): Quinn Jarecki, Meredith Kupinski, Wyant College of Optical Sciences (United States)

21 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 8

12690-5

#### Contrast enhancement through an air-water interface with polarization imaging

Author(s): Erica Venkatesulu, Kyndra L. Buglione, Nathaniel J. Field, Montana State Univ. (United States); Kristin D. Doney, Lockheed Martin Space Systems Co. (United States); Joseph A. Shaw, Montana State Univ. (United States)

21 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 8

12690-6

#### The in-situ monitoring of microalgae by particulate Mueller matrix polarimetry

Author(s): Li Jiajin, Ran Liao, Hui Ma, Tsinghua Univ. Shenzhen International Graduate School (China)

21 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 8

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: BIOMEDICAL POLARIMETRY

21 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 8

Session Chair: Joseph A. Shaw, Montana State Univ. (United States)

12690-7

#### Photon mayhem: polarized light for structural and functional assessment of biological tissues (*Invited Paper*)

Author(s): I. Alex Vitkin, Univ. Health Network (Canada)

21 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 8

12690-8

#### Optical biopsy and biomedical diagnosis with circular polarisation and orbital angular momentum of light

Author(s): Igor V. Meglinski, Aston Univ. (United Kingdom), Univ. of Oulu (Finland); Ivan Lopushenko, Anton Sdobnov, Alexander Bykov, Univ. of Oulu (Finland)

21 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 8

12690-39

#### Complete Mueller polarimetry: Do we need it for biological tissues diagnosis? (*Invited Paper*)

Author(s): Tatiana Novikova, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris (France), Florida International Univ. (United States); Jessica C. Ramella-Roman, Florida International Univ. (United States); Leonard Felger, Inselspital (Switzerland); Romain Gros, Univ. Bern (Switzerland); Ekkehard Hewer, Ctr. Hospitalier Univ. Vaudois (Switzerland); Theoni Maragkou, Univ. Bern (Switzerland); Richard I. McKinley, Stefano Moriconi, Michael Murek, Inselspital (Switzerland); Angelo Pierangelo, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris (France); Omar Rodriguez-Nunez, Irena Zubak, Philippe Schucht, Inselspital (Switzerland)

21 August 2023 • 11:20 AM - 11:50 AM | Conv. Ctr. Room 8

Lunch Break 11:50 AM - 1:20 PM

### SESSION 3: MATHEMATICS OF COHERENCE AND POLARIZATION

21 August 2023 • 1:20 PM - 2:50 PM | Conv. Ctr. Room 8  
Session Chair: Bradley M. Ratliff, Univ. of Dayton (United States)

12690-9

#### Introduction to the wave description of geometric phase

Author(s): Luis Garza-Soto, Nathan Hagen, Utsunomiya Univ. (Japan); Dorilian Lopez-Mago, Tecnológico de Monterrey (Mexico); Yukitoshi Otani, Utsunomiya Univ. (Japan)  
21 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 8

12690-10

#### Geometry and topology in 3D polarization (*Invited Paper*)

Author(s): Miguel A. Alonso, Institut Fresnel (France)  
21 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 8

12690-11

#### The degree of genuine unpolarization

Author(s): Sethuraj Karimparambil Raju, Nick Vamivakas, Univ. of Rochester (United States)  
21 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 8

12690-12

#### Geometric phase vs propagation phase

Author(s): Luis Garza-Soto, Nathan Hagen, Utsunomiya Univ. (Japan); Dorilian Lopez-Mago, Tecnológico de Monterrey (Mexico)  
21 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 8

Coffee Break 2:50 PM - 3:20 PM

### SESSION 4: POLARIMETRIC IMAGE QUALITY AND CALIBRATION

21 August 2023 • 3:20 PM - 4:20 PM | Conv. Ctr. Room 8  
Session Chair: J. Scott Tyo, Monash Univ. (Australia)

12690-13

#### Improved polarimetric calibration using a microcontroller-driven rotating analyzer

Author(s): Amber L. Iler, David W. Kletzli, Brandon T. Cesul, KBR, Inc. (United States)  
21 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 8

12690-14

#### Mueller matrix image quality evaluator based on physical realizability

Author(s): Tongyu Huang, Zheng Hu, Hui Ma, Tsinghua Univ. Shenzhen International Graduate School (China)  
21 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 8

12690-15

#### Production of high-resolution reference polarization images from real world scenes

Author(s): Laurent Bigué, Alban Foulonneau, Pierre-Jean Lapray, Univ. de Haute Alsace (France)  
21 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 8

### SESSION 5: POLARIZATION PROPERTIES OF MATERIALS

21 August 2023 • 4:20 PM - 5:40 PM | Conv. Ctr. Room 8  
Session Chair: Yukitoshi Otani, Utsunomiya Univ. (Japan)

12690-16

#### Measurement of stress-optic coefficient

Author(s): Jeremy C. Parkinson, Wyant College of Optical Sciences (United States); Jake Greivenkamp, Daniel Vukobratovich, Raytheon Missiles & Defense (United States); Meredith Kupinski, Wyant College of Optical Sciences (United States)  
21 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 8

12690-17

#### Utilizing the PReMA polarization metric to quantify surface roughness

Author(s): Bradley G. Henderson, Kyle J. Gorkowski, Los Alamos National Lab. (United States)  
21 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 8

12690-18

#### Developing a reconstruction algorithm for 3-d birefringence from tomographic polarimetry

Author(s): Masafumi Seigo, Nalux Co., Ltd. (Japan); Meredith Kupinski, The Univ. of Arizona (United States); Hidetoshi Fukui, Shogo Kawano, Nalux Co., Ltd. (Japan)  
21 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 8

12690-19

#### Building a colorimetric sensor of incident linearly polarized light through symmetry-violated dielectric nanoarrays

Author(s): Zaid Haddadin, Jiuk Byun, Anna My Nguyen, Lisa V. Poulikakos, Univ. of California, San Diego (United States)  
21 August 2023 • 5:20 PM - 5:40 PM | Conv. Ctr. Room 8

### SESSION 6: ASTRONOMICAL POLARIMETRY

22 August 2023 • 8:10 AM - 9:10 AM | Conv. Ctr. Room 8  
Session Chair: Jaren N. Ashcraft,  
Wyant College of Optical Sciences (United States)

12690-20

#### Polarimetric modeling and assessment of science cases for Giant Magellan Telescope-Polarimeter (GMT-Pol) (*Invited Paper*)

Author(s): Ramya M. Anche, Steward Observatory (United States); Grant Williams, Steward Observatory (United States), The Univ. of Arizona (United States); Chris Packham, The Univ. of Texas at San Antonio (United States); Jaren N. Ashcraft, Wyant College of Optical Sciences (United States); Ewan S. Douglas, Steward Observatory (United States)  
22 August 2023 • 8:10 AM - 8:40 AM | Conv. Ctr. Room 8

12690-21

#### Searching for extraterrestrial life with polarized light (*Invited Paper*)

Author(s): Kimberly Bott, Univ. of California, Riverside (United States)  
22 August 2023 • 8:40 AM - 9:10 AM | Conv. Ctr. Room 8

# TECHNICAL CONFERENCES

## Conference 12690

### SESSION 7: POLARIMETRIC METROLOGY AND INSTRUMENTATION I

22 August 2023 • 9:10 AM - 10:10 AM | Conv. Ctr. Room 8  
Session Chair: Bradley M. Ratliff, Univ. of Dayton (United States)

12690-22

#### Multi-harmonic reconstruction of photoelastic modulator-based complete Mueller polarimeters

Author(s): Luis Oscar Gonzalez Siu, Andrey S. Alenin, UNSW Canberra (Australia); Neil C. Bruce, Univ. Nacional Autónoma de México (Mexico); Joe Kurtz, UNSW Canberra (Australia); J. Scott Tyo, Monash Univ. (Australia)

22 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 8

12690-23

#### Hybrid spatial-temporal Mueller matrix imaging spectropolarimeter for high throughput plant phenotyping

Author(s): Michael W. Kudenov, North Carolina State Univ. (United States)

22 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 8

12690-24

#### The effect of experimental errors on optimized polarimeters

Author(s): Neil C. Bruce, Iván Montes Gonzalez, Univ. Nacional Autónoma de México (Mexico)

22 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 8

Coffee Break 10:10 AM - 10:40 AM

### SESSION 8: POLARIMETRIC METROLOGY AND INSTRUMENTATION II

22 August 2023 • 10:40 AM - 11:50 AM | Conv. Ctr. Room 8  
Session Chairs: Michael W. Kudenov, North Carolina State Univ. (United States), T. Lamkins

12690-25

#### Feasibility analysis and Mueller matrix retrieval strategy for a scene-adaptive modulated imaging polarimeter (Invited Paper)

Author(s): Oscar G. Rodríguez-Herrera, Univ. Nacional Autónoma de México (Mexico), Monash Univ. (Australia); J. Scott Tyo, Lingxi Wang, Mehrtash T. Harandi, Monash Univ. (Australia); Connor Flannery, Joe Kurtz, Andrey S. Alenin, UNSW Canberra (Australia)

22 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 8

12690-26

#### Snapshot full Stokes camera by RGB polarization camera

Author(s): Yukitoshi Otani, Nobuaki Endo, Nathan Hagen, Utsunomiya Univ. (Japan); Atsushi Ito, Chuo Univ. (Japan); Hirotsugu Yamamoto, Utsunomiya Univ. (Japan)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 8

12690-27

#### Evaluation and characterization of imaging polarimetry through metasurface polarization gratings

Author(s): Lisa W. Li, Noah A. Rubin, Michael Juhl, Joon-Suh Park, Federico Capasso, Harvard Univ. (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 8

Lunch/Exhibition Break 11:50 AM - 1:40 PM

### SESSION 9: POLARIZATION IN EARTH REMOTE SENSING I

*Joint Session with Conferences 12685 and 12690*

22 August 2023 • 1:40 PM - 3:10 PM | Conv. Ctr. Room 6F

**NOTE ROOM CHANGE**

Session Chair: Joseph A. Shaw, Montana State Univ. (United States)

12690-28

#### Advanced light-scattering computational capability for solving the optical properties of nonspherical particles (Invited Paper)

Author(s): Ping Yang, Jiachen Ding, Texas A&M Univ. (United States)

22 August 2023 • 1:40 PM - 2:10 PM | Conv. Ctr. Room 6F

12685-11

#### PACE OCI polarization sensitivity based on pre-launch testing

Author(s): Jeffrey W. McIntire, Science Systems and Applications, Inc. (United States); Eugene Waluschka, Stellar Solutions Inc. (United States); Gerhard Meister, Joseph Knuble, William B. Cook, NASA Goddard Space Flight Ctr. (United States)

22 August 2023 • 2:10 PM - 2:30 PM | Conv. Ctr. Room 6F

12685-12

#### Cloud thermodynamic phase retrievals with a low-cost, division-of-focal-plane polarization camera

Author(s): Erica Venkatesulu, Joseph A. Shaw, Montana State Univ. (United States)

22 August 2023 • 2:30 PM - 2:50 PM | Conv. Ctr. Room 6F

12690-29

#### Spectral LWIR polarimetry of ice and water

Author(s): Jaclyn John, Jeremy Parkinson, Meredith Kupinski, The Univ. of Arizona (United States)

22 August 2023 • 2:50 PM - 3:10 PM | Conv. Ctr. Room 6F

Coffee Break 3:10 PM - 3:40 PM

### SESSION 10: POLARIZATION IN EARTH REMOTE SENSING II

*Joint Session with Conferences 12685 and 12690*

22 August 2023 • 3:40 PM - 5:00 PM | Conv. Ctr. Room 6F

Session Chair: Meredith K. Kupinski, Wyant College of Optical Sciences (United States)

12690-30

#### GRASP Aerosol Retrievals of AirMSPI Observations from the FIREX-AQ Campaign

Author(s): Clarissa M. DeLeon, The Univ. of Arizona (United States); Michael Garay, Olga Kalashnikova, Jet Propulsion Lab. (United States); Meredith Kupinski, The Univ. of Arizona (United States)

22 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 6F



12690-31

### **Disk-resolved and disk-integrated polarization state of moonlight as a function of lunar phase**

Author(s): Erica Venkatesulu, Montana State Univ. (United States);  
Sierra L. J. Dabby, Univ. of California, Berkeley (United States);  
Joseph A. Shaw, Montana State Univ. (United States)

22 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 6F

12690-32

### **Mitigating illumination-, leaf-, and view-angle dependencies in hyperspectral imaging using polarimetry**

Author(s): Danny Krafft, Grant Scarboro, Peter Balint-Kurti, Colleen Doherty, Michael W. Kudenov, North Carolina State Univ. (United States)

22 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 6F

12690-33

### **A radiative transfer model with Jacobian computational capabilities for polarimetric remote sensing of the earth system**

Author(s): Jiachen Ding, Ping Yang, Texas A&M Univ. (United States)

22 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 6F

## POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12690-34

### **Experimental estimation of cancer invasion depth using scattering of circularly polarized light**

Author(s): Nozomi Nishizawa, Kitasato Univ. (Japan); Takahiro Kuchimaru, Jichi Medical Univ. (Japan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12690-36

### **Concept and demonstration for a method of integrating depolarization in a slit homogenizer for spectrometry applications**

Author(s): Gabrielle Beach, Derek Sabatke, Madeline Cowell, James Leitch, Betsy Farris, Phil Oakley, Rachel O'Connor, Ball Aerospace (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12690-37

### **Deep learning approach to vehicle pose estimation from polarimetric image data**

Author(s): Matthew D. Siefring, Bradley M. Ratliff, Univ. of Dayton (United States); Brett S. Ballard, BAE Systems (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12691

# Laser Communication and Propagation through the Atmosphere and Oceans XII

22 - 23 August 2023 | Conv. Ctr. Room 6E (Tue) and 7B (Wed)

Conference Chairs: **Jaime A. Anguita**, Univ. de los Andes (Chile); **Jeremy P. Bos**, Michigan Technological Univ. (United States); **David T. Wayne**, Naval Information Warfare Ctr. Pacific (United States)

Program Committee: **Melissa Beason**, Air Force Research Lab. (United States); **Szymon Gladysz**, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); **Stephen Hammel**, Naval Information Warfare Ctr. Pacific (United States); **Vladimir B. Markov**, Advanced Systems & Technologies, Inc. (United States); **Andreas Muschinski**, NorthWest Research Associates (United States); **Darío G. Pérez**, Pontificia Univ. Católica de Valparaíso (Chile); **Karin Stein**, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); **Alexander M. J. van Eijk**, TNO Defence, Security and Safety (Netherlands); **Miranda van Iersel**, Univ. of Dayton (United States); **Thomas Weyrauch**, Univ. of Dayton (United States)

### TUESDAY 22 AUGUST 2023

#### SESSION 1: ATMOSPHERIC CHARACTERIZATION I

##### *Joint Session with Conferences 12691 and 12693*

22 August 2023 • 8:00 AM - 11:50 AM | Conv. Ctr. Room 6E

Session Chairs: Andreas Muschinski, NorthWest Research Associates (United States), Jeremy P. Bos, Michigan Technological Univ. (United States)

12691-1

#### **Investigating the feasibility of direct image subtraction for atmospheric turbulence detection**

Author(s): Anthony Eppley, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

22 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6E

12693-20

#### **Sonic anemometry used as a baseline for turbulence experiments**

Author(s): Shyheim N. Afanador, Melissa Beason, Air Force Research Lab. (United States); Denis W. Oesch, Leidos, Inc. (United States); Michael Sexauer, Air Force Research Lab. (United States); David Kirby, Leidos, Inc. (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6E

12691-2

#### **Aerial transmissometer for EO atmospheric measurement**

Author(s): Skylar D. Lilledahl, Benjamin Laxton, LaChelle McMahan, Naval Information Warfare Ctr. Pacific (United States); Rodrigo De La Mora, Southwestern College (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6E

12691-3

#### **Predicting top-of-atmosphere radiance for arbitrary viewing geometries from the visible to thermal infrared II**

Author(s): Christopher J. Florio, The Aerospace Corp. (United States)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 6E

12693-21

#### **Development of a stereo SCIDAR system in the ASALT lab**

Author(s): Denis W. Oesch, Leidos, Inc. (United States); Colton M. Bigler, Robert L. Johnson, Lee A. Kann, Air Force Research Lab. (United States)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 6E

12691-4

#### **Experimental measurements of atmospheric turbulence strength through scintillation and beam-wander analysis**

Author(s): Carlos S. Pirela, Jaime A. Anguita, Univ. de los Andes (Chile), Millenium Institute for Research in Optics (Chile); Jaime E. Cisternas, Univ. de los Andes (Chile)

22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 6E

**Coffee Break 10:00 AM - 10:30 AM**

12691-5

#### **Assessing the effects of severe winter weather on automotive lidar**

Author(s): Jeremy P. Bos, Wei Weng, Michigan Technological Univ. (United States)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6E

12691-6

#### **Software implementation and comparison of imagery-based optical turbulence estimation techniques**

Author(s): Matthew B. Salfer-Hobbs, Thomas J. Miletich, Univ. of Central Florida (United States); Martin Richardson, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6E

12693-22

#### **Attempting to understand the vertical distribution of turbulence in the surface layer from multi-camera time-lapse imagery**

Author(s): Benjamin Wilson, Santasri Bose, Jack McCrae, Steven Fiorino, Air Force Institute of Technology (United States)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6E

12693-23

### Profiling a low, horizontal path with SMASH

Author(s): Denis W. Oesch, Leidos, Inc. (United States); Michael Sexauer, Shyheim N. Afanador, Melissa K. Beason, Air Force Research Lab. (United States); David M. Kirby, Stephen A. Shock, Leidos, Inc. (United States)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6E

Lunch/Exhibition Break 11:50 AM - 1:30 PM

#### SESSION 2: ATMOSPHERIC CHARACTERIZATION II

### Joint Session with Conferences 12691 and 12693

22 August 2023 • 1:30 PM - 4:30 PM | Conv. Ctr. Room 6E

Session Chairs: Santasri R. Bose-Pillai, Air Force Institute of Technology (United States), Steven M. Zuraski, Air Force Research Lab. (United States)

12693-24

### Quantification of surface layer turbulence using sensible heat values from energy balance versus aerodynamic methods *(Invited Paper)*

Author(s): Steven T. Fiorino, Yogendra Raut, Jack McCrae, Santasri Bose-Pillai, Ben Wilson, Blaine Fourman, Air Force Institute of Technology (United States)

22 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 6E

12691-7

### Machine learning for optical turbulence prediction in geographically diverse regions

Author(s): Bethany Campbell, Kevin McBryde, Kyle Drexler, Erich Walter, Naval Information Warfare Ctr. Pacific (United States)

22 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 6E

12691-8

### In-situ observations of intermittency of optical turbulence between 1 m and 300 m above the ground

Author(s): Andreas Muschinski, NorthWest Research Associates (United States)

22 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 6E

12693-25

### Sonic anemometry with simulated and measured atmospheric turbulence

Author(s): Jack E. McCrae, Benjamin Wilson, Santasri Bose-Pillai, Steven Fiorino, Air Force Institute of Technology (United States)

22 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 6E

Coffee Break 3:00 PM - 3:30 PM

12693-26

### A new approach to profiling atmospheric turbulence using a dynamically ranged Raleigh beacon system

Author(s): Benjamin Wilson, Santasri Bose, Air Force Institute of Technology (United States); Steven Zuraski, Air Force Research Lab. (United States); Jack McCrae, Steven Fiorino, Air Force Institute of Technology (United States)

22 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 6E

12691-9

### Analysis of atmospheric conditions for optimizing optical communications

Author(s): Mohamed Baghdady, Samuel Mellon, Jonathan Wells, Robert Younts, Naval Information Warfare Ctr. Atlantic (United States)

22 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 6E

12693-27

### Optical-turbulence characterization of a littoral test environment using a Shack-Hartmann wavefront sensor

Author(s): Timothy J. Bukowski, Univ. of Notre Dame (United States); Matthew Kalensky, Kelsey Miller, Darren Getts, Shannon O'Sullivan, Naval Surface Warfare Ctr. Dahlgren Div. (United States); Stanislav Gordeyev, Univ. of Notre Dame (United States)

22 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 6E

## WEDNESDAY 23 AUGUST 2023

#### SESSION 3: FREE SPACE OPTICAL COMMUNICATIONS THROUGH TURBULENCE

23 August 2023 • 8:00 AM - 10:10 AM | Conv. Ctr. Room 7B

Session Chairs: Miranda van Iersel, Univ. of Dayton (United States), David T. Wayne, Naval Information Warfare Ctr. Pacific (United States)

12691-10

### Estimating maritime free space optical link performance using models based on experimental measurements *(Invited Paper)*

Author(s): William S. Rabinovich, Rita Mahon, Mike S. Ferraro, U.S. Naval Research Lab. (United States)

23 August 2023 • 8:00 AM - 8:30 AM | Conv. Ctr. Room 7B

12691-11

### High-speed wavefront reconstruction of a Gaussian beam propagating through controlled optical turbulence

Author(s): Eduardo Peters, Univ. de los Andes (Chile); Marco Sepúlveda, Pablo Scherz, Aarón Cofré, Jorge Tapia, Bastián Romero, Darío G. Pérez, Pontificia Univ. Católica de Valparaíso (Chile)

23 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 7B

12691-12

### A tone-based irradiance variance monitoring technique

Author(s): Mike S. Ferraro, Rita Mahon, Zachary T. Zern, William S. Rabinovich, U.S. Naval Research Lab. (United States)

23 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 7B

12691-13

### Research in multiple access optical communications

Author(s): Samuel Mellon, Robert Younts, Jonathan Wells, Jakob Kunzler, Mohamed Baghdady, Jason Pizarro, Naval Information Warfare Ctr. Atlantic (United States)

23 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 7B

# TECHNICAL CONFERENCES

## Conference 12691

12691-14

### Model-based design of a free-space optical communication transceiver in turbulence

Author(s): Jason D. Schmidt, Eric P. Magee, Jason A. Tellez, MZA Associates Corp. (United States); Cullen Bradley, Exciting Technology, LLC (United States)

23 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 7B

12691-15

### Forecasting the scintillation index using a machine learning approach

Author(s): Mohammad A. Al-Ghezi, Miranda van Iersel, Univ. of Dayton (United States)

23 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 7B

Coffee Break 10:10 AM - 10:40 AM

## SESSION 4: ORBITAL ANGULAR MOMENTUM (OAM) BEAMS IN TURBULENCE

23 August 2023 • 10:40 AM - 12:10 PM | Conv. Ctr. Room 7B

Session Chairs: Nathaniel A. Ferlic, Naval Air Warfare Ctr. Aircraft Div. (United States), Jaime E. Cisternas, Univ. de los Andes (Chile)

12691-16

### Propagation of OAM beams through atmospheric turbulence: comparison of simulation and experiment (*Invited Paper*)

Author(s): Miranda van Iersel, HaoLun Wu, Univ. of Dayton (United States)

23 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 7B

12691-18

### Topological charge analysis of experimental optical vortices from a 1-km terrestrial range

Author(s): Jaime A. Anguita, Carlos S. Pirela, Jaime E. Cisternas, Univ. de los Andes (Chile)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 7B

12691-19

### Experimental study on the effects of OAM beams propagating through atmospheric turbulence

Author(s): HaoLun Wu, Miranda van Iersel, Univ. of Dayton (United States)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 7B

12691-20

### Numerical detection of vector vortex beams in turbulence using optimal transport theory

Author(s): Jaime E. Cisternas, Jaime A. Anguita, Univ. de los Andes (Chile)

23 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 7B

Lunch/Exhibition Break 12:10 PM - 2:00 PM

## SESSION 5: UNDERWATER OPTICAL COMMUNICATIONS AND PROPAGATION OF ULTRASHORT PULSED LASERS

23 August 2023 • 2:00 PM - 3:20 PM | Conv. Ctr. Room 7B

Session Chairs: Matthew B. Salfer-Hobbs, Univ. of Central Florida (United States), HaoLun Wu, Univ. of Dayton (United States)

12691-21

### Low intensity laser pulse train propagation in air: Part I: Analysis and simulations

Author(s): Gavin Blair, Univ. of Maryland, College Park (United States); Vladimir Markov, Advanced Systems & Technologies, Inc. (United States); Phillip Sprangle, Univ. of Maryland, College Park (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 7B

12691-22

### Low intensity laser pulse train propagation in air: Part II: Experimental studies

Author(s): Vladimir Markov, Igor Marienko, Advanced Systems & Technologies, Inc. (United States); Gavin Blair, Phillip Sprangle, Univ. of Maryland, College Park (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 7B

12691-24

### Temporal statistics of synced optical phase and intensity measurements through Rayleigh B ernard turbulence

Author(s): Nathaniel A. Ferlic, Naval Air Warfare Ctr. Aircraft Div. (United States); Svetlana Avramov-Zamurovic, Owen O'Malley, U.S. Naval Academy (United States); Linda J. Mullen, Naval Air Warfare Ctr. Aircraft Div. (United States); Peter Judd, U.S. Naval Research Lab. (United States)

23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 7B

12691-25

### Atmospheric propagation of femtosecond optical pulses: Gaussian beamlet model of coherence effects

Author(s): Wayne H. Knox, Alex LeBon, Taz M. Colangelo, Brian Gregory, Tom Chaffee, Attochron, LLC (United States)

23 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 7B

Coffee Break 3:20 PM - 4:00 PM

## SESSION 6: ADVANCED TOPICS IN ATMOSPHERIC TURBULENCE

23 August 2023 • 4:00 PM - 5:20 PM | Conv. Ctr. Room 7B

Session Chairs: Skylar D. Lilledahl, Naval Information Warfare Ctr. Pacific (United States), Jaime A. Anguita, Univ. de los Andes (Chile)

12691-26

### Reduction of photon losses caused by turbulence using spatial diversity in free-space optics quantum communication

Author(s): Andres I. Seguel, Carlos S. Pirela, Jaime A. Anguita, Univ. de los Andes (Chile), Millennium Institute for Research in Optics (Chile)

23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 7B

12691-27

### Study of beam widening effects on free space system

Author(s): Tom Elkayam, Basile Scoffie, Xiaomin Jin, California Polytechnic State Univ., San Luis Obispo (United States)

23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 7B

12691-29

### Atmospheric propagation emulator for free space optical applications: design and performances

Author(s): Jawaher Alameri, Reem Alameri, Asma Alahmadi, Aaisha Alteneiji, Guillaume Matras, Abdellatif Bouchalkha, Safa A.H. Al Hosani, Chaouki Kasmi, Karim Elayoubi, Juan Coronel, Technology Innovation Institute (United Arab Emirates)

23 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 7B

12691-37

### Measuring and analysing atmospheric optical turbulence in an urban environment

Author(s): Lily Westerby-Griffin, Durham Univ. (United Kingdom)

23 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 7B

## POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12691-32

### Advances in combinational sensors for FSO applications

Author(s): Zachary Zern, Mike S. Ferraro, U.S. Naval Research Lab. (United States); Austin Singh, Jacobs Corp. (United States); William S. Rabinovich, Rita Mahon, U.S. Naval Research Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12691-33

### Investigating timing jitter on a free-space high-bandwidth data communication link with seasonal weather variations

Author(s): Vijit Bedi, Air Force Research Lab. (United States); Vladimir Nikulin, Binghamton Univ. (United States); Kathy-Anne Soderberg, Laura Wessing, Peter A. Ricci, William F. Lipe, Robert J. DiMeo, Christine A. Mathers, John W. Heinig, Air Force Research Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12691-34

### Compact dual channel free space optical communication for CubeSat inter-satellite links

Author(s): Sheng-feng Lin, Taiwan Space Agency (TASA) (Taiwan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12691-35

### Ground-based testbed design for evaluation of point, acquisition, and tracking control systems in optical inter-satellite links between two 6U nanosatellites

Author(s): Ohgan Kim, YongHwan Kim, Ji-Nyeong Choi, Seongick Cho, Seonghui Kim, Sehyun Seong, Telepix Co., Ltd. (Republic of Korea); Sang-Young Park, Yonsei Univ. (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12691-36

### Ground-based atmospheric optical turbulence prediction using different machine learning models

Author(s): Merve Yigitoglu Keskin, Middle East Technical Univ. (Turkey), Roketsan Inc. (Turkey); Yakup Midilli, Cafer Bayar, Iklim Aslantas, Recep Yerebakan, Roketsan Inc. (Turkey)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12692

# Quantum Communications and Quantum Imaging XXI

20 - 21 August 2023 | Conv. Ctr. Room 15A

Conference Chairs: **Keith S. Deacon**, DEVCOM Army Research Lab. (United States); **Ronald E. Meyers**, DEVCOM Army Research Lab. (United States)

Program Committee: **Stefania A. Castelletto**, RMIT Univ. (Australia); **Milena D'Angelo**, Univ. degli Studi di Bari Aldo Moro (Italy); **Warren P. Grice**, Oak Ridge National Lab. (United States); **Mark T. Gruneisen**, Air Force Research Lab. (United States); **Richard J. Hughes**, Los Alamos National Lab. (Retired) (United States); **Yoon-Ho Kim**, Pohang Univ. of Science and Technology (Republic of Korea); **William J. Munro**, NTT Basic Research Labs. (Japan); **Kae Nemoto**, National Institute of Informatics (Japan); **Todd B. Pittman**, Univ. of Maryland, Baltimore County (United States); **Barry C. Sanders**, Univ. of Calgary (Canada); **Alexander V. Sergienko**, Boston Univ. (United States); **Oliver Slattery**, National Institute of Standards and Technology (United States); **Dmitry V. Strekalov**, Jet Propulsion Lab. (United States); **Shigeki Takeuchi**, Kyoto Univ. (Japan)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: QUANTUM IMAGING AND QUANTUM SENSING I

20 August 2023 • 8:55 AM - 10:00 AM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-1

#### Engineering nanodiamonds for quantum sensing (Invited Paper)

Author(s): Philip R. Hemmer, Texas A&M Univ. (United States)

20 August 2023 • 8:55 AM - 9:20 AM | Conv. Ctr. Room 15A

12692-2

#### Undetected photon interference measurements on a silicon chip

Author(s): Chiara Michelini, Univ. degli Studi di Trento (Italy); Stefano Signorini, Valerio Pruneri, ICFO - Institut de Ciències Fotòniques (Spain); Lorenzo Pavesi, Univ. degli Studi di Trento (Italy)

20 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 15A

12692-3

#### Metasurface-based shadow tomography for quantum states

Author(s): Hang Ren, Univ. of California, Berkeley (United States); Ze Zheng, Nottingham Trent Univ. (United Kingdom); Yipei Zhang, Univ. of California, Berkeley (United States); Cuifeng Ying, Lei Xu, Mohsen Rahmani, Nottingham Trent Univ. (United Kingdom); Birgitta Whaley, Univ. of California, Berkeley (United States)

20 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 15A

Coffee Break 10:00 AM - 10:30 AM

#### SESSION 2: QUANTUM IMAGING AND QUANTUM SENSING II

20 August 2023 • 10:30 AM - 12:00 PM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-5

#### Table-top demonstration of interferometric imaging using path-entangled single photons (Invited Paper)

Author(s): Matthew R. Brown, Markus Allgaier, Valerian Thiel, Univ. of Oregon (United States); John Monnier, Univ. of Michigan (United States); Michael Raymer, Brian Smith, Univ. of Oregon (United States)

20 August 2023 • 10:30 AM - 10:55 AM | Conv. Ctr. Room 15A

12692-6

#### Enhancing quantum imaging with undetected photons: balance, seeding and high-gain

Author(s): Rupert F. Oulton, Emma Pearce, Jefferson Florez, Nathan Gemmel, Mariame Karzazi, Yue Ma, Gabrielle Bressanini, Ronan Battle, Robert Murray, Myungshik Kim, Chris Phillips, Imperial College London (United Kingdom); Alex Clark, Imperial College London (United Kingdom), Univ. of Bristol (United Kingdom)

20 August 2023 • 10:55 AM - 11:15 AM | Conv. Ctr. Room 15A

12692-7

#### Quantum enhanced probes of magnetic circular dichroism

Author(s): Benjamin J. Lawrie, Chengyun Hua, Oak Ridge National Lab. (United States); Seongjin Hong, Oak Ridge National Lab. (United States), Chung-Ang Univ. (Kiriabati, Republic of); Matthew Feldman, Claire Marvinnay, Raphael Pooser, Alberto Marino, Oak Ridge National Lab. (United States)

20 August 2023 • 11:15 AM - 11:35 AM | Conv. Ctr. Room 15A

12692-8

#### Tomographic imaging of cold atoms and sensing of external fields in three dimensions (Invited Paper)

Author(s): Michal Parniak, Mateusz Mazelanik, Univ. of Warsaw (Poland)

20 August 2023 • 11:35 AM - 12:00 PM | Conv. Ctr. Room 15A

Lunch Break 12:00 PM - 1:50 PM

### SESSION 3: QUANTUM COMMUNICATIONS I

20 August 2023 • 1:50 PM - 3:05 PM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-10

#### **Portable and integrated entanglement sources for quantum communication** (*Invited Paper*)

Author(s): Tiphaine Kouadou, Paul G. Kwiat, Univ. of Illinois (United States)

20 August 2023 • 1:50 PM - 2:15 PM | Conv. Ctr. Room 15A

12692-11

#### **Quantum-enhanced secure-link architecture with quantum stream cipher Y-00 and post-quantum cryptography: basic structure and experiment** (*Invited Paper*)

Author(s): Kentaro Kato, Fumio Futami, Ken Tanizawa, Tamagawa Univ. (Japan)

20 August 2023 • 2:15 PM - 2:40 PM | Conv. Ctr. Room 15A

12692-37

#### **Quantum nodes towards a quantum internet** (*Invited Paper*)

Author(s): Samuele Grandi, Hugues de Riedmatten, ICFO - Institut de Ciències Fotòniques (Spain)

20 August 2023 • 2:40 PM - 3:05 PM | Conv. Ctr. Room 15A

Coffee Break 3:05 PM - 3:35 PM

### SESSION 4: QUANTUM COMMUNICATIONS II

20 August 2023 • 3:35 PM - 4:45 PM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-12

#### **Experimental characterization of entanglement characteristics in free-space quantum communication links** (*Invited Paper*)

Author(s): Vladimir V. Nikulin, Binghamton Univ. (United States); Vijit Bedi, Kathy-Anne Soderberg, Paul Alsing, Laura Wessing, Peter Ricci, John Heinig, William Lipe, Air Force Research Lab. (United States)

20 August 2023 • 3:35 PM - 4:00 PM | Conv. Ctr. Room 15A

12692-15

#### **Practical passive state preparation QKD for quantum networks with multiple users**

Author(s): Yury Kurochkin, Marios Papadovasilakis, James A. Grieve, Technology Innovation Institute (United Arab Emirates)

20 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 15A

12692-16

#### **Nonlocal network coding in interference channels based on the Clauser-Horne-Shimony-Holt game** (*Invited Paper*)

Author(s): Joonwoo Bae, KAIST (Republic of Korea)

20 August 2023 • 4:20 PM - 4:45 PM | Conv. Ctr. Room 15A

### SUNDAY EVENING PLENARY

20 August 2023 • 6:00 PM - 7:50 PM | Conv. Ctr. Room 6A

Session Chair: Bernard Kress, Google (United States)

#### **Welcome and Opening Remarks**

20 August 2023 • 6:00 PM - 6:05 PM | Conv. Ctr. Room 6A

12660-501

#### **A perovskite paved pathway to multi-terawatt scale photovoltaics** (*Plenary Presentation*)

Author(s): Joseph J. Berry, National Renewable Energy Lab. (United States)

20 August 2023 • 6:05 PM - 6:40 PM | Conv. Ctr. Room 6A

12650-501

#### **Unlocking solar cell efficiency: insights into singlet fission and triplet-triplet annihilation processes in organic and biological systems** (*Plenary Presentation*)

Author(s): Jenny S. Clark, The Univ. of Sheffield (United Kingdom)

20 August 2023 • 6:40 PM - 7:15 PM | Conv. Ctr. Room 6A

12648-501

#### **Plasmonics for sustainable technologies and green energy: from advancing materials to machine-learning assisted designs** (*Plenary Presentation*)

Author(s): Alexandra Boltasseva, Purdue Univ. (United States), The Quantum Science Ctr., Oak Ridge National Lab. (United States)

20 August 2023 • 7:15 PM - 7:50 PM | Conv. Ctr. Room 6A

## MONDAY 21 AUGUST 2023

### NANOSCIENCE + ENGINEERING PLENARY

21 August 2023 • 8:30 AM - 9:55 AM | Conv. Ctr. Room 6A

Session Chairs: Gennady Shvets, Cornell Univ. (United States) and Cornelia Denz, Physikalisch-Technische Bundesanstalt (Germany)

#### **Welcome and Opening Remarks**

21 August 2023 • 8:35 AM - 3:35 AM | Conv. Ctr. Room 6A

12653-501

#### **Nanophotonics for energy applications** (*Plenary Presentation*)

Author(s): Shanhui Fan, Stanford Univ. (United States)

21 August 2023 • 8:35 AM - 9:15 AM | Conv. Ctr. Room 6A

12653-502

#### **From atoms to black holes: with nano-engineering to next-level precision experiments** (*Plenary Presentation*)

Author(s): Stefanie Kroker, Technische Univ. Braunschweig (Germany)

21 August 2023 • 9:15 AM - 9:55 AM | Conv. Ctr. Room 6A

Coffee Break 9:55 AM - 10:25 AM

# TECHNICAL CONFERENCES

## Conference 12692

### SESSION 5: QUANTUM INFORMATION AND QUANTUM COMPUTING I

21 August 2023 • 10:25 AM - 11:40 AM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-17

#### Quantum fog computing *(Invited Paper)*

Author(s): William J. Munro, NTT Basic Research Labs. (Japan); Kae Nemoto, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

21 August 2023 • 10:25 AM - 10:50 AM | Conv. Ctr. Room 15A

12692-19

#### Continuous-variable quantum computation with optical quantum entanglement and quantum teleportation in time domain *(Invited Paper)*

Author(s): Warit Asavanant, The Univ. of Tokyo (Japan), RIKEN Ctr. for Quantum Computing (Japan); Akito Kawasaki, Ryuhoh Ide, Takumi Suzuki, The Univ. of Tokyo (Japan); Hector Brunel, Ecole Normale Supérieure (France); Baramée Charoensombutamon, The Univ. of Tokyo (Japan); Atsushi Sakaguchi, RIKEN Ctr. for Quantum Computing (Japan); Kosuke Fukui, The Univ. of Tokyo (Japan); Takahiro Kashiwazaki, Nippon Telegraph and Telephone Corp. (Japan); Asuka Inoue, NTT Device Technology Labs. (Japan); Takeshi Umeki, NTT Photonics Labs. (Japan); Kan Takase, The Univ. of Tokyo (Japan), RIKEN Ctr. for Quantum Computing (Japan); Jun-ichi Yoshikawa, RIKEN Ctr. for Quantum Computing (Japan); Mamoru Endo, Akira Furusawa, The Univ. of Tokyo (Japan), RIKEN Ctr. for Quantum Computing (Japan)

21 August 2023 • 10:50 AM - 11:15 AM | Conv. Ctr. Room 15A

12692-20

#### Characterizing the noise output by a fiber-based entangled photon source *(Invited Paper)*

Author(s): Atiyya A. Davis, Univ. of Illinois at Chicago (United States); Brian T. Kirby, DEVCOM Army Research Lab. (United States), Tulane Univ. (United States); Thomas A. Searles, Univ. of Illinois at Chicago (United States); Daniel E. Jones, DEVCOM Army Research Lab. (United States)

21 August 2023 • 11:15 AM - 11:40 AM | Conv. Ctr. Room 15A

Lunch Break 11:40 AM - 1:10 PM

### SESSION 6: QUANTUM INFORMATION AND QUANTUM COMPUTING II

21 August 2023 • 1:10 PM - 2:25 PM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-21

#### Simulation of stochastic processes with quantum devices *(Invited Paper)*

Author(s): Farzad Ghafari, Griffith Univ. (Australia)

21 August 2023 • 1:10 PM - 1:35 PM | Conv. Ctr. Room 15A

12692-22

#### Quantum hypothesis testing applications: from quantum reading to pattern recognition *(Invited Paper)*

Author(s): Marco Genovese, Giuseppe Ortolano, Ivano Ruo Berchera, Istituto Nazionale di Ricerca Metrologica (Italy); Stefano Pirandola, Univ. of York (United Kingdom); Carmine Napoli, Istituto Nazionale di Ricerca Metrologica (Italy); Cillian Harney, Univ. of York (United Kingdom)

21 August 2023 • 1:35 PM - 2:00 PM | Conv. Ctr. Room 15A

12692-23

#### Minimum-cost aggregation of quantum repeaters *(Invited Paper)*

Author(s): Koji Azuma, NTT Basic Research Labs. (Japan)

21 August 2023 • 2:00 PM - 2:25 PM | Conv. Ctr. Room 15A

Coffee Break 2:25 PM - 2:55 PM

### SESSION 7: QUANTUM TECHNOLOGY

21 August 2023 • 2:55 PM - 5:40 PM | Conv. Ctr. Room 15A

Session Chair: Keith S. Deacon,  
DEVCOM Army Research Lab. (United States)

12692-24

#### Contextuality and inequality violations in a three-path interferometer *(Invited Paper)*

Author(s): Ming Ji, Masataka Iinuma, Holger F. Hofmann, Hiroshima Univ. (Japan)

21 August 2023 • 2:55 PM - 3:20 PM | Conv. Ctr. Room 15A

12692-25

#### A -0.64dB loss hybrid coupling platform with high stability for SOI single photon source *(Invited Paper)*

Author(s): Jinyi Du, National Univ. of Singapore (Singapore); George F. R. Chen, Hongwei Gao, Singapore Univ. of Technology and Design (Singapore); Dawn Tan, Singapore Univ. of Technology and Design (Singapore); A\*STAR Institute of Microelectronics (Singapore); James A. Grieve, Technology Innovation Institute (United Arab Emirates), Ctr. for Quantum Technologies (Singapore); Alexander Ling, Ctr. for Quantum Technologies (Singapore), National Univ. of Singapore (Singapore)

21 August 2023 • 3:20 PM - 3:45 PM | Conv. Ctr. Room 15A

12692-26

#### Investigation of squeezed light propagation in thermal fluctuation *(Invited Paper)*

Author(s): Genta Masada, Tamagawa Univ. (Japan)

21 August 2023 • 3:45 PM - 4:10 PM | Conv. Ctr. Room 15A

12692-27

#### Time-multiplexed programmable continuous-variable photonic quantum computing *(Invited Paper)*

Author(s): Shuntaro Takeda, The Univ. of Tokyo (Japan)

21 August 2023 • 4:10 PM - 4:35 PM | Conv. Ctr. Room 15A

12692-28

#### Wavefront division quantum interferometry

Author(s): Mahdi Eshaghi, Univ. of Central Florida (United States); Erwan Baleine, Lockheed Martin Corp. (United States); Aristide Dogariu, Univ. of Central Florida (United States)

21 August 2023 • 4:35 PM - 4:55 PM | Conv. Ctr. Room 15A



12692-29

### Effect of pump laser linewidth on nonlinear quantum interferometric fringes

Author(s): Jasleen Kaur, Yu Mukai, Ryo Okamoto, Shigeki Takeuchi, Kyoto Univ. (Japan)

21 August 2023 • 4:55 PM - 5:15 PM | Conv. Ctr. Room 15A

12692-30

### Generation and manipulation of broadband frequency entangled photons (*Invited Paper*)

Author(s): Shigeki Takeuchi, Ryo Okamoto, Bo Cao, Kyoto Univ. (Japan)

21 August 2023 • 5:15 PM - 5:40 PM | Conv. Ctr. Room 15A

## POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12692-32

### Microwave-photon generation by polarized infrared radiation in a ferrimagnetic insulator

Author(s): Duk Y. Kim, Taek Jeong, Dong Hwan Kim, Zaeill Kim, Agency for Defense Development (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12692-33

### The microwave quantum frequency conversion via mechanical mode

Author(s): Jihwan Kim, Sangwoo Jeon, Zaeill Kim, Agency for Defense Development (Republic of Korea); Eunseong Kim, Jaekyung Choi, Hyeok Hwang, KAIST (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12692-34

### Quantum illumination by combination measurements of on-off and photon number resolving detectors

Author(s): Su-Yong Lee, DongHwan Kim, Yonggi Jo, Taek Jeong, Zaeill Kim, Agency for Defense Development (Republic of Korea)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12692-35

### Multi-mode entangled state generated from an unbalanced SU(1,1) interferometer for quantum information technology

Author(s): Xueshi Guo, Wen Zhao, Xiaoying Li, Tianjin Univ. (China); Z.Y. Ou, City Univ. of Hong Kong (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12692-36

### Integrated photonics based on nonlinear optical scattering

Author(s): Antonio Carlos Amaro de Faria Júnior, Instituto de Estudos Avançados (Brazil), Univ. Tecnológica Federal do Paraná (Brazil)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12693

# Unconventional Imaging, Sensing, and Adaptive Optics 2023

21 - 24 August 2023 | Conv. Ctr. Room 6E

Conference Chairs: **Jean J. Dolne**, The Boeing Co. (United States); **Mark F. Spencer**, Air Force Research Lab. (United States); **Santasri R. Bose-Pillai**, Air Force Institute of Technology (United States)

Program Committee: **James R. Fienup**, The Institute of Optics, Univ. of Rochester (United States); **Victor L. Gamiz**, Zimagine Innovations (United States); **Stanislav V. Gordeyev**, Univ. of Notre Dame (United States); **Brett H. Hokr**, EO Solutions LLC (United States); **Kenneth J. Jerkatis**, Ball Aerospace (United States); **Matthew Kalensky**, Naval Surface Warfare Ctr. Dahlgren Div. (United States); **Matthew Kemnetz**, Air Force Research Lab. (United States); **Casey J. Pellizzari**, U.S. Air Force Academy (United States); **Cameron J. Radosevich**, Sandia National Labs. (United States); **Italo Toselli**, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); **Steven M. Zuraski**, Air Force Research Lab. (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: UNCONVENTIONAL IMAGING I

21 August 2023 • 8:00 AM - 10:10 AM | Conv. Ctr. Room 6E

Session Chairs: Jean J. Dolne, The Boeing Co. (United States), Mark F. Spencer, Air Force Research Lab. (United States)

12693-1

#### **Towards creation of an asymmetric vision environment**

Author(s): Adriana Stohn, Michael Boyarsky, Mauricio Martinez, Michael E. Gehm, Duke Univ. (United States)

21 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6E

12693-2

#### **Evaluating sparse aperture imaging performance: simulation and experiment**

Author(s): Joshua Snyder, Christopher Bailey, Leidos, Inc. (United States); Steven Zuraski, Air Force Research Lab. (United States)

21 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6E

12693-3

#### **Multiplexed, multi-wavelength 3D digital holographic imaging methods with range unwrapping**

Author(s): Matthias T. Banet, Air Force Research Lab. (United States); Anand Idris, James R. Fienup, Univ. of Rochester (United States)

21 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6E

12693-4

#### **Photonic quantum-inspired sub-diffraction imager for space debris awareness (Invited Paper)**

Author(s): Stephen S. Eikenberry, Rodrigo Amezcua-Correa, Kerri Donaldson-Hanna, Robert Conwell, Matthew Cooper, Tara Crowe, Caleb Dobias, Christina Moraitis, Miguel Romer, Univ. of Central Florida (United States)

21 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 6E

12693-5

#### **One-sided imaging of non-fluorescing objects through scattering media**

Author(s): Richard G. Paxman, David A. Carrara, Maxar Technologies (United States)

21 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 6E

12693-6

#### **Facial classification from multispectral imagery through atmospheric turbulence using machine learning**

Author(s): Abu Bucker Siddik, Steven Sandoval, David Voelz, Laura E. Boucheron, Luis Varela, New Mexico State Univ. (United States)

21 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 6E

Coffee Break 10:10 AM - 10:40 AM

#### SESSION 2: UNCONVENTIONAL SENSING I

21 August 2023 • 10:40 AM - 11:50 AM | Conv. Ctr. Room 6E

Session Chairs: Casey J. Pellizzari, U.S. Air Force Academy (United States), Santasri R. Bose-Pillai, Air Force Institute of Technology (United States)

12693-7

#### **Imaging through deep turbulence with a Fresnel wavefront sensor (Invited Paper)**

Author(s): Justin R. Crepp, Univ. of Notre Dame (United States)

21 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 6E

12693-8

#### **Dynamic DH-MBIR for real-time low latency wavefront estimation**

Author(s): Ali G. Sheikh, Purdue Univ. (United States); Casey J. Pellizzari, U.S. Air Force Academy (United States); Sherman J. Kisner, High Performance Imaging, LLC (United States); Gregory T. Buzzard, Charles A. Bouman, Purdue Univ. (United States)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6E

12693-9

#### **Optical sensing in high dimensions**

Author(s): Thomas Mueller, Dmitry Polyushkin, Dohyun Kwak, Lukas Mennel, Technische Univ. Wien (Austria)

21 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6E

Lunch Break 11:50 AM - 1:20 PM

### SESSION 3: UNCONVENTIONAL SENSING II

21 August 2023 • 1:20 PM - 2:40 PM | Conv. Ctr. Room 6E

Session Chairs: Casey J. Pellizzari, U.S. Air Force Academy (United States), Santasri R. Bose-Pillai, Air Force Institute of Technology (United States)

12693-10

#### Outlandish sensor array designs: what could be achieved with volumetric detector elements

Author(s): Nathan A. Hagen, Utsunomiya Univ. (Japan)

21 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 6E

12693-11

#### Development of a tilted shearing interferometer wavefront sensor

Author(s): Denis W. Oesch, Leidos, Inc. (United States); Michael Sexauer, Kelsey L. Miller, Air Force Research Lab. (United States)

21 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 6E

12693-12

#### Branch-point detection using a Shack-Hartmann wavefront sensor

Author(s): Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (United States); Timothy J. Bukowski, Univ. of Notre Dame (United States); Kelsey Miller, Darren Getts, Naval Surface Warfare Ctr. Dahlgren Div. (United States); Denis Oesch, Leidos, Inc. (United States)

21 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 6E

12693-13

#### Gas density measurement in high-pressure conditions by spontaneous Rayleigh-Brillouin scattering

Author(s): Youchan Park, Kyeongsun Kim, Seonwoong Kim, Hyungrok Do, Seoul National Univ. (Republic of Korea)

21 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 6E

Coffee Break 2:40 PM - 3:10 PM

### SESSION 4: UNCONVENTIONAL ADAPTIVE OPTICS

21 August 2023 • 3:10 PM - 4:50 PM | Conv. Ctr. Room 6E

Session Chairs: Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (United States), Kenneth J. Jerkatis, Ball Aerospace (United States)

12693-15

#### Measuring turbulence using digital adaptive optics and spatially encoded targets

Author(s): Kyle R. Drexler, Skylar Lilledahl, Burton Neuner, Naval Information Warfare Ctr. Pacific (United States)

21 August 2023 • 3:10 PM - 3:30 PM | Conv. Ctr. Room 6E

12693-16

#### Calibration and first light on-sky testing of the upgraded MMT adaptive secondary mirror

Author(s): Jess Johnson, Amali Vaz, Manny Montoya, Ron Jones, The Univ. of Arizona (United States); Jacob Taylor, Univ. of Toronto (Canada); Andrew Gardner, The Univ. of Arizona (United States); Jennifer Patience, Arizona State Univ. (United States)

21 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 6E

12693-17

#### Shack-Hartmann wavefront reconstruction by deep learning neural network for adaptive optics

Author(s): Zareb A. Noel, Timothy Bukowski, Stanislav Gordeyev, Robert M. Rennie, Univ. of Notre Dame (United States)

21 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 6E

12693-18

#### Two-color nonlocal aberration cancellation with stimulated parametric down-conversion

Author(s): Yang Xu, Sirui Tang, Robert Boyd, Univ. of Rochester (United States)

21 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 6E

12693-19

#### High-speed 3D particle tracking with dynamic aberration correction using a Fresnel guide star

Author(s): Clemens Bilsing, Lars Büttner, TU Dresden (Germany); Sebastian Burgmann, Bergische Univ. Wuppertal (Germany); Jürgen W. Czarske, TU Dresden (Germany)

21 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 6E

## TUESDAY 22 AUGUST 2023

### SESSION 5: ATMOSPHERIC CHARACTERIZATION I

#### Joint Session with Conferences 12691 and 12693

22 August 2023 • 8:00 AM - 11:50 AM | Conv. Ctr. Room 6E

Session Chairs: Andreas Muschinski, NorthWest Research Associates (United States), Jeremy P. Bos, Michigan Technological Univ. (United States)

12691-1

#### Investigating the feasibility of direct image subtraction for atmospheric turbulence detection

Author(s): Anthony Eppley, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)

22 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6E

12693-20

#### Sonic anemometry used as a baseline for turbulence experiments

Author(s): Shyheim N. Afanador, Melissa Beason, Air Force Research Lab. (United States); Denis W. Oesch, Leidos, Inc. (United States); Michael Sexauer, Air Force Research Lab. (United States); David Kirby, Leidos, Inc. (United States)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6E

12691-2

#### Aerial transmissometer for EO atmospheric measurement

Author(s): Skylar D. Lilledahl, Benjamin Laxton, LaChelle McMahan, Naval Information Warfare Ctr. Pacific (United States); Rodrigo De La Mora, Southwestern College (United States)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 6E

# TECHNICAL CONFERENCES

## Conference 12693

12691-3

### **Predicting top-of-atmosphere radiance for arbitrary viewing geometries from the visible to thermal infrared II**

Author(s): Christopher J. Florio, The Aerospace Corp. (United States)  
22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 6E

12693-21

### **Development of a stereo SCIDAR system in the ASALT lab**

Author(s): Denis W. Oesch, Leidos, Inc. (United States); Colton M. Bigler, Robert L. Johnson, Lee A. Kann, Air Force Research Lab. (United States)  
22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 6E

12691-4

### **Experimental measurements of atmospheric turbulence strength through scintillation and beam-wander analysis**

Author(s): Carlos S. Pirela, Jaime A. Anguita, Univ. de los Andes (Chile), Millenium Institute for Research in Optics (Chile); Jaime E. Cisternas, Univ. de los Andes (Chile)  
22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 6E  
**Coffee Break 10:00 AM - 10:30 AM**

12691-5

### **Assessing the effects of severe winter weather on automotive lidar**

Author(s): Jeremy P. Bos, Wei Weng, Michigan Technological Univ. (United States)  
22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6E

12691-6

### **Software implementation and comparison of imagery-based optical turbulence estimation techniques**

Author(s): Matthew B. Salfer-Hobbs, Thomas J. Miletich, Univ. of Central Florida (United States); Martin Richardson, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)  
22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6E

12693-22

### **Attempting to understand the vertical distribution of turbulence in the surface layer from multi-camera time-lapse imagery**

Author(s): Benjamin Wilson, Santasri Bose, Jack McCrae, Steven Fiorino, Air Force Institute of Technology (United States)  
22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6E

12693-23

### **Profiling a low, horizontal path with SMASH**

Author(s): Denis W. Oesch, Leidos, Inc. (United States); Michael Sexauer, Shyheim N. Afanador, Melissa K. Beason, Air Force Research Lab. (United States); David M. Kirby, Stephen A. Shock, Leidos, Inc. (United States)  
22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6E

**Lunch/Exhibition Break 11:50 AM - 1:30 PM**

## SESSION 6: ATMOSPHERIC CHARACTERIZATION II

### *Joint Session with Conferences 12691 and 12693*

22 August 2023 • 1:30 PM - 4:30 PM | Conv. Ctr. Room 6E  
Session Chairs: Santasri R. Bose-Pillai, Air Force Institute of Technology (United States), Steven M. Zuraski, Air Force Research Lab. (United States)

12693-24

### **Quantification of surface layer turbulence using sensible heat values from energy balance versus aerodynamic methods** (*Invited Paper*)

Author(s): Steven T. Fiorino, Yogendra Raut, Jack McCrae, Santasri Bose-Pillai, Ben Wilson, Blaine Fourman, Air Force Institute of Technology (United States)  
22 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 6E

12691-7

### **Machine learning for optical turbulence prediction in geographically diverse regions**

Author(s): Bethany Campbell, Kevin McBryde, Kyle Drexler, Erich Walter, Naval Information Warfare Ctr. Pacific (United States)  
22 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 6E

12691-8

### **In-situ observations of intermittency of optical turbulence between 1 m and 300 m above the ground**

Author(s): Andreas Muschinski, NorthWest Research Associates (United States)  
22 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 6E

12693-25

### **Sonic anemometry with simulated and measured atmospheric turbulence**

Author(s): Jack E. McCrae, Benjamin Wilson, Santasri Bose-Pillai, Steven Fiorino, Air Force Institute of Technology (United States)  
22 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 6E

**Coffee Break 3:00 PM - 3:30 PM**

12693-26

### **A new approach to profiling atmospheric turbulence using a dynamically ranged Raleigh beacon system**

Author(s): Benjamin Wilson, Santasri Bose, Air Force Institute of Technology (United States); Steven Zuraski, Air Force Research Lab. (United States); Jack McCrae, Steven Fiorino, Air Force Institute of Technology (United States)  
22 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 6E

12691-9

### **Analysis of atmospheric conditions for optimizing optical communications**

Author(s): Mohamed Baghdady, Samuel Mellon, Jonathan Wells, Robert Younts, Naval Information Warfare Ctr. Atlantic (United States)  
22 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 6E

12693-27

### **Optical-turbulence characterization of a littoral test environment using a Shack-Hartmann wavefront sensor**

Author(s): Timothy J. Bukowski, Univ. of Notre Dame (United States); Matthew Kalensky, Kelsey Miller, Darren Getts, Shannon O'Sullivan, Naval Surface Warfare Ctr. Dahlgren Div. (United States); Stanislav Gordeyev, Univ. of Notre Dame (United States)

22 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 6E

## WEDNESDAY 23 AUGUST 2023

### SESSION 7: UNCONVENTIONAL IMAGING II

23 August 2023 • 8:30 AM - 10:00 AM | Conv. Ctr. Room 6E

Session Chairs: Steven M. Zuraski, Air Force Research Lab. (United States), Jean J. Dolne, The Boeing Co. (United States)

12693-64

### **Shock-wave tolerant phase reconstructor for the Shack-Hartmann wavefront sensor**

Author(s): Thomas DeFoor, The Ohio State Univ. (United States); Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (United States); Matthew R. Kemnetz, Timothy J. Bukowski, Mark F. Spencer, Air Force Research Lab. (United States)

23 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 6E

12693-29

### **Imaging asymmetry in the presence of a bright interferent**

Author(s): M. Martinez, A. Stohn, M. E. Gehm, Duke Univ. (United States)

23 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 6E

12693-31

### **HADAR: Fundamental limits to thermal perception** *(Invited Paper)*

Author(s): Hyunsoo Choi, Fanglin Bao, Seungman Choi, Peter Menart, Andrew Schramka, Zubin Jacob, Purdue Univ. (United States)

23 August 2023 • 9:10 AM - 9:40 AM | Conv. Ctr. Room 6E

12693-32

### **Maximizing the information content of passive scattered light fields from non-line-of-sight objects: a comparison between visible, long-wave IR, and THz radiation**

Author(s): Takahiro Sasaki, James R. Leger, Univ. of Minnesota, Twin Cities (United States)

23 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 6E

Coffee Break 10:00 AM - 10:30 AM

### SESSION 8: EVENT-BASED SENSING I

23 August 2023 • 10:30 AM - 11:50 AM | Conv. Ctr. Room 6E

Session Chairs: Mark F. Spencer, Air Force Research Lab. (United States), Joseph C. Cox, Wyant College of Optical Sciences (United States)

12693-33

### **Event-based camera refractory period characterization and initial clock drift evaluation**

Author(s): Peter N. McMahon-Crabtree, Lucas Kulesza, Air Force Research Lab. (United States); Brian J. McReynolds, Institute of Neuroinformatics, UZH/ETH Zurich, Sensors Group (Switzerland); Daniel S. O'Keefe, Anirvin Puttur, U.S. Air Force Academy, Space Physics and Atmospheric Research Center (United States); Diana Maestas, Christian P. Morath, Air Force Research Lab. (United States); Matthew G. McHarg, U.S. Air Force Academy, Space Physics and Atmospheric Research Center (United States)

23 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6E

12693-34

### **Analysis of event-based sensor system performance with moving object detection tasks**

Author(s): Joseph Cox, Amit Ashok, The Univ. of Arizona (United States); Nicholas J. Morley, Air Force Research Lab. (United States); Jacob Trzaska, The Univ. of Arizona (United States)

23 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6E

12693-35

### **INSPIRED: single pixel imaging regularized by EBS data**

Author(s): Anthony Giljum, Zachry Theis, Air Force Research Lab. (United States)

23 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6E

12693-36

### **Optical contrast amplification for enhancing event-based vision**

Author(s): Sebastian Valencia, Joseph C. Cox, Amit Ashok, The Univ. of Arizona (United States)

23 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 6E

Lunch/Exhibition Break 11:50 AM - 1:10 PM

### SESSION 9: EVENT-BASED SENSING II

23 August 2023 • 1:10 PM - 3:00 PM | Conv. Ctr. Room 6E

Session Chairs: Mark F. Spencer, Air Force Research Lab. (United States), Joseph C. Cox, Wyant College of Optical Sciences (United States)

12693-37

### **Unconventional machine learning for event-based sensors** *(Invited Paper)*

Author(s): Guido Zarrella, The MITRE Corp. (United States)

23 August 2023 • 1:10 PM - 1:40 PM | Conv. Ctr. Room 6E

12693-38

### **Hybrid event and frame-based system for target detection, tracking, and identification**

Author(s): Trevor Schlack, Logan Pawlowski, Amit Ashok, The Univ. of Arizona (United States)

23 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 6E

# TECHNICAL CONFERENCES

## Conference 12693

12693-39

### Off-axis laser scatter detection with an event camera

Author(s): Chancellor C. Roach, Dylan C. Tomlinson, Matthew McHarg, Timothy Bate, U.S. Air Force Academy (United States)  
23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 6E

12693-40

### An event-driven light field, digital coded exposure imager architecture for per-pixel image regeneration in post processing

Author(s): David L. Mascarenas, Andre Green, Moises Felipe Silva, Alessandro Cattaneo, Los Alamos National Lab. (United States)  
23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 6E

12693-41

### Modeling and decoding event-based sensor lightning response

Author(s): Brian J. McReynolds, Rui Graca, Institute of Neuroinformatics, UZH/ETH Zurich (Switzerland); Daniel O'Keefe, U.S. Air Force Academy (United States); Rachel Oliver, Cornell Univ. (United States); Richard Balthazor, Nathaniel George, Matthew McHarg, U.S. Air Force Academy (United States)  
23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 6E

Coffee Break 3:00 PM - 3:30 PM

#### SESSION 10: AERO-OPTICAL EFFECTS

23 August 2023 • 3:30 PM - 5:20 PM | Conv. Ctr. Room 6E

Session Chairs: Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (United States), Stanislav V. Gordeyev, Univ. of Notre Dame (United States)

12693-42

### Experimental investigation into the effects of shock waves on Shack-Hartmann wavefront sensor measurements (*Invited Paper*)

Author(s): Matthew R. Kemnetz, Air Force Research Lab. (United States); Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (United States); Mark F. Spencer, Air Force Institute of Technology (United States)  
23 August 2023 • 3:30 PM - 4:00 PM | Conv. Ctr. Room 6E

12693-43

### Experimental and computational comparison of laser beam propagation through a free shear layer

Author(s): Jonathan Wells, Naval Information Warfare Ctr. Atlantic (United States); Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (United States)  
23 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 6E

12693-44

### Optical effects of a temperature-mismatched supersonic mixing layer

Author(s): Aaron Fassler, Sergey Leonov, Stanislav Gordeyev, Univ. of Notre Dame (United States)  
23 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 6E

12693-45

### Studies of local shock effects on Shack-Hartmann and digital holography wavefront sensors

Author(s): Ethan Chu, Tim Bukowski, Stanislav Gordeyev, Univ. of Notre Dame (United States)  
23 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 6E

12693-46

### Robust, regularized wavefront reconstruction of Shack-Hartmann data in discontinuous flow

Author(s): Zareb A. Noel, Univ. of Notre Dame (United States); Matthew Kemnetz, Air Force Research Lab. (United States); Stanislav Gordeyev, Robert M. Rennie, Univ. of Notre Dame (United States)  
23 August 2023 • 5:00 PM - 5:20 PM | Conv. Ctr. Room 6E

#### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12693-60

### Zernike polynomials vs circular Bessel functions to represent aberrated wavefronts

Author(s): Cristian M. Medina Coca, Brandon D. Sánchez Valencia, Emerson A. González Díaz, José L. Magaña-Chávez, Joel Cervantes Lozano, Sandra E. Balderas-Mata, Univ. de Guadalajara (Mexico)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12693-61

### Fiber sensing using interferometry for seismic detection

Author(s): Joel Auccapuella, Thormund Tay, Yicheng Shi, Hou Shun Poh, Christian Kurtsiefer, Ctr. for Quantum Technologies (Singapore), National Univ. of Singapore (Singapore)  
23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

#### SESSION 11: UNCONVENTIONAL IMAGING III

24 August 2023 • 8:00 AM - 11:30 AM | Conv. Ctr. Room 6E  
Session Chairs: Brett H. Hokr, EO Solutions LLC (United States), Victor L. Gamiz

12693-47

### Experimental synthesis of super-growing fields for super-resolution imaging

Author(s): Sethuraj Karimparambil Raju, Tathagata Karmakar, Abhishek Chakraborty, Nick Vamivakas, Univ. of Rochester (United States); Andrew N. Jordan, Univ. of Rochester (United States), Chapman Univ. (United States)  
24 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 6E

12693-48

### **Photoacoustic metasurface design with gold nanoparticles (AuNPs) for dynamic acoustic wavefront shaping**

Author(s): Jiuk Byun, Julia Holland, Univ. of California, San Diego (United States); Tamal Roy, ETH Zurich (Switzerland); Zaid Haddadin, Nicholas Boechler, Lisa V. Poulikakos, Univ. of California, San Diego (United States)

24 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 6E

12693-49

### **Quantum-enhanced Brillouin spectroscopy and imaging** *(Invited Paper)*

Author(s): Vladislav V. Yakovlev, Texas A&M Univ. (United States)

24 August 2023 • 8:40 AM - 9:10 AM | Conv. Ctr. Room 6E

12693-50

### **Bioinspired nano-optical metasurfaces for histopathology**

Author(s): Paula Kirya, Samantha Bordy, Kaylani Patel, Zaid Haddadin, Omonigho Aisagbonhi, Lisa Poulikakos, Univ. of California, San Diego (United States)

24 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 6E

12693-52

### **Compressed ultrahigh-speed and reconfigurable single-pixel imaging** *(Invited Paper)*

Author(s): Patrick Kilcullen, Tsuneyuki Ozaki, Jinyang Liang, Institut National de la Recherche Scientifique (Canada)

24 August 2023 • 9:30 AM - 10:00 AM | Conv. Ctr. Room 6E

**Coffee Break 10:00 AM - 10:30 AM**

12693-53

### **3D imaging of pulsed laser ablation at 1 million frames per second using a rotary mirror and strobe photography**

Author(s): Joel N. Bixler, Air Force Research Lab. (United States)

24 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 6E

12693-54

### **A patch-based regression convolutional neural network for motion blur estimation**

Author(s): Luis G. Varela, Laura E. Boucheron, David Voelz, Abu B. Siddik, Steven Sandoval, New Mexico State Univ. (United States)

24 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 6E

12693-51

### **Supercritical angle photoacoustic microscopy**

Author(s): Rong Zhou, Deng Pan, Hao Shen, East China Normal Univ. (China)

24 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 6E

**Lunch/Exhibition Break 11:30 AM - 1:00 PM**

## **SESSION 12: WAVE OPTICS SIMULATIONS AND EXPERIMENTS**

24 August 2023 • 1:00 PM - 3:00 PM | Conv. Ctr. Room 6E

Session Chairs: Matthew R. Kemnetz, Air Force Research Lab. (United States), Cameron J. Radosevich, Sandia National Labs. (United States)

12693-55

### **Atmospheric path characterization using wave-optics modeling and simulation software platform integrated with numerical weather prediction data** *(Invited Paper)*

Author(s): Svetlana L. Lachinova, II-VI Aerospace & Defense, Inc. (United States)

24 August 2023 • 1:00 PM - 1:30 PM | Conv. Ctr. Room 6E

12693-56

### **Semi-analytic simulation of closed-form sources propagating through turbulence** *(Invited Paper)*

Author(s): Jason D. Schmidt, Jason A. Tellez, MZA Associates Corp. (United States); Gregory J. Gbur, The Univ. of North Carolina at Charlotte (United States)

24 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 6E

12693-57

### **Zernike decomposition of aberrations in strong atmospheric turbulence**

Author(s): Richard B. Holmes, Boeing LTS Inc. (United States); Venkata Gudimetla, Air Force Research Lab. (United States); Michael Werth, Boeing LTS Inc. (United States)

24 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 6E

12693-58

### **Simulating atmospheric propagation through dynamic real-time weather conditions**

Author(s): Jonathan Wells, Naval Information Warfare Ctr. Atlantic (United States)

24 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 6E

12693-59

### **Measurement of turbulence parameters induced by the reflective atmospheric turbulence simulator**

Author(s): Samuel B. Horst, BlueHalo (United States)

24 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 6E

# TECHNICAL CONFERENCES

## Conference 12694

# Advances in X-Ray/EUV Optics and Components XVIII

22 August 2023 | Conv. Ctr. Room 15B

Conference Chairs: **Hidekazu Mimura**, The Univ. of Tokyo (Japan); **Ali M. Khounsary**, Illinois Institute of Technology (United States); **Christian Morawe**, ESRF - The European Synchrotron (France)

Program Committee: **Bernhard W. Adam**, Research Instruments Corp. (United States); **Lahsen Assoufid**, Argonne National Lab. (United States); **Roman Chernikov**, Canadian Light Source Inc. (Canada); **Fredrik Eriksson**, Linköping Univ. (Sweden); **Yoshio Ichii**, JTEC Corp. (Japan); **Satoshi Matsuyama**, Nagoya Univ. (Japan); **Bernd C. Meyer**, Brazilian Synchrotron Light Laboratory (Brazil); **Haruhiko Ohashi**, RIKEN SPring-8 Ctr. (Japan); **Markus Osterhoff**, Georg-August-Univ. Göttingen (Germany); **Phakkhananan Pakawanit**, Synchrotron Light Research Institute (Thailand); **Ladislav Pina**, Czech Technical Univ. in Prague (Czech Republic); **Yuriy Y. Platonov**, Rigaku Innovative Technologies, Inc. (United States); **Kazuto Yamauchi**, Osaka Univ. (Japan); **Lin Zhang**, SLAC National Accelerator Lab. (United States)

### MONDAY 21 AUGUST 2023

#### X-RAY, GAMMA-RAY, AND PARTICLE TECHNOLOGIES PLENARY

21 August 2023 • 4:00 PM - 5:25 PM | Conv. Ctr. Room 6A

Session Chairs: Ralph B. James, Savannah River National Lab. (United States); Ali M. Khounsary, Illinois Institute of Technology (United States)

#### Welcome and Opening Remarks

21 August 2023 • 4:00 PM - 4:05 PM - 4:45 PM | Conv. Ctr. Room 6A

12694-501

#### FLASH Radiotherapy: a new cancer treatment modality and its challenges, physics, engineering, and biology (Plenary Presentation)

Author(s): Magdalena Bazalova-Carter, Univ. of Victoria (Canada)

21 August 2023 • 4:05 PM - 4:45 PM | Conv. Ctr. Room 6A

12696-502

#### Recent advances in X-ray, gamma-ray, and charged-particle imaging (Plenary Presentation)

Author(s): Lars R. Furenid, The Univ. of Arizona (United States)

21 August 2023 • 4:45 PM - 5:25 PM | Conv. Ctr. Room 6A

### TUESDAY 22 AUGUST 2023

#### SESSION 1: X-RAY IMAGING AND X-RAY MEASUREMENT

22 August 2023 • 8:20 AM - 10:00 AM | Conv. Ctr. Room 15B

Session Chair: Christian Morawe, ESRF - The European Synchrotron (France)

12694-1

#### Development of a combined soft X-ray and visible light microscope at SACLA BL1

Author(s): Satoru Egawa, Kai Sakurai, Yoko Takeo, Kyota Yoshinaga, The Univ. of Tokyo (Japan); Shigeki Owada, RIKEN SPring-8 Ctr. (Japan), Japan Synchrotron Radiation Research Institute (Japan); Gota Yamaguchi, RIKEN SPring-8 Ctr. (Japan); Shunya Yokomae, Natsume Optical Corp. (Japan); Yutaka Yamagata, RIKEN Ctr. for Advanced Photonics (Japan); Makina Yabashi, RIKEN SPring-8 Ctr. (Japan), Japan Synchrotron Radiation Research Institute (Japan); Takashi Kimura, The Univ. of Tokyo (Japan); Mari Shimura, RIKEN SPring-8 Ctr. (Japan), National Ctr. for Global Health and Medicine (Japan)

22 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 15B

12694-2

#### A high-speed x-ray radiography setup for in-situ electron beam powder bed fusion at PETRA III

Author(s): Pidassa M. Bidola, Guilherme Abreu-Faria, Johannes Klingenberg, Jens Brehling, Hilmar Burmester, Ursula Tietze, Christina Krywka, Peter Staron, Bernd Schwebke, Lars Lottermoser, Helmholtz-Zentrum Hereon GmbH (Germany); Greta Lindwall, Chrysoula Ioannidou, Hans-Henrik König, Gabriel Spartacus, KTH Royal Institute of Technology (Sweden); Nick Semjatov, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany); Felix Beckmann, Helmholtz-Zentrum Hereon GmbH (Germany)

22 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 15B

12694-4

#### Soft X-ray spectral-ptychography of a mammalian cell and spectral classification by machine learning

Author(s): Kai Sakurai, Yoko Takeo, Kyota Yoshinaga, Shunki Takamoto, Satoru Egawa, Jordan T. O'Neal, The Univ. of Tokyo (Japan); Keiichi Inoue, The Institute for Solid State Physics, The Univ. of Tokyo (Japan); Mari Shimura, RIKEN, National Ctr. for Global Health and Medicine (Japan); Takashi Kimura, The Univ. of Tokyo (Japan)

22 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 15B



12694-5

### **X-ray fluorescence measurement of multi-layer materials with the laser-induced X-ray and electron sources**

Author(s): Jungu Kang, Do-Kyeong Ko, Gwangju Institute of Science and Technology (Republic of Korea)

22 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 15B

12694-22

### **Addressing calibration of high-harmonic generation sources used for studying magnetism**

Author(s): Taylor Buckway, Aaron Redd, Devin Lewis, Brigham Young Univ. (United States); Eric Gullikson, Lawrence Berkeley National Lab. (United States); Joshua Vawdrey, Karine Chesnel, David Allred, Richard L. Sandberg, Brigham Young Univ. (United States)

22 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 15B

Coffee Break 10:00 AM - 10:30 AM

#### **SESSION 2: X-RAY MIRROR FABRICATION AND DESIGN**

22 August 2023 • 10:30 AM - 12:10 PM | Conv. Ctr. Room 15B

Session Chair: Hidekazu Mimura, The Univ. of Tokyo (Japan)

12694-6

### **Surface figure correction using differential deposition of WSi<sub>2</sub>**

Author(s): Christian Morawe, Patrice Bras, Sylvain Labouré, François Perrin, Amparo Vivo, ESRF - The European Synchrotron (France)

22 August 2023 • 10:30 AM - 10:50 AM | Conv. Ctr. Room 15B

12694-7

### **Development of magnetron sputtering system for soft X-ray mirrors**

Author(s): Shunya Yokomae, Natsume Optical Corp. (Japan); Yusuke Matsuzawa, Takehiro Kume, Kentarou Hiraguri, Natsume Optical Corp. (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan), Institute of Physical and Chemical Research (Japan); Hirokazu Hashizume, Natsume Optical Corp. (Japan)

22 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 15B

12694-8

### **Development of deposition system for the inner surface of Wolter mirror for X-ray telescopes**

Author(s): Shutaro Mohri, Akinari Ito, Shunsuke Ito, The Univ. of Tokyo (Japan); Gota Yamaguchi, RIKEN SPring-8 Ctr. (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan), RIKEN SPring-8 Ctr. (Japan)

22 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 15B

12694-10

### **Fabrication and surface evaluation of high-precision monolithic mirror with complex geometry for soft X-ray focusing**

Author(s): Takehiro Kume, Yusuke Matsuzawa, Takahiro Saito, Kentaro Hiraguri, Natsume Optical Corp. (Japan); Yoko Takeo, Takashi Kimura, The Univ. of Tokyo (Japan), Japan Synchrotron Radiation Research Institute (Japan); HIKARU Kishimoto, Yasunori Senba, Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan), Institute of Physical and Chemical Research (Japan); Hirokazu Hashizume, Natsume Optical Corp. (Japan)

22 August 2023 • 11:30 AM - 11:50 AM | Conv. Ctr. Room 15B

12694-23

### **The dual KB mirror system for the CXI beamline of the LCLS-HE upgrade**

Author(s): Xianchao Cheng, William Lane, Serge Guillet, Mengning Liang, May Ling Ng, Lin Zhang, Matthew H. Seaberg, SLAC National Accelerator Lab. (United States)

22 August 2023 • 11:50 AM - 12:10 PM | Conv. Ctr. Room 15B

Lunch Break 12:10 PM - 1:30 PM

#### **SESSION 3: CRYSTAL OPTICS**

22 August 2023 • 1:30 PM - 2:10 PM | Conv. Ctr. Room 15B

Session Chair: Hidekazu Mimura, The Univ. of Tokyo (Japan)

12694-11

### **Towards wavefront preservation X-ray crystal monochromator for coherent light sources**

Author(s): Lin Zhang, Matthew Seaberg, Hasan Yavas, SLAC National Accelerator Lab. (United States)

22 August 2023 • 1:30 PM - 1:50 PM | Conv. Ctr. Room 15B

12694-12

### **X-ray topography of diffracting crystal optics at the Diamond Light Source**

Author(s): John P. Sutter, Vishal P. Dhamgaye, Oliver Fox, Kawal J. S. Sawhney, Diamond Light Source Ltd. (United Kingdom)

22 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 15B

#### **SESSION 4: NEW X-RAY SOURCES**

22 August 2023 • 2:10 PM - 3:00 PM | Conv. Ctr. Room 15B

Session Chair: Bernhard W. Adams, Research Instruments Corp. (United States)

12694-13

### **Generation of Gamma-rays with low-energy picosecond laser pulses (*Invited Paper*)**

Author(s): Christoph Rose-Petruck, Brown Univ. (United States); Daniel DeCiccio, Bernhard Adams, Research Instruments Corp. (United States)

22 August 2023 • 2:10 PM - 2:40 PM | Conv. Ctr. Room 15B

12694-14

### **Developments in an ultra-high-brightness quasi-monochromatic laboratory x-ray source with tender/soft x-ray production**

Author(s): Stuart Coleman, Wenbing Yun, Sylvia J. Y. Lewis, John C. Burnett, Emma Litzer, Sigray, Inc. (United States)

22 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 15B

Coffee Break 3:00 PM - 3:30 PM

# TECHNICAL CONFERENCES

## Conference 12694

### SESSION 5: DIFFRACTIVE OPTICS

22 August 2023 • 3:30 PM - 4:30 PM | Conv. Ctr. Room 15B  
Session Chair: Hiroto Motoyama, The Univ. of Tokyo (Japan)

12694-15

#### **Fabrication and characterization of zone plates for EUV applications**

Author(s): Remko van den Hurk, Robert Peters, Mirwais Aktary, Applied NanoTools Inc. (Canada)

22 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 15B

12694-16

#### **Nanostructured diffractive X-ray optics: From blazed gratings to achromatic optics**

Author(s): Florian Döring, Damien Eschimese, Talgat Mamyrbayev, Florian Sander, Christin Döring, Ethouba Al Jassin, Adam Kubec, XRnanotech (Switzerland)

22 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 15B

12694-17

#### **Development of ultra-precise low blaze angle gratings at ALS**

Author(s): Sooyeon Park, Dmitriy L. Voronov, Eric M. Gullikson, Fahard H. Salmassi, Howard A. Padmore, Lawrence Berkeley National Lab. (United States)

22 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 15B

### SESSION 6: XFEL

22 August 2023 • 4:30 PM - 5:30 PM | Conv. Ctr. Room 15B  
Session Chair: Lin Zhang, SLAC National Accelerator Lab. (United States)

12694-18

#### **Design and characterization of x-ray diagnostics for the Cavity-Based X-ray Free-Electron Laser project**

Author(s): Peifan Liu, Paresch C. Pradhan, Antonino Miceli, Donald A. Walko, Deming Shu, Joseph Sullivan, Keenan Lang, Argonne National Lab. (United States); Mark L. Rivers, The Univ. of Chicago (United States); Diling Zhu, Aliaksei Halavanau, SLAC National Accelerator Lab. (United States); Yuri V. Shvyd'ko, Argonne National Lab. (United States)

22 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 15B

12694-19

#### **Vibration studies at European XFEL hard x-ray beamlines**

Author(s): Silja Schmidtchen, Idoia Freijo Martin, Antje Trapp, Maurizio Vannoni, Harald Sinn, European XFEL GmbH (Germany)

22 August 2023 • 4:50 PM - 5:10 PM | Conv. Ctr. Room 15B

12694-20

#### **Two-stage soft x-ray focusing system developed at BL1 of SACLA**

Author(s): Hiroto Motoyama, Satoru Egawa, The Univ. of Tokyo (Japan); Gota Yamaguchi, RIKEN SPring-8 Ctr. (Japan); Shigeki Owada, Japan Synchrotron Radiation Research Institute (Japan); Takashi Kimura, The Univ. of Tokyo (Japan); Makina Yabashi, RIKEN SPring-8 Ctr. (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan)

22 August 2023 • 5:10 PM - 5:30 PM | Conv. Ctr. Room 15B

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A  
Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12694-3

#### **High-speed imaging of electrical discharge machining using 100 keV X-rays at SPring-8**

Author(s): Yusuke Kudo, The Univ. of Tokyo (Japan); Gota Yamaguchi, RIKEN SPring-8 Ctr. (Japan); Hirokatsu Yumoto, Takahisa Koyama, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan); Hidekazu Takano, Yujiro Hayashi, Makina Yabashi, RIKEN SPring-8 Ctr. (Japan); Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan), RIKEN SPring-8 Ctr. (Japan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12694-9

#### **High-reflectivity x-ray mirror coatings with suppressed absorption edges over a wide energy range**

Author(s): Yujia Ding, Carlo U. Segre, Ali M. Khounsary, Illinois Institute of Technology (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## Conference 12695

# Advances in Metrology for X-Ray and EUV Optics X

23 August 2023 | Conv. Ctr. Room 13

Conference Chairs: **Lahsen Assoufid**, Argonne National Lab. (United States); **Haruhiko Ohashi**, Japan Synchrotron Radiation Research Institute (Japan); **Frank Siewert**, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

Program Committee: **Simon G. Alcock**, Diamond Light Source Ltd. (United Kingdom); **Raymond Barret**, European Synchrotron Radiation Facility (France); **Roman Chernikov**, Canadian Light Source Inc. (Canada); **Uwe Flechsig**, Paul Scherrer Institut (Switzerland); **Ralf D. Geckeler**, Physikalisch-Technische Bundesanstalt (Germany); **Lei Huang**, Brookhaven National Lab. (United States); **Mourad Idir**, Brookhaven National Lab. (United States); **Jangwoo Kim**, Pohang Accelerator Lab. (Republic of Korea); **Bernard Koziolowski**, Lawrence Livermore National Lab. (United States); **Bernd C. Meyer**, Ctr. Nacional de Pesquisa em Energia e Materiais (Brazil); **Hidekazu Mimura**, The Univ. of Tokyo (Japan); **May Ling Ng**, SLAC National Accelerator Lab. (United States); **Josep Nicolas**, ALBA Synchrotron (Spain); **Kawal J. S. Sawhney**, Diamond Light Source Ltd. (United Kingdom); **Frank Scholze**, Physikalisch-Technische Bundesanstalt (Germany); **Peter Z. Takacs**, Brookhaven National Lab. (United States); **Kazuto Yamauchi**, Osaka Univ. (Japan); **Valeriy V. Yashchuk**, Lawrence Berkeley National Lab. (United States)

### WEDNESDAY 23 AUGUST 2023

#### SESSION 1: MIRROR SLOPE PROFILOMETRY

23 August 2023 • 8:00 AM - 10:00 AM | Conv. Ctr. Room 13

Session Chair: Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan)

12695-1

#### **Towards a new generation long trace profiler LTP-2020: optical design of pencil beam interferometry sensor**

Author(s): Peter Z. Takacs, Surface Metrology Solutions LLC (United States); Ian Lacey, Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (United States)

23 August 2023 • 8:00 AM - 8:20 AM | Conv. Ctr. Room 13

12695-2

#### **Development of an inner surface profile measurement system for precise electroformed Wolter mirrors for X-ray telescopes**

Author(s): Shunsuke Ito, Akinari Ito, Shutaro Mohri, The Univ. of Tokyo (Japan); Gota Yamaguchi, RIKEN SPring-8 Ctr. (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan), RIKEN SPring-8 Ctr. (Japan)

23 August 2023 • 8:20 AM - 8:40 AM | Conv. Ctr. Room 13

12695-3

#### **Towards a new generation long trace profiler LTP-2020: Design, motion control, and performance of a two-carriage gantry system**

Author(s): Ian Lacey, Kevan Anderson, Jeff Dickert, Lawrence Berkeley National Lab. (United States); Blake Nelson, Meadows Manufacturing (United States); Peter Z. Takacs, Surface Metrology Solutions LLC (United States); Valeriy V. Yashchuk, Damon English, Lawrence Berkeley National Lab. (United States)

23 August 2023 • 8:40 AM - 9:00 AM | Conv. Ctr. Room 13

12695-4

#### **Towards new generation long trace profiler LTP-2020: system design with different sensors in different operation modes**

Author(s): Valeriy V. Yashchuk, Kevan Anderson, Grant D. Cutler, Jeff Dickert, Damon English, Lawrence Berkeley National Lab. (United States); Ralf D. Geckeler, Physikalisch-Technische Bundesanstalt (Germany); Ian Lacey, Lawrence Berkeley National Lab. (United States); Peter Z. Takacs, Surface Metrology Solutions LLC (United States)

23 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 13

12695-5

#### **Developing bendable air bearing shafts supporting long trace profiler to compensate gravity effect during measuring process**

Author(s): Shang-Wei Lin, Chao-Chih Chiu, Chih-Yu Hua, Hok-Sum Fung, Ming-Ying Hsu, Huang-Wen Fu, Chia-Feng Chang, Gung-Chian Yin, National Synchrotron Radiation Research Ctr. (Taiwan)

23 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 13

12695-6

#### **Fabrication and LTP test result for a 460 mm long deformable mirror to reduce "Junction effect"**

Author(s): Yoshio Ichii, JTEC Corp. (Japan), SLAC National Accelerator Lab. (United States); Takato Inoue, Nagoya Univ. (Japan); Fumiharu Tramae, Shinsaku Shiroma, Shinya Aono, JTEC Corp. (Japan); Xianbo Shi, Jun Qian, Luca Rebuffi, Argonne National Lab. (United States); Juniki Sonoyama, Hisataka Takenaka, TOYAMA Co., Ltd. (Japan); Satoshi Matsuyama, Nagoya Univ. (Japan); Lahsen Assoufid, Argonne National Lab. (United States); Kazuto Yamauchi, Osaka Univ. (Japan)

23 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 13

Coffee Break 10:00 AM - 10:25 AM

# TECHNICAL CONFERENCES

## Conference 12695

### SESSION 2: X-RAY/EUV OPTICS TESTING AND MEASUREMENTS WITH INTERFEROMETRY

23 August 2023 • 10:25 AM - 12:15 PM | Conv. Ctr. Room 13  
Session Chair: Frank Siewert, Helmholtz-Zentrum Berlin für  
Materialien und Energie GmbH (Germany)

12695-7

#### **X-Ray and EUV optics: Driving the state of the art in optical metrology** *(Invited Paper)*

Author(s): Peter J. de Groot, Vivek G. Badami, Zygo Corporation (United States)

23 August 2023 • 10:25 AM - 10:55 AM | Conv. Ctr. Room 13

12695-8

#### **Upgrade of the LCLS optics metrology stitching measurement capability**

Author(s): May Ling Ng, Lance Lee, SLAC National Accelerator Lab. (United States)

23 August 2023 • 10:55 AM - 11:15 AM | Conv. Ctr. Room 13

12695-9

#### **Metrology and characterization of two optical delay line mirrors before and after B4C coating at European XFEL**

Author(s): Idoia Freijo-Martin, Silja Schmidtchen, Maurizio Vannoni, European XFEL GmbH (Germany); Michael Störmer, Helmholtz-Zentrum Hereon GmbH (Germany)

23 August 2023 • 11:15 AM - 11:35 AM | Conv. Ctr. Room 13

12695-10

#### **CGH Interferometer system for two-dimensional curved X-ray mirror production**

Author(s): Shunichiro Matsuzaka, Toshio Nakano, Toshiki Taniguchi, Hiroki Nakamori, Akira Miyake, JTEC Corp. (Japan)

23 August 2023 • 11:35 AM - 11:55 AM | Conv. Ctr. Room 13

12695-11

#### **Modeling and characterizing transmission windows for in-situ interferometric measurements of cryogenically cooled mirrors**

Author(s): Grant D. Cutler, Daniele Cocco, Lawrence Berkeley National Lab. (United States); Lei Huang, Mourad Idir, Brookhaven National Lab. (United States)

23 August 2023 • 11:55 AM - 12:15 PM | Conv. Ctr. Room 13

Lunch/Exhibition Break 12:15 PM - 1:30 PM

### SESSION 3: OPTICS TESTING, CALIBRATION, POLARIZATION-RESOLVED REFLECTANCE, AND WAVEFRONT CORRECTION

23 August 2023 • 1:30 PM - 3:20 PM | Conv. Ctr. Room 13  
Session Chair: May Ling Ng,  
SLAC National Accelerator Lab. (United States)

12695-13

#### **The art of X-ray optics metrology developed and under development at the Advanced Light Source X-Ray Optics Laboratory** *(Invited Paper)*

Author(s): Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (United States)

23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 13

12695-24

#### **The multiple array detector optical lever deflection angle metrology for x-ray mirrors, and semiconductor applications**

Author(s): Wojtek J. Walecki, Optoprofilier LLC (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 13

12695-14

#### **The advanced photon source new slope measuring system: Upgrades, performance, and results of mirror measurements**

Author(s): Lahsen Assoufid, Jun Qian, Michael Fisher, Max D. Wayman, Zhi Qiao, Luca Rebuffi, Xianbo Shi, Argonne National Lab. (United States); Raluca Ghilea, Argonne National Lab. (United States), Goldman, Sachs & Co. (United States); Bryan Monk, Joseph Sullivan, Argonne National Lab. (United States); Peter Takacs, Surface Metrology Solutions LLC (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 13

12695-15

#### **In-situ metrology of high heat load optics in SPring-8**

Author(s): Haruhiko Ohashi, Hirokatsu Yumoto, Takahisa Koyama, Yasunori Senba, Hiroshi Yamazaki, Koji Tsubota, Satsuki Shimizu, Takamitsu Saito, Hikaru Kishimoto, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan); Masayuki Tanaka, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan); Yasuhiro Shimizu, Takahisa Matsuzaki, Takanori Miura, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan)

23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 13

12695-16

#### **Investigating the sensitivity of optical constant determination in the vacuum ultraviolet spectral range to s- and p-polarized reflectance**

Author(s): Najmeh Abbasirad, Udo Kroth, Qais Saadeh, Richard Ciesielski, Alexander Gottwald, Physikalisch-Technische Bundesanstalt (Germany); Vicky Philipsen, imec (Belgium); Frank Scholze, Victor Soltwisch, Physikalisch-Technische Bundesanstalt (Germany)

23 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 13

Coffee Break 3:20 PM - 3:45 PM

### SESSION 4: AT-WAVELENGTH WAVEFRONTS SENSORS, MEASUREMENT, AND CONTROL

23 August 2023 • 3:45 PM - 5:25 PM | Conv. Ctr. Room 13

Session Chair: Lahsen Assoufid,  
Argonne National Lab. (United States)

12695-17

#### **X-ray wavefront sensing development at the Advanced Light Source**

Author(s): Kenneth A. Goldberg, Antoine Wojdyla, Diane Bryant,  
Lawrence Berkeley National Lab. (United States)

23 August 2023 • 3:45 PM - 4:05 PM | Conv. Ctr. Room 13

12695-18

#### **Pulse-to-pulse field characterization at X-ray free-electron lasers using a speckle-correlation scattering matrix**

Author(s): KyeoReh Lee, KAIST (Republic of Korea); Jun Lim,  
Pohang Accelerator Lab. (Republic of Korea); YongKeun Park, KAIST  
(Republic of Korea)

23 August 2023 • 4:05 PM - 4:25 PM | Conv. Ctr. Room 13

12695-19

#### **Design, fabrication, and characterization of x-ray optics for the cavity-based x-ray free-electron laser project**

Author(s): Peifan Liu, Paresch Pradhan, Xianbo Shi, Deming Shu,  
Keshab Kauchha, Zhi Qiao, Argonne National Lab. (United States);  
Kenji Tamasaku, Taito Osaka, RIKEN SPring-8 Ctr. (Japan); Diling  
Zhu, Takahiro Sato, James MacArthur, SLAC National Accelerator  
Lab. (United States); Xianrong Huang, Lahsen Assoufid, Marion  
White, Kwang-Je Kim, Yuri Shvyd'ko, Argonne National Lab. (United  
States)

23 August 2023 • 4:25 PM - 4:45 PM | Conv. Ctr. Room 13

12695-20

#### **Supporting the development of X-ray optical elements through at-wavelength and ex-situ investigations**

Author(s): Analía Fernández Herrero, Andrey Sokolov, Helmholtz-  
Zentrum Berlin für Materialien und Energie GmbH (Germany);  
Nazanin Samadi, Paul Scherrer Institut (Switzerland); Grzegorz  
Gwalt, Helmholtz-Zentrum Berlin für Materialien und Energie  
GmbH (Germany); Anke Teichert, NOB Nano Optics Berlin GmbH  
(Germany); Jana Buchheim, Stefan Rehbein, Tino Seliger, Helmholtz-  
Zentrum Berlin für Materialien und Energie GmbH (Germany);  
Christoph Braig, Institut für Angewandte Photonik e.V. (Germany);  
Thomas Krist, NOB Nano Optics Berlin GmbH (Germany); Christian  
David, Paul Scherrer Institut (Switzerland); Frank Siewert, Helmholtz-  
Zentrum Berlin für Materialien und Energie GmbH (Germany)

23 August 2023 • 4:45 PM - 5:05 PM | Conv. Ctr. Room 13

12695-21

#### **The LCLS-II x-ray optical system: From metrology to routine operation**

Author(s): Matthew H. Seaberg, Lance Lee, May Ling Ng, William  
Lane, SLAC National Accelerator Lab. (United States)

23 August 2023 • 5:05 PM - 5:25 PM | Conv. Ctr. Room 13

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12695-22

#### **Advances in at-wavelength metrology of X-ray optics at the Advanced Photon Source**

Author(s): Xianbo Shi, Matthew J. Highland, Matthew G. Frith, Lisa Gades, Orlando Quaranta, Runyu Zhang, Luca Rebuffi, Lahsen Assoufid, Argonne National Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12695-23

#### **Diamond-VeNOM: A high-speed slope profiler for characterising X-ray mirrors**

Author(s): Ioana-Theodora Nistea, Simon G. Alcock, Murilo Bazan da Silva, Kawal Sawhney, Diamond Light Source Ltd. (United Kingdom)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12695-25

#### **Preparing for cost effective soft X-ray metrology for 3D chip architecture**

Author(s): Henry Chou, Don McDaniel, Deborah Gustafson, David B. Reisman, Chris Lee, Energetiq Technology, Inc. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12696

# Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXV

21 - 22 August 2023 | Conv. Ctr. Room 13

Conference Chairs: **Nerine J. Cherepy**, Lawrence Livermore National Lab. (United States); **ichaël Fiederle**, FMF - Freiburger Materialforschungszentrum (Germany); **Ralph B. James**, Savannah River National Lab. (United States)

Program Committee: **Toru Aoki**, Shizuoka Univ. (Japan); **Gerard Ariño-Estrada**, Univ. of California, Davis (United States); **Jim E. Bacia**, Univ. of Florida (United States); **Aleksey E. Bolotnikov**, Brookhaven National Lab. (United States); **Arnold Burger**, Fisk Univ. (United States); **Lei Raymond Cao**, The Ohio State Univ. (United States); **Henry Chen**, Consulting LLC (United States); **Mao-Hua Du**, Oak Ridge National Lab. (United States); **Petro Fochuk**, Chernivtsi National Univ. Y. Fedkovich (Ukraine); **Jan Franc**, Charles Univ. (Czech Republic); **Larry Franks**, Consultant (United States); **Volodymyr A. Gnatyuk**, V. E. Lashkaryov Institute of Semiconductor Physics NASU (Ukraine); **Amber L. Guckes**, Nevada National Security Site (United States); **Zhong He**, Univ. of Michigan (United States); **Keitaro Hitomi**, Tohoku Univ. (Japan); **Mercouri Kanatzidis**, Northwestern Univ. (United States); **KiHyun Kim**, Korea Univ. (Republic of Korea); **Krishna C. Mandal**, Univ. of South Carolina (United States); **Sanjoy Mukhopadhyay**, International Atomic Energy Agency (United States); **Madan Niraula**, Nagoya Institute of Technology (Japan); **Stephen A. Payne**, Lawrence Livermore National Lab. (United States); **Utpal N. Roy**, Savannah River National Lab. (United States); **Arie Ruzin**, Tel Aviv Univ. (Israel); **Michael R. Squillante**, Radiation Monitoring Devices, Inc. (United States); **Sergey E. Ulin**, National Research Nuclear Univ. MEPhI (Russian Federation); **Edgar V. van Loef**, Radiation Monitoring Devices, Inc. (United States); **Richard S. Wolf**, U.S. Naval Research Lab. (United States); **Ge Yang**, North Carolina State Univ. (United States); **Ren-Yuan Zhu**, Caltech (United States); **Mariya Zhuravleva**, The Univ. of Tennessee Knoxville (United States)

### MONDAY 21 AUGUST 2023

#### SESSION 1: SEMICONDUCTORS

21 August 2023 • 8:00 AM - 9:55 AM | Conv. Ctr. Room 13  
Session Chair: Ralph B. James,  
Savannah River National Lab. (United States)

12696-1

#### Annealing effects of lead-free perovskite FA<sub>3</sub>Bi<sub>2</sub>I<sub>9</sub> single Crystals for Radiation Detection *(Invited Paper)*

Author(s): Ge Yang, Doup Kim, North Carolina State Univ. (United States); Ralph B. James, Savannah River National Lab. (United States)

21 August 2023 • 8:00 AM - 8:25 AM | Conv. Ctr. Room 13

12696-2

#### Direct current mode neutron detection, investigation of polarization effect on 500 μm single crystal CVD diamond detector, and depolarization techniques

Author(s): Kaleab Ayalew, Amber Guckes, Robert Buckles, Adam Wolverton, Irene Garza, Mission Support and Test Services LLC (United States)

21 August 2023 • 8:25 AM - 8:45 AM | Conv. Ctr. Room 13

12696-3

#### All-inorganic Cs<sub>2</sub>AgBiBr<sub>6</sub> double perovskite single crystals for radiation detectors *(Invited Paper)*

Author(s): Michael Fiederle, Simay Sahsuvar, Harald Hillebrecht, Michael Daub, Catharine Schwänzle, FMF - Freiburger Materialforschungszentrum (Germany)

21 August 2023 • 8:45 AM - 9:10 AM | Conv. Ctr. Room 13

12696-4

#### Correlation of transport properties with charge trapping parameters in Cd<sub>0.9</sub>Zn<sub>0.1</sub>Te<sub>1-x</sub>Se<sub>x</sub> room temperature gamma-ray detectors

Author(s): Ritwik Nag, Sandeep K. Chaudhuri, Krishna C. Mandal, Univ. of South Carolina (United States)

21 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 13

12696-5

#### Trap center identification in Ni/Y<sub>2</sub>O<sub>3</sub>/4H-SiC heteroepitaxial vertical MOS detectors with up to 250-um-thick 4H-SiC epitaxial layer *(Invited Paper)*

Author(s): Krishna C. Mandal, Sandeep K. Chaudhuri, Ritwik Nag, Univ. of South Carolina (United States)

21 August 2023 • 9:30 AM - 9:55 AM | Conv. Ctr. Room 13

Coffee Break 9:55 AM - 10:25 AM

#### SESSION 2: DETECTOR SYSTEMS

21 August 2023 • 10:25 AM - 11:30 AM | Conv. Ctr. Room 13  
Session Chair: Nerine J. Cherepy,  
Lawrence Livermore National Lab. (United States)

12696-6

#### Radiation detection for nuclear treaty verification *(Invited Paper)*

Author(s): Sara A. Pozzi, Univ. of Michigan (United States)

21 August 2023 • 10:25 AM - 10:50 AM | Conv. Ctr. Room 13

12696-7

### High fidelity ground deposition measurement with robots after explosive radiological dispersion

Author(s): Richard J. Maurer, National Security Technologies, LLC (United States); Sanjoy Mukhopadhyay, Johnny Grimes, Nevada National Security Site (United States); Paul P. Guss, Ronald E. Guise, National Security Technologies, LLC (United States)

21 August 2023 • 10:50 AM - 11:10 AM | Conv. Ctr. Room 13

12696-8

### Neutron radiation detection instrument-1A (NeRDI-1A)

Author(s): Anthony L. Hutcheson, Bernard F. Philips, U.S. Naval Research Lab. (United States); W. Neil Johnson, Technology Service Corp. (United States); Lee J. Mitchell, Joshua M. Wolf, Mary V. Johnson-Rambert, Joseph M. Davis, Theodore T. Finne, Richard S. Woolf, U.S. Naval Research Lab. (United States); Rose S. Perea, NRC Research Associate at the U.S. Naval Research Laboratory (United States)

21 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 13

Lunch Break 11:30 AM - 1:00 PM

### SESSION 3: X-RAY/GAMMA RAY IMAGING

21 August 2023 • 1:00 PM - 2:10 PM | Conv. Ctr. Room 13

Session Chair: Sean P. O'Neal,  
Lawrence Livermore National Lab. (United States)

12696-9

### High efficiency X-ray sources (*Invited Paper*)

Author(s): Arundhuti Ganguly, Sami Tantawi, Amy Shiroma, Filippou Toufexis, TibaRay (United States)

21 August 2023 • 1:00 PM - 1:25 PM | Conv. Ctr. Room 13

12696-10

### High resolution lens-coupled MeV X-radiography of dense additively manufactured objects

Author(s): Nerine J. Cherepy, Daniel Schneberk, Zachary Seeley, Colby McNamee, Stephen Payne, Lawrence Livermore National Lab. (United States); Paul Carriere, Robert Berry, RadiaBeam Technologies, LLC (United States); Jarvis Caffrey, NASA Marshall Space Flight Ctr. (United States)

21 August 2023 • 1:25 PM - 1:45 PM | Conv. Ctr. Room 13

12696-11

### Gamma imaging of burning fusion capsules at the National Ignition Facility (NIF) using the ceramic scintillator GYGAG (*Invited Paper*)

Author(s): Michael Rubery, Lawrence Livermore National Lab. (United States)

21 August 2023 • 1:45 PM - 2:10 PM | Conv. Ctr. Room 13

Coffee Break 2:10 PM - 2:40 PM

### SESSION 4: NEUTRON IMAGING AND DETECTORS

21 August 2023 • 2:40 PM - 3:50 PM | Conv. Ctr. Room 13

Session Chair: Sara A. Pozzi, Univ. of Michigan (United States)

12696-12

### Fast neutron radiography-based on single-photon digital photosensor: concept and demonstration (*Invited Paper*)

Author(s): Jean-Francois Pratte, Keven Deslandes, Tommy Rossignol, Nicolas Roy, Frederic Vachon, Robin Scarpellini, Guillaume Theberge-Dupuis, Univ. de Sherbrooke (Canada); Paul A. Hausladen, Lorenzo Fabris, Oak Ridge National Lab. (United States); Serge A. Charlebois, Univ. de Sherbrooke (Canada)

21 August 2023 • 2:40 PM - 3:05 PM | Conv. Ctr. Room 13

12696-13

### Improved image stitching methods for neutron imaging of large object with small beam size

Author(s): Matthew G. Bisbee, The Ohio State Univ. (United States); Ibrahim Oksuz, The Ohio State Univ. (United States), AwareAbility Technologies, LLC (United States); Nerine Cherepy, Andrew Townsend, Lawrence Livermore National Lab. (United States); Lei R. Cao, Quinnan Hetrick, The Ohio State Univ. (United States)

21 August 2023 • 3:05 PM - 3:25 PM | Conv. Ctr. Room 13

12696-14

### Dual particle imaging with iridium-bismuth and fast-curing plastic scintillators (*Invited Paper*)

Author(s): Andrew W. Decker, Juan Manfredi, Air Force Institute of Technology (United States); Mike Febbraro, Oak Ridge National Lab. (United States); Nerine Cherepy, Saphon Hok, Lawrence Livermore National Lab. (United States); Paul Hausladen, Oak Ridge National Lab. (United States); Jason Hayward, The Univ. of Tennessee Knoxville (United States)

21 August 2023 • 3:25 PM - 3:50 PM | Conv. Ctr. Room 13

### X-RAY, GAMMA-RAY, AND PARTICLE TECHNOLOGIES PLENARY

21 August 2023 • 4:00 PM - 5:25 PM | Conv. Ctr. Room 6A

Session Chairs: Ralph B. James, Savannah River National Lab. (United States); Ali M. Khounsary, Illinois Institute of Technology (United States)

### Welcome and Opening Remarks

21 August 2023 • 4:00 PM - 4:05 PM - 4:45 PM | Conv. Ctr. Room 6A

12694-501

### FLASH Radiotherapy: a new cancer treatment modality and its challenges, physics, engineering, and biology (*Plenary Presentation*)

Author(s): Magdalena Bazalova-Carter, Univ. of Victoria (Canada)

21 August 2023 • 4:05 PM - 4:45 PM | Conv. Ctr. Room 6A

12696-502

### Recent advances in X-ray, gamma-ray, and charged-particle imaging (*Plenary Presentation*)

Author(s): Lars R. Furenlid, The Univ. of Arizona (United States)

21 August 2023 • 4:45 PM - 5:25 PM | Conv. Ctr. Room 6A

# TECHNICAL CONFERENCES

## Conference 12696

TUESDAY 22 AUGUST 2023

### SESSION 5: IMAGING DETECTORS

22 August 2023 • 8:10 AM - 10:15 AM | Conv. Ctr. Room 13

Session Chair: Michael Fiederle, FMF - Freiburger  
Materialforschungszentrum (Germany)

12696-36

#### Additive manufactured high-aspect-ratio pixelated transparent ceramic scintillator for X-ray imaging

Author(s): Joshua Smith, Ross Osborne, Tim Yee, Phil Kerr, Zach Seeley, Nerine Cherepy, Steve Payne, Lawrence Livermore National Lab. (United States)

22 August 2023 • 8:10 AM - 8:30 AM | Conv. Ctr. Room 13

12696-15

#### Characterization suite of a 1 ns, multi-frame hybridized CMOS imager for the ultra-fast x-ray imager program

Author(s): Anne Garafalo, Arthur C. Carpenter, Clement Trosseille, Brad T. Funsten, Jack Dean, Robin Benedetti, Brian Hassard, Brandon Morioka, Lawrence Livermore National Lab. (United States); Michael Jones, Sandia National Labs. (United States); Liam Claus, Marcos Sanchez, Advanced hCMOS Systems (United States); Matthew Dayton, Advanced hCMOS Systems (United States), Lawrence Livermore National Lab. (United States); Andrew Sharp, Peter Nyholm, Lawrence Livermore National Lab. (United States)

22 August 2023 • 8:30 AM - 8:50 AM | Conv. Ctr. Room 13

12696-16

#### Pixel-by-pixel image correction using X-ray photon energy

Author(s): Hiroki Kase, Kento Tabata, Junichi Nishizawa, Katsuyuki Takagi, Toru Aoki, Shizuoka Univ. (Japan)

22 August 2023 • 8:50 AM - 9:10 AM | Conv. Ctr. Room 13

12696-17

#### Development and performance of CMOS scientific camera platform used at the National Ignition Facility

Author(s): Jason Prince, Dana Hargrove, Arthur Carpenter, Lawrence Livermore National Lab. (United States); Gary Sims, Spectral Instruments, Inc. (United States)

22 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 13

12696-18

#### X-ray tracking using a perovskite scintillator with an event-based sensor

Author(s): Clio Sleator, Marc Christophersen, C.C. Cheung, S. Noor Qadri, Freddie Santiago, U.S. Naval Research Lab. (United States)

22 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 13

12696-19

#### Single crystal diamond X-ray image sensor with photon-counting ROIC (Invited Paper)

Author(s): Toru Aoki, Kohei Toyoda, Shizuoka Univ. (Japan), ANSeeN Inc. (Japan); Koji Koyama, Seong-Woo Kim, Orbray Co., Ltd. (Japan); Junichi Nishizawa, Shizuoka Univ. (Japan), ANSeeN Inc. (Japan); Kento Tabata, Hiroki Kase, Katsuyuki Takagi, Shizuoka Univ. (Japan); Keitaro Hitomi, Tohoku Univ. (Japan)

22 August 2023 • 9:50 AM - 10:15 AM | Conv. Ctr. Room 13

Coffee Break 10:15 AM - 10:45 AM

### SESSION 6: INORGANIC SCINTILLATORS

22 August 2023 • 10:45 AM - 11:30 AM | Conv. Ctr. Room 13

Session Chair: Nerine J. Cherepy,  
Lawrence Livermore National Lab. (United States)

12696-20

#### Fast scintillating material with high light yield utilizing InAs quantum dots in GaAs matrix for radiation detection

Author(s): Tushar Mahajan, Allan Minns, Vadim Tokranov, Michael Yakimov, SUNY Polytechnic Institute (United States); Michael Hedges, Purdue Univ. (United States); Pavel Murat, Fermi National Accelerator Lab. (United States); Serge Oktyabrsky, SUNY Polytechnic Institute (United States)

22 August 2023 • 10:45 AM - 11:05 AM | Conv. Ctr. Room 13

12696-21

#### Development of dual-mode halide scintillators: 6LiSr215 and 6Li-doped Cs3Cu215 (Invited Paper)

Author(s): Luis Stand, Yauhen Tratsiak, Ketaki Joshi, Xianfei Wen, Daniel Rutstrom, The Univ. of Tennessee Knoxville (United States); Lakshmi Soundara-Pandian, Guido Ciampi, Radiation Monitoring Devices, Inc. (United States); Jason Hayward, Charles Melcher, The Univ. of Tennessee Knoxville (United States); Jarek Glodo, Edgar van Loef, Radiation Monitoring Devices, Inc. (United States); Mariya Zhuravleva, The Univ. of Tennessee Knoxville (United States)

22 August 2023 • 11:05 AM - 11:30 AM | Conv. Ctr. Room 13

Lunch/Exhibition Break 11:30 AM - 1:00 PM

### SESSION 7: ORGANIC SCINTILLATORS

22 August 2023 • 1:00 PM - 2:10 PM | Conv. Ctr. Room 13

Session Chair: Lei Raymond Cao,  
The Ohio State Univ. (United States)

12696-23

#### Nanocomposite plastic scintillators (Invited Paper)

Author(s): Qibing Pei, Univ. of California, Los Angeles (United States)

22 August 2023 • 1:00 PM - 1:25 PM | Conv. Ctr. Room 13

12696-24

#### Large volume bismuth-loaded plastics for portal monitors (Invited Paper)

Author(s): Sean P. O'Neal, Saphon Hok, Nerine Cherepy, Stephen Payne, Lawrence Livermore National Lab. (United States); Charles Hurlbut, Eljen Technology (United States)

22 August 2023 • 1:25 PM - 1:50 PM | Conv. Ctr. Room 13

12696-26

#### Pulse shape discrimination in 3D printable plastic scintillators using polyvinyl toluene-based resins (Invited Paper)

Author(s): Yongwook Kim, Natalia Zaitseva, Michael Ford, Leslie Carman, Andrew Glenn, Lawrence Livermore National Lab. (United States); Michael Febbraro, Paul Hausladen, Oak Ridge National Lab. (United States)

22 August 2023 • 1:50 PM - 2:10 PM | Conv. Ctr. Room 13

Coffee Break 2:10 PM - 2:40 PM



### SESSION 8: ADVANCED DETECTORS

22 August 2023 • 2:40 PM - 4:05 PM | Conv. Ctr. Room 13

Session Chair: Luis Stand,  
The Univ. of Tennessee Knoxville (United States)

12696-27

#### **Application of neutron depth profiling in lithium-ion battery research** (*Invited Paper*)

Author(s): Lei Raymond Cao, Matt Bisbee, David Wood, Praneeth Kandlakunta, Andrew Maier, Anne Co, Robert G. Downing, The Ohio State Univ. (United States)

22 August 2023 • 2:40 PM - 3:05 PM | Conv. Ctr. Room 13

12696-28

#### **New optics design of the Cherenkov threshold detectors at CERN**

Author(s): Jan Buesa Orgaz, Martin Schwinzerl, Johannes Bernhard, Markus Brugger, Nikolaos Charitonidis, Ramon Folch, Berare Göktürk, Yacine Kadi, Laurence Nevay, Inaki Ortega Ruiz, Giulia Romagnoli, Francisco Sanchez Galan, Maarten Van Dijk, CERN (Switzerland)

22 August 2023 • 3:05 PM - 3:25 PM | Conv. Ctr. Room 13

12696-29

#### **A novel 4 x 4 SiPM array and integrated preamplification stage optimized for the PWO detectors of the EIC EEMCAL**

Author(s): Olivier Philip, Irina Shestakova, CRYTUR USA (United States); Silvia Sýkorová, Jaromír Šubcík, Jan Kovár, Vojtech Malý, Jindrich Houzvícka, CRYTUR spol s.r.o. (Czech Republic); Tanja Horn, The Catholic Univ. of America (United States); Alexander Somov, Vladimir Berdnikov, Yeran Ghandilyan, Thomas Jefferson National Accelerator Facility (United States); Joshua Crafts, The Catholic Univ. of America (United States); Bruno Jorion, Independent (United States)

22 August 2023 • 3:25 PM - 3:45 PM | Conv. Ctr. Room 13

12696-35

#### **From count rates to quantifying isotopic activities: Field analysis of radiation monitoring data**

Author(s): Sanjoy Mukhopadhyay, Johnny Grimes, Richard J. Maurer, Nevada National Security Site (United States)

22 August 2023 • 3:45 PM - 4:05 PM | Conv. Ctr. Room 13

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### **Poster Setup: Wednesday 10:00 AM - 4:30 PM**

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12696-30

#### **Melting and crystallization peculiarities of Cd<sub>0.50</sub>Mn<sub>0.50</sub>Te solid solutions**

Author(s): Oleh Kopach, Vasylyna Kopach, Petro Fochuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine); Aleksey Bolotnikov, Brookhaven National Lab. (United States); Ralph B. James, Savannah River National Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12696-31

#### **CsPbBr<sub>3</sub> perovskite single crystals for X- and $\gamma$ -radiation detectors**

Author(s): Valerii Skliarchuk, Petro M. Fochuk, Oleh Kopach, Chernivtsi National Univ. Y. Fedkovich (Ukraine); Aleksey Bolotnikov, Brookhaven National Lab. (United States); Ralph B. James, Savannah River National Lab. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12696-32

#### **Growth and characterization of (Cd,Mn) Te crystals**

Author(s): Michael Fiederle, Alex Fauler, Manuel Lasson, FMF - Freiburger Materialforschungszentrum (Germany)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12696-33

#### **Effect of the metal nature on the I-V characteristics of CdTe diodes for ionizing radiation detectors**

Author(s): Valeriy Sklyarchuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine); Volodymyr A. Gnatyuk, V. E. Lashkaryov Institute of Semiconductor Physics NASU (Ukraine); Toru Aoki, Shizuoka Univ. (Japan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12696-34

#### **Crystal growth and thermodynamic studies of the formation of Cesium Hexachlorohafnate (CHC) from Melt**

Author(s): Stephen Babalola, Elijah Adedeji, Jordan Drake, Angel Reeder, Alabama A&M Univ. (United States)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

# TECHNICAL CONFERENCES

## Conference 12697

# Advances in Computational Methods for X-Ray Optics VI

20 - 21 August 2023 | Conv. Ctr. Room 15B

Conference Chairs: **Oleg Chubar**, Brookhaven National Lab. (United States); **Takashi Tanaka**, RIKEN SPring-8 Ctr. (Japan)

Program Committee: **Roman Chernikov**, Canadian Light Source Inc. (Canada); **Gianluca Aldo Geloni**, European XFEL GmbH (Germany); **Ali M. Khounsary**, Illinois Institute of Technology (United States); **Carolyn A. MacDonald**, Univ. at Albany, SUNY (United States); **Bernd C. Meyer**, Ctr. Nacional de Pesquisa em Energia e Materiais (Brazil); **Hidekazu Mimura**, The Univ. of Tokyo (Japan); **Liubov Samoylova**, European XFEL GmbH (Germany); **Manuel Sanchez del Rio**, European Synchrotron Radiation Facility (France); **Xianbo Shi**, Argonne National Lab. (United States); **Yuri V. Shvyd'ko**, Argonne National Lab. (United States); **Giorgia Sironi**, INAF - Osservatorio Astronomico di Brera (Italy); **John P. Sutter**, Diamond Light Source Ltd. (United Kingdom); **Ivan A. Vartaniants**, Deutsches Elektronen-Synchrotron (Germany); **Garth J. Williams**, Brookhaven National Lab. (United States); **Fugui Yang**, Institute of High Energy Physics, Chinese Academy of Sciences (China); **Valeriy V. Yashchuk**, Lawrence Berkeley National Lab. (United States)

### SUNDAY 20 AUGUST 2023

#### SESSION 1: NEW LIGHT SOURCES AND BEAMLINES

20 August 2023 • 9:10 AM - 10:20 AM | Conv. Ctr. Room 15B

Session Chair: Oleg Chubar,  
Brookhaven National Lab. (United States)

12697-1

#### Simulation use at NSLS-II's coherent diffractive imaging (CDI) beamline

Author(s): Garth J. Williams, Yuan Gao, Lonny Berman, Oleg Chubar,  
Brookhaven National Lab. (United States)

20 August 2023 • 9:10 AM - 9:30 AM | Conv. Ctr. Room 15B

12697-3

#### Femtosecond-terawatt hard X-ray pulse generation with chirped pulse amplification on a free electron laser

Author(s): Haoyuan Li, Stanford Univ. (United States)

20 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 15B

12697-4

#### Transverse coherence properties and propagation of x-ray radiation from spontaneous and free-electron laser sources (*Invited Paper*)

Author(s): Andrei Trebushinin, European XFEL GmbH (Germany);  
Mirko Siano, Univ. degli Studi di Milano (Italy), Istituto Nazionale di  
Fisica Nucleare (Italy); Svitozar Serkez, Gianluca A. Geloni, European  
XFEL GmbH (Germany)

20 August 2023 • 9:50 AM - 10:20 AM | Conv. Ctr. Room 15B

Coffee Break 10:20 AM - 10:40 AM

#### SESSION 2: COMPUTATION METHODS AND CODES I

20 August 2023 • 10:40 AM - 11:30 AM | Conv. Ctr. Room 15B

Session Chair: Takashi Tanaka, RIKEN SPring-8 Ctr. (Japan)

12697-5

#### FOCUS: current status and future perspectives (*Invited Paper*)

Author(s): Mirko Siano, Univ. degli Studi di Milano (Italy); Gianluca  
A. Geloni, European XFEL GmbH (Germany); Bruno Paroli, Marco  
Potenza, Univ. degli Studi di Milano (Italy)

20 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 15B

12697-8

#### New wavefront split propagator in SRW code and its application in simulation of high-resolution fresnel zone plate

Author(s): An He, Oleg Chubar, Wen Hu, Joseph Dvorak, Brookhaven  
National Lab. (United States)

20 August 2023 • 11:10 AM - 11:30 AM | Conv. Ctr. Room 15B

Lunch Break 11:30 AM - 1:00 PM

#### SESSION 3: COMPUTATION METHODS AND CODES II

20 August 2023 • 1:00 PM - 2:00 PM | Conv. Ctr. Room 15B

Session Chair: Takashi Tanaka, RIKEN SPring-8 Ctr. (Japan)

12697-9

#### Comparing coherent mode decomposition methods for undulator radiation in modern synchrotron light sources

Author(s): Oleg Chubar, Brookhaven National Lab. (United States);  
Takashi Tanaka, RIKEN SPring-8 Ctr. (Japan); Ruizi Li, Brookhaven  
National Lab. (United States)

20 August 2023 • 1:00 PM - 1:20 PM | Conv. Ctr. Room 15B

12697-10

#### PyCSFex: an extensible Python three package for calculating x-ray structure factors in complex crystals

Author(s): John P. Sutter, Diamond Light Source Ltd. (United  
Kingdom); James Pittard, Univ. of Bristol (United Kingdom); Jacob  
Filik, Diamond Light Source Ltd. (United Kingdom); Alfred Q. R.  
Baron, RIKEN SPring-8 Ctr. (Japan)

20 August 2023 • 1:20 PM - 1:40 PM | Conv. Ctr. Room 15B

12697-11

### Application of beam propagation method for solving dynamic diffraction problems in distorted crystals

Author(s): Jacek Krzywinski, SLAC National Accelerator Lab. (United States); Aliaksei Halavanau, SLAC National Accelerator Lab (United States)

20 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 15B

Coffee Break 2:00 PM - 2:30 PM

#### SESSION 4: METHODS FOR BEAMLINE ALIGNMENT AND CONTROL

20 August 2023 • 2:30 PM - 4:40 PM | Conv. Ctr. Room 15B

Session Chair: Oleg Chubar,  
Brookhaven National Lab. (United States)

12697-12

### AI-driven real-time optics control system to achieve aberration-free coherent wavefronts at 4th-generation synchrotron radiation and free electron laser beamlines (*Invited Paper*)

Author(s): Luca Rebuffi, Xianbo Shi, Matthew J. Highland, Matthew G. Frith, Wonsuk Cha, Ross J. Harder, Saugat Kandel, Argonne National Lab. (United States); Mathew J. Cherukara, Argonne National Lab (United States); Lahsen Assoufid, Argonne National Lab. (United States)

20 August 2023 • 2:30 PM - 3:00 PM | Conv. Ctr. Room 15B

12697-13

### Machine learning alignment for LCLS-II-HE optics

Author(s): Matthew H. Seaberg, SLAC National Accelerator Lab. (United States); Nicholas Brennan, Harvard Univ. (United States); Tianyu Huang, Univ. of Rochester (United States); Hasan Yavas, SLAC National Accelerator Lab. (United States)

20 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 15B

12697-14

### Signatures of misalignment in X-ray cavities of cavity-based X-ray free-electron lasers

Author(s): Yuri V. Shvyd'ko, Peng Qi, Argonne National Lab. (United States)

20 August 2023 • 3:20 PM - 3:40 PM | Conv. Ctr. Room 15B

12697-15

### Reduced model representations of synchrotron radiation and a software framework for beamline control

Author(s): Boaz Nash, RadiaSoft LLC (United States); Max . Rakitin, Brookhaven National Lab. (United States); Dan T. Abell, Michael Keilman, Paul Moeller, Ilya Pogorelov, RadiaSoft LLC (United States); Yonghua Du, Abigail C. Giles, Joshua K. Lynch, Thomas W. Morris, Andrew L. Walter, Brookhaven National Lab. (United States); Nicholas Goldring, State33, Inc. (United States)

20 August 2023 • 3:40 PM - 4:00 PM | Conv. Ctr. Room 15B

12697-16

### Bayesian optimization of synchrotron beamlines using Gaussian processes

Author(s): Thomas W. Morris, Max . Rakitin, Brookhaven National Lab. (United States); Boaz Nash, RadiaSoft LLC (United States); Yonghua Du, Andrew L. Walter, Abigail C. Giles, Joshua K. Lynch, Brookhaven National Lab. (United States); Dan T. Abell, Paul Moeller, Ilya Pogorelov, RadiaSoft LLC (United States); Nicholas Goldring, State33, Inc. (United States)

20 August 2023 • 4:00 PM - 4:20 PM | Conv. Ctr. Room 15B

12697-17

### Recent updates of the Sirepo-Bluesky library for virtual beamline representation

Author(s): Max Rakitin, Thomas W. Morris, Abigail C. Giles, Andrew L. Walter, Joshua K. Lynch, Jennefer Maldonado, Brookhaven National Lab. (United States); Brianna Romasky, Rutgers, The State Univ. of New Jersey (United States); Paul Moeller, RadiaSoft LLC (United States); Yonghua Du, Brookhaven National Lab. (United States); Boaz Nash, RadiaSoft LLC (United States)

20 August 2023 • 4:20 PM - 4:40 PM | Conv. Ctr. Room 15B

#### HOT TOPICS DISCUSSION I

20 August 2023 • 4:40 PM - 5:00 PM | Conv. Ctr. Room 15B

Session Chairs: Oleg Chubar, Brookhaven National Lab. (United States), Takashi Tanaka, RIKEN SPring-8 Ctr. (Japan)

Discussion with conference chairs.

## MONDAY 21 AUGUST 2023

#### SESSION 5: MIRRORS AND GRATINGS

21 August 2023 • 9:00 AM - 10:10 AM | Conv. Ctr. Room 15B

Session Chair: Luca Rebuffi, Argonne National Lab. (United States)

12697-18

### Combining wave-optical and ray-tracing calculations in X-ray reflective optical systems (*Invited Paper*)

Author(s): Hidekazu Mimura, The Univ. of Tokyo (Japan), RIKEN SPring-8 Ctr. (Japan); Yoko Takeo, Hiroto Motoyama, Satoru Egawa, Takashi Kimura, The Univ. of Tokyo (Japan); Yasunori Senba, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan); Takashi Tanaka, RIKEN SPring-8 Ctr. (Japan); Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan), RIKEN SPring-8 Ctr. (Japan)

21 August 2023 • 9:00 AM - 9:30 AM | Conv. Ctr. Room 15B

12697-20

### Exploring the use of x-ray adaptive optics in soft x-ray grating monochromators with wavefront propagation simulations

Author(s): Paola Luna, Antoine Wojdyla, Lawrence Berkeley National Lab. (United States)

21 August 2023 • 9:30 AM - 9:50 AM | Conv. Ctr. Room 15B

12697-21

### Effects on spatial coherence caused by soft X-ray grating monochromator

Author(s): Ruslan Khubbutdinov, Martin Seyrich, Ivan A. Vartaniants, Kai Bagschik, Deutsches Elektronen-Synchrotron (Germany)

21 August 2023 • 9:50 AM - 10:10 AM | Conv. Ctr. Room 15B

Coffee Break 10:10 AM - 10:40 AM

# TECHNICAL CONFERENCES

## Conference 12697

### SESSION 6: SIMULATION OF EXPERIMENTS I

21 August 2023 • 10:40 AM - 12:10 PM | Conv. Ctr. Room 15B  
Session Chair: Hidekazu Mimura, The Univ. of Tokyo (Japan)

12697-22

#### **SimEx-Lite: Easy access to start-to-end simulation for experiments at advanced light sources** (*Invited Paper*)

Author(s): Juncheng E, European XFEL GmbH (Germany); Carsten Fortmann-Grote, European XFEL GmbH (Germany), Max-Planck-Institut für Evolutionsbiologie (Germany); Adrian P. Mancuso, Diamond Light Source Ltd. (United Kingdom), La Trobe Univ. (Australia)

21 August 2023 • 10:40 AM - 11:10 AM | Conv. Ctr. Room 15B

12697-23

#### **Investigation of X-ray Hartmann wavefront sensing: From simulation to the initial experiment test** (*Invited Paper*)

Author(s): Lei Huang, Tianyi Wang, Oleg Chubar, Brookhaven National Lab. (United States); Guillaume Dovillaire, Imagine Optic SA (France); An He, Max Rakitin, Yang Yang, Andrew M. Kiss, Mourad Idir, Brookhaven National Lab. (United States)

21 August 2023 • 11:10 AM - 11:40 AM | Conv. Ctr. Room 15B

12697-24

#### **Speckle tracking virtual experiments for X-ray refractive lens(es) metrology** (*Invited Paper*)

Author(s): Rafael Celestre, Thomas Roth, Raymond Barrett, ESRF - The European Synchrotron (France)

21 August 2023 • 11:40 AM - 12:10 PM | Conv. Ctr. Room 15B

**Lunch Break 12:10 PM - 1:40 PM**

### SESSION 7: SIMULATION OF EXPERIMENTS II

21 August 2023 • 1:40 PM - 2:40 PM | Conv. Ctr. Room 15B  
Session Chair: Hidekazu Mimura, The Univ. of Tokyo (Japan)

12697-25

#### **Start-to-end simulations of advanced coherent X-ray imaging techniques with a novel software package built on SRW**

Author(s): Martin Seyrich, Ruslan Khubbutdinov, Kai Bagschik, Deutsches Elektronen-Synchrotron (Germany)

21 August 2023 • 1:40 PM - 2:00 PM | Conv. Ctr. Room 15B

12697-26

#### **Partially coherent radiation propagation simulations including electron beam and X-ray optics instabilities at hard X-ray nanoprobe beamline of NSLS-II**

Author(s): Oleg Chubar, Yong S. Chu, Hanfei Yan, Xiaojing Huang, Brookhaven National Lab. (United States); Himanshu Goel, Sukho Kongtawong, Stony Brook Univ. (United States); Ruizhi Li, Thomas W. Morris, Brookhaven National Lab. (United States)

21 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 15B

12697-27

#### **GPU accelerated simulations of time-dependent coherent X-ray scattering experiments**

Author(s): Himanshu Goel, Stony Brook Univ. (United States), Brookhaven National Lab. (United States); Oleg Chubar, Lutz Wiegart, Andrei Fluerasu, Ruizhi Li, An He, Max Rakitin, Brookhaven National Lab. (United States); Paul Moeller, Robert Nagler, RadiaSoft LLC (United States)

21 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 15B

### HOT TOPICS DISCUSSION II

21 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 15B  
Session Chairs: Oleg Chubar, Brookhaven National Lab. (United States), Takashi Tanaka, RIKEN SPring-8 Ctr. (Japan)

Discussion with conference chairs.

### X-RAY, GAMMA-RAY, AND PARTICLE TECHNOLOGIES PLENARY

21 August 2023 • 4:00 PM - 5:25 PM | Conv. Ctr. Room 6A  
Session Chairs: Ralph B. James, Savannah River National Lab. (United States); Ali M. Khounsary, Illinois Institute of Technology (United States)

#### **Welcome and Opening Remarks**

21 August 2023 • 4:00 PM - 4:05 PM - 4:45 PM | Conv. Ctr. Room 6A

12694-501

#### **FLASH Radiotherapy: a new cancer treatment modality and its challenges, physics, engineering, and biology** (*Plenary Presentation*)

Author(s): Magdalena Bazalova-Carter, Univ. of Victoria (Canada)

21 August 2023 • 4:05 PM - 4:45 PM | Conv. Ctr. Room 6A

12696-502

#### **Recent advances in X-ray, gamma-ray, and charged-particle imaging** (*Plenary Presentation*)

Author(s): Lars R. Furenlid, The Univ. of Arizona (United States)

21 August 2023 • 4:45 PM - 5:25 PM | Conv. Ctr. Room 6A

## Conference 12698

# X-Ray Nanoimaging: Instruments and Methods VI

23 - 24 August 2023 | Conv. Ctr. Room 7A

Conference Chairs: **Barry Lai**, Argonne National Lab. (United States); **Andréa Somogyi**, Synchrotron SOLEIL (France)

Program Committee: **Yong S. Chu**, Brookhaven National Lab. (United States); **Christian G. Schroer**, Deutsches Elektronen-Synchrotron (Germany); **Ulrich Vogt**, KTH Royal Institute of Technology (Sweden); **Kazuto Yamauchi**, Osaka Univ. (Japan); **Gung-Chian Yin**, National Synchrotron Radiation Research Ctr. (Taiwan)

### WEDNESDAY 23 AUGUST 2023

#### SESSION 1: NOVEL METHODS

23 August 2023 • 1:30 PM - 3:00 PM | Conv. Ctr. Room 7A

Session Chair: Barry Lai, Argonne National Lab. (United States)

12698-1

#### X-ray imaging and spectroscopy aided by machine learning (*Invited Paper*)

Author(s): Mingyuan Ge, Brookhaven National Lab. (United States); Zeyuan Li, Rice Univ. (United States); Jiayong Zhang, Thomas Flynn, Brookhaven National Lab. (United States); Ming Tang, Rice Univ. (United States); Wah-Keat Lee, Brookhaven National Lab. (United States)

23 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 7A

12698-2

#### Limited angle x-ray tomography with machine learning

Author(s): Chonghang Zhao, Mingyuan Ge, Xiaogang Yang, Yong S. Chu, Hanfei Yan, National Synchrotron Light Source II, Brookhaven National Lab. (United States)

23 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 7A

12698-3

#### Super-resolution X-ray fluorescence microscopy using channel attention networks

Author(s): Xiaoyin Zheng, Varun R. Kankanallu, Stony Brook Univ. (United States); Yu-Chen K. Chen-Wiegart, Stony Brook Univ. (United States), Brookhaven National Lab. (United States); Xiaojing Huang, Brookhaven National Lab. (United States)

23 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 7A

12698-4

#### A machine-learning-based approach for angular alignment of 2D multilayer Laue lenses for high-resolution hard x-ray microscopy

Author(s): Wei Xu, Weihe Xu, Nathalie Bouet, Juan Zhou, Hanfei Yan, Xiaojing Huang, Lei Huang, Ming Lu, Brookhaven National Lab. (United States); Maxim Zalalutdinov, U.S. Naval Research Lab. (United States); Yong S. Chu, Evgeny Nazaretski, Brookhaven National Lab. (United States)

23 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 7A

Coffee Break 3:00 PM - 3:30 PM

#### SESSION 2: NANOIMAGING APPLICATIONS

23 August 2023 • 3:30 PM - 4:50 PM | Conv. Ctr. Room 7A

Session Chair: Christoph Rau,  
Diamond Light Source Ltd. (United Kingdom)

12698-6

#### Standard and unconventional sample environments for in-situ and operando materials characterization at the submicron scale by scanning photoemission imaging and spectromicroscopy

Author(s): Matteo Amati, Luca Gregoratti, Elettra-Sincrotrone Trieste S.C.p.A. (Italy)

23 August 2023 • 3:30 PM - 3:50 PM | Conv. Ctr. Room 7A

12698-7

#### Unraveling device evolution through multimodal in-situ X-ray characterizations in halide perovskite photovoltaics

Author(s): Naveed Rahman, Dina Sheyfer, Ross Harder, Argonne National Lab. (United States); Sakshi Sharma, Carlo A. R. Perini, Georgia Institute of Technology (United States); Sarah Wieghold, Barry Lai, Luxi Li, Argonne National Lab. (United States); Juan-Pablo Correa-Baena, Georgia Institute of Technology (United States); Yanqi Luo, Lawrence Berkeley National Lab. (United States)

23 August 2023 • 3:50 PM - 4:10 PM | Conv. Ctr. Room 7A

12698-9

#### Correlative microscopy using SEM based nano-CT

Author(s): Jonas Fell, Univ. des Saarlandes (Germany); Fabian Lutter, Julius-Maximilians-Univ. Würzburg (Germany); Christoph Pauly, Michael Engstler, Univ. des Saarlandes (Germany); Feng Han, Rémi Costa, Deutsches Zentrum für Luft- und Raumfahrt e. V. (Germany); Simon Zabler, Fraunhofer-Entwicklungszentrum Röntgentechnik EZRT (Germany); Michael Maisl, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren IZFP (Germany); Frank Mücklich, Univ. des Saarlandes (Germany), Steinbeis Forschungszentrum Material Engineering Ctr. Saarland (Germany); Randolph Hanke, Julius-Maximilians-Univ. Würzburg (Germany); Hans-Georg Herrmann, Univ. des Saarlandes (Germany), Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren IZFP (Germany)

23 August 2023 • 4:10 PM - 4:30 PM | Conv. Ctr. Room 7A

12698-10

#### Visualizing subcellular rearrangements under gold ions stress using soft X-ray tomography

Author(s): Zheng Dang, Lijiao Tian, Zhao Wu, Yong Guan, Gang Liu, Yangchao Tian, Univ. of Science and Technology of China (China)

23 August 2023 • 4:30 PM - 4:50 PM | Conv. Ctr. Room 7A

# TECHNICAL CONFERENCES

## Conference 12698

### POSTERS-WEDNESDAY

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

Conference attendees are invited to attend the poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions.

#### Poster Setup: Wednesday 10:00 AM - 4:30 PM

Poster authors, view poster presentation guidelines and set-up instructions at <https://spie.org/OP/poster-presentation-guidelines>

12698-24

#### Design of tender X-ray microspectroscopy imaging beamline station at Hefei Advanced Light Source

Author(s): Yong Guan, Gang Liu, Tian Yangchao, Zhao Wu, Univ. of Science and Technology of China (China)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

12698-25

#### The application of collision detection software development kit at TPS 39A2 nanoARPES beamline

Author(s): Te-Hui Lee, Bo-Yi Chen, Ro-Ya Liu, Cheng-Maw Cheng, National Synchrotron Radiation Research Ctr. (Taiwan)

23 August 2023 • 5:30 PM - 7:00 PM | Conv. Ctr. Exhibit Hall A

## THURSDAY 24 AUGUST 2023

### SESSION 3: PTYCHOGRAPHY I

24 August 2023 • 8:30 AM - 10:00 AM | Conv. Ctr. Room 7A  
Session Chair: Volker Rose, Argonne National Lab. (United States)

12698-11

#### Chemical state visualization using X-ray spectroscopic ptychography in SPring-8 (*Invited Paper*)

Author(s): Nozomu Ishiguro, Tohoku Univ. (Japan)

24 August 2023 • 8:30 AM - 9:00 AM | Conv. Ctr. Room 7A

12698-12

#### Multibeam X-ray ptychography: Using partial coherence to speed-up high-resolution imaging

Author(s): Mikhail Lyubomirskiy, Tang Li, Deutsches Elektronen-Synchrotron (Germany); Maik Kahnt, Max IV Lab. (Sweden); Felix Wittwer, National Energy Research Scientific Computing Ctr. (United States); Martin Seyrich, Deutsches Elektronen-Synchrotron (Germany); Adam Kubec, XRnanotech (Switzerland); Ken Falch, Jan Garrevoet, Deutsches Elektronen-Synchrotron (Germany); Christian David, Paul Scherrer Institut (Switzerland); Christian Schroer, Univ. Hamburg (Germany), Deutsches Elektronen-Synchrotron (Germany)

24 August 2023 • 9:00 AM - 9:20 AM | Conv. Ctr. Room 7A

12698-13

#### Multi-beam ptychography with coded Fresnel zone plates

Author(s): Mattias Åstrand, KTH Royal Institute of Technology (Sweden); Maik Kahnt, Ulf Johansson, Max IV Lab., Lund Univ. (Sweden); Ulrich Vogt, KTH Royal Institute of Technology (Sweden)

24 August 2023 • 9:20 AM - 9:40 AM | Conv. Ctr. Room 7A

12698-14

#### Ultrafast dynamical diffraction with nanobeams, simulations on thin Au crystals

Author(s): Angel Rodriguez-Fernandez, European XFEL GmbH (Germany)

24 August 2023 • 9:40 AM - 10:00 AM | Conv. Ctr. Room 7A

Coffee Break 10:00 AM - 10:30 AM

### SESSION 4: PTYCHOGRAPHY II

24 August 2023 • 10:30 AM - 11:20 AM | Conv. Ctr. Room 7A

Session Chair: Gung-Chian Yin, National Synchrotron Radiation Research Ctr. (Taiwan)

12698-15

#### Advanced X-ray ptychography enables high-speed 3D imaging at the velociprobe (*Invited Paper*)

Author(s): Junjing Deng, Yi Jiang, Fabricio Marin, Jeffrey A. Klug, Curt A. Preissner, Zhonghou Cai, Barry Lai, Argonne National Lab. (United States)

24 August 2023 • 10:30 AM - 11:00 AM | Conv. Ctr. Room 7A

12698-16

#### Automatic parameter optimization for high-resolution ptychography

Author(s): Yi Jiang, Junjing Deng, Jeffrey A. Klug, Zhonghou Cai, Barry Lai, Argonne National Lab. (United States)

24 August 2023 • 11:00 AM - 11:20 AM | Conv. Ctr. Room 7A

### SESSION 5: NANOIMAGING INSTRUMENTATION I

24 August 2023 • 11:20 AM - 12:00 PM | Conv. Ctr. Room 7A

Session Chair: Gung-Chian Yin, National Synchrotron Radiation Research Ctr. (Taiwan)

12698-17

#### Upcoming Soft X-ray nanoprobe beamline at NSLS-II

Author(s): Wen Hu, Andrew L. Walter, Joseph Dvorak, Oleg Chubar, An He, Lukas Lienhard, Evgeny Nazaretski, Daniel Bacescu, Steve Hulbert, Brookhaven National Lab. (United States)

24 August 2023 • 11:20 AM - 11:40 AM | Conv. Ctr. Room 7A

12698-18

#### Decentralization of synchrotron x-ray fluorescence microscopy: recent advances in lab-based $\mu$ XRF

Author(s): Bill Williams, IXRF Systems, Inc. (United States)

24 August 2023 • 11:40 AM - 12:00 PM | Conv. Ctr. Room 7A

Lunch/Exhibition Break 12:00 PM - 1:30 PM

**SESSION 6: NANOIMAGING INSTRUMENTATION II**

24 August 2023 • 1:30 PM - 3:20 PM | Conv. Ctr. Room 7A

Session Chair: Evgeny Nazaretski,  
Brookhaven National Lab. (United States)

12698-19

**Synchrotron X-ray scanning tunneling microscopy  
reaches real-space characterization of just one atom**  
*(Invited Paper)*

Author(s): Volker Rose, Nozomi Shirato, Sarah Wieghold, Daniel  
Rosenmann, Saw-Wai Hla, Argonne National Lab. (United States)

24 August 2023 • 1:30 PM - 2:00 PM | Conv. Ctr. Room 7A

12698-20

**Multi-modal imaging with a hard X-ray sub-micron  
probe at 5-ID, NSLS-II**

Author(s): Yang Yang, Andrew M. Kiss, Qun Liu, Zihan Lin, Yong S.  
Chu, Brookhaven National Lab. (United States)

24 August 2023 • 2:00 PM - 2:20 PM | Conv. Ctr. Room 7A

12698-21

**High-speed fly-scan capabilities for x-ray microscopy  
systems at NSLS-II**

Author(s): Weihe Xu, Huijuan Xu, Dmitri Gavrilov, Xiaojing Huang,  
Hanfei Yan, Yong S. Chu, Evgeny Nazaretski, Brookhaven National  
Lab. (United States)

24 August 2023 • 2:20 PM - 2:40 PM | Conv. Ctr. Room 7A

12698-22

**OCTOPI: Upgrade of the I13L beamline at Diamond  
Light Source Ltd**

Author(s): Christoph Rau, Diamond Light Source Ltd. (United  
Kingdom)

24 August 2023 • 2:40 PM - 3:00 PM | Conv. Ctr. Room 7A

12698-23

**The high-efficiency micro and nano-tomography  
endstations at Taiwan Photon Source**

Author(s): Gung-Chian Yin, Chien-Yu Lee, Bo-Yi Chen, Yen-Fang  
Song, Ming-Ying Hsu, Ying-Shuo Tseng, National Synchrotron  
Radiation Research Ctr. (Taiwan); Pei-Tzu Lee, National Synchrotron  
Radiation Research Ctr (Taiwan); Shih-Ting Lo, National Synchrotron  
Radiation Research Ctr. (Taiwan)

24 August 2023 • 3:00 PM - 3:20 PM | Conv. Ctr. Room 7A

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en Óptica, Mexico*



# SPIE. AWARDS

# 20 23



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**DAVID BENARON**  
*all.health, United States*



**SPIE BIOPHOTONICS  
TECHNOLOGY  
INNOVATOR AWARD**  
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*Columbia University, United States*



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OPTICAL DESIGN**  
**WILHELM ULRICH**  
*(Retired) Carl Zeiss, Germany*



**SPIE G.G. STOKES AWARD IN  
OPTICAL POLARIZATION**  
**MIGUEL A. ALONSO**  
*Institut Fresnel, Aix-Marseille  
Universite, France; The  
Institute of Optics, University  
of Rochester, United States*



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VIKRAM AWARD IN  
OPTICAL METROLOGY**  
**ZEEV ZALEVSKY**  
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**SPIE FRITS ZERNIKE AWARD  
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**ANTHONY YEN**  
*ASML, United States*



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**ALEXIS SPILMAN VOGT**  
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**WOLFGANG FINK**  
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committee members who  
devoted many hours in  
selecting this year's winners.

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Sterling John Backus

Caroline Boudoux

Arthur F. Gmitro

Viktor Gruev

Maryah Elisa  
Morastoni Haertel

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Carmña Londoño

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