

TECHNICAL  
PROGRAM

# SPIE. OPTICS+ PHOTONICS

21-25 AUGUST 2022 | SAN DIEGO, CALIFORNIA, USA



# SPIE. OPTICS+ PHOTONICS

THE PREMIER EVENT FOR OPTICAL ENGINEERING AND APPLICATIONS,  
NANOTECHNOLOGY, QUANTUM SCIENCE, AND ORGANIC PHOTONICS.

**21-25 August 2022**  
**Conferences and Courses**

**23-25 August 2022**  
**Exhibition**

**San Diego, California, USA**

Cutting-edge research

Exhibition

Industry events

Training and education



## Download the **SPIE Conference and Exhibition App**

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SPIE, the international society for optics and photonics, brings engineers, scientists, students, and business professionals together to advance light-based science and technology. The Society, founded in 1955, connects and engages with our global constituency through industry-leading conferences and exhibitions; publications of conference proceedings, books, and journals in the SPIE Digital Library; and career-building opportunities. Over the past five years, SPIE has contributed more than \$22 million to the international optics community through our advocacy and support, including scholarships, educational resources, travel grants, endowed gifts, and public-policy development. [www.spie.org](http://www.spie.org).

## What to expect at SPIE Optics + Photonics



### VACCINES

Vaccines authorized to prevent COVID-19 are strongly recommended.



### MASK RECOMMENDATIONS

Masks are also strongly recommended for all indoor spaces and for unvaccinated individuals.



### KEEP A SAFE DISTANCE

Respect the personal space and comfort level of others.

As an event with more than 500 attendees taking place in San Diego, SPIE Optics + Photonics will comply with the city's recommendations and requirements.

Enhanced sanitation measures will be taken throughout the event.

Masks and hand sanitizers will be widely available.





Kocanic Technologies Ltd.



**Promotional Partners**

Electro Optics Magazine  
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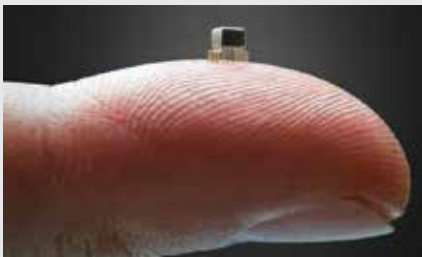
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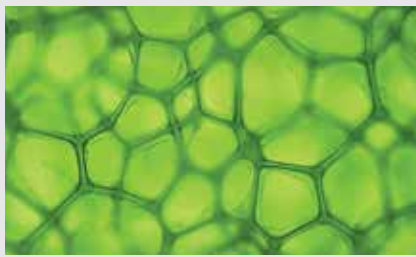
## Experience the energy of SPIE Optics + Photonics

Get ready to enjoy real conversations, hear the latest breakthroughs, and make important connections in person. Hear cutting-edge research in optical engineering, nanotechnology, quantum science, and organic photonics.



### **NANOSCIENCE + ENGINEERING**

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



### **ORGANIC PHOTONICS + ELECTRONICS**

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



### **OPTICAL ENGINEERING + APPLICATIONS**

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

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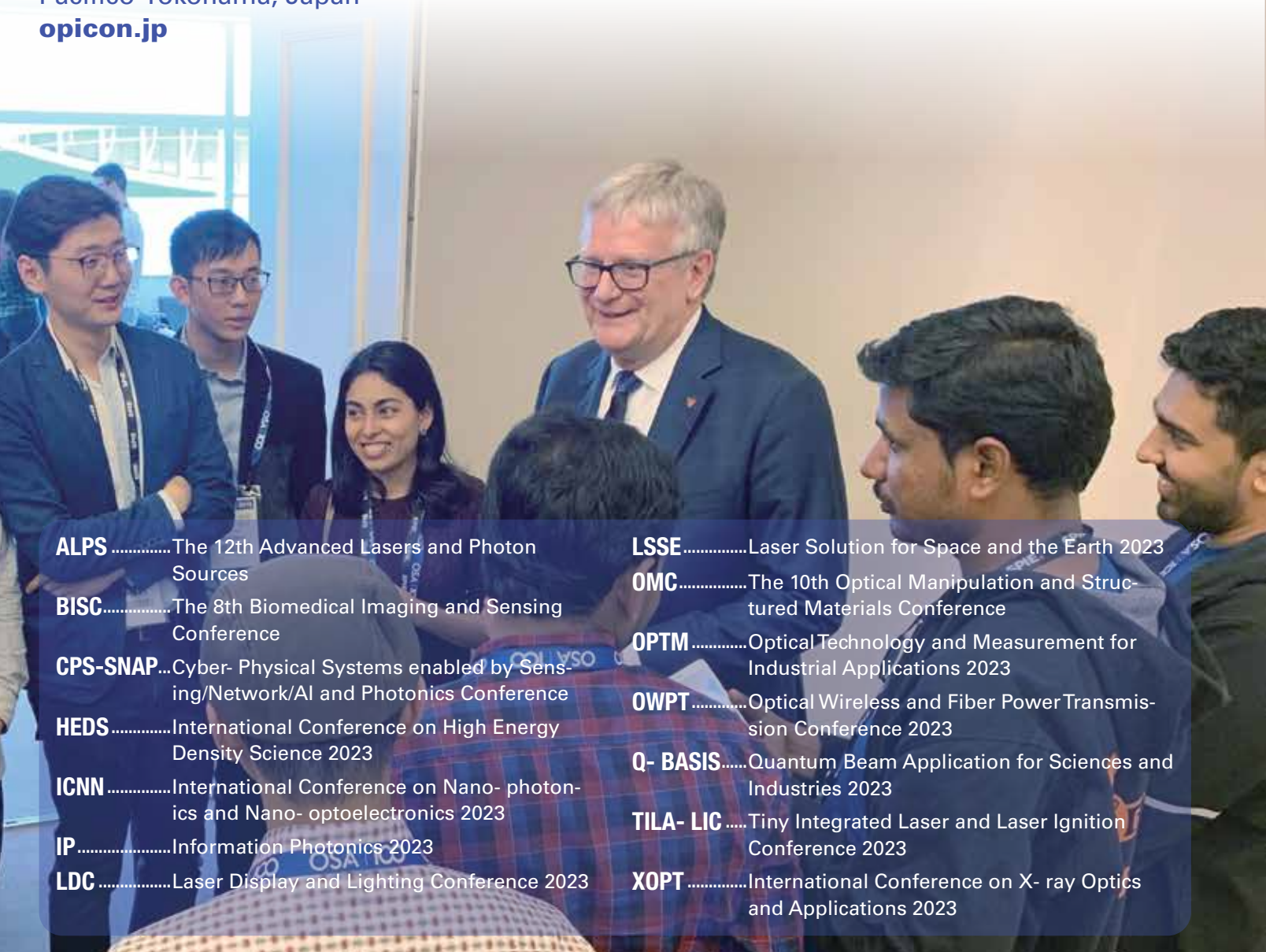
OPTICS & PHOTONICS International Congress

# OPIE 2023

17-21 April 2023

Pacifico Yokohama, Japan

[opicon.jp](http://opicon.jp)



**ALPS** ..... The 12th Advanced Lasers and Photon Sources  
**BISC** ..... The 8th Biomedical Imaging and Sensing Conference  
**CPS-SNAP** ... Cyber- Physical Systems enabled by Sensing/Network/AI and Photonics Conference  
**HEDS** ..... International Conference on High Energy Density Science 2023  
**ICNN** ..... International Conference on Nano- photonics and Nano- optoelectronics 2023  
**IP** ..... Information Photonics 2023  
**LDC** ..... Laser Display and Lighting Conference 2023

**LSSE** ..... Laser Solution for Space and the Earth 2023  
**OMC** ..... The 10th Optical Manipulation and Structured Materials Conference  
**OPTM** ..... Optical Technology and Measurement for Industrial Applications 2023  
**OWPT** ..... Optical Wireless and Fiber Power Transmission Conference 2023  
**Q- BASIS** ..... Quantum Beam Application for Sciences and Industries 2023  
**TILA- LIC** .... Tiny Integrated Laser and Laser Ignition Conference 2023  
**XOPT** ..... International Conference on X- ray Optics and Applications 2023

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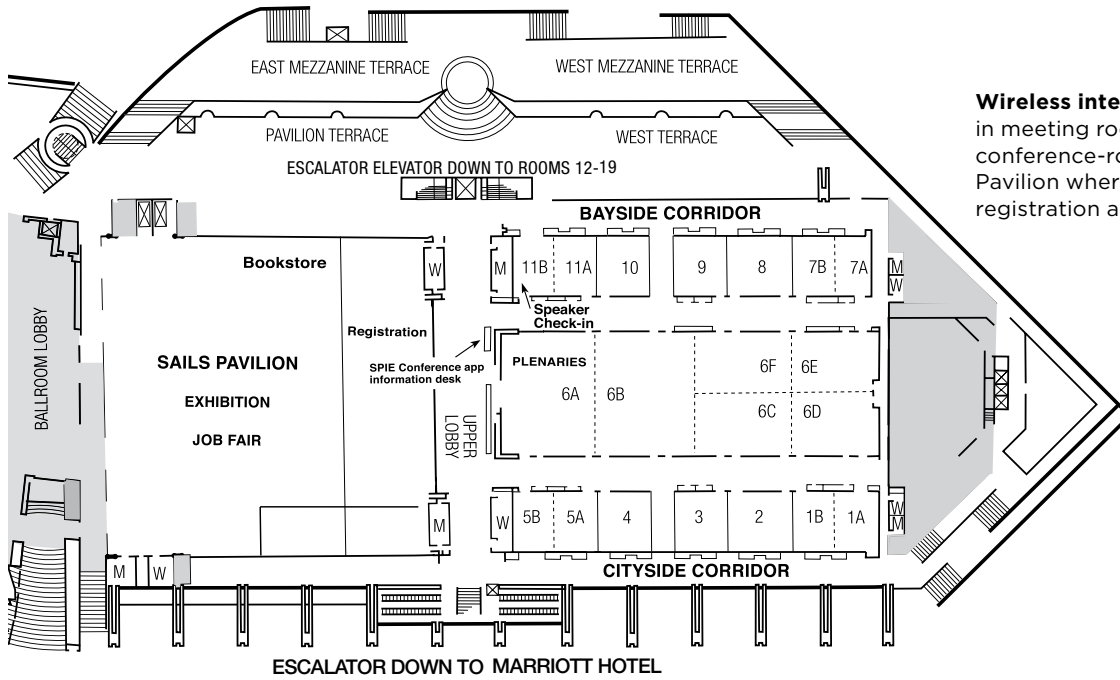


International Partners



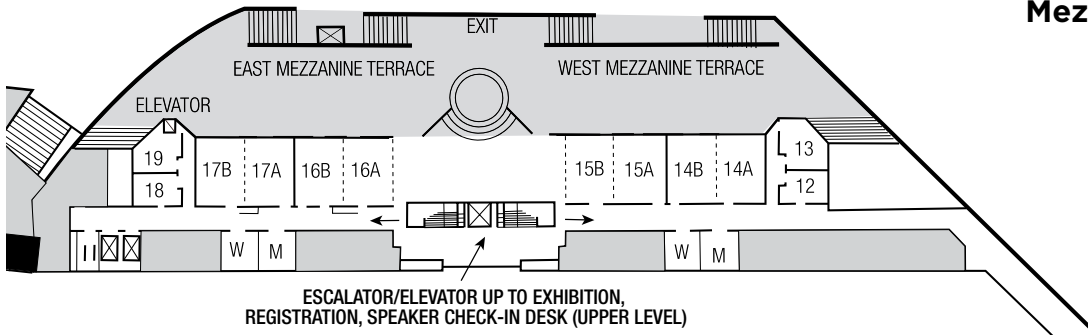
# San Diego Convention Center, Upper Level, Mezzanine, and Ground Level

## Upper Level



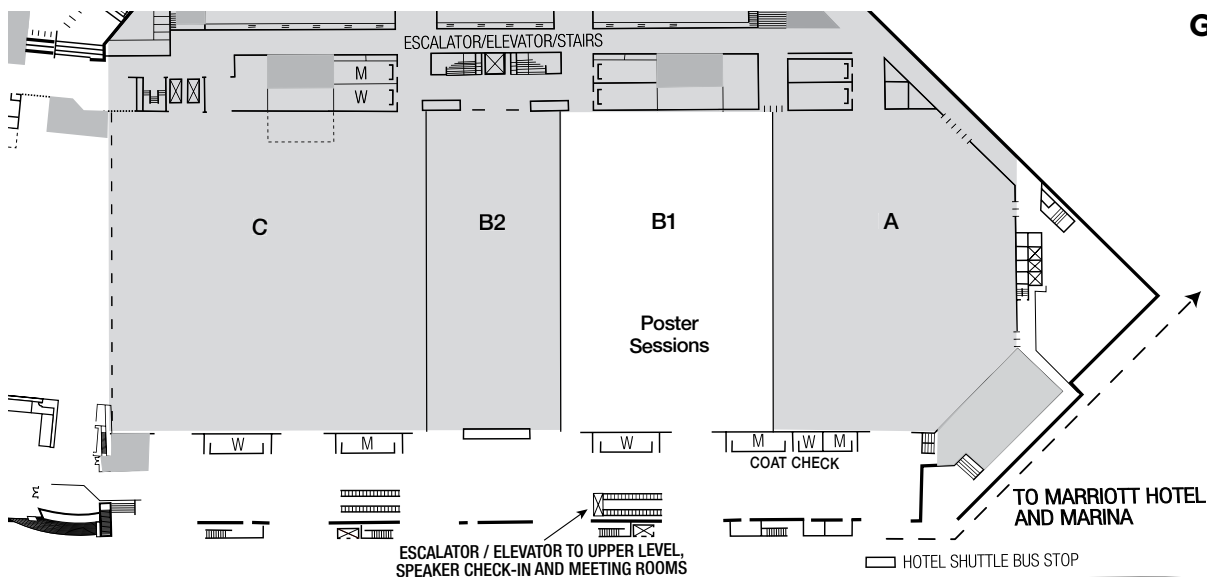
Wireless internet access is available in meeting rooms, lobbies on the conference-room level and in the Sails Pavilion where the exhibition and registration are located.

## Mezzanine Level (Access via Upper Level)



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

## Ground Level

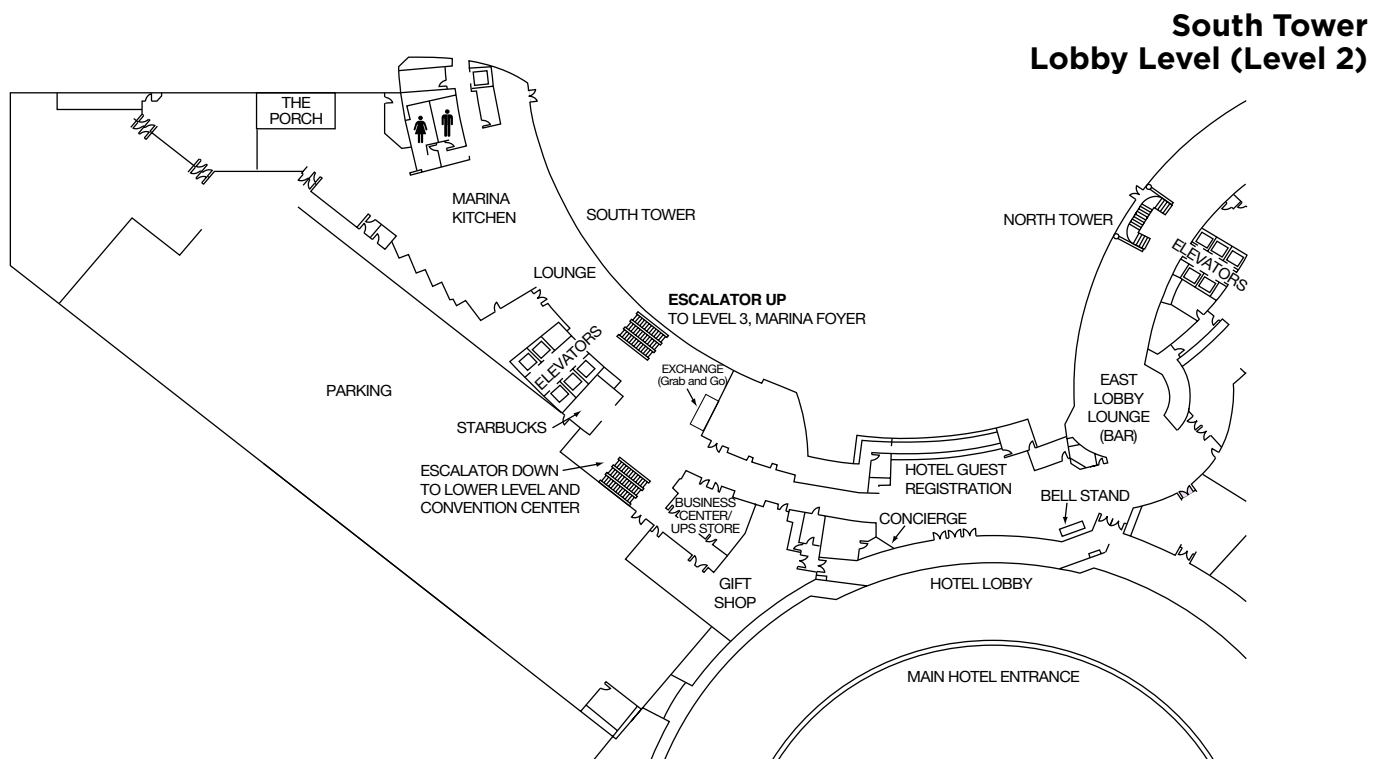
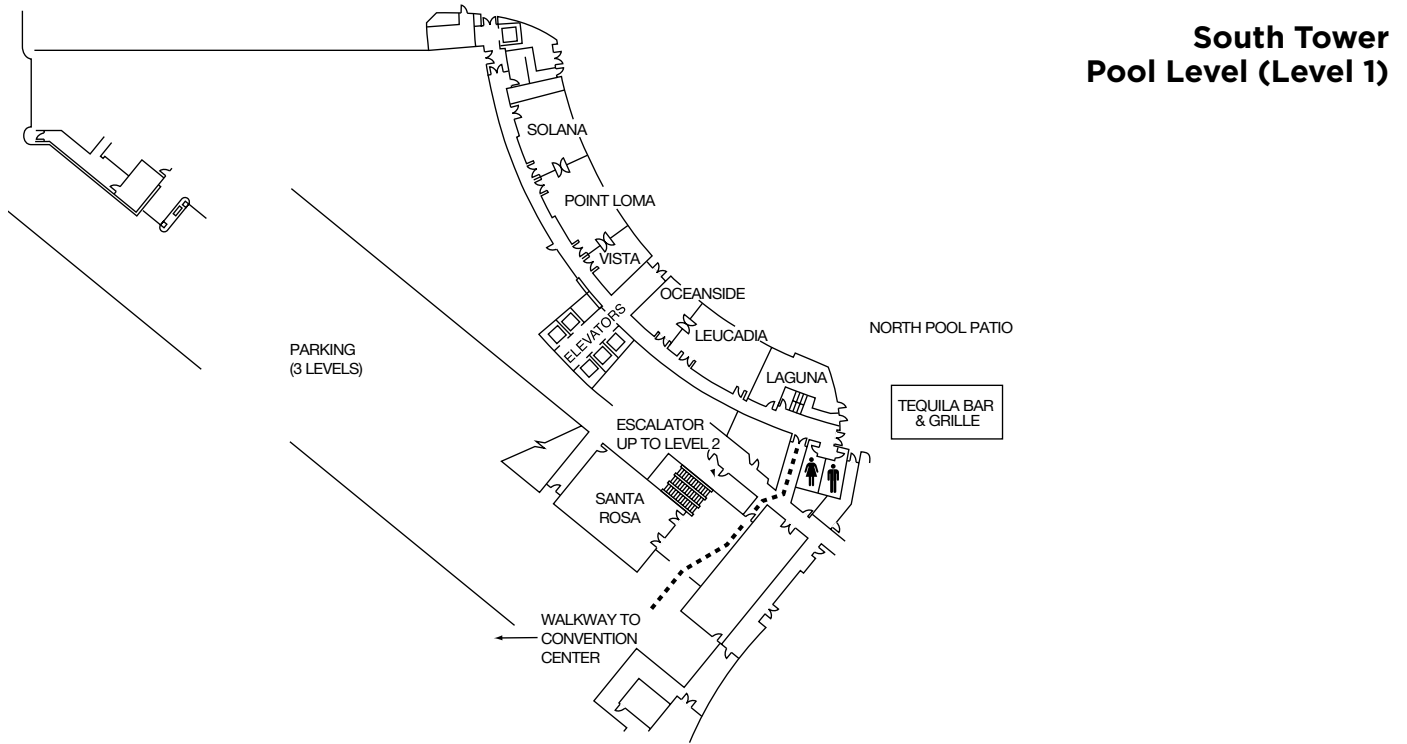


ESCALATOR / ELEVATOR TO UPPER LEVEL, SPEAKER CHECK-IN AND MEETING ROOMS

HOTEL SHUTTLE BUS STOP

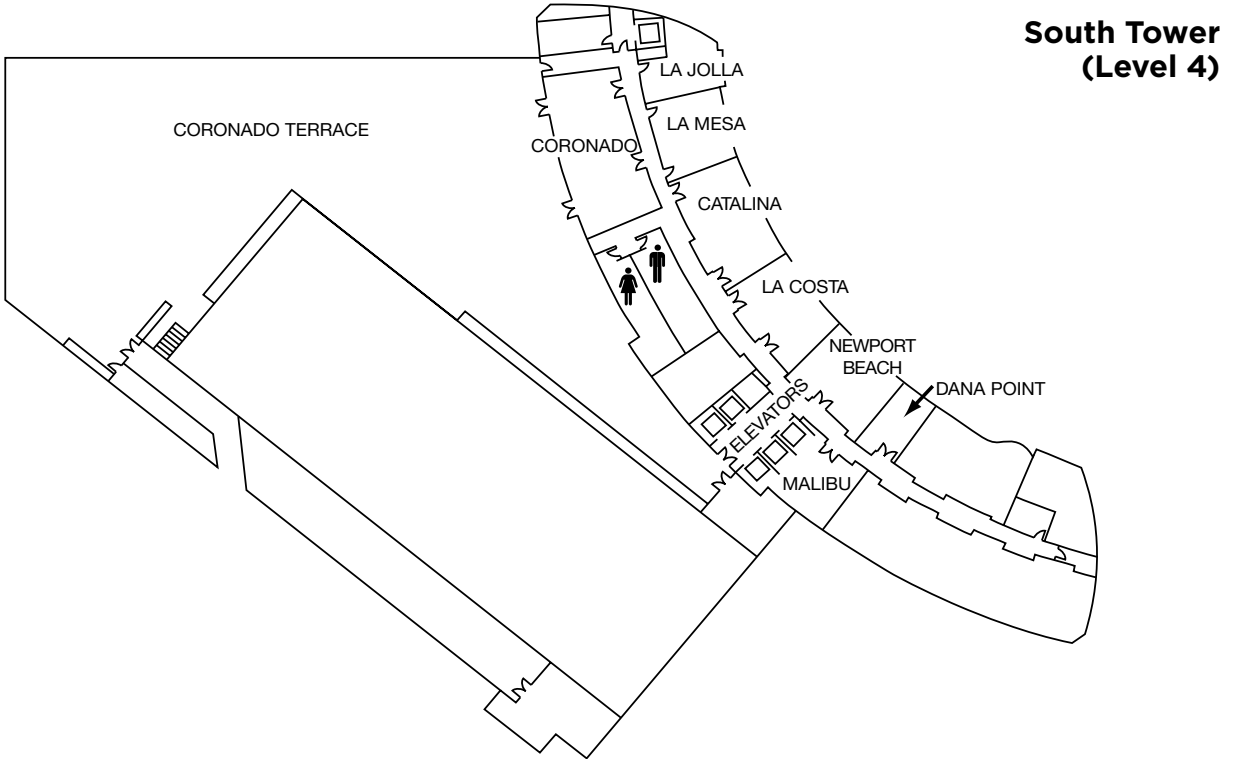
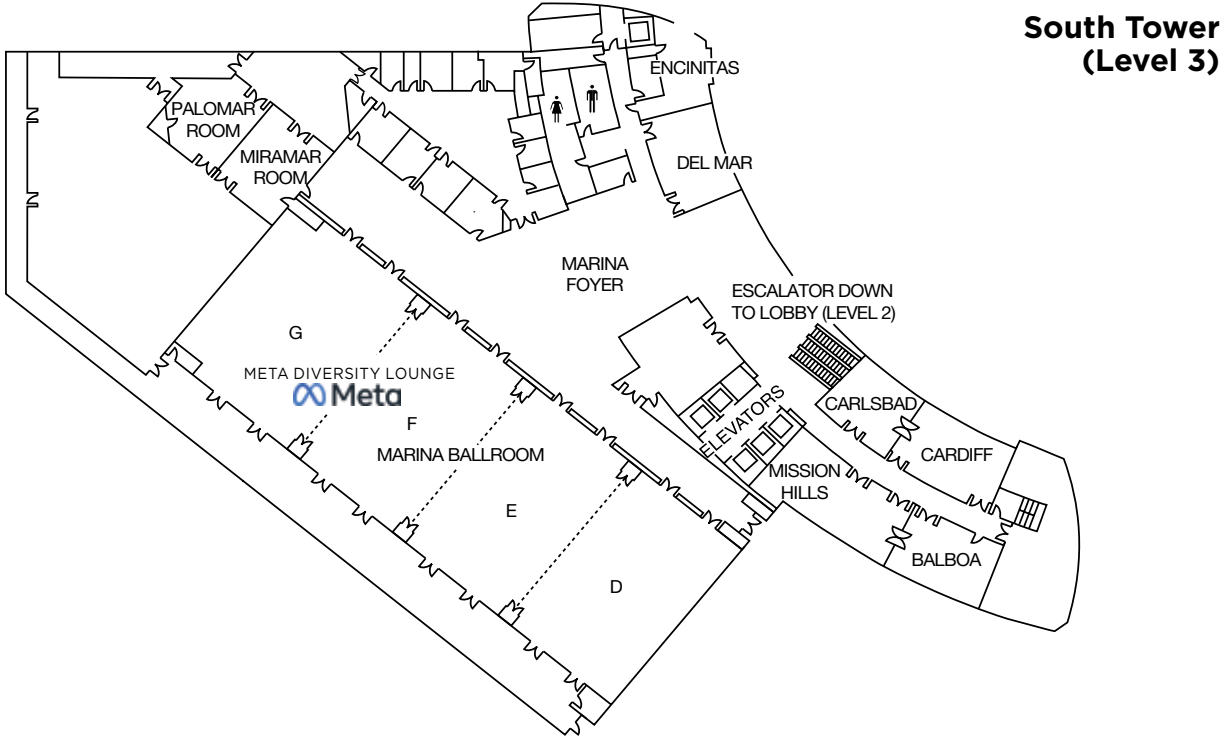


# San Diego Marriott Marquis and Marina meeting rooms





# San Diego Marriott Marquis and Marina meeting rooms



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

# Technical conferences schedule

## Nanoscience + Engineering Applications

### Symposium chairs



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



**Cornelia Denz**  
Westfälische Wilhelms-Univ.  
Münster (Germany)

### Symposium co-chairs



**Reuven Gordon**  
Univ. of Victoria (Canada)



**Natalia M. Litchinitser**  
Duke Univ. (USA)

SUNDAY 21	MONDAY 22	TUESDAY 23	WEDNESDAY 24	THURSDAY 25
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## Nanoscience

12195 <b>Metamaterials, Metadevices, and Metasystems 2022</b> ( <i>Engheta, Noginov, Zheludev</i> ), Conv. Ctr. Room 2				
12196 <b>Active Photonic Platforms (APP) 2022</b> ( <i>Subramania, Foteinopoulou</i> ), Conv. Ctr. Room 3				
12197 <b>Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XX</b> ( <i>Tsai, Tanaka, Lu</i> ), Conv. Ctr. Room 4				
12198 <b>Optical Trapping and Optical Micromanipulation XIX</b> ( <i>Dholakia, Spalding</i> ), Conv. Ctr. Room 1B				
12201 <b>UV and Higher Energy Photonics: From Materials to Applications 2022</b> ( <i>Cho, Lérondel, Taguchi, Kawata</i> ) Conv. Ctr. Room 6C		12199 <b>Physical Chemistry of Semiconductor Materials and Interfaces XXI</b> ( <i>Musser, Baran</i> ), Conv. Ctr. Room 6C		
12202 <b>Nanoengineering: Fabrication, Properties, Optics, Thin Films, and Devices XIX</b> ( <i>Panchapakesan, Attias, Park</i> ), Conv. Ctr. Room 1A		12200 <b>Low-Dimensional Materials and Devices 2022</b> ( <i>Kobayashi, Talin, Davydov, Islam</i> ), Conv. Ctr. Room 5B		
12203 <b>Enhanced Spectroscopies and Nanoimaging 2022</b> ( <i>Verma, Suh</i> ), Conv. Ctr. Room 5B				
12204 <b>Emerging Topics in Artificial Intelligence (ETAI) 2022</b> ( <i>Volpe, Pereira, Brunner, Ozcan</i> ), Conv. Ctr. Room 5A				

## Quantum Sciences and Technology

12205 <b>Spintronics XV</b> ( <i>Drouhin, Wegrowe, Razeghi, Jaffrès</i> ), Conv. Ctr. Room 6D (and 6C for Session 20)				
12206 <b>Quantum Nanophotonic Materials, Devices, and Systems 2022</b> ( <i>Soci, Sheldon, Agio, Aharonovich</i> ), Conv. Ctr. Room 1A				

### Poster Session

Conference Poster Session will be held  
Monday 22 August, 5:30 PM–7:30 PM  
Location: Conv. Ctr. Exhibit Hall B1



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

# Technical conferences schedule

## Organic Photonics + Electronics

Symposium chairs



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



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

SUNDAY 21	MONDAY 22	TUESDAY 23	WEDNESDAY 24	THURSDAY 25
<b>Organic Photonics + Electronics</b>				
	12207 <b>Liquid Crystals XXVI</b> ( <i>Khoo</i> ), Conv. Ctr. Room 7B			
	12208 <b>Organic and Hybrid Light Emitting Materials and Devices XXVI</b> ( <i>Adachi, Lee, So</i> ), Conv. Ctr. Room 9			
	12210 <b>Organic and Hybrid Sensors and Bioelectronics XV</b> ( <i>Kymissis, List-Kratochvil, Shinar</i> ), Conv. Ctr. Room 8	12209 <b>Organic, Hybrid, and Perovskite Photovoltaics XXIII</b> ( <i>Li, Stingelin, Nogueira, Nguyen, Moons, Rand</i> ), Conv. Ctr. Room 6C (Tue) and Room 9 (Wed/Thu)		
	12212 <b>Molecular and Nano Machines V</b> ( <i>Sekkat, Omatsu</i> ), Conv. Ctr. Room 10	12211 <b>Organic and Hybrid Field-Effect Transistors XXI</b> ( <i>McCulloch, Jurchescu</i> ), Conv. Ctr. Room 8		

## Optical Engineering + Applications

<b>Special Program</b>				
	12213 <b>Optics Education and Outreach VII</b> ( <i>Gregory, Poullin-Girard</i> ), Conv. Ctr. Room 17B	12214 <b>Light in Nature IX</b> ( <i>Lakshminarayanan, Creath, Shaw</i> ), Conv. Ctr. Room 14A		

<b>Optical Design</b> Program track chair: José Sasián, Wyant College of Optical Sciences (USA)				
12220 <b>Nonimaging Optics: Efficient Design for Illumination and Solar Concentration XVIII</b> , ( <i>Winston, Koshel, Jiang</i> ), Conv. Ctr. Room 14B	12215 <b>Optical Modeling and Performance Predictions XII</b> ( <i>Kahan</i> ), Conv. Ctr. Room 16A	12218 <b>Laser Beam Shaping XXII</b> ( <i>Dudley, Laskin</i> ), Conv. Ctr. Room 17B		
	12216 <b>Novel Optical Systems, Methods, and Applications XXV</b> ( <i>Hahlweg, Mulley</i> ), Conv. Ctr. Room 17A			
	12219 <b>Polymer Optics and Molded Glass Optics: Design, Fabrication, and Materials 2022</b> , ( <i>Symmons, Claytor</i> ), Conv. Ctr. Room 14B	12217 <b>Current Developments in Lens Design and Optical Engineering XXIII</b> ( <i>Johnson, Mahajan, Thibault, Sun, Padilla-Vivanco</i> ), Conv. Ctr. Room 16A		

SUNDAY 21	MONDAY 22	TUESDAY 23	WEDNESDAY 24	THURSDAY 25
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## Optical Alignment, Testing, and Fabrication

Program track chair: H. Philip Stahl, NASA Marshall Space Flight Ctr. (USA)

12222 <b>Optical System Alignment, Tolerancing, and Verification XIV</b> ( <i>Sasián, Youngworth</i> ), Conv. Ctr. Room 15A	12221 <b>Optical Manufacturing and Testing XIV</b> ( <i>Kim, Rascher, Choi, Ottevaere</i> ), Conv. Ctr. Room 15A			
			12223 <b>Interferometry XXI</b> ( <i>North-Morris, Creath, Porras-Aguilar</i> ), Conv. Ctr. Room 17A (Wed) and Room 10 (Thu)	
		12224 <b>Space Systems Contamination: Prediction, Control, and Performance 2022</b> ( <i>Soares, Wooldridge, Matheson</i> ), Conv. Ctr. Room 14B		

## Signal, Image, and Data Processing


Program track chair: Khan Iftekharuddin, Old Dominion Univ. (USA)

			12225 <b>Optics and Photonics for Information Processing XVI</b> ( <i>Awwal, Iftekharuddin, Diaz-Ramirez, Márquez</i> ), Conv. Ctr. Room 14A	
		12226 <b>Applications of Digital Image Processing XLV</b> ( <i>Tescher, Ebrahimi</i> ), Conv. Ctr. Room 15B		
		12227 <b>Applications of Machine Learning 2022</b> ( <i>Zelinski, Taha, Howe, Awwal, Iftekharuddin</i> ), Conv. Ctr. Room 12		

## Photonic Devices and Applications

Program track chair: Ruyan Guo, The Univ. of Texas at San Antonio (USA)

12228 <b>Ultrafast Nonlinear Imaging and Spectroscopy X</b> ( <i>Liu, Psaltis, Shi</i> ), Conv. Ctr. Room 18				
12230 <b>Terahertz Emitters, Receivers, and Applications XIII</b> ( <i>Razeghi, Baranov</i> ), Conv. Ctr. Room 16B				
12229 <b>Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XVI</b> ( <i>Yin, Guo</i> ), Conv. Ctr. Room 17B				
12231 <b>ODS 2022: Industrial Optical Devices and Systems</b> ( <i>Katayama, Takashima</i> ), Conv. Ctr. Room 17A				



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

**Poster Session**  
 Conference Poster Session will be held  
 Monday 22 August, 5:30 PM–7:30 PM  
 Location: Conv. Ctr. Exhibit Hall B1



SUNDAY 21	MONDAY 22	TUESDAY 23	WEDNESDAY 24	THURSDAY 25
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**Remote Sensing and Atmospheric Propagation**  
 Program track chairs: Stephen Hammel, Naval Information Warfare Ctr. Pacific (USA)  
 and Alexander M. J. van Eijk, TNO Defence, Security, and Safety (Netherlands)


12236 <b>CubeSats and SmallSats for Remote Sensing VI</b> ( <i>Babu, Norton</i> ), Conv. Ctr. Room 16A	12235 <b>Imaging Spectrometry XXV: Applications, Sensors, and Processing</b> ( <i>Ientilucci, Bradley</i> ), Conv. Ctr. Room 12	12232 <b>Earth Observing Systems XXVII</b> ( <i>Butler, Xiong, Gu</i> ), Conv. Ctr. Room 16B (Tue/Wed) and Room 8 (Thu)		
	12233 <b>Infrared Remote Sensing and Instrumentation XXX</b> ( <i>Strojnik</i> ), Conv. Ctr. Room 19		12234 <b>Infrared Sensors, Devices, and Applications XII</b> ( <i>Wijewarnasuriya, D'Souza, Sood</i> ), Conv. Ctr. Room 7B	
	12237 <b>Laser Communication and Propagation through the Atmosphere and Oceans XI</b> ( <i>Anguita, Bos, Wayne</i> ), Conv. Ctr. Room 10			
12238 <b>Quantum Communications and Quantum Imaging XX</b> ( <i>Deacon, Meyers</i> ), Conv. Ctr. Room 14A	12239 <b>Unconventional Imaging and Adaptive Optics 2022</b> ( <i>Dolne, Spencer, Bose-Pillai</i> ), Conv. Ctr. Room 10			

**X-Ray, Gamma-Ray, and Particle Technologies**  
 Program track chairs: Ali Khounsary, Illinois Institute of Technology (USA) and Ralph James, Savannah River National Lab. (USA)

	12240 <b>Advances in X-Ray/EUV Optics and Components XVII</b> ( <i>Khounsary, Mimura, Morawe, Spiga</i> ), Conv. Ctr. Room 7A			
	12241 <b>Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXIV</b> ( <i>Cherepy, Fiederle, James</i> ), Conv. Ctr. Room 6E			
	12242 <b>Developments in X-Ray Tomography XIV</b> ( <i>Müller, Wang</i> ), Conv. Ctr. Room 6F			

Check out all of the Equity, Diversity, and Inclusion events happening throughout the week.

[spie.org/op-inclusion](https://spie.org/op-inclusion)



**SPIE. DIGITAL LIBRARY**

**50 proceedings downloads included with registration**

Paid registration includes 50 downloads from the conference. Details on accessing the proceedings will be emailed following the conference.

# Exhibition

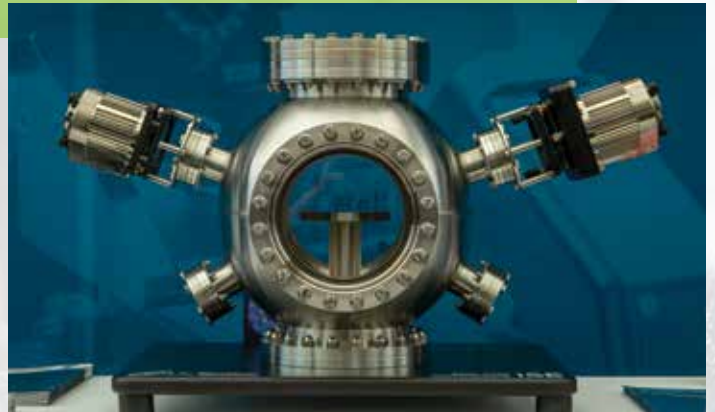
## Attend the exhibition in the Sails Pavilion

Tuesday 23 August · 10:00 AM–5:00 PM  
Wednesday 24 August · 10:00 AM–5:00 PM  
Thursday 25 August · 10:00 AM–2:00 PM

**A unique marketplace for  
essential optical components,  
materials, devices, and more.**

### The SPIE Optics + Photonics exhibition showcases:

- Lasers, laser systems
- Optical components, lenses
- Fiber optics
- Chemicals, optical coatings,  
thin films
- Nano-precision products
- Test and measurement  
equipment
- Detectors, sensors



### **TWO-DAY JOB FAIR**

Sponsored by SPIE Career Center

Tuesday 23 August  
10:00 AM–5:00 PM

Wednesday 24 August  
10:00 AM–5:00 PM

Location: 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.

# SPIE Courses

Focused, efficient training from the most experienced and accomplished minds in industry and research.



SPIE Student Members receive discounts on courses.

Price key: SPIE Member / Non-Member / Student Member

- SC003 **Practical Optical System Design** (Youngworth, Olson), Tuesday, 8:30 AM–5:30 PM, \$745.00 / \$875.00 / \$425.00
- SC010 **Introduction to Optical Alignment Techniques** (Castle), Tuesday, 8:30 AM–5:30 PM, \$745.00 / \$875.00 / \$425.00
- SC014 **Introduction to Optomechanical Design** (Vukobratovich), Sunday–Monday, 8:30 AM–5:30 PM, \$1,395.00 / \$1,650.00 / \$735.00
- SC015 **Fastening Optical Elements with Adhesives** (Daly), Monday, 1:30 PM–5:30 PM, \$450.00 / \$525.00 / \$285.00
- SC157 **MTF in Optical and Electro-Optical Systems** (Boreman), Sunday, 8:30 AM–5:30 PM, \$790.00 / \$920.00 / \$443.00
- SC213 **Introduction to Interferometric Optical Testing** (Kim), Sunday, 1:30 PM–5:30 PM, \$485.00 / \$560.00 / \$299.00
- SC567 **Introduction to Optical Remote Sensing Systems** (Shaw), Wednesday, 1:30 PM–5:30 PM, \$450.00 / \$525.00 / \$285.00
- SC690 **Optical System Design: Layout Principles and Practice** (Bentley), Sunday, 8:30 AM–5:30 PM, \$780.00 / \$910.00 / \$439.00
- SC863 **Introduction to Modern Optical Drawings – the ISO 10110 Standard** (Aikens), Wednesday, 1:30 PM–5:30 PM, \$500.00 / \$575.00 / \$305.00
- SC912 **Intermediate Lens Design** (Bentley), Monday, 8:30 AM–5:30 PM, \$790.00 / \$910.00 / \$439.00  
**CANCELLED**
- SC915 **Radiometry Revealed** (Shaw), Wednesday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1086 **Optical Materials, Fabrication and Testing for the Optical Engineer** (Nelson), Wednesday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1169 **Optical Manufacturing Fundamentals** (Williamson), Sunday, 8:30 AM–5:30 PM, \$775.00 / \$905.00 / \$437.00
- SC1170 **A Hands-On Introduction to Optics** (Diehl), Monday, 1:30 PM–3:30 PM, \$290.00 / \$315.00 / \$201.00
- SC1222 **Deep Learning and Its Applications in Image Processing** (Nasrabadi), Sunday, 8:30 AM–5:30 PM, \$745.00 / \$875.00 / \$425.00
- SC1232 **Introduction to LIDAR for Autonomous Vehicles** (Shaw), Monday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1271 **NEW Optical Measurement of Surface Topography** (de Groot), Sunday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1272 **Mirror System Design with Freeform Surfaces** (Sasián), Monday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1277 **Photodetectors: Theory, Practice, and Applications** (Piatek), Sunday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1305 **NEW Organic and Hybrid Perovskite Photovoltaics: Materials, Mechanisms, and Devices** (Shaheen), Monday, 8:30 AM–12:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1310 **NEW Optical Metrology for AR/VR/MR** (Zhou), Tuesday, 1:30 PM–5:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1311 **NEW Understanding Optical System Specifications: Identifying and Managing Hidden Conflicts** (Bentley), Wednesday, 1:30 PM–5:30 PM, \$450.00 / \$525.00 / \$285.00
- SC1313 **NEW Designing Illumination Optics** (Muschaweck, Rehn), Monday, 8:30 AM–5:30 PM, \$785.00 / \$915.00 / \$441.00
- SC1314 **NEW Colorimetry for LED Users** (Muschaweck), Wednesday, 8:30 AM–12:30 PM, \$485.00 / \$560.00 / \$299.00
- SC1315 **NEW Precision Glass Molded Optics: Design Through Manufacturing** (Symmons), Tuesday, 8:30 AM–5:30 PM, \$745.00 / \$875.00 / \$425.00

## Optics Workshops for Educators

- WS1156 **Dumpster Optics: Teaching Optics with Junk** (Magnani, Viera-González), Tuesday, 1:30 PM–3:30 PM, \$20.00 / \$25.00 / \$20.00
- WS1248 **Everything You Wanted to Know About Outreach** (McKee, Magnani, Posner), Tuesday, 10:30 AM–12:30 PM, \$20.00 / \$25.00 / \$20.00
- WS1309 **Harnessing Peer Instruction: An Introduction to myDALITE** (Adams), Tuesday, 10:30 AM–12:30 PM, \$20.00 / \$25.00 / \$20.00

View course descriptions and register online.  
[spie.org/op-courses](https://spie.org/op-courses)



## 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.

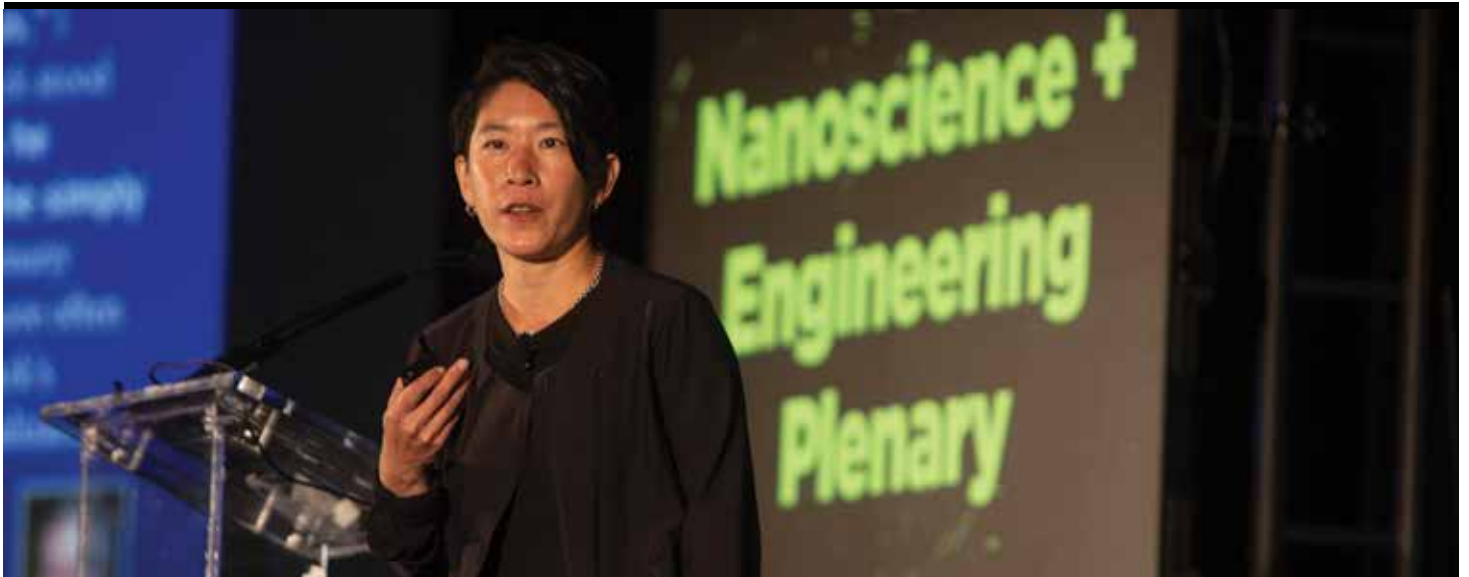
[spie.org/education](https://spie.org/education)

## 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](https://spie.org/digital-badges).

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

# Plenary presentations



## Sunday Evening Plenary

21 August 2022 • 6:00 PM–7:25 PM

Location: Conv. Ctr. Room 6A

Session Chair: **Anita Mahadevan-Jansen**, SPIE 2022 President, Vanderbilt Univ. (USA)

6:00 PM–6:05 PM: **Welcome and Opening Remarks**

6:05 PM–6:35 PM:

**Photon scissors and tweezers: a cell surgeon's story**



**Michael W. Berns**, Beckman Laser Institute and Medical Clinic (USA) and 2022 SPIE Gold Medal Winner

6:35 PM–6:45 PM: **Q&A**

6:45 PM–7:15 PM:

**Quantum science and metrology**



**Jun Ye**, JILA, Univ. of Colorado (USA)

7:15 PM–7:25 PM: **Q&A**

## Nanoscience + Engineering

22 August 2022 • 8:30 AM–10:05 AM

Location: Conv. Ctr. Room 6A

Session Chairs: **Gennady Shvets**, Cornell Univ. (USA); **Cornelia Denz**, Westfälische Wilhelms-Univ. Münster (Germany)

8:30 AM–8:35 PM: **Welcome and Opening Remarks**

8:35 AM–9:10 PM:

**Colorimetric metasurfaces for next-generation on-chip imaging of tissue microstructure**



**Lisa Poulidakos**, Univ. of California, San Diego (USA)

9:10 AM–9:20 PM: **Q&A**

9:20 AM–9:55 PM:

**Petascale photonic connectivity for energy efficient AI computing**



**Keren Bergman**, Columbia Univ. (USA)

9:55 AM–10:05 PM: **Q&A**



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



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

22 August 2022 • 4:30 PM–5:25 PM  
Location: Conv. Ctr. Room 6A

Session Chairs: **Ralph B. James**, Savannah River National Lab. (USA); **Ali M. Khounsary**, Illinois Institute of Technology (USA)

4:30 PM–4:35 PM: **Welcome and Opening Remarks**

4:35 PM–5:15 PM:

**Toward new frontiers: Encounters and synergies with state-of-the-art astronomical X-ray detectors**



**Tadayuki Takahashi**, The Univ. of Tokyo (Japan)

5:15 PM–5:25 PM: **Q&A**

## Organic Photonics + Electronics

23 August 2022 • 9:15 AM–11:50 AM  
Location: Conv. Ctr. Room 6A

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

9:15 AM–9:20 PM: **Welcome and Opening Remarks**

9:20 AM–9:50 PM:

**Efficient organic and perovskite solar cells with small energy losses**



**René A.J. Janssen**, Technische Univ. Eindhoven (Netherlands)

9:50 AM–10:00 PM: **Q&A**

Coffee Break 10:00 AM–10:30 AM

10:30 AM–11:00 PM:

**Can solution-processed organic thin-film transistors enable ubiquitous electronics?**



**Oana D. Jurchescu**, Wake Forest Univ. (USA)

11:00 AM–11:10 PM: **Q&A**

11:10 AM–11:40 PM:

**Designing room temperature quantum materials through quantum analog of vibration isolation**



**Kenan Gundogdu**, North Carolina State Univ. (USA)

11:40 AM–11:50 PM: **Q&A**

## Optical Engineering

23 August 2022 • 4:00 PM–4:45 PM  
Location: Conv. Ctr. Room 6A

Session Chair: **Allison Barto**, Ball Aerospace (USA)

4:00 to 4:05 PM: **Welcome and Opening Remarks**

4:05 PM–4:35 PM:

**The James Webb Space Telescope: an optical success story!**



**Lee Feinberg**, NASA Goddard Space Flight Ctr. (USA)

4:35 PM–4:45 PM: **Q&A**

Check out all of the Equity, Diversity, and Inclusion events happening throughout the week.

[spie.org/op-inclusion](https://spie.org/op-inclusion)



# Technical events

## Panel Discussion: Photonics for (Neuromorphic) AI Hardware

22 August 2022 • 4:10 PM–5:40 PM  
Location: Conv. Ctr. Room 5A

Join us as we discuss the current and upcoming trends in neuromorphic computing.

## Poster Session

22 August 2022 • 5:30 PM–7:30 PM  
Location: Conv. Ctr. Exhibit Hall B1


Come view posters spanning the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. Enjoy light refreshments, ask questions, and network with colleagues in your field.

## Illumination Technical Event

22 August 2022 • 8:00 PM–10:00 PM  
Location: Marriott Marquis, Marina Ballroom E

Join us for an evening of stimulating discussion, networking, and conversation within the field of illumination.

Light refreshments sponsored by:

The Optical Solutions Group at 

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

22 August 2022 • 8:00 PM–10:00 PM  
Location: Marriott Marquis, Balboa

Join us as we share key optical lessons learned from leaders in the fields of optics and optical systems engineering.

## Panel Discussion: Advanced Video Compression and Applications

23 August 2022 • 2:00 PM–3:00 PM  
Location: Conv. Ctr. Room 15B

In this panel, we explore consumer services that are enabled by a wide breadth of video codecs, emerging 4K HDR HEVC, 8K and beyond, as well as HDR, and AR/VR.

## Panel on Space Systems Contamination Control

23 August 2022 • 3:00 PM–3:45 PM  
Location: Conv. Ctr. Room 14B

Participate in an interactive discussion on space systems contamination control and effects with subject matter experts.

## Panel Discussion: AI for Applications in (Neuro)-Imaging

23 August 2022 • 3:10 PM–4:40 PM  
Location: Conv. Ctr. Room 5A

This panel will explore the cross-road between the biological substrates for brain imaging and the technological implementations of artificial intelligence.



## Workshop on X-Ray optics

23 August 2022 • 8:00 PM–10:00 PM  
Location: 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.


## Lens Design Technical Event

23 August 2022 • 8:00 PM–10:00 PM  
Location: Marriott Marquis, Marina Ballroom E

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.

Co-Sponsored by: 

Light refreshments sponsored by:

The Optical Solutions Group at 

## Workshop on Solar Energy: Heliostats, Metrology Challenges, and Heliostat Consortium Funding Opportunities

24 August 2022 • 12:30 PM–4:30 PM  
Location: Conv. Ctr. Room 17B

Join experts from national labs, industry, and academia to discuss heliostat challenges and funding opportunities. Speakers will give an overview and describe current needs and challenges. No prior knowledge is assumed, and a working lunch is served.

# Professional development events

## Structuring and Delivering Research Talks

21 August 2022 • 9:00 AM–12:00 PM  
Location: Marriott Marquis, Balboa

Are you nervous or unsure about presenting your research effectively? Join Jean-luc Doumont for this workshop!

## Networking for Researchers

21 August 2022 • 1:00 PM–4:00 PM  
Location: Marriott Marquis, Balboa

This workshop with Jean-luc Doumont explores the very concept of a network, then discusses approaches to effective networking, both face to face and online, each time offering concrete, readily applicable tips.

## Everyone's Favorite Mistakes

22 August 2022 • 9:00 AM–12:00 PM  
Location: Marriott Marquis, Balboa

Facilitated by Dr. Jean-luc Doumont, this workshop will sharpen your critical thinking in every aspect of your life, from personal to career.

## Persuading Other People

22 August 2022 • 1:00 PM–4:00 PM  
Location: Marriott Marquis, Balboa

Learn the essential skills of persuasion through this workshop with Jean-luc Doumont!

## Career Showdown: The State of Optics and Photonics

23 August 2022 • 3:00 PM–4:30 PM  
Location: Conv. Ctr. Sails Pavilion, Exhibition Hall, Booth #740

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. Free snacks and drinks! Sponsored by the SPIE Career Lab.



## Wikipedia Edit-a-thon

24 August 2022 • 9:00 AM–12:00 PM  
Location: Marriott Marquis, Marina Ballroom F/G

Stop by anytime between 9:00 AM and 12:00 PM with your laptop and join us in editing Wikipedia pages about inspiring women, ethnic, or racial minority scientists.

Sponsored by  Meta

## Communicating Your Science: How to Promote Your Research and Why It Matters

24 August 2022 • 1:30 PM–3:00 PM  
Location: Marriott Marquis, Balboa

This 90-minute workshop will cover managing, promoting, and communicating your research output, and we'll build a good case for why it's important to take ownership of your research promotion. Bring your laptop!

## Improving the Visibility of Women in STEM

24 August 2022 • 4:00 PM–5:30 PM  
Location: Marriott Marquis, Marina Ballroom F/G

Join us for a thought provoking presentation and stay after to discuss takeaways during the reception.

Sponsored by  Meta



Check out all of the Equity, Diversity, and Inclusion events happening throughout the week.

[spie.org/op-inclusion](https://spie.org/op-inclusion)



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

# Social and networking events

## Student and early career networking social

21 August 2022 • 5:00 PM–6:00 PM

Location: Marriott Marquis, Coronado Terrace

SPIE Student and Early Career Professional Member social and speed-networking extravaganza!

## Black in Photonics meetup

21 August 2022 • 7:30 PM–8:30 PM

Location: Marriott Marquis, Marina Ballroom F/G

Join us for a social meetup organized by SPIE and Black in Photonics.

Sponsored by  Meta

## Women in Optics meetup

22 August 2022 • 3:00 PM–4:00 PM

Location: Marriott Marquis, Marina Ballroom F/G

Join other women in the field for an informal networking reception.

Sponsored by  Meta

## All-conference welcome reception

22 August 2022 • 7:00 PM–8:30 PM

Location: 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 registered attendees welcome.

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Manufacturing the Future

## SPIE Student Chapter meetup

23 August 2022 • 12:15 PM–1:00 PM

Location: Marriott Marquis, Marina Ballroom F/G

Come meet your fellow Student Chapter Members from all over the world! Make new friends and play some games to expand your network.

## Career networking mixer

23 August 2022 • 4:00 PM–5:00 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

A casual mixer to chat with recruiters from the Job Fair and other industry and academia professionals about careers in the optics industry.

Sponsored by  Meta

## SPIE Career Lab meetup

23 August 2022 • 5:30 PM–6:30 PM

Location: Marriott Marquis, Tequila Bar

Join members of the SPIE Career Lab for a networking event in real life! Get to know your fellow community members and brainstorm ideas for future Career Lab events at this casual mixer.

## LGBTQ+ social

23 August 2022 • 8:30 PM–9:30 PM

Location: Marriott Marquis, Marina Ballroom F/G

Come join us and socialize and network with other LGBTQ+

and allies in the optics and photonics community.

Sponsored by  Meta

## Cappuccinos at the SPIE Membership booth

Wednesday 24 August • 10:00 AM–12:00 PM

Thursday 25 August • 10:00 AM–12:00 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

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.

## Afternoon networking social with exhibitors

24 August 2022 • 3:00 PM–4:00 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Join the exhibitors to network during this social gathering time over fresh smoothies.

## SPIE Publications reception

24 August 2022 • 5:00 PM–6:00 PM

*By Invitation Only*

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

## SPIE Scholarship and student conference support winners meetup

24 August 2022 • 5:00 PM–6:00 PM

Location: Marriott Marquis, Mission Hills

Join SPIE Student Member Scholarship and Student Conference Support winners at this casual networking meetup with industry representatives and SPIE leadership.

## SPIE Awards banquet and celebration

24 August 2022 • 6:00 PM–9:00 PM

Location: Marriott Marquis, Coronado Terrace

Join us for a gala evening honoring your colleagues and peers! Tickets are \$65 each and can be purchased through the online registration system, or onsite at the SPIE Cashier.

## Networking brunch with exhibitors

25 August 2022 • 10:00 AM–11:00 AM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Join the exhibitors to network during this informal brunch.



## SPIE Member events



### Annual general meeting of the SPIE Corporation

22 August 2022 • 10:00 AM-11:00 AM  
Location: Marriott Marquis, Marina Ballroom E

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

### SPIE Fellow Member luncheon

23 August 2022 • 12:00 PM-1:30 PM  
Location: 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.

### SPIE Member reception

23 August 2022 • 7:00 PM-8:30 PM  
Location: Marriott Marquis, Coronado 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

24 August 2022 • 8:00 AM-9:00 AM  
Location: 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.



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

## Industry events

Find products and services and explore career opportunities in the exhibition hall.

### SPIE Optics + Photonics Exhibition

Tuesday 23 August • 10:00 AM-5:00 PM  
Wednesday 24 August • 10:00 AM-5:00 PM  
Thursday 25 August • 10:00 AM-2:00 PM  
Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Don't let summer slip away without connecting with your customers, clients, and suppliers at the SPIE Optics + Photonics Exhibition.

### Job Fair

Tuesday 23 August • 10:00 AM-5:00 PM  
Wednesday 24 August • 10:00 AM-5:00 PM  
Location: 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.

Companies exhibiting in the Job Fair:

**THORLABS**

**GLOBAL FOUNDRIES**

**Meta**

**DANBURY**

**QUARTUS ENGINEERING**

**APL JOHNS HOPKINS APPLIED PHYSICS LABORATORY**

**ASML**

**EXCELITAS TECHNOLOGIES**

**mks**

### Company spotlights

23 August 2022 • 11:00 AM-2:00 PM  
Location: Conv. Ctr. Sails Pavilion, Exhibition Hall, Booth #840

Find out what companies are hiring and what it's like to work there. Hear 15-minute pitches from company representatives followed by 5-minute Q&As. Check out the SPIE event mobile app or website for the specific schedule of presentations.

Check out all of the Equity, Diversity, and Inclusion events happening throughout the week.

[spie.org/op-inclusion](https://spie.org/op-inclusion)



# General information

## Conference + exhibition registration

### Badge pick-up and registration hours

Location: San Diego Conv. Ctr. Sails Pavilion (Upper Level)

Sunday 21 August · 7:15 AM–5:00 PM

Monday 22 August · 7:30 AM–5:00 PM

Tuesday 23 August · 7:30 AM–5:00 PM

Wednesday 24 August · 7:45 AM–5:00 PM

Thursday 25 August · 7:45 AM–2:00 PM

### SPIE CASHIER

Location: San Diego 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 11B (Upper Level)

Open during registration hours

All speakers must stop at Speaker Check-In to upload their slide presentation files at least two hours before their scheduled session or the day before if you present in the first session. 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: 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.

Sponsored by:



## 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.

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

Sponsored by:



### SPIE Bookstore

Location: Conv. Ctr. Sails Pavilion–Exhibition Hall (Upper Level)

Tuesday 23 August · 10:00 AM–5:00 PM

Wednesday 24 August · 10:00 AM–5:00 PM

Thursday 25 August · 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 Desk

Location: Conv. Ctr. Sails Pavilion (Upper Level)

Open during registration hours

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 21 August · 7:15 AM–7:45 PM

Monday 22 August · 7:30 AM–8:45 PM

Tuesday 23 August · 7:30 AM–6:00 PM

Wednesday 24 August · 7:45 AM–6:00 PM

Thursday 25 August · 7:45 AM–6:00 PM

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

# General information

## Business center - FedEx office

Location: Conv. Ctr., Hall D Lobby (Ground Level)  
Monday–Thursday 22–25 August · 8:00 AM–5:00 PM

Services include photocopying, faxing, printing services, and shipping. Office supplies are also available. Phone 619.525.5450

## Child care services

### SITTERWISE

Email: [sarah@sitterwise.com](mailto:sarah@sitterwise.com)

Office: 619.303.4379 or text 619.663.4379

Learn more and make a reservation online:  
[www.sitterwise.com](http://www.sitterwise.com)

Note: 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.

Did you know SPIE offers Family Care Grants to SPIE members? For more information on deadlines and how to apply visit <https://spie.org/about-spie/advocacy/equity-diversity-and-inclusion/spie-family-care-grants>.

## Street level lobby services and amenities

### ATMS

### COURTESY PHONES

For local calls

### GENDER INCLUSIVE RESTROOM

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

### MOTHERS' LOUNGE

Location: Conv. Ctr. Sails Pavilion (Upper Level)

Open during registration hours

The Mothers' Lounge is a lockable room intended for nursing mothers. There is no storage, running water, or refrigeration available in this space.

### 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 or beverages allowed.

## Urgent message line

An urgent message line is available during registration hours: 619.525.5701

## 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, lost and found hotline: 619.525.5490 or from house phone 5490.

## Food and beverage services

### Complimentary coffee

Sunday 21 August · 7:30 AM–4:00 PM

Location: Conv. Ctr. Room 6 Lobby (Upper Level)

Monday 22 August · 7:30 AM–4:00 PM

Location: Conv. Ctr. Room 6 Lobby (Upper Level)

Tuesday 23 August

7:30 AM–9:30 AM, Location: Conv. Ctr. Room 6 Lobby (Upper Level)

10:00 AM–5:00 PM, Location: Conv. Ctr. Sails Pavilion, Exhibition Hall (Upper Level)

Wednesday 24 August

7:45 AM–9:30 AM, Location: Conv. Ctr. Room 6 Lobby (Upper Level)

10:00 AM–5:00 PM, Location: Conv. Ctr. Sails Pavilion, Exhibition Hall (Upper Level)

Thursday 25 August

7:45 AM–9:30 AM, Location: Conv. Ctr. Room 6 Lobby (Upper Level)

10:00 AM–2:00 PM, Location: Conv. Ctr. Sails Pavilion, Exhibition Hall (Upper Level)

2:00 PM–4:00 PM, Location: Conv. Ctr. Room 6 Lobby (Upper Level)

Please check the conference schedule for specific break times.

Sponsored by:



## Food & refreshments for purchase

### STARBUCKS

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

Sunday–Wednesday · 7:00 AM–3:00 PM

Thursday · 7:00 AM–2:00 PM

### MRS. FIELDS COOKIES/AUNTIE ANNE'S PRETZELS

Location: Conv. Ctr. Sails Pavilion (Upper Level)

Sunday–Wednesday · 7:30 AM–4:00 PM

Thursday · 7:30 AM–12:00 PM

Note: Times subject to change.



# Visit the Diversity Lounge

Sponsored by  Meta

Marriott Marquis, Marina Ballroom F/G

Events throughout the week. Open to all registered attendees.

- Attend diversity focused education sessions and social meetups for networking and peer support
- Demo Virtual Reality headsets with the Meta team
- Decompress and recharge with coffee and snacks
- Meet with Meta about career opportunities or follow the QR code.



**SPIE.** EQUITY  
DIVERSITY  
INCLUSION



# SPIE. DIGITAL LIBRARY

Get unlimited access for your organization to 60 years of research published in the SPIE Digital Library.

Request a quote for your organization:

[SPIDigitalLibrary.org/subscribe](https://SPIDigitalLibrary.org/subscribe)



# SPIE Event Policies

## Acceptance of policies and registration conditions

The following policies and conditions apply to all SPIE events, both online and in person. As a condition of registration, you will be required to acknowledge and accept the SPIE policies and conditions contained herein.

SPIE has established a confidential reporting system for all SPIE event participants to raise concerns about possible unethical or inappropriate behavior within our community. When at an SPIE event, you may contact any SPIE staff with concerns. If you feel that you are in immediate danger, please dial the local emergency number for police intervention.

### Agreement to hold harmless

Attendee agrees to release and hold harmless SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

### Be well agreement

Any public space where other people are present holds an inherent risk of exposure to COVID-19 and other communicable diseases. By attending this event, I agree to voluntarily assume all risk related to exposure and agree to not hold SPIE or any of their affiliates including partners and sponsors, directors, officers, employees, agents, contractors, volunteers, or sponsored venues liable for illness. I will take necessary precautions while at the event including, but not limited to, engaging in appropriate social distancing, wearing a mask in public areas when not consuming food or beverage if required, minimizing face touching, frequently washing hands, and avoiding risky environments such as overcrowded bars or restaurants. I agree to not attend any SPIE event if I feel ill or had recent exposure to a COVID-19 case.

### Anti-harassment policy

It is SPIE policy that all employees, volunteers, and participants are entitled to respectful treatment. Any form of bullying, discrimination, harassment, sexual or otherwise, is unacceptable and will not be tolerated. This policy applies to all locations and situations where SPIE business is conducted and to all SPIE-sponsored activities and events.

*Read complete policy*

### Attendee registration and admission policies

SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, SPIE, or event management, reserves the right to prohibit entry of or to remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, whose conduct is not in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to anyone who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

### Capture and use of a person's image

By registering for an SPIE event, you grant full permission to SPIE to capture, store, use, and/or reproduce your image or likeness, including incidental capture of any individuals in your household or workplace, by any audio and/or visual recording technique and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE purpose. By registering for an SPIE event, you waive any right to inspect or approve the use of the images or recordings or of any written copy. You also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, you release, defend, indemnify, and hold harmless SPIE from and against any claims, damages, or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion, or use in composite form that may occur or be produced in taking, processing, reduction, or production of the finished product, its publication or distribution.

### Code of conduct

SPIE is committed to providing a harassment- and discrimination-free experience for everyone at our events, an experience that embraces the richness of diversity where participants may exchange ideas, learn, network, and socialize in the company of colleagues in an environment of mutual respect.

*Read complete code*

### Event cancellation policy

If for some unforeseen reason SPIE should have to cancel an event, processed registration fees will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.

### Family-friendly policy

**Conference events:** All conference technical and networking events require a badge for admission. Registered attendees may bring children with them if they have been issued a badge. Registration badges for children under 18 are free and available at the SPIE registration desk onsite. Children under 14 years of age must be accompanied by an adult at all times, and guardians are asked to help maintain a professional, disturbance-free conference environment.

**Exhibition hall:** Everyone who attends the exhibition must be registered and have a badge. Badges for children are free and available onsite at the registration desk. Children under 14 years of age must be accompanied by an adult at all times. Guardians are asked to help maintain a professional, disturbance-free exhibition environment. Children under 18 are not allowed in the exhibition area during exhibition move-in and move-out.

### Identification requirement

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued photo identification at registration to collect registration materials. Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

For online events, SPIE requires individuals to register with their legal identity.

### Laser-pointer safety policy

SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers. Use of a personal laser pointer represents the user's acceptance of liability for use of a non-SPIE-supplied laser pointer. If you choose to use your own laser pointer, you must have it tested at speaker check-in.

### No smoking policy

Attendees will observe all non-smoking regulations that are publicly posted by the facilities used by the event.

### Online commenting policy

SPIE moderates all comments posted in an online event. We encourage robust discussion, the exchange of scientific ideas, and the sharing of multiple, diverse perspectives. We expect the discussion to be consistent with the norms of scholarly research community interactions at events. Online event participants should report any comments or content that falls short of those community norms. We will remove comments, content, or people that are considered inappropriate by SPIE standards or that:

- are defamatory, libelous, obscene, indecent, abusive, or threatening to others
- infringe the copyright, trademark, or other rights of a third party
- upload viruses or are a cybersecurity hazard
- are off topic or inappropriately commercial in nature
- are in violation of any applicable laws or regulations

### Payment policy

Registrations must be fully paid before access to the conference is allowed. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks, and wire transfers. Onsite registrations can also be paid with cash.

### Recording policy

**Conferences, courses, and poster sessions:** For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at speaker check-in, SPIE registration, or from SPIE online event hosts. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media. Refusal to comply with such requests is grounds for expulsion from the event.

**Exhibition hall:** Recordings of any kind are prohibited without explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their recording media and to leave the exhibition hall. Refusal to comply with such requests is grounds for expulsion from the event.

### Unauthorized solicitation

Unauthorized solicitation in the exhibition hall is prohibited. Any non-exhibiting organization observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

### Unsecured items

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

### Wireless internet service

At most events, SPIE provides wireless access for attendees. Properly secure your computer before accessing the public wireless network. SPIE is not responsible for computer viruses or other kinds of computer damage.



# SCIENCE IS FOR EVERYONE

## EQUITY

Is access to opportunities, fair treatment, and advancement for all people; it's about eliminating barriers that prevent full participation.

## DIVERSITY

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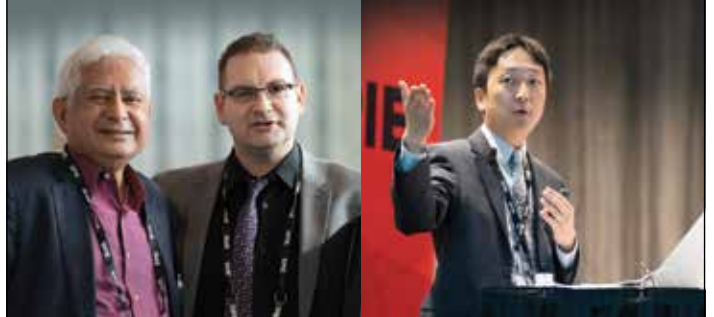
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# **SPIE Optics + Photonics Technical Conferences**

## **Nanoscience + Engineering Applications**, pages 26-80

ADVANCES IN METAMATERIALS, NANOPHOTONIC MATERIALS, PLASMONICS,  
QUANTUM MATERIALS AND DEVICES, OPTICAL TRAPPING, SPINTRONICS, AND MORE.

## **Organic Photonics + Electronics**, pages 81-100

A COMPREHENSIVE TECHNICAL FOCUS OF ORGANIC-BASED MATERIALS AND  
DEVICES THAT ADVANCES RENEWABLE ENERGY SOURCES AND OTHER COMMERCIAL  
APPLICATIONS.

## **Optical Engineering + Applications**, pages 101-183

DEVELOPMENTS IN OPTICAL DESIGN, OPTICAL ALIGNMENT, TESTING, AND  
FABRICATION, ASTRONOMICAL OPTICS AND INSTRUMENTATION, PHOTONIC  
DEVICES, PARTICLE TECHNOLOGIES, AND MORE.

# Metamaterials, Metadevices, and Metasystems 2022

21 - 23 August 2022 | Conv. Ctr. Room 2

Conference Chairs: Nader Engheta, Univ. of Pennsylvania (USA); Mikhail A. Noginov, Norfolk State Univ. (USA); Nikolay I. Zheludev, Optoelectronics Research Ctr. (United Kingdom)

Program Committee: Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (USA); Alexandra Boltasseva, Purdue Univ. (USA); Igal Brener, Sandia National Labs. (USA); Mark Brongersma, Stanford Univ. (USA); Joshua D. Caldwell

U.S. Naval Research Lab. (USA); Jennifer A. Dionne, Stanford Univ. (USA); Jonathan A. Fan, Stanford Univ. (USA); Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain); Behrad Gholipour, Univ. of Alberta (Canada); Harald W. Giessen, Univ. Stuttgart (Germany); Yuri S. Kivshar, The Australian National Univ. (Australia); Jacob B. Khurgin, Johns Hopkins Univ. (USA); Uriel Levy, The Hebrew Univ. of Jerusalem (Israel); Alexander V. Kildishev, Purdue Univ. (USA); Natalia M. Litchinitser, Univ. at Buffalo (USA); Renmin Ma, Peking Univ. (China); Peter Nordlander, Rice Univ. (USA); Timur Shegav, Chalmers Univ. of Technology (Sweden); Gennady B. Shvets, The Univ. of Texas at Austin (USA); David R. Smith, Duke Univ. (USA); Sergei Tretyakov, Aalto Univ. School of Science and Technology (Finland); Din Ping Tsai, National Taiwan Univ. (Taiwan); Augustine M. Urbas, Air Force Research Lab. (USA); Martin Wegener, Karlsruhe Institut für Technologie (Germany); Jeong Weon Wu, Ewha Womans Univ. (Korea, Republic of)

## SESSION 1: METASURFACES I

21 August 2022 • 8:45 AM - 10:35 AM PDT | Conv. Ctr. Room 2

Session Chair: Behrad Gholipour, Univ. of Alberta (Canada)

12195-96

### Recent progress in tunable and active metasurfaces (Invited Paper)

Author(s): Uriel Levy, Zhengli Han, Aharon Weiss, Christian Frydendahl, S.R.K.Chaitanya Indukuri, Eitan Edrei, Jacob Engelberg, Noa Mazurski, Hebrew Univ of Jerusalem (Israel)

21 August 2022 • 8:45 AM - 9:10 AM PDT | Conv. Ctr. Room 2

12195-51

### A meta-device for magic stairs (Invited Paper)

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

21 August 2022 • 9:10 AM - 9:35 AM PDT | Conv. Ctr. Room 2

12195-2

### Systematic design of metasurface scattering spectra using analytical criteria on resonances

Author(s): Mohammed Benzaouia, John D. Joannopoulos, Steven Johnson, Aristeidis Karalis, Massachusetts Institute of Technology (USA)

21 August 2022 • 9:35 AM - 9:50 AM PDT | Conv. Ctr. Room 2

12195-4

### Large area W:VO<sub>2</sub> metasurface infrared coatings for passive regulation of radiative cooling in space

Author(s): Otto L. Muskens, Kai Sun, Kees de Groot, Univ. of Southampton (United Kingdom); Alessandro Urbani, Matteo Gaspari, Sandro Mengali, Consorzio CREO (Italy); Ilja Czolkos, NIL Technology (Denmark); Agata Bialy, NIL Technology ApS (Denmark); Giovanni Bartolini, Mostafa Jamalipour, Behcet Alpat, Maprad (Italy)

21 August 2022 • 9:50 AM - 10:05 AM PDT | Conv. Ctr. Room 2

12195-5

### Metasurfaces shaping ultrashort pulses in time and space

Author(s): Marcus Ossiander, Federico Capasso, Harvard John A. Paulson School of Engineering and Applied Sciences (USA)

21 August 2022 • 10:05 AM - 10:20 AM PDT | Conv. Ctr. Room 2

12195-6

### An efficient scheme for fullwave inverse design of large-scale metasurfaces

Author(s): Wenjin Xue, Hanwen Zhang, Owen D. Miller, Yale Univ. (USA)

21 August 2022 • 10:20 AM - 10:35 AM PDT | Conv. Ctr. Room 2

### Break

Coffee Break 10:35 AM - 11:00 AM

## SESSION 2: METASURFACES II

21 August 2022 • 11:00 AM - 11:55 AM PDT | Conv. Ctr. Room 2

Session Chair: Uriel Levy, The Hebrew Univ. of Jerusalem (Israel)

12195-7

### Waveguide and optical fiber integrated reconfigurable chalcogenide metasurfaces (Invited Paper)

Author(s): Behrad Gholipour, Yihao Cui, Avik Mandal, Ahmed Elfarash, Joshua Perkins, Abbas Sheikh Ansari, Kwanghyun Kim, Viraj Bhingardive, Univ. of Alberta (Canada)

21 August 2022 • 11:00 AM - 11:25 AM PDT | Conv. Ctr. Room 2

12195-9

### Metasurface-based multi-signal biosensing platforms

Author(s): Haogang Cai, Taerin Chung, Hao Wang, NYU Langone Health (USA)

21 August 2022 • 11:25 AM - 11:40 AM PDT | Conv. Ctr. Room 2

12195-10

### Trapping atoms using dielectric metasurfaces

Author(s): Amit K. Agrawal, National Institute of Standards and Technology (USA)

21 August 2022 • 11:40 AM - 11:55 AM PDT | Conv. Ctr. Room 2

### Break

Lunch Break 11:55 AM - 1:30 PM

## SESSION 3: METASURFACES III

21 August 2022 • 1:30 PM - 2:30 PM PDT | Conv. Ctr. Room 2

Session Chair: Wenjin Xue

12195-11

### Metasurfaces robustness analysis: Perfect nanostructures are not always the best!

Author(s): Hsiang-Chu Wang, Karim Achouri, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

21 August 2022 • 1:30 PM - 1:45 PM PDT | Conv. Ctr. Room 2

12195-12

### Nano-electromechanically tunable dielectric metasurfaces

Author(s): Ayse Bilgehan Baspinar, Tianzhe Zheng, Andrei Faraon, Caltech (USA)

21 August 2022 • 1:45 PM - 2:00 PM PDT | Conv. Ctr. Room 2

12195-97

### Symmetric high-Q nonlinear metasurface enabled by bound states in the continuum

Author(s): Hayk Harutyunyan, Guoce Yang, Emory University (USA); Sukrith U. Dev, Monica S. Allen, Jeffery W. Allen, Air Force Research Laboratory (USA)

21 August 2022 • 2:00 PM - 2:15 PM PDT | Conv. Ctr. Room 2

12195-36

**Emulation of Dirac physics with position-dependent mass and emergence of supersymmetric quantum mechanics in photonic crystals**

Author(s): Kai Chen, Filipp Komissarenko, The City College of New York (USA); Daria Smirnova, The Australian National Univ. (Australia); Anton Vakulenko, Svetlana Kiriushchikina, Sriram Guddala, Vinod M. Menon, The City College of New York (USA); Andrea Alù, The City Univ. of New York (USA); Alexander Khanikaev, The City College of New York (USA)

21 August 2022 • 2:15 PM - 2:30 PM PDT | Conv. Ctr. Room 2

**Break****Coffee Break 2:30 PM - 3:15 PM****SESSION 4: POLARITONIC PHENOMENA**

21 August 2022 • 3:15 PM - 5:15 PM PDT | Conv. Ctr. Room 2

Session Chair: Sriram Guddala, The City College of New York (USA)

12195-14

**Strong coupling and extreme anisotropy in infrared polaritonic media (Invited Paper)**

Author(s): Joshua D. Caldwell, Joseph R. Matson, Vanderbilt Univ. (USA)

21 August 2022 • 3:15 PM - 3:40 PM PDT | Conv. Ctr. Room 2

12195-15

**Controlling and utilizing vibration-cavity polaritons (Invited Paper)**

Author(s): Blake S. Simpkins, U.S. Naval Research Lab. (USA); Wonmi Ahn, U.S. Naval Research Lab. (USA); Bilkent Univ. (Turkey); Igor Vurgaftman, U.S. Naval Research Lab. (USA); Jeremy Pietron, Lawrence Livermore National Lab. (USA); Kenan P. Fears, Adam D. Dunkelberger, Jeff C. Owrutsky, U.S. Naval Research Lab. (USA)

21 August 2022 • 3:40 PM - 4:05 PM PDT | Conv. Ctr. Room 2

12195-46

**Dispersion-induced non-Markovian effects for emission spectra of exciton-plasmon systems (Invited Paper)**

Author(s): Jawnaye A. Nash, Zoe Skott, Tigran V. Shahbazyan, Jackson State Univ. (USA)

21 August 2022 • 4:05 PM - 4:30 PM PDT | Conv. Ctr. Room 2

12195-16

**Fundamental limits and complete coupling of light into polaritons**

Author(s): Eduardo J. C. Brioso Dias, ICFO - Institut de Ciències Fotòniques (Spain); Javier García de Abajo, ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

21 August 2022 • 4:30 PM - 4:45 PM PDT | Conv. Ctr. Room 2

12195-17

**Perfect absorption and cavity-free polaritons in MoS<sub>2</sub>**

Author(s): Adriana Canales, Oleg Kotov, Timur Shegai, Chalmers Univ. of Technology (Sweden)

21 August 2022 • 4:45 PM - 5:00 PM PDT | Conv. Ctr. Room 2

12195-18

**Deeply subwavelength photonics enabled by high index Van der Waals materials**

Author(s): Haonan Ling, Artur R. Davoyan, UCLA Samueli School of Engineering (USA)

21 August 2022 • 5:00 PM - 5:15 PM PDT | Conv. Ctr. Room 2

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks****12203-501****Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502****Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break****Coffee Break 10:05 AM - 10:30 AM****SESSION 5: EPSILON NEAR ZERO (ENZ)**

22 August 2022 • 10:30 AM - 11:25 AM PDT | Conv. Ctr. Room 2

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

12195-79

**Multilayered AZO/ZnO metamaterial for ultrafast pulse shaping at the epsilon-near-zero spectral point (Invited Paper)**

Author(s): Priscilla Kelly, Lyuba Kuznetsova, San Diego State Univ. (USA)

22 August 2022 • 10:30 AM - 10:55 AM PDT | Conv. Ctr. Room 2

12195-81

**Plasma frequency tuning of epsilon-near-zero metafilm with ITO-SiO<sub>2</sub> multilayer structure**

Author(s): Jimmy H. Ni, DEVCOM Army Research Lab. (USA)

22 August 2022 • 10:55 AM - 11:10 AM PDT | Conv. Ctr. Room 2

12195-82

**THz metamaterials based on phase-transition materials actuated MEMS**

Author(s): Zhixiang Huang, Weipeng Wu, Eric Herrmann, Ke Ma, Benjamin Jungfleisch, Xi Wang, Univ. of Delaware (USA)

22 August 2022 • 11:10 AM - 11:25 AM PDT | Conv. Ctr. Room 2

**SESSIO N 6: CHIRALITY, HELICITY, AND STRUCTURED LIGHT**

22 August 2022 • 11:25 AM - 12:10 PM PDT | Conv. Ctr. Room 2

Session Chair: Lyuba Kuznetsova, San Diego State Univ. (USA)

12195-84

**Electrically tunable intensity of metaholography using liquid-crystal assisted chiral metasurfaces at the visible**

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

22 August 2022 • 11:25 AM - 11:40 AM PDT | Conv. Ctr. Room 2

12195-85

**Design of a helicity-preserving metasurface mirror**

Author(s): Alma K. Gonzalez-Alcalde, Univ. Nacional Autónoma de México (Mexico); Rafael Salas-Montiel, Univ. de Technologie Troyes (France); Eugenio R. Méndez, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico)

22 August 2022 • 11:40 AM - 11:55 AM PDT | Conv. Ctr. Room 2

12195-86

**Excitation of magnetic quadrupole via structured lights**

Author(s): Hooman Barati Sedeh, Danilo G. Pires, Nitish Chandra, Pavel D. Terekhov, Jiannan Gao, Duke Univ. (USA); Ivan I. Kravchenko, Oak Ridge National Lab. (USA); Natalia M. Litchinitser, Duke Univ. (USA)

22 August 2022 • 11:55 AM - 12:10 PM PDT | Conv. Ctr. Room 2

**Break**

**Lunch Break 12:10 PM - 1:40 PM**

**SESSION 7: EMISSION AND EMITTERS**

22 August 2022 • 1:40 PM - 3:30 PM PDT | Conv. Ctr. Room 2

Session Chair: Blake S. Simpkins, U.S. Naval Research Lab. (USA)

12195-19

**Gate-tunable 2D material-based plasmonic phototransistors with ultrahigh photoresponsivity (Invited Paper)**

Author(s): Yu-Jung Lu, Academia Sinica (Taiwan), National Taiwan Univ. (Taiwan)

22 August 2022 • 1:40 PM - 2:05 PM PDT | Conv. Ctr. Room 2

12195-20

**Random lasing in quasi-2D lead-halide perovskite (Invited Paper)**

Author(s): Colton Fruhling, Kang Wang, Sarah N. Chowdhury, Alexander V. Kildishev, Purdue Univ. (USA); Xiangeng Meng, Purdue Univ. (USA); Qilu Univ. of Technology (Shandong Academy of Sciences) (China); Letian Dou, Vladimir M. Shalaev, Alexandra Boltasseva, Purdue Univ. (USA)

22 August 2022 • 2:05 PM - 2:30 PM PDT | Conv. Ctr. Room 2

12195-23

**Gigantic suppression of recombination rate in 3D Lead-Halide Perovskites for enhanced photodetector performance**

Author(s): Mohamed El Kabbash, Massachusetts Institute of Technology (USA); Chunlei Guo, Kwangjin Li, Univ. of Rochester (USA)

22 August 2022 • 2:30 PM - 2:45 PM PDT | Conv. Ctr. Room 2

12195-21

**High Emissive Contrast of Patterned Tungsten-Doped VO<sub>2</sub> Thin Film Composites**

Author(s): Gabriella Hunt, David B. Shrekenhamer, Joseph A. Miragliotta, Johns Hopkins Univ. Applied Physics Lab., LLC (USA); James C. Ginn, Andrew P. Warren, Plasmonics, Inc. (USA)

22 August 2022 • 2:45 PM - 3:00 PM PDT | Conv. Ctr. Room 2

12195-22

**Quantitative modelling of photoluminescence from light-emitting metasurfaces via absorption calculations**

Author(s): Elise Bailly, Univ. Paris-Saclay (France), Lab. Charles Fabry, Ctr. National de la Recherche Scientifique (France), Institut d'Optique Graduate School (France); Camilo R. Pérez de la Vega, Kevin Chevrier, Institut Langevin, Ctr. National de la Recherche Scientifique (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France); Jean-Paul Hugonin, Univ. Paris-Saclay (France), Lab. Charles Fabry, Ctr. National de la Recherche Scientifique (France), Institut d'Optique Graduate School (France); Yannick De Wilde, Valentina Krachmalnicoff, Institut Langevin, Ctr. National de la Recherche Scientifique (France), Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (France), Univ. PSL (France); Benjamin Vest, Jean-Jacques Greffet, Univ. Paris-Saclay (France), Lab. Charles Fabry, Ctr. National de la Recherche Scientifique (France), Institut d'Optique Graduate School (France)

22 August 2022 • 3:00 PM - 3:15 PM PDT | Conv. Ctr. Room 2

12195-24

**Angularly selective thermal emitters for robust and deep subfreezing daytime radiative cooling**

Author(s): Mohamed El Kabbash, Massachusetts Institute of Technology (USA); Chunlei Guo, Univ. of Rochester (USA); Wei Li, Sandeep Chamoli, Changchun Institute of Optics, Fine Mechanics and Physics (China)

22 August 2022 • 3:15 PM - 3:30 PM PDT | Conv. Ctr. Room 2

**Break**

**Coffee Break 3:30 PM - 3:55 PM**

**SESSION 8: NONLINEAR PHENOMENA**

22 August 2022 • 3:55 PM - 5:45 PM PDT | Conv. Ctr. Room 2

Session Chair: Priscilla N. Kelly, San Diego State Univ. (USA)

12195-25

**Plasmonically enhanced second harmonic generation in TaAs Weyl semimetal (Invited Paper)**

Author(s): Alexandra Boltasseva, Purdue Univ. (USA)

22 August 2022 • 3:55 PM - 4:20 PM PDT | Conv. Ctr. Room 2

12195-27

**Harmonic generation from metal surfaces and gratings: free electron spill-out layer as an epsilon-near-zero boundary layer (Invited Paper)**

Author(s): Michael Scalora, U.S. Army Combat Capabilities Development Command (USA); Shroddha Mukhopadhyay, Laura Rodriguez-Sune, Univ. Politècnica de Catalunya (Spain); Kent A. Hallman, PeopleTec, Inc. (USA); Maria Antonietta A. Vincenti, Univ. degli Studi di Brescia (Italy); Domenico de Ceglia, Univ. degli Studi di Padova (Italy); Neset Akozbek, U.S. Army Combat Capabilities Development Command (USA); Josep F. Trull, Crina M. Cojocar, Univ. Politècnica de Catalunya (Spain)

22 August 2022 • 4:20 PM - 4:45 PM PDT | Conv. Ctr. Room 2

12195-29

**Nonlinear frequency-mixing in high-Q GaP metasurfaces**

Author(s): Maria del Rocio Camacho Morales, The Australian National Univ. (Australia); Lei Xu, Nottingham Trent Univ. (United Kingdom); Haizhong Zhang, Son Tung Ha, Leonid A. Krivitskiy, Arseniy I. Kuznetsov, A\*STAR Agency for Science, Technology and Research (Singapore); Mohsen Rahmani, Nottingham Trent Univ. (United Kingdom); Dragomir N. Neshev, The Australian National Univ. (Australia)

22 August 2022 • 4:45 PM - 5:00 PM PDT | Conv. Ctr. Room 2

12195-30

**Quasi-bound states in the continuum enhanced wavelength conversion in lossy chalcogenide metasurfaces**

Author(s): Jiannan Gao, Duke Univ. (USA); Maria A. Vincenti, Univ. degli Studi di Brescia (Italy); Jesse A. Frantz, U.S. Naval Research Lab. (USA); Anthony R. Clabeau, Univ. Research Foundation (USA); Xingdu Qiao, Liang Feng, Univ. of Pennsylvania (USA); Michael Scalora, U.S. Army Combat Capabilities Development Command (USA); Natalia M. Litchinitser, Duke Univ. (USA)

22 August 2022 • 5:00 PM - 5:15 PM PDT | Conv. Ctr. Room 2

12195-31

**Active tuning of plasmon damping via light induced magnetism**

Author(s): Matthew T. Sheldon, Texas A&amp;M Univ (USA)

22 August 2022 • 5:15 PM - 5:30 PM PDT | Conv. Ctr. Room 2

12195-28

**Boosted second-harmonic generation in the half-etching metasurfaces governed by guided resonances and bound states in the continuum**

Author(s): Ze Zheng, Mohsen Rahmani, Nottingham Trent Univ. (United Kingdom); Xu Lei, Nottingham Trent Univ (United Kingdom); Cui-Feng Ying, Nottingham Trent Univ. (United Kingdom); Lujun Huang, The Univ. of New South Wales (Australia)

22 August 2022 • 5:30 PM - 5:45 PM PDT | Conv. Ctr. Room 2

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 Session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

12195-87

**Study of chromatic dispersion in multilayer metalens**

Author(s): Carlos Basilio-Ortiz, Ivan H. Moreno, Univ. Autónoma de Zacatecas (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-88

**Efficiency enhancement of terahertz plasmonic photoconductive antenna**

Author(s): Jae-Hyung Jang, Korea Institute of Energy Technology (Korea, Republic of); Gye Jung Lee, Gwangju Institute of Science and Technology (Korea, Republic of); Byungwoo Son, Gwangju Institute of Science and Technology (Korea, Republic of); Do-Kyung Ko, Sungbae J. Lee, Gwangju Institute of Science and Technology (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-89

**Mode properties of bigradient anisotropic magnetolectric metastructures**

Author(s): Igor P. Rudenok, Volgograd State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-90

**Effect of electrochromic polymer switching on surface plasmon polaritons.**

Author(s): Ashleigh Wilson, Paula Fortuno, Mohammad Shahabuddin, Natalia Noginova, Norfolk State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-91

**Low SWaP Hyperspectral Imaging Sensor for CubeSat Applications**

Author(s): Igor Bendoy, Phoebus Optoelectronics, LLC (USA); Lori Lepak, Phoebus Optoelectronics (USA); David Crouse, Clarkson University (USA); James Leitch, Jeff Applegate, Ball Aerospace &amp; Technologies Corp (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-92

**Dispersion in reflection and emission of dye molecules strongly coupled to surface plasmon polaritons**

Author(s): Md Golam Rabbani Chowdhury, Shamaar R. Howard, Kanij Mehtanin Khabir, Mikhail A. Noginov, Norfolk State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-47

**Kelvin probe work-function studies of components of Fabry-Perot cavities and MIM waveguides**

Author(s): Kanij Mehtanin Khabir, Mohammad Shahabuddin, Jalyn-Rose L. Clark, Natalia Noginova, Mikhail A. Noginov, Norfolk State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-99

**Near-infrared metalenses employing hyperuniform disordered arrangement of nanostructures**

Author(s): Sheng Siang Su, Ying Chu Wu, Hsueh Li Liu, Peichen Yu, National Yang Ming Chiao Tung University (Taiwan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-100

**High-efficiency photolithographic NIR metalenses enabled by optical proximity correction with a neural-network lithographic model**

Author(s): Hsuehli Liu, Weiping Liao, Yuteng Chen, Shengsiang Su, Tongke Lin, National Yang Ming Chiao Tung Univ. (Taiwan); Jiamin Shieh, National Yang Ming Chiao Tung Univ. (Taiwan), Taiwan Semiconductor Research Institute (Taiwan); Peichen Yu, Youchia Chang, National Yang Ming Chiao Tung Univ. (Taiwan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-43

**Magnetic control of photovoltages in permalloy based metasurfaces**

Author(s): David Keene, Md A. Rab, Md. Shahabuddin, Natalia Noginova, Norfolk State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

12195-13

**Anomalous Dips in Reflection Spectra of Optical Polymers Deposited on Plasmonic Metals**

Author(s): Md Golam Rabbani Chowdhury, Ayanna N. Shorter, Sangeeta Rout, Mikhail A. Noginov, Norfolk State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 9: THEORY AND SIMULATIONS**

23 August 2022 • 8:00 AM - 10:30 AM PDT | Conv. Ctr. Room 2

Session Chair: Chenkai Mao, Stanford Univ. (USA)

12195-32

**Quantum interactions enable a new generation of low-dimensional materials (Invited Paper)**

Author(s): F. Javier Garcia de Abajo, Valerio Di Giulio, Paulo André D. Gonçalves, ICFO - Institut de Ciències Fotòniques (Spain)

23 August 2022 • 8:00 AM - 8:25 AM PDT | Conv. Ctr. Room 2

12195-33

**Science-informed machine-learning for optical composites (Invited Paper)**

Author(s): Viktor A. Podolskiy, Abantika Ghosh, Univ. of Massachusetts Lowell (USA); Mohannad Elhamod, Jie Bu, Virginia Polytechnic Institute and State Univ. (USA); Wei-Cheng Lee, Binghamton Univ. (USA); Anuj Karpatne, Virginia Polytechnic Institute and State Univ. (USA)

23 August 2022 • 8:25 AM - 8:50 AM PDT | Conv. Ctr. Room 2



## CONFERENCE 12195

- 12195-34  
**Modeling quantum optics of metasurfaces on the IBM quantum computer: the photon-transmon analogy (Invited Paper)**  
Author(s): Anton N. Vetlugin, Cesare Soci, Nanyang Technological Univ. (Singapore); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom), Nanyang Technological Univ. (Singapore)  
23 August 2022 • 8:50 AM - 9:15 AM PDT | Conv. Ctr. Room 2
- 12195-35  
**Quasi-normal mode theory enforcing symmetries of the scattering matrix**  
Author(s): Mohammed Benzaouia, Massachusetts Institute of Technology (USA), Ginzton Lab, Stanford Univ. (USA); John D. Joannopoulos, Steven Johnson, Aristeidis Karalis, Massachusetts Institute of Technology (USA)  
23 August 2022 • 9:15 AM - 9:30 AM PDT | Conv. Ctr. Room 2
- 12195-37  
**Optimizing photonic funnels for mid-IR NSOM tips**  
Author(s): Jacob LaMountain, Univ. of Massachusetts Lowell (USA); Aaron J. Muhowski, Daniel M. Wasserman, The Univ. of Texas at Austin (USA); Viktor A. Podolskiy, Univ. of Massachusetts Lowell (USA)  
23 August 2022 • 9:30 AM - 9:45 AM PDT | Conv. Ctr. Room 2
- 12195-101  
**Arbitrary space-time wave packet synthesis**  
Author(s): Amit K. Agrawal, Lu Chen, Wenqi Zhu, National Institute of Standards and Technology (USA)  
23 August 2022 • 9:45 AM - 10:00 AM PDT | Conv. Ctr. Room 2
- 12195-102  
**Direct observation of lasing over exceptional points in Anderson-localizing systems**  
Author(s): Krishna Joshi, Sushil A. Mujumdar, Tata Institute for Fundamental Research (India)  
23 August 2022 • 10:00 AM - 10:15 AM PDT | Conv. Ctr. Room 2
- 12195-98  
**Generative modeling and reinforcement learning for acoustic lens design**  
Author(s): Wei-Ching Wang, Feruza Amirkulova, San Jose State University (USA)  
23 August 2022 • 10:15 AM - 10:30 AM PDT | Conv. Ctr. Room 2
- Break**  
**Coffee Break 10:30 AM - 10:55 AM**
- SESSION 10: NOVEL PHENOMENA I**
- 23 August 2022 • 10:55 AM - 12:55 PM PDT | Conv. Ctr. Room 2  
Session Chair: F. Javier Garcia de Abajo, ICFO - Institut de Ciències Fotòniques (Spain)
- 12195-38  
**Knots of darkness in linear and nonlinear metasurfaces (Invited Paper)**  
Author(s): Natasha M. Litchinitser, Jiannan Gao, Dmitrii Tsvetkov, Danilo Gomes M. Pires, Duke Univ. (USA); Ivan Kravchenko, Oak Ridge National Lab. (USA)  
23 August 2022 • 10:55 AM - 11:20 AM PDT | Conv. Ctr. Room 2
- 12195-39  
**Conformal volumetric grayscale metamaterials with broad angle and broadband electromagnetic functionality (Invited Paper)**  
Author(s): Jonathan A. Fan, Qinglan Huang, Lucia T. Gan, Chenkai Mao, Stanford Univ. (USA)  
23 August 2022 • 11:20 AM - 11:45 AM PDT | Conv. Ctr. Room 2
- 12195-40  
**Metamaterials for breakthrough space exploration (Invited Paper)**  
Author(s): Artur R. Davoyan, UCLA Samueli School of Engineering (USA)  
23 August 2022 • 11:45 AM - 12:10 PM PDT | Conv. Ctr. Room 2
- 12195-41  
**Temperature-dependent optical properties of materials for light-sail applications**  
Author(s): Demeng Feng, Shenwei Yin, Gabriel R. Jaffe, Gregory R. Holdman, Tanuj Kumar, Joel F. Siegel, Univ. of Wisconsin-Madison (USA); Merlin Mah, Phyo Lin, Univ. of Minnesota, Twin Cities (USA); Min Seok Jang, KAIST (Korea, Republic of); Joseph Talghader, Univ. of Minnesota, Twin Cities (USA); Victor W. Brar, Mikhail A. Kats, Univ. of Wisconsin-Madison (USA)  
23 August 2022 • 12:10 PM - 12:25 PM PDT | Conv. Ctr. Room 2
- 12195-42  
**Large scale nanoimprinted anomalously reflecting metasurfaces for radiation driven solar sail and attitude control**  
Author(s): Anirban Swakshar, Univ. of Alabama (USA); Elizabeth Philip, The Univ. of Alabama (USA); Andrew Heaton, Les Johnson, NASA Marshall Space Flight Ctr. (USA); Patrick Kung, Seongsin M. Kim, The Univ. of Alabama (USA)  
23 August 2022 • 12:25 PM - 12:40 PM PDT | Conv. Ctr. Room 2
- 12195-60  
**Reconfigurable magnetic diodes for rectification**  
Author(s): Jin Ho Kim, U.S. Army Combat Capabilities Development Command (USA); Guinever Strack, Alkim Akyurtlu, Univ. of Massachusetts Lowell (USA); Richard M. Osgood, U.S. Army Combat Capabilities Development Command Soldier Ctr. (USA)  
23 August 2022 • 12:40 PM - 12:55 PM PDT | Conv. Ctr. Room 2
- Break**  
**Lunch/Exhibition Break 12:55 PM - 2:25 PM**
- SESSION 11: NOVEL PHENOMENA II**
- 23 August 2022 • 2:25 PM - 3:45 PM PDT | Conv. Ctr. Room 2  
Session Chair: Artur R. Davoyan, UCLA Samueli School of Engineering (USA)
- 12195-44  
**Compact supercavity systems with optimized excitation of quasi-BIC resonators (Invited Paper)**  
Author(s): Alexander V. Kildishev, Zahra Manzoor, Michael D. Sinanis, Omer Yesilyurt, Vahagn Mkhitaryan, Dimitrios Peroulis, Purdue Univ. (USA)  
23 August 2022 • 2:25 PM - 2:50 PM PDT | Conv. Ctr. Room 2
- 12195-45  
**Photonic time-crystals (Invited Paper)**  
Author(s): Mordechai (Moti) Segev, Eran Lustig, Alex Dikopoltsev, Yonatan Sharabi, Mark Lyubarov, Ohad Segal, Yaakov Lumer, Technion-Israel Institute of Technology (Israel)  
23 August 2022 • 2:50 PM - 3:15 PM PDT | Conv. Ctr. Room 2
- 12195-48  
**Multi-stop band wave propagation in a honeycomb metamaterial with embedded resonators**  
Author(s): Mauro Murer, Walter Lacarbonara, Sapienza Univ. di Roma (Italy); Giovanni Formica, Univ. degli Studi di Roma Tre (Italy)  
23 August 2022 • 3:15 PM - 3:30 PM PDT | Conv. Ctr. Room 2
- 12195-49  
**Observation of second-order corner skin modes in non-Hermitian electric circuits**  
Author(s): Yung Kim, Minwook Kyung, KAIST (Korea, Republic of); Hee Chul Park, Institute for Basic Science (Korea, Republic of); Kyungmin Lee, KAIST (Korea, Republic of); Jung-Wan Ryu, Moon Jip Park, Institute for Basic Science (Korea, Republic of); Bumki Min, KAIST (Korea, Republic of)  
23 August 2022 • 3:30 PM - 3:45 PM PDT | Conv. Ctr. Room 2

**Break**  
**Coffee Break 3:45 PM - 4:10 PM**

### SESSION 12: METADEVICES I

23 August 2022 • 4:10 PM - 5:45 PM PDT | Conv. Ctr. Room 2

Session Chair: Mordechai (Moti) Segev, Technion-Israel Institute of Technology (Israel)

12195-50

#### **Nonlocal flat optics (Invited Paper)**

Author(s): Francesco Monticone, Cornell Univ. (USA)

23 August 2022 • 4:10 PM - 4:35 PM PDT | Conv. Ctr. Room 2

12195-52

#### **Tunable nanocavities for dynamic wavefront manipulation**

Author(s): Ramón J. Paniagua-Domínguez, Pariskhit Moitra, Shampy Mansha, Anton V. Baranikov, Xuewu Xu, Tobias W. W. Mass, Damien Eschimese, Rasna Maruthiyodan Veetil, Xinan Liang, Arseniy I. Kuznetsov, A\*STAR Institute of Materials Research and Engineering (Singapore)

23 August 2022 • 4:35 PM - 4:50 PM PDT | Conv. Ctr. Room 2

12195-53

#### **Digital holography for photolithographic micro-nano surface patterning**

Author(s): Alex Berdin, Tampere Univ. (Finland); Heikki T. Rekola, Univ. of Eastern Finland (Finland); Arri Priimägi, Tampere Univ. (Finland)

23 August 2022 • 4:50 PM - 5:05 PM PDT | Conv. Ctr. Room 2

12195-54

#### **Reconfigurable asymmetric transmission through all-dielectric metagratings**

Author(s): Abbas Sheikh Ansari, Ashwin K. Iyer, Behrad Gholipour, Joshua Perkins, Univ. of Alberta (Canada)

23 August 2022 • 5:05 PM - 5:20 PM PDT | Conv. Ctr. Room 2

12195-1

#### **Nonlocal metasurfaces (Invited Paper)**

Author(s): Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (USA)

23 August 2022 • 5:20 PM - 5:45 PM PDT | Conv. Ctr. Room 2

### SESSION 13: METADEVICES II

24 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 2

Session Chair: Cesare Soci, Nanyang Technological Univ. (Singapore)

12195-56

#### **Comparison of charge and field driven optical modulators (Invited Paper)**

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

24 August 2022 • 8:00 AM - 8:25 AM PDT | Conv. Ctr. Room 2

12195-57

#### **Three-dimensional broadband metamaterial absorbers for IR gas molecules sensing (Invited Paper)**

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

24 August 2022 • 8:25 AM - 8:50 AM PDT | Conv. Ctr. Room 2

12195-95

#### **Perovskite light-emitting metatransistors (Invited Paper)**

Author(s): Cesare Soci, Nanyang Technological Univ (Singapore)

24 August 2022 • 8:50 AM - 9:15 AM PDT | Conv. Ctr. Room 2

12195-58

#### **Experimental characterization of a high-performance Y-junction enhanced with subwavelength grating metamaterials**

Author(s): Raquel Fernández de Cabo, Consejo Superior de Investigaciones Científicas (Spain); Jaime Vilas Ramos, Alcyon Photonics S.L. (Spain); Pavel Cheben, National Research Council Canada (Canada); Aitor Villafranca Velasco, Consejo Superior de Investigaciones Científicas (Spain); David González Andrade, Ctr. de Nanosciences et de Nanotechnologies (France)

24 August 2022 • 9:15 AM - 9:30 AM PDT | Conv. Ctr. Room 2

12195-59

#### **A dispersion-engineered metafiber for broadband and polarization-insensitive focusing and imaging over the entire telecommunication range**

Author(s): Jaehyuck Jang, Pohang Univ. of Science and Technology (Korea, Republic of); Haoran Ren, Macquarie Univ. (Australia); Chenhao Li, Ludwig-Maximilians-Univ. München (Germany); Junsuk Rho, Pohang Univ. of Science and Technology (Korea, Republic of); Markus A. Schmidt, Leibniz-Institut für Photonische Technologien e.V. (Germany); Stefan A. Maier, Ludwig-Maximilians-Univ. München (Germany)

24 August 2022 • 9:30 AM - 9:45 AM PDT | Conv. Ctr. Room 2

12195-61

#### **Design and analysis of multiband metamaterial in microwave regime**

Author(s): Ankit Kumar, Kamal Kishor, Ravindra Kumar Sinha, Delhi Technological Univ. (India)

24 August 2022 • 9:45 AM - 10:00 AM PDT | Conv. Ctr. Room 2

**Break**

**Coffee Break 10:00 AM - 10:25 AM**

### SESSION 14: METADEVICES III

24 August 2022 • 10:25 AM - 12:05 PM PDT | Conv. Ctr. Room 2

Session Chair: Jacob B. Khurgin, Johns Hopkins Univ. (USA)

12195-62

#### **Active metasurfaces empowered by 2D-materials (Invited Paper)**

Author(s): Isabelle Staude, Falk Eilenberger, Friedrich-Schiller-Univ. Jena (Germany)

24 August 2022 • 10:25 AM - 10:50 AM PDT | Conv. Ctr. Room 2

12195-64

#### **Tunable one-step nanoimprinted RGB-achromatic bifocal metalens**

Author(s): Trevon Badloe, Sunae So, Jooheon Kim, Younghwan Yang, Jaekyung Kim, Yeseul Kim, Junsuk Rho, Pohang Univ. of Science and Technology (Korea, Republic of)

24 August 2022 • 10:50 AM - 11:05 AM PDT | Conv. Ctr. Room 2

12195-63

#### **Design and investigation of a metalens for efficiency enhancement of laser-waveguide coupling in a limited space system**

Author(s): Huddad laeim, Kasetsart Univ. (Thailand); Christian Schlickriede, Univ. Paderborn (Germany); Papichaya Chaisakul, Nattaporn Chattham, Kasetsart Univ. (Thailand); Hathai Panitchakan, Krisda Siangchaew, Western Digital (Thailand) Co., Ltd. (Thailand); Apichart Pattanaporhratana, Kasetsart Univ. (Thailand)

24 August 2022 • 11:05 AM - 11:20 AM PDT | Conv. Ctr. Room 2

12195-65

#### **Broadband visible achromatic metalenses enabled by cascaded group delay compensation**

Author(s): Shengyuan Chang, Lidan Zhang, Xingjie Ni, The Pennsylvania State Univ. (USA)

24 August 2022 • 11:20 AM - 11:35 AM PDT | Conv. Ctr. Room 2

## CONFERENCE 12195

12195-66

### **Angle of incidence independent metamaterial for hyperspectral imaging**

Author(s): Igor Bendoym, Phoebus Optoelectronics, LLC (USA); Lori Lepak, David T. Crouse, Phoebus Optoelectronics (USA)

24 August 2022 • 11:35 AM - 11:50 AM PDT | Conv. Ctr. Room 2

12195-68

### **Gradient-index nanophotonics and metamaterials**

Author(s): Igor I. Smolyaninov, Univ. of Maryland, College Park (USA)

24 August 2022 • 11:50 AM - 12:05 PM PDT | Conv. Ctr. Room 2

### **Break**

**Lunch/Exhibition Break 12:05 PM - 1:50 PM**

## SESSION 15: TOPOLOGY

24 August 2022 • 1:50 PM - 3:50 PM PDT | Conv. Ctr. Room 2

Session Chair: Vera N. Smolyaninova, Towson Univ. (USA)

12195-69

### **Topologically protected edge states in continuous media: attenuation without dissipation (Invited Paper)**

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

24 August 2022 • 1:50 PM - 2:15 PM PDT | Conv. Ctr. Room 2

12195-70

### **Topological polaritonics with Van der Waals materials (Invited Paper)**

Author(s): Alexander B. Khanikaev, The City College of New York (USA)

24 August 2022 • 2:15 PM - 2:40 PM PDT | Conv. Ctr. Room 2

12195-71

### **Phase, symmetry, and topology for metasurfaces (Invited Paper)**

Author(s): Gururaj V. Naik, Rice Univ. (USA)

24 August 2022 • 2:40 PM - 3:05 PM PDT | Conv. Ctr. Room 2

12195-72

### **Spin-full guided modes trapped by effective potentials in topological photonic metasurfaces**

Author(s): Svetlana Kiriushchikina, Anton Vakulenko, The City College of New York (USA); Daria A. Smirnova, The Australian National Univ. (Australia); Sriram Guddala, Filipp Komissarenko, The City College of New York (USA); Monica S. Allen, Jeffery W. Allen, Air Force Research Lab. (USA); Alexander B. Khanikaev, The City College of New York (USA)

24 August 2022 • 3:05 PM - 3:20 PM PDT | Conv. Ctr. Room 2

12195-73

### **Improving topological boundary states in photonic metasurfaces via profile engineering**

Author(s): Anton Vakulenko, Svetlana Kiriushchikina, The City College of New York (USA); Daria A. Smirnova, The Australian National Univ. (Australia); Yuma Kawaguchi, Kai Chen, Sriram Guddala, Filipp Komissarenko, The City College of New York (USA); Monica S. Allen, Jeffery W. Allen, Air Force Research Lab. (USA); Alexander B. Khanikaev, The City College of New York (USA)

24 August 2022 • 3:20 PM - 3:35 PM PDT | Conv. Ctr. Room 2

12195-74

### **Deep subwavelength resonant meta-optics enabled by high-index topological insulators**

Author(s): Tomer Lewi, Bar-Ilan Univ (Israel)

24 August 2022 • 3:35 PM - 3:50 PM PDT | Conv. Ctr. Room 2

### **Break**

**Coffee Break 3:50 PM - 4:15 PM**

## SESSION 16: HYPERBOLIC METAMATERIALS

24 August 2022 • 4:15 PM - 5:25 PM PDT | Conv. Ctr. Room 2

Session Chair: Falk Eilenberger, Friedrich-Schiller-Univ. Jena (Germany)

12195-75

### **Ghost crystals: from exceptional points to exchange interaction in linear optics (Invited Paper)**

Author(s): Evgenii E. Narimanov, Emroz Khan, Purdue Univ. (USA)

24 August 2022 • 4:15 PM - 4:40 PM PDT | Conv. Ctr. Room 2

12195-76

### **Nonlinear optics in ferrofluid-based hyperbolic metamaterials**

Author(s): Vera N. Smolyaninova, Jonathon Cartelli, Nathaniel Christopher, Jonathan Perry, Stephanie Spickard, Mary S. Devadas, Towson Univ. (USA); Igor I. Smolyaninov, Univ. of Maryland, College Park (USA)

24 August 2022 • 4:40 PM - 4:55 PM PDT | Conv. Ctr. Room 2

12195-77

### **An anisotropic transfer matrix approach to profiled optical field propagation through hyperbolic metamaterials**

Author(s): Guo Chen, Partha P. Banerjee, Univ. of Dayton (USA)

24 August 2022 • 4:55 PM - 5:10 PM PDT | Conv. Ctr. Room 2

12195-78

### **Ultrafast phase transition to hyperbolic metamaterial state**

Author(s): Derek Bas, Azimuth Corp. (USA); Heather J. Haugan, Kurt G. Eyink, Augustine M. Urbas, Air Force Research Lab. (USA)

24 August 2022 • 5:10 PM - 5:25 PM PDT | Conv. Ctr. Room 2

**Active Photonic Platforms (APP) 2022**

21 - 25 August 2022 | Conv. Ctr. Room 3

Conference Chairs: Ganapathi S. Subramania, Sandia National Labs. (USA); Stavroula Foteinopoulou, The Univ. of New Mexico (USA)  
 Program Committee: Andrea Alù, The City Univ. of New York (USA); Koray Aydin, Northwestern Univ. (USA); Harish Bhaskaran, Univ. of Oxford (United Kingdom); Paul V. Braun, Univ. of Illinois at Urbana-Champaign (USA); 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. (USA); Didier Felbacq, Univ. Montpellier (France); Juejun Hu, Massachusetts Institute of Technology (USA); Stephen Hughes, Queen's Univ. (Canada); Boubacar Kante, Univ. of California, Berkeley (USA); Mercedeh Khajavikhan, Univ. of Southern California (USA); Alexander V. Kildishev, Purdue Univ. (USA); Nathaniel Kinsey, Virginia Commonwealth Univ. (USA); 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, Tyndall National Institute (Ireland); Rupert F. Oulton, Imperial College London (United Kingdom); Nicolae-Coriolan Panou, Univ. College London (United Kingdom); Ruwen Peng, Nanjing Univ. (China); Ekaterina Poutrina, Air Force Research Lab. (USA); Michelle L. Povinelli, The Univ. of Southern California (USA); 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. (USA); Volker J. Sorger, The George Washington Univ. (USA); 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. (USA); Daniel M. Wasserman, The Univ. of Texas at Austin (USA); Sharon M. Weiss, Vanderbilt Univ. (USA)

**Opening Remarks**

21 August 2022 • 8:00 AM - 8:15 AM PDT | Conv. Ctr. Room 3

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

**Opening remarks and welcome from conference chairs.****SESSION 1: DESIGNER PHOTONIC MATERIALS FOR ENHANCED NON-LINEAR EFFECTS AND HIGHER-HARMONIC GENERATION**

21 August 2022 • 8:15 AM - 10:25 AM PDT | Conv. Ctr. Room 3

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

**12196-1****Optics on the nanoscale: conquering absorption with nonlinear optics (Keynote Presentation)**

Author(s): Natalia M. Litchinitser, Jiannan Gao, Duke Univ. (USA); Maria Antonietta Vincenti, Univ. degli Studi di Brescia (Italy); Jesse Frantz, U.S. Naval Research Lab. (USA); Anthony Clabeau, Univ. Research Foundation (USA); Xingdu Qiao, Liang Feng, Univ. of Pennsylvania (USA); Michael Scalora, U.S. Army Combat Capabilities Development Command (USA)

21 August 2022 • 8:15 AM - 8:55 AM PDT | Conv. Ctr. Room 3

**12196-2****Harmonic generation from silicon membranes in the visible and UV ranges (Invited Paper)**

Author(s): Michael Scalora, U.S. Army Combat Capabilities Development Command (USA); Laura Rodriguez-Suné, Univ. Politècnica de Catalunya (Spain); Kent A. Hallman, PeopleTec, Inc. (USA); Josep Trull, Crina Cojocar, Univ. Politècnica de Catalunya (Spain); Maria Antonietta Vincenti, Univ. degli Studi di Brescia (Italy)

21 August 2022 • 8:55 AM - 9:20 AM PDT | Conv. Ctr. Room 3

**12196-3****Tailoring second-harmonic generation with spatial (2) engineering in metasurfaces**

Author(s): Anna Fedotova, Friedrich-Schiller-Univ. Jena (Germany), Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Mohammadreza Younesi, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Dennis Arslan, Friedrich-Schiller-Univ. Jena (Germany); Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Maximilian Weissflog, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Thomas Pertsch, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Isabelle Staude, Friedrich-Schiller-Univ. Jena (Germany); Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Frank Setzpfandt, Abbe Ctr. of Photonics, Friedrich-Schiller-Univ. Jena (Germany); Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

21 August 2022 • 9:20 AM - 9:35 AM PDT | Conv. Ctr. Room 3

**12196-4****Nonlinearities when the index vanishes (Invited Paper)**

Author(s): Nathaniel Kinsey, Adam Ball, Dhruv Fomra, Virginia Commonwealth Univ. (USA); Ray Secondo, Virginia Commonwealth Univ. (USA); Azimuth Corp. (USA); Jingwei Wu, Mohammad A. H. Sojib, Samprity Saha, Vitaliy Avrutin, Umüt Ozgur, Virginia Commonwealth Univ. (USA)

21 August 2022 • 9:35 AM - 10:00 AM PDT | Conv. Ctr. Room 3

**12196-5****Enhanced optical nonlinearity and carrier dynamics in nano-engineered epsilon-near-zero materials (Invited Paper)**

Author(s): Howard Lee, Univ. of California, Irvine (USA), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (USA); Sudip Gurung, Univ. of California, Irvine (USA); Subhajit Bej, Tampere Univ. (Finland); Aleksei Anopchenko, Kent Nguyen, Univ. of California, Irvine (USA)

21 August 2022 • 10:00 AM - 10:25 AM PDT | Conv. Ctr. Room 3

**Break****Coffee Break 10:25 AM - 10:55 AM****SESSION 2: PHOTONICS WITH ATOMICALLY THIN MATERIALS I: IR AND THERMAL LIGHT CONTROL AND DEVICES**

21 August 2022 • 10:55 AM - 12:15 PM PDT | Conv. Ctr. Room 3

Session Chair: Howard Lee, Univ. of California, Irvine (USA)

**12196-6****CVD-graphene plasmonic metasurfaces for terahertz optoelectronics (Invited Paper)**

Author(s): Roberto Paiella, Yuyu Li, Boston Univ. (USA)

21 August 2022 • 10:55 AM - 11:20 AM PDT | Conv. Ctr. Room 3

**12196-7****Graphene-based metamaterial for on-demand spectral shaping in the mid-infrared**

Author(s): Mashnoon A. Sakib, Romil Audhkhaski, Michelle L. Povinelli, The Univ. of Southern California (USA)

21 August 2022 • 11:20 AM - 11:35 AM PDT | Conv. Ctr. Room 3

**12196-9****Ultra-low energy programmable nonvolatile silicon photonics based on phase-change materials with graphene heaters**

Author(s): Zhuoran Fang, Univ. of Washington (USA)

21 August 2022 • 11:35 AM - 11:50 AM PDT | Conv. Ctr. Room 3

**12196-23****Reconfigurable thermal absorbers and emitters (Invited Paper)**

Author(s): Michelle L. Povinelli, Romil Audhkhaski, Alok Ghanekar, Mashnoon Sakib, Ahmed Morsy, Bo Shrewsbury, The Univ. of Southern California (USA)

21 August 2022 • 11:50 AM - 12:15 PM PDT | Conv. Ctr. Room 3

**Break****Lunch Break 12:15 PM - 1:40 PM**



**SESSION 3: PHOTONICS WITH ATOMICALLY THIN MATERIALS II: PLATFORMS FOR TUNABLE AND DYNAMIC LIGHT CONTROL**

21 August 2022 • 1:40 PM - 3:25 PM PDT | Conv. Ctr. Room 3

Session Chair: Roberto Paiella, Boston Univ. (USA)

**12196-21**

**Active metasurfaces and heterostructures for phase modulation and polarization conversion (Keynote Presentation)**

Author(s): Harry A. Atwater, Caltech (USA)

21 August 2022 • 1:40 PM - 2:20 PM PDT | Conv. Ctr. Room 3

**12196-13**

**Active nonlinear nano-optics with atomically-thin materials**

Author(s): Joel D. Cox, Univ. of Southern Denmark (Denmark); Álvaro Rodríguez Echarri, ICFO - The Institute of Photonic Sciences Chapter (Spain)

21 August 2022 • 2:20 PM - 2:35 PM PDT | Conv. Ctr. Room 3

**12196-22**

**Nanophotonics with Van der Waals metastructures (Invited Paper)**

Author(s): Artur Davoyan, UCLA Samueli School Of Engg (USA)

21 August 2022 • 2:35 PM - 3:00 PM PDT | Conv. Ctr. Room 3

**12196-24**

**Optical and electronic fourier surfaces (Invited Paper)**

Author(s): David J. Norris, ETH Zurich (Switzerland)

21 August 2022 • 3:00 PM - 3:25 PM PDT | Conv. Ctr. Room 3

**Break**

**Coffee Break 3:25 PM - 3:55 PM**

**SESSION 4: PHOTONICS WITH ATOMICALLY THIN MATERIALS III: STRONG COUPLING AND QUANTUM LIGHT**

21 August 2022 • 3:55 PM - 5:50 PM PDT | Conv. Ctr. Room 3

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

**12196-14**

**Photonics with atomically thin materials (Keynote Presentation)**

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

21 August 2022 • 3:55 PM - 4:35 PM PDT | Conv. Ctr. Room 3

**12196-10**

**Monolayer exciton polariton for photonic quantum simulation (Invited Paper)**

Author(s): Arka Majumdar, Univ. of Washington (USA)

21 August 2022 • 4:35 PM - 5:00 PM PDT | Conv. Ctr. Room 3

**12196-11**

**Tunable light-matter interactions in excitonic and magnetic semiconductors (Invited Paper)**

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

21 August 2022 • 5:00 PM - 5:25 PM PDT | Conv. Ctr. Room 3

**12196-12**

**Single-photon emitters in monolayer WSe<sub>2</sub> by nano-indentation (Invited Paper)**

Author(s): Berend T. Jonker, U.S. Naval Research Lab. (USA)

21 August 2022 • 5:25 PM - 5:50 PM PDT | Conv. Ctr. Room 3

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks**

**12198-501**

**In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502**

**Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks**

**12203-501**

**Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502**

**Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break**

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

**SESSION 5: 4D LIGHT: DESIGNING PHOTONIC COMPONENTS IN SPACE-TIME**

22 August 2022 • 10:30 AM - 12:05 PM PDT | Conv. Ctr. Room 3

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

**12196-26**

**Time metamaterials (Keynote Presentation)**

Author(s): Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (USA)

22 August 2022 • 10:30 AM - 11:10 AM PDT | Conv. Ctr. Room 3

**12196-18**

**Non-reciprocal thermal emitter with dynamic modulation of graphene**

Author(s): Alok Ghanekar, The Univ. of Southern California (USA); Jiahui Wang, Shanhui Fan, Stanford Univ. (USA); Michelle L. Povinelli, The Univ. of Southern California (USA)

22 August 2022 • 11:10 AM - 11:25 AM PDT | Conv. Ctr. Room 3

**12196-27**

**Emerging directions in time-varying meta-optics (Invited Paper)**

Author(s): Francesco Monticone, Cornell Univ. (USA)

22 August 2022 • 11:25 AM - 11:50 AM PDT | Conv. Ctr. Room 3

**12196-30**

**Towards on-chip incoherent space-time wave generation**

Author(s): Omid Hemmatyar, Yufei Jia, Andrew Wilkey, Mercedesh Khajavikhan, The Univ. of Southern California (USA)

22 August 2022 • 11:50 AM - 12:05 PM PDT | Conv. Ctr. Room 3

**Break**

**Lunch Break 12:05 PM - 1:40 PM**



**SESSION 6: LEVERAGING OR BREAKING SYMMETRIES FOR EXTREME LIGHT CONTROL I: NATURAL AND DESIGNER 2D MATERIAL**

22 August 2022 • 1:40 PM - 3:15 PM PDT | Conv. Ctr. Room 3

Session Chair: Ewold Verhagen, AMOLF (Netherlands)

**12196-15**

**Topological photonics across active material platforms: from liquid crystals to 2D materials (Keynote Presentation)**

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

22 August 2022 • 1:40 PM - 2:20 PM PDT | Conv. Ctr. Room 3

**12196-16**

**Generation and resilient routing of helical lattice vibrations in mid-infrared topological metasurfaces**

Author(s): Sriram Guddala, Filipp Komissarenko, Svetlana kirjushchikina, Anton Vakulenko, Mengyao Li, The City College of New York (USA); Vinod M. Menon, The City College of New York (USA), The Graduate Ctr., CUNY (USA); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (USA), The Graduate Ctr., CUNY (USA), The City College of New York, The City Univ. of New York (USA); Alexander B. Khanikaev, The City College of New York, The City Univ. of New York (USA), The Graduate Ctr., The City Univ. of New York (USA)

22 August 2022 • 2:20 PM - 2:35 PM PDT | Conv. Ctr. Room 3

**12196-17**

**All-optical nonreciprocity and isolation in a ring resonator integrating transition metal dichalcogenides**

Author(s): Yuma Kawaguchi, Sriram Guddala, Filipp Komissarenko, Svetlana Kirjushchikina, Anton Vakulenko, The City College of New York (USA); Kai Chen, The City College of New York (USA), The City Univ. of New York (USA); Andrea Alù, The City Univ. of New York Advanced Science Research Ctr. (USA), Graduate Ctr., CUNY (USA), The City College of New York (USA); Vinod M. Menon, Graduate Ctr., CUNY (USA), The City College of New York (USA); Alexander B. Khanikaev, The City College of New York (USA), Graduate Ctr., CUNY (USA)

22 August 2022 • 2:35 PM - 2:50 PM PDT | Conv. Ctr. Room 3

**12196-19**

**Light-matter interaction with a twist- from 2D materials to photonic crystals (Invited Paper)**

Author(s): Jie Yao, Univ. of California, Berkeley (USA)

22 August 2022 • 2:50 PM - 3:15 PM PDT | Conv. Ctr. Room 3

**Break**

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

**SESSION 7: LEVERAGING OR BREAKING SYMMETRIES FOR EXTREME LIGHT CONTROL II: ALL-DIELECTRIC SYSTEMS**

22 August 2022 • 3:45 PM - 5:30 PM PDT | Conv. Ctr. Room 3

Session Chair: Stephen Hughes, Queen's Univ. (Canada)

**12196-31**

**Some recent developments in photonics (Keynote Presentation)**

Author(s): Marin Soljacic, Massachusetts Institute of Technology (USA)

22 August 2022 • 3:45 PM - 4:25 PM PDT | Conv. Ctr. Room 3

**12196-32**

**A linear passive route to transmission asymmetry with meta-gratings**

Author(s): Stavroula Foteinopoulou, The Univ. of New Mexico (USA)

22 August 2022 • 4:25 PM - 4:40 PM PDT | Conv. Ctr. Room 3

**12196-33**

**Probing topological states and their robustness in two-dimensional photonic crystals (Invited Paper)**

Author(s): Ewold Verhagen, AMOLF (Netherlands)

22 August 2022 • 4:40 PM - 5:05 PM PDT | Conv. Ctr. Room 3

**12196-34**

**Topological aspects of periodic and aperiodic photonic crystals (Invited Paper)**

Author(s): Didier Felbacq, Emmanuel Rousseau, Univ. de Montpellier (France); Emmanuel Kling, Safran Electronics & Defense (France)

22 August 2022 • 5:05 PM - 5:30 PM PDT | Conv. Ctr. Room 3

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Session Chairs: Romil Audhkhasi, The Univ. of Southern California (USA), Martin Thomaschewski, Univ. of Southern Denmark (Denmark)

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12196-95**

**Fibre-optical platform for research and applications**

Author(s): S. Kobtsev, Novosibirsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12196-97**

**AI-free structure of a highly stacked InAs quantum dot laser grown on an InP(311)B substrate**

Author(s): Kouichi Akahane, National Institute of Information and Communications Technology (Japan); Satoshi Yanase, Aoyama Gakuin Univ. (Japan), National Institute of Information and Communications Technology (Japan); Atsushi Matsumoto, Toshimasa Umezawa, Naokatsu Yamamoto, National Institute of Information and Communications Technology (Japan); Tomohiro Maeda, Aoyama Gakuin Univ. (Japan), National Institute of Information and Communications Technology (Japan); Hideyuki Sotobayashi, Aoyama Gakuin Univ. (Japan); Atsushi Kanno, National Institute of Information and Communications Technology (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12196-102**

**Hybrid micro-patch lasers with high alignment tolerance**

Author(s): Byoung Jun Park, Korea Univ. (Korea, Republic of); Yushin Kim, Stanford Univ. (USA); Moohyuk Kim, Myung-Ki Kim, Korea Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12196-103**

**Effect of plasmonic substrate on the resonance frequency of whispering gallery modes in microspheres**

Author(s): Yia-Chung Chang, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Ching-Hang Chien, National Yang Ming Chiao Tung Univ. (Taiwan); Zhan-Hong Lin, Jer-Shing Huang, Leibniz-Institut für Photonische Technologien e.V. (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 8: ADVANCES IN HARNESSING NON-CLASSICAL LIGHT I**

23 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 3

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

**12196-41**

**Nanoplasmonics as enabler of room-temperature quantum nanophotonics (Keynote Presentation)**

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

23 August 2022 • 8:00 AM - 8:40 AM PDT | Conv. Ctr. Room 3

**12196-42**

**Classical and quantum mode theories for coupled cavity resonators using quasinormal modes (Keynote Presentation)**

Author(s): Stephen Hughes, Queen's Univ (Canada)  
23 August 2022 • 8:40 AM - 9:20 AM PDT | Conv. Ctr. Room 3

**12196-40**

**Machine learning for photonics (Keynote Presentation)**

Author(s): Alexandra Boltasseva, Vladimir Shalaev, Blake Wilson, Purdue Univ. (USA)  
23 August 2022 • 9:20 AM - 10:00 AM PDT | Conv. Ctr. Room 3

**Break**

**Coffee Break 10:00 AM - 10:30 AM**

**SESSION 9: NEW PARADIGMS FOR PHOTONIC-BASED COMPUTING**

23 August 2022 • 10:30 AM - 12:15 PM PDT | Conv. Ctr. Room 3

Session Chair: Marin Soljacic, Massachusetts Institute of Technology (USA)

**12196-54**

**Non-Hermitian topology and optical computing in synthetic dimensions (Keynote Presentation)**

Author(s): Shanhui Fan, Stanford Univ. (USA)  
23 August 2022 • 10:30 AM - 11:10 AM PDT | Conv. Ctr. Room 3

**12196-56**

**Photonic devices, ASICs and systems for machine intelligence (Keynote Presentation)**

Author(s): Volker J. Sorger, The George Washington Univ. (USA)  
23 August 2022 • 11:10 AM - 11:50 AM PDT | Conv. Ctr. Room 3

**12196-55**

**Integrated photonic components for computing and beyond (Invited Paper)**

Author(s): June Sang Lee, Nikolaos Farmakidis, Harish Bhaskaran, Univ. of Oxford (United Kingdom)  
23 August 2022 • 11:50 AM - 12:15 PM PDT | Conv. Ctr. Room 3

**Break**

**Lunch/Exhibition Break 12:15 PM - 2:00 PM**

**SESSION 10: ADVANCES IN HARNESSING NON-CLASSICAL LIGHT II**

23 August 2022 • 2:00 PM - 3:30 PM PDT | Conv. Ctr. Room 3

Session Chair: Femius Koenderink, AMOLF (Netherlands)

**12196-39**

**Topological quantum photonics (Invited Paper)**

Author(s): Andrea Blanco-Redondo, Nokia Bell Labs. (USA)  
23 August 2022 • 2:00 PM - 2:25 PM PDT | Conv. Ctr. Room 3

**12196-38**

**Metasurfaces and diffractive components for quantum applications (Invited Paper)**

Author(s): Mikhail A. Kats, Univ. of Wisconsin-Madison (USA)  
23 August 2022 • 2:25 PM - 2:50 PM PDT | Conv. Ctr. Room 3

**12196-36**

**Hybrid quantum photonics: plasmonic speedup and single-photon emitters in SiN (Keynote Presentation)**

Author(s): Alexander Senichev, Zachariah O. Martin, Purdue Univ (USA), The Quantum Science Center (QSC) (USA); Samuel Peana, Purdue Univ (USA); Omer Yesilyurt, Demid Sychev, Xiaohui Xu, Alexei S. Lagutchev, Alexandra Boltasseva, Purdue Univ (USA), The Quantum Science Center (QSC) (USA); Vladimir M. Shalaev, Purdue Univ (USA), The Quantum Science Center (QSC), a National Quantum Information Science Research Center of the U.S. Department of Energy (DOE) (USA)  
23 August 2022 • 2:50 PM - 3:30 PM PDT | Conv. Ctr. Room 3

**Break**

**Coffee Break 3:30 PM - 4:00 PM**

**SESSION 11: LEVERAGING OR BREAKING SYMMETRIES FOR EXTREME LIGHT CONTROL III: NON-CLASSICAL LIGHT AND LASING**

23 August 2022 • 4:00 PM - 5:30 PM PDT | Conv. Ctr. Room 3

Session Chair: Andrea Blanco-Redondo, Nokia Bell Labs. (USA)

**12196-44**

**Femtosecond and nonlinear fourier microscopy of emitting and amplifying metalattices (Invited Paper)**

Author(s): Femius Koenderink, AMOLF (Netherlands)  
23 August 2022 • 4:00 PM - 4:25 PM PDT | Conv. Ctr. Room 3

**12196-65**

**Topological lasers and infinitely scalable Berkeley Surface Emitting Lasers (BerkSELS) (Invited Paper)**

Author(s): Boubacar Kanté, Univ. of California, Berkeley (USA)  
23 August 2022 • 4:25 PM - 4:50 PM PDT | Conv. Ctr. Room 3

**12196-46**

**Topological Insulator Lasers (Invited Paper)**

Author(s): Miguel A. Bandres, Steffen Wittek, Univ. Central Florida (USA); Gal Harari, Mordechai Segev, Technion-Israel Institute of Technology (Israel); Demetrios N. Christodoulides, Univ. Central Florida (USA); Mercedeh Khajavikhan, The Univ. of Southern California (USA)  
23 August 2022 • 4:50 PM - 5:15 PM PDT | Conv. Ctr. Room 3

**12196-88**

**Aharonov-Bohm photonic caging in multi-orbital diamond lattices**

Author(s): Rodrigo A. Vicencio, Diego Guzmán-Silva, Gabriel Cáceres-Aravena, Ignacio Salinas, Univ. de Chile (Chile)  
23 August 2022 • 5:15 PM - 5:30 PM PDT | Conv. Ctr. Room 3

**SESSION 12: PHASE-CHANGE MATERIALS I: PROGRAMMABLE AND RECONFIGURABLE PHOTONICS**

24 August 2022 • 8:35 AM - 10:20 AM PDT | Conv. Ctr. Room 3

Session Chair: Juejun Hu, Massachusetts Institute of Technology (USA)

**12196-48**

**Phase-change materials for reconfigurable nanophotonic structures (Keynote Presentation)**

Author(s): Sajjad Abdollahramezani, Hossein Taghinejad, Ali Adibi, Georgia Institute of Technology (USA)  
24 August 2022 • 8:35 AM - 9:15 AM PDT | Conv. Ctr. Room 3

**12196-50**

**Antimony trisulfide programmable photonics (Invited Paper)**

Author(s): Robert E. Simpson, Tingyu Teo, Alyssa Poh, Li Lu, Singapore Univ. of Technology and Design (Singapore); Yunzheng Wang, Shandong Univ. (Singapore); Jing Ning, Singapore Univ. of Technology and Design (Singapore); Ramon J. Paniagua Dominguez, Zhao Gang Dong, Arseniy Kuznetsov, A\*STAR Institute of Materials Research and Engineering (Singapore); Joel Yang, Singapore Univ. of Technology and Design (Singapore)  
24 August 2022 • 9:15 AM - 9:40 AM PDT | Conv. Ctr. Room 3

**12196-51**

**Reconfigurable and programmable optical devices with phase change materials Sb<sub>2</sub>S<sub>3</sub> and Sb<sub>2</sub>Se<sub>3</sub> (Invited Paper)**

Author(s): Wei Jia, Rajesh Menon, Berardi Sensale-Rodriguez, The Univ. of Utah (USA)  
24 August 2022 • 9:40 AM - 10:05 AM PDT | Conv. Ctr. Room 3

**12196-53**

**Non-mechanical reconfigurable zoom metalenses**

Author(s): Fan Yang, Hung-I Lin, Mikhail Shalaginov, Katherine Stoll, Sensong An, Massachusetts Institute of Technology (USA); Clara Rivero-Baleine, Lockheed Martin Corp. (USA); Myungkoo Kang, Univ. of Central Florida (USA); Anuradha Agarwal, Massachusetts Institute of Technology (USA); Kathleen Richardson, Univ. of Central Florida (USA); Hualiang Zhang, Univ. of Massachusetts Lowell (USA); Juejun Hu, Tian Gu, Massachusetts Institute of Technology (USA)

24 August 2022 • 10:05 AM - 10:20 AM PDT | Conv. Ctr. Room 3

**Break**

**Coffee Break 10:20 AM - 10:50 AM**

**SESSION 13: TUNABLE AND DYNAMIC PHOTONICS I**

24 August 2022 • 10:50 AM - 12:20 PM PDT | Conv. Ctr. Room 3

Session Chair: Richard M. Osgood, U.S. Army Combat Capabilities Development Command Soldier Ctr. (USA)

**12196-109**

**High-speed electro-optic guided resonance spatial light modulator**

Author(s): Mohamed Elkabbash, Dirk Englund, Sivan Trajtenberg Mills, Christopher L. Panuski, Cole Brabec, Ian R. Christen, Massachusetts Institute of Technology (USA)

24 August 2022 • 10:50 AM - 11:05 AM PDT | Conv. Ctr. Room 3

**12196-83**

**Plasmon-enhanced lithium niobate optoelectronics**

Author(s): Martin Thomaschewski, Sergey I. Bozhevolnyi, Univ. of Southern Denmark (Denmark)

24 August 2022 • 11:05 AM - 11:20 AM PDT | Conv. Ctr. Room 3

**12196-104**

**All optical modulation of high-Q plasmonic resonances**

Author(s): Dhruv Fomra, Adam Ball, Virginia Commonwealth Univ. (USA); Henri J. Lezec, National Institute of Standards and Technology (USA); Nathaniel Kinsey, Virginia Commonwealth Univ. (USA)

24 August 2022 • 11:20 AM - 11:35 AM PDT | Conv. Ctr. Room 3

**12196-52**

**Constructing active metasurfaces and dynamically tunable metadevices**

Author(s): Ru-Wen Peng, Mu Wang, Nanjing Univ. (China)

24 August 2022 • 11:35 AM - 11:50 AM PDT | Conv. Ctr. Room 3

**12196-84**

**Sub-wavelength custom reprogrammable active photonic platform for high-resolution beam shaping and holography**

Author(s): Guillaume Croes, imec (Belgium), KU Leuven (Belgium); Robert Gehlhaar, imec (Belgium); Jan Genoe, imec (Belgium), KU Leuven (Belgium)

24 August 2022 • 11:50 AM - 12:05 PM PDT | Conv. Ctr. Room 3

**12196-98**

**One-step nanoimprinting of PVA for dynamic dual-mode security metasurfaces**

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

24 August 2022 • 12:05 PM - 12:20 PM PDT | Conv. Ctr. Room 3

**Break**

**Lunch/Exhibition Break 12:20 PM - 1:50 PM**

**SESSION 14: PHASE-CHANGE MATERIALS II: ADVANCES IN PHOTONICS-FOCUSED MATERIAL AND SYSTEMS DESIGN**

24 August 2022 • 1:50 PM - 3:30 PM PDT | Conv. Ctr. Room 3

Session Chair: Harish Bhaskaran, Univ. of Oxford (United Kingdom)

**12196-57**

**New phase change materials for active photonics (Keynote Presentation)**

Author(s): Cosmin Constantin-Popescu, Mikhail Shalaginov, Fan Yang, Hung-I Lin, Sensong An, Massachusetts Institute of Technology (USA); Christopher Roberts, Paul Miller, MIT Lincoln Lab., Massachusetts Institute of Technology (USA); Myungkoo Kang, Kathleen Richardson, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA); Hualiang Zhang, Univ. of Massachusetts Lowell (USA); Clara Rivero-Baleine, Lockheed Martin Missiles and Fire Control (USA); Hyun Jung Kim, NASA Langley Research Ctr. (USA); Tian Gu, Massachusetts Institute of Technology (USA); Steven Vitale, MIT Lincoln Lab., Massachusetts Institute of Technology (USA); Juejun Hu, Massachusetts Institute of Technology (USA)

24 August 2022 • 1:50 PM - 2:30 PM PDT | Conv. Ctr. Room 3

**12196-111**

**An all-dielectric platform for non-volatile MWIR/LWIR light path reconfigurability based on optical phase-change-materials (O-PCMs)**

Author(s): Nikolaos L. Tsitsas, Aristotle Univ. of Thessaloniki (Greece); Stavroula Foteinopoulou, The Univ. of New Mexico (USA)

24 August 2022 • 2:30 PM - 2:45 PM PDT | Conv. Ctr. Room 3

**12196-58**

**Ion beam doping of phase-change materials: a platform for active metasurfaces**

Author(s): Martin Hafermann, Robin Schock, Jacob Grandmontagne, Carsten Ronning, Friedrich-Schiller-Univ. Jena (Germany)

24 August 2022 • 2:45 PM - 3:00 PM PDT | Conv. Ctr. Room 3

**12196-59**

**Quasi-continuously tunable non-volatile photonic switches**

Author(s): Rui Chen, Zhuoran Fang, Univ. of Washington (USA); Jiajiu Zheng, Analog Photonics, LLC (USA); Arka Majumdar, Univ. of Washington (USA)

24 August 2022 • 3:00 PM - 3:15 PM PDT | Conv. Ctr. Room 3

**12196-60**

**Waveguide-coupled plasmonic nanogap-integrated phase change metasurfaces**

Author(s): Ahmed H. Elfarash, B. Gholipour, Univ. of Alberta (Canada)

24 August 2022 • 3:15 PM - 3:30 PM PDT | Conv. Ctr. Room 3

**Break**

**Coffee Break 3:30 PM - 4:00 PM**

**SESSION 15: TUNABLE AND DYNAMIC PHOTONICS II**

24 August 2022 • 4:00 PM - 5:45 PM PDT | Conv. Ctr. Room 3

Session Chair: Robert E. Simpson, Singapore Univ. of Technology and Design (Singapore)

**12196-61**

**Optical rectification in inherently linear metasurfaces with broken inversion symmetry and active biophotonics (Invited Paper)**

Author(s): Richard M. Osgood, Jin Ho Kim, U.S. Army Combat Capabilities Development Command Soldier Ctr. (USA); Peter Moroshkin, Joseph Plumitallo, Jimmy Xu, Brown Univ. (USA); T. Ochiai, National Institute for Materials Science (Japan); Guinevere Strack, Univ. of Massachusetts Lowell (USA); Christopher Roberts, Mordechai Rothschild, Lalitha Parameswaran, MIT Lincoln Lab. (USA)

24 August 2022 • 4:00 PM - 4:25 PM PDT | Conv. Ctr. Room 3

**12196-63**

**Extreme light scattering and extraordinary nonlinearities in complex nanophotonic systems (Invited Paper)**

Author(s): Otto L. Muskens, Luke Burke, Haobijam J. Singh, Doxi Misatziou, Univ. of Southampton (United Kingdom); Peter R. Wiecha, Lab. d'Analyse et d'Architecture des Systèmes du CNRS (France); Antonios Kanaras, Idris Aija, Univ. of Southampton (United Kingdom)

24 August 2022 • 4:25 PM - 4:50 PM PDT | Conv. Ctr. Room 3

## CONFERENCE 12196

### 12196-62

#### Low power continuous-wave all-optical magnetic switching in ferromagnetic nanoarrays

Author(s): Kilian D. Stenning, Imperial College London (United Kingdom); Xiaofei Xiao, Imperial College London (United Kingdom), Technology Innovation Institute (United Arab Emirates); Holly H. Holder, Jack C. Gartside, Alex Vanstone, Oskar W. Kennedy, Rupert F. Oulton, Will R. Branford, Imperial College London (United Kingdom)

24 August 2022 • 4:50 PM - 5:05 PM PDT | Conv. Ctr. Room 3

### 12196-96

#### Light-switchable quasi-BIC optical vortex generators

Author(s): Yuhao Wu, Lei Kang, Sawyer D. Campbell, Pingjuan L. Werner, Douglas H. Werner, The Pennsylvania State Univ. (USA)

24 August 2022 • 5:05 PM - 5:20 PM PDT | Conv. Ctr. Room 3

### 12196-64

#### Modeling of directed particle assembly in two-dimensional structures based on constructal law (Invited Paper)

Author(s): Scott Bukosky, Air Force Research Lab. (USA); Evan Bursch, Univ. of Notre Dame (USA); Sukrith Dev, Monica Allen, Jeffery Allen, Air Force Research Lab. (USA); Nathan Anthony, Air Force Research Laboratory, Munitions Directorate (USA)

24 August 2022 • 5:20 PM - 5:45 PM PDT | Conv. Ctr. Room 3

## SESSION 16: NEW PARADIGMS FOR SENSING APPLICATIONS

25 August 2022 • 8:25 AM - 10:00 AM PDT | Conv. Ctr. Room 3

Session Chair: Kevin F. MacDonald, Optoelectronics Research Ctr. (United Kingdom)

### 12196-70

#### High-performance low-cost biosensors: opportunities and limitations (Keynote Presentation)

Author(s): Thomas F. Krauss, Univ. of York (United Kingdom)

25 August 2022 • 8:25 AM - 9:05 AM PDT | Conv. Ctr. Room 3

### 12196-68

#### Enhanced total internal reflection fluorescence imaging of viruses

Author(s): Anita Mouttou, Institut de Recherche en Infectiologie de Montpellier (France), Institut Fresnel (France); Fabien Le Marchand, Institut Fresnel (France); Manon Gourdelier, Institut de Recherche en Infectiologie de Montpellier (France); Antonin Moreau, Institut Fresnel (France); Delphine Muriaux, Institut de Recherche en Infectiologie de Montpellier (France); Julien Lumeau, Institut Fresnel (France); Cyril Favard, Institut de Recherche en Infectiologie de Montpellier (France); Aude L. Lereu, Institut Fresnel (France)

25 August 2022 • 9:05 AM - 9:20 AM PDT | Conv. Ctr. Room 3

### 12196-67

#### A new approach for the optical sensing of contaminants of emerging concern based upon core-shell nanoparticles

Author(s): Carlos A. Marquez Ibarra, The Univ. of Texas at San Antonio (USA); Gesuri Morales-Luna, Tecnológico de Monterrey (Mexico); Nicolas Large, The Univ. of Texas at San Antonio (USA); Nancy Ornelas Soto, Tecnológico de Monterrey (Mexico); Kathryn M. Mayer, The Univ. of Texas at San Antonio (USA)

25 August 2022 • 9:20 AM - 9:35 AM PDT | Conv. Ctr. Room 3

### 12196-66

#### Advances in photonic and optomechanical thermometry (Invited Paper)

Author(s): Pablo A. Postigo, The Institute of Optics, Univ. of Rochester (USA)

25 August 2022 • 9:35 AM - 10:00 AM PDT | Conv. Ctr. Room 3

### Break

Coffee Break 10:00 AM - 10:30 AM

## SESSION 17: LEVERAGING OR BREAKING SYMMETRIES FOR EXTREME LIGHT CONTROL IV: PT-SYMMETRY AND EXCEPTIONAL POINTS

25 August 2022 • 10:30 AM - 12:20 PM PDT | Conv. Ctr. Room 3

Session Chair: Antonio Garcia-Martin, Consejo Superior de Investigaciones Científicas (Spain)

### 12196-71

#### Taming Thermal Radiation with Non-Hermitian Metasurfaces (Invited Paper)

Author(s): Gururaj V. Naik, Rice Univ. (USA)

25 August 2022 • 10:30 AM - 10:55 AM PDT | Conv. Ctr. Room 3

### 12196-72

#### Exceptional point generated robust asymmetric high-order harmonics

Author(s): Hamidreza Ramezani, Amir Targholizadeh, Gui-Lei Zhu, The Univ. of Texas Rio Grande Valley (USA); Xin-You Lu, Huazhong Univ. of Science and Technology (China); Cem Yuce, The Univ. of Texas Rio Grande Valley (USA)

25 August 2022 • 10:55 AM - 11:10 AM PDT | Conv. Ctr. Room 3

### 12196-73

#### Lasing with multimode guided waves with exceptional degeneracy (Invited Paper)

Author(s): Tarek Mealy, Albert Herrero Parareda, Nathaniel Furman, Alireza Nikzamid, Filippo Capolino, Univ. of California, Irvine (USA)

25 August 2022 • 11:10 AM - 11:35 AM PDT | Conv. Ctr. Room 3

### 12196-74

#### PT-symmetric coupled-cavity AlGaAs laser for tunable THz generation

Author(s): Andrew Wilkey, The Univ. of Southern California (USA); Yifan Zhao, Univ. of California, Los Angeles (USA); Yufei Jia, The Univ. of Southern California (USA); Mona Jarrahi, Univ. of California, Los Angeles (USA); Mercedeh Khajavikhan, The Univ. of Southern California (USA)

25 August 2022 • 11:35 AM - 11:50 AM PDT | Conv. Ctr. Room 3

### 12196-75

#### Non-Hermitian skin effect in phase-locked laser arrays

Author(s): Yuzhou G. Liu, Omid Hemmatyar, The Univ. of Southern California (USA); Georgios G. Pyrialakos, Pawel S. Jung, Demetrios N. Christodoulides, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA); Mercedeh Khajavikhan, The Univ. of Southern California (USA)

25 August 2022 • 11:50 AM - 12:05 PM PDT | Conv. Ctr. Room 3

### 12196-106

#### Interplay of PT symmetry and topological charge in circular photonic arrays

Author(s): Cristian Mejía-Cortés, Jesús Muñoz-Muñoz, Univ. del Atlántico (Colombia); Mario I. Molina, Univ. de Chile (Chile)

25 August 2022 • 12:05 PM - 12:20 PM PDT | Conv. Ctr. Room 3

### Break

Lunch/Exhibition Break 12:20 PM - 1:50 PM



**SESSION 18: LEVERAGING OR BREAKING SYMMETRIES FOR EXTREME LIGHT CONTROL V: MAGNETOPHOTONIC SYSTEMS**

25 August 2022 • 1:50 PM - 2:55 PM PDT | Conv. Ctr. Room 3

Session Chair: Gururaj V. Naik, Rice Univ. (USA)

**12196-76****Active angular tuning and switching of Brewster quasi bound states in the continuum in magneto-optic metasurfaces (Invited Paper)**

Author(s): Antonio Garcia-Martin, Diego R. Abujetas, Consejo Superior de Investigaciones Científicas (Spain); Nuno de Sousa, Donostia International Physics Ctr. (Spain); Jose M. Llorens, José A. Sánchez-Gil, Consejo Superior de Investigaciones Científicas (Spain)

25 August 2022 • 1:50 PM - 2:15 PM PDT | Conv. Ctr. Room 3

**12196-77****Magneto-optical isolation and topological edge states at singular points in plasmonic structures (Invited Paper)**

Author(s): Georgios Veronis, Louisiana State Univ. (USA); Yin Huang, Central South Univ. (China); Yuecheng Shen, Sun Yat-Sen Univ. (China); Vahid Foroughi Nezhad, Chenglong You, Louisiana State Univ. (USA)

25 August 2022 • 2:15 PM - 2:40 PM PDT | Conv. Ctr. Room 3

**12196-78****Charged interlayer exciton crystallization phenomena in bilayer transition-metal-dichalcogenides**

Author(s): Igor V. Bondarev, North Carolina Central Univ. (USA); Yurii Lozovik, Institute of Spectroscopy (Russian Federation)

25 August 2022 • 2:40 PM - 2:55 PM PDT | Conv. Ctr. Room 3

**Break****Coffee Break 2:55 PM - 3:25 PM****SESSION 19: ADVANCES IN ACTIVE DEVICES AND INTEGRABLE SYSTEMS**

25 August 2022 • 3:25 PM - 4:45 PM PDT | Conv. Ctr. Room 3

Session Chair: Pablo A. Postigo, Instituto de Micro y Nanotecnología (Spain)

**12196-80****Nanomechanically nonlinear photonic metamaterials (Invited Paper)**

Author(s): Kevin F. MacDonald, Jinxiang Li, Dimitrios Papas, Jun-Yu Ou, Eric Plum, Univ. of Southampton (United Kingdom); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom), Nanyang Technological Univ. (Singapore)

25 August 2022 • 3:25 PM - 3:50 PM PDT | Conv. Ctr. Room 3

**12196-81****Nonlinear effects in modeling thin-film graded-bandgap solar cells (Invited Paper)**

Author(s): Peter B. Monk, Benjamin Civiletti, Univ. of Delaware (USA); Faiz Ahmad, COMSATS Univ. Islamabad (Pakistan); Akhlesh Lakhtakia, The Pennsylvania State Univ. (USA)

25 August 2022 • 3:50 PM - 4:15 PM PDT | Conv. Ctr. Room 3

**12196-86****Stimulated emission tomography analysis of plasmonic nanoantennas**

Author(s): John Yang, Paul Dichtl, Jefferson Florez Gutierrez, Chris Phillips, Imperial College London (United Kingdom); Alex Clark, Univ. of Bristol (United Kingdom); Rupert Oulton, Imperial College London (United Kingdom)

25 August 2022 • 4:15 PM - 4:30 PM PDT | Conv. Ctr. Room 3

**12196-93****Phase change reconfigurable grating couplers with ultrahigh modulation contrast**

Author(s): Avik Mandal, Rachel Ellis, Behrad Gholipour, Univ. of Alberta (Canada)

25 August 2022 • 4:30 PM - 4:45 PM PDT | Conv. Ctr. Room 3

**Closing Remarks**

25 August 2022 • 4:45 PM - 4:50 PM PDT | Conv. Ctr. Room 3

Session Chair: Stavroula Foteinopoulou, The Univ. of New Mexico (USA)

**Closing remarks from conference chairs.**

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

21 - 25 August 2022 | Conv. Ctr. Room 4

Conference Chairs: Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China); 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, California Institute of Technology (USA); 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-Chorng Chang, Academia Sinica (Taiwan); Harald W. Giessen, Univ. Stuttgart (Germany); Naomi J. Halas, Rice Univ. (USA); Dai-Sik Kim, Seoul National Univ. (Korea, Republic of); Wakana Kubo, Tokyo Univ. of Agriculture and Technology (Japan); Laurens K. Kuipers, FOM Institute for Atomic and Molecular Physics (Netherlands); Mikhail Lapine, The Univ. of Sydney (Australia); Ai Qun Liu, Nanyang Technological Univ. (Singapore); Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Peter Nordlander, Rice Univ. (USA); George C. Schatz, Northwestern Univ. (USA); Tigran V. Shahbazyan, Jackson State Univ. (USA); Vladimir M. Shalaev, Purdue Univ. (USA); Gennady B. Shvets, Institute for Fusion Studies (USA); 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)

## Opening Remarks

21 August 2022 • 8:30 AM - 8:35 AM PDT | Conv. Ctr. Room 4

**Welcome and opening remarks from conference chairs.**

### SESSION 1: FUNDAMENTAL OF PLASMONICS I

21 August 2022 • 8:35 AM - 10:15 AM PDT | Conv. Ctr. Room 4

Session Chair: Takuo Tanaka, RIKEN (Japan)

#### 12197-1

##### **Picophotonics (Keynote Presentation)**

Author(s): Nikolay I. Zheludev, Optoelectronics Research Ctr. (United Kingdom), Nanyang Technological Univ. (Singapore); Kevin F. MacDonald, Optoelectronics Research Ctr. (United Kingdom)

21 August 2022 • 8:35 AM - 9:15 AM PDT | Conv. Ctr. Room 4

#### 12197-2

##### **Dispersion of surface plasmon polaritons (SPPs) in weak and strong coupling regimes (Invited Paper)**

Author(s): Md Golam Rabbani Chowdhury, Shamaar R. Howard, Kanij M. Khabir, Mikhail A. Noginov, Norfolk State Univ. (USA)

21 August 2022 • 9:15 AM - 9:45 AM PDT | Conv. Ctr. Room 4

#### 12197-3

##### **Multipoles made simple and universal (Invited Paper)**

Author(s): Marco Riccardi, Andrei Kiselev, Karim Achouri, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

21 August 2022 • 9:45 AM - 10:15 AM PDT | Conv. Ctr. Room 4

## Break

**Coffee Break 10:15 AM - 10:45 AM**

### SESSION 2: PLASMONIC APPLICATIONS I

21 August 2022 • 10:45 AM - 12:15 PM PDT | Conv. Ctr. Room 4

Session Chair: Mikhail A. Noginov, Norfolk State Univ. (USA)

#### 12197-4

##### **Metamaterials for infrared spectroscopy: metals vs dielectrics (Invited Paper)**

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

21 August 2022 • 10:45 AM - 11:15 AM PDT | Conv. Ctr. Room 4

#### 12197-5

##### **Plasmonic near-fields for imaging and strong light-matter interactions in excitonic semiconductors (Invited Paper)**

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

21 August 2022 • 11:15 AM - 11:45 AM PDT | Conv. Ctr. Room 4

#### 12197-6

##### **Plasmonic solutions for all-optical, real-time image processing and phase contrast imaging (Invited Paper)**

Author(s): Ann Roberts, The Univ. of Melbourne (Australia)

21 August 2022 • 11:45 AM - 12:15 PM PDT | Conv. Ctr. Room 4

## Break

**Lunch Break 12:15 PM - 1:45 PM**

### SESSION 3: METASURFACES I

21 August 2022 • 1:45 PM - 3:55 PM PDT | Conv. Ctr. Room 4

Session Chair: Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

#### 12197-8

##### **Tunable structured light with multifunctional metasurfaces (Keynote Presentation)**

Author(s): Ahmed H. Dorrah, Federico Capasso, Harvard John A. Paulson School of Engineering and Applied Sciences (USA)

21 August 2022 • 1:45 PM - 2:25 PM PDT | Conv. Ctr. Room 4

#### 12197-121

##### **Two UV plasmonic devices by high-performance epitaxial Al metasurfaces: an ultrasensitive photodetector and a surface-enhanced resonance Raman spectroscopic (SERRS) biosensor (Invited Paper)**

Author(s): Abhishek Dubey, Ragini Mishra, National Tsing Hua Univ. (Taiwan); Yu-Hung Hsieh, National Tsing Hua Univ. (Taiwan), Research Ctr. for Applied Science (Taiwan); Chang Wei Cheng, Bao-Hsien Wu, Lih-Juann Chen, National Tsing Hua Univ. (Taiwan); Shangjr Gwo, National Tsing Hua Univ. (Taiwan), Research Ctr. for Applied Science (Taiwan); Ta-Jen Yen, National Tsing Hua Univ. (Taiwan)

21 August 2022 • 2:25 PM - 2:55 PM PDT | Conv. Ctr. Room 4

#### 12197-10

##### **Metasurface-enhanced infrared reflection spectroscopy of live cells: integrating microfluidics with plasmonics for drug screening (Invited Paper)**

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

21 August 2022 • 2:55 PM - 3:25 PM PDT | Conv. Ctr. Room 4

#### 12197-11

##### **Additive printing of gold/silver nanostructures towards plasmonic metasurfaces (Invited Paper)**

Author(s): Yangxi Zhang, A. Ping Zhang, The Hong Kong Polytechnic Univ. (Hong Kong, China)

21 August 2022 • 3:25 PM - 3:55 PM PDT | Conv. Ctr. Room 4

## Break

**Coffee Break 3:55 PM - 4:25 PM**

**SESSION 4: PLASMONIC APPLICATIONS II**

21 August 2022 • 4:25 PM - 5:15 PM PDT | Conv. Ctr. Room 4

Session Chair: Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

**12197-7****High spatiotemporal resolution live cell imaging on a plasmonic metasurface (Invited Paper)**

Author(s): Kaoru Tamada, Shi Ting Lee, Yuto Kajino, Thasaneeya Kuboki, Satoru Kidoaki, Yusuke Arima, Kyushu Univ. (Japan)

21 August 2022 • 4:25 PM - 4:55 PM PDT | Conv. Ctr. Room 4

**12197-82****Ultrafast colorimetric vapor sensors with disordered plasmonic nanoparticles**

Author(s): Jaehyuck Jang, Chunghwan Jung, Pohang Univ. of Science and Technology (Korea, Republic of); Soo-Jung Kim, Sung-Hoon Hong, Electronics and Telecommunications Research Institute (Korea, Republic of); Junsuk Rho, Pohang Univ. of Science and Technology (Korea, Republic of)

21 August 2022 • 4:55 PM - 5:15 PM PDT | Conv. Ctr. Room 4

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks****12203-501****Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502****Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break****Coffee Break 10:05 AM - 10:30 AM****SESSION 5: PLASMONIC MATERIALS AND NANOSTRUCTURES I**

22 August 2022 • 10:30 AM - 12:00 PM PDT | Conv. Ctr. Room 4

Session Chair: Howard Lee, Univ. of California, Irvine (USA)

**12197-15****Extraordinary light scattering from plasmonic lattices (Keynote Presentation)**

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

22 August 2022 • 10:30 AM - 11:10 AM PDT | Conv. Ctr. Room 4

**12197-16****Realization of ultra-sharp plasmonic nanocavity for extreme photon squeezing via collapse control (Invited Paper)**

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

22 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 4

**12197-18****Optical field mapping of nanostructures by means of vibrational spectroscopic techniques**

Author(s): Ryo Kato, Taka-aki Yano, Tokushima Univ. (Japan), RIKEN (Japan); Takayuki Umakoshi, Prabhat Verma, Osaka Univ. (Japan); Takuo Tanaka, RIKEN (Japan), Tokushima Univ. (Japan)

22 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 4

**Break****Lunch Break 12:00 PM - 1:40 PM****SESSION 6: PLASMONIC MATERIALS AND NANOSTRUCTURES II**

22 August 2022 • 1:40 PM - 3:10 PM PDT | Conv. Ctr. Room 4

Session Chair: Benjamin Vest, Lab. Charles Fabry (France)

**12197-43****Temporal modulation of dielectric permittivity in transparent conducting oxides: from tunable photonics to new phenomena (Keynote Presentation)**

Author(s): Soham Saha, Mustafa Özlü, Vladimir M. Shalaev, Alexandra Boltasseva, Purdue Univ. (USA)

22 August 2022 • 1:40 PM - 2:20 PM PDT | Conv. Ctr. Room 4

**12197-44****Laser-empowered quasi-random plasmonic metamaterials for visual security (Invited Paper)**

Author(s): Van Doan Le, Hubert Curien Lab. (France); Nicolas Dalloz, Hongfeng Ma, Manuel Alejandro Flores Figueroa, Francis Vocanson, Nathalie Destouches, Lab. Hubert Curien (France)

22 August 2022 • 2:20 PM - 2:50 PM PDT | Conv. Ctr. Room 4

**12197-87****Enhanced light-matter interaction in 2D materials coupled with metasurfaces**

Author(s): Carlos Rodríguez Fernández, Ibrahim Issah, Humeyra Caglayan, Tampere Univ. (Finland)

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 4

**Break****Coffee Break 3:10 PM - 3:40 PM****SESSION 7: METASURFACES II**

22 August 2022 • 3:40 PM - 5:30 PM PDT | Conv. Ctr. Room 4

Session Chair: Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

**12197-20****Wavefront manipulation with rolled-up metasurfaces (Invited Paper)**

Author(s): Humeyra Caglayan, Mohsin Habib, Ibrahim Issah, Daria Briukhanova, Tampere Univ. (Finland)

22 August 2022 • 3:40 PM - 4:10 PM PDT | Conv. Ctr. Room 4

**12197-23**

**Circularly polarized light emission by incandescent metasurfaces**

Author(s): Anne Nguyen, Jean-Paul Hugonin, Univ. Paris-Saclay (France), Institut d'Optique Graduate School (France), Lab. Charles Fabry, CNRS (France); Enrique Garcia-Caurel, Lab. de Physique des Interfaces et des Couches Minces, CNRS (France), Ecole Polytechnique (France), Institut Polytechnique de Paris (France); Anne-Lise Coutrot, Benjamin Vest, Jean-Jacques Greffet, Univ. Paris-Saclay (France), Institut d'Optique Graduate School (France), Lab. Charles Fabry, CNRS (France)

22 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 4

**12197-22**

**Bound states in the continuum in all-plasmonic metasurfaces (Invited Paper)**

Author(s): Yao Liang, City Univ. of Hong Kong (Hong Kong, China); Kirill Koshelev, The Australian National Univ. (Australia); Mu-Ku Chen, City Univ. of Hong Kong (Hong Kong, China); Yuri Kivshar, The Australian National Univ. (Australia); Din Ping Tsai, City Univ. of Hong Kong (China)

22 August 2022 • 4:30 PM - 5:00 PM PDT | Conv. Ctr. Room 4

**12197-19**

**"Meta"-optical fibers (Invited Paper)**

Author(s): Howard Lee, Univ. of California, Irvine (USA), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (USA); Jingyi Yang, Andrew Palmer, Leon Zhang, Univ. of California, Irvine (USA)

22 August 2022 • 5:00 PM - 5:30 PM PDT | Conv. Ctr. Room 4

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12197-75**

**Tunable mid-wave infrared multispectral response of photodetector based on Quasi-three-dimensional plasmonic nanostructure**

Author(s): Jiyeon Jeon, Korea Research Institute of Standards and Science (Korea, Republic of); Youryang Seo, Vivek Mohan More, Korea Research Institute of Standards and Science (Korea, Republic of), Yeungnam Univ. (Korea, Republic of); Hakseong Kim, Byoung Sun Chun, Korea Research Institute of Standards and Science (Korea, Republic of); Jong Su Kim, Yeungnam Univ. (Korea, Republic of); Yeongho Kim, Sang Jun Lee, Korea Research Institute of Standards and Science (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-77**

**Towards complete optical coupling to ultraconfined surface polaritons**

Author(s): Saad Abdullah, Jan Krpensky, Eduardo J.C Dias, ICFO - Institut de Ciències Fotòniques (Spain); Vahagn Mkhitarian, ICFO - Institut de Ciències Fotòniques (Spain), Purdue Quantum Science and Engineering Institute, Purdue Univ. (USA); Javier Garcia de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), Institució Catalana de Recerca i Estudis Avançats (Spain)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-78**

**Tuning of reflective optical properties on anisotropically arranged plasmonic nanostructures**

Author(s): Hyerin Song, Heesang Ahn, Taeyeon Kim, Soojung Kim, Jihyun Jung, Kyujung Kim, Pusan National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-80**

**A study of optical lithography using the bull's eye mask with an immersion medium**

Author(s): Taeyeon Kim, Byungsook Lee, Heesang Ahn, Soojung Kim, Hyerin Song, Pusan National Univ. (Korea, Republic of); Jong-ryul Choi, Daegu-Gyeongbuk Medical Innovation Foundation (Korea, Republic of); Kyujung Kim, Pusan National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-81**

**Regeneration studies of surface plasmon resonance based optical fiber biosensor**

Author(s): Priyanka Thawany, Central Scientific Instruments Organisation, Council of Scientific & Industrial Research (India); Ashima Khanna, Univ. Institute of Engineering and Technology, Panjab Univ. (India); Akash Deep, Central Scientific Instruments Organisation, Council of Scientific & Industrial Research (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-83**

**Additively manufactured nano-porous micro-scale Ag structures for SERS sensing**

Author(s): Nikolaus Porenta, Ralph Spolenak, ETH Zurich (Switzerland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-84**

**Optical geometry dependent scattering spectrum analysis of gold semi-shell structures using propagation surface plasmon**

Author(s): Tomoki Watanabe, Toshihiro Okamoto, Kenzo Yamaguchi, Masanobu Haraguchi, Tokushima Univ. (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-85**

**Fabrication of periodic Si-Au nanocone-nanoparticle arrays for homogeneous enhancement factor in Raman scattering**

Author(s): Ketki Srivastava, Dirk Jonker, Marta Lafuente, Arturo Susarrey-Arce, Albert van den Berg, Han Gardeniers, Univ. Twente (Netherlands); Ward van der Stam, Utrecht Univ. (Netherlands); Mathieu Odijk, Univ. Twente (Netherlands)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-86**

**Deep learning based approach on interferometric plasmonic microscopy images for efficient detection of nanoparticle**

Author(s): Gwiyeong Moon, Yonsei Univ. (Korea, Republic of); Taehwang Son, Massachusetts General Hospital (USA); Hongki Lee, Donghyun Kim, Yonsei Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-88**

**Plasmon-enhanced upconversion luminescence in two-dimensional halide perovskite film**

Author(s): Yen-Yu Wang, National Taiwan Univ. (Taiwan), Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Tzu-Yu Peng, National Taiwan Univ. (Taiwan); Jia-Wern Chen, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Fang-Zhou Liu, Tik-Lun Leung, The Univ. of Hong Kong (Hong Kong, China); Chih-Wei Chu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Aleksandra B. Djurišić, The Univ. of Hong Kong (Hong Kong, China); Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12197-90**

**Dynamics of microtubule motility on various nanostructures for investigation of functions of mechanical properties to influence cell survival**

Author(s): Soojung Kim, Hyerin Song, Taeyeon Kim, Kyujung Kim, Pusan National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

- 12197-91**  
**Significant improvement of green light emission efficiency of InGaN/GaN quantum wells by oxide thin films**  
 Author(s): Seiya Kaito, Tetsuya Matsuyama, Kenji Wada, Osaka Metropolitan Univ. (Japan); Mitsuru Funato, Yoichi Kawakami, Kyoto Univ. (Japan); Koichi Okamoto, Osaka Metropolitan Univ. (Japan)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-93**  
**Three-dimensional texture of canonical electromagnetic spin angular momentum in plasmonic nanostructure**  
 Author(s): Sanghyeok Park, Min-Kyo Seo, KAIST (Korea, Republic of)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-95**  
**Thin film metamaterials for extreme solar sailing**  
 Author(s): Ho-Ting Tung, Artur Davoyan, Univ. of California, Los Angeles (USA)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-99**  
**Plasmonic resonances of hybrid dielectric-metal nanopatch antennas and dynamic tunability induced by thermotropic liquid crystals**  
 Author(s): Tristan Madeleine, Giampaolo D'Alessandro, Malgosia Kaczmarek, Univ. of Southampton (United Kingdom); Vanessa Verrina, Luciano De sio, Sapienza University of Rome (Italy); Francesca Petronella, Italian National Research Council (Italy)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-100**  
**Multi-plasmon effects in the photoemission spectra of plasmonic nanostructures: plasmon satellites**  
 Author(s): Paulo André D. Gonçalves, ICFO - Institut de Ciències Fotòniques (Spain); F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-101**  
**Dynamically tunable integrated plasmonic-photonic systems for multi-color generation**  
 Author(s): Sravya Nuguri, Univ. of Massachusetts Amherst (USA); Benjamin W. Cerjan, Rice Univ. (USA); Daniel Shreiber, DEVCOM Army Research Lab. (USA); Vincent Einck, Univ. of Massachusetts Amherst (USA); Naomi J. Halas, Rice Univ. (USA); James J. Watkins, Univ. of Massachusetts Amherst (USA)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-102**  
**Controlling the emission behavior of chiral dipole emitters with a dielectric nanoantenna**  
 Author(s): Kan Yao, Yuebing Zheng, The Univ. of Texas at Austin (USA)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-105**  
**Thermal control of surface plasmons in atomically-thin materials**  
 Author(s): Eduardo Brioso Dias, Renwen Yu, ICFO - Institut de Ciències Fotòniques (Spain); Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), ICREA (Spain)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-111**  
**Greater photostability of semiconductive polymers via plasmonic enhanced fluorescence**  
 Author(s): Seth Goldberg, Carnegie Mellon Univ. (USA)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-113**  
**Lifetime enhancement of ultra-fast nonlinear plasmon resonances**  
 Author(s): Hira Asif, Ramazan Şahin, Akdeniz Üniv. (Turkey)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-114**  
**Perturbative analysis of the Wood anomalies of metallic diffraction gratings**  
 Author(s): Juan D. Castrillón Gómez, Eugenio R. Méndez Méndez, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-116**  
**Effect of size, shape, and material of plasmonic nanoparticles on hot carrier generation**  
 Author(s): Seokheon Kim, Ly Thi Minh Huynh, Joohwan Park, Sangwoon Yoon, Chung-Ang Univ (Korea, Republic of)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-118**  
**Utilization of noble metal nanolayers in laser-induced photothermal therapy**  
 Author(s): Lucie Válková, Palacký Univ. Olomouc (Czech Republic); Lucie Hochvaldová, Palacký University in Olomouc (Czech Republic); Karolína Šimkovičová, Aleš Panáček, Hana Kolářová, Palacký Univ. Olomouc (Czech Republic)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-119**  
**Tunable phase-detection sensitivity of azimuthally scanning grating-coupled surface plasmon resonance sensor**  
 Author(s): Wen-Kai Kuo, National Formosa Univ. (Taiwan)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1
- 12197-120**  
**Plasmonic silver nanolayers-modified surfaces for microthermal-induced subcellular-targeted protein damage in cells**  
 Author(s): Ales Panacek, Palacký University, Faculty of Science (Czech Republic); Lucie Hochvaldova, Palacký University (Czech Republic); Martin Mistrik, Zdenek Skrott, Palacký Univ. Olomouc (Czech Republic)  
 22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### SESSION 8: PLASMONIC MATERIALS AND NANOSTRUCTURES III

- 23 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 4  
 Session Chair: Wakana Kubo, Tokyo Univ. of Agriculture and Technology (Japan)
- 12197-24**  
**Tailoring optical field topologies with plasmonics and metamaterials (Keynote Presentation)**  
 Author(s): Vittorio Aita, Diane Roth, Anton Bykov, Anatoly V. Zayats, King's College London (United Kingdom)  
 23 August 2022 • 8:30 AM - 9:10 AM PDT | Conv. Ctr. Room 4
- 12197-25**  
**Plasmonic nanoparticle supercrystals for ultrastrong light-matter coupling (Invited Paper)**  
 Author(s): Stephanie Reich, Niclas S. Mueller, Emanuel Pfitzner, Joachim Heberle, Freie Univ. Berlin (Germany); Florian Schulz, Holger Lange, Univ. Hamburg (Germany); Eduardo B. Barros, Univ. Federal do Ceará (Brazil)  
 23 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 4
- 12197-103**  
**Influence of dopants and defects on the optical and structural properties of Zirconium Nitride**  
 Author(s): Steven Bopp, Zhaowei Liu, Univ. of California, San Diego (USA)  
 23 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 4
- Break**  
**Coffee Break 10:00 AM - 10:30 AM**



**SESSION 9: METASURFACES III**

23 August 2022 • 10:30 AM - 11:30 AM PDT | Conv. Ctr. Room 4

Session Chair: Hui Cao, Yale Univ. (USA)

**12197-41**

**Random Mie-resonant metasurfaces for nonlinear harmonic generation (Invited Paper)**

Author(s): Polina P. Vabishchevich, National Institute of Standards and Technology (USA), Univ. of Maryland (USA)

23 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 4

**12197-57**

**Wafer-scale nanofabrication of functional metasurfaces (Invited Paper)**

Author(s): Ming Lun Tseng, National Yang Ming Chiao Tung Univ. (Taiwan); Aleksandrs I. Leitis, Aurelian John-Herpin, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Yuri S. Kivshar, The Australian National Univ. (Australia); Hatice Altug, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

23 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 4

**Break**

**Lunch/Exhibition Break 11:30 AM - 1:00 PM**

**SESSION 10: RADIATION ENGINEERING AND QUANTUM PLASMONICS**

23 August 2022 • 1:00 PM - 3:30 PM PDT | Conv. Ctr. Room 4

Session Chair: Koichi Okamoto, Osaka Prefecture Univ. (Japan)

**12197-31**

**Quantum emitters in hexagonal boron nitride and plasmonic enhancement (Keynote Presentation)**

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

23 August 2022 • 1:00 PM - 1:40 PM PDT | Conv. Ctr. Room 4

**12197-32**

**Depth-targeted energy delivery deep inside random scattering media (Invited Paper)**

Author(s): Hui Cao, Yale Univ. (USA)

23 August 2022 • 1:40 PM - 2:10 PM PDT | Conv. Ctr. Room 4

**12197-68**

**Insights into the behavior of certain optical systems gleaned from Feynman's approach to quantum electrodynamics (Invited Paper)**

Author(s): Masud Mansuripur, Wyant College of Optical Sciences (USA)

23 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 4

**12197-104**

**Quantifying quantum nonlocal effects in nanoplasmonics using electron-beam spectroscopies**

Author(s): Paulo André D. Gonçalves, ICFO - Institut de Ciències Fotòniques (Spain); F. Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain); ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

23 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 4

**12197-36**

**Efficient DNA-driven method for strong coupling between a nanocavity and a few fluorophores (Invited Paper)**

Author(s): Wan-Ping Chan, Jie-Ren Li, National Cheng Kung Univ. (Taiwan); Chi Chen, Academia Sinica (Taiwan); Shiu-Yeh Chen, National Cheng Kung Univ. (Taiwan)

23 August 2022 • 3:00 PM - 3:30 PM PDT | Conv. Ctr. Room 4

**Break**

**Coffee Break 3:30 PM - 4:00 PM**

**SESSION 11: THERMAL PLASMONICS AND HOT CARRIERS**

23 August 2022 • 4:00 PM - 5:30 PM PDT | Conv. Ctr. Room 4

Session Chair: Ruzan Sokhoyan, Caltech (USA)

**12197-27**

**Superiority of metamaterial as an absorber and a heat generator (Invited Paper)**

Author(s): Wakana Kubo, Tokyo Univ. of Agriculture and Technology (Japan)

23 August 2022 • 4:00 PM - 4:30 PM PDT | Conv. Ctr. Room 4

**12197-30**

**High-quality materials and nanoantennas for plasmonic hot carrier devices (Invited Paper)**

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

23 August 2022 • 4:30 PM - 5:00 PM PDT | Conv. Ctr. Room 4

**12197-29**

**Investigation of the collective motion of water vapor microbubbles by thermoplasmonic effect (Invited Paper)**

Author(s): Kyoko Namura, Motofumi Suzuki, Kyoto Univ. (Japan)

23 August 2022 • 5:00 PM - 5:30 PM PDT | Conv. Ctr. Room 4

**SESSION 12: PLASMONIC APPLICATIONS III**

24 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 4

Session Chair: Taka-aki Yano, Tokushima Univ. (Japan)

**12197-58**

**Disordered and hybrid plasmonic systems for energy conversion (Keynote Presentation)**

Author(s): Stefan A. Maier, Imperial College London (United Kingdom)

24 August 2022 • 8:30 AM - 9:10 AM PDT | Conv. Ctr. Room 4

**12197-60**

**Characterization of monolayer graphene wrinkles via tip-enhanced Raman spectroscopy (Invited Paper)**

Author(s): Maria Vanessa Oguchi, Norihiko Hayazawa, Takuo Tanaka, RIKEN (Japan)

24 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 4

**12197-61**

**Near unity couple in efficiency of surface enhanced Raman scattering in a plasmonic waveguide**

Author(s): Ming Fu, Mónica Mota, Xiaofei Xiao, Andrea Jacassi, Imperial College London (United Kingdom); Yi Li, Imperial College London (United Kingdom), Southern Univ. of Science and Technology of China (China); Ahad Riaz, Imperial College London (United Kingdom); Stefan Maier, Imperial College London (United Kingdom), Ludwig-Maximilians-Univ. München (Germany); Rupert Oulton, Imperial College London (United Kingdom)

24 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 4

**Break**

**Coffee Break 10:00 AM - 10:30 AM**

**SESSION 13: PLASMONIC APPLICATIONS IV**

24 August 2022 • 10:30 AM - 11:50 AM PDT | Conv. Ctr. Room 4

Session Chair: Maxim R. Shcherbakov, Univ. of California, Irvine (USA)

**12197-49**

**Plasmonic and plasmonic metamaterials using random metal nanostructures for smart photonic devices (Invited Paper)**

Author(s): Koichi Okamoto, Osaka Prefecture Univ. (Japan)

24 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 4

**12197-107****Neural network design of epsilon near zero materials and absorbers**

Author(s): David Dang, Aleksei Anopchenko, Ho Wai (Howard) Lee, Univ. of California, Irvine (USA)

24 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 4

**12197-51****Active plasmon-enhanced Raman microscopy for nanoscale control of chemical reactions (Invited Paper)**

Author(s): Taka-aki Yano, Ryo Kato, Tokushima Univ. (Japan); Takuo Tanaka, Tokushima Univ. (Japan), RIKEN (Japan)

24 August 2022 • 11:20 AM - 11:50 AM PDT | Conv. Ctr. Room 4

**Break****Lunch/Exhibition Break 11:50 AM - 1:20 PM****SESSION 14: ACTIVE CONTROL**

24 August 2022 • 1:20 PM - 3:30 PM PDT | Conv. Ctr. Room 4

Session Chair: Rupert F. Oulton, Imperial College London (United Kingdom)

**12197-46****Electrically switchable metallic polymer nanoantennas, metasurfaces, and metalenses (Invited Paper)**

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

24 August 2022 • 1:20 PM - 1:50 PM PDT | Conv. Ctr. Room 4

**12197-48****Active metasurfaces for laser communications (Invited Paper)**

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

24 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 4

**12197-94****Dynamic emission control by tunable hybrid ENZ mode of two-dimensional ITO heterostructure**

Author(s): Aleksei Anopchenko, Univ. of California, Irvine (USA); Susanna Weber, Univ. of California, Berkeley (USA); Howard Lee, Univ. of California, Irvine (USA), Beckman Laser Institute and Medical Clinic (USA)

24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 4

**12197-106****Two-dimensional ITO for gate-tunable optical absorption**

Author(s): Christopher M. Gonzalez, Ho Wai Howard Lee, Alexander Galkin, Aleksei Anopchenko, Sudip Gurung, Univ. of California, Irvine (USA); Meena Salib, Villa Park High School (USA)

24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 4

**12197-47****Tunable photonic metasurfaces: fundamentals and applications (Invited Paper)**

Author(s): Maxim R. Shcherbakov, Univ. of California, Irvine (USA)

24 August 2022 • 3:00 PM - 3:30 PM PDT | Conv. Ctr. Room 4

**SESSION 15: PLASMONIC MATERIALS AND NANOSTRUCTURES IV**

24 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 4

Session Chair: Maria Vanessa Oguchi, RIKEN (Japan)

**12197-45****Enhanced light matter interaction in waveguides with extreme nanofocussing (Invited Paper)**

Author(s): Rupert F. Oulton, Ming Fu, Imperial College London (United Kingdom); Nicholas Gusken, Imperial College London (United Kingdom), Stanford Univ. (USA); Michael P. Nielsen, Imperial College London (United Kingdom), The Univ. of New South Wales (Australia); Andrea Jacassi, Monica Mota, Paul M. Dichtl, Imperial College London (United Kingdom); Xiaofei Xiao, Imperial College London (United Kingdom), Technology Innovation Institute (United Arab Emirates); Stefan A. Maier, Imperial College London (United Kingdom), Ludwig-Maximilians-Univ. (Germany)

24 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 4

**Break****Coffee/Exhibition Break 4:00 PM - 5:00 PM****SESSION 16: NONLINEAR**

25 August 2022 • 8:30 AM - 10:20 AM PDT | Conv. Ctr. Room 4

Session Chair: Benjamin Stadtmueller, Technische Univ. Kaiserslautern (Germany)

**12197-12****Nonlinear behavior of photonic-plasmonic resonators (Invited Paper)**

Author(s): Andrea M. Armani, Jinghan He, Armando Urbina, Raymond Yu, Jiaqi Yuan, The Univ. of Southern California (USA)

25 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 4

**12197-108****Saturation intensity, an overlooked nonlinear optical phenomenon in ultrathin epsilon-near-zero films**

Author(s): Sudip J. Gurung, Kent Nguyen, Univ. of California, Irvine (USA); Subhajit Bej, Tampere Univ. (Finland); Aleksei Anopchenko, Howard Lee, Univ. of California, Irvine (USA)

25 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 4

**12197-13****Geometric phase and nonlinear photonic metasurfaces (Invited Paper)**

Author(s): Guixin Li, Southern Univ. of Science and Technology of China (China)

25 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 4

**12197-14****Short-wavelength nonlinear optical meta-device (Invited Paper)**

Author(s): Jin Yao, Mu-Ku Chen, City Univ. of Hong Kong (Hong Kong, China); Ming Lun Tseng, National Yang Ming Chiao Tung Univ. (China); Michael Semmlinger, Rice Univ. (USA), Lab. for Nanophotonics, Rice Univ. (USA), Applied Physics Graduate Program, Rice Univ. (USA); Ming Zhang, Lab. for Nanophotonics, Rice Univ. (USA), Applied Physics Graduate Program, Rice Univ. (USA), Rice Univ. (USA); Tzu-Ting Huang, Research Ctr. for Applied Sciences - Academia Sinica (China); Catherine Arndt, Rice Univ. (USA), Lab. for Nanophotonics, Rice Univ. (USA), Applied Physics Graduate Program, Rice Univ. (USA); Jian Yang, Lab. for Nanophotonics, Rice Univ. (USA), Applied Physics Graduate Program, Rice Univ. (USA), Rice Univ. (USA); Hsin Yu Kuo, National Taiwan Univ. (China); Vin-Cent Su, National United Univ. (China); Cheng Hung Chu, Research Ctr. for Applied Sciences - Academia Sinica (China); Benjamin Cerjan, Rice Univ. (USA), Lab. for Nanophotonics, Rice Univ. (USA); Peter Nordlander, Naomi J. Halas, Rice Univ. (USA); Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China), Research Ctr. for Applied Sciences - Academia Sinica (China), National Taiwan Univ. (China)

25 August 2022 • 9:50 AM - 10:20 AM PDT | Conv. Ctr. Room 4

**Break****Coffee Break 10:20 AM - 10:50 AM****SESSION 17: FUNDAMENTAL OF PLASMONICS II**

25 August 2022 • 10:50 AM - 12:10 PM PDT | Conv. Ctr. Room 4

Session Chair: Yang Zhao, Holonyak Micro & Nanotechnology Lab. (USA)

**12197-66****Gate-tuning of surface plasmons and their optical properties (Invited Paper)**

Author(s): David J. Bergman, Tel Aviv Univ. (Israel); Yakov M. Strelniker, Bar-Ilan Univ. (Israel)

25 August 2022 • 10:50 AM - 11:20 AM PDT | Conv. Ctr. Room 4

**12197-98****Advances in the plasmonic response of crystalline atomically thin films**

Author(s): Álvaro Rodríguez Echarri, ICFO - Institut de Ciències Fotòniques (Spain); Joel D. Cox, Univ. of Southern Denmark (Denmark); Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

25 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 4

## CONFERENCE 12197

### 12197-65

#### **Ultrafast dynamics of plasmon- and photon-induced hot carriers in energy and momentum space (Invited Paper)**

Author(s): Benjamin Stadtmueller, Johannes Gutenberg Univ. Mainz (Germany), Technische Univ. Kaiserslautern (Germany)

25 August 2022 • 11:40 AM - 12:10 PM PDT | Conv. Ctr. Room 4

#### **Break**

**Lunch/Exhibition Break 12:10 PM - 1:40 PM**

### SESSION 18: ADVANCED NANOPHOTONIC DESIGN

25 August 2022 • 1:40 PM - 4:00 PM PDT | Conv. Ctr. Room 4

Session Chair: Yu-Jung Lu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

### 12197-70

#### **Ultrafast optical force nanoscopy (Invited Paper)**

Author(s): Hanwei Wang, Holonyak Micro & Nanotechnology Lab. (USA); Sean Michael Meyer, Catherine J. Murphy, Univ. of Illinois (USA); Yun-Sheng Chen, Beckman Institute for Advanced Science and Technology (USA); Yang Zhao, Holonyak Micro & Nanotechnology Lab. (USA)

25 August 2022 • 1:40 PM - 2:10 PM PDT | Conv. Ctr. Room 4

### 12197-71

#### **Smartphone-based spectral barcode and its application (Invited Paper)**

Author(s): Un Jeong Kim, Suyeon Lee, Hyochul Kim, Young-Geun Roh, Hojung Kim, Hyuck Choo, SAMSUNG Advanced Institute of Technology (Korea, Republic of); Yeonsang Park, Chungnam National Univ. (Korea, Republic of)

25 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 4

### 12197-72

#### **Analysis of light effect over nonlinear optical properties of Ag nanoparticles**

Author(s): Orlando Ortiz-Jimenez, Edgar Alvarado-Méndez, Univ. de Guanajuato (Mexico); Alejandro Vazquez-Dimas, Univ. Autónoma de Nuevo León (Mexico); José Amparo Andrade Lucio, Mónica Trejo-Durán, Univ. de Guanajuato (Mexico)

25 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 4

### 12197-122

#### **Hyperbolic metamaterial resonator for enhancing UV laser emission (Invited Paper)**

Author(s): Kun-Ching Shen, Lung-Hsing Hsu, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China), Research Ctr. for Applied Sciences - Academia Sinica (Taiwan); Yuh-Jen Cheng, Research Ctr. for Applied Sciences - Academia Sinica (Taiwan)

25 August 2022 • 3:00 PM - 3:30 PM PDT | Conv. Ctr. Room 4

### 12197-69

#### **Digital virus manipulation chip with a large array of all-dielectric nanocavities (Invited Paper)**

Author(s): Yuzhi Shi, Shanghai Jiao Tong Univ. (China); Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China); Yuri Kivshar, The Australian National Univ. (Australia); Ai Qun Liu, Nanyang Technological Univ. (Singapore)

25 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 4

# Optical Trapping and Optical Micromanipulation XIX

21 - 24 August 2022 | Conv. Ctr. Room 1B

Conference Chairs: Kishan Dholakia, Univ. of St. Andrews (United Kingdom); Gabriel C. Spalding, Illinois Wesleyan Univ. (USA)

Program Committee: Ashley R. Carter, Amherst College (USA); Reuven Gordon, Univ. of Victoria (Canada); Catherine M. Herne, State Univ. of New York at New Paltz (USA); Masud Mansuripur, Wyant College of Optical Sciences (USA); James Millen, King's College London (United Kingdom); David C. Moore, Yale Univ. (USA); Justus C. Ndukaife, Vanderbilt Univ. (USA); Daniel H. Ou-Yang, Lehigh Univ. (USA); Daryl Preece, Univ. of California, San Diego (USA); Ruben Ramos-Garcia, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia); Nick Vamivakas, Univ. of Rochester (USA); Karen P. Volke-Sepúlveda, Univ. Nacional Autónoma de México (Mexico); Yuebing Zheng, The Univ. of Texas at Austin (USA)

## Information

This year's OTOM will be held in honor of Michael Berns, winner of the 2022 SPIE Gold Medal, the highest honor the Society bestows. Michael always played a special role in this conference community, a beloved senior statesman who first observed optical momentum transfer to microcomponents in the late 1960s, and whose stellar research career has spanned the major history of our field. With his passing, we have lost a giant, and a dear friend to the OTOM community.

## SESSION 1: STUDIES OF DYNAMICAL BIOPHYSICAL SYSTEMS

21 August 2022 • 8:50 AM - 10:00 AM PDT | Conv. Ctr. Room 1B

Session Chair: Daryl C. Preece, Beckman Laser Institute and Medical Clinic (USA)

### 12198-1

#### Thermal noise imaging probes the 3D structure and dynamics of microtubule networks with 4 nm precision

Author(s): Michael Himmelsbach, Jordan Zesch, Ernst-Ludwig Florin, The Univ. of Texas at Austin (USA)

21 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 1B

### 12198-2

#### Elucidating mechanisms of cytoskeletal ensemble synergy using optical tweezers (Invited Paper)

Author(s): Dana Reinemann, The Univ. of Mississippi (USA)

21 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 1B

### 12198-3

#### Laser induced photolysis reveals a role of ATP in traumatic brain injury repair

Author(s): Nicole Wakida, Vincent Nguyen, Michael W. Berns, Univ. of California (USA)

21 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 1B

## Break

**Coffee Break 10:00 AM - 10:30 AM**

## SESSION 2: BIOPHOTONIC LAB-ON-A-CHIP & HYBRID SYSTEMS I

21 August 2022 • 10:30 AM - 12:10 PM PDT | Conv. Ctr. Room 1B

Session Chair: Jürgen W. Czarske, TU Dresden (Germany)

### 12198-5

#### Metallic/dielectric nanostructure for single-protein characterization (Invited Paper)

Author(s): Cuifeng Ying, Arman Yousefi, Ze Zheng, Lei Xu, Mohsen Rahmani, Nottingham Trent Univ. (United Kingdom)

21 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 1B

### 12198-6

#### Rapid analysis of single proteins and their interactions with accessible aperture-based tweezers (Invited Paper)

Author(s): Reuven Gordon, Univ. of Victoria (Canada)

21 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 1B

### 12198-7

#### Remote optical sensing by a spinning microparticle

Author(s): Elisa Ortiz-Rivero, Patricia Haro González, Daniel Jaque, Univ. Autónoma de Madrid (Spain)

21 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 1B

### 12198-9

#### Development of a fiber-based microfluidic flow cytometry platform using viscoelastic fluids for polydisperse particle suspensions

Author(s): Murat Serhatlioglu, Emil Alstrup Jensen, Maria Niora, Technical Univ. of Denmark (Denmark); Anne T. Hansen, Copenhagen Univ. Hospital, Rigshospitalet (Denmark); Christian Friberg Nielsen, Univ. of Copenhagen (Denmark); Michelle Maria Theresia Jansman, Leticia Hosta-Rigau, Technical Univ. of Denmark, Ctr. for Nanomedicine and Theranostics (Denmark); Morten H. Dziegiel, Copenhagen Univ. Hospital, Rigshospitalet (Denmark); Kirstine Berg-Sørensen, Technical Univ. of Denmark (Denmark); Ian D. Hickson, Univ. of Copenhagen (Denmark); Anders Kristensen, Technical Univ. of Denmark (Denmark)

21 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 1B

## Break

**Lunch Break 12:10 PM - 2:00 PM**

## SESSION 3: BIOPHOTONIC LAB-ON-A-CHIP & HYBRID SYSTEMS II

21 August 2022 • 2:00 PM - 3:20 PM PDT | Conv. Ctr. Room 1B

Session Chair: Kishan Dholakia, Univ. of St. Andrews (United Kingdom)

### 12198-11

#### 3D cell-rotation using multi-core fiber-based lab-on-a-chip for optical tomography

Author(s): Jiawei Sun, Nektarios Koukourakis, Jürgen W. Czarske, TU Dresden (Germany)

21 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 1B

### 12198-12

#### Nanofabrication using structured light

Author(s): Declan Armstrong, Halina Rubinsztein-Dunlop, Alexander B. Stilgoe, The Univ. of Queensland (Australia)

21 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 1B

### 12198-13

#### Hemorheological alterations of erythrocytes induced by plasmonic nanoparticles assessed with the combined application of optical tweezers and conventional microscopy modalities

Author(s): Tatiana Avsievich, Alexander Bykov, Univ. of Oulu (Finland); Anton Popov, Andrei Kabashin, Aix-Marseille Univ. (France); Igor V. Meglinski, Aston Univ. (United Kingdom)

21 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 1B

### 12198-14

#### Optical signaling through biological waveguides

Author(s): Nicolas R. Perez, Beckman Laser Institute and Medical Clinic (USA), Univ. of California, Irvine (USA); Anna Bezryadina, California State Univ., Northridge (USA); Robert H. Wilson, Beckman Laser Institute and Medical Clinic (USA); Daryl Preece, Beckman Laser Institute and Medical Clinic (USA), Univ. of California, Irvine (USA)

21 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 1B

## Break

**Coffee Break 3:20 PM - 3:50 PM**

**SESSION 4: BIOPHOTONIC LAB-ON-A-CHIP & HYBRID SYSTEMS III**

21 August 2022 • 3:50 PM - 5:00 PM PDT | Conv. Ctr. Room 1B

Session Chair: Reuven Gordon, Univ. of Victoria (Canada)

**12198-16**

**Multiplexed near-field optical trapping (Invited Paper)**

Author(s): Donato Conteduca, Univ. of York (United Kingdom); Giuseppe Brunetti, Politecnico di Bari (Italy); Giampaolo Pitruzzello, Univ. of York (United Kingdom); Kishan Dholakia, Univ. of St. Andrews (United Kingdom); Thomas F. Krauss, Univ. of York (United Kingdom); Caterina Ciminelli, Politecnico di Bari (Italy)

21 August 2022 • 3:50 PM - 4:20 PM PDT | Conv. Ctr. Room 1B

**12198-17**

**Recent advances in waveguide-based optical trapping for molecular biomarker analysis**

Author(s): Holger Schmidt, Mohammad Sampad, M. S. Saiduzzaman, Univ. of California, Santa Cruz (USA); Aaron R. Hawkins, Zach Walker, Tanner Wells, Brigham Young Univ. (USA)

21 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 1B

**12198-15**

**Controlling spatial distribution of speckle fields for multi-manipulation of colloids**

Author(s): Elyas Nasimdoust, Ramin Jamali, Faeze Amarloo, Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of); Mehdi Shafiei Aporvari, Bilkent Univ. (Turkey); Sabareesh K. P. Velu, Rathinam College of Arts and Science (India); Ali-Reza Moradi, Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of)

21 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 1B

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks**

**12198-501**

**In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502**

**Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks**

**12203-501**

**Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502**

**Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break**

**Coffee Break 10:05 AM - 10:35 AM**

**SESSION 5: PHOTONIC DEVICES FOR OPTICALLY INDUCED FORCES**

22 August 2022 • 10:35 AM - 12:05 PM PDT | Conv. Ctr. Room 1B

Session Chair: Justus C. Ndukaife, Vanderbilt Univ. (USA)

**12198-20**

**Optical measurements of the picosecond fluid mechanics generated by vibrating nanostructures**

Author(s): Matthew A. Pelton, Univ. of Maryland, Baltimore County (USA)

22 August 2022 • 10:35 AM - 10:55 AM PDT | Conv. Ctr. Room 1B

**12198-21**

**Optical trapping in a material world (Invited Paper)**

Author(s): Kishan Dholakia, Univ. of St. Andrews (United Kingdom)

22 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 1B

**12198-22**

**Design study for an optical conveyor using lateral optical forces**

Author(s): Simon Hanna, Michael O'Donnell, Univ. of Bristol (United Kingdom)

22 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 1B

**12198-23**

**Optical levitation with a metasurface lens**

Author(s): Tongcang Li, Purdue Univ. (USA)

22 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 1B

**Break**

**Lunch Break 12:05 PM - 1:35 PM**

**SESSION 6: SYSTEMS WITH BROKEN SYMMETRY, INCLUDING OPTICAL ANGULAR MOMENTUM**

22 August 2022 • 1:35 PM - 3:05 PM PDT | Conv. Ctr. Room 1B

Session Chair: Masud Mansuripur, Wyant College of Optical Sciences (USA)

**12198-24**

**Recent applications of optical tweezers: from Casimir force measurements to enantioselective manipulation of chiral particles. (Invited Paper)**

Author(s): Paulo Maia Neto, Univ. Federal do Rio de Janeiro (Brazil)

22 August 2022 • 1:35 PM - 2:05 PM PDT | Conv. Ctr. Room 1B

**12198-26**

**Dynamics of particle clusters in vortex beams**

Author(s): Simon Hanna, Michael O'Donnell, Univ. of Bristol (United Kingdom)

22 August 2022 • 2:05 PM - 2:25 PM PDT | Conv. Ctr. Room 1B

**12198-27**

**Optical rotation of a nanoparticle drive by optical torque of plasmonic nano-vortex field**

Author(s): Yuji Sunaba, Hokkaido Univ. (Japan); Hideki Fujiwara, Hokkai-Gakuen Univ. (Japan); Christophe Pin, Keiji Sasaki, Hokkaido Univ. (Japan)

22 August 2022 • 2:25 PM - 2:45 PM PDT | Conv. Ctr. Room 1B

**12198-30**

**Optically driven nano-motors designed by machine learning**

Author(s): Mintae Chung, Karim Achouri, Olivier J. F. Martin, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

22 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 1B

**Break**

**Coffee Break 3:05 PM - 3:25 PM**



**SESSION 7: OPTICAL MANIPULATION OF MATTER THROUGH GASEOUS MEDIA**

22 August 2022 • 3:25 PM - 4:25 PM PDT | Conv. Ctr. Room 1B

Session Chair: Kishan Dholakia, Univ. of St. Andrews (United Kingdom)

**12198-41****A water droplet as a toy atom**

Author(s): Javier Marmolejo, Göteborgs Univ. (Sweden); Adriana Canales, Chalmers Univ. of Technology (Sweden); Dag Hanstorp, Göteborgs Univ. (Sweden); Ricardo Méndez-Fragoso, Univ. Nacional Autónoma de México (Mexico)

22 August 2022 • 3:25 PM - 3:45 PM PDT | Conv. Ctr. Room 1B

**12198-42****Coupling Between Modulated Mie Scattering and Photoacoustic Signal Generation in Optically Trapped, Single Aerosol Particles**

Author(s): Michael Gleichweit, Dominique Borgeaud dit Avocat, Matus E. Diveky, ETH Zürich (Switzerland); Grégory David, ETH Zurich (Switzerland); Ruth Signorell, ETH Zürich (Switzerland)

22 August 2022 • 3:45 PM - 4:05 PM PDT | Conv. Ctr. Room 1B

**12198-43****Measuring charging and discharging rates of isolated aerosol particles**

Author(s): Isaac C. D. Lenton, Andrea Stöllner, Scott R. Waitukaitis, Institute of Science and Technology Austria (Austria)

22 August 2022 • 4:05 PM - 4:25 PM PDT | Conv. Ctr. Room 1B

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12198-67****Laser-induced photolysis leads to a Ca<sup>2+</sup> transient in surrounding astrocytes which is dependent on internal stores**

Author(s): Veronica Gomez-Godinez, Huayan Li, Yixuan Kuang, Linda Shi, Michael W. Berns, Univ. of California, San Diego (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-69****Data-driven analysis by Raman spectroscopy for ABO blood typing**

Author(s): Emil Alstrup Jensen, Murat Serhatlioglu, Airidas Žukauskas, Cihan Uyanik, Technical Univ. of Denmark (Denmark); Anne T. Hansen, Copenhagen Univ. Hospital, Rigshospitalet (Denmark); Sadasivan Puthusserypady, Technical Univ. of Denmark (Denmark); Morten H. Dziegiel, Copenhagen Univ. Hospital, Rigshospitalet (Denmark); Anders Kristensen, Technical Univ. of Denmark (Denmark)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-70****Investigating single cell topology with optically trapped nanoparticles**

Author(s): Emelie Tornéus, Chalmers Univ. of Technology (Sweden); Caroline Adiels, Göteborgs Univ. (Sweden); Hana Šípová-Jungová, Chalmers Univ. of Technology (Sweden)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-71****Optical manipulation of single DNA molecules by depletion interactions**

Author(s): David Simon, Tobias Thalheim, Frank Cichos, Univ. Leipzig (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-72****Investigation of the power spectral density of a scaled model simulation of an optical tweezer**

Author(s): Vatsal Joshi, Alan P. Bowling, The Univ. of Texas at Arlington (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-73****Detection of hot ballistic Brownian motion with optical tweezers**

Author(s): Xiaoya Su, Frank Cichos, Univ. Leipzig (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-74****The modal evolution of the Gouy phase, with application to optical bottle beams**

Author(s): Yossif Elmadny, Bhavin Koirala, Gabriel C. Spalding, Illinois Wesleyan Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-75****Anapole-assisted near-field optical trapping**

Author(s): Ikjun Hong, Chuchuan Hong, Guodong Zhu, Theodore Anyika, Justus Ndukaife, Vanderbilt Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-76****Optical trapping of dielectric microparticles with the focused annular beam**

Author(s): Sumit Yadav, Abdul Alim, Arijit Kumar De, Indian Institute of Science Education and Research Mohali (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-77****Experimental methods for diagnosing the movement of carbon nanoparticles in a complex optical field**

Author(s): Dmytro Ivanskyi, Vladyslav M. Tkachuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-78****Analysis of the size of carbon nanoparticles on their motion in a speckle field**

Author(s): Vladyslav M. Tkachuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-79****Reconfigurable optical manipulation and assembly of functional nanowires on solid substrates**

Author(s): Zhihan Chen, Jingang Li, Yuebing Zheng, The Univ. of Texas at Austin (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-82****Rotation of nanoparticles on solid substrates via opto-thermocapillary forces**

Author(s): Pavana Siddhartha Kollipara, Jingang Li, Yuebing Zheng, The Univ. of Texas at Austin (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-84****3D manipulation of vapor microbubbles driven by the Marangoni force**

Author(s): Julio Aurelio Sarabia-Alonso, Rubén Ramos-García, Joaquín Alberto Ascencio-Rodríguez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); José Gabriel Ortega-Mendoza, Univ. Tecnológica de Tulancingo (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-85****Simulation and fabrication of 3D structures for photophoretic levitation**

Author(s): Thomas Celenza, Andy Eskenazi, Zhipeng Lu, Leah Tesfa, Lorenzo Yao-Bate, Mohsen Azadi, Matthew Campbell, Igor Bargatin, Univ. of Pennsylvania (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## CONFERENCE 12198

**12198-87**

### **Investigating opto-thermophoresis of liquid droplets to understand charging of water/oil interfaces**

Author(s): Youngsun Kim, Yuebing Zheng, The Univ. of Texas at Austin (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-88**

### **Optical design of nano-aperture plasmonic optical tweezers for ultra-high field enhancement and nanoscale optical force generation**

Author(s): Theodore Anyika, Justus Ndukaife, Chuchuan Hong, Vanderbilt Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12198-89**

### **Isolation and optical studies of nature-found microplastics from the ocean**

Author(s): Viktor Nascak, Noorulhoda Kazemi, Anna S. Bezryadina, California State Univ., Northridge (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## **SESSION 8: SHAPING THE FLOW OF INFORMATION, ENERGY, AND MOMENTUM**

23 August 2022 • 8:45 AM - 10:25 AM PDT | Conv. Ctr. Room 1B

Session Chair: Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia)

**12198-31**

### **Programmable random lasers from reversible colloidal assemblies**

Author(s): Giorgio Volpe, Univ. College London (United Kingdom)

23 August 2022 • 8:45 AM - 9:05 AM PDT | Conv. Ctr. Room 1B

**12198-33**

### **Superkicks and momentum density test via micromanipulation**

Author(s): Andrei Afanasev, The George Washington Univ. (USA); Carl E. Carlson, William & Mary (USA); Asmita Mukherjee, Indian Institute of Technology Bombay (India)

23 August 2022 • 9:05 AM - 9:25 AM PDT | Conv. Ctr. Room 1B

**12198-34**

### **Optically powered train of microparticles**

Author(s): Pawel Karpinski, Wroclaw Univ. of Science and Technology (Poland)

23 August 2022 • 9:25 AM - 9:45 AM PDT | Conv. Ctr. Room 1B

**12198-35**

### **Linear and angular momenta of photons in the context of “which path” experiments of quantum mechanics**

Author(s): Masud Mansuripur, Wyant College of Optical Sciences (USA)

23 August 2022 • 9:45 AM - 10:05 AM PDT | Conv. Ctr. Room 1B

**12198-36**

### **Optical manipulation of matter waves**

Author(s): Kamran Akbari, Valerio Di Giulio, ICFO - Institut de Ciències Fotòniques (Spain); Javier Garcia de Abajo, ICFO - Institut de Ciències Fotòniques (Spain); ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

23 August 2022 • 10:05 AM - 10:25 AM PDT | Conv. Ctr. Room 1B

**Break**

**Coffee Break 10:25 AM - 10:55 AM**

## **SESSION 9: PRECISION MEASUREMENT INCLUDING TESTING FUNDAMENTAL PHYSICS I**

23 August 2022 • 10:55 AM - 12:05 PM PDT | Conv. Ctr. Room 1B

Session Chair: Gabriel C. Spalding, Illinois Wesleyan Univ. (USA)

**12198-37**

### **High-Q nanomechanical torsion beams for quantum experiments and precision sensing**

Author(s): Christian M. Pluchar, Aman R. Agrawal, Charles A. Condos, Wyant College of Optical Sciences, The Univ. of Arizona (USA); Jon Pratt, Stephan Schlamminger, National Institute of Standards and Technology (USA); Dalziel Wilson, Wyant College of Optical Sciences, The Univ. of Arizona (USA)

23 August 2022 • 10:55 AM - 11:15 AM PDT | Conv. Ctr. Room 1B

**12198-38**

### **Optical trapping of hexagonal microdisks for detection of high frequency gravitational waves (Invited Paper)**

Author(s): Zhiyuan (Aaron) Wang, Shelby Klomp, George P. Winstone, Daniel H. Grass, Andrew Laeuger, Northwestern Univ. (USA); Greg Felsted, Peter Pauzuskie, Univ. of Washington (USA); Jacob Sprague, Nancy Aggarwal, Shane L. Larson, Vicky Kalogera, Andrew Geraci, Northwestern Univ. (USA)

23 August 2022 • 11:15 AM - 11:45 AM PDT | Conv. Ctr. Room 1B

**12198-39**

### **Fundamental physics tests with optically trapped dielectric objects**

Author(s): Andrew Geraci, Northwestern Univ. (USA)

23 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 1B

**Break**

**Lunch/Exhibition Break 12:05 PM - 1:35 PM**

## **SESSION 10: PRECISION MEASUREMENT INCLUDING TESTING FUNDAMENTAL PHYSICS II**

23 August 2022 • 1:35 PM - 3:45 PM PDT | Conv. Ctr. Room 1B

Session Chair: Andrew Geraci, Northwestern Univ. (USA)

**12198-44**

### **Controlling electric dipole moments in levitated optomechanics**

Author(s): Molly Watts, Gadi Afek, Sarah Dickson, Fernando Monteiro, Luke Mozarsky, Juan Recoaro, Benjamin Siegel, Yu-Han Tseng, Jiaxiang Wang, David C. Moore, Yale Univ. (USA)

23 August 2022 • 1:35 PM - 1:55 PM PDT | Conv. Ctr. Room 1B

**12198-47**

### **Nonconservative levitated optomechanics (Invited Paper)**

Author(s): Yoshihiko Arita, Univ. of St. Andrews (United Kingdom), Chiba Univ. (Japan); Stephen Simpson, Institute of Scientific Instruments of the CAS, v.v.i. (Czech Republic); Graham Bruce, Univ. of St. Andrews (United Kingdom); Pavel Zemánek, Institute of Scientific Instruments of the CAS, v.v.i. (Czech Republic); Kishan Dholakia, Univ. of St. Andrews (United Kingdom), Chiba University (Japan), Yonsei Univ. (Korea, Republic of)

23 August 2022 • 1:55 PM - 2:25 PM PDT | Conv. Ctr. Room 1B

**12198-48**

### **Levitated cavity optomechanics at UCL exploiting coherent scattering (Invited Paper)**

Author(s): Antonio Pontin, Hayden Fu, Tania S. Monteiro, Peter F. Barker, Univ. College London (United Kingdom)

23 August 2022 • 2:25 PM - 2:55 PM PDT | Conv. Ctr. Room 1B

**12198-49**

### **A cavity optomechanical platform for GHz phonon amplification via Anderson-localized optical modes**

Author(s): Ryan C. Ng, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); Guillermo Arregui, DTU Fotonik (Denmark); Guilhem Madiot, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); Marcus Albrechtsen, DTU Fotonik (Denmark); Omar Florez, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); Søren Stobbe, DTU Fotonik (Denmark); Clivia M. Sotomayor-Torres, David Garcia, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain)

23 August 2022 • 2:55 PM - 3:15 PM PDT | Conv. Ctr. Room 1B

**12198-46****Force spectrum calibration and displacement calibration of optically levitated particles in vacuum (Invited Paper)**

Author(s): Huizhu Hu, Zhejiang Univ. (China), Zhejiang Lab. (China); Zhenhai Fu, Zhejiang Lab. (China); Nan Li, Zhejiang Univ. (China); Xiaowen Gao, Zhejiang Lab. (China)

23 August 2022 • 3:15 PM - 3:45 PM PDT | Conv. Ctr. Room 1B

**SESSION 11: STATISTICAL MECHANICS OF SMALL SYSTEMS**

24 August 2022 • 8:30 AM - 10:30 AM PDT | Conv. Ctr. Room 1B

Session Chair: Gabriel C. Spalding, Illinois Wesleyan Univ. (USA)

**12198-54****Ordering and dynamics of active matter systems on static and dynamic periodic optical substrates (Invited Paper)**

Author(s): Charles M. Reichhardt, Cynthia Reichhardt, Los Alamos National Lab. (USA)

24 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 1B

**12198-56****Levitated nanoparticle thermometry of heat conduction in rarified gases**

Author(s): Danika R. Luntz-Martin, Dinesh K. Bommididi, Kai Zhang, Andrea D. Pickel, A. Nick Vamivakas, Univ. of Rochester (USA)

24 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 1B

**12198-57****Synthesis and thermometry of optically-trapped NV-nanodiamond/ -NaF composite nanostructures**

Author(s): Lars Forberger, Robert G. Felsted, Univ. of Washington (USA); Danika R. Luntz-Martin, Nick Vamivakas, Univ. of Rochester (USA); Peter J. Pauzaskie, Univ. of Washington (USA)

24 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 1B

**12198-58****Solid-state laser refrigeration of core-shell polystyrene microspheres**

Author(s): Xiaojing Xia, Lawrence Berkeley National Lab. (USA); Rachel Garipey, Robert G. Felsted, Univ. of Washington (USA); Ayelet Teitelboim, Lawrence-Berkeley National Lab. (USA); Emory M. Chan, Lawrence Berkeley National Lab. (USA); Peter Pauzaskie, Univ. of Washington (USA)

24 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 1B

**12198-59****Trapping and monitoring of single nanoparticle using a metallic nanoantenna (Invited Paper)**

Author(s): Seung Ju Yoon, Da In Song, KAIST (Korea, Republic of), LG Display (Korea, Republic of); Jungmin Lee, KAIST (Korea, Republic of), SAMSUNG Electronics Co., Ltd. (Korea, Republic of); Myung-Ki Kim, Korea Univ. (Korea, Republic of); Yong-Hee Lee, KAIST (Korea, Republic of); Chang-Kyu Kim, Korea Polytechnic Univ. (Korea, Republic of)

24 August 2022 • 10:00 AM - 10:30 AM PDT | Conv. Ctr. Room 1B

**Break****Coffee Break 10:30 AM - 11:00 AM****SESSION 12: NEAR-FIELD MICROMANIPULATION, PLASMONIC, AND NANOPARTICLE TRAPPING**

24 August 2022 • 11:00 AM - 12:00 PM PDT | Conv. Ctr. Room 1B

Session Chair: Rubén Ramos-García, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico)

**12198-50****Multiplexed long-range electrohydrodynamic transport and near-field optical trapping with cascaded bowtie photonic crystal nanobeams**

Author(s): Sen Yang, Joshua A. Allen, Institute of Nanoscale Science and Engineering, Vanderbilt Univ. (USA); Chuchuan Hong, Vanderbilt Univ. (USA); Kellen P. Arnold, Institute of Nanoscale Science and Engineering, Vanderbilt Univ. (USA); Sharon M. Weiss, Justus C. Ndukaife, Vanderbilt Univ. (USA)

24 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 1B

**12198-51****Electrically Controlled Thermohydrodynamic Trapping of Single Nanoparticles**

Author(s): Martin Fränzl, Frank Cichos, Univ. Leipzig (Germany)

24 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 1B

**12198-53****Electrically controlled plasmonic conveyor belt network for optical trapping and manipulation of nanoscale objects**

Author(s): Peter Qiang Liu, Puspita Paul, Univ. at Buffalo (USA)

24 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 1B

**Break****Lunch/Exhibition Break 12:00 PM - 1:30 PM****SESSION 13: EXTENSIONS OF THE OTOM TOOLKIT**

24 August 2022 • 1:30 PM - 3:40 PM PDT | Conv. Ctr. Room 1B

Session Chair: Yuebing Zheng, The Univ. of Texas at Austin (USA)

**12198-60****A revolution in optical tweezers: noninvasive manipulation and extension of working environments (Invited Paper)**

Author(s): Jingang Li, Univ. of California, Berkeley (USA)

24 August 2022 • 1:30 PM - 2:00 PM PDT | Conv. Ctr. Room 1B

**12198-61****Periodic feedback effect in counterpropagating intracavity optical tweezers**

Author(s): Antonio Ciarlo, Giuseppe Pesce, Univ. degli Studi di Napoli Federico II (Italy); Fatemeh Kalantarifard, Technical Univ. of Denmark (Denmark); Parviz Elahi, Bogaziçi Üniv. (Turkey); Agnese Callegari, Giovanni Volpe, Göteborgs Univ. (Sweden); Antonio Sasso, Univ. degli Studi di Napoli Federico II (Italy)

24 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 1B

**12198-64****Interplay of thermal and nonlinear processes for stable optical tweezers**

Author(s): Debabrata Goswami, Indian Institute of Technology Kanpur (India)

24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 1B

**12198-65****Improving stability and thermal sensitivity of an optically trapped upconversion nanoparticle by coating with a thermo-sensitive polymer**

Author(s): Dasheng Lu, Univ. Autónoma de Madrid (Spain); Jorge Rubio Retama, Univ. Complutense de Madrid (Spain); Ricardo Marin, Manuel Marqués, Patricia Haro-González, Daniel Jaque, Univ. Autónoma de Madrid (Spain)

24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 1B

**12198-66****Optical magnetic trapping of nanoparticles**

Author(s): Sui Yang, Univ. of California, Berkeley (USA), Arizona State Univ. (USA); Xuexin Ren, Univ. of California at Berkeley (USA); Rongkuo Zhao, Univ. of California, Berkeley (USA); Bo Wang, Fudan Univ. (China); Haokun Li, Yuan Wang, Univ. of California, Berkeley (USA); Lei Shi, Fudan Univ. (China); Xiang Zhang, Univ. of California, Berkeley (USA), The Univ. of Hong Kong (Hong Kong, China)

24 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 1B

**12198-10****Hybrid optical and 3D acoustic trapping in a 'sono-optical' microfluidic chip for flexible manipulation of biological samples**

Author(s): Mia Kvåle Løvmo, Simon Moser, Gregor Thalhammer, Monika Ritsch-Marte, Medizinische Univ. Innsbruck (Austria)

24 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 1B

**Physical Chemistry of Semiconductor Materials and Interfaces XXI**

23 - 24 August 2022 | Conv. Ctr. Room 6C

Conference Chairs: Andrew J. Musser, Cornell Univ. (USA); 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, The Rowland Institute at Harvard (USA); Felix Deschler, Technische Univ. München (Germany); Alexandre Fürstenberg, Univ. de Genève (Switzerland); David S. Ginger, Univ. of Washington (USA); Naomi S. Ginsberg, Univ. of California, Berkeley (USA); Robert Lovrincic, Technische Univ. Braunschweig (Germany); Paul Meredith, Swansea Univ. (United Kingdom); Christian Nielsen, Queen Mary Univ. of London (United Kingdom); Linda A. Peteanu, Carnegie Mellon Univ. (USA); Lee J. Richter, National Institute of Standards and Technology (USA); Carlos Silva, Georgia Institute of Technology (USA); Sergei Tretiak, Los Alamos National Lab. (USA); Lauren Webb, The Univ. of Texas at Austin (USA); Omer Yaffe, Weizmann Institute of Science (Israel)

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12199-7****Investigation of the cyclic switchover effect for a quantum point-contact detector of gaseous and liquid media**

Author(s): Anna Gerus, B. Verkin Institute for Low Temperature Physics and Engineering of NASU (Ukraine)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 1: LOW-DIMENSIONAL MATERIALS AND INTERFACES**

23 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 6C

Session Chair: Aaron S. Rury, Wayne State Univ. (USA)

**12199-1****Hot carrier cooling dynamics in low-dimensional lead halide perovskites**

Author(s): Ben Carwithen, Imperial College London (United Kingdom); Thomas R. Hopper, Stanford Univ. (USA); Ziyuan Ge, Navendu Mondal, Imperial College London (United Kingdom); Franziska Krieg, Federico Montanarella, ETH Zurich (Switzerland); Martin Kroll, Karl Leo, Yana Vaynzof, TU Dresden (Germany); Maryna Bodnarchuk, Maksym Kovalenko, ETH Zurich (Switzerland); Artem Bakulin, Imperial College London (United Kingdom)

23 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 6C

**12199-2****Having it all: spatiotemporally discerning charge and heat in energy transduction and nanoscale transport (Invited Paper)**

Author(s): Hannah L. Weaver, Univ. of California, Berkeley (USA); Cora M. Went, Caltech (USA); Dipti Jasarasaria, Univ. of California, Berkeley (USA); Joeson Wong, Caltech (USA); Eran Rabani, Univ. of California, Berkeley (USA); Harry A. Atwater, Caltech (USA); Naomi S. Ginsberg, Univ. of California, Berkeley (USA)

23 August 2022 • 8:20 AM - 8:50 AM PDT | Conv. Ctr. Room 6C

**12199-3****Ultrafast excitonic response in layered hybrid perovskites driven by intense mid-infrared pulses**

Author(s): Peijun Guo, Shunran Li, Yale Univ. (USA); Xiaotong Li, Northwestern Univ. (USA); Constantinos C. Stoumpos, Univ. of Crete (Greece); Mercouri G. Kanatzidis, Northwestern Univ. (USA)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 6C

**12199-5****Dark-exciton driven energy funneling into dielectric inhomogeneities in two-dimensional semiconductors**

Author(s): Haowen Su, Ding Xu, Shan-Wen Cheng, Baichang Li, Song Liu, Columbia Univ. (USA); Kenji Watanabe, Takashi Taniguchi, National Institute for Materials Science (Japan); Timothy C. Berkelbach, James Hone, Milan Delor, Columbia Univ. (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 6C

**12199-6****Compositional engineering in 2D monolayer silver-bismuth double perovskites (Invited Paper)**

Author(s): Teresa Gatti, Justus-Liebig-Universität Giessen (Germany)

23 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6C

**Break****Coffee Break 10:00 AM - 10:25 AM****SESSION 2: ADVANCES IN POLARITONICS**

23 August 2022 • 10:25 AM - 12:45 PM PDT | Conv. Ctr. Room 6C

Session Chair: MingLee Tang, The Univ. of Utah (USA)

**12199-7****Rabi oscillations in disguise: strong exciton-surface plasmon polariton coupling probed by two-dimensional electronic spectroscopy (Invited Paper)**

Author(s): Christoph Lienau, Carl von Ossietzky Univ. Oldenburg (Germany)

23 August 2022 • 10:25 AM - 10:55 AM PDT | Conv. Ctr. Room 6C

**12199-8****Molecular cavity polariton formation using multimode resonator structures (Invited Paper)**

Author(s): Aleksandr G. Avramenko, Aaron S. Rury, Wayne State Univ. (USA)

23 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 6C

**12199-9****Ultrafast imaging of polariton propagation and interactions**

Author(s): Ding Xu, Milan Delor, Arkajit Mandal, David R. Reichman, Shanwen Cheng, James M. Baxter, Inki Lee, Columbia Univ. (USA)

23 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 6C

**12199-10****Theoretical investigations of intermolecular and polariton energy transport in disordered multimode photonic wires (Invited Paper)**

Author(s): Raphael F. Ribeiro, Charles Qi, Kyle Kairys, Emory Univ. (USA)

23 August 2022 • 11:45 AM - 12:15 PM PDT | Conv. Ctr. Room 6C

**12199-11****Photophysics and photochemistry of functionalized acene and anthradithiophene derivatives in microcavities (Invited Paper)**

Author(s): Oksana Ostroverkhova, Winston Goldthwaite, Roshell Lamug, Jonathan Van Schenck, Richard Puro, Oregon State Univ. (USA); John E. Anthony, Univ. of Kentucky (USA)

23 August 2022 • 12:15 PM - 12:45 PM PDT | Conv. Ctr. Room 6C

**Break****Lunch/Exhibition Break 12:45 PM - 2:15 PM**



**SESSION 3: ADVANCES IN ORGANIC SOLAR CELLS: JOINT SESSION WITH CONFERENCES 12199 AND 12209**

23 August 2022 • 2:15 PM - 5:00 PM PDT | Conv. Ctr. Room 6C

Session Chairs: Anna Köhler, Univ. Bayreuth (Germany), Martijn Kemerink, Ruprecht-Karls-Univ. Heidelberg (Germany)

**This Session is of related interest to Conference 12199: Physical Chemistry of Semiconductor Materials and Interfaces XXI and Conference 12209: Organic, Hybrid, and Perovskite Photovoltaics XXIII****12199-25****Can organic solar cells surpass the Shockley-Queisser limit? (Invited Paper)**

Author(s): Martijn Kemerink, Ruprecht-Karls-Univ. Heidelberg (Germany)

23 August 2022 • 2:15 PM - 2:45 PM PDT | Conv. Ctr. Room 6C

**12209-1****A universal conundrum of determination of Frenkel exciton binding energy**

Author(s): Somayeh Kashani, North Carolina State Univ. (USA); Jeromy J. Rech, The Univ. of North Carolina at Chapel Hill (USA); Tuo Liu, Kyle Baustert, Univ. of Kentucky (USA); Wei You, The Univ. of North Carolina at Chapel Hill (USA); Kenneth Graham, Univ. of Kentucky (USA); Carlos Silva, Natalie Stingelin, Georgia Institute of Technology (USA); Gitti Frey, Technion-Israel Institute of Technology (Israel); Harald Ade, North Carolina State Univ. (USA)

23 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 6C

**Coffee Break 3:05 PM - 3:30 PM****12209-3****Interfacial energetic landscape in non-fullerene acceptor organic solar cells and its impact on device performance (Invited Paper)**

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

23 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 6C

**12209-29****Grazing incidence x-ray and neutron scattering based organic and perovskite photovoltaic studies (Invited Paper)**

Author(s): Xinhui Lu, The Chinese Univ. of Hong Kong (Hong Kong, China)

23 August 2022 • 4:00 PM - 4:30 PM PDT | Conv. Ctr. Room 6C

**12199-26****Organic solar cells based on Y-series non-fullerene acceptors: from charge separation to device performance (Invited Paper)**

Author(s): Safa Shoaee, Univ. Potsdam (Germany)

23 August 2022 • 4:30 PM - 5:00 PM PDT | Conv. Ctr. Room 6C

**SESSION 4: MORPHOLOGY AND SYMMETRY IN ORGANIC SEMICONDUCTORS**

24 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 6C

Session Chair: Mark W. B. Wilson, Univ. of Toronto (Canada)

**12199-12****Solvent-driven helix-coil transitions in chiral conjugated polymers**

Author(s): Linda A. Peteanu, Megan Rice, Stephanie N. Kramer, Manami Kawakami, Kevin J. T. Noonan, Tomasz A. Kowalewski, Carnegie Mellon Univ. (USA)

24 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 6C

**12199-13****In situ transient absorption spectroscopy during thermal annealing of organic films (Invited Paper)**

Author(s): Cathy Y. Wong, Univ. of Oregon (USA)

24 August 2022 • 8:50 AM - 9:20 AM PDT | Conv. Ctr. Room 6C

**12199-14****Conformation and assembly of conjugated polymers revealed by high-resolution imaging: direct comparison between glycol and alkyl side-chains (Invited Paper)**

Author(s): Giovanni Costantini, The Univ. of Warwick (United Kingdom)

24 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 6C

**12199-15****Electronic excitation dynamics of dibenzo [a,i] pyrene oligomers**

Author(s): Suman Gunasekaran, Cornell Univ. (USA); Xiushang Xu, Okinawa Institute of Science and Technology Graduate Univ. (Japan); Scott Renken, Cornell Univ. (USA); Lorenzo Ripani, Univ. degli Studi di Bologna (Italy); Dieter Schollmeyer, Johannes Gutenberg Univ. Mainz (Germany); Woojae Kim, Cornell Univ. (USA); Massimo Marcaccio, Univ. degli Studi di Bologna (Italy); Andrew J. Musser, Cornell Univ. (USA); Akimitsu Narita, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

24 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 6C

**Break****Coffee Break 10:10 AM - 10:40 AM****SESSION 5: BULK AND INTERFACIAL TRIPLET DYNAMICS**

24 August 2022 • 10:40 AM - 12:30 PM PDT | Conv. Ctr. Room 6C

Session Chair: David S. Ginger, Univ. of Washington (USA)

**12199-16****Magnetic field effects on triplet pairs in organic crystals (Invited Paper)**

Author(s): Tomoaki Yago, Saitama Univ. (Japan)

24 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 6C

**12199-17****Nanocrystal-sensitized triplet-fusion upconversion photochemistry (Invited Paper)**

Author(s): Mark W. B. Wilson, Univ. of Toronto (Canada)

24 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 6C

**12199-18****Disentangling singlet fission dynamics in high quality Rubrene single crystals**

Author(s): Dmitrii R. Maslennikov, Marios Maimaris, Xijia Zheng, Yifan Dong, Imperial College London (United Kingdom); Vitaly Podzorov, Vladimir V. Bruevich, Rutgers, The State Univ. of New Jersey (USA); Artem A. Bakulin, Imperial College London (United Kingdom)

24 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 6C

**12199-19****Does energy transfer between nanocrystals and molecules involve spin selectivity? (Invited Paper)**

Author(s): MingLee Tang, The Univ. of Utah (USA)

24 August 2022 • 12:00 PM - 12:30 PM PDT | Conv. Ctr. Room 6C

**Break****Lunch/Exhibition Break 12:30 PM - 2:00 PM****SESSION 6: CARRIER TRANSPORT IN ORGANIC AND HYBRID MATERIALS**

24 August 2022 • 2:00 PM - 4:00 PM PDT | Conv. Ctr. Room 6C

Session Chair: Cathy Y. Wong, Univ. of Oregon (USA)

**12199-20****Self-assembled ensembles of protein complexes enable long-range interfacial tunneling**

Author(s): Ryan Chiechi, North Carolina State Univ. (USA); Xinkai Qiu, Univ. of Cambridge (United Kingdom)

24 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 6C

**12199-21****Electron transfer at bio-organic interfaces: a multiscale approach**

Author(s): Silvio Osella, Univ. of Warsaw (Poland)

24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 6C

**12199-22****Understanding and controlling the mobility of carriers in chemically-doped semiconducting polymers (Invited Paper)**

Author(s): Benjamin J. Schwartz, Univ. of California, Los Angeles (USA)

24 August 2022 • 2:40 PM - 3:10 PM PDT | Conv. Ctr. Room 6C



## CONFERENCE 12199

### **12199-23**

#### **Backbone-driven host-dopant miscibility modulates molecular doping in NDI conjugated polymers**

Author(s): Diego Rosas Villalva, King Abdullah Univ. of Science and Technology (Saudi Arabia); Saumya Singh, Univ. College London (United Kingdom); Luke A. Galuska, The Univ. of Southern Mississippi (USA); Anirudh Sharma, Jianhua Han, King Abdullah Univ. of Science and Technology (Saudi Arabia); Jian Liu, Zernike Institute for Advanced Materials (Netherlands); Md Azimul Haque, Soyeong Jang, Abdul H. Emwas, King Abdullah Univ. of Science and Technology (Saudi Arabia); L. Jan Anton Koster, Zernike Institute for Advanced Materials (Netherlands); Xiaodan Gu, The Univ. of Southern Mississippi (USA); Bob C. Schroeder, Univ. College London (United Kingdom); Derya Baran, King Abdullah Univ. of Science and Technology (Saudi Arabia)

24 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 6C

### **12199-24**

#### **Recombination at perovskite/organic semiconductor interfaces (Invited Paper)**

Author(s): David S. Ginger, Univ of Washington (USA)

24 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 6C

# Low-Dimensional Materials and Devices 2022

23 - 24 August 2022 | Conv. Ctr. Room 5B

Conference Chairs: Nobuhiko P. Kobayashi, Univ. of California, Santa Cruz (USA); A. Alec Talin, Sandia National Labs. (USA); Albert V. Davydov, National Institute of Standards and Technology (USA); M. Saif Islam, Univ. of California, Davis (USA)

Program Committee: Deji Akinwande, The Univ. of Texas at Austin (USA); Kristine A. Bertness, National Institute of Standards and Technology (USA); Sonia Conesa-Boj, Technische Univ. Delft (Netherlands); Alexey Kopusov, Institute for Energy Technology (Norway); Andrey Krayev, HORIBA Scientific (USA); Marina S. Leite, Univ. of Maryland, College Park (USA); Paola Prete, Istituto per la Microelettronica e Microsistemi (Italy); Volker J. Sorger, The George Washington Univ. (USA); George T. Wang, Sandia National Labs. (USA); Sanshui Xiao, Technical Univ. of Denmark (Denmark)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12200-29

#### Study of phase-dependent third-harmonic generation in MoTe<sub>2</sub> thin films

Author(s): Seongju Ha, Hyeonkyeong Kim, Hyunjun Nam, Jungseok Choi, Kwan Byung Chae, Ji-Yong Park, Youngdong Yoo, Ajou Univ. (Korea, Republic of); Dong-Il Yeom, Ajou Univ. (Korea, Republic of), Boston Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-30

#### Single-walled carbon nanotubes defected by ion beams

Author(s): Valentina A. Eremina, A. M. Prokhorov General Physics Institute (Russian Federation), Univ. of Eastern Finland (Finland); Yurii V. Balakshin, Skobeltsyn Institute of Nuclear Physics, M. V. Lomonosov Moscow State Univ. (Russian Federation); ; Dmitrii A. Musatov, Alexandr A. Tonkikh, A. M. Prokhorov General Physics Institute (Russian Federation), Moscow Institute of Physics and Technology (Russian Federation); Elena D. Obraztsova, A. M. Prokhorov General Physics Institute of the RAS (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-31

#### NO<sub>2</sub> gas sensing using quantum capacitance of graphene

Author(s): Sungbae J. Lee, Wonbin Ju, Gwangju Institute of Science and Technology (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-32

#### Au-contacted halide-assisted CVD grown WSe<sub>2</sub> for gas sensing applications

Author(s): Thomas Mather, University of North Texas (USA); Kishan Jayanand, Anupama B. Kaul, Univ. of North Texas (USA); Ideal Ademaj, Univ of North Texas (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-33

#### In-situ electrical and electrochemical characteristic measurement using AFM in high temperature

Author(s): Suhan Lee, Yong-Jin Yoon, KAIST (Korea, Republic of); Chee Seng Ng, Nanyang Technological Univ. (Singapore)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-34

#### Protonation of oxygen-doped single-walled carbon nanotubes

Author(s): Timofei Eremin, Elena Obraztsova, A. M. Prokhorov General Physics Institute (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-35

#### Highly efficient room-temperature NO<sub>x</sub> gas sensing of ZnO nanorods and ZnO nanotubes covered with Pt nanoparticles under UV light irradiation

Author(s): Min-Woo Park, Korea Polytechnic Univ. (Korea, Republic of); Byung-Hun Ahn, Hanyang Technology (Korea, Republic of); Kyoung-Kook Kim, Tech University of Korea (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-37

#### Inkjet-printed graphene and molybdenum disulfide based gas sensors for toxic, flammable, and atmospheric gases

Author(s): Thomas Mather, Ideal Ademaj, Ravindra Mehta, Kishan Jayanand, Anupama Kaul, Univ. of North Texas (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-41

#### Impact of annealing ambient on ZnO nanowires synthesized by electrochemical anodization technique

Author(s): Sangita Bhomick, Indian Institute of Technology Bombay (India), Shiv Nadar Univ. (India); Aloke Kanjilal, Shiv Nadar Univ. (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-44

#### Fast and accurate identification of 2D materials by machine learning optical microscopy

Author(s): Felice Gesuele, Univ. degli Studi di Napoli Federico II (Italy)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-45

#### Bandgap enabled photocatalytic degradation of crystal violet dye using 2D layered molybdenum disulfide

Author(s): Susmi Anna Thomas, Arun Aravind, Bishop Moore College Mavelikara (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-7

#### Effects of freeze thaw cycles on various protective coatings on silver-based telescope mirrors: a new perspective on the endurance

Author(s): Søren A. Tornøe, Univ. of California, Santa Cruz (USA); Andrew C. Phillips, Univ. of California Observatories (USA); Nobuhiko P. Kobayashi, Univ. of California, Santa Cruz (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12200-47

#### The electrical, morphological and optical properties of heavily boron-doped diamond sheets as a function of methane concentration in the gas phase

Author(s): Michał Ryciewicz, Gdańsk University of Technology (Poland); Adrian Nosek, Univ. of California, Riverside (USA); Mirosław Sawczak, Polish Academy of Sciences (Poland); Jacek Ryl, Robert Bogdanowicz, Gdansk Univ. of Technology (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## CONFERENCE 12200

### SESSION 1: FABRICATION OF ADVANCED NANOSTRUCTURED MATERIALS: FROM 0D AND 1D TO THIN-FILM-HETEROSTRUCTURES I

23 August 2022 • 1:30 PM - 3:10 PM PDT | Conv. Ctr. Room 5B

Session Chair: Anupama B. Kaul, Univ. of North Texas (USA)

#### 12200-2

##### **GaN vacuum nanoelectronic devices (Invited Paper)**

Author(s): George T. Wang, Sandia National Labs (USA); Keshab R. Sapkota, A. Alec T. Talin, Francois Leonard, Gyorgy Vizkelethy, Brendan Gunning, Sandia National Laboratories (USA)

23 August 2022 • 1:30 PM - 2:00 PM PDT | Conv. Ctr. Room 5B

#### 12200-3

##### **AlGaIn Fin light emitting diodes (Invited Paper)**

Author(s): Babak Nikoobakht, Yuqin Zong, National Institute of Standards and Technology (USA)

23 August 2022 • 2:00 PM - 2:30 PM PDT | Conv. Ctr. Room 5B

#### 12200-5

##### **Solvent based thickness control of MoSe<sub>2</sub> 2D structures produced by PLAL**

Author(s): Alejandro Morales Betancourt, Sumeyra Tek, Andreas Christodoulou, Ernesto Flores, Jacob Flowers, Amber Arooj, Kelly L. Nash, The Univ. of Texas at San Antonio (USA)

23 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 5B

#### 12200-4

##### **Crystallization and structural properties of piezoelectric-magnetostrictive hybrid nanowires for nano magneto- electro-mechanical systems (NMEMS)**

Author(s): Wiktoria Zajkowska, Henryk Teisseyre, Institute of Physics, Polish Academy of Sciences (Poland); Janusz Sadowski, Institute of Physics, Polish Academy of Sciences (Poland), Univ. of Warsaw (Poland), Linnaeus Univ. (Sweden); Wojciech Pacuski, Univ. of Warsaw (Poland); Krzysztof Fronc, Michał Chojnacki, Bogusława Kurowska, Sławomir Kret, Institute of Physics, Polish Academy of Sciences (Poland)

23 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 5B

#### Break

**Coffee Break 3:10 PM - 3:40 PM**

### SESSION 2: FABRICATION OF ADVANCED NANOSTRUCTURED MATERIALS: FROM 0D AND 1D TO THIN-FILM-HETEROSTRUCTURES II

23 August 2022 • 3:40 PM - 5:20 PM PDT | Conv. Ctr. Room 5B

Session Chair: Anupama B. Kaul, Univ. of North Texas (USA)

#### 12200-9

##### **Solving the in/out-coupling problem in strongly-confined polaritonics (Keynote Presentation)**

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

23 August 2022 • 3:40 PM - 4:20 PM PDT | Conv. Ctr. Room 5B

#### 12200-6

##### **Protection of silver-based telescope mirrors using a single-layer of aluminum oxide formed by various atomic layer deposition processes: a comparative study**

Author(s): Søren A. Tornøe, Nanostructured Energy Conversion Technology and Research, Univ. of California Santa Cruz (USA); Brian DuPraw, Univ. of California Observatories (USA); Yoshimasa Okamura, Meiden America, Inc. (USA); Andrew C. Phillips, Univ. of California Observatories (USA); Nobuhiko P. Kobayashi, Univ. of California, Santa Cruz (USA)

23 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 5B

#### 12200-46

##### **Long term resilience of silver-based telescope mirrors with a single aluminum oxide protection layer deposited via thermal atomic layer deposition using H<sub>2</sub>O and pure ozone: a comparative study of progressive changes in surface structures during defect formation**

Author(s): Søren A. Tornøe, Nanostructured Energy Conversion Technology and Research, Univ. of California Santa Cruz (USA); Brian Dupraw, Univ. of California Observatories (USA); Yoshimasa Okamura, Meiden America, Inc. (USA); Andrew A. Phillips, Univ. of California Observatories (USA); Nobuhiko P. Kobayashi, Univ. of California, Santa Cruz (USA)

23 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 5B

#### 12200-8

##### **2D BiOBr/MoS<sub>2</sub> heterojunctions by liquid-phase exfoliation as photoelectrocatalysts for hydrogen evolution**

Author(s): Mengjiao Wang, Justus-Liebig-Universität Gießen (Germany)

23 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 5B

### SESSION 3: OPTICAL, ELECTRONIC, AND THERMAL PROPERTIES OF LOW-DIMENSIONAL MATERIALS I

24 August 2022 • 8:40 AM - 10:10 AM PDT | Conv. Ctr. Room 5B

Session Chair: George T. Wang, Sandia National Labs. (USA)

#### 12200-10

##### **Light-matter interactions in Transition Metal Dichalcogenides and Organo-halide Perovskites for Photoabsorbers and Solar Cells (Invited Paper)**

Author(s): Anupama B. Kaul, Univ. of North Texas (USA)

24 August 2022 • 8:40 AM - 9:10 AM PDT | Conv. Ctr. Room 5B

#### 12200-11

##### **Recent advances in TERS/TEPL characterization of lateral and vertical heterostructures of TMDCs (Invited Paper)**

Author(s): Andrey Krayev, HORIBA Scientific (USA)

24 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 5B

#### 12200-12

##### **Low-symmetry nanophotonics (Invited Paper)**

Author(s): Alex Krasnok, Florida International University (USA)

24 August 2022 • 9:40 AM - 10:10 AM PDT | Conv. Ctr. Room 5B

#### Break

**Coffee Break 10:10 AM - 10:35 AM**

### SESSION 4: OPTICAL, ELECTRONIC, AND THERMAL PROPERTIES OF LOW-DIMENSIONAL MATERIALS II

24 August 2022 • 10:35 AM - 11:35 AM PDT | Conv. Ctr. Room 5B

Session Chair: George T. Wang, Sandia National Labs. (USA)

#### 12200-13

##### **Charge transport in single particle SrTiO<sub>3</sub> photocatalysts for water splitting**

Author(s): Brian Zutter, Sandia National Labs. (USA); Zejie Chen, Univ. of California, Irvine (USA); Luisa Barrera, Univ. of Michigan (USA); Aliya Lapp, Sandia National Labs. (USA); Akihiko Kudo, Tokyo Univ. of Science (Japan); Dan Esposito, Columbia Univ. (USA); Rohini Bala Chandran, Univ. of Michigan (USA); Shane Ardo, Univ. of California, Irvine (USA); A. Alec Talin, Sandia National Labs. (USA)

24 August 2022 • 10:35 AM - 10:55 AM PDT | Conv. Ctr. Room 5B

#### 12200-14

##### **Visualizing electronic and structural properties of 2D materials by correlative optical microspectroscopy**

Author(s): Felice Gesuele, Univ. degli Studi di Napoli Federico II (Italy)

24 August 2022 • 10:55 AM - 11:15 AM PDT | Conv. Ctr. Room 5B

**12200-15**

**Thermal radiation engineering with MXene based selective emission for thermal camouflage**

Author(s): Changhoon Park, Jisung Kwon, Korea Univ. (Korea, Republic of); Chong M. Koo, Hyerim Kim, Korea Institute of Science and Technology (Korea, Republic of); Myung-Ki Kim, Korea Univ. (Korea, Republic of)  
24 August 2022 • 11:15 AM - 11:35 AM PDT | Conv. Ctr. Room 5B

**Break**

**Lunch/Exhibition Break 11:35 AM - 1:05 PM**

**SESSION 5: LOW-DIMENSIONAL DEVICES AND APPLICATIONS I**

24 August 2022 • 1:05 PM - 3:15 PM PDT | Conv. Ctr. Room 5B

Session Chair: Alexandr E. Krasnok, Florida International Univ. (USA)

**12200-48**

**Semiconductor metasurfaces in strong optical fields (Invited Paper)**

Author(s): Maxim R. Shcherbakov, Univ. of California, Irvine (USA)  
24 August 2022 • 1:05 PM - 1:35 PM PDT | Conv. Ctr. Room 5B

**12200-17**

**High-performance opto-electronics with emerging materials (Invited Paper)**

Author(s): Volker J. Sorger, George Washington Univ (USA)  
24 August 2022 • 1:35 PM - 2:05 PM PDT | Conv. Ctr. Room 5B

**12200-18**

**Charge-density-wave phase transitions in Quasi-2D 1T-TaS<sub>2</sub> devices (Invited Paper)**

Author(s): Alexander A. Balandin, Univ. of California, Riverside (USA)  
24 August 2022 • 2:05 PM - 2:35 PM PDT | Conv. Ctr. Room 5B

**12200-20**

**Challenges and opportunities in 2D materials for optical modulation/detection**

Author(s): Behrouz Movahhed Nouri, The George Washington Univ. (USA); Hamed Dalir, GWU (USA)  
24 August 2022 • 2:35 PM - 2:55 PM PDT | Conv. Ctr. Room 5B

**12200-21**

**PL and CL characterization of thin barrier in resonant tunneling diodes for THz application**

Author(s): Michele Cito, Razvan Baba, Univ. of Glasgow (United Kingdom); Toshikazu Mukai, Rohm Semiconductor (Japan); Ben J. Stevens, IQE (United Kingdom); Richard A. Hogg, Univ of Glasgow (United Kingdom)  
24 August 2022 • 2:55 PM - 3:15 PM PDT | Conv. Ctr. Room 5B

**Break**

**Coffee Break 3:15 PM - 3:40 PM**

**SESSION 6: LOW-DIMENSIONAL DEVICES AND APPLICATIONS II**

24 August 2022 • 3:40 PM - 5:30 PM PDT | Conv. Ctr. Room 5B

Session Chair: Alexandr E. Krasnok, Florida International Univ. (USA)

**12200-22**

**Room temperature resonant tunneling behavior observed in layered GeS/BP transistors (Invited Paper)**

Author(s): Moh Amer, Univ. of California, Los Angeles (USA), King Abdulaziz City for Science and Technology (Saudi Arabia)  
24 August 2022 • 3:40 PM - 4:10 PM PDT | Conv. Ctr. Room 5B

**12200-23**

**Wavelength selective silicon avalanche photodiodes with controlled wide spectral gain by integrating photon-trapping microstructures**

Author(s): Amita Amita, Univ. of California, Davis (USA); Ahasan Ahamed, Lisa N. Mcphillips, Univ. of California (USA); Cesar Bartolo-Perez, Univ. of California, Davis (USA); Shih-Yuan Wang, W&Wsens Devices Inc. (USA); M. Saif Islam, Univ. of California, Davis (USA)  
24 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 5B

**12200-24**

**Photoexcitation of C60-WSe<sub>2</sub> Hybrids for Optical Sensing**

Author(s): Kishan Jayanand, Silvino P. Bastos, Anupama B. Kaul, Univ. of North Texas (USA)  
24 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 5B

**12200-25**

**Solution-processed dielectric films and Au rf antenna for temperature sensing**

Author(s): Sujan Aryal, Dipon K. Biswas, Ravindra K. Mehta, Ifana Mahbub, Anupama B. Kaul, Univ. of North Texas (USA)  
24 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 5B

**12200-26**

**Near-infrared sensors for high efficiency and high-temperature operation enabled by ultra-thin type-II quantum wells and photon-trapping structures**

Author(s): Amita Rawat, Univ. of California, Davis (USA); Kwong-Kit Choi, Patrick Oduor, Achyut Dutta, Banpil Photonics, Inc. (USA); M. Saif Islam, Univ. of California, Davis (USA)  
24 August 2022 • 5:10 PM - 5:30 PM PDT | Conv. Ctr. Room 5B

CONFERENCE 12201

# UV and Higher Energy Photonics: From Materials to Applications 2022

21 - 22 August 2022 | Conv. Ctr. Room 6C

Conference Chairs: Yong-Hoon Cho, KAIST (Korea, Republic of); Gilles L  rondel, Univ. de Technologie Troyes (France); Atsushi Taguchi, Hokkaido Univ. (Japan); Satoshi Kawata, Osaka Univ. (Japan)

Program Committee: Sanford A. Asher, Univ. of Pittsburgh (USA); Steve Blair, The Univ. of Utah (USA); Zhanghai Chen, Fudan Univ. (China); Yasin Ekinci, Paul Scherrer Institut (Switzerland); Torsten Frosch, Leibniz-Institut f  r Photonische Technologien e.V. (Germany); Naomi J. Halas, Rice Univ. (USA); Hans D. Hallen, North Carolina State Univ. (USA); 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 (Korea, Republic of); Paul T. Matsudaira, National Univ. of Singapore (Singapore); Eva Monroy, CEA Grenoble (France); Fernando Moreno, Univ. de Cantabria (Spain); Yukihiro Ozaki, Kwansai Gakuin Univ. (Japan); Sung-Jin Park, Univ. of Illinois (USA); J  r  me Plain, Univ. de Technologie de Troyes (France); Remo Proietti Zaccaria, Istituto Italiano di Tecnologia (Italy); Olivier Soppera, Univ. de Haute Alsace (France); Yunshan Wang, The Univ. of Utah (USA)

## SESSION 1: UNCONVENTIONAL UV LIGHT SOURCES

21 August 2022 • 2:00 PM - 3:10 PM PDT | Conv. Ctr. Room 6C

Session Chair: Yong-Hoon Cho, KAIST (Korea, Republic of)

### 12201-8

**From parity time-reversal symmetry to its breaking via whispering gallery polariton based on wide bandgap semiconductor (Invited Paper)**

Author(s): Hyun Gyu Song, Korea Institute of Science and Technology (Korea, Republic of); Yong-Hoon Cho, KAIST (Korea, Republic of)

21 August 2022 • 2:00 PM - 2:30 PM PDT | Conv. Ctr. Room 6C

### 12201-9

**Whispering gallery mode emission of a single desulfurized ZnO/ZnO core-shell microrod**

Author(s): Junze Zhou, Lawrence Berkeley National Lab. (USA)

21 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 6C

### 12201-10

**Tailoring high-harmonic generation in atomically-thin materials**

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

21 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 6C

## SESSION 2: UV PLASMONICS AND METAMATERIALS

21 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 6C

Session Chair: Atsushi Taguchi, Hokkaido Univ. (Japan)

### 12201-7

**Photonic crystal nanomembranes: a new tool for wavelength conversion and polarization control in the vacuum ultraviolet region (Invited Paper)**

Author(s): Kuniaki Konishi, The Univ. of Tokyo (Japan)

21 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 6C

### Break

**Coffee Break 3:40 PM - 4:10 PM**

## SESSION 3: NEW METHODS, DEVICES AND INSTRUMENTATIONS I

21 August 2022 • 4:10 PM - 5:20 PM PDT | Conv. Ctr. Room 6C

Session Chair: Gilles L  rondel, Univ. de Technologie Troyes (France)

### 12201-15

**Displacement Talbot lithography: a new and versatile technology for printing periodic nanostructures (Invited Paper)**

Author(s): Harun H. Solak, Eulitha AG (Switzerland)

21 August 2022 • 4:10 PM - 4:40 PM PDT | Conv. Ctr. Room 6C

### 12201-16

**Carbon nanotube microfabricated window with extreme ultraviolet transmission and differential pumping**

Author(s): Scott C. Olsen, Richard Vanfleet, David Allred, Robert Davis, Brigham Young Univ. (USA)

21 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 6C

### 12201-17

**Decontamination of tritium-exposed ion chambers using ultraviolet LEDs**

Author(s): George K. Larsen, Savannah River National Lab. (USA)

21 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 6C

## SUNDAY EVENING PLENARY

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks**

### 12198-501

**In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

### 12238-502

**Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

## NANOSCIENCE + ENGINEERING PLENARY

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks**

### 12203-501

**Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

### 12204-502

**Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

### Break

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



**SESSION 4: FAR- AND DEEP-UV SPECTROSCOPY**

22 August 2022 • 10:30 AM - 11:20 AM PDT | Conv. Ctr. Room 6C

Session Chair: Atsushi Taguchi, Hokkaido Univ. (Japan)

**12201-1****Investigation of the electronic states of saturated cyclic molecules using attenuated total reflectance far-ultraviolet spectroscopy (Invited Paper)**

Author(s): Yusuke Morisawa, Yugo Higaki, Kindai Univ. (Japan)

22 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 6C

**12201-2****Monitoring glycation using the intrinsic fluorescence of biological fluorophores**

Author(s): Rhona Muir, Olaf Rolinski, Univ. of Strathclyde (United Kingdom); Shareen Forbes, The Univ. of Edinburgh (United Kingdom); David J.S. Birch, Univ. of Strathclyde (United Kingdom)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 6C

**Break****Lunch Break 11:20 AM - 1:10 PM****SESSION 5: NEW METHODS, DEVICES AND INSTRUMENTATIONS II**

22 August 2022 • 1:10 PM - 2:40 PM PDT | Conv. Ctr. Room 6C

Session Chair: Harun H. Solak, Eulitha AG (Switzerland)

**12201-18****Leveraging sparsity for nanoscale hyperdimensional ptychographic tomography (Invited Paper)**

Author(s): Manuel Guizar-Sicairos, Zirui Gao, Paul Scherrer Institut (Switzerland)

22 August 2022 • 1:10 PM - 1:40 PM PDT | Conv. Ctr. Room 6C

**12201-19****Far UV-C 222nm microplasma flat lamp: its performance and applications as a new inactivation tool of airborne pathogens with human safety**

Author(s): Sung-Jin Park, Eden Park Illumination, Inc. (USA), Univ. of Illinois (USA)

22 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 6C

**12201-20****Reflectance measurements of building materials in the Far UVC (222nm) wavelength range**

Author(s): Holger Claus, Ushio America, Inc. (USA); Catherine Cooksey, National Institute of Standards and Technology (USA)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 6C

**12201-21****Laser Eye Protection (LEP) solar degradation assessment and ballistic performance**

Author(s): Gholam Yousefi, Canadian Dept. of National Defence (Canada)

22 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 6C

**Break****Coffee Break 2:40 PM - 3:10 PM****SESSION 6: NANOMATERIALS AND NANOSTRUCTURES**

22 August 2022 • 3:10 PM - 4:00 PM PDT | Conv. Ctr. Room 6C

Session Chair: Gilles Léronde, Univ. de Technologie Troyes (France)

**12201-13****Laser interference and nanospheres UV lithography to produce micro and nanostructured TiO<sub>2</sub> and TiN based sol-gel layers (Invited Paper)**

Author(s): Yves Jourlin, Nicolas Crespo-Monteiro, Lab. Hubert Curien, CNRS (France); Victor Vallejo Otero, Marie Traynar, Maria Usuga Higuaita, Emilie GAMET, Lab. Hubert Curien (France)

22 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 6C

**12201-22****Development of a Programmable UV Laser Source for the Dragonfly Mass Spectrometer (DraMS)**

Author(s): D. Barry Coyle, Matthew W. Mullin, Paul R. Stysley, Bryan L. James, Michael J. Hersh, NASA Goddard Space Flight Ctr (USA); Melissa G. Trainer, NASA Goddard Space Flight Ctr. (USA)

22 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 6C

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

21 - 23 August 2022 | Conv. Ctr. Room 1A

Conference Chairs: Balaji Panchapakesan, Worcester Polytechnic Institute (USA); André-Jean Attias, Sorbonne Univ. (France); Wounghang Park, Univ. of Colorado Boulder (USA)

Program Committee: Bharat Bhushan, The Ohio State Univ. (USA); Stephane Bruynooghe, Carl Zeiss Jena GmbH (Germany); Francesco Chiadini, Univ. degli Studi di Salerno (Italy); Pankaj Kumar Choudhury, Univ. Kebangsaan Malaysia (Malaysia); Luca Dal Negro, Boston Univ. (USA); Elizabeth A. Dobisz, Spin Transfer Technologies, Inc. (USA); Frédéric Guittard, Univ. de Nice Sophia Antipolis (France); Ghassan E. Jabbour, Arizona State Univ. (USA); Yi-Jun Jen, National Taipei Univ. of Technology (Taiwan); Anders Kristensen, DTU Nanotech (Denmark); Akhlesh Lakhtakia, The Pennsylvania State Univ. (USA); Tom G. Mackay, The Univ. of Edinburgh (United Kingdom); H. Angus Macleod, Thin Film Center, Inc. (USA); Robert Magnusson, The Univ. of Texas at Arlington (USA); Dorota A. Pawlak, Institute of Electronic Materials Technology (Poland); Michael T. Postek, Univ. of South Florida (USA); Dianne L. Poster, National Institute of Standards and Technology (USA); Anne E. Sakdinawat, SLAC National Accelerator Lab. (USA); Andrew M. Sarangan, Univ. of Dayton (USA); 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 (USA); Anatoly V. Zayats, King's College London (United Kingdom)

## SESSION 1: NANOSTRUCTURED THIN FILMS I

21 August 2022 • 9:00 AM - 10:20 AM PDT | Conv. Ctr. Room 1A

Session Chair: Tom Nakotte, Lawrence Livermore National Lab. (USA)

### 12202-1 Understanding methods to determine energy levels of quantum dot films for device integration

Author(s): Tom Nakotte, Lawrence Livermore National Lab. (USA)

21 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 1A

### 12202-2 Layer by layer thin film fabrication with in-process laser patterning

Author(s): Kaelyn Leake, Hank Yochum, The Citadel-The Military College of South Carolina (USA)

21 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 1A

### 12202-3 Fundamentals of defect-free III-V growth on oxide-nanopatterned GaAs substrates

Author(s): Bill McMahon, John S. Mangum, San Theingi, Anica Neumann, Myles A. Steiner, Emily L. Warren, National Renewable Energy Lab. (USA)

21 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 1A

### 12202-4 Freestanding specular reflective carbon nanotube thin film for solar sailing

Author(s): Ho-Ting Tung, Artur Davoyan, Univ. of California, Los Angeles (USA)

21 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 1A

**Break**  
**Coffee Break 10:20 AM - 11:00 AM**

## SESSION 2: NANOSTRUCTURED THIN FILMS II

21 August 2022 • 11:00 AM - 12:40 PM PDT | Conv. Ctr. Room 1A

Session Chair: Balaji Panchapakesan, Worcester Polytechnic Institute (USA)

### 12202-7 Fabrication of patterned, flexible and large-scale Bragg mirrors by inkjet printing

Author(s): Qiaoshuang Zhang, Qihao Jin, Adrian Mertens, Robert Huber, Jan Fessler, Karlsruher Institut für Technologie (Germany); Gerardo Hernandez-Sosa, Uli Lemmer, Karlsruher Institut für Technologie (Germany), InnovationLab GmbH (Germany)

21 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 1A

### 12202-8 Performance investigation of pulsed laser ablated of MoS2 based thin film transistors

Author(s): Midhun P. S., Aldrin Antony, Rajeev Kumar K., Cochin Univ. of Science & Technology (India); M. K. Jayaraj, Univ. of Calicut (India)

21 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 1A

### 12202-9 Towards scalable hybrid electro-optics

Author(s): Lewis E. Johnson, Univ. of Washington (USA), NLM Photonics (USA); Scott R. Hammond, NLM Photonics (USA), Univ. of Washington (USA); Delwin L. Elder, Univ. of Washington (USA), NLM Photonics (USA); Kevin M. O'Malley, NLM Photonics (USA); Huajun Xu, Larry R. Dalton, Bruce H. Robinson, Univ. of Washington (USA)

21 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 1A

### 12202-10 Laser conditioning effect for all-silica mirrors

Author(s): Lukas Ramalis, Rytis Buzelis, Gustė Dolmantaitė, Ctr. for Physical Sciences and Technology (Lithuania); Tomas Tolenis, Ctr. for Physical Sciences and Technology (Lithuania), ELI Beamlines, Institute of Physics (Czech Republic)

21 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 1A

### 12202-11 Direct color printing on Ag:TiO2 thin films induced by nanosecond laser pulses

Author(s): Van Doan Le, Univ. Jean Monnet Saint-Etienne (France), CNRS (France), Institut d'Optique Graduate School (France); Balint Eles, Univ. Jean Monnet Saint-Etienne (France), Institut d'Optique Graduate School (France), Lab. Hubert Curien (France); Nicolas Dalloz, Univ. Jean Monnet Saint-Etienne (France), Lab. Hubert Curien (France), HID Global Corp. (France); Manuel A. Flores Figueroa, Univ. Jean Monnet Saint-Etienne (France), CNRS (France), Institut d'Optique Graduate School (France); Nathalie Destouches, Univ. Jean Monnet Saint-Etienne (France), Institut d'Optique Graduate School (France), Lab. Hubert Curien (France)

21 August 2022 • 12:20 PM - 12:40 PM PDT | Conv. Ctr. Room 1A

**Break**  
**Lunch Break 12:40 PM - 2:10 PM**

## SESSION 3: NANOPHOTONIC STRUCTURES AND DEVICES

21 August 2022 • 2:10 PM - 4:10 PM PDT | Conv. Ctr. Room 1A

Session Chair: Seyed M. Sadeghi, The Univ. of Alabama in Huntsville (USA)

### 12202-13 Control of in-plane light scattering using surface lattice resonances

Author(s): Seyed M. Sadeghi, Dustin Roberts, Sean Ramsay, The Univ. of Alabama in Huntsville (USA)

21 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 1A

### 12202-15 Suppressing optical losses of hydrogenated amorphous silicon for dielectric metasurfaces working at the visible frequencies, and revealing its structural disorder.

Author(s): Younghwan Yang, Pohang Univ. of Science and Technology (Korea, Republic of); Gwanho Yoon, Seoul National Univ. of Science and Technology (Korea, Republic of); Sunghak Park, Ki Tae Nam, Seoul National Univ. (Korea, Republic of); Junsuk Rho, Pohang Univ. of Science and Technology (Korea, Republic of)

21 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 1A

**12202-17****Multi-section coupled cavity mid-IR quantum cascade lasers**

Author(s): Kamil Pierscinski, Dorota Pierscinska, Aleksandr Kuzmicz, Grzegorz Sobczak, Piotr Gutowski, Krzysztof Chmielewski, Łukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

21 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 1A

**12202-18****The experimental investigation of thermal properties of mid-IR quantum cascade lasers**

Author(s): Dorota Pierscinska, Grzegorz Sobczak, Katarzyna Krajewska, Krzysztof Chmielewski, Aleksandr Kuzmicz, Piotr Gutowski, Łukasiewicz Research Network - Institute of Microelectronics and Photonics (Poland)

21 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 1A

**12202-20****Tuning and transfer of slow photons in inverse opal TiO<sub>2</sub>-BiVO<sub>4</sub> hetero-composite photonic crystal for visible light photocatalysis**

Author(s): Thomas Lourdu Madanu, Bao-Lian Su, Olivier Deparis, Sébastien R. Mouchet, Univ. de Namur (Belgium)

21 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 1A

**12202-16****Low cost fabrication of quantum emitter integrated microcavities by replica molding**

Author(s): Brijesh Kumar, Anuj Kumar Singh, Indian Institute of Technology Bombay (India); Lekshmi Eswaramoorthy, Indian Institute of Technology Bombay (India), IITB-Monash Research Academy (India); Yashika Gupta, Kishor Kumar Mandal, Abhay V. S. Anand, Anshuman Kumar, Indian Institute of Technology Bombay (India)

21 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 1A

**Break**

**Coffee Break 4:10 PM - 4:40 PM**

**SESSION 4: LIGHT-MATTER INTERACTION**

21 August 2022 • 4:40 PM - 5:40 PM PDT | Conv. Ctr. Room 1A

Session Chairs: Vera Marie Titze, Univ. of St. Andrews (United Kingdom), Daniel Lanzillotti-Kimura, Ctr. de Nanosciences et de Nanotechnologies (France)

**12202-22****GaN/AlGaN nanolasers optimized for red-shifted excitation and two-photon pumping to sense from within living cells**

Author(s): Vera Marie Titze, Soraya Caixeiro, Andrea Di Falco, Univ. of St. Andrews (United Kingdom); Marcel Schubert, Humboldt Ctr. for Nano- and Biophotonics, Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom); Malte C. Gather, Humboldt Ctr. for Nano- and Biophotonics, Univ. zu Köln (Germany), Univ. of St. Andrews (United Kingdom)

21 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 1A

**12202-24****Simultaneous confinement of acoustic phonons and near infrared photons in GaAs/AIAs multilayers by band inversion**

Author(s): Priya Priya, Anne Rodriguez, Omar Ortiz, Aristide Lemaitre, Daniel Lanzillotti-Kimura, Ctr. de Nanosciences et de Nanotechnologies (France)

21 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 1A

**12202-26****An aqueous electrochromic device with emissivity contrast >0.85 for programmable radiative thermoregulation**

Author(s): Po-Chun Hsu, Duke Univ. (USA)

21 August 2022 • 5:20 PM - 5:40 PM PDT | Conv. Ctr. Room 1A

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks****12203-501****Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502****Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12202-27****UV-LED assisted highly sensitive room temperature NO<sub>2</sub> gas sensors based on solution-processed ZnO/TiO<sub>2</sub> nanorods with Au nanoparticles**

Author(s): Sang-Mn Kim, Soon-Hwan Kwon, So-Hyeon Kim, Min-Woo Park, Ju-Eun Yang, Yoon-Seo Park, Kyoung-Kook Kim, Korea Polytechnic Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12202-29****Near-perfect absorption in the visible regime using ultrathin semiconducting grating**

Author(s): Tao Gong, Jeremy N. Munday, Univ. of California, Davis (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12202-31****Electrohydrodynamic redox printing: advances in nanofabrication for future photonic applications**

Author(s): Nikolaus Porenta, Mirco Nydegger, Maxence Menétrey, Ralph Spolenak, Lukas Koch, ETH Zurich (Switzerland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## CONFERENCE 12202

### 12202-32

#### **Laser-induced Si nanoparticle and the application of RGB resonance color-filters**

Author(s): Euisun Hwang, Min Jin Kang, Byoung Ho Cheong, Korea Univ. Sejong Campus (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-34

#### **Polymer coatings with rare-earth activated phosphors for optical fiber fluorosensors**

Author(s): Rodolfo A. Carrillo-Betancourt, Juan Hernández-Cordero, Univ. Nacional Autónoma de México (Mexico), Instituto de Investigaciones en Materiales (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-35

#### **Flexible electrochromic organic nanofilms (FEON) applied in civil construction**

Author(s): Andre F. S. Guedes, Univ. Estácio de Sá (Brazil); Simone Tartari, INTELLECTOS (Brazil)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-36

#### **Nanoengineering instrumentation to control the optical properties of plasmonic nanoparticles for thin film optics**

Author(s): James N. Monks, Qioptiq Ltd. (United Kingdom), Bangor Univ. (United Kingdom); Jonathan Williams, Andrew Hurst, Qioptiq Ltd. (United Kingdom); Zengbo Wang, Bangor Univ. (United Kingdom)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-37

#### **All transparent amorphous IZO thin film transistor fabrication and characterization**

Author(s): Min-Woo Park, Suyeon Son, Sohyeon Kim, Sang-Min Kim, Min-Ji Kim, Gyeong-Hoon Jeong, Yeong-Hyeon Kim, Korea Polytechnic Univ. (Korea, Republic of); Byeong-Hoon Ahn, Hanyang Technology Co., Ltd. (Korea, Republic of); Kyoung-Kook Kim, Korea Polytechnic Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-38

#### **TEM study of the structure of MoTe<sub>2</sub> layers grown by molecular beam epitaxy on GaAs(111)B substrates with MnTe and NiTe<sub>2</sub> buffers**

Author(s): Slawomir Kret, Wiktoria Zajkowska, Bogusława Kurowska, Institute of Physics (Poland); Bartłomiej Serebnyński, Zuzanna Ogorzałek, Marta Gryglas-Borysiewicz, Univ. of Warsaw (Poland); Janusz Sadowski, Univ. of Warsaw (Poland), Linnaeus Univ. (Sweden); Wojciech Pacuski, Univ. of Warsaw (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-39

#### **Nucleation, growth, and movement of MnAs precipitates in wurtzite GaAs nanowire shells during in-situ annealing in transmission electron microscope**

Author(s): Anna Kaleta, Slawomir P. Kret, Serhii Kryvyi, Institute of Physics (Poland); Abinash Kumar, Xi Chen, Michael Xu, Massachusetts Institute of Technology (USA); Aubrey Penn, North Carolina State Univ. (USA); James LeBeau, Massachusetts Institute of Technology (USA); Bogusława Kurowska, Marta Biłska, Katarzyna Gas, Maciej Sawicki, Institute of Physics (Poland); Hannes Raebiger, Soungmin Bae, Yokohama National Univ. (Japan); Janusz Sadowski, Institute of Physics (Poland), Linnaeus Univ. (Sweden)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-40

#### **A method for modifying the surface properties of ZnO nanowires deposited as thin films on various substrates**

Author(s): Vadims Kolbjonoks, Vladimirs Kostjukičs, Daugavpils Univ. (Latvia)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-41

#### **Fabrication of photonic devices using EBL with silicon nitride-quartz platform**

Author(s): Macallister Bishop, Frederick Flynn, Rubing Wu, Elizabeth Canon, Azad Siahmakoun, Rose-Hulman Institute of Technology (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-43

#### **Optimization of substrate to culture and image live cells for surface plasmon microscopy**

Author(s): Ipsita Chakraborty, Daiki Matsubayashi, Tomoki Omachi, Yasushi Hasegawa, Hiroshi Kano, Muroran Institute of Technology (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-44

#### **A simple multifaceted polymer coating as an emitter material for passive radiative cooling of buildings and solar cells**

Author(s): Udayan Banik, Hosni Meddeb, Maximilian Götz-Köhler, Ashutosh Agrawal, Jonas Stührenberg, Oleg Sergeev, Nies Reininghaus, Kai Gehrke, Martin Vehse, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12202-45

#### **Design and optimization of multilayer planar structures for passive thermal regulation**

Author(s): Bo K. Shrewsbury, Ahmed M. Morsy, Michelle L. Povinelli, The Univ. of Southern California (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

# Enhanced Spectroscopies and Nanoimaging 2022

21 - 23 August 2022 | Conv. Ctr. Room 5B

Conference Chairs: Prabhat Verma, Osaka Univ. (Japan); Yung Doug Suh, Korea Research Institute of Chemical Technology (Korea, Republic of)  
 Program Committee: Katrin F. Domke, Max-Planck-Institut für Polymerforschung (Germany); Masayuki Futamata, Saitama Univ. (Japan); Tamitake Itoh, AIST (Japan); Dayong Jin, Univ. of Technology, Sydney (Australia); Satoshi Kawata, Osaka Univ. (Japan); Jung-Hoon Lee, City Univ. of Hong Kong (Hong Kong, China); 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 (USA); Markus B. Raschke, Univ. of Colorado Boulder (USA); Bin Ren, Xiamen Univ. (China); P. James Schuck, Columbia Univ. (USA); Zachary D. Schultz, The Ohio State Univ. (USA); 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. (USA); Peng Xi, Peking Univ. (China); Hongxing Xu, Wuhan Univ. (China); Taka-aki Yano, Tokushima Univ. (Japan); Renato Zenobi, ETH Zurich (Switzerland)

## SESSION 1: TIP-ENHANCED SPECTROSCOPY AND IMAGING I

21 August 2022 • 8:30 AM - 10:30 AM PDT | Conv. Ctr. Room 5B

Session Chair: Prabhat Verma, Osaka Univ. (Japan)

### 12203-1

#### Plasmon-driven chemistry on mono and bimetallic nanostructures (Invited Paper)

Author(s): Dmitry Kurovski, Texas A&M Univ. (USA)

21 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 5B

### 12203-2

#### Nano-Raman spectral imaging of localized phonons in low-angle twisted bilayer graphene and other two-dimensional systems (Invited Paper)

Author(s): Ado Jorio, Luiz Gustavo Cançado, Rafael B. Nadas, Cassiano Rabelo, Hudson Miranda, Univ. Federal de Minas Gerais (Brazil); Thiago Vasconcelos, INMETRO (Brazil); Andreij Gadelha, Univ. Federal de Minas Gerais (Brazil)

21 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 5B

### 12203-3

#### Molecular-level insights on reactive arrangement in on-surface photocatalytic coupling reactions (Invited Paper)

Author(s): Naresh Kumar, Zhen-Feng Cai, Renato Zenobi, ETH Zurich (Switzerland)

21 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 5B

### 12203-4

#### Enhanced spectroscopy of a plasmon-mediated thin-film waveguide (Invited Paper)

Author(s): Takehiro Tachizaki, Tokai Univ. (Japan)

21 August 2022 • 10:00 AM - 10:30 AM PDT | Conv. Ctr. Room 5B

### Break

Coffee Break 10:30 AM - 11:00 AM

## SESSION 2: ENHANCED SPECTROSCOPY FOR BIOSENSING I

21 August 2022 • 11:00 AM - 12:30 PM PDT | Conv. Ctr. Room 5B

Session Chair: Yung Doug Suh, Korea Research Institute of Chemical Technology (Korea, Republic of)

### 12203-5

#### Plasmonically engineered nanogap probes for biosensing and bioimaging applications (Invited Paper)

Author(s): Jwa-Min Nam, Seoul National Univ. (Korea, Republic of)

21 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 5B

### 12203-6

#### Enhanced Raman techniques for infection diagnostics (Invited Paper)

Author(s): Niall Hanrahan, Institute for Life Sciences (IfLS), University of Southampton (United Kingdom), School of Chemistry, University of Southampton (United Kingdom); Callum J. Highmore, National Biofilms Innovation Centre (NBIC), University of Southampton (United Kingdom), School of Biological Sciences, University of Southampton, (United Kingdom); Jeremy S. Webb, National Biofilms Innovation Centre (NBIC), University of Southampton (United Kingdom), School of Biological Sciences, University of Southampton (United Kingdom); Sumeet Mahajan, Institute for Life Sciences (IfLS), University of Southampton (United Kingdom), School of Chemistry, University of Southampton (United Kingdom)

21 August 2022 • 11:30 AM - 12:00 PM PDT | Conv. Ctr. Room 5B

### 12203-7

#### Ultrasensitive plasmonic sensing of single biomolecular complexes (Invited Paper)

Author(s): Taka-aki Yano, Ryo Kato, Takuo Tanaka, Tokushima Univ. (Japan)

21 August 2022 • 12:00 PM - 12:30 PM PDT | Conv. Ctr. Room 5B

### Break

Lunch Break 12:30 PM - 2:00 PM

## SESSION 3: TIP-ENHANCED SPECTROSCOPY AND IMAGING II

21 August 2022 • 2:00 PM - 3:50 PM PDT | Conv. Ctr. Room 5B

Session Chair: Dmitry Kurovski, Texas A&M Univ. (USA)

### 12203-9

#### Broadband nanolight source generated through plasmon nanofocusing and its applications (Invited Paper)

Author(s): Takayuki Umakoshi, Koki Taguchi, Hiroshi Arata, Prabhat Verma, Osaka Univ. (Japan)

21 August 2022 • 2:00 PM - 2:30 PM PDT | Conv. Ctr. Room 5B

### 12203-10

#### Detection of regions with reduced symmetry in crystal surfaces via tip-enhanced Raman spectroscopy (Invited Paper)

Author(s): Andreas Ruediger, Azza Hadj Youssef, Mohammad Bakhtbidar, Institut National de la Recherche Scientifique (Canada); Alexandre Merlen, Univ. de Toulon (France)

21 August 2022 • 2:30 PM - 3:00 PM PDT | Conv. Ctr. Room 5B

### 12203-11

#### Electrochemical tip surface-enhanced Raman spectroscopy: concept and applications in material science and electrocatalysis (Invited Paper)

Author(s): jad RABAH, Gabriel Boitel-Aullen, Lab. Interfaces et Systèmes Electrochimiques, Sorbonne Univ. (France); Iwona Nierengarten, Jean-Francois Nierengarten, Univ. de Strasbourg (France); Emmanuel Maisonhaute, Lab. Interfaces et Systèmes Electrochimiques, Sorbonne Univ. (France)

21 August 2022 • 3:00 PM - 3:30 PM PDT | Conv. Ctr. Room 5B

### 12203-12

#### Fabrication of campanile near-field probe with sub-20nm gap size for polarization-resolved photoluminescence mapping

Author(s): Junze Zhou, Lawrence Berkeley National Lab. (USA); Keiko Munechika, HighRI Optics (USA); Edward Barnard, Archana Raja, Adam Schwartzberg, Stefano Cabrini, Alexander Weber-Bargioni, Lawrence Berkeley National Lab. (USA)

21 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 5B

### Break

Coffee Break 3:50 PM - 4:20 PM



**SESSION 4: ENHANCED SPECTROSCOPY FOR BIOSENSING II**

21 August 2022 • 4:20 PM - 5:20 PM PDT | Conv. Ctr. Room 5B

Session Chair: Sumeet Mahajan, Univ. of Southampton (United Kingdom)

**12203-13**

**Super-Resolution SERS Spectral Bioimaging (Invited Paper)**

Author(s): Zachary D. Schultz, The Ohio State Univ. (USA)

21 August 2022 • 4:20 PM - 4:50 PM PDT | Conv. Ctr. Room 5B

**12203-14**

**SERS for molecular information of mitochondria in the live cell (Invited Paper)**

Author(s): Dong-Kwon Lim, Korea Univ. (Korea, Republic of)

21 August 2022 • 4:50 PM - 5:20 PM PDT | Conv. Ctr. Room 5B

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks**

**12198-501**

**In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502**

**Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks**

**12203-501**

**Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502**

**Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break**

**Coffee Break 10:05 AM - 10:45 AM**

**SESSION 5: SURFACE ENHANCED SPECTROSCOPY**

22 August 2022 • 10:45 AM - 11:45 AM PDT | Conv. Ctr. Room 5B

Session Chair: Prabhat Verma, Osaka Univ. (Japan)

**12203-18**

**Surface-enhanced Raman spectroscopy at electrified interfaces: electronic SERS and low-frequency vibrational SERS (Invited Paper)**

Author(s): Katsuyoshi Ikeda, Nagoya Institute of Technology (Japan)

22 August 2022 • 10:45 AM - 11:15 AM PDT | Conv. Ctr. Room 5B

**12203-19**

**Investigating multiscale interfaces and interphases using advanced spectroscopy for electrochemical energy storage (Invited Paper)**

Author(s): Guang Yang, Jagjit Nanda, Oak Ridge National Lab. (USA)

22 August 2022 • 11:15 AM - 11:45 AM PDT | Conv. Ctr. Room 5B

**Break**

**Lunch Break 11:45 AM - 1:25 PM**

**SESSION 6: ENHANCED IR SPECTROSCOPY**

22 August 2022 • 1:25 PM - 2:55 PM PDT | Conv. Ctr. Room 5B

Session Chair: Taka-aki Yano, Tokushima Univ. (Japan)

**12203-21**

**Ultrafast nano-imaging of far-from-equilibrium carrier and vibrational dynamics (Invited Paper)**

Author(s): Markus B. Raschke, Univ. of Colorado Boulder (USA)

22 August 2022 • 1:25 PM - 1:55 PM PDT | Conv. Ctr. Room 5B

**12203-22**

**Metamaterial absorber and reflector for ultra-sensitive infrared spectroscopy (Invited Paper)**

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

22 August 2022 • 1:55 PM - 2:25 PM PDT | Conv. Ctr. Room 5B

**12203-23**

**Plasmon-enhanced infrared spectroscopy with 2D materials (Invited Paper)**

Author(s): Qing Dai, National Ctr. for Nanoscience and Technology (China)

22 August 2022 • 2:25 PM - 2:55 PM PDT | Conv. Ctr. Room 5B

**Break**

**Coffee Break 2:55 PM - 3:25 PM**

**SESSION 7: PLASMONICS AND NANOIMAGING**

22 August 2022 • 3:25 PM - 4:15 PM PDT | Conv. Ctr. Room 5B

Session Chair: Takayuki Umakoshi, Osaka Univ. (Japan)

**12203-25**

**Extreme light localization for super-resolved imaging intracellular dynamics and Raman microscopy (Invited Paper)**

Author(s): Donghyun Kim, Yonsei Univ. (Korea, Republic of); Hongki Lee, Univ. of California, San Diego (USA); Hajun Yoo, Gwiyeong Moon, Yonsei Univ. (Korea, Republic of)

22 August 2022 • 3:25 PM - 3:55 PM PDT | Conv. Ctr. Room 5B

**12203-27**

**Hyperbolic metamaterials for large-area surface-enhanced Raman scattering (SERS) sensing**

Author(s): Melisa Ekin Gulseren, Univ. of California, Davis (USA); Lucas Domulevicz, University of California (USA); Joshua Hihath, Juan Sebastian Gomez-Diaz, Univ. of California, Davis (USA)

22 August 2022 • 3:55 PM - 4:15 PM PDT | Conv. Ctr. Room 5B

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12203-32****Structured illumination microscopy with DMD based UV laser illumination for wide-range and high-resolution imaging**

Author(s): Taerim Yoon, Pusan National Univ. (Korea, Republic of); Pil Un Kim, LG Electronics Inc. (Korea, Republic of); Heesang Ahn, Pusan National Univ. (Korea, Republic of); Tae Joong Eom, Advanced Photonics Research Institute (Korea, Republic of); Kyujung Kim, Pusan National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12203-33****Case studies on sensitivity of absorption spectra for NIR-SWIR absorbing dyes relative to inverse analysis**

Author(s): Scott Ramsey, Rachel Viger, Troy Mayo, Samuel G. Lambrakos, U.S. Naval Research Lab. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12203-36****2D REMPI to simultaneously obtain rotational distributions and vector correlations following photodissociation**

Author(s): Megan Aardema, Texas A&M Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12203-37****The Vibrationally Excited Nitric Oxide Monitoring (VENOM) Laser Diagnostic Applied to Hypersonic Environments**

Author(s): Madeline Smotzer, Texas A&M Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 8: OTHER PHENOMENA AT NANOSCALE I**

23 August 2022 • 9:00 AM - 10:00 AM PDT | Conv. Ctr. Room 5B

Session Chair: Yung Doug Suh, Korea Research Institute of Chemical Technology (Korea, Republic of)

**12203-28****Photon-induced near-field interaction in ultrafast low energy electron microscopy (Invited Paper)**

Author(s): Christoph Lienau, Carl von Ossietzky Univ. Oldenburg (Germany)

23 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 5B

**12203-29****Bond-selective intensity diffraction tomography (Invited Paper)**

Author(s): Jian Zhao, Boston Univ. (USA); Alex Matlock, Massachusetts Institute of Technology (USA); Lei Tian, Ji-Xin Cheng, Boston Univ. (USA)

23 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 5B

**Break****Coffee Break 10:00 AM - 10:30 AM****SESSION 9: OTHER PHENOMENA AT NANOSCALE II**

23 August 2022 • 10:30 AM - 11:40 AM PDT | Conv. Ctr. Room 5B

Session Chair: Prabhat Verma, Osaka Univ. (Japan)

**12203-31****Imaging with a steerable photonic nanojet probe**

Author(s): Mirza Karamahmedovic, Kenneth Scheel, Frederik L.-S. Pedersen, Technical Univ. of Denmark (Denmark); Poul-Erik Hansen, DFM A/S (Denmark)

23 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 5B

**12203-34****Two-dimensional materials by stacking order and applications of homo-structural devices (Invited Paper)**

Author(s): Ze Xiang Shen, Nanyang Technological Univ (Singapore)

23 August 2022 • 10:50 AM - 11:20 AM PDT | Conv. Ctr. Room 5B

**12203-35****In-situ optical spectroscopy and imaging of layered hybrid perovskites under high pressure**

Author(s): Yulia Lekina, Ze Xiang Shen, Nanyang Technological University (Singapore)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 5B

**Emerging Topics in Artificial Intelligence (ETAI) 2022**

21 - 25 August 2022 | Conv. Ctr. Room 5A

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, Univ. of California, Los Angeles (USA)

Program Committee: Jonas Andersson, Volvo Car Corp. (Sweden); George Barbastathis, Massachusetts Institute of Technology (USA); Frank Cichos, Univ. Leipzig (Germany); Margareta Colangelo, Jthereum (USA); Miguel C. Cornelles-Soriano, Instituto de Fisica Interdisciplinar y Sistemas Complejos (Spain); Meltem Elitas, Sabanci Univ. (Turkey); Claudio Gallicchio, Univ. di Pisa (Italy); Saga Helgadottir, Göteborgs Univ. (Sweden); Antoni Homs-Corbera, Cherry Biotech (France); Danny Krautz, Axel Springer hy GmbH (Germany); Sebastian Kühn, Axel Springer Consulting Group (Germany); Pablo Loza-Alvarez, ICFO - Institut de Ciències Fotòniques (Spain); Carlo Manzo, Univ. de Vic (Spain); Alireza Marandi, Caltech (USA); Paula Merino Serrais, Cajal Institute (Spain); Mite Mijalkov, Karolinska Institute (Sweden); Bert Jan Offrein, IBM Research - Zürich (Switzerland); Yair Rivenson, Pictor Labs (USA); Elena Rodriguez-Vieitez, Karolinska Institute (Sweden); 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. (USA); Lei Tian, Boston Univ. (USA)

**SESSION 1: FUNDAMENTALS OF DEEP LEARNING**

21 August 2022 • 1:00 PM - 2:30 PM PDT | Conv. Ctr. Room 5A

Session Chair: Giovanni Volpe, Göteborgs Univ. (Sweden)

**12204-3****Diffraction computing using cascaded all-optical NAND gates**

Author(s): Yi Luo, Deniz Mengu, Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

21 August 2022 • 1:00 PM - 1:20 PM PDT | Conv. Ctr. Room 5A

**12204-4****Adversarial attacks for machine learning denoisers and how to resist them**

Author(s): Michael Hecht, Shao Zongru, Saiyam B. Jain, CASUS - Ctr. for Advanced System Understanding (Germany)

21 August 2022 • 1:20 PM - 1:40 PM PDT | Conv. Ctr. Room 5A

**12204-5****Photonics-inspired models for solving the planar Potts model**

Author(s): Mostafa Honari-Latifpour, Queens College (USA), The Graduate Ctr., CUNY (USA); Mohammad-Ali Miri, Queens College (USA)

21 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 5A

**12204-27****Ultrasound image formation in the deep learning age (Invited Paper)**

Author(s): Muyinatu A. Lediju Bell, Johns Hopkins Univ. (USA)

21 August 2022 • 2:00 PM - 2:30 PM PDT | Conv. Ctr. Room 5A

**Break****Coffee Break 2:30 PM - 3:00 PM****SESSION 2: NEUROMORPHIC COMPUTING I**

21 August 2022 • 3:00 PM - 5:10 PM PDT | Conv. Ctr. Room 5A

Session Chairs: Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France), Adria Grabulosa i Vallmajó, FEMTO-ST (France), Anas Skalli, Univ. de Franche-Comté (France)

**12204-8****(3+1)D-printed adiabatic 1-to-N couplers**

Author(s): Adria Grabulosa, Xavier Porte, Johnny Moughames, Daniel Brunner, FEMTO-ST (France), Univ. Bourgogne Franche-Comté (France)

21 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 5A

**12204-9****A JTC-based photonic neural network accelerator architecture (Invited Paper)**

Author(s): Puneet Gupta, Shurui Li, UCLA Samueli School of Engineering (USA)

21 August 2022 • 3:20 PM - 3:50 PM PDT | Conv. Ctr. Room 5A

**12204-10****Optical spike processing with exciton-polariton microcavities**

Author(s): Krzysztof Tyszka, Univ. of Warsaw (Poland); Magda Furman, University of Warsaw (Poland); Rafał Mirek, Mateusz Król, Univ. of Warsaw (Poland); Andrzej Opala, Polish Academy of Sciences (Poland); Bartłomiej Seredyński, Jan Suffczyński, Wojciech Pacuski, Univ. of Warsaw (Poland); Michał Matuszewski, Institute of Physics, Polish Academy of Sciences (Poland); Jacek Szczytko, Barbara Piętka, Univ. of Warsaw (Poland)

21 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 5A

**12204-12****Integrated photonic-electronic platform for real-time analog data processing in LiDARs**

Author(s): Mahsa Salmani, Sreenil Saha, Armaghian Eshaghi, Huawei Technologies Co., Ltd. (Canada)

21 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 5A

**12204-13****Efficiency and scalability of optical neural networks based on exciton-polariton nonlinearity**

Author(s): Michal Matuszewski, Institute of Physics (Poland); Andrzej Opala, Institute of Physics, Polish Academy of Sciences (Poland); Rafał Mirek, Magdalena Furman, Mateusz Król, Krzysztof Tyszka, Univ. of Warsaw (Poland); Timothy C. H. Liew, Nanyang Technological Univ. (Singapore); Dario Ballarini, Daniele Sanvitto, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Jacek Szczytko, Barbara Piętka, Univ. of Warsaw (Poland)

21 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 5A

**12204-14****Wavelength tunable resonant phase-change synaptic weights for photonic neuromorphic computing**

Author(s): Yihao Cui, Behrad Gholipour, Univ. of Alberta (Canada)

21 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 5A

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks****12203-501****Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502****Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break****Coffee Break 10:05 AM - 10:35 AM****SESSION 3: NEUROMORPHIC COMPUTING II**

22 August 2022 • 10:35 AM - 12:35 PM PDT | Conv. Ctr. Room 5A

Session Chairs: Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France), Adrià Grabulosa i Vallmajó, FEMTO-ST (France), Anas Skalli, Univ. de Franche-Comté (France)

**12204-15****Photonic tensor core for machine intelligence (Invited Paper)**

Author(s): Xiaoxuan Ma, Nicola Peserico, The George Washington Univ. (USA); Ahmed Khaled, Queen's Univ. (Canada); Zhimu Guo, Queens University (Canada); Behrouz Movahhed Nouri, Hamed Dalir, Optelligence LLC (USA); Bahvin Shastri, Queens University (Canada); Volker J. Sorger, The George Washington Univ. (USA)

22 August 2022 • 10:35 AM - 11:05 AM PDT | Conv. Ctr. Room 5A

**12204-16****Scalable construction of quantum dot arrays using optical tweezers and deep learning**

Author(s): Martin Selin, Göteborgs Univ. (Sweden); Johnny Moughames, Univ. Bourgogne Franche-Comté (France); Lucas Bremer, Technische Univ. Berlin (Germany); Xavier Porte, Univ. Bourgogne Franche-Comté (France); Giuseppe Pesce, Univ. degli Studi di Napoli Federico II (Italy); Stephan Reitzenstein, Technische Univ. Berlin (Germany); Daniel Brunner, Univ. Bourgogne Franche-Comté (France); Giovanni Volpe, Göteborgs Univ. (Sweden)

22 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 5A

**12204-17****Computational metrics of an injection-locked large area semiconductor laser for neural network computing**

Author(s): Anas Skalli, Xavier Porte, FEMTO-ST (France); Nasibeh Haghghi, Stephan Reitzenstein, James A. Lott, Technische Univ. Berlin (Germany); Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

22 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 5A

**12204-59****Photonic reservoir computing with non-linear memory cells: Interplay between topology, delay and delayed input (Invited Paper)**

Author(s): Lina C. Jaurigue, Technische Univ. Ilmenau (Germany); Elizabeth Robertson, Janik Wolters, Technische Univ. Berlin (Germany); Kathy Lüdge, Technische Univ. Ilmenau (Germany)

22 August 2022 • 11:45 AM - 12:15 PM PDT | Conv. Ctr. Room 5A

**12204-58****Batch processing and data streaming fourier-based convolutional neural network accelerator**

Author(s): Volker J. Sorger, The George Washington Univ. (USA)

22 August 2022 • 12:15 PM - 12:35 PM PDT | Conv. Ctr. Room 5A

**Break****Lunch Break 12:35 PM - 2:20 PM****SESSION 4: NEUROMORPHIC COMPUTING III**

22 August 2022 • 2:20 PM - 3:40 PM PDT | Conv. Ctr. Room 5A

Session Chairs: Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France), Adrià Grabulosa i Vallmajó, FEMTO-ST (France), Anas Skalli, Univ. de Franche-Comté (France)

**12204-79****Image sensing with nonlinear optical neural networks (Invited Paper)**

Author(s): Mandar Sohoni, Cornell University (USA), NTT Research Inc. (USA); Tianyu Wang, Cornell University (USA); Logan G Wright, Tatsuhiro Onodera, Cornell University (USA), NTT Research Inc. (USA); Martin M Stein, Cornell Univ. (USA), NTT Research Inc. (USA); Shiyuan Ma, Cornell University (USA); Maxwell Anderson, Cornell Univ. (USA); Peter L. McMahon, Cornell University (USA), Kavli Institute at Cornell for Nanoscale Science (USA)

22 August 2022 • 2:20 PM - 2:50 PM PDT | Conv. Ctr. Room 5A

**12204-18****Realization of large-scale photonic spiking hardware system**

Author(s): Ria Talukder, Xavier Porte, Daniel Brunner, FEMTO-ST (France)

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 5A

**12204-19****On-chip training and inference with neuromorphic silicon photonic platforms (Invited Paper)**

Author(s): Bhavin J. Shastri, Queen's Univ. (Canada); Volker J. Sorger, The George Washington Univ. (USA)

22 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 5A

**Break****Coffee Break 3:40 PM - 4:10 PM****Panel Discussion: Photonics for (Neuromorphic) AI Hardware**

22 August 2022 • 4:10 PM - 5:40 PM PDT | Conv. Ctr. Room 5A

Moderator:

Daniel Brunner, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

Panelists to be announced soon

This panel will discuss the current and upcoming trends in neuromorphic computing, including next generation materials for optical nonlinearity, integration of ultra-parallel photonic architectures, going beyond 2D substrates, and physical substrates for machine learning applications. The discussion will look at the possible evolution of neuromorphic computing over the next 5 years as well as the role that optics and photonics can play. Open to all SPIE Optics + Photonics 2022 paid conference attendees.

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12204-76****Holographic characterisation of biological nanoparticles using deep learning**

Author(s): Fredrik Skärberg, Göteborgs Univ. (Sweden); Erik Olsén, Chalmers Univ. of Technology (Sweden); Benjamin Midtvedt, Göteborgs Univ. (Sweden); Emelie V. Wesén, Elin K. Esbjörner, Chalmers Univ. of Technology (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden); Fredrik Höök, Chalmers Univ. of Technology (Sweden); Daniel Midtvedt, Göteborgs Univ. (Sweden)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1



**12204-77**

**XOR gates based ultrafast exciton-polariton neuromorphic computing**

Author(s): Rafal Mirek, Univ. of Warsaw (Poland); Andrzej Opala, Polish Academy of Sciences (Poland); Magdalena Furman, Mateusz Król, Krzysztof Tyszka, Bartłomiej Sereżyński, Univ. of Warsaw (Poland); Dario Ballarini, CNR-NANOTEC (Italy); Daniele Sanvitto, CNR-NANOTEC (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Timothy C. H. Liew, Nanyang Technological Univ. (Singapore); Wojciech Pacuski, Jan Suffczyński, Univ. of Warsaw (Poland); Michał Matuszewski, Institute of Physics, Polish Academy of Sciences (Poland); Barbara Piętko, Jacek Szczytko, Univ. of Warsaw (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12204-39**

**Dynamic virtual live/apoptotic cell assay using deep learning**

Author(s): Zofia Korczak, Jesús D. Pineda, Saga Helgadottir, Benjamin Midtvedt, Mattias Goksör, Giovanni Volpe, Caroline B. Adiels, Göteborgs Univ. (Sweden)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 5: MICROSCOPY WITH AI I**

23 August 2022 • 8:45 AM - 10:35 AM PDT | Conv. Ctr. Room 5A

Session Chairs: Giovanni Volpe, Göteborgs Univ. (Sweden), Jesús D. Pineda Castro, Göteborgs Univ. (Sweden), Ria Talukder, Institut Franche-Comte Electronique Mecanique Thermique et Optique (France)

**12204-21**

**Machine learning for large-scale volumetric microscopy in biology (Invited Paper)**

Author(s): Ivo Sbalzarini, TU Dresden (Germany), Max-Planck-Institut für Molekulare Zellbiologie und Genetik (Germany)

23 August 2022 • 8:45 AM - 9:15 AM PDT | Conv. Ctr. Room 5A

**12204-22**

**Seeing the invisible: deep learning optical microscopy for label-free biomolecule screening in the sub-10 kDa regime**

Author(s): Henrik Klein Moberg, Christoph Langhammer, Chalmers Univ. of Technology (Sweden); Daniel Midtvedt, Göteborgs Univ. (Sweden); Barbora Spackova, Institute of Photonics and Electronics, Czech Academy of Sciences (Czech Republic); Bohdan Yeroshenko, David Albinsson, Joachim Fritzsche, Chalmers Univ. of Technology (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden)

23 August 2022 • 9:15 AM - 9:35 AM PDT | Conv. Ctr. Room 5A

**12204-23**

**CM2Net: a deep learning framework for computational miniature mesoscope**

Author(s): Qianwan Yang, Yujia Xue, Guorong Hu, Kehan Guo, Lei Tian, Boston Univ. (USA)

23 August 2022 • 9:35 AM - 9:55 AM PDT | Conv. Ctr. Room 5A

**12204-25**

**All-optical reconstruction of holograms using diffractive networks**

Author(s): Md Sadman Sakib Rahman, Aydogan Ozcan, Univ. of California, Los Angeles (USA)

23 August 2022 • 9:55 AM - 10:15 AM PDT | Conv. Ctr. Room 5A

**12204-26**

**Imaging through unknown, random diffusers using diffractive all-optical computing**

Author(s): Yi Luo, Yifan Zhao, Jingxi Li, Ege Çetintaş, Yair Rivenson, Mona Jarrahi, Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

23 August 2022 • 10:15 AM - 10:35 AM PDT | Conv. Ctr. Room 5A

**Break**

**Coffee Break 10:35 AM - 11:05 AM**

**SESSION 6: MICROSCOPY WITH AI II**

23 August 2022 • 11:05 AM - 12:05 PM PDT | Conv. Ctr. Room 5A

Session Chair: Daniel Midtvedt, Göteborgs Univ. (Sweden)

**12204-28**

**Revealing the spatiotemporal fingerprint of microscopic motion using geometric deep learning**

Author(s): Jesús D. Pineda Castro, Benjamin Midtvedt, Harshith Bachimanchi, Göteborgs Univ. (Sweden); Sergio Nóe, Univ. de Vic (Spain); Daniel Midtvedt, Giovanni Volpe, Göteborgs Univ. (Sweden); Carlo Manzo, Univ. de Vic (Spain)

23 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 5A

**12204-29**

**Few-shot generalizable hologram reconstruction model using a recurrent neural network (RNN)**

Author(s): Luzhe Huang, Xilin Yang, Tairan Liu, Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

23 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 5A

**12204-30**

**Deep-learning enhanced bioluminescence microscopy**

Author(s): Luis Felipe Morales Curiel, Lynn Lin, Gustavo Castro, Montserrat Porta, Pablo Loza, Michael Krieg, ICFO - Institut de Ciències Fotòniques (Spain)

23 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 5A

**Break**

**Lunch/Exhibition Break 12:05 PM - 1:40 PM**

**SESSION 7: MICROSCOPY WITH AI III**

23 August 2022 • 1:40 PM - 2:40 PM PDT | Conv. Ctr. Room 5A

Session Chair: Daniel Midtvedt, Göteborgs Univ. (Sweden)

**12204-31**

**Simulating intracavity optical trapping with machine learning**

Author(s): Agnese Callegari, Göteborgs Univ. (Sweden); Antonio Ciarlo, Giuseppe Pesce, Antonio Sasso, Univ. degli Studi di Napoli Federico II (Italy); David Bronte Ciriza, Onofrio M. Maragò, Alessandro Magazzù, Istituto per i Processi Chimico Fisici (Italy); Giovanni Volpe, Mathias Samuelsson, Göteborgs Univ. (Sweden)

23 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 5A

**12204-32**

**Quantitative phase imaging using diffractive optical networks**

Author(s): Deniz Mengü, Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

23 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 5A

**12204-33**

**Single-shot self-supervised particle tracking**

Author(s): Benjamin Midtvedt, Jesús 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, Göteborgs Univ. (Sweden); Fredrik Höök, Chalmers Univ. of Technology (Sweden); Daniel Midtvedt, Giovanni Volpe, Göteborgs Univ. (Sweden)

23 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 5A

**Break**

**Coffee Break 2:40 PM - 3:10 PM**

**Panel Discussion: AI for Applications in (Neuro)-Imaging**

23 August 2022 • 3:10 PM - 4:40 PM PDT | Conv. Ctr. Room 5A

Moderator:

Joana B. Pereira, Karolinska Institute (Sweden)

Panelists to be announced soon

This panel will explore the cross-road between the biological substrates for brain imaging and the technological implementations of artificial intelligence. It will focus on questions such as: What lessons can we learn from brain imaging to improve artificial intelligence? What can artificial intelligence teach us about the brain in health and disease? What can we learn from the pathways of neurodegeneration? And can we improve brain health through advanced diagnostic tools?

Open to all SPIE Optics + Photonics 2022 paid conference attendees.



**SESSION 8: BIOMEDICINE AND BIOPHYSICS I**

24 August 2022 • 8:00 AM - 10:10 AM PDT | Conv. Ctr. Room 5A

Session Chairs: Aydogan Ozcan, UCLA Samueli School of Engineering (USA), Md Sadman Sakib Rahman, Univ. of California, Los Angeles (USA), Jingxi Li, UCLA Samueli School of Engineering (USA)

**12204-34****Artificial intelligence and medical imaging: best practices and trustworthy ecosystems (Invited Paper)**

Author(s): Arman Rahmim, The Univ. of British Columbia (Canada)

24 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 5A

**12204-35****Deep learning-enabled, non-invasive virtual histology of skin using reflectance confocal microscopy**

Author(s): Jingxi Li, UCLA Samueli School of Engineering (USA); Jason Garfinkel, Dermatology and Laser Ctr. (USA); Xiaoran Zhang, UCLA Samueli School of Engineering (USA); Di Wu, Yijie Zhang, Kevin de Haan, Hongda Wang, Univ. of California, Los Angeles (USA); Tairan Liu, Bijie Bai, Yair Rivenson, UCLA Samueli School of Engineering (USA); Gennady Rubinstein, Dermatology and Laser Ctr. (USA); Philip O. Scumpia, Univ. of California, Los Angeles (USA); Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

24 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 5A

**12204-36****Virtual immunohistochemical (IHC) staining of unlabeled tissue using deep learning**

Author(s): Bijie Bai, UCLA Samueli School of Engineering (USA); Hongda Wang, Yuzhu Li, Univ. of California, Los Angeles (USA); Kevin De Haan, UCLA Samueli School of Engineering (USA); Francesco Colonnese, Yujie Wan, Jingyi Zuo, Ngan Doan, Univ. of California, Los Angeles (USA); Xiaoran Zhang, UCLA Samueli School of Engineering (USA); Yijie Zhang, Univ. of California, Los Angeles (USA); Jingxi Li, UCLA Samueli School of Engineering (USA); Wenjie Dong, Univ. of California, Los Angeles (USA); Morgan A. Darrow, Elham Kamangar, Han Sung Lee, UC Davis Health System (USA); Yair Rivenson, Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

24 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 5A

**12204-37****Label-free characterization of biological matter across scales (Invited Paper)**

Author(s): Daniel Midtvedt, Göteborgs Univ. (Sweden); Erik Olsén, Chalmers Univ. of Technology (Sweden); Benjamin Midtvedt, Göteborgs Univ. (Sweden); Elin K. Esbjörner, Chalmers Univ. of Technology (Sweden); Fredrik Skärberg, Berenice Garcia, Caroline B. Adiels, Göteborgs Univ. (Sweden); Fredrik Höök, Chalmers Univ. of Technology (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden)

24 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 5A

**12204-38****Virtual histological staining via deep learning (Invited Paper)**

Author(s): Hongda Wang, Pictor Labs (USA); Yair Rivenson, Pictor Labs (USA), UCLA Samueli School of Engineering (USA); Aydogan Ozcan, UCLA Samueli School of Engineering (USA)

24 August 2022 • 9:40 AM - 10:10 AM PDT | Conv. Ctr. Room 5A

**Break****Coffee Break 10:10 AM - 10:35 AM****SESSION 9: BIOMEDICINE AND BIOPHYSICS II**

24 August 2022 • 10:35 AM - 12:35 PM PDT | Conv. Ctr. Room 5A

Session Chairs: Aydogan Ozcan, UCLA Samueli School of Engineering (USA), Md Sadman Sakib Rahman, Univ. of California, Los Angeles (USA), Bijie Bai, UCLA Samueli School of Engineering (USA)

**12204-40****A deep learning approach for quantitative single-cell analysis of ciprofloxacin-treated escherichia coli cells in heterogenous microenvironment**

Author(s): Sumeyra Vural Kaymaz, Sabanci Univ. (Turkey); Meltem Elitas, Sabanci Univ. (Turkey), Sabanci University Nanotechnology Research and Application Ctr. (Turkey); Özge Umut, Sabanci Univ. (Turkey)

24 August 2022 • 10:35 AM - 10:55 AM PDT | Conv. Ctr. Room 5A

**12204-41****Artificial intelligence in radiology: from machine learning to clinical application (Invited Paper)**

Author(s): Axel Wismüller, Univ. of Rochester Medical Ctr. (USA)

24 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 5A

**12204-42****Microfluidics with feedback control and machine learning**

Author(s): Desmond Quinn, Tobias Thalheim, Frank Cichos, Univ. Leipzig (Germany)

24 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 5A

**12204-43****Quantitative microplankton tracking by holographic microscopy and deep learning**

Author(s): Harshith Bachimanchi, Benjamin Midtvedt, Daniel Midtvedt, Erik Selander, Giovanni Volpe, Göteborgs Univ. (Sweden)

24 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 5A

**12204-44****Learning-based high-resolution lensless fiber microendoscopy (Invited Paper)**

Author(s): Juergen W. Czarske, Jiachen Wu, Tijue Wang, Tom Glosemeyer, Julian Andreas Lich, Robert Kuschmierz, TU Dresden (Germany)

24 August 2022 • 12:05 PM - 12:35 PM PDT | Conv. Ctr. Room 5A

**Break****Lunch/Exhibition Break 12:35 PM - 2:05 PM****SESSION 10: BRAIN CONNECTIVITY I**

24 August 2022 • 2:05 PM - 3:25 PM PDT | Conv. Ctr. Room 5A

Session Chair: Joana B. Pereira, Karolinska Institute (Sweden)

**12204-47****BRAPH 2.0: brain connectivity software with multilayer network analyses and machine learning**

Author(s): Pablo Emiliano Gomez Ruiz, Göteborgs Univ. (Sweden); Anna Canal Garcia, Karolinska Institute (Sweden); Yu-Wei Chang, Göteborgs Univ. (Sweden); Mite Mijalkov, Daniel Vereb, Joana B. Pereira, Karolinska Institute (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden)

24 August 2022 • 2:05 PM - 2:25 PM PDT | Conv. Ctr. Room 5A

**12204-48****Multilayer brain connectivity analysis in Alzheimer's disease using functional MRI data**

Author(s): Anna Canal-Garcia, Dániel Veréb, Mite Mijalkov, Karolinska Institute (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden)

24 August 2022 • 2:25 PM - 2:45 PM PDT | Conv. Ctr. Room 5A

**12204-51**

**Classification between early onset Alzheimer's disease and frontotemporal dementia using a single neuroimaging feature**

Author(s): Agnès Pérez-Millan, Hospital Clínic de Barcelona (Spain), Univ. de Barcelona (Spain); Laia Borrell, Univ. de Barcelona (Spain); José Contador, Hospital Clínic de Barcelona (Spain); Mircea Balasa, Hospital Clínic de Barcelona (Spain), Global Brain Health Institute (USA); Albert Lladó, Hospital Clínic de Barcelona (Spain), CIBERNED - Ctr. de Investigación Biomédica en Red (Spain); Raquel Sanchez-Valle, Hospital Clínic de Barcelona (Spain); Roser Sala-Llonch, Univ. de Barcelona (Spain), Ctr. de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina (Spain)

24 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 5A

**12204-52**

**A novel method for quantifying men and women-like features in brain structure and function**

Author(s): Mite Mijalkov, Karolinska Institute (Sweden); Oveis Jamialahmadi, Stefano Romeo, Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden)

24 August 2022 • 3:05 PM - 3:25 PM PDT | Conv. Ctr. Room 5A

**Break**

**Coffee Break 3:25 PM - 3:50 PM**

**SESSION 11: BRAIN CONNECTIVITY II**

24 August 2022 • 3:50 PM - 5:30 PM PDT | Conv. Ctr. Room 5A

Session Chair: Joana B. Pereira, Karolinska Institute (Sweden)

**12204-53**

**Functional heterogeneity in the posterior medial parietal cortex is associated with cognition**

Author(s): Dániel Veréb, Joana B. Pereira, Karolinska Institute (Sweden)

24 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 5A

**12204-54**

**Computation of personalized functional networks using self-supervised deep learning (Invited Paper)**

Author(s): Yong Fan, Penn Medicine (USA)

24 August 2022 • 4:10 PM - 4:40 PM PDT | Conv. Ctr. Room 5A

**12204-55**

**Deep-learning analysis in tau PET for Alzheimer's continuum**

Author(s): Yu-Wei Chang, Giovanni Volpe, Göteborgs Univ. (Sweden); Joana B. Pereira, Karolinska Institute (Sweden), Lund Univ. (Sweden)

24 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 5A

**12204-78**

**Dynamical graph networks may aid in determining disease epicenters for neurodegenerative diseases and phenotyping prognostically different brain tumor types (Invited Paper)**

Author(s): Anke Meyer-Baese, Florida State Univ (USA); Ali Moradi Amani, School of Engineering, RMIT University, Melbourne (Australia); Uwe Meyer-Baese, Florida State Univ (USA); Kerstin Juetten, Universitätsklinikum der RWTH Aachen (Germany)

24 August 2022 • 5:00 PM - 5:30 PM PDT | Conv. Ctr. Room 5A

**SESSION 12: ANDI: THE ANOMALOUS DIFFUSION CHALLENGE**

25 August 2022 • 9:00 AM - 10:30 AM PDT | Conv. Ctr. Room 5A

Session Chair: Giovanni Volpe, Göteborgs Univ. (Sweden)

**12204-69**

**An anomalous competition: assessment of methods for anomalous diffusion through a community effort (Invited Paper)**

Author(s): Carlo Manzo, Univ. de Vic (Spain); Giovanni Volpe, Göteborgs Univ. (Sweden)

25 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 5A

**12204-70**

**Characterizing anomalous diffusion with classical statistics and deep learning (Invited Paper)**

Author(s): Giorgio Volpe, Univ. College London (United Kingdom)

25 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 5A

**12204-71**

**Characterization of anomalous diffusion with neural networks (Invited Paper)**

Author(s): Stefano Bo, Max-Planck-Institut für Physik komplexer Systeme (Germany); Aykut Argun, Göteborgs Univ. (Sweden); Falko Schmidt, Friedrich-Schiller-Univ. Jena (Germany); Ralf Eichhorn, Nordic Institute for Theoretical Physics (Sweden); Giovanni Volpe, Göteborgs Univ. (Sweden)

25 August 2022 • 10:00 AM - 10:30 AM PDT | Conv. Ctr. Room 5A

**Break**

**Coffee Break 10:30 AM - 11:00 AM**

**SESSION 13: PHYSICS-INFORMED DEEP LEARNING**

25 August 2022 • 11:00 AM - 11:50 AM PDT | Conv. Ctr. Room 5A

Session Chair: Giovanni Volpe, Göteborgs Univ. (Sweden)

**12204-80**

**Machine learning for inverse problems (Invited Paper)**

Author(s): Rebecca M. Willett, Univ of Chicago (USA)

25 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 5A

**12204-57**

**Using untrained, physics-informed neural networks for structured illumination image reconstruction**

Author(s): Zachary Burns, Zhaowei Liu, Univ. of California, San Diego (USA)

25 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 5A

**Break**

**Lunch/Exhibition Break 11:50 PM - 1:20 AM**

**SESSION 14: RESERVOIR COMPUTING AND REINFORCEMENT LEARNING**

25 August 2022 • 1:20 PM - 2:20 PM PDT | Conv. Ctr. Room 5A

Session Chair: Rebecca M. Willett, The Univ. of Chicago (USA)

**12204-60**

**Realization of reservoir computing by delayed oscillators with active microparticles**

Author(s): Xiangzun Wang, Frank Cichos, Univ. Leipzig (Germany)

25 August 2022 • 1:20 PM - 1:40 PM PDT | Conv. Ctr. Room 5A

**12204-61**

**Time-delayed nonlinear phenomena in exciton-polariton condensates for neuromorphic computing**

Author(s): Magdalena Furman, Rafał Mirek, Univ. of Warsaw (Poland); Andrzej Opala, Institute of Physics, Polish Academy of Sciences (Poland); Mateusz Król, Krzysztof Tyszcza, Bartłomiej Serebnyński, Wojciech Pacuski, Jan Suffczyński, Jacek Szczytko, Univ. of Warsaw (Poland); Michał Matuszewski, Institute of Physics, Polish Academy of Sciences (Poland); Barbara Piętka, Univ. of Warsaw (Poland)

25 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 5A

**12204-63**

**Deep reinforcement learning with artificial microswimmers**

Author(s): Ravi Pradip, Univ. Politècnica De Catalunya (Spain); Frank Cichos, Univ. Leipzig (Germany)

25 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 5A

**Break**

**Coffee Break 2:20 PM - 2:50 PM**

**SESSION 15: APPLICATIONS OF AI**

25 August 2022 • 2:50 PM - 4:00 PM PDT | Conv. Ctr. Room 5A

Session Chair: Volker J. Sorger, The George Washington Univ. (USA)

**12204-65****Machine learning for scanning probe and electron microscopy for materials discovery (Invited Paper)**

Author(s): Sergei Kalinin, The Univ. of Tennessee Knoxville (USA); Yongtao Liu, Oak Ridge National Lab. (USA)

25 August 2022 • 2:50 PM - 3:20 PM PDT | Conv. Ctr. Room 5A

**12204-67****Non-destructive and fast conductivity calculation of various nanowires combining THz time-domain spectroscopy with artificial neural network**

Author(s): M. Zeki Güngördü, Patrick Kung, Seongsin M. Kim, The Univ. of Alabama (USA)

25 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 5A

**12204-68****Adversarial Sensing: A Learning-based Approach to Inverse Problems with Stochastic Forward Models**

Author(s): Brandon Y. Feng, Mingyang Xie, Univ. of Maryland, College Park (USA); Christopher Metzler, University of Maryland College Park (USA)

25 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 5A

## CONFERENCE 12205

# Spintronics XV

21 - 25 August 2022 | Conv. Ctr. Room 6D (and 6C for Session 20)

Conference Chairs: Henri-Jean M. Drouhin, Lab. des Solides Irradiés, Ecole Polytechnique (France); Jean-Eric Wegrowe, Ecole Polytechnique (France); Manijeh Razeghi, Northwestern Univ. (USA)

Conference Co-Chair: Henri Jaffrès, Unité Mixte de Physique CNRS/Thales (France)

Program Committee: Claire Baraduc, CEA-Grenoble (France); Franco Ciccacci, Politecnico di Milano (Italy); Russell P. Cowburn, Univ. of Cambridge (United Kingdom); Scott A. Crooker, Los Alamos National Lab. (USA); Vincent Cros, Unité Mixte de Physique CNRS/Thales (France); Hanan Dery, Univ. of Rochester (USA); Rogério de Sousa, Univ. of Victoria (Canada); Michel I. Dyakonov, Univ. Montpellier 2 (France); Michael E. Flatté, The Univ. of Iowa (USA); Joseph S. Friedman, The Univ. of Texas at Dallas (USA); 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); Tomás Jungwirth, Institute of Physics of the CAS, v.v.i. (Czech Republic); Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (USA); Mathias Klaui, Univ. Konstanz (Germany); Daniel Lacour, Institut Jean Lamour (France); Connie H. Li, U.S. Naval Research Lab. (USA); Aurélien Manchon, King Abdullah Univ. of Science and Technology (Saudi Arabia); Xavier Marie, INSA - Univ. of Toulouse (France); Laurens W. Molenkamp, Julius-Maximilians-Univ. Würzburg (Germany); Hans T. Nembach, National Institute of Standards and Technology (USA); Yoshichika Otani, The Univ. of Tokyo (Japan); Vlad Pribiagi, Univ. of Minnesota, Twin Cities (USA); 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 (USA); Vasily V. Temnov, Univ. du Maine (France); Luc Thomas, Applied Materials, Inc. (USA); Evgeny Tsybal, Univ. of Nebraska-Lincoln (USA); Olaf M. J. van 't Erve, U.S. Naval Research Lab. (USA); Joerg Wunderlich, Univ. Regensburg (Germany); Igor Zutic, Univ. at Buffalo (USA)

### SESSION 1: THZ SPINTRONICS

21 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6D

Session Chair: Henri-Yves Jaffrès, Unité Mixte de Physique CNRS/Thales (France)

#### 12205-2

##### **Helicity-dependent terahertz-wave emission from the Dirac electrons in bismuth (Invited Paper)**

Author(s): Yoshua Hirai, The Univ. of Tokyo (Japan); Naotaka Yoshikawa, Hana Hirose, Masashi Kawaguchi, Masamitsu Hayashi, The Univ. of Tokyo (Japan); Ryo Shimano, The Univ. of Tokyo (Japan), Cryogenic Research Ctr., The Univ. of Tokyo (Japan)

21 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 6D

#### 12205-3

##### **Surface states mediated spin-to-charge conversion in Bi<sub>1-x</sub>Sb<sub>x</sub>/Co and Bi<sub>2</sub>SnTe<sub>4</sub>/Co topological insulators probed by THz emission spectroscopy. (Invited Paper)**

Author(s): Enzo Rongione, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France), Lab. de Physique de l'Ecole Normale Supérieure (France), CNRS (France); Laëticia Baringthon, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France), Synchrotron SOLEIL, Cassiopée beamline (France); Sotirios Fragkos, Institute of Nanoscience and Nanotechnology, National Ctr. for Scientific Research "Demokritos" (Greece); Univ. of West Attica (Greece); Jacques Hawecker, Laboratoire de Physique de l'Ecole Normale Supérieure, ENS, Université PSL, CNRS, Sorbonne Université (France); Thi Huong Dang, Unité Mixte de Physique CNRS, Thales, Université Paris-Saclay (France); Evangelia Xenogiannopoulou, Polychronis Tsipas, Institute of Nanoscience and Nanotechnology, National Ctr. for Scientific Research "Demokritos" (Greece); Patrick Le Fèvre, Synchrotron SOLEIL, Cassiopée beamline (France); Nicolas Reyren, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France); Gilles Patriarche, Ctr. de Nanosciences et de Nanotechnologies, Université Paris-Saclay, CNRS (France); Aristide Lemaître, Ctr. de Nanosciences et de Nanotechnologies, Univ. Paris-Saclay, CNRS (France); Athanasios Dimoulas, Institute of Nanoscience and Nanotechnology, National Ctr. for Scientific Research "Demokritos" (Greece); Romain Lebrun, Jean-Marie George, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France); Sukhdeep Dhillon, Lab. de Physique de l'Ecole Normale Supérieure (France), Univ. PSL (France), CNRS (France); Henri Jaffrès, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France)

21 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 6D

#### 12205-4

##### **Light and microwave driven spin pumping across FeGaB-BiSb interface (Invited Paper)**

Author(s): Matthias Benjamin Jungfleisch, Univ. of Delaware (USA); Vinay Sharma, Morgan State Univ. (USA); Weipeng Wu, Univ. of Delaware (USA); Prabesh Bajracharya, Morgan State Univ. (USA); Duy Quang To, Univ. of Delaware (USA); Anthony Johnson, Morgan State Univ. (USA); Anderson Janotti, Univ. of Delaware (USA); Garnett W. Bryant, National Institute of Standards and Technology (USA); Lars Gundlach, Univ. of Delaware (USA); Ramesh C. Budhani, Morgan State Univ. (USA)

21 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6D

### Break

**Coffee Break 10:00 AM - 10:25 AM**

### SESSION 2: TOPOLOGICAL SPINTRONICS I

21 August 2022 • 10:25 AM - 12:25 PM PDT | Conv. Ctr. Room 6D

Session Chair: Matthias Benjamin Jungfleisch, Univ. of Delaware (USA)

#### 12205-5

##### **Bulk spin torques in topological insulators (Invited Paper)**

Author(s): Dimitrie Culcer, James Cullen, The Univ. of New South Wales (Australia); Rhonald Burgos Atencia, Univ. del Sinú (Colombia)

21 August 2022 • 10:25 AM - 10:55 AM PDT | Conv. Ctr. Room 6D

#### 12205-6

##### **Magneto-optics of materials with Dirac and Weyl fermions (Invited Paper)**

Author(s): Alexey Belyanin, Texas A&M Univ. (USA)

21 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 6D

#### 12205-7

##### **Imaging of topological magnetic spins textures in transparent oxides using polarimetric coherent diffractive imaging (Invited Paper)**

Author(s): Edwin Fohtung, Xiaowen Shi, Rensselaer Polytechnic Institute (USA); Dmitry Karpov, European Synchrotron Radiation Facility (France)

21 August 2022 • 11:25 AM - 11:55 AM PDT | Conv. Ctr. Room 6D

#### 12205-8

##### **Bilinear magnetoresistance in HgTe topological insulator: opposite signs at opposite interfaces demonstrated by gate control (Invited Paper)**

Author(s): Salvatore Teresi, Jean-Philippe Attané, Laurent Vila, Maxen Cosset-Cheneau, CEA (France), Spintec (France); Albert Fert, Unité Mixte de Physique CNRS/Thales, Univ. Paris Saclay (France); Tristan Meunier, Institut NÉEL, CNRS (France); Philippe Ballet, CEA-LETI (France); Yann-Michel Niquet, Interdisciplinary Research Institute of Grenoble, CEA (France); Candice Thomas, CEA-LETI (France); Thomas Guillet, Cécile Grezes, Paul Noël, Jules Papin, CEA (France), Spintec (France); Jing Li, CEA-LETI (France); Yu Fu, CEA (France), Spintec (France)

21 August 2022 • 11:55 AM - 12:25 PM PDT | Conv. Ctr. Room 6D

### Break

**Lunch Break 12:25 PM - 1:25 PM**

**SESSION 3: TOPOLOGICAL SPINTRONICS II**

21 August 2022 • 1:25 PM - 2:25 PM PDT | Conv. Ctr. Room 6D

Session Chair: Dimitrie Culcer, The Univ. of New South Wales (Australia)

**12205-10****Spin-orbit torque switching of ferromagnet from bulk insulating Bi<sub>2</sub>Se<sub>3</sub> in topological insulator/ferromagnet heterostructures (Invited Paper)**

Author(s): Connie H. Li, Mehmet A. Noyan, Jisoo Moon, Olaf van 't Erve, Enrique D. Cobas, U.S. Naval Research Lab. (USA); Mark I. Lohmann, U.S. Naval Research Lab (USA); Xiaohang Zhang, Berry T. Jonker, U.S. Naval Research Lab. (USA)

21 August 2022 • 1:25 PM - 1:55 PM PDT | Conv. Ctr. Room 6D

**12205-12****Influence of disorder on vortex Majorana states in 3D topological insulators (Invited Paper)**

Author(s): Jukka Vayrynen, Purdue Univ. (USA)

21 August 2022 • 1:55 PM - 2:25 PM PDT | Conv. Ctr. Room 6D

**Break****Coffee Break 2:25 PM - 2:50 PM****SESSION 4: FERROMAGNETIC RESONANCE AND THZ SPINTRONICS**

21 August 2022 • 2:50 PM - 4:50 PM PDT | Conv. Ctr. Room 6D

Session Chair: Connie H. Li, U.S. Naval Research Lab. (USA)

**12205-14****Ultrafast spintronic THz emitters (Invited Paper)**

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

21 August 2022 • 2:50 PM - 3:20 PM PDT | Conv. Ctr. Room 6D

**12205-15****Spin-sink interfacial engineering for correlated enhancement of spin-orbit torques and THz generation (Invited Paper)**

Author(s): Sachin Krishnia, Enzo Rongione, Vincent Cros, Sophie Collin, Jean Marie George, Unité Mixte de Physique CNRS/Thales (France); Sukhdeep DHILLON, Univ. PSL (France), Lab. de Physique de l'Ecole Normale Supérieure (France); Juliette Mangeney, Jerome Jerome, Lab. de Physique Statistique de l'ENS (France); Henri-Yves Jaffrès, Unité Mixte de Physique CNRS/Thales (France)

21 August 2022 • 3:20 PM - 3:50 PM PDT | Conv. Ctr. Room 6D

**12205-16****Ultrafast optically-induced spin transfer in ferromagnetic alloys and compounds (Invited Paper)**

Author(s): Stefan Mathias, Georg-August-Univ. Göttingen (Germany)

21 August 2022 • 3:50 PM - 4:20 PM PDT | Conv. Ctr. Room 6D

**12205-17****Inertial spin dynamics in epitaxial cobalt films (Invited Paper)**

Author(s): Vivek Unikandanunni, Stockholm Univ. (Sweden); Rajasekhar Medapalli, Lancaster Univ. (United Kingdom); Marco Asa, Politecnico di Milano (Italy); Edoardo Albisetti, Politecnico di Milano (Italy); Daniela Petti, Riccardo Bertacco, Politecnico di Milano (Italy); Eric Fullerton, Univ. of California, San Diego (USA); Stefano Bonetti, Stockholm Univ. (Sweden), Univ. Ca' Foscari di Venezia (Italy)

21 August 2022 • 4:20 PM - 4:50 PM PDT | Conv. Ctr. Room 6D

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks****12203-501****Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502****Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break****Coffee Break 10:05 AM - 10:30 AM****SESSION 5: MRAMS AND SENSORS**

22 August 2022 • 10:30 AM - 12:40 PM PDT | Conv. Ctr. Room 6D

Session Chair: Igor Zutic, Univ. at Buffalo (USA)

**12205-18****Nonvolatile, neuromorphic, and probabilistic spintronics (Keynote Presentation)**

Author(s): Hideo Ohno, Shunsuke Fukami, Tohoku Univ. (Japan)

22 August 2022 • 10:30 AM - 11:10 AM PDT | Conv. Ctr. Room 6D

**12205-19****Spin-transfer torque MRAM technology development: tuning MTJ characteristics to build high density stand-alone to low-latency industrial products (Invited Paper)**

Author(s): Han K. Lee, Fred B. Mancoff, Everspin Technologies, Inc. (USA)

22 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 6D

**12205-20****Efficient spin transfer torque switching of perpendicular magnetic tunnel junctions and scaling outlook (Invited Paper)**

Author(s): Ricardo C. Sousa, Daniel S. Hazen, Nuno Caçoilo, Bruno M. S. Teixeira, Alvaro Palomino Lopez, Olivier Fruchart, David Salomoni, Stéphane Auffret, Laurent Vila, Ioan-Lucian Prejbeanu, Liliana D. Buda-Prejbeanu, Bernard Dieny, Spintec, Univ. Grenoble Alpes (France), CEA (France), CNRS (France)

22 August 2022 • 11:40 AM - 12:10 PM PDT | Conv. Ctr. Room 6D

**12205-21****Modeling and design for spin-orbit-torque and magnetoelectric devices for memory and compute-in-memory (Invited Paper)**

Author(s): Azad Naeemi, Piyush Kumar, Georgia Institute of Technology (USA); Yu-Ching Liao, Intel Corp. (USA); Siri Narla, Georgia Institute of Technology (USA)

22 August 2022 • 12:10 PM - 12:40 PM PDT | Conv. Ctr. Room 6D

**Break****Lunch Break 12:40 PM - 2:10 PM**



## CONFERENCE 12205

### SESSION 6: MRAMS AND SPINTRONICS DEVICES

22 August 2022 • 2:10 PM - 4:10 PM PDT | Conv. Ctr. Room 6D

Session Chair: Ricardo C. Sousa, Spintec (France)

#### 12205-22

##### **Spintronic devices and architectures for radiation hardened environments (past, current, and future) (Invited Paper)**

Author(s): Thomas D. Boone, Western Digital Corp. (USA)

22 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 6D

#### 12205-23

##### **Enhancing the performances of spintronic devices at the atomic scale using ion irradiation (Invited Paper)**

Author(s): Dafaïné Ravelosona, Spin-Ion Technologies (France), CNRS (France), Univ. Paris Saclay (France)

22 August 2022 • 2:40 PM - 3:10 PM PDT | Conv. Ctr. Room 6D

#### 12205-24

##### **High resolution magnetoelastic surface acoustic wave (SAW) magnetic field sensors (Invited Paper)**

Author(s): Henrik Wolfram, Eckhard Quandt, Andreas Bahr, Christian-Albrechts-Univ. zu Kiel (Germany)

22 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 6D

#### 12205-25

##### **Spintronic harvesting of thermal fluctuations using quantum thermodynamics (Invited Paper)**

Author(s): Martin Bowen, Institut de Physique et de Chimie des Matériaux de Strasbourg (France)

22 August 2022 • 3:40 PM - 4:10 PM PDT | Conv. Ctr. Room 6D

### SESSION 7: SPIN PHOTONICS

22 August 2022 • 4:10 PM - 4:40 PM PDT | Conv. Ctr. Room 6D

Session Chair: Dafaïné Ravelosona, Spin-ION Technologies (France)

#### 12205-47

##### **Spin-dependent photocurrent in ferromagnetic metal / semiconductor tunnel junctions (Invited Paper)**

Author(s): Henri-Jean M. Drouhin, Lab. des Solides Irradiés, Ecole Polytechnique (France), CEA-DRF (France), CNRS (France); Viatcheslav I. Safarov, Lab. des Solides Irradiés, Ecole Polytechnique (France), CEA-DRF-IRAMIS (France), CNRS (France); Igor V. Rozhansky, Ioffe Institute (Russian Federation); Henri Jaffrès, Unité Mixte de Physique CNRS/Thales, Univ. Paris-Saclay (France); Yuan Lu, Institut Jean Lamour, Univ. de Lorraine, CNRS (France)

22 August 2022 • 4:10 PM - 4:40 PM PDT | Conv. Ctr. Room 6D

### POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

#### 12205-80

##### **Symmetry or gouge groups of Maxwell and Yang-Mills electromagnetism from observer's mathematics point of view**

Author(s): Boris Khots, Dmitriy Khots, Self Employment (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### SESSION 8: VAN DER WAALS SPINTRONICS

23 August 2022 • 8:00 AM - 10:20 AM PDT | Conv. Ctr. Room 6D

Session Chair: Jean-Eric Wegrowe, Ecole Polytechnique (France)

#### 12205-31

##### **Spin-orbit proximity in van der Waals heterostructures (Invited Paper)**

Author(s): Felix Casanova, CIC nanoGUNE (Spain), IKERBASQUE, Basque Foundation for Science (Spain)

23 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 6D

#### 12205-32

##### **Probing and controlling magnetism in 2D magnetic semiconductor CrSBr (Invited Paper)**

Author(s): John Cenker, Univ. of Washington (USA); Xiaoyang Zhu, Columbia University (USA); Ting Cao, Xiaodong Xu, Univ. of Washington (USA)

23 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 6D

#### 12205-33

##### **Controlling spin and valley hall effect in monolayer WSe<sub>2</sub> at elevated temperatures (Invited Paper)**

Author(s): Xintong Li, Jean Anne Incorvia, Zhida Liu, The Univ. of Texas at Austin (USA); Yihan Liu, Univ. of Pittsburgh (USA); Suyogya Karki, Xiaoqin Li, Deji Akinwande, The Univ. of Texas at Austin (USA)

23 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 6D

#### 12205-9

##### **Epitaxial MnSb<sub>2</sub>Te<sub>4</sub>: an intrinsic magnetic topological insulator with high Curie temperature (Invited Paper)**

Author(s): Oliver Rader, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany)

23 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6D

#### 12205-82

##### **Build-up of spin polarization due to spin dependent charge transfer in MoSe<sub>2</sub>/hBN/Ni hybrid structures**

Author(s): Pierre Renucci, Hans Tornatzky, Cedric Robert, Bo Han, LPCNO INSA Toulouse (France); Thomas Blon, Benjamin Lassagne, Géraldine Ballon, Lab. de Physique et Chimie des Nano-objets (France), Institut National des Sciences Appliquées de Toulouse (France); Yuan Lu, Institut Jean Lamour, UMR 7198, CNRS-Université de Lorraine, BP 239 (France); Kenji Watanabe, Research Center for Functional Materials, National Institute for Materials Science (Japan); Takashi Taniguchi, International Center for Materials Nanoarchitectonics, National Institute for Materials Science, (Japan); Bernhard Urbaszek, LPCNO INSA Toulouse (France); Joao Marcelo Lopes, Paul-Drude-Institut für Festkörperelektronik, Leibniz-Institut im Forschungsverbund Berlin e.V (Germany); Xavier Marie, LPCNO INSA Toulouse (France)

23 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 6D

#### Break

#### Coffee Break 10:20 AM - 10:50 AM

### SESSION 9: NEUROMORPHIC COMPUTING I

23 August 2022 • 10:50 AM - 12:20 PM PDT | Conv. Ctr. Room 6D

Session Chair: Damien Querlioz, Univ. Paris-Saclay (France)

#### 12205-26

##### **Implementation of a binary neural network on a passive array of magnetic tunnel junctions (Invited Paper)**

Author(s): Jonathan M. Goodwill, National Institute of Standards and Technology (USA); Nitin Prasad, National Institute of Standards and Technology (USA), Univ. of Maryland (USA); Brian D. Hoskins, Matthew W. Daniels, National Institute of Standards and Technology (USA); Advait Madhavan, National Institute of Standards and Technology (USA), Univ. of Maryland (USA); Lei Wan, Tiffany S. Santos, Michael Tran, Jordan A. Katine, Patrick M. Braganca, Western Digital Corp. (USA); Mark D. Stiles, Jabez McClelland, National Institute of Standards and Technology (USA)

23 August 2022 • 10:50 AM - 11:20 AM PDT | Conv. Ctr. Room 6D

**12205-27****Secure logic locking with hybrid CMOS-nanomagnet logic (Invited Paper)**

Author(s): Naimul Hassan, Alexander J. Edwards, The Univ. of Texas at Dallas (USA); Dhritiman Bhattacharya, Georgetown Univ. (USA); Mustafa M. Shihab, Peng Zhou, Xuan Hu, The Univ. of Texas at Dallas (USA); Jayasimha Atulasimha, Virginia Commonwealth Univ. (USA); Yiorgos Makris, Joseph S. Friedman, The Univ. of Texas at Dallas (USA)

23 August 2022 • 11:20 AM - 11:50 AM PDT | Conv. Ctr. Room 6D

**12205-28****Frustrated arrays of nanomagnets for efficient reservoir computing (Invited Paper)**

Author(s): Alexander Edwards, The Univ. of Texas at Dallas (USA); Dhritiman Bhattacharya, Virginia Commonwealth Univ. (USA); Peng Zhou, The Univ. of Texas at Dallas (USA); Nathan R. McDonald, Lisa Loomis, Clare D. Thiem, Air Force Research Lab. (USA); Jayasimha Atulasimha, Virginia Commonwealth Univ. (USA); Joseph S. Friedman, The Univ. of Texas at Dallas (USA)

23 August 2022 • 11:50 AM - 12:20 PM PDT | Conv. Ctr. Room 6D

**Break****Lunch/Exhibition Break 12:20 PM - 1:50 PM****SESSION 10: NEUROMORPHIC COMPUTING II**

23 August 2022 • 1:50 PM - 3:20 PM PDT | Conv. Ctr. Room 6D

Session Chair: Joseph S. Friedman, The Univ. of Texas at Dallas (USA)

**12205-29****Binarized neuromorphic inference network with STT MTJ synapses (Invited Paper)**

Author(s): Peng Zhou, Alexander J. Edwards, The Univ. of Texas at Dallas (USA); Fred B. Mancoff, Dimitri Houssameddine, Sanjeev Aggarwal, Everspin Technologies, Inc. (USA); Joseph S. Friedman, The Univ. of Texas at Dallas (USA)

23 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 6D

**12205-30****A data-driven approach for solving the vortex-based spin-torque oscillator dynamics as a new tool for exploring neuromorphic applications (Invited Paper)**

Author(s): Chloé Chopin, Simon de Wergifosse, Flavio Abreu Araujo, Univ. Catholique de Louvain (Belgium)

23 August 2022 • 2:20 PM - 2:50 PM PDT | Conv. Ctr. Room 6D

**12205-81****Forecasting the outcome of spintronic experiments with neural ordinary differential equations (Invited Paper)**

Author(s): Damien Querlioz, Univ. Paris-Saclay (France)

23 August 2022 • 2:50 PM - 3:20 PM PDT | Conv. Ctr. Room 6D

**Break****Coffee Break 3:20 PM - 3:50 PM****SESSION 11: SPIN-HALL EFFECT AND SPIN-ORBIT TORQUE**

23 August 2022 • 3:50 PM - 5:20 PM PDT | Conv. Ctr. Room 6D

Session Chair: Giti A. Khodaparast, Virginia Polytechnic Institute and State Univ. (USA)

**12205-34****Sagnac interferometry for high-sensitivity optical measurements of spin-orbit torque (Invited Paper)**

Author(s): Yunqiu Kelly Luo, Cornell Univ. (USA)

23 August 2022 • 3:50 PM - 4:20 PM PDT | Conv. Ctr. Room 6D

**12205-35****Magnetic proximity effect, unidirectional spin Hall magnetoresistance, and spin-orbit torques in heavy metal/Co/ heavy metal trilayer systems (Invited Paper)**

Author(s): Anastasiia Moskaltsova, Timo Kuschel, Univ. Bielefeld (Germany)

23 August 2022 • 4:20 PM - 4:50 PM PDT | Conv. Ctr. Room 6D

**12205-36****Spin-Hall devices: quantitative predictions of the spin-accumulation and pure spin-currents (Invited Paper)**

Author(s): Jean-Eric Wegrowe, Ecole Polytechnique (France)

23 August 2022 • 4:50 PM - 5:20 PM PDT | Conv. Ctr. Room 6D

**SESSION 12: COHERENCE AND BALLISTIC TRANSPORT**

24 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 6D

Session Chair: Jason Robinson, Univ. of Cambridge (United Kingdom)

**12205-38****Coherent magnonics for quantum information science (Invited Paper)**

Author(s): Michael E. Flatté, The Univ. of Iowa (USA)

24 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 6D

**12205-39****Oscillatory behavior of the low-energy spin precession angle in a ferromagnet by molecular field tuning (Invited Paper)**

Author(s): Valentin Desbuis, Daniel Lacour, Institut Jean Lamour (France); Coriolan Tiusan, Ctr. of Superconductivity, Spintronics and Surface Science (Romania); Christopher Vautrin, Yuan Lu, Institut Jean Lamour (France); Wolfgang Weber, Institut de Physique et de Chimie des Matériaux de Strasbourg (France); Michel Hehn, Institut Jean Lamour (France)

24 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 6D

**12205-40****Spectral Control of Quantum Emitters in Quantum Information Processing (Invited Paper)**

Author(s): Herbert F. Fotsch, Univ. at Albany, The State Univ. of New York (USA); Univ. at Buffalo, The State Univ. of New York (USA); David Hucul, Kathy-Anne Soderberg, Air Force Research Lab. - Rome (USA)

24 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 6D

**12205-41****Hot electron transport in an all solid state device: secondary electrons and d-band effects (Invited Paper)**

Author(s): Valentin Desbuis, Daniel Lacour, Institut Jean Lamour (France); Coriolan Tiusan, Ctr. of Superconductivity, Spintronics and Surface Science, Univ. Tehnica din Cluj Napoca (Romania); Yuan Lu, Christopher Vautrin, Institut Jean Lamour (France); Wolfgang Weber, Institut de Physique et de Chimie des Matériaux de Strasbourg (France); Michel Hehn, Institut Jean Lamour (France)

24 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6D

**Break****Coffee Break 10:00 AM - 10:25 AM****SESSION 13: SUPERCONDUCTING AND VOLTAGE-CONTROLLED SPINTRONICS**

24 August 2022 • 10:25 AM - 12:25 PM PDT | Conv. Ctr. Room 6D

Session Chair: Michael E. Flatté, The Univ. of Iowa (USA)

**12205-56****Energy efficient computing devices with voltage control of nanoscale magnetism (Invited Paper)**

Author(s): Jayasimha Atulasimha, Virginia Commonwealth Univ. (USA)

24 August 2022 • 10:25 AM - 10:55 AM PDT | Conv. Ctr. Room 6D

**12205-55****Advanced voltage-controlled MRAM devices for low-power memory and machine learning (Invited Paper)**

Author(s): Pedram Khalili, Northwestern Univ. (USA)

24 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 6D

**12205-51****Temperature-dependent spin-transport and current-induced torques in superconductor/ferromagnet heterostructures (Invited Paper)**

Author(s): Matthias Althammer, Walter Schottky Institut, Bayerische Akademie der Wissenschaften (Germany)

24 August 2022 • 11:25 AM - 11:55 AM PDT | Conv. Ctr. Room 6D

**12205-54**

**Infinite spin-valve effect in an s-wave superconductor (Invited Paper)**

Author(s): Jason Robinson, Univ. of Cambridge (United Kingdom)  
24 August 2022 • 11:55 AM - 12:25 PM PDT | Conv. Ctr. Room 6D

**Break**

**Lunch/Exhibition Break 12:25 PM - 1:50 PM**

**SESSION 14: SPIN LASERS**

24 August 2022 • 1:50 PM - 3:50 PM PDT | Conv. Ctr. Room 6D

Session Chair: Christopher H. Marrows, Univ. of Leeds (United Kingdom)

**12205-42**

**Spin lasing in high-beta bimodal quantum dot micropillar cavities (Invited Paper)**

Author(s): Niels Heermeier, Tobias Heuser, Jan Große, Technische Univ. Berlin (Germany); Natalie Jung, Ruhr-Univ. Bochum (Germany); Arseniy Kaganskiy, Technische Univ. Berlin (Germany); Markus Lindemann, Nils C. Gerhardt, Martin R. Hofmann, Ruhr-Univ. Bochum (Germany); Stephan Reitzenstein, Technische Univ. Berlin (Germany)

24 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 6D

**12205-43**

**Injection-locked spin-VCSELs for coherent optical communications (Invited Paper)**

Author(s): Nobuhide Yokota, Tohoku Univ. (Japan); Kazuhiro Ikeda, National Institute of Advanced Industrial Science and Technology (Japan); Hiroshi Yasaka, Tohoku Univ. (Japan)

24 August 2022 • 2:20 PM - 2:50 PM PDT | Conv. Ctr. Room 6D

**12205-46**

**Linear gain anisotropy and mode profile asymmetry in spin-VCSELs: extended spin-flip models (Invited Paper)**

Author(s): Mariusz Drong, VŠB-Technical Univ. of Ostrava (Czech Republic), Ecole Polytechnique, Institut Polytechnique de Paris (France); Tibor Fördös, VŠB-Technical Univ. of Ostrava (Czech Republic); Henri Jaffrès, Unité Mixte de Physique CNRS/Thales (France); Kamil Postava, VŠB-Technical Univ. of Ostrava (Czech Republic); Henri-Jean Drouhin, Ecole Polytechnique, Institut Polytechnique de Paris (France)

24 August 2022 • 2:50 PM - 3:20 PM PDT | Conv. Ctr. Room 6D

**12205-76**

**Spin-1 photons, spin-1/2 electrons, Bell's inequalities, and Feynman's special perspective on quantum mechanics (Invited Paper)**

Author(s): Masud Mansuripur, Wyant College of Optical Sciences (USA)  
24 August 2022 • 3:20 PM - 3:50 PM PDT | Conv. Ctr. Room 6D

**Break**

**Coffee Break 3:50 PM - 4:15 PM**

**SESSION 15: NANOMAGNETISM AND MAGNONICS**

24 August 2022 • 4:15 PM - 5:45 PM PDT | Conv. Ctr. Room 6D

Session Chair: Matthias Althammer, Walter Schottky Institut (Germany)

**12205-65**

**Spin textures in synthetic antiferromagnets (Invited Paper)**

Author(s): Christopher Barker, Univ. of Leeds (United Kingdom); Simone Finizio, Paul Scherrer Institut (Switzerland); Craig Barton, National Physical Lab. (United Kingdom); Eloi Haltz, Univ. of Leeds (United Kingdom); Sophie Morley, Lawrence Berkeley National Lab. (USA); Francesco Maccherozzi, Brice Sarpi, Diamond Light Source Ltd. (United Kingdom); Sina Mayr, Paul Scherrer Institute (Switzerland), ETH Zurich (Switzerland); Thomas Moore, Gavin Burnell, Univ. of Leeds (United Kingdom); Jörg Raabe, Paul Scherrer Institut (Switzerland); Olga Kazakova, National Physical Lab. (United Kingdom); Christopher H. Marrows, Univ. of Leeds (United Kingdom)

24 August 2022 • 4:15 PM - 4:45 PM PDT | Conv. Ctr. Room 6D

**12205-61**

**Time-resolved magneto-optical and ferromagnetic resonance properties of multifunctional BaTiO<sub>3</sub>-BiFeO<sub>3</sub> films and nano-rod arrays (Invited Paper)**

Author(s): Giti A. Khodaparast, Nicholas W. G. Smith, Shuang Wu, Satoru Emori, Brenden A. Magill, Rathara H. Mudiyansele, Virginia Polytechnic Institute and State Univ. (USA); Jade Holleman, Stephen McGill, National High Magnetic Field Lab. (USA); Min Gyu Kang, Priya Shashank, The Pennsylvania State Univ. (USA); Christopher Stanton, Univ. of Florida (USA)  
24 August 2022 • 4:45 PM - 5:15 PM PDT | Conv. Ctr. Room 6D

**12205-66**

**Ferrimagnetic spintronics (Invited Paper)**

Author(s): Kyung-Jin Lee, KAIST (Korea, Republic of)  
24 August 2022 • 5:15 PM - 5:45 PM PDT | Conv. Ctr. Room 6D

**SESSION 16: ORBITAL TORQUE AND SPIN SEEBECK EFFECT**

25 August 2022 • 8:00 AM - 10:30 AM PDT | Conv. Ctr. Room 6D

Session Chair: Hyunsoo Yang, National Univ. of Singapore (Singapore)

**Session 16 runs concurrently with Session 19**

**12205-69**

**Observation of the orbital Hall effect in a light metal Ti (Invited Paper)**

Author(s): Dongwook Go, Forschungszentrum Jülich GmbH (Germany), Jülich Aachen Research Alliance (Germany); Young-Gwan Choi, Sungkyunkwan Univ. (Korea, Republic of); Daegeun Jo, Pohang Univ. of Science and Technology (Korea, Republic of); Kyung-Hun Ko, Sungkyunkwan Univ. (Korea, Republic of); Kyung-Han Kim, Pohang Univ. of Science and Technology (Korea, Republic of); Hee Gyum Park, Korea Institute of Science and Technology (Korea, Republic of); Changyoung Kim, Seoul National Univ. (Korea, Republic of); Byoung-Chul Min, Korea Institute of Science and Technology (Korea, Republic of); Gyung-Min Choi, Sungkyunkwan Univ. (Korea, Republic of); Hyun-Woo Lee, Pohang Univ. of Science and Technology (Korea, Republic of)

25 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 6D

**12205-70**

**Orbital torque in magnetic bilayers (Invited Paper)**

Author(s): OukJae Lee, Korea Institute of Science and Technology (Korea, Republic of); Kyung-Jin Lee, KAIST (Korea, Republic of); Hyun-Woo Lee, Pohang Univ. of Science and Technology (Korea, Republic of); Dongjoon Lee, Korea Institute of Science and Technology (Korea, Republic of); Dongwook Go, Peter Grünberg Institut (IPG), Forschungszentrum Jülich GmbH (Germany), Institute for Advanced Simulation (IAS), Forschungszentrum Jülich GmbH (Germany); Hyeon-Jong Park, KAIST (Korea, Republic of)

25 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 6D

**12205-71**

**Enhancement of spin-orbit torques in ferromagnetic layer via orbital Hall effect (Invited Paper)**

Author(s): Sachin Krishnia, Vincent Cros, Sophie Collin, Jean-Marie George, Henri-Yves Jaffrès, Unité Mixte de Physique CNRS/Thales (France)

25 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 6D

**12205-72**

**Enhancing spin-orbit torque efficiency via orbital currents (Invited Paper)**

Author(s): Chen-Yu Hu, Yu-Fang Chiu, Chia-Chin Tsai, Chao-Chun Huang, Kuan-Hao Chen, Cheng-Wei Peng, National Taiwan Univ. (Taiwan); Chien-Min Lee, Ming-Yuan Song, Yen-Lin Huang, Shy-Jay Lin, Taiwan Semiconductor Manufacturing Co. Ltd. (Taiwan); Chi-Feng Pai, National Taiwan Univ. (Taiwan)

25 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6D

**12205-73****Observation of nuclear-spin Seebeck effect in Pt/MnCO<sub>3</sub> (Invited Paper)**

Author(s): Takashi Kikkawa, The Univ. of Tokyo (Japan); Derek Reitz, Univ. of California, Los Angeles (USA); Hiroaki Ito, Takahiko Makiuchi, Takahiro Sugimoto, Kakeru Tsunekawa, Shunsuke Daimon, The Univ. of Tokyo (Japan); Koichi Oyanagi, Iwate Univ. (Japan); Rafael Ramos, Univ. de Santiago de Compostela (Spain); Saburo Takahashi, Tohoku Univ. (Japan); Yuki Shiomi, The Univ. of Tokyo (Japan); Yaroslav Tserkovnyak, Univ. of California, Los Angeles (USA); Eiji Saitoh, The Univ. of Tokyo (Japan)

25 August 2022 • 10:00 AM - 10:30 AM PDT | Conv. Ctr. Room 6D

**Break**

**Coffee Break 10:30 AM - 10:55 AM**

**SESSION 17: TIME-RESOLVED SPECTROSCOPY AND MAGNETIC IMAGING**

25 August 2022 • 10:55 AM - 12:25 PM PDT | Conv. Ctr. Room 6D

Session Chair: Daniel Lacour, Institut Jean Lamour (France)

**12205-68****Superluminal propagation of antiferromagnetic magnons in NiO (Invited Paper)**

Author(s): Kyusup Lee, Hyunsoo Yang, National Univ. of Singapore (Singapore)

25 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 6D

**12205-63****Weak stripe angle determination by quantitative x-ray magnetic microscopy (Invited Paper)**

Author(s): Daniel Lacour, K. Ait Oukaci, Institut Jean Lamour (France); D. Stoeffler, Institut de Physique et de Chimie des Matériaux de Strasbourg (France); B. Sarpi, Synchrotron SOLEIL (France); F. Montaigne, Institut Jean Lamour (France); R. Belkhou, Synchrotron SOLEIL (France); M. Hehn, Institut Jean Lamour (France)

25 August 2022 • 11:25 AM - 11:55 AM PDT | Conv. Ctr. Room 6D

**12205-64****High-resolution quantum diamond magnetic imaging for interrogating magnetic fields in electronic devices (Invited Paper)**

Author(s): Pauli Kehayias, Sandia National Labs. (USA)

25 August 2022 • 11:55 AM - 12:25 PM PDT | Conv. Ctr. Room 6D

**Break**

**Lunch/Exhibition Break 12:25 PM - 1:40 PM**

**SESSION 18: VOLTAGE-CONTROLLED SPINTRONICS**

25 August 2022 • 1:40 PM - 2:40 PM PDT | Conv. Ctr. Room 6D

Session Chair: Henri-Jean M. Drouhin, Lab. des Solides Irradiés (France)

**12205-57****Perspectives of non-magnetic spin-textured ferroelectric semiconductors (Invited Paper)**

Author(s): Christian C. Rinaldi, Politecnico di Milano (Italy)

25 August 2022 • 1:40 PM - 2:10 PM PDT | Conv. Ctr. Room 6D

**12205-59****Non-volatile electric-field control of spin-orbit torques in perpendicular ferromagnet- SrTiO<sub>3</sub> system (Invited Paper)**

Author(s): Aurélie Kandazoglou, CEA-DRF, Spintec (France); Cécile Grezes, Maxen Cosset-Chéneau, CEA, Spintec (France); Luis Moreno Vincente-Arche, Unité Mixte de Physique CNRS/Thales (France); Paolo Sgarro, CEA, Spintec (France); Paul Noël, ETH Zurich (Switzerland); Stéphane Auffret, Kévin Garello, CEA, Spintec (France); Manuel Bibes, Unité Mixte de Physique CNRS/Thales (France); Laurent Vila, Jean-Philippe Attané, CEA, Spintec (France)

25 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 6D

**SESSION 19: QUANTUM SPINTRONICS THEORY**

25 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 6C

Session Chair: Branislav Nikolic, Univ. of Delaware (USA)

**Session 19 runs concurrently with Session 16**

**12205-74****What is quantum spin torque: spintronics meets strongly correlated and long-range entangled quantum matter (Invited Paper)**

Author(s): Branislav Nikolic, Univ. of Delaware (USA)

25 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 6C

**12205-75****Radial spin texture and exotic Weyl fermions in the electronic properties of chiral Te crystals (Invited Paper)**

Author(s): Alberto Crepaldi, Politecnico di Milano (Italy)

25 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 6C

**12205-77****Transport properties in the steady-state regime of spin and bosonic chains (Invited Paper)**

Author(s): Tharnier Puel, The Univ. of Iowa (USA); Stefano Chesi, Beijing Computational Science Research Ctr. (China); Stefan Kirchner, Zhejiang Institute of Modern Physics, Zhejiang Univ. (China); Pedro Ribeiro, CeFEMA, Instituto Superior Técnico (Portugal)

25 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 6C

**12205-78****Dissipationless circulating currents and fringe magnetic fields near a single spin embedded in a two-dimensional electron gas (Invited Paper)**

Author(s): Adonai Rodrigues da Cruz, Technische Univ. Eindhoven (Netherlands); Michael E. Flatté, The Univ. of Iowa (USA)

25 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 6C



# Quantum Nanophotonic Materials, Devices, and Systems 2022

22 - 23 August 2022 | Conv. Ctr. Room 1A

Conference Chairs: Cesare Soci, Nanyang Technological Univ. (Singapore); Matthew T. Sheldon, Texas A&M Univ. (USA); Mario Agio, Univ. Siegen (Germany); Igor Aharonovich, Univ. of Technology, Sydney (Australia)

Program Committee: Vikas Anant, Photon Spot, Inc. (USA); Jennifer A. Dionne, Stanford Univ. (USA); Andrei Faraon, Caltech (USA); Mohammad Hafezi, Joint Quantum Institute (USA); Zubin Jacob, Purdue Univ. (USA); Christian Kurtsiefer, National Univ. of Singapore (Singapore); Mark Lawrence, Stanford Univ. (USA); Peter Lodahl, Niels Bohr Institute (Denmark); Marko Loncar, Harvard John A. Paulson School of Engineering and Applied Sciences (USA); Chao-Yang Lu, Univ. of Science and Technology of China (China); Patrick Maletinsky, Univ. Basel (Switzerland); Maiken H. Mikkelsen, Duke Univ. (USA); Prineha Narang, Harvard Univ. (USA); Kae Nemoto, National Institute of Informatics (Japan); Jeremy L. O'Brien, Univ. of Bristol (United Kingdom); Teri W. Odom, Northwestern Univ. (USA); Jian-Wei Pan, Univ. of Science and Technology of China (China); Pascale Senellart, Lab. de Photonique et de Nanostructures (France); Andrew J. Shields, Toshiba Research Europe Ltd. (United Kingdom); Kartik Srinivasan, National Institute of Standards and Technology (USA); Daniel L. Stick, Sandia National Labs. (USA); Mark Tame, Stellenbosch Univ. (South Africa); Wolfgang Tittel, Univ. of Calgary (Canada); Ewold Verhagen, AMOLF (Netherlands); Ulrike Woggon, Technische Univ. Berlin (Germany)

## NANOSCIENCE + ENGINEERING PLENARY

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks****12203-501****Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502****Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

**Break****Coffee Break 10:05 AM - 10:35 AM**

## SESSION 1: MATERIAL PLATFORMS FOR QUANTUM PHOTONIC DEVICES I

22 August 2022 • 10:35 AM - 11:45 AM PDT | Conv. Ctr. Room 1A

Session Chair: Filippo Martinelli, Nanyang Technological Univ. (Singapore)

**12206-15****Optical transparency induced by a largely Purcell-enhanced single photon emitter in a low-Q cavity**

Author(s): Demitry Farfurnik, Harjot Singh, Zhouchen Luo, Univ. of Maryland (USA); Allan S. Bracker, Samuel G. Carter, U.S. Naval Research Lab. (USA); Edo Waks, Univ. of Maryland, College Park (USA)

22 August 2022 • 10:35 AM - 10:55 AM PDT | Conv. Ctr. Room 1A

**12206-4****Quantum nonlocality in an urban network combining SPDC- and quantum dot-based photonic hardware**

Author(s): Francesco Basso Basset, Gonzalo Carvacho, Emanuele Rocca, Mauro Valeri, Davide Poderini, Claudio Pardo, Emanuele Polino, Lorenzo Carosini, Michele B. Rota, Julia Neuwirth, Sapienza Univ. di Roma (Italy); Saimon Filipe Covre da Silva, Armando Rastelli, Johannes Kepler Univ. Linz (Austria); Nicolò Spagnolo, Sapienza Univ. di Roma (Italy); Rafael Chaves, Univ. Federal do Rio Grande do Norte (Brazil); Fabio Sciarrino, Rinaldo Trotta, Sapienza Univ. di Roma (Italy)

22 August 2022 • 10:55 AM - 11:15 AM PDT | Conv. Ctr. Room 1A

**12206-5****Nanoscale strain control of spin defects in hBN (Invited Paper)**

Author(s): Benjamin J. Lawrie, Oak Ridge National Lab. (USA)

22 August 2022 • 11:15 AM - 11:45 AM PDT | Conv. Ctr. Room 1A

**Break****Lunch Break 11:45 AM - 1:25 PM**

## SESSION 2: MATERIAL PLATFORMS FOR QUANTUM PHOTONIC DEVICES II

22 August 2022 • 1:25 PM - 2:15 PM PDT | Conv. Ctr. Room 1A

Session Chair: Christian Schimpf, Johannes Kepler Univ. Linz (Austria)

**12206-6****Pico-electrodynamics (Invited Paper)**

Author(s): Zubin Jacob, Todd Van Mechelen, Sathwik Bharadwaj, Purdue Univ. (USA)

22 August 2022 • 1:25 PM - 1:55 PM PDT | Conv. Ctr. Room 1A

**12206-7****Single photon detection in micron wide NbTiN bridges**

Author(s): Milos Petrovic, Nanyang Technological Univ. (Singapore); Lijiong Shen, Ctr. for Quantum Technologies, National Univ. of Singapore (Singapore); Shuyu Dong, Nanyang Technological Univ. (Singapore); Filippo Martinelli, Ctr. for Disruptive Photonic Technologies, Nanyang Technological Univ. (Singapore); Christian Kurtsiefer, Ctr. for Quantum Technologies, National Univ. of Singapore (Singapore); Cesare Soci, Ctr. for Disruptive Photonic Technologies, Nanyang Technological Univ. (Singapore)

22 August 2022 • 1:55 PM - 2:15 PM PDT | Conv. Ctr. Room 1A

**Break****Coffee Break 2:15 PM - 2:45 PM**

## SESSION 3: MATERIAL PLATFORMS FOR QUANTUM PHOTONIC DEVICES III

22 August 2022 • 2:45 PM - 3:55 PM PDT | Conv. Ctr. Room 1A

Session Chair: Matthew T. Sheldon, Texas A&amp;M Univ. (USA)

**12206-9****Multipair emission effects in quantum dot-based entangled photon sources**

Author(s): Julia Neuwirth, Francesco Basso Basset, Michele B. Rota, Sapienza Univ. di Roma (Italy); Saimon . Covre da Silva, Johannes Kepler Univ. Linz (Austria); Klaus D. Jöns, Univ. Paderborn (Germany); Armando Rastelli, Johannes Kepler Univ. Linz (Austria); Rinaldo Trotta, Johannes Kepler Univ. Linz (Italy)

22 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 1A

**12206-10****Enhanced spontaneous emission on epsilon-near-zero thin films (Invited Paper)**

Author(s): Howard Lee, Univ. of California, Irvine (USA), Beckman Laser Institute and Medical Clinic, Univ. of California, Irvine (USA); Aleksei Anopchenko, Univ. of California, Irvine (USA)

22 August 2022 • 3:05 PM - 3:35 PM PDT | Conv. Ctr. Room 1A

**12206-11****Deterministic formation of quantum emitters in hexagonal boron nitride by femtosecond laser irradiation**

Author(s): Felice Gesuele, Univ. degli Studi di Napoli Federico II (Italy)

22 August 2022 • 3:35 PM - 3:55 PM PDT | Conv. Ctr. Room 1A



## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12206-28****Quantum Dot-Organic Light Emitting Diodes for High Color Purity**

Author(s): Byoung-Seong Jeong, Kyungpook National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12206-29****Formation of highly-crystalline InN nanowires by controlling initial growth behavior and their application to touch-free sensors**

Author(s): Sangmoon Han, Jeonbuk National Univ. (Korea, Republic of); Seoung-Ki Lee, Pusan National Univ. (Korea, Republic of); Jaehyeok Shin, Siyun Noh, Jeonbuk National Univ. (Korea, Republic of); Sang-Hoon Bae, Washington Univ. in St. Louis (USA); Jin Soo Kim, Jeonbuk National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12206-30****Cryogenic photoluminescence setup for rapid prototyping and active device biasing of monolayer 2D semiconductors for quantum applications**

Author(s): Carlos M. Torres, B. Melvin L. Pascoguin, James R. Adleman, Brad C. Liu, Richard C. Ordonez, Cody K. Hayashi, Kathryn M. Liotta, Naval Information Warfare Ctr. Pacific (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12206-31****The optimization of metal-semiconductor light detection by Schottky interface force**

Author(s): Ching-Fuh Lin, Zih-Chun Su, National Taiwan Univ. (Taiwan); Ashish Gaurav, National Taiwan Univ. (India); Deepali Sinha, National Taiwan Univ. (Taiwan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 4: QUANTUM NANOPHOTONIC SYSTEMS I

23 August 2022 • 8:30 AM - 9:40 AM PDT | Conv. Ctr. Room 1A

Session Chair: Sathwik Bharadwaj, Purdue Univ. (USA)

**12206-12****Room-temperature strong coupling in plasmonic nanocavities (Invited Paper)**

Author(s): Matthew A. Pelton, Univ. of Maryland, Baltimore County (USA)

23 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 1A

**12206-13****Room-temperature strong coupling of a single-photon emitter and a bound-state-in-the-continuum cavity**

Author(s): Thu Ha Do, A\*STAR Agency for Science, Technology and Research (Singapore); Milad Nonahal, Chi Li, Univ. of Technology, Sydney (Australia); Vytautas Valuckas, Arseniy Kuznetsov, A\*STAR Agency for Science, Technology and Research (Singapore); Hai Son Nguyen, Ecole Centrale de Lyon (France); Igor Aharonovich, Univ. of Technology, Sydney (Australia); Son Tung Ha, A\*STAR Agency for Science, Technology and Research (Singapore)

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 1A

**12206-14****Tunable entangled photon emitters based on cavity-enhanced GaAs quantum dots on micromachined piezoelectric substrates**

Author(s): Michele B. Rota, Sapienza Univ. di Roma (Italy); Tobias M. Krieger, Johannes Kepler Univ. Linz (Austria); Quirin Buchinger, Julius-Maximilians-Univ. Würzburg (Germany); Julia Neuwirth, Sapienza Univ. di Roma (Italy); Santanu Manna, Johannes Kepler Univ. Linz (Austria); Francesco Basso Basset, Sapienza Univ. di Roma (Italy); Magdalena

Moczala-Dusanowska, Julius-Maximilians-Univ. Würzburg (Germany); Saimon Filipe . Covre da Silva, Xueyong Yuan, Johannes Kepler Univ. Linz (Austria); Giorgio Pettinari, CNR-Istituto di Fotonica e Nanotecnologie (Italy); Tobias Huber, Sven Höfling, Julius-Maximilians-Univ. Würzburg (Germany); Armando Rastelli, Johannes Kepler Univ. Linz (Austria); Rinaldo Trotta, Sapienza Univ. di Roma (Italy)

23 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 1A

**Break****Coffee Break 9:40 AM - 10:10 AM**

## SESSION 5: QUANTUM NANOPHOTONIC SYSTEMS II

23 August 2022 • 10:10 AM - 11:30 AM PDT | Conv. Ctr. Room 1A

Session Chair: Igor Aharonovich, Univ. of Technology, Sydney (Australia)

**12206-3****Generation of entangled photon pairs in nonlinear waveguides by free-space illumination**

Author(s): Álvaro Rodríguez Echarri, ICFO - Institut de Ciències Fotòniques (Spain); Joel Cox, Univ. of Southern Denmark (Denmark), Danish Institute for Advanced Study, Univ. of Southern Denmark (Denmark); Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

23 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 1A

**12206-16****Integrated photonics for trapped ion quantum information experiments at Sandia National Laboratories (Invited Paper)**

Author(s): Hayden McGuinness, Michael Gehl, William J. Setzer, Nickolas Karl, Justin Schultz, Megan Ivory, Rex Kay, Douglass Trotter, Daniel Dominguez, Matt Eichenfield, Daniel L. Stick, Sandia National Laboratories (USA)

23 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 1A

**12206-17****Dielectric nanoantenna lasers: design concepts and experimental demonstrations (Invited Paper)**

Author(s): Son Tung Ha, Mengfei Wu, A\*STAR Institute of Materials Research and Engineering (Singapore); Thanh Xuan Hoang, Hong-Son Chu, A\*STAR Institute of High Performance Computing (Singapore); Hilmi Volkan Demir, Nanyang Technological Univ. (Singapore); Ramón Paniagua Domínguez, Arseniy Kuznetsov, A\*STAR Institute of Materials Research and Engineering (Singapore)

23 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 1A

**Break****Lunch/Exhibition Break 11:30 AM - 1:00 PM**

## SESSION 6: QUANTUM PHOTONIC DEVICES FOR SIMULATIONS, METROLOGY, ETC. I

23 August 2022 • 1:00 PM - 2:40 PM PDT | Conv. Ctr. Room 1A

Session Chair: Matthew A. Pelton, Univ. of Maryland, Baltimore County (USA)

**12206-19****Deterministic generation of building-block photonic cluster states from a single quantum emitter (Invited Paper)**

Author(s): Shuo Sun, Univ. of Colorado Boulder (USA)

23 August 2022 • 1:00 PM - 1:30 PM PDT | Conv. Ctr. Room 1A

**12206-20****Coherent light absorption and photon number discrimination (Invited Paper)**

Author(s): Anton N. Vetlugin, Ruixiang Guo, Filippo Martinelli, Nanyang Technological Univ. (Singapore); Nikolay I. Zheludev, Univ. of Southampton (United Kingdom), Nanyang Technological Univ. (Singapore); Cesare Soci, Nanyang Technological Univ. (Singapore)

23 August 2022 • 1:30 PM - 2:00 PM PDT | Conv. Ctr. Room 1A

## CONFERENCE 12206

### 12206-21

#### **Simulated generation of indistinguishable single photons from a quantum ladder system**

Author(s): Friedrich Sbresny, Lukas Hanschke, Technische Univ. München (Germany); Eva Schöll, Univ. Paderborn (Germany); William Rauhaus, Technische Univ München (Germany); Bianca Scaparra, Katarina Boos, Jonathan J. Finley, Technische Univ. München (Germany); Klaus Jöns, Univ. Paderborn (Germany); Kai Müller, Technische Univ. München (Germany)

23 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 1A

### 12206-22

#### **Improving superconducting nanowire single-photon detectors made of NbTiN using a novel method to characterize the timing jitter**

Author(s): Rasmus Flaschmann, Lucio Zugliani, Christian Schmid, Stefan Strohauer, Fabian Wietschorke, Stefanie Grotowski, Simone Spedicato, Sven Ernst, Fabian Flassig, Matthias Althammer, Walter Schottky Institut (Germany); Rudolf Gross, Walther-Meissner-Institute (Germany); Jonathan Finley, Kai Müller, Walter Schottky Institut (Germany)

23 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 1A

### Break

**Coffee Break 2:40 PM - 3:10 PM**

## SESSION 7: QUANTUM PHOTONIC DEVICES FOR SIMULATIONS, METROLOGY, ETC. II

23 August 2022 • 3:10 PM - 4:40 PM PDT | Conv. Ctr. Room 1A

Session Chair: Demitry Farfurnik, Institute for Research in Electronics & Applied Physics (USA)

### 12206-23

#### **Quantum communication with semiconductor quantum dots (Invited Paper)**

Author(s): Christian Schimpf, Armando Rastelli, Saimon Covre da Silva, Santanu Manna, Johannes Kepler Univ. Linz (Austria); Philip Walther, Michal Vyvlecka, Univ. Wien (Austria)

23 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 1A

### 12206-24

#### **Packaged foundry-fabricated silicon spiral photon pair source**

Author(s): Joseph A. Monteleone, Matthew van Niekerk, Mario J. Ciminelli, Rochester Institute of Technology (USA); Gerald L. Leake, Daniel Coleman, SUNY Polytechnic Institute (USA); Michael Fanto, Air Force Research Lab. (USA); Stefan F. Preble, Rochester Institute of Technology (USA)

23 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 1A

### 12206-25

#### **Efficient semiconductor quantum light sources at telecom wavelength based on hybrid circular Bragg gratings**

Author(s): Andrea Barbiero, Toshiba Research Europe Ltd. (United Kingdom)

23 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 1A

### 12206-26

#### **Quantum-phase two-dimensional materials**

Author(s): Valerio Di Giulio, P. André D. Gonçalves, ICFO - Institut de Ciències Fotòniques (Spain); Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain), ICREA - Institució Catalana de Recerca i Estudis Avançats (Spain)

23 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 1A

# Liquid Crystals XXVI

22 - 23 August 2022 | Conv. Ctr. Room 7B

Conference Chairs: Iam Choon Khoo, The Pennsylvania State Univ. (USA)

Program Committee: Timothy J. Bunning, Air Force Research Lab. (USA); 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. (USA); Sin-Doo Lee, Seoul National Univ. (Korea, Republic of); Tsung-Hsien Lin, National Sun Yat-Sen Univ. (Taiwan); Kenneth L. Marshall, Lab. for Laser Energetics (USA); Francesco Simoni, Univ. Politecnica delle Marche (Italy); Nelson V. Tabiryan, BEAM Engineering For Advanced Measurements Co. (USA); David M. Walba, Univ. of Colorado Boulder (USA); Shin-Tson Wu, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA)

## SESSION 1: OPTICAL/PHOTONIC DEVICES AND APPLICATIONS

22 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 7B

Session Chair: Iam-Choon Khoo, The Pennsylvania State Univ. (USA)

### 12207-1

#### Direct observation of the dynamic heterogeneity in soft matter by fluctuation microscope (Keynote Presentation)

Author(s): Jun Yamamoto, Kyoto Univ. (Japan)

22 August 2022 • 8:30 AM - 8:55 AM PDT | Conv. Ctr. Room 7B

### 12207-2

#### Liquid crystalline systems as sources of electrically tunable white laser light (Invited Paper)

Author(s): Jaroslaw Mysliwiec, Alina Szukalska, Adam Szukalski, Lech Sznitko, Wroclaw Univ. of Science and Technology (Poland); Justyna Stachera, Ewa Chrzumnicka, Tomasz Martynski, Poznan Univ. of Technology (Poland); Luana Persano, Dario Pisigniano, Andrea Camposeo, NEST (Italy)

22 August 2022 • 8:55 AM - 9:15 AM PDT | Conv. Ctr. Room 7B

### 12207-3

#### Quantification of neutral mechanical plane shifting in bending elastomer film using cholesteric liquid crystal sensor (Invited Paper)

Author(s): Masayuki Kishino, Norihisa Akamatsu, Ryo Taguchi, Shoichi Kubo, Tokyo Institute of Technology (Japan); Kyohei Hisano, Ritsumeikan Univ. (Japan); Osamu Tsutsumi, Ritsumeikan Univ. (Japan); Atsushi Shishido, Tokyo Institute of Technology (Japan)

22 August 2022 • 9:15 AM - 9:35 AM PDT | Conv. Ctr. Room 7B

### 12207-5

#### Photorefractive effect of flexoelectric liquid crystal mixtures and their application to laser ultrasonic remote sensing (Invited Paper)

Author(s): Takeo Sasaki, Takaaki Yagami, Toshinobu Takashi, Kaita Suzuki, Gouta Ikeda, Yukihiko Ishii, Khoa V. Le, Yumiko Naka, Tokyo Univ. of Science (Japan)

22 August 2022 • 9:35 AM - 9:55 AM PDT | Conv. Ctr. Room 7B

### 12207-6

#### Aligned polymer dispersed liquid crystal film and its application in light efficiency enhancement of quantum dot backlight

Author(s): Suman Halder, Kent State Univ. (USA); Yunho Shin, Ziyuan Zhou, Xinfang Zhang, Lang Hu, Advanced Materials and Liquid Crystal Institute (USA); Deng-Ke Yang, Kent State Univ. (USA)

22 August 2022 • 9:55 AM - 10:10 AM PDT | Conv. Ctr. Room 7B

### Break

Coffee Break 10:10 AM - 10:40 AM

## SESSION 2: NOVEL LIQUID CRYSTALLINE AND SOFT MATERIALS/STRUCTURE

22 August 2022 • 10:40 AM - 12:20 PM PDT | Conv. Ctr. Room 7B

Session Chair: Nelson V. Tabiryan, BEAM Engineering for Advanced Measurements Co. (USA)

### 12207-7

#### Liquid crystal-polymer systems (Keynote Presentation)

Author(s): Timothy J. Bunning, Michael McConney, Jon Slagle, Kyung Min Lee, Air Force Research Lab. (USA); David Roberts, Nelson Tabiryan, BEAM Engineering for Advanced Measurements Co. (USA)

22 August 2022 • 10:40 AM - 11:05 AM PDT | Conv. Ctr. Room 7B

### 12207-8

#### Side-chain free and conformationally flexible conjugated calamitic liquid crystals (Invited Paper)

Author(s): S. Holger Eichhorn, Jacob J. G. Rothera, Hi H. Taing, Univ. of Windsor (Canada)

22 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 7B

### 12207-9

#### Transition to spatiotemporal intermittency and defect turbulence in a liquid crystal light valve with translational optical feedback (Invited Paper)

Author(s): Fabian Álvarez-Garrido, Marcel G. Clerc, Gregorio González-Cortés, Mario Wilson, Univ. de Chile (Chile)

22 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 7B

### 12207-10

#### Light-flow control by topological solitons in frustrated cholesteric liquid crystals (Invited Paper)

Author(s): Andrew J. Hess, Univ. of Colorado Boulder (USA); Guilhem Poy, Univ. of Ljubljana (Slovenia), Univ. de Montpellier (France); Jung-Shen B. Tai, Ivan I. Smalyukh, Univ. of Colorado Boulder (USA); Slobodan Zumer, Univ. of Ljubljana (Slovenia), Jožef Stefan Institute (Slovenia)

22 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 7B

### 12207-11

#### Extraordinarily thick liquid crystalline chiral photonic crystals and their extraordinary optical properties

Author(s): Iam-Choon Khoo, The Pennsylvania State Univ. (USA); Chun-Wei Chen, Yale Univ. (USA); Ting-Mao Feng, Tsung-Hsien Lin, National Sun Yat-sen Univ. (Taiwan)

22 August 2022 • 12:05 PM - 12:20 PM PDT | Conv. Ctr. Room 7B

### Break

Lunch Break 12:20 PM - 1:50 PM

## SESSION 3: PHOTOALIGNMENT, RESONATOR, AND BEAM STEERING

22 August 2022 • 1:50 PM - 3:15 PM PDT | Conv. Ctr. Room 7B

Session Chair: Kenneth L. Marshall, Univ. of Rochester (USA)

### 12207-12

#### Photoalignment of liquid crystals for functional coatings (Keynote Presentation)

Author(s): Atsushi Shishido, Tokyo Institute of Technology (Japan)

22 August 2022 • 1:50 PM - 2:15 PM PDT | Conv. Ctr. Room 7B

### 12207-13

#### Ultrafast laser processing with liquid crystal spatial light modulators: optimizations and challenges (Invited Paper)

Author(s): Cyril Maclair, Lab. Hubert Curien (France)

22 August 2022 • 2:15 PM - 2:35 PM PDT | Conv. Ctr. Room 7B

### 12207-14

#### Cholesteric ring resonators (Invited Paper)

Author(s): Juergen Schmidtke, Univ. Paderborn (Germany)

22 August 2022 • 2:35 PM - 2:55 PM PDT | Conv. Ctr. Room 7B

## CONFERENCE 12207

### 12207-15

#### **Influence of some smectic liquid crystals' retardation switching behavior on beam steering performance (Invited Paper)**

Author(s): Akihiro Mochizuki, i-CORE Technology, LLC (USA)

22 August 2022 • 2:55 PM - 3:15 PM PDT | Conv. Ctr. Room 7B

#### **Break**

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

### SESSION 4: 4-G, HIGH POWER OPTICS, AND PHOTOREFRACTIVE

22 August 2022 • 3:45 PM - 5:30 PM PDT | Conv. Ctr. Room 7B

Session Chair: Iam-Choon Khoo, The Pennsylvania State Univ. (USA)

### 12207-17

#### **4G optics saving environment and time (Keynote Presentation)**

Author(s): Nelson V. Tabiryán, BEAM Engineering for Advanced Measurements Co. (USA); Brian R. Kimball, Diane M. Steeves, U.S. Army Natick Soldier Systems Ctr. (USA); Michael McConney, Jonathan Slagle, Timothy J. Bunning, Air Force Research Lab. (USA)

22 August 2022 • 3:45 PM - 4:10 PM PDT | Conv. Ctr. Room 7B

### 12207-18

#### **Berry curvature and strong light-matter coupling in liquid crystal microcavities with perovskites (Invited Paper)**

Author(s): Karolina Łempicka-Mirek, Mateusz Król, Adam Wincukiewicz, Univ. of Warsaw (Poland); Przemysław Morawiak, Rafał Mazur, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland); Marcin Muszyński, Univ. of Warsaw (Poland); Wiktor Piecek, Przemysław Kula, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland); Tomasz Stefaniuk, Maria Kamińska, Univ. of Warsaw (Poland); Luisa De Marco, CNR-NANOTEC, Istituto di Nanotecnologia (Italy); Pavlos G. Lagoudakis, Skolkovo Institute of Science and Technology (Russian Federation), Univ. of Southampton (United Kingdom); Helgi Sigurdsson, Univ. of Iceland (Iceland), Univ. of Southampton (United Kingdom); Dario Ballarini, Daniele Sanvitto, CNR-NANOTEC (Italy); Jacek Szczytko, Barbara Piętko, Univ. of Warsaw (Poland)

22 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 7B

### 12207-43

#### **Stable colloidal suspension of graphene oxide liquid crystals: optical characteristics and electro-optic switching for LCDs (Invited Paper)**

Author(s): Giusy Scalia, Sharif Shahini, Michel Meylender, Tom Menei, Univ. du Luxembourg (Luxembourg)

22 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 7B

### 12207-20

#### **Performance comparison of continuous optical beam steering approaches (Invited Paper)**

Author(s): Brandon Vreeland, Kent State Univ. (USA); Andre Van Rynbach, Air Force Research Lab. (USA); Doug Bryant, Kent State Univ. (USA); Philip J. Bos, Kent State Univ. (USA)

22 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 7B

### 12207-21

#### **A universal liquid crystal element for focusing, steering and more (Invited Paper)**

Author(s): Tigran Galstian, Zhanna Zemska, Justin Stevens, Univ. Laval (Canada)

22 August 2022 • 5:10 PM - 5:30 PM PDT | Conv. Ctr. Room 7B

### POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12207-37

#### **Morphological transition of labyrinthine patterns in frustrated chiral nematic liquid crystals**

Author(s): Sebastian Echeverría-Alar, Univ. de Chile (Chile)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12207-38

#### **Dancing vortex in a driven nematic liquid crystal cell: theory and experiment**

Author(s): Roberto Gajardo, Marcel G. Clerc, Univ. de Chile (Chile)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12207-39

#### **Dynamically controlled infrared linear to circular polarizer**

Author(s): Nicholas Sanford, Organic Harmonics (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12207-40

#### **Direct fabrication of liquid-crystalline polymer films selectively diffracting circularly polarized light by scanning wave photopolymerization**

Author(s): Hirona Nakamura, Yoshiaki Kobayashi, Megumi Ota, Tokyo Institute of Technology (Japan); Miho Aizawa, National Institute of Advanced Industrial Science and Technology (Japan); Shoichi Kubo, Atsushi Shishido, Tokyo Institute of Technology (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12207-41

#### **Solubility and molecular alignment behavior of liquid-crystalline polymers by scanning wave photopolymerization**

Author(s): T. Ishiyama, Y. Kobayashi, H. Nakamura, Tokyo Institute of Technology (Japan); M. Aizawa, Tokyo Institute of Technology (Japan), PRESTO, JST (Japan); K. Hisano, S. Kubo, A. Shishido, Tokyo Institute of Technology (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12207-42

#### **Induced patterns in dye-doped nematic liquid crystals**

Author(s): Lucciano Letelier Carreño, Marcel G. Clerc, Univ. de Chile (Chile)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

23 August 2022 • 9:15 AM - 11:50 AM PDT | Conv. Ctr. Room 6A

Session Chair: Ifor D.W. Samuel, Univ. of St. Andrews (United Kingdom)

#### **9:15 AM - 9:20 AM: Welcome and Opening Remarks**

### 12209-501

#### **Thin-film solution-processed multijunction solar cells (Plenary Presentation)**

Author(s): René A.J. Janssen, Technische Univ. Eindhoven (Netherlands)

23 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 6A

#### **Coffee Break 10:00 AM - 10:30 AM**

### 12211-502

#### **Can solution-processed organic thin-film transistors enable ubiquitous electronics? (Plenary Presentation)**

Author(s): Oana D. Jurchescu, Wake Forest Univ. (USA)

23 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 6A

**12209-503**

**Designing room temperature quantum materials through quantum analog of vibration isolation (Plenary Presentation)**

Author(s): Kenan Gundogdu, North Carolina State Univ. (USA)  
23 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 6A

**Break**

**Lunch/Exhibition Break 11:50 AM - 1:30 PM**

**SESSION 5: IMAGING, ACTIVE OPTICS, AND BIOSENSING**

23 August 2022 • 1:30 PM - 2:50 PM PDT | Conv. Ctr. Room 7B

Session Chair: Oleg D. Lavrentovich, Kent State Univ. (USA)

**12207-22**

**Scattering-based microscope imaging of light beams in soft birefringent media with orientational fluctuations (Invited Paper)**

Author(s): Guilhem Poy, Lab. Charles Coulomb, Univ. de Montpellier, CNRS (France); Slobodan Žumer, Jožef Stefan Institute (Slovenia), Univ. of Ljubljana (Slovenia)

23 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 7B

**12207-23**

**Structure and local order of lyotropic cholesteric calamitic phases: the effect of the chiral molecule (Invited Paper)**

Author(s): Antônio M. Figueiredo Neto, Univ. de São Paulo (Brazil); Oscar R. Santos, Univ. Tecnológica Federal do Paraná (Brazil); Dennys Reis, Arnaldo G. Oliveira-Filho, Cristiano L. P. Oliveira, Univ. de São Paulo (Brazil)

23 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 7B

**12207-26**

**Electrically tunable achromatic polarization rotator and its application for smart glass (Invited Paper)**

Author(s): Ting-Mao Feng, Li-Min Chang, Duan-Yi Guo, National Sun Yat-sen Univ. (Taiwan); Chun-Wei Chen, Yale Univ. (USA); Iam-Choon Khoo, The Pennsylvania State Univ. (USA); Tsung-Hsien Lin, National Sun Yat-sen Univ. (Taiwan)

23 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 7B

**12207-25**

**Liquid crystal active optics in augmented reality and virtual reality (Invited Paper)**

Author(s): Yi-Hsin Lin, Chang-Nien Mao, Wei-Cheng Cheng, Yu-Jen Wang, National Yang Ming Chiao Tung Univ. (Taiwan)

23 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 7B

**Break**

**Coffee Break 2:50 PM - 3:20 PM**

**SESSION 6: CHARACTERIZATION, FILTER, CHIRAL- AND NANO-OPTICS**

23 August 2022 • 3:20 PM - 5:15 PM PDT | Conv. Ctr. Room 7B

Session Chair: Iam-Choon Khoo, The Pennsylvania State Univ. (USA)

**12207-29**

**Electro-optics and material properties of oblique helicoidal cholesteric (Keynote Presentation)**

Author(s): Oleg D. Lavrentovich, Olena Iadlovska, Kamal Thapa, Sergij Shiyankovskii, Kent State Univ. (USA)

23 August 2022 • 3:20 PM - 3:45 PM PDT | Conv. Ctr. Room 7B

**12207-31**

**Liquid crystal beam steering devices for LiDAR applications (Invited Paper)**

Author(s): Yannanqi Li, Univ. of Central Florida (USA); Zhenyi Luo, Univ. Central Florida (USA); Shin-Tson Wu, Univ. of Central Florida (USA)

23 August 2022 • 3:45 PM - 4:05 PM PDT | Conv. Ctr. Room 7B

**12207-32**

**Challenges in liquid crystal characterisation: from thin cells to complex liquid crystals captured by optical and topological methods (Invited Paper)**

Author(s): Malgosia Kaczmarek, Giampaolo D'Alessandro, Nina Podoliak, Denitsa Bankova, Nicolas Brouckaert, Tetiana Orlova, Ingrid Membrillo-Solis, Jacek Brodzki, Tristan Madeleine, Univ. of Southampton (United Kingdom)

23 August 2022 • 4:05 PM - 4:25 PM PDT | Conv. Ctr. Room 7B

**12207-33**

**Nano-embossing of sub-micron surface features in liquid crystal devices for photonic applications (Invited Paper)**

Author(s): Cliff Jones, Zach Gradwell, Thomas Moorhouse, Erms R. Pereira, Pete J. M. Wyatt, Univ. of Leeds (United Kingdom)

23 August 2022 • 4:25 PM - 4:45 PM PDT | Conv. Ctr. Room 7B

**12207-34**

**Engineered optical rotatory dispersion of cholesteric liquid crystal for tunable color filter**

Author(s): Yun-Seok Choi, Wongi Park, Hyewon Park, Dong Ki Yoon, KAIST (Korea, Republic of)

23 August 2022 • 4:45 PM - 5:00 PM PDT | Conv. Ctr. Room 7B

**12207-35**

**Design of a tunable-reflective Pancharatnam phase optical beam steering device with enhanced steering performance**

Author(s): Brandon Vreeland, Kent State Univ. (USA); Andre Rynbach, Air Force Research Lab. (USA); Comrun Yousefzadeh, Philip Bos, Kent State Univ. (USA)

23 August 2022 • 5:00 PM - 5:15 PM PDT | Conv. Ctr. Room 7B



# Organic and Hybrid Light Emitting Materials and Devices XXVI

21 - 23 August 2022 | Conv. Ctr. Room 9

Conference Chair: Chihaya Adachi, Kyushu Univ. (Japan); Tae-Woo Lee, Seoul National Univ. (Korea, Republic of); Franky So, North Carolina State Univ. (USA)

Program Committee: Wolfgang Brütting, Univ. Augsburg (Germany); Lay Lay Chua, National Univ. of Singapore (Singapore); Malte C. Gather, Univ. of St. Andrews (United Kingdom); Kenan Gundogdu, North Carolina State Univ. (USA); Hironori Kaji, Kyoto Univ. (Japan); Ji-Seon Kim, Imperial College London (United Kingdom); Anna Köhler, Univ. Bayreuth (Germany); Jian Li, Arizona State Univ. (USA); Dongge Ma, South China Univ. of Technology (China); Andrew P. Monkman, Durham Univ. (United Kingdom); Jongwook Park, Kyung Hee Univ. (Korea, Republic of); Yong-Jin Pu, RIKEN Ctr. for Emergent Matter Science (Japan); Barry P. Rand, Princeton Univ. (USA); Sebastian Reineke, TU Dresden (Germany); Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom); Joseph Shinar, Iowa State Univ. of Science and Technology (USA); Ken-Tsung Wong, National Taiwan Univ. (Taiwan); Chung-Chih Wu, National Taiwan Univ. (Taiwan); Seunghyup Yoo, KAIST (Korea, Republic of)

## SESSION 1: KEYNOTE SESSION

21 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 9

Session Chair: Franky So, North Carolina State Univ. (USA)

### 12208-1 Development of next generation emitting materials for OLED display (Keynote Presentation)

Author(s): Byoungki Choi, SAMSUNG Advanced Institute of Technology (Korea, Republic of)

21 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 9

## SESSION 2: THERMALLY ACTIVATED DELAYED FLUORESCENT MATERIALS AND OLEDs

21 August 2022 • 9:00 AM - 10:20 AM PDT | Conv. Ctr. Room 9

Session Chair: Franky So, North Carolina State Univ. (USA)

### 12208-4 High-efficiency and stable blue hyperfluorescence organic light-emitting diode (Invited Paper)

Author(s): Chin-Yiu Chan, Yi-Ting Lee, Youichi Tsuchiya, Hajime Nakanotani, Chihaya Adachi, Kyushu Univ. (Japan)

21 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 9

### 12208-5 Development of high-efficient blue dopant materials using triplet (Invited Paper)

Author(s): Yun-Hi Kim, Gyeongsang National Univ. (Korea, Republic of)

21 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 9

### 12208-6 Anthracene-bridged exciplexes utilizing hot-exciton states for fast and bright TADF from locally excited states (Invited Paper)

Author(s): Alexander J. C. Kuehne, Univ. Ulm (Germany)

21 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 9

### 12208-7 High-efficiency and roll-off-free blue electroluminescence based on Au(I) complexes exhibiting rapid reverse intersystem crossing (Invited Paper)

Author(s): Youngmin You, Ewha Womans Univ. (Korea, Republic of)

21 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 9

**Break**  
**Coffee Break 10:20 AM - 10:50 AM**

## SESSION 3: ORGANIC LIGHT EMITTING MATERIALS AND DEVICES

21 August 2022 • 10:50 AM - 11:25 AM PDT | Conv. Ctr. Room 9

Session Chair: Tae-Woo Lee, Seoul National Univ. (Korea, Republic of)

### 12208-8 Nurturing next blue solution: blue phosphorescent organic light-emitting diode (Invited Paper)

Author(s): Jinwon Sun, Sunghan Kim, Changwoong Chu, SAMSUNG Display Co., Ltd. (Korea, Republic of)

21 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 9

### 12208-12 Non-doped deep-blue (<400 nm) organic light-emitting diodes

Author(s): Bo-Yen Lin, Yuan Ze Univ. (Taiwan); Jing-Xiang Huang, Chia-Hsun Chen, National Taiwan Univ. (Taiwan); Jian-Haur Lee, Chin-Ti Chen, Institute of Chemistry - Academia Sinica (Taiwan), Taiwan International Graduate Program (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan); Jiun-Haw Lee, National Taiwan Univ. (Taiwan)

21 August 2022 • 11:10 AM - 11:25 AM PDT | Conv. Ctr. Room 9

**Break**  
**Lunch Break 11:25 AM - 1:40 PM**

## SESSION 4: PEROVSKITE LIGHT EMITTING MATERIALS AND DEVICES

21 August 2022 • 1:40 PM - 3:00 PM PDT | Conv. Ctr. Room 9

Session Chair: Seunghyup Yoo, KAIST (Korea, Republic of)

### 12208-13 Organic semiconductor-incorporated perovskite (OSiP) lighting-emitting materials and devices (Invited Paper)

Author(s): Letian Dou, Purdue Univ. (USA)

21 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 9

### 12208-15 Exploiting the full advantages of colloidal perovskite nanocrystals for large-area efficient light-emitting diodes (Invited Paper)

Author(s): Young-Hoon Kim, Jinwoo Park, Tae-Woo Lee, Seoul National Univ. (Korea, Republic of)

21 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 9

### 12208-16 Reduced-dimensional perovskites for efficient light-emitting diodes (Invited Paper)

Author(s): Mingjian Yuan, Nankai Univ. (China)

21 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 9

### 12208-17 In-situ fabricated perovskite quantum dots for electroluminescence applications (Invited Paper)

Author(s): Haizheng Zhong, Beijing Institute of Technology (China)

21 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 9

**Break**  
**Coffee Break 3:00 PM - 3:30 PM**

**SESSION 5: PHOTOPHYSICS OF PEROVSKITE LIGHT EMITTING MATERIALS**

21 August 2022 • 3:30 PM - 4:40 PM PDT | Conv. Ctr. Room 9

Session Chair: Letian Dou, Purdue Univ. (USA)

**12208-19****Room temperature superfluorescence in perovskites (Invited Paper)**

Author(s): Kenan Gundogdu, Franky So, Melike Biliroglu, Gamze Findik, Dovletgeldi Seyitliyev, Lei Lei, North Carolina State Univ. (USA)

21 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 9

**12208-20****Linear and nonlinear light-emitting behaviors of charge-transfer excitons in heterostructured perovskites (Invited Paper)**

Author(s): Bin A. Hu, The Univ. of Tennessee Knoxville (USA)

21 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 9

**12208-21****Colloidal nanostructures control the formation and orientation of quantum wells in layered hybrid perovskites**

Author(s): Kasra Darabi, Dovletgeldi Seyitliyev, Boyu Guo, Fazel Bateni, Tonghui Wang, Masoud Ghasemi, Laine Taussig, Milad Abolhasani, Kenan Gundogdu, Aram Amassian, North Carolina State Univ. (USA)

21 August 2022 • 4:10 PM - 4:25 PM PDT | Conv. Ctr. Room 9

**12208-73****Optical manipulation of EQE in top-emitting perovskite LEDs**

Author(s): James C. Loy, Barry P. Rand, Princeton Univ. (USA)

21 August 2022 • 4:25 PM - 4:40 PM PDT | Conv. Ctr. Room 9

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**SESSION 6: FABRICATION OF FULL COLOR, PATTERNED, AND STRETCHABLE DISPLAYS**

22 August 2022 • 8:30 AM - 10:30 AM PDT | Conv. Ctr. Room 9

Session Chair: Tae-Woo Lee, Seoul National Univ. (Korea, Republic of)

**12208-22****Progress in wearable OLEDs: from stretchable OLEDs to health-monitoring applications (Invited Paper)**

Author(s): Seunghyup Yoo, Taehyun Kim, Seunghye Lee, KAIST (Korea, Republic of)

22 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 9

**12208-23****Stretchable electroluminescent devices (Invited Paper)**

Author(s): Qibing Pei, Univ. of California, Los Angeles (USA)

22 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 9

**12208-24****Avalanche upconversion devices (Invited Paper)**

Author(s): Noel C. Giebink, The Pennsylvania State Univ. (USA)

22 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 9

**12208-25****Hybrid color conversion control using OLED and perovskite emitters (Invited Paper)**

Author(s): Hyukmin Kwon, Seokwoo Kang, Sunwoo Park, Seyoung Oh, Jongwook Park, Kyung Hee Univ. (Korea, Republic of)

22 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 9

**12208-26****Device design and fabrication process of quantum dot light-emitting diodes for full-color displays and lighting sources (Invited Paper)**

Author(s): Taesoo Lee, Geun Woo Baek, Jeonghun Kwak, Seoul National Univ. (Korea, Republic of)

22 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 9

**12208-27****Directly patterned perovskite metamaterials and light sources (Invited Paper)**

Author(s): Qing Gu, North Carolina State Univ. (USA)

22 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 9

**Break****Coffee Break 10:30 AM - 11:00 AM****SESSION 7: QUANTUM DOT LIGHT EMITTING MATERIALS AND DEVICES**

22 August 2022 • 11:00 AM - 11:55 AM PDT | Conv. Ctr. Room 9

Session Chair: Noel C. Giebink, The Pennsylvania State Univ. (USA)

**12208-29****Operation mechanisms of prototypical quantum dot light-emitting diodes (Invited Paper)**

Author(s): Hiroyoshi Naito, Osaka Prefecture Univ. (Japan), Osake Metropolitan Univ. (Japan)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 9

**12208-30****The influence of charge transport layers on the EL stability of QDLEDs (Invited Paper)**

Author(s): Dong Seob Chung, Tyler Davidson-Hall, Atefeh Ghorbani Koltapeh, Univ. of Waterloo (Canada); Mohsen Azadinia, Hany Aziz, Univ. of Waterloo (Canada)

22 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 9

**12208-31****Modulation in charge distribution via polyethylenimine-incorporation into ZnO electron transport layer and its impact on quantum-dots light emitting device stability**

Author(s): Dong Seob Chung, Hany Aziz, Univ. of Waterloo (Canada)

22 August 2022 • 11:40 AM - 11:55 AM PDT | Conv. Ctr. Room 9

**Break****Lunch Break 11:55 AM - 1:40 PM****SESSION 8: ORGANIC AND PEROVSKITE LASERS I**

22 August 2022 • 1:40 PM - 3:00 PM PDT | Conv. Ctr. Room 9

Session Chair: Russell J. Holmes, Univ. of Minnesota, Twin Cities (USA)

**12208-34****Molecular arrangement for low threshold polariton lasers (Invited Paper)**

Author(s): Malte C. Gather, Univ. zu Köln (Germany)

22 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 9

**12208-35**

**High current density (>kA/cm<sup>2</sup>) electrical operation in a transparent perovskite LED architecture with reduced amplified spontaneous emission threshold**

Author(s): Iakov Goldberg, Nirav Annavarapu, Karim Elkhoully, Weiming Qiu, Robert Gehlhaar, Cedric Rolin, Jan Genoe, Paul Heremans, imec (Belgium)

22 August 2022 • 2:00 PM - 2:15 PM PDT | Conv. Ctr. Room 9

**12208-36**

**Continuous-wave lasing conditions in organic semiconductors: the role of the resonator**

Author(s): Anthony Dall'Agnol, Sebastien Forget, Univ. Sorbonne Paris Nord, CNRS (France); Fatima Bencheikh, Chihaya Adachi, OPERA Ctr. for Organic Photonics and Electronics Research, Kyushu Univ. (Japan); Sébastien Chénais, Univ. Sorbonne Paris Nord, CNRS (France)

22 August 2022 • 2:15 PM - 2:30 PM PDT | Conv. Ctr. Room 9

**12208-37**

**Persistent spin-helix laser based on liquid crystal optical microcavity**

Author(s): Marcin Muszyński, Mateusz Król, Katarzyna Rechcińska, Przemysław Oliwa, Mateusz Kędziora, Karolina Łempicka-Mirek, Univ. of Warsaw (Poland); Rafał Mazur, Przemysław Morawiak, Wiktor Piecek, Przemysław Kula, Wojskowa Akademia Techniczna im. Jarosława Dąbrowskiego (Poland); Pavlos Lagoudakis, Univ. of Southampton (United Kingdom); Barbara Piętka, Jacek Szczytko, Univ. of Warsaw (Poland)

22 August 2022 • 2:30 PM - 2:45 PM PDT | Conv. Ctr. Room 9

**12208-38**

**Widely real-time tunable organic solid-state lasing emitters**

Author(s): Jaroslaw Mysliwiec, Martyna Durko, Anna Popczyk, Wrocław Univ. of Science and Technology (Poland); Gilles Ulrich, Julien Massue, Ecole européenne de Chimie, Polymères et Matériaux (France); Yann Bretonniere, Chantal Andraud, Ecole Normale Supérieure de Lyon (France)

22 August 2022 • 2:45 PM - 3:00 PM PDT | Conv. Ctr. Room 9

**Break**

**Coffee Break 3:00 PM - 3:30 PM**

**SESSION 9: ORGANIC AND PEROVSKITE LASERS II**

22 August 2022 • 3:30 PM - 4:15 PM PDT | Conv. Ctr. Room 9

Session Chair: Hany Aziz, Univ. of Waterloo (Canada)

**12208-39**

**Symmetry control in metal-dielectric photonic crystal OLEDs**

Author(s): David Allemeier, Matthew S. White, The Univ. of Vermont (USA)

22 August 2022 • 3:30 PM - 3:45 PM PDT | Conv. Ctr. Room 9

**12208-40**

**What is the correct unit for amplified spontaneous emission thresholds in organic thin films?**

Author(s): Raphael Florentin, Sébastien Forget, Sébastien Chénais, Univ. Sorbonne Paris Nord, CNRS (France)

22 August 2022 • 3:45 PM - 4:00 PM PDT | Conv. Ctr. Room 9

**12208-42**

**Low onset stimulated emission in OLEDs**

Author(s): Mitch Nelson, Organophotonics LLC (USA)

22 August 2022 • 4:00 PM - 4:15 PM PDT | Conv. Ctr. Room 9

**SESSION 10: QUANTUM DOTS AND EMERGING LIGHT EMITTING MATERIALS AND DEVICES**

22 August 2022 • 4:15 PM - 5:10 PM PDT | Conv. Ctr. Room 9

Session Chair: Kenan Gundogdu, North Carolina State Univ. (USA)

**12208-43**

**Effect of matrix material on room-temperature phosphorescence characteristics of graphene quantum dots (Invited Paper)**

Author(s): Seokwoo Jeon, KAIST (Korea, Republic of)

22 August 2022 • 4:15 PM - 4:35 PM PDT | Conv. Ctr. Room 9

**12208-44**

**Novel star-shaped conjugated macromolecules with fused cores for photonic and electronic applications (Invited Paper)**

Author(s): Peter J. Skabara, Univ. of Glasgow (United Kingdom)

22 August 2022 • 4:35 PM - 4:55 PM PDT | Conv. Ctr. Room 9

**12208-45**

**Optical and luminescence studies on Dy<sup>3+</sup> and Ce<sup>3+</sup> co-doped aluminoborosilicate glasses for white-LEDs application**

Author(s): Monisha Murthi, Sudha D. Kamath, Manipal Institute of Technology (India)

22 August 2022 • 4:55 PM - 5:10 PM PDT | Conv. Ctr. Room 9

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Session Chair: Tae-Woo Lee, Seoul National Univ. (Korea, Republic of)

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12208-58**

**Enhanced cavity effect via interlayer for strong forward luminescence in OLED**

Author(s): Shichen Yin, Qi Dong, Liping Zhu, North Carolina State Univ. (USA); Franky So, North Carolina State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-59**

**Improving laser performance by optimizing optical cavity design**

Author(s): Yash Mehta, North Carolina State Univ. (USA); Kun-Chieh Chien, The Univ. of Texas at Austin (USA); Dövletgeldi Seyitliyev, Kenan Gundogdu, North Carolina State Univ. (USA); Chih-Hao Chang, The Univ. of Texas at Austin (USA); Franky So, North Carolina State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-60**

**Electronic and optical properties of double perovskites A<sub>2</sub>BX<sub>6</sub> (A = Cs, B = Sn, and (X = Cl, Br, I.) using modified Becke Johnson potential study**

Author(s): Kolli Vamsi Krishna, S. Sritanvi, Niharika Reddy, Saibhavani Reddy, Deepika Nandyala, Anand Pandarinath, G. Nagakumari, Rajendran Mahesh, Vidya Jyothi Institute of Technology (India); Paduru Venugopal Reddy, Vidya Jyothi Institute of Technology (India), Osmania Univ. (India); Vinay Kandrapu, Vidya Jyothi Institute of Technology (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-62**

**Push-pull molecules displaying thermally activated delayed fluorescence inspired by highly emissive coumarin dyes**

Author(s): Simon Paredis, Univ. Hasselt (Belgium); Tom Cardeynals, Univ. Hasselt (Belgium), imec (Belgium), Univ. Namur (Belgium); Jasper Deckers, Univ. Hasselt (Belgium), imec (Belgium); Andrew Danos, Ctr. for Advanced Instrumentation (United Kingdom); Suman Kulla, Andrew P. Monkman, Durham Univ. (United Kingdom); Benoît Champagne, Univ. de Namur (Belgium); Wouter Maes, Univ. Hasselt (Belgium), imec (Belgium)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-63**

**High efficiency non-doped blue triplet-triplet annihilation organic light-emitting diode based on pyrene derivative**

Author(s): Chia-Hsun Chen, National Taiwan Univ. (Taiwan); Che-Yu Li, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan); Chen-Jun Zhu, National Taiwan Univ. (Taiwan); Bo-Yen Lin, Yuan Ze Univ. (Taiwan); Man-Kit Leung, National Taiwan Univ. (Taiwan); Tien-Lung Chiu, Yuan Ze Univ. (Taiwan); Jiun-Haw Lee, Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-64****High-resolution nano pixel imaging via hybrid ZnO nanowire LEDs array**

Author(s): Heesang Ahn, Hyerin Song, Kyujung Kim, Pusan National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-65****The nature of excitons and luminescence efficiencies of OLED materials in solid-state morphologies**

Author(s): Hadi Abroshan, Paul Winget, Shaun Kwak, Christopher T. Brown, Mathew D. Halls, Schrödinger, LLC (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-66****Efficient prediction of phosphorescence spectra for organometallic complexes**

Author(s): Yixiang Cao, Thomas F. Hughes, David J. Giesen, Paul Winget, Thomas J. L. Mustard, Shaun Kwak, Hadi Abroshan, Ken Dyall, Tati Reddy Vadicherla, Mathew D. Halls, Schrödinger, LLC (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-67****Rapid crystallization driven highly efficient phase-pure deep blue Ruddlesden-Popper perovskite light-emitting diodes**

Author(s): Gyumin Jang, Sunihl Ma, Junwoo Lee, Chan Uk Lee, Wooyong Jeong, Jaehyun Son, Jooho Moon, Yonsei Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-68****Simple measurement of triplet lifetime and other triplet-related photophysical parameters of organic semiconductors with photoluminescence transient analysis**

Author(s): Anthony Dall'Agnol, Sebastien Forget, Raphael Florentin, Sébastien Chénais, Univ. Sorbonne Paris Nord, CNRS (France)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-69****Titanium-particle-embedded indium zinc oxide mesh electrodes for TADF blue stretchable OLEDs with high efficiency**

Author(s): Ho Jin Lee, Tae Hoon Park, Wanqi Ren, Nahyun Kim, Seok Hee Hong, Hwi Geun Kim, Tae Geun Kim, Korea Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-70****Simulation of high efficiency crosstalk-free PMOLED display**

Author(s): Rifat Kacar, Ramis Berkay Serin, Esin Ucar, ASELSAN Microelectronics (Turkey), Gebze Technical Univ. (Turkey); Alper Ülkü, ASELAN Microelectronics (Turkey), Gebze Technical Univ. (Turkey)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-71****2,7-substituted N-carbazole donors on tris (2,4,6-trichlorophenyl) methyl radicals with high quantum yield**

Author(s): Lisa Chen, Mona Arnold, Ulm Univ. (Germany); Yonca Kittel, DWI Leibniz-Institute for Interactive Materials e.V. (Germany); Rémi Blinder, Fedor Jelezko, Alexander J. C. Kuehne, Ulm Univ. (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-72****Investigations of halogenated derivatives of diphenylsulphone thermally activated delayed fluorescent emitters**

Author(s): Vladyslav Ievtukhov, Gdansk University (Poland); Michal Monka, Estera Hoffman-Rusin, Piotr Bojarski, Illia Serdiuk, Univ. Gdansk (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-76****Tuning of photophysical properties of perylenediimide derivatives for photosensitizing purposes**

Author(s): Karol Kozakiewicz, Estera Hoffman, Michał Mońka, Daria Grzywacz, Małgorzata Rybczyńska, Beata Liberek, Piotr Bojarski, Illia E. Serdiuk, Univ. Gdansk (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-77****Efficient near-infrared-to-blue photon upconversion based on ion pair**

Author(s): Dayoon Song, Yukyung Moon, Yu Sung Chun, Youngmin You, Ewha Womans Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-78****Spectral properties of red/NIR emitters as photosensitizers in water-micelles medium**

Author(s): Estera Hoffman-Rusin, Michal Monka, Daria Grzywacz, Karol Kozakiewicz, Beata Liberek, Illia E. Serdiuk, Piotr Bojarski, Univ. Gdansk (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12208-79****Development of the thermally activated delayed fluorescent red emitters with heavy atom effect**

Author(s): Daria Grzywacz, Michal Monka, Beata Liberek, Piotr Bojarski, Illia E. Serdiuk, Univ. Gdansk (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION**

23 August 2022 • 9:15 AM - 11:50 AM PDT | Conv. Ctr. Room 6A

Session Chair: Ifor D.W. Samuel, Univ. of St. Andrews (United Kingdom)

**9:15 AM - 9:20 AM: Welcome and Opening Remarks****12209-501****Thin-film solution-processed multijunction solar cells (Plenary Presentation)**

Author(s): René A.J. Janssen, Technische Univ. Eindhoven (Netherlands)

23 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 6A

**Coffee Break 10:00 AM - 10:30 AM****12211-502****Can solution-processed organic thin-film transistors enable ubiquitous electronics? (Plenary Presentation)**

Author(s): Oana D. Jurchescu, Wake Forest Univ. (USA)

23 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 6A

**12209-503****Designing room temperature quantum materials through quantum analog of vibration isolation (Plenary Presentation)**

Author(s): Kenan Gundogdu, North Carolina State Univ. (USA)

23 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 6A

**Break****Lunch/Exhibition Break 11:50 AM - 1:30 PM****SESSION 11: PHOTOPHYSICS OF THERMALLY ACTIVATED DELAYED FLUORESCENT MATERIALS**

23 August 2022 • 1:30 PM - 3:00 PM PDT | Conv. Ctr. Room 9

Session Chair: Bin A. Hu, The Univ. of Tennessee Knoxville (USA)

**12208-46****Intermolecular interactions in thermally activated delayed fluorescence emitters (Invited Paper)**

Author(s): Marc K. Etherington, Northumbria Univ. (United Kingdom)

23 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 9

**12208-47****Long-persistent luminescence from an exciplex-based organic light-emitting diode (Invited Paper)**

Author(s): Ryota Kabe, Okinawa Institute of Science and Technology Graduate Univ. (Japan)

23 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 9



## CONFERENCE 12208

### 12208-49

#### **Universal photophysical kinetic analysis for thermally activated delayed fluorescence (Invited Paper)**

Author(s): Youichi Tsuchiya, Kyushu Univ. (Japan); Stefan Diesing, Eli Zysman-Colman, Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom); Chihaya Adachi, Kyushu Univ. (Japan)

23 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 9

### 12208-74

#### **Understanding the heavy-atom effect for efficient enhancement of spin-orbit coupling in organic thermally activated delayed fluorescence emitters**

Author(s): Michal Monka, Daria Grzywacz, Karol Kozakiewicz, Estera Hoffman, Vladyslav Ievtukhov, Radoslaw Rogowski, Aleksander Kubicki, Beata Liberek, Piotr Bojarski, Illia E. Serdiuk, Univ. Gdansk (Poland)

23 August 2022 • 2:30 PM - 2:45 PM PDT | Conv. Ctr. Room 9

### 12208-75

#### **Breaking bad organic materials: how do thermally activated delayed fluorescence emitters break the rules of photophysics?**

Author(s): Illia Serdiuk, Michal Monka, Vladyslav Ievtukhov, Daria Grzywacz, Karol Kozakiewicz, Estera Hoffman, Univ. Gdansk (Poland); Chi Hyun Ryoo, Seoul National Univ. (Korea, Republic of); Beata Liberek, Univ. Gdansk (Poland); Soo Young Park, Seoul National Univ. (Korea, Republic of); Piotr Bojarski, Univ. Gdansk (Poland)

23 August 2022 • 2:45 PM - 3:00 PM PDT | Conv. Ctr. Room 9

### Break

**Coffee Break 3:00 PM - 3:30 PM**

## **SESSION 12: MOLECULAR LEVEL APPROACHES FOR ORGANIC LIGHT EMITTING MATERIALS**

23 August 2022 • 3:30 PM - 5:25 PM PDT | Conv. Ctr. Room 9

Session Chair: Youngmin You, Ewha Womans Univ. (Korea, Republic of)

### 12208-51

#### **Simultaneous observation of charge accumulation and exciton quenching at organic hetero interfaces (Invited Paper)**

Author(s): Yutaka Noguchi, Kaito Ninomiya, Katsuya Sato, Meiji Univ. (Japan)

23 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 9

### 12208-52

#### **Spontaneous orientation of polar OLED materials: its role and applications (Invited Paper)**

Author(s): Yuya Tanaka, Yuki Tazo, Shin Shinohara, Hideyuki Kayaguchi, Naoya Abe, Keisuke Kurihara, Masahiro Ohara, Hisao Ishii, Chiba Univ. (Japan)

23 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 9

### 12208-53

#### **Controlling polarization-induced exciton-polaron quenching in OLEDs via materials selection, mixtures, and processing conditions (Invited Paper)**

Author(s): Russell J. Holmes, Univ. of Minnesota, Twin Cities (USA)

23 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 9

### 12208-54

#### **Towards understanding the morphology of OLED light-emitting layers (Invited Paper)**

Author(s): Paul L. Burn, The Univ. of Queensland (Australia)

23 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 9

### 12208-55

#### **Dynamic molecular conformational change in organic semiconductors and its impact on optoelectronic device performance (Invited Paper)**

Author(s): Ji-Seon Kim, Imperial College London (United Kingdom)

23 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 9

### 12208-57

#### **Impact of the emissive layer spontaneous orientation polarization on OLED performance**

Author(s): Evgeny Pakhomenko, Russell Holmes, Univ. of Minnesota, Twin Cities (USA)

23 August 2022 • 5:10 PM - 5:25 PM PDT | Conv. Ctr. Room 9



**Organic, Hybrid, and Perovskite Photovoltaics XXIII**

23 - 25 August 2022 | Conv. Ctr. Room 6C (Tue) and Room 9 (Wed/Thu)

Conference Co-Sponsor



Conference Chairs: Gang Li, The Hong Kong Polytechnic Univ. (Hong Kong, China); Natalie Stingelin, Georgia Institute of Technology (USA)

Conference Co-Chairs: Ana Flávia Nogueira, Univ. of Campinas (Brazil); Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (USA); Ellen Moons, Karlstad Univ. (Sweden); Barry P. Rand, Princeton Univ. (USA)

Program Committee: Harald W. Ade, North Carolina State Univ. (USA); 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, Karlsruher Institut für Technologie (Germany); Daniel Congreve, Stanford Univ. (USA); Renaud Demadrille, Systèmes Moléculaires et nanoMatériaux pour l'Énergie et la Santé (France); Giulia Grancini, Univ. degli Studi di Pavia (Italy); Martin J. Heeney, Imperial College London (United Kingdom); Zakya H. Kafafi, Lehigh Univ. (USA); Bumjooon Kim, KAIST (Korea, Republic of); 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 (China)

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12209-37****Unraveling photoelectronic processes in organic semitransparent solar cells**

Author(s): Nora Schopp, Univ. of California, Santa Barbara (USA); Viktor Brus, Nazarbayev Univ. (Kazakhstan); Quyen Nguyen, Univ. of California, Santa Barbara (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-38****Ink formulations for solution-processable organic photodiodes to deposit homogeneous layers on >6-inch silicon wafers for organic CMOS image sensors**

Author(s): Hidenori Nakayama, Kazuhiro Nakabayashi, Shigeru Nakane, Yasuo Miyata, Kazuhiro Mouri, Izuru Takei, Mitsubishi Chemical Corp. (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-41****Engineering for conductive nanocomposites via incorporating newly designed silver-doped carbon quantum dots for efficient perovskite photoactivation**

Author(s): Dong Hwan Wang, Byung Gi Kim, Woongsik Jang, Jae Sang Cho, Ji Hyun Lim, Min Soo Kim, Jin Young Kim, Chung-Ang Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-42****OPV degradation physics: how light plays a role**

Author(s): Mona Shabani, Carr Ho, Franky So, North Carolina State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-43****First principle study of electronic and optical properties of lead-free double perovskites ABiCuX<sub>6</sub> [A = Rb<sub>2</sub>, X = I, Br] using Modified Becke Jhonson potential study**

Author(s): P. Pavankumarreddy, G. Pranitha, N Anvesh, Anand Pandarinath, Gogisetty Naga Kumari, Rajendran Mahesh, Vidya Jyothi Institute of Technology (India); P. Venugopal Reddy, Vidya Jyothi Institute of Technology (India), Osmania Univ. (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-47****Unconventional donor-acceptor architecture for solar energy harvesting: an in-silico design approach**

Author(s): Cleber Marchiori, Franco Leandro, Ellen Moons, C. Moyses Araujo, Karlstad Univ. (Sweden)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-48****In-situ spectroscopy studies of all-polymer organic solar cells: investigation of the influence of molecular weight on the drying process and morphology**

Author(s): Sven Englund, Yanfeng Liu, Linköping Univ. (Sweden); Ergang Wang, Chalmers Univ. of Technology (Sweden); Rui Zhang, Fengling Zhang, Linköping Univ. (Sweden)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-50****RoboMapper: a compact robotic lab for accelerated hybrid perovskite research via micro-experimentation**

Author(s): Tonghui Wang, North Carolina State Univ. (USA); Ruipeng Li, Brookhaven National Lab. (USA); Hossein Ardekani, Mahdi Ramezani, Ryan Wilmington, Robert W. Epps, Milad Abolhasani, Kenan Gundogdu, Aram Amassian, North Carolina State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-51****In situ laser curvature: a new investigative tool to reveal thin film formation, attachment, and stress evolution mechanisms in solution-processed metal halide perovskites**

Author(s): Boyu Guo, Mihirsinh Chauhan, Nathan Woodward, North Carolina State Univ. (USA); Gabriel R. Mcandrews, Univ. of Colorado Boulder (USA); Aram Amassian, North Carolina State Univ. (USA); Michael D. McGehee, Univ. of Colorado Boulder (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-53****Fabricate anti-solvent free tin-lead based perovskite solar cells with MAAC additives**

Author(s): C. Q. Howlader, B. Mishra, N. Khakurel, D. W. Amyx, W. Geerts, Texas State Univ. (USA); G. Gibson, FAS Technologies, Inc. (USA); M. Chen, Texas State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12209-55****Toluene processed semitransparent optoelectronic devices based on narrow bandgap composition of donor polymer and non-fullerene acceptors**

Author(s): Ziyue Zhu, Guillermo Bazan, Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## CONFERENCE 12209

### 12209-57

#### Morphology manipulation for organic photovoltaics: graded and oligomer ternary bulk-heterojunctions

Author(s): Gang Li, Ying Zhang, The Hong Kong Polytechnic Univ. (Hong Kong, China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12209-58

#### Neutral-colored semitransparent perovskite solar cells by controlling aperture ratios

Author(s): Hyong Joon Lee, Korea University (Korea, Republic of); Seok Yeong Hong, Jin Kyoung Park, Linlin Feng, Jin Hyuck Heo, Sang Hyuk Im, Korea Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12209-59

#### Efficient perovskite solar cells from acetylacetone modified TiO<sub>2</sub> nanoparticles

Author(s): Seok Yeong Hong, Korea university (Korea, Republic of); Hyong Joon Lee, Jin Kyoung Park, Min Jeong Ki, Jin Hyuck Heo, Sang Hyuk Im, Korea Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12209-60

#### Large-area organic photovoltaics for indoor light source

Author(s): Hyeonjeong Choi, Hyeok Kim, Yongju lee, The Univ. of Seoul (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

23 August 2022 • 9:15 AM - 11:50 AM PDT | Conv. Ctr. Room 6A

Session Chair: Ifor D.W. Samuel, Univ. of St. Andrews (United Kingdom)

### 9:15 AM - 9:20 AM: Welcome and Opening Remarks

#### 12209-501

#### Thin-film solution-processed multijunction solar cells (Plenary Presentation)

Author(s): René A.J. Janssen, Technische Univ. Eindhoven (Netherlands)

23 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 6A

### Coffee Break 10:00 AM - 10:30 AM

#### 12211-502

#### Can solution-processed organic thin-film transistors enable ubiquitous electronics? (Plenary Presentation)

Author(s): Oana D. Jurchescu, Wake Forest Univ. (USA)

23 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 6A

### 12209-503

#### Designing room temperature quantum materials through quantum analog of vibration isolation (Plenary Presentation)

Author(s): Kenan Gundogdu, North Carolina State Univ. (USA)

23 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 6A

### Break

### Lunch/Exhibition Break 11:50 AM - 2:15 PM

## SESSION 1: ADVANCES IN ORGANIC SOLAR CELLS: JOINT SESSION WITH CONFERENCES 12199 AND 12209

23 August 2022 • 2:15 PM - 5:00 PM PDT | Conv. Ctr. Room 6C

Session Chairs: Anna Köhler, Univ. Bayreuth (Germany), Martijn Kemerink, Ruprecht-Karls-Univ. Heidelberg (Germany)

This Session is of related interest to Conference 12199: Physical Chemistry of Semiconductor Materials and Interfaces XXI and Conference 12209: Organic, Hybrid, and Perovskite Photovoltaics XXIII

### 12199-25

#### Can organic solar cells surpass the Shockley-Queisser limit? (Invited Paper)

Author(s): Martijn Kemerink, Ruprecht-Karls-Univ. Heidelberg (Germany)

23 August 2022 • 2:15 PM - 2:45 PM PDT | Conv. Ctr. Room 6C

### 12209-1

#### A universal conundrum of determination of Frenkel exciton binding energy

Author(s): Somayeh Kashani, North Carolina State Univ. (USA); Jeromy J. Rech, The Univ. of North Carolina at Chapel Hill (USA); Tuo Liu, Kyle Baustert, Univ. of Kentucky (USA); Wei You, The Univ. of North Carolina at Chapel Hill (USA); Kenneth Graham, Univ. of Kentucky (USA); Carlos Silva, Natalie Stingelin, Georgia Institute of Technology (USA); Gitti Frey, Technion-Israel Institute of Technology (Israel); Harald Ade, North Carolina State Univ. (USA)

23 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 6C

### Coffee Break 3:05 PM - 3:30 PM

#### 12209-3

#### Interfacial energetic landscape in non-fullerene acceptor organic solar cells and its impact on device performance (Invited Paper)

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

23 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 6C

### 12209-29

#### Grazing incidence x-ray and neutron scattering based organic and perovskite photovoltaic studies (Invited Paper)

Author(s): Xinhui Lu, The Chinese Univ. of Hong Kong (Hong Kong, China)

23 August 2022 • 4:00 PM - 4:30 PM PDT | Conv. Ctr. Room 6C

### 12199-26

#### Organic solar cells based on Y-series non-fullerene acceptors: from charge separation to device performance (Invited Paper)

Author(s): Safa Shoaee, Univ. Potsdam (Germany)

23 August 2022 • 4:30 PM - 5:00 PM PDT | Conv. Ctr. Room 6C

## SESSION 2: MOLECULAR AND MACROMOLECULAR PHOTOVOLTAICS

24 August 2022 • 9:00 AM - 10:20 AM PDT | Conv. Ctr. Room 9

Session Chair: Frédéric Laquai, King Abdullah Univ. of Science and Technology (Saudi Arabia)

### 12209-5

#### Infrared photodetection using narrow bandgap conjugated polymers (Invited Paper)

Author(s): Jason D. Azoulay, The Univ. of Southern Mississippi (USA); Tse Nga Ng, Univ. of California, San Diego (USA); Jarrett Vella, Wright-Patterson Air Force Base (USA)

24 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 9

### 12209-6

#### Material development for OPV blends (Invited Paper)

Author(s): Martin J. Heeney, Imperial College London (United Kingdom)

24 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 9

### 12209-7

#### Understanding mechanisms and applications of dilute donor non-fullerene organic solar cells

Author(s): Fengling Zhang, Nannan Yao, Yanfeng Liu, Linköping Univ. (Sweden)

24 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 9

### Break

### Coffee Break 10:20 AM - 10:50 AM

## SESSION 3: HYBRID ORGANIC/INORGANIC PHOTOVOLTAICS I

24 August 2022 • 10:50 AM - 12:10 PM PDT | Conv. Ctr. Room 9

Session Chair: Jason D. Azoulay, The Univ. of Southern Mississippi (USA)

### 12209-8

#### Photovoltaic photographs

Author(s): Jean V. Manca, Jeroen Hustings, Nico Fransaert, Kristof Vrancken, Roland Valcke, Univ. Hasselt (Belgium)

24 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 9

**12209-9****The interplay between device's and material's properties in determining solar cells' performance (Invited Paper)**

Author(s): Sapir Bitton, Hela Fadul, Dan Liraz, Nir Tessler, Technion-Israel Institute of Technology (Israel)

24 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 9

**12209-10****Development of photochromic photosensitizers for a new generation of solar cells with dynamic optical properties (Invited Paper)**

Author(s): Renaud Demadrille, Valid M. Mwalukuku, Samuel Fauvel, Systèmes Moléculaires et nanoMatériaux pour l'Énergie et la Santé (France); Antonio J. Riquelme, Univ. Pablo de Olavide (Spain); Johan Liotier, José-Maria Andres Castan, Quentin Huauilmé, Pascale Maldivi, Systèmes Moléculaires et nanoMatériaux pour l'Énergie et la Santé (France); Juan A. Anta, Univ. Pablo de Olavide (Spain)

24 August 2022 • 11:40 AM - 12:10 PM PDT | Conv. Ctr. Room 9

**Break****Lunch/Exhibition Break 12:10 PM - 1:40 PM****SESSION 4: HYBRID ORGANIC/INORGANIC PHOTOVOLTAICS II**

24 August 2022 • 1:40 PM - 3:10 PM PDT | Conv. Ctr. Room 9

Session Chair: Natalie Stingelin, Georgia Institute of Technology (USA)

**12209-11****Rationalizing synthesis complexity in halide perovskites (Invited Paper)**

Author(s): Tim Kodalle, Maged Abdelsamie, Mriganka Singh, Carolin Sutter-Fella, Lawrence Berkeley National Lab. (USA)

24 August 2022 • 1:40 PM - 2:10 PM PDT | Conv. Ctr. Room 9

**12209-12****Tailoring materials and process for commercialization of perovskite solar cells (Invited Paper)**

Author(s): Hyun Suk Jung, Sungkyunkwan Univ. (Korea, Republic of)

24 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 9

**12209-13****Crystallized 2D perovskite for x-ray and visible light detection applications (Invited Paper)**

Author(s): Lebin Nie, The Univ. of Hong Kong (Hong Kong, China); Jiayun Sun, The Univ. of Hong Kong (Hong Kong, China), Southern Univ. of Science and Technology (China); Gang Li, The Hong Kong Polytechnic Univ. (Hong Kong, China); Kai Wang, Southern Univ. of Science and Technology of China (China); Wallace C. H. Choy, The Univ. of Hong Kong (Hong Kong, China)

24 August 2022 • 2:40 PM - 3:10 PM PDT | Conv. Ctr. Room 9

**Break****Coffee Break 3:10 PM - 3:40 PM****SESSION 5: ELECTRON AND HOLE TRANSPORT MATERIALS, CONTACTS, AND ELECTRODE MATERIALS**

24 August 2022 • 3:40 PM - 4:40 PM PDT | Conv. Ctr. Room 9

Session Chair: Renaud Demadrille, Systèmes Moléculaires et nanoMatériaux pour l'Énergie et la Santé (France)

**12209-16****Multiple ligands-tailored SnO<sub>2</sub> quantum dots endow in situ dual-interface binding for high efficiency and low energy loss perovskite photovoltaics**

Author(s): Gang Li, Zhiwei Ren, The Hong Kong Polytechnic Univ. (Hong Kong, China)

24 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 9

**12209-17****Green processing of carbon electrodes from renewable sources for silver-bismuth bromide perovskite solar cells**

Author(s): Teresa Gatti, Justus-Liebig-Universität Giessen (Germany)

24 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 9

**12209-36****In-situ VASE thermal characterization of optoelectronic materials**

Author(s): Reece L. Henry, Nrup Balar, Harald Ade, North Carolina State Univ. (USA)

24 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 9

**SESSION 6: EXCITON DIFFUSION, CHARGE CARRIER GENERATION, TRANSPORT, AND RECOMBINATION**

25 August 2022 • 8:30 AM - 11:40 AM PDT | Conv. Ctr. Room 9

Session Chairs: Carolin Sutter-Fella, Lawrence Berkeley National Lab. (USA), Safa Shoaee, Univ. Potsdam (Germany)

**12209-20****Strain modulation of 2D perovskite thin film carrier dynamics**

Author(s): Daniel C. Ratchford, Vanessa M. Breslin, Tara J. Michael, Gloria Bazargan, Daniel Gunlycke, Paul A. Brown, Jungheon Yeom, Adam Dunkelberger, Jeffrey C. Owruksy, Robert B. Balow, Blake S. Simpkins, U.S. Naval Research Lab. (USA)

25 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 9

**12209-21****Quantitative multiscale diffusion framework for metal halide perovskites**

Author(s): Masoud Ghasemi, The Pennsylvania State Univ. (USA); Boyu Guo, North Carolina State Univ. (USA); Chiung-Wei Huang, Garrett Baucom, The Univ. of North Carolina at Chapel Hill (USA); Kasra Darabi, Laine Taussig, Tonghui Wang, Taesoo Kim, North Carolina State Univ. (USA); Joanna M. Atkin, The Univ. of North Carolina at Chapel Hill (USA); Aram Amassian, North Carolina State Univ. (USA)

25 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 9

**12209-22****Exciton-phonon coupling and lattice anharmonicity in Ruddlesden Popper metal halides (Invited Paper)**

Author(s): Ajay Ram Srimath Kandada, Wake Forest Univ. (USA)

25 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 9

**Coffee Break 9:40 AM - 10:10 AM****12209-23****Distributed-range Marcus electron transfer in organic photovoltaic (OPV) systems (Invited Paper)**

Author(s): Obadiah Reid, Joshua Carr, Univ. of Colorado Boulder (USA); Taylor Allen, Garry Rumbles, National Renewable Energy Lab. (USA)

25 August 2022 • 10:10 AM - 10:40 AM PDT | Conv. Ctr. Room 9

**12209-25****Separating charge transfer states in organic solar cells (Invited Paper)**

Author(s): Anna Köhler, Univ. Bayreuth (Germany)

25 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 9

**12209-26****Inter-molecular charge-transfer states for organic optoelectronics (Invited Paper)**

Author(s): Koen Vandewal, Univ. Hasselt (Belgium)

25 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 9

**Break****Lunch/Exhibition Break 11:40 AM - 1:30 PM**

## CONFERENCE 12209

### SESSION 7: STRUCTURE, PROCESSING, AND PROPERTY INTERRELATIONSHIPS

25 August 2022 • 1:30 PM - 3:10 PM PDT | Conv. Ctr. Room 9

Session Chair: Koen Vandewal, Univ. Hasselt (Belgium)

#### 12209-27

##### **The crystal packing of non-fullerene acceptors in organic solar cells**

Author(s): Pierluigi Mondelli, Univ. of Oxford (United Kingdom), Merck Chemicals Ltd. (United Kingdom); Pascal Kaienburg, Univ. of Oxford (United Kingdom); Francesco Silvestri, Institut de Ciència de Materials de Barcelona (Spain); Eduardo Solano, ALBA Synchrotron (Spain); Esther Barrena, Institut de Ciència de Materials de Barcelona (Spain); Moritz Riede, Univ. of Oxford (United Kingdom); Graham Morse, Merck Chemicals Ltd. (United Kingdom)

25 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 9

#### 12209-30

##### **Manipulating molecular organization in high-efficiency organic solar cells**

Author(s): Rui Zhang, Feng Gao, Linköping Univ. (Sweden)

25 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 9

#### 12209-31

##### **Electronic and microstructure properties of all-small-molecule organic solar cells**

Author(s): Pascal Kaienburg, Andreas Lauritzen, Irfan Habib, Olivia Gough, Univ. of Oxford (United Kingdom); Subhrangsu Mukherjee, National Institute of Standards and Technology (USA); Harald Ade, North Carolina State Univ. (USA); Moritz Riede, Univ. of Oxford (United Kingdom)

25 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 9

#### 12209-32

##### **11% organic solar cells fabricated from nanoparticle dispersions**

Author(s): Felix Manger, Philipp Marlow, Karen Fischer, Alexander Colsmann, Karlsruher Institut für Technologie (Germany)

25 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 9

#### 12209-54

##### **Insights into the structure-processing-morphology property of bulk heterojunction organic solar cells**

Author(s): Zhifang Du, Thuc-Quyen Nguyen, Univ. of California, Santa Barbara (USA)

25 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 9

#### Break

**Coffee Break 3:10 PM - 3:30 PM**

### SESSION 8: STABILITY, LIFETIME, AND RELIABILITY

25 August 2022 • 3:30 PM - 4:40 PM PDT | Conv. Ctr. Room 9

Session Chair: Ajay Ram Srimath Kandada, Georgia Institute of Technology (USA)

#### 12209-33

##### **Exploration of low-cost perovskites for decentralized energy generation and warfighter environmental impact reduction**

Author(s): Andre Slonopas, U.S. Army CCDC C5ISR Ctr. Night Vision & Electronic Sensors Directorate (USA); Vijay Parameshwaran, US Army Research Laboratory (USA)

25 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 9

#### 12209-34

##### **Intrinsic photodegradation mechanisms of organic bulk heterojunctions based on non-fullerene acceptors**

Author(s): Kan Ding, Yongxi Li, North Carolina State Univ. (USA); Stephen Forrest, Univ. of Michigan (USA); Harald Ade, North Carolina State Univ. (USA)

25 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 9

#### 12209-35

##### **Pb in halide perovskites for photovoltaics: reasons for optimism (Invited Paper)**

Author(s): Iris Visoly-Fisher, Ben-Gurion Univ. of the Negev (Israel)

25 August 2022 • 4:10 PM - 4:40 PM PDT | Conv. Ctr. Room 9



# Organic and Hybrid Sensors and Bioelectronics XV

21 - 22 August 2022 | Conv. Ctr. Room 8

Conference Chairs: Ioannis Kyymissis, Columbia Univ. (USA); Emil J. W. List-Kratochvil, Humboldt-Univ. zu Berlin (Germany); Ruth Shinar, Iowa State Univ. of Science and Technology (USA)

Program Committee: Magnus Berggren, Linköping Univ. (Sweden); Annalisa Bonfiglio, Univ. degli Studi di Cagliari (Italy); Paul L. Burn, The Univ. of Queensland (Australia); Alon Gorodetsky, Univ. of California, Irvine (USA); Sahika Inal, King Abdullah Univ. of Science and Technology (Saudi Arabia); 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); Franky So, North Carolina State Univ. (USA); Arash Takshi, Univ. of South Florida (USA); Luisa Torsi, Univ. degli Studi di Bari Aldo Moro (Italy)

## SESSION 1: OLED/OPTICAL-BASED SENSING

21 August 2022 • 8:00 AM - 9:55 AM PDT | Conv. Ctr. Room 8

Session Chair: Ruth Shinar, Iowa State Univ. of Science and Technology (USA)

### 12210-1

#### Fluorescence-based sensors for the detection of illicit drugs (Invited Paper)

Author(s): Paul E. Shaw, Alex Loch, Paul Burn, The Univ. of Queensland (Australia)

21 August 2022 • 8:00 AM - 8:25 AM PDT | Conv. Ctr. Room 8

### 12210-2

#### OLEDs for biosensing (Invited Paper)

Author(s): Cheng Lian, Kou Yoshida, Dan Young, Richard Randall, Univ. of St. Andrews (United Kingdom); Claude Noguez, Univ. Paris-Saclay (France); Ifor D. W. Samuel, Univ. of St. Andrews (United Kingdom)

21 August 2022 • 8:25 AM - 8:50 AM PDT | Conv. Ctr. Room 8

### 12210-3

#### Understanding the detection of chemical warfare agents (Invited Paper)

Author(s): Paul L. Burn, The Univ. of Queensland (Australia)

21 August 2022 • 8:50 AM - 9:15 AM PDT | Conv. Ctr. Room 8

### 12210-4

#### Organic LEDs as technology platform for high density all-optical neural interfaces

Author(s): Malte C. Gather, Univ. of St. Andrews (United Kingdom)

21 August 2022 • 9:15 AM - 9:30 AM PDT | Conv. Ctr. Room 8

### 12210-6

#### Dynamic materials inspired by cephalopods (Invited Paper)

Author(s): Alon Gorodetsky, Georgii Bogdanov, Univ. of California, Irvine (USA)

21 August 2022 • 9:30 AM - 9:55 AM PDT | Conv. Ctr. Room 8

### Break

Coffee Break 9:55 AM - 10:25 AM

## SESSION 2: ORGANIC AND HYBRID PHOTODETECTORS

21 August 2022 • 10:25 AM - 12:10 PM PDT | Conv. Ctr. Room 8

Session Chair: Ioannis Kyymissis, Columbia Univ. (USA)

### 12210-7

#### Surface passivation of quantum dot for short-wavelength infrared light detection

Author(s): Shichen Yin, Carr Hoi Yi Ho, Shuo Ding, Xiangyu Fu, Liping Zhu, Julian Gullett, Chen Dong, Franky So, North Carolina State Univ. (USA)

21 August 2022 • 10:25 AM - 10:40 AM PDT | Conv. Ctr. Room 8

### 12210-9

#### Near-infrared organic photodetectors using a cross-linked polymer charge blocking layer (Invited Paper)

Author(s): Do Young Kim, Tai Nguyen, Hyocheol Jung, Oklahoma State Univ. (USA)

21 August 2022 • 10:40 AM - 11:05 AM PDT | Conv. Ctr. Room 8

### 12210-10

#### Elastomeric photodetectors enabled by bulk heterojunction with skin-like mechanical properties

Author(s): Canek Fuentes-Hernández, Northeastern Univ. (USA), Georgia Institute of Technology (USA); Youngrak Park, Georgia Institute of Technology (USA); Kyungjin Kim, Georgia Institute of Technology (USA), Univ. of Connecticut (USA); Wen-Fang Chou, Georgia Institute of Technology (USA); Felipe A. Larrain, Georgia Institute of Technology (USA), Univ. Antonio Ibañez (Chile); Samuel Graham, Georgia Institute of Technology (USA), Univ. of Maryland (USA); Olivier Pierron, Bernard Kippelen, Georgia Institute of Technology (USA)

21 August 2022 • 11:05 AM - 11:20 AM PDT | Conv. Ctr. Room 8

### 12210-40

#### Designs for upconversion and photomultiplication in organic shortwave infrared detectors (Invited Paper)

Author(s): Tse Nga Ng, Ning Li, Chanhho Shin, Bogyeom Seo, Univ. of California, San Diego (USA)

21 August 2022 • 11:20 AM - 11:45 AM PDT | Conv. Ctr. Room 8

### Break

Lunch Break 11:45 AM - 1:30 PM

## SESSION 3: VOLATILE ORGANIC CHEMICAL (VOC) SENSING

21 August 2022 • 1:30 PM - 2:40 PM PDT | Conv. Ctr. Room 8

Session Chair: Beatrice Fraboni, Univ. degli Studi di Bologna (Italy)

### 12210-11

#### Electronic-nose for plant health monitoring in a closed environment system (Invited Paper)

Author(s): Arash Takshi, Mohammad Shakhawat Hossain, Univ. of South Florida (USA)

21 August 2022 • 1:30 PM - 1:55 PM PDT | Conv. Ctr. Room 8

### 12210-12

#### Toward chemical sensing: an electrochemical study of the selectivity trend of metal phthalocyanines

Author(s): Mohammad Shakhawat Hossain, Arash Takshi, Univ. of South Florida (USA)

21 August 2022 • 1:55 PM - 2:10 PM PDT | Conv. Ctr. Room 8

### 12210-13

#### Highly sensitive detection of volatile organic compounds via surface plasmon polaritons tuned by vapor-phase deposited metal-organic framework thin films

Author(s): Max Lutz Tietze, Martin Obst, Giel Arnauts, Nathalie Wauteraerts, Sabina Rodriguez-Hermida, Rob Ameloot, KU Leuven (Belgium)

21 August 2022 • 2:10 PM - 2:25 PM PDT | Conv. Ctr. Room 8

### 12210-14

#### Microfabrication of bio-inspired photonic crystals functionalized with metal-organic framework thin films as chemical sensors

Author(s): Giel Arnauts, Cesar Parra Cabrera, Nathalie Wauteraerts, KU Leuven (Belgium); Christian Renaux, Wallonia Infrastructure Nano Fabrication (WINF) (Belgium); Max Lutz Tietze, Margot Verstreken, Rob Ameloot, KU Leuven (Belgium)

21 August 2022 • 2:25 PM - 2:40 PM PDT | Conv. Ctr. Room 8

### Break

Coffee Break 2:40 PM - 3:10 PM



## CONFERENCE 12210

### SESSION 4: BIO- AND MEDICAL-SENSING

21 August 2022 • 3:10 PM - 5:45 PM PDT | Conv. Ctr. Room 8

Session Chair: Eleonora Macchia, Åbo Akademi Univ. (Finland)

#### 12210-15

##### **New approaches to metallic nanogap sensors and devices (Invited Paper)**

Author(s): John C. de Mello, Norwegian Univ. of Science and Technology (Norway); Sihai Luo, Norwegian Univ. of Science and Technology (Norway)

21 August 2022 • 3:10 PM - 3:35 PM PDT | Conv. Ctr. Room 8

#### 12210-18

##### **Fully printed high-density temperature sensor array**

Author(s): Robert Huber, Henning Mescher, Georg Gramlich, Qiaoshuang Zhang, Gerardo Hernandez-Sosa, Uli Lemmer, Karlsruher Institut für Technologie (Germany)

21 August 2022 • 3:35 PM - 3:50 PM PDT | Conv. Ctr. Room 8

#### 12210-19

##### **Piezoelectric and mechanical studies of hybrid organic-inorganic halometallates towards force sensors**

Author(s): Michael Wells, Jacob Hempel, Sean Parkin, Yang-Tse Cheng, Univ. of Kentucky (USA); Aron Huckaba

21 August 2022 • 3:50 PM - 4:05 PM PDT | Conv. Ctr. Room 8

#### 12210-20

##### **Implementation of experimental design techniques to optimize immunoglobulins detection with Simoa SP-X System (Invited Paper)**

Author(s): Eleonora Macchia, Univ. degli Studi di Bari Aldo Moro (Italy), Åbo Akademi Univ. (Finland)

21 August 2022 • 4:05 PM - 4:30 PM PDT | Conv. Ctr. Room 8

#### 12210-21

##### **Peptide based supramolecular materials for transient electronics (Invited Paper)**

Author(s): Nurit Ashkenasy, Ben-Gurion Univ. of the Negev (Israel)

21 August 2022 • 4:30 PM - 4:55 PM PDT | Conv. Ctr. Room 8

#### 12210-22

##### **Using new materials for brain-like computing: from fundamental mechanisms to high-performance devices (Invited Paper)**

Author(s): Alberto Salleo, Tyler Quill, Stanford Univ. (USA)

21 August 2022 • 4:55 PM - 5:20 PM PDT | Conv. Ctr. Room 8

#### 12210-39

##### **Material and device considerations for electronic drug delivery (Invited Paper)**

Author(s): Christopher Proctor, Univ. of Cambridge (United Kingdom)

21 August 2022 • 5:20 PM - 5:45 PM PDT | Conv. Ctr. Room 8

### SUNDAY EVENING PLENARY

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

#### **6:00 PM - 6:05 PM: Welcome and Opening Remarks**

#### 12198-501

##### **In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

#### 12238-502

##### **Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

### SESSION 5: NEUROMORPHIC AND BIOELECTRONIC DEVICES I

22 August 2022 • 8:00 AM - 9:55 AM PDT | Conv. Ctr. Room 8

Session Chair: Ioannis Kymissis, Columbia Univ. (USA)

#### 12210-37

##### **Translational NeuroElectronics (Invited Paper)**

Author(s): Dion Khodagholy, Columbia Univ. (USA)

22 August 2022 • 8:00 AM - 8:25 AM PDT | Conv. Ctr. Room 8

#### 12210-23

##### **Organic neuromorphic electronics for bio-inspired processing and local sensorimotor learning in robotics (Invited Paper)**

Author(s): Paschalis Gkoupidenis, Max-Planck-Institut für Polymerforschung (Germany)

22 August 2022 • 8:25 AM - 8:50 AM PDT | Conv. Ctr. Room 8

#### 12210-24

##### **Evolvable organic electrochemical transistors (Invited Paper)**

Author(s): Jennifer Gerasimov, Arnab Halder, Mathieu Linares, Chiara Musumeci, Linköping Univ. (Sweden); Sarbani Ghosh, Birla Institute of Technology and Science, Pilani (India); Deyu Tu, Tobias Abrahamsson, Linköping Univ. (Sweden); David Bliman, Göteborgs Univ. (Sweden); Roger Olsson, Göteborgs Univ. (Sweden), Lund Univ. (Sweden); Magnus Berggren, Daniel T. Simon, Robert Forchheimer, Simone Fabiano, Linköping Univ. (Sweden)

22 August 2022 • 8:50 AM - 9:15 AM PDT | Conv. Ctr. Room 8

#### 12210-25

##### **Functional biohybrid neuromorphic interfaces (Invited Paper)**

Author(s): Francesca Santoro, Forschungszentrum Jülich GmbH (Germany), RWTH Aachen Univ. (Germany), Istituto Italiano di Tecnologia (Italy)

22 August 2022 • 9:15 AM - 9:40 AM PDT | Conv. Ctr. Room 8

#### 12210-26

##### **Stability of fiber-based organic electrochemical transistors with a gel electrolyte for wearable electronics**

Author(s): Nestor O. Marquez Rios, Arash Takshi, Univ. of South Florida (USA)

22 August 2022 • 9:40 AM - 9:55 AM PDT | Conv. Ctr. Room 8

#### Break

#### **Coffee Break 9:55 AM - 10:25 AM**

### SESSION 6: NEUROMORPHIC AND BIOELECTRONIC DEVICES II

22 August 2022 • 10:25 AM - 12:20 PM PDT | Conv. Ctr. Room 8

Session Chair: Alberto Salleo, Stanford Univ. (USA)

#### 12210-27

##### **Organic neuromorphic electronics and biohybrid systems (Invited Paper)**

Author(s): Yoeri van de Burgt, Technische Univ. Eindhoven (Netherlands)

22 August 2022 • 10:25 AM - 10:50 AM PDT | Conv. Ctr. Room 8

#### 12210-28

##### **Skin-like neuromorphic devices for intelligence and personalized wearable technology (Invited Paper)**

Author(s): Sihong Wang, The Univ. of Chicago (USA)

22 August 2022 • 10:50 AM - 11:15 AM PDT | Conv. Ctr. Room 8

#### 12210-29

##### **On the modeling of organic electrochemical transistors (Invited Paper)**

Author(s): Lukas M. Bongartz, TU Dresden (Germany); Matteo Cucchi, TU Dresden (Switzerland), EPFL (Switzerland); Karl Leo, Hans Kleemann, TU Dresden (Germany)

22 August 2022 • 11:15 AM - 11:40 AM PDT | Conv. Ctr. Room 8

**12210-31****Conducting polymer scaffold device as a tool to mimic and monitor 3D tissue microenvironment for use in organ-on-chip platforms (Invited Paper)**

Author(s): Charalampos Pitsalidis, Khalifa Univ. of Science, Technology and Research (United Arab Emirates); Róisín Owens, Univ. of Cambridge (United Kingdom)

22 August 2022 • 11:40 AM - 12:05 PM PDT | Conv. Ctr. Room 8

**12210-38****Hybrid triboelectric-electromagnetic nanosensor for energy threshold**

Author(s): Mohammed Uddin, The Univ. of Texas Rio Grande Valley (USA)

22 August 2022 • 12:05 PM - 12:20 PM PDT | Conv. Ctr. Room 8

**Break**

**Lunch Break 12:20 PM - 2:00 PM**

**SESSION 7: FIELD EFFECT TRANSISTOR AND SENSORS: JOINT SESSION WITH 12210 AND 12211**

22 August 2022 • 2:00 PM - 5:35 PM PDT | Conv. Ctr. Room 8

Session Chair: Iain McCulloch, Univ. of Oxford (United Kingdom)

**12210-32****Organic active material design for radiation sensing (Keynote Presentation)**

Author(s): John E. Anthony, Univ. of Kentucky (USA); Oana Jurchescu, Wake Forest Univ. (USA)

22 August 2022 • 2:00 PM - 2:35 PM PDT | Conv. Ctr. Room 8

**12211-1****Plant bioelectronics for real time monitoring of plant physiology (Invited Paper)**

Author(s): Eleni Stavrinidou, Linköping Univ. (Sweden)

22 August 2022 • 2:35 PM - 3:00 PM PDT | Conv. Ctr. Room 8

**12211-2****Organic mixed ionic-electronic conductors (OMIECs) for electrochemical transistors and circuits (Invited Paper)**

Author(s): Jonathan Rivnay, Northwestern Univ. (USA)

22 August 2022 • 3:00 PM - 3:25 PM PDT | Conv. Ctr. Room 8

**Coffee Break 3:25 PM - 3:55 PM****12211-3****Organic electrochemical transistor-based sensors (Invited Paper)**

Author(s): Anna-Maria Pappa, Khalifa Univ. of Science, Technology and Research (United Arab Emirates)

22 August 2022 • 3:55 PM - 4:20 PM PDT | Conv. Ctr. Room 8

**12211-4****Integration of spiking neurons with electrochemical transistors using a photo-patternable solid electrolyte**

Author(s): Anton Weissbach, Hsin Tseng, TU Dresden (Germany); Laurie Calvet, Univ. Paris-Saclay (France); Hans Kleemann, Karl Leo, TU Dresden (Germany)

22 August 2022 • 4:20 PM - 4:35 PM PDT | Conv. Ctr. Room 8

**12211-5****Large-area interfaces for single-molecule label-free bioelectronic detection (Invited Paper)**

Author(s): Luisa Torsi, Eleonora Macchia, Univ. degli Studi di Bari Aldo Moro (Italy)

22 August 2022 • 4:35 PM - 5:00 PM PDT | Conv. Ctr. Room 8

**12210-33****In-operando and in-vivo polymerization of trimers for neuromorphic and bioelectronic systems (Keynote Presentation)**

Author(s): Magnus Berggren, Linköping Univ. (Sweden)

22 August 2022 • 5:00 PM - 5:35 PM PDT | Conv. Ctr. Room 8

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12210-34****Filamented network assembly by electric field induced percolation for highly sensitive directional strain sensing**

Author(s): Pariya Nazari, Ruprecht-Karls-Univ. Heidelberg (Germany); Johannes Zimmermann, Christian Melzer, InnovationLab GmbH (Germany); Palak Gupta, Rainer Bäuerle, Uwe Bunz, Ruprecht-Karls-Univ. Heidelberg (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany); Gerardo Hernandez-Sosa, Jasmin Aghassi-Hagmann, Uli Lemmer, Karlsruher Institut für Technologie (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

# Organic and Hybrid Field-Effect Transistors XXI

22 - 24 August 2022 | Conv. Ctr. Room 8

Conference Chair: Iain McCulloch, Univ. of Oxford (United Kingdom); Oana D. Jurchescu, Wake Forest Univ. (USA)

## SESSION 1: FIELD EFFECT TRANSISTOR AND SENSORS: JOINT SESSION WITH 12210 AND 12211

22 August 2022 • 2:00 PM - 5:35 PM PDT | Conv. Ctr. Room 8

Session Chair: Iain McCulloch, Univ. of Oxford (United Kingdom)

### 12210-32

#### Organic active material design for radiation sensing (Keynote Presentation)

Author(s): John E. Anthony, Univ. of Kentucky (USA); Oana Jurchescu, Wake Forest Univ. (USA)

22 August 2022 • 2:00 PM - 2:35 PM PDT | Conv. Ctr. Room 8

### 12211-1

#### Plant bioelectronics for real time monitoring of plant physiology (Invited Paper)

Author(s): Eleni Stavrinidou, Linköping Univ. (Sweden)

22 August 2022 • 2:35 PM - 3:00 PM PDT | Conv. Ctr. Room 8

### 12211-2

#### Organic mixed ionic-electronic conductors (OMIECs) for electrochemical transistors and circuits (Invited Paper)

Author(s): Jonathan Rivnay, Northwestern Univ. (USA)

22 August 2022 • 3:00 PM - 3:25 PM PDT | Conv. Ctr. Room 8

### Coffee Break 3:25 PM - 3:55 PM

### 12211-3

#### Organic electrochemical transistor-based sensors (Invited Paper)

Author(s): Anna-Maria Pappa, Khalifa Univ. of Science, Technology and Research (United Arab Emirates)

22 August 2022 • 3:55 PM - 4:20 PM PDT | Conv. Ctr. Room 8

### 12211-4

#### Integration of spiking neurons with electrochemical transistors using a photo-patternable solid electrolyte

Author(s): Anton Weissbach, Hsin Tseng, TU Dresden (Germany); Laurie Calvet, Univ. Paris-Saclay (France); Hans Kleemann, Karl Leo, TU Dresden (Germany)

22 August 2022 • 4:20 PM - 4:35 PM PDT | Conv. Ctr. Room 8

### 12211-5

#### Large-area interfaces for single-molecule label-free bioelectronic detection (Invited Paper)

Author(s): Luisa Torsi, Eleonora Macchia, Univ. degli Studi di Bari Aldo Moro (Italy)

22 August 2022 • 4:35 PM - 5:00 PM PDT | Conv. Ctr. Room 8

### 12210-33

#### In-operando and in-vivo polymerization of trimers for neuromorphic and bioelectronic systems (Keynote Presentation)

Author(s): Magnus Berggren, Linköping Univ. (Sweden)

22 August 2022 • 5:00 PM - 5:35 PM PDT | Conv. Ctr. Room 8

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12211-10

#### Importance of charge percolation pathways in organic mixed ionic-electronic conducting (OMIEC) polymers

Author(s): Masoud Ghasemi, Enrique D. Gomez, The Pennsylvania State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12211-32

#### The role of electron affinity in polaron stability of n-type rigid semiconducting polymers in aqueous electrochemical applications

Author(s): Maryam Alsufyani, Univ. of Oxford (United Kingdom); Ruiheng Wu, Reem Rashid, Jonathan Rivnay, Northwestern Univ. (USA); Iain McCulloch, Univ. of Oxford (United Kingdom)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12211-33

#### Dimensionality of photogenerated charges transport in the organic phototransistor

Author(s): A. Kuzma, T. Vincze, M. Micjan, J. Nevrela, M. Donoval, M. Weis, Slovak Univ. of Technology in Bratislava (Slovakia)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## ORGANIC PHOTONICS + ELECTRONICS PLENARY SESSION

23 August 2022 • 9:15 AM - 11:50 AM PDT | Conv. Ctr. Room 6A

Session Chair: Ifor D.W. Samuel, Univ. of St. Andrews (United Kingdom)

### 9:15 AM - 9:20 AM: Welcome and Opening Remarks

### 12209-501

#### Thin-film solution-processed multijunction solar cells (Plenary Presentation)

Author(s): René A.J. Janssen, Technische Univ. Eindhoven (Netherlands)

23 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 6A

### Coffee Break 10:00 AM - 10:30 AM

### 12211-502

#### Can solution-processed organic thin-film transistors enable ubiquitous electronics? (Plenary Presentation)

Author(s): Oana D. Jurchescu, Wake Forest Univ. (USA)

23 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 6A

### 12209-503

#### Designing room temperature quantum materials through quantum analog of vibration isolation (Plenary Presentation)

Author(s): Kenan Gundogdu, North Carolina State Univ. (USA)

23 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 6A

### Break

### Lunch/Exhibition Break 11:50 AM - 1:55 PM

**SESSION 2: MATERIALS I**

23 August 2022 • 1:55 PM - 2:35 PM PDT | Conv. Ctr. Room 8

Session Chair: Iain McCulloch, Univ. of Oxford (United Kingdom)

**12211-7****Does structure really matter? Influence of structural 'perfectness' of conjugated polymers on their optoelectronic properties and device performance**

Author(s): Jochen Vanderspikken, Univ. Hasselt (Belgium), Institute for Material Research (Belgium); Omar Beckers, Sam Gielen, Quan Liu, Univ. Hasselt (Belgium), Institute of Material Research (Belgium); Alberto Salleo, Stanford Univ. (USA); Koen Vandewal, Wouter Maes, Univ. Hasselt (Belgium), Institute of Material Research (Belgium)

23 August 2022 • 1:55 PM - 2:10 PM PDT | Conv. Ctr. Room 8

**12211-9****Crystal structure tuning of new chromophores for organic transistors (Invited Paper)**

Author(s): John E. Anthony, Univ. of Kentucky (USA)

23 August 2022 • 2:10 PM - 2:35 PM PDT | Conv. Ctr. Room 8

**Break****Coffee Break 2:35 PM - 3:05 PM****SESSION 3: MATERIALS II**

23 August 2022 • 3:05 PM - 4:20 PM PDT | Conv. Ctr. Room 8

Session Chair: Ulrike Kraft, Max-Planck-Institut für Polymerforschung (Germany)

**12211-11****Operationally stable two-dimensional lead-free perovskite field-effect transistors by grain engineering**

Author(s): Shuanglong Wang, Denis Adrienko, Hai Wang, Mischa Bonn, Paul W. M. Blom, Wojciech Pisula, Max-Planck-Institut für Polymerforschung (Germany); Tomasz Marszalek, Max-Planck-Institut für Polymerforschung (Germany), Lodz Univ. of Technology (Poland)

23 August 2022 • 3:05 PM - 3:20 PM PDT | Conv. Ctr. Room 8

**12211-12****Sidechain modification of ethynyl acenes: effects on solid-state packing and molecular stability**

Author(s): Karl Thorley, Univ. of Kentucky (USA); Derek Dremann, Wake Forest Univ. (USA); Sean Parkin, Univ. of Kentucky (USA); Oana Jurchescu, Wake Forest Univ. (USA); John Anthony, Univ. of Kentucky (USA)

23 August 2022 • 3:20 PM - 3:35 PM PDT | Conv. Ctr. Room 8

**12211-13****Next-generation polymeric semiconductors for organic electrochemical transistors**

Author(s): Jasper Deckers, Lize Bynens, Jochen Vanderspikken, Koen Vandewal, Univ. Hasselt (Belgium), imec (Belgium); Laurence Lutsen, imec (Belgium); Wouter Maes, Univ. Hasselt (Belgium), imec (Belgium)

23 August 2022 • 3:35 PM - 3:50 PM PDT | Conv. Ctr. Room 8

**12211-34****From exciton dynamics to transistor photocurrent in varied structures of functionalized tetracene**

Author(s): Chad Cruz, John C. Stephenson, National Institute of Standards and Technology (USA); John Anthony, University of Kentucky (USA); Jared Wahlstrand, Emily G. Bittle, National Institute of Standards and Technology (USA)

23 August 2022 • 3:50 PM - 4:05 PM PDT | Conv. Ctr. Room 8

**12211-35****The role of electron affinity in advancing the electrical performance of n-type semiconducting polymers**

Author(s): Maryam Alsufyani, Univ. of Oxford (United Kingdom); Benjamin Moss, Imperial College London (United Kingdom); Karl Thorley, Univ. of Kentucky (USA); Iain McCulloch, Univ. of Oxford (United Kingdom); Reem Rashid, Jonathan Rivnay, Northwestern University (USA); James Durrant, Imperial College London (United Kingdom)

23 August 2022 • 4:05 PM - 4:20 PM PDT | Conv. Ctr. Room 8

**SESSION 4: PROCESSING**

24 August 2022 • 8:30 AM - 9:50 AM PDT | Conv. Ctr. Room 8

Session Chair: Thomas D. Anthopoulos, King Abdullah Univ. of Science and Technology (Saudi Arabia)

**12211-14****Completely printed, flexible carbon nanotube based transistor using poly vinyl alcohol (PVA) as gate dielectric via aerosol jet printing**

Author(s): Bhagyashree Mishra, Chandan Howlader, Texas State Univ. (USA); Yihong (Chen) Chen, Texas State Univ. (USA), Ingram School of Engineering (USA)

24 August 2022 • 8:30 AM - 8:45 AM PDT | Conv. Ctr. Room 8

**12211-15****Pathways to fast and edible printed organic electronics (Invited Paper)**

Author(s): Mario Caironi, Istituto Italiano di Tecnologia (Italy)

24 August 2022 • 8:45 AM - 9:10 AM PDT | Conv. Ctr. Room 8

**12211-16****Multi-scale ordering of PEDOT and PSS in the presence of ionic salts enables water-stable 2D/3D printable conductors and devices**

Author(s): Laine Taussig, North Carolina State Univ. (USA); Masoud Ghasemi, The Pennsylvania State Univ. (USA); Sanggil Han, University of Cambridge (United Kingdom); Tatiana Proksch, North Carolina State Univ. (USA); Ruipeng Li, Brookhaven National Lab. (USA); Enrique Gomez, The Pennsylvania State Univ. (USA); Albert Kwansa, Yaroslava Yingling, North Carolina State Univ. (USA); George Malliaras, Univ. of Cambridge (United Kingdom); Aram Amassian, North Carolina State Univ. (USA)

24 August 2022 • 9:10 AM - 9:25 AM PDT | Conv. Ctr. Room 8

**12211-17****A benchtop robotic platform to accelerate printed electronics research (Invited Paper)**

Author(s): Aram Amassian, North Carolina State Univ. (USA)

24 August 2022 • 9:25 AM - 9:50 AM PDT | Conv. Ctr. Room 8

**Break****Coffee Break 9:50 AM - 10:20 AM****SESSION 5: CHARACTERIZATION**

24 August 2022 • 10:20 AM - 12:00 PM PDT | Conv. Ctr. Room 8

Session Chair: Aram Amassian, North Carolina State Univ. (USA)

**12211-18****Small, but highly effective: functional molecules in polymer devices (Invited Paper)**

Author(s): Ulrike Kraft, Max-Planck-Institut für Polymerforschung (Germany)

24 August 2022 • 10:20 AM - 10:45 AM PDT | Conv. Ctr. Room 8

**12211-19****Electrolyte-gated transistors and inverters operating at 10 MHz (Invited Paper)**

Author(s): C. Daniel Frisbie, Univ. of Minnesota, Twin Cities (USA)

24 August 2022 • 10:45 AM - 11:10 AM PDT | Conv. Ctr. Room 8

**12211-31****Linking microstructure to transport at several length scales in conjugated polymers (Invited Paper)**

Author(s): Alberto Salleo, Stanford Univ. (USA)

24 August 2022 • 11:10 AM - 11:35 AM PDT | Conv. Ctr. Room 8

**12211-21****High-resolution STM imaging for the advanced characterisation of organic transistor materials (Invited Paper)**

Author(s): Giovanni Costantini, The Univ. of Warwick (United Kingdom)

24 August 2022 • 11:35 AM - 12:00 PM PDT | Conv. Ctr. Room 8

**Break****Lunch/Exhibition Break 12:00 PM - 1:30 PM**

## CONFERENCE 12211

### SESSION 6: DEVICES I

24 August 2022 • 1:30 PM - 3:10 PM PDT | Conv. Ctr. Room 8

Session Chair: Alberto Salleo, Stanford Univ. (USA)

#### 12211-22

##### **High-performance organic transistors: gigahertz and beyond (Invited Paper)**

Author(s): Karl Leo, TU Dresden (Germany)

24 August 2022 • 1:30 PM - 1:55 PM PDT | Conv. Ctr. Room 8

#### 12211-23

##### **Flexible nanoscale organic thin-film transistors (Invited Paper)**

Author(s): Ute Zschieschang, Hagen Klauk, Max-Planck-Institut für Festkörperforschung (Germany)

24 August 2022 • 1:55 PM - 2:20 PM PDT | Conv. Ctr. Room 8

#### 12211-24

##### **The intrinsic (trap-free) transistors based on perovskite single crystals with self-passivated surfaces (Invited Paper)**

Author(s): Vitaly Podzorov, Vladimir Bruevich, Leila Kasaei, Sylvie Rangan, Hussein Hijazi, Zhenyuan Zhang, Thomas Emge, Eva Andrei, Robert A. Bartynski, Leonard C. Feldman, Rutgers, The State Univ. of New Jersey (USA)

24 August 2022 • 2:20 PM - 2:45 PM PDT | Conv. Ctr. Room 8

#### 12211-25

##### **Charge transport physics of organic and hybrid perovskite field effect transistors (Invited Paper)**

Author(s): Henning Sirringhaus, Univ. of Cambridge (United Kingdom)

24 August 2022 • 2:45 PM - 3:10 PM PDT | Conv. Ctr. Room 8

#### Break

**Coffee Break 3:10 PM - 3:40 PM**

### SESSION 7: DEVICES II

24 August 2022 • 3:40 PM - 5:00 PM PDT | Conv. Ctr. Room 8

Session Chair: Oana D. Jurchescu, Wake Forest Univ. (USA)

#### 12211-27

##### **Transistors based on perovskites and organic-perovskite composites (Invited Paper)**

Author(s): Thomas D. Anthopoulos, King Abdullah Univ. of Science and Technology (Saudi Arabia)

24 August 2022 • 3:40 PM - 4:05 PM PDT | Conv. Ctr. Room 8

#### 12211-28

##### **Tailoring the Performance Metrics of Organic Electrochemical Transistors (Invited Paper)**

Author(s): Alexandra Paterson, Univ. of Kentucky (USA)

24 August 2022 • 4:05 PM - 4:30 PM PDT | Conv. Ctr. Room 8

#### 12211-29

##### **Smart integration of organic light-emitting transistors with organic photodiodes for ultra-compact plasmonic sensors**

Author(s): Mario Prosa, Istituto per lo Studio dei Materiali Nanostrutturati (Italy)

24 August 2022 • 4:30 PM - 4:45 PM PDT | Conv. Ctr. Room 8

#### 12211-30

##### **The photo-hall effect in high-mobility organic semiconductors**

Author(s): Vladimir Bruevich, Hyun Ho Choi, Vitaly Podzorov, Rutgers, The State Univ. of New Jersey (USA)

24 August 2022 • 4:45 PM - 5:00 PM PDT | Conv. Ctr. Room 8



# Molecular and Nano Machines V

21 August 2022 | Conv. Ctr. Room 10

Conference Chairs: Zouheir Sekkat, Univ. Mohamed V (Morocco); Takashige Omatsu, Chiba Univ. (Japan)

Program Committee: Christopher J. Barrett, McGill Univ. (Canada); Anna S. Bezryadina, California State Univ., Northridge (USA); Cornelia Denz, Westfälische Wilhelms-Universität Münster (Germany); Katsumasa Fujita, Osaka Univ. (Japan); Tigran Galstian, Univ. Laval (Canada); Shinji Hayashi, Kobe Univ. (Japan); Yasushi Inouye, Osaka Univ. (Japan); Masahiro Irie, Rikkyo Univ. (Japan); Hidekazu Ishitobi, Osaka Univ. (Japan); Peter Karageorgiev, Univ. Regensburg (Germany); Satoshi Kawata, Osaka Univ. (Japan); Kwang-Sup Lee, Hannam Univ. (Korea, Republic of); Keitaro Nakatani, École normale supérieure Paris-Saclay (France); Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia); Atsushi Shishido, Tokyo Institute of Technology (Japan); Hong-Bo Sun, Tsinghua Univ. (China); Diederik S. Wiersma, LENS - Lab. Europeo di Spettroscopia Non-Lineari (Italy)

## SESSION 1: LIGHT MOMENTUM AND VORTEX INTERACTION WITH MATTER

21 August 2022 • 10:00 AM - 11:50 AM PDT | Conv. Ctr. Room 10

Session Chair: Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

### 12212-1

**Optical vortex laser induced forward transfer: manifestation of interaction between orbital angular momentum and matters (Keynote Presentation)**

Author(s): Takashige Omatsu, Chiba Univ. (Japan)

21 August 2022 • 10:00 AM - 10:40 AM PDT | Conv. Ctr. Room 10

### 12212-2

**Optically driven nano and micromachines in optical tweezers (Invited Paper)**

Author(s): Halina Rubinsztein-Dunlop, Declan Armstrong, Mark Watson, Itia Favre-Bulle, Timo Nieminen, Alexander B. Stilgoe, The Univ. of Queensland (Australia)

21 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 10

### 12212-3

**Printed 2-D materials via optical vortex laser induced forward transfer**

Author(s): Nobuyuki Aoki, Haruki Sasaki, Haruki Kawaguchi, Katsuhiko Miyamoto, Takashige Omatsu, Chiba Univ. (Japan)

21 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 10

### 12212-4

**Optical vortex fabrication the electroconductive microdot with close-packed gold nanoparticles**

Author(s): Rong Wei, Haruki Kawaguchi, Graduate School of Engineering, Chiba Univ. (Japan); Katsuhiko Miyamoto, Graduate School of Engineering, Chiba Univ. (Japan), Molecular Chirality Research Ctr. (Japan); Takashige Omatsu, Graduate School of Engineering Chiba Univ. (Japan), Molecular Chirality Research Ctr. (Japan)

21 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 10

### Break

**Lunch Break 11:50 AM - 1:45 PM**

## SESSION 2: IMAGING, BIOSENSING, AND CONTROL BY LIGHT

21 August 2022 • 1:45 PM - 3:15 PM PDT | Conv. Ctr. Room 10

Session Chair: Takashige Omatsu, Chiba Univ. (Japan)

### 12212-5

**Exploiting fluctuation for micro/nano imaging and fabrication (Keynote Presentation)**

Author(s): Satoshi Kawata, Nanophoton Corp. (Japan), Osaka Univ. (Japan)

21 August 2022 • 1:45 PM - 2:25 PM PDT | Conv. Ctr. Room 10

### 12212-6

**Can we control the trans-membrane ion exchange by using amphiphilic azobenzene molecules? (Invited Paper)**

Author(s): Tigran Galstian, Ilham Touati, Univ. Laval (Canada); Yue Zhao, Univ. de Sherbrooke (Canada)

21 August 2022 • 2:25 PM - 2:55 PM PDT | Conv. Ctr. Room 10

### 12212-19

**Hybrid interfaces (semiconductors) showing exceptionally to high photon-to-electron conversion**

Author(s): Mohammed Uddin, Brishty Deb Chowdhury, Glenn Grissom, The Univ. of Texas Rio Grande Valley (USA)

21 August 2022 • 2:55 PM - 3:15 PM PDT | Conv. Ctr. Room 10

### Break

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

## SESSION 3: PHOTOMECHANICS OF AZO-POLYMERS

21 August 2022 • 3:45 PM - 4:55 PM PDT | Conv. Ctr. Room 10

Session Chair: Anna S. Bezryadina, California State Univ., Northridge (USA)

### 12212-10

**Model for athermal enhancement of molecular mobility in solid polymers by light**

Author(s): Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

21 August 2022 • 3:45 PM - 4:05 PM PDT | Conv. Ctr. Room 10

### 12212-12

**Light-fueled dye-doped liquid crystal systems for deformable low-threshold optical limiter (Invited Paper)**

Author(s): Atsushi Shishido, Tokyo Institute of Technology (Japan)

21 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 10

### 12212-13

**Multi-armed chiral surface relief formation in azo-polymers with rotating petal beams**

Author(s): Arata Tomita, Chiba Univ. (Japan); Adam Vallés, Chiba Univ. (Japan), ICFO - Institut de Ciències Fotòniques (Spain), Molecular Chirality Research Ctr. (Japan); Katsuhiko Miyamoto, Takashige Omatsu, Chiba Univ. (Japan), Molecular Chirality Research Ctr. (Japan)

21 August 2022 • 4:35 PM - 4:55 PM PDT | Conv. Ctr. Room 10

## SUNDAY EVENING PLENARY

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks**

### 12198-501

**In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

### 12238-502

**Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12212-7**

**Light propagation in DNA suspensions**

Author(s): Rebecca Sipe, Anna S. Bezryadina, California State Univ., Northridge (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12212-15**

**Surface enhanced visible absorption of dye molecules in the near-field of gold nanoparticles seen by photo-orientation enhancement**

Author(s): Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12212-16**

**Plasmonic mode coupling and thin film sensing in metal-insulator-metal structures**

Author(s): Siham Refki, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco); Youssef EL Idrissi, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco), Univ. Mohammed V de Rabat (Morocco); Najat Andam, Shinji Hayashi, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco); Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic, Univ. Mohammed V de Rabat (Morocco), Osaka Univ. (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12212-17**

**Optical characterization of ultra-thin films of dye doped solid polymers**

Author(s): Siham Refki, MASciR/ University Mohammed VI Polytechnic (Morocco), Univ. Mohammed VI Polytechnic (Morocco); Youssef El Idrissi, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco), Univ. Mohammed V de Rabat (Morocco); Najat Andam, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco); Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic, Univ. Mohammed V de Rabat (Morocco), Osaka Univ. (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12212-18**

**Amplification of holographic recording in azo-polymers by surface-enhanced visible absorption of azo dye in the vicinity of gold NPs**

Author(s): Ibrahim Boudene, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco), Univ. Mohammed V de Rabat (Morocco); Siham Refki, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic (Morocco); Zouheir Sekkat, Moroccan Foundation for Advanced Science, Innovation and Research (Morocco), Univ. Mohammed VI Polytechnic, Univ. Mohammed V de Rabat (Morocco), Osaka Univ. (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

# Optics Education and Outreach VII

22 August 2022 | Conv. Ctr. Room 17B

Conference Chairs: G. Groot Gregory, Synopsys, Inc. (USA); Anne-Sophie Poulin-Girard, Univ. Laval (Canada)

Program Committee: Robert M. Bunch, Rose-Hulman Institute of Technology (USA); Anna Consortini, Univ. degli Studi di Firenze (Italy); Barbara A. Darnell, ScinTech (USA); Judith F. Donnelly, Problem Based Learning Projects (USA); Danielle J. Harper, Wellman Ctr. for Photomedicine (USA); Nicholas S. Kochan, Univ. of Rochester (USA); Amanda K. Meier, Front Range Community College (USA); Brian Monacelli, Jet Propulsion Lab. (USA); Ignacio Moreno Soriano, Univ. Miguel Hernández (Spain); Joseph Niemela, The Abdus Salam International Ctr. for Theoretical Physics (Italy); Matthew T. Posner, Excelitas Technologies Inc. (Canada); Paul B. Ruffin, Alabama A&M Univ. (USA); Marcelo Saito Nogueira, Tyndall National Institute (Ireland); Donn M. Silberman, OpticsAge (USA); Perla Marlene Viera-González, Univ. Autónoma de Nuevo León (Mexico); María Viñas Peña, Wellman Ctr. for Photomedicine (USA); Linhui Yu, Wellman Ctr. for Photomedicine (USA); María Josefa Yzuel Giménez, Univ. Autónoma de Barcelona (Spain)

## Welcome and Opening Remarks

22 August 2022 • 8:00 AM - 8:10 AM PDT | Conv. Ctr. Room 17B

**The conference chairs of Optics Education and Outreach VII, Mr. G. Groot Gregory and Dr. Anne-Sophie Poulin-Girard, will provide opening remarks.**

## SESSION 1: LEARNING ONLINE

22 August 2022 • 8:10 AM - 9:50 AM PDT | Conv. Ctr. Room 17B

Session Chair: Perla M. Viera-González, Univ. Autónoma de Nuevo León (Mexico)

### 12213-1

**A case study into technical eLearning: Upskilling Excelitas' workforce with SPIE partnership**

Author(s): Matthew T. Posner, Excelitas Canada Inc. (Canada); Lucy Rimmer, Steve Jones, Excelitas Technologies UK Ltd. (United Kingdom); Felicia Andreotta, Laura Sharik, SPIE (USA)

22 August 2022 • 8:10 AM - 8:30 AM PDT | Conv. Ctr. Room 17B

### 12213-2

**Online collaborative approach to teaching hands-on photonic integrated circuit (PIC) device testing**

Author(s): Juejun Hu, Jerome Michon, Mikhail Shalaginov, Gillian Micale, Massachusetts Institute of Technology (USA); Jaime Cardenas, Univ. of Rochester (USA); Jelena Notaros, Milica Notaros, Massachusetts Institute of Technology (USA); Jifeng Liu, Dartmouth College (USA); Samuel Serna, Bridgewater State Univ. (USA); Pradnya Nagarkar, Lionel C. Kimerling, Anuradha M. Agarwal, Massachusetts Institute of Technology (USA)

22 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 17B

### 12213-6

**Problem-based learning in advanced photonics manufacturing: Adapting to online delivery during a global pandemic**

Author(s): Nicholas Massa, Aimee Dalenta, Springfield Technical Community College (USA)

22 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 17B

### 12213-3

**Online learning games and simulations for photonic integrated circuit (PIC) sensor design and operation**

Author(s): Ira Fay, Massachusetts Institute of Technology (USA); Kelsey Gardner, Ryan Chadwick, Fire Hose Games (USA); Samuel Serna, Bridgewater State Univ. (USA); Trevor Morrissey, Robin Singh, Anuradha M. Agarwal, Erik Verlage, Massachusetts Institute of Technology (USA)

22 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 17B

### 12213-5

**Learning in a pandemic: a model for virtual outreach**

Author(s): Judy Donnelly, Three Rivers Community College (USA); Nancy Magnani, Sumner-Bonney Lake School District (USA)

22 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 17B

## Break

**Coffee Break 9:50 AM - 10:20 AM**

## SESSION 2: PROMOTING OPTICS

22 August 2022 • 10:20 AM - 11:50 AM PDT | Conv. Ctr. Room 17B

Session Chair: Brian Monacelli, Jet Propulsion Lab. (USA)

### 12213-7

**Promoting photonics in education and the media: the Photon Awards experience (Invited Paper)**

Author(s): Juan Diego Ania-Castañón, Instituto de Óptica "Daza de Valdés" (Spain)

22 August 2022 • 10:20 AM - 10:50 AM PDT | Conv. Ctr. Room 17B

### 12213-8

**Assessing the biomedical optics outreach landscape**

Author(s): Chhavi Goenka, Linhui Yu, Haley L. Marks, Amira M. Eltony, Massachusetts General Hospital (USA), Harvard Medical School (USA); Helen Keshishian, Abigail Gregg, Massachusetts General Hospital (USA); Tayyaba Hasan, Massachusetts General Hospital (USA), Harvard Medical School (USA), Harvard-MIT Health Sciences and Technology (USA); Danielle J. Harper, Massachusetts General Hospital (USA), Harvard Medical School (USA)

22 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 17B

### 12213-9

**Optics, arts, and sound: celebrating 100 years of Kaluza's 5th Dimension in a geographically-distributed interactive hybrid exhibition**

Author(s): Cornelius F. Hahlweg, bbw Hochschule (Germany); Witold Stypa, Stypa Cosmoreal Museum of Future (Germany)

22 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 17B

### 12213-38

**Quantum education and pathways: an open-source modifiable presentation to high school and college students**

Author(s): Donn M. Silberman, OpticsAge - Optics Institute of Southern California (USA)

22 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 17B

## Break

**Lunch Break 11:50 AM - 1:20 PM**

## SESSION 3: TOOLS FOR EDUCATION

22 August 2022 • 1:20 PM - 2:40 PM PDT | Conv. Ctr. Room 17B

Session Chair: Danielle J. Harper, Wellman Ctr. for Photomedicine (USA)

### 12213-11

**Using lidar performance to teach accuracy and precision to undergraduate students**

Author(s): Hossein Alisafaei, Rose-Hulman Institute of Technology (USA)

22 August 2022 • 1:20 PM - 1:40 PM PDT | Conv. Ctr. Room 17B

### 12213-12

**Lambertian surfaces with over- and under-filled field of view**

Author(s): Nathaniel J. Field, Joseph A. A. Shaw, Montana State Univ. (USA)

22 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 17B

## CONFERENCE 12213

### 12213-13

#### Re-sequencing optics instruction to first build conceptual understanding in introductory courses

Author(s): Sarah L. McGregor, Keene State College (USA); Jacob Pleasants, The Univ. of Oklahoma (USA)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 17B

### 12213-14

#### Free space fiber optics experiments for photonics engineers and technician training

Author(s): Elif Demirbas, Samuel F. Serna-Otalvaro, Edward F. Deveney, Bridgewater State Univ. (USA)

22 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 17B

### Break

**Coffee Break 2:40 PM - 3:10 PM**

## SESSION 4: FILLING THE SKILLS GAP

22 August 2022 • 3:10 PM - 5:30 PM PDT | Conv. Ctr. Room 17B

Session Chair: Donn M. Silberman, OpticsAge (USA)

### 12213-18

#### AmeriCOM: a new optics manufacturing and workforce training consortium

Author(s): Jeffrey L. Ruckman, American Ctr. for Optics Manufacturing, Inc. (USA)

22 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 17B

### 12213-16

#### Addressing the critical shortage of optics technicians

Author(s): Alexis Vogt, Monroe Community College (USA)

22 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 17B

### 12213-17

#### Optics manufacturing technician apprenticeships

Author(s): Ross Micali, Alexis Vogt, Monroe Community College (USA)

22 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 17B

### 12213-19

#### Upskilling photonics technicians to meet challenges of the quantum 2.0 revolution

Author(s): Moamer Hasanovic, Indian River State College (USA); Chrysanthos Panayiotou, LASER-TEC, National Ctr. for Lasers and Fiber Optics Education (USA); Donn Silberman, Optics Institute of Southern California (USA)

22 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 17B

### 12213-20

#### Leading owls toward the light: advances in optics and precision manufacturing educational pathways at Keene State College

Author(s): James R. Kraly, Karrie Kalich, Sarah McGregor, Lisa Hix, Keene State College (USA)

22 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 17B

### 12213-21

#### Hands-on optics course for technician and engineers training

Author(s): Samuel Felipe Serna Otálvaro, Elif Demirbas, Edward Deveney, Bridgewater State Univ. (USA)

22 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 17B

### 12213-26

#### The Massachusetts LEAP network: building a template for a hands-on advanced manufacturing hub in integrated photonics

Author(s): Anuradha M. Agarwal, Drew Weninger, Lionel C. Kimerling, Massachusetts Institute of Technology (USA); Guiru Gu, Cheryl Schnitzer, Karl Kissa, Stonehill College (USA); Edward Deveney, Samuel Serna, Elif Demirbas, Bridgewater State Univ. (USA); Douglas Petkie, James Eakin, Worcester Polytechnic Institute (USA); Jacob Longacre, Adrienne Linnell, Kathy Rentsch, Quinsigamond Community College (USA); Farhad Vazehgoo, Massachusetts Technology Collaborative (USA); Stephen Adamshick, Western New England Univ. (USA); Nicholas Massa, Springfield Technical Community College (USA); Andrea Agliati, Convergent Photonics (USA)

22 August 2022 • 5:10 PM - 5:30 PM PDT | Conv. Ctr. Room 17B

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12213-23

#### Successfully implementing inquiry-based labs: a case study for a college waves and modern physics course

Author(s): Elizabeth S. Charles, Dawson College (Canada); Kevin Lenton, Rhys Adams, Vanier College (Canada); Michael Dugdale, Sean Hughes, John Abbott College (Canada); Karl Laroche, Vanier College (Canada); Caroline Cormier, Véronique Turcotte, Cégep André-Laurendeau (Canada); Chao Zhang, McGill Univ. (Canada)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-24

#### The practical optics workshop: educating the optical engineers of tomorrow

Author(s): Jaren Nicholas Ashcraft, Trenton Brendel, Simran Agarwal, Joel Berkson, Alexander D. Hedglen, Hyukmo Kang, Yanqi Zhang, Wyant College of Optical Sciences, The Univ. of Arizona (USA); Heejoo Choi, Wyant College of Optical Sciences, The Univ. of Arizona (USA), Large Binocular Telescope Corp. (USA); Daewook Kim, Wyant College of Optical Sciences, The Univ. of Arizona (USA), Steward Observatory (USA), Large Binocular Telescope Corp. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-25

#### 3D-printed OCT demonstrator: making optical imaging visible to the public

Author(s): Elisabet A. Rank, Fabian Placzek, Danielle Harper, Laurin Ginner, Michael Niederleithner, Antonia Lichtenegger, Sylvia Desissaire, Pablo Eugui, Johanna Gesperger, Matthias Salas, Medizinische Univ. Wien (Austria)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-30

#### Nonlinear photonics in undergraduate curriculum: hands-on training to meet the demands of a qualified workforce

Author(s): Juan J. Arango, Univ. Nacional de Colombia Sede Medellín (Colombia); Samuel Bechtold, Bridgewater State Univ. (USA); Pablo Bedoya-Ríos, Univ. Nacional de Colombia Sede Medellín (Colombia); Samuel Serna, Bridgewater State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-31

#### Optics education: where light meets technology

Author(s): Jonathan Teator, Kay Wilkoff, Luke Edelman, Alex Lasher, Alexander Hoyt, Jaiden Minott, Maxwell Clement, Jimmie Salone, Bayleigh Nugent, Monroe Community College (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-32

#### Electron-beam lithography as a tool for teaching silicon photonics

Author(s): Azad Siahmakoun, Rose-Hulman Institute of Technology (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-33

#### Learning and thoughts of how industrial internship can inspire new generation talents

Author(s): Teresa Zhang, Jiang He, Wei Zhou, MLOPTIC Corp. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12213-34

#### Laser maze outreach activity in Terre Haute Children's Museum

Author(s): Hossein Alisafaei, Rose-Hulman Institute of Technology (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12213-35****FMEA activity as an assessment tool in engineering design in the context of ABET accreditation**

Author(s): Hossein Alisafae, Sergio Granieri, Dan Marincel, Syed Azer Reza, Rose-Hulman Institute of Technology (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12213-36****Computer generated hologram (CGH) education kit for hands-on learning of optical metrology for complex optics and systems**

Author(s): Tyler Steele, Shelby D. Ament, Jake Beverage, James H. Burge, Chunyu Zhao, Arizona Optical Metrology LLC (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12213-37****New teaching method to simplify Boolean logic functions using 3D cubes**

Author(s): Ibrahim A. Elewah, Sara A. Jalaeddine, American College of The Middle East (ACM) (Kuwait)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12213-40****Leveraging TikTok and other new media for optics educational outreach**

Author(s): Cory S. Boone, Edmund Optics Inc. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12213-41****From Mars to humans: interactive Raman spectroscopy-based outreach activities**

Author(s): Jacob Kleboe, Univ. of Southampton (United Kingdom); Helen Szoor-Mcelhinney, The Univ. of Edinburgh (United Kingdom); Hiroki Cook, Simon Lane, Niall Hanrahan, James Read, Univ of Southampton (United Kingdom); Tommy Loan, The Univ. of Edinburgh (United Kingdom); Sumeet Mahajan, Univ of Southampton (United Kingdom)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1



# Light in Nature IX

23 August 2022 | Conv. Ctr. Room 14A

Conference Chairs: Vasudevan Lakshminarayanan, Univ. of Waterloo (Canada); Katherine Creath, Optineering (USA); Joseph A. Shaw, Montana State Univ. (USA)

Program Committee: Indrani Bhattacharya, Univ. of Calcutta (India); Maria Luisa Calvo Padilla, Univ. Complutense de Madrid (Spain); Dan Curticapean, Hochschule Offenburg (Germany); Viktoria Greanya, Wright State Research Institute (USA); Akhlesh Lakhtakia, The Pennsylvania State Univ. (USA); Yoko Miyamoto, The Univ. of Electro-Communications (Japan); Sébastien R. Mouchet, Univ. de Namur (Belgium); Lorian Schweikert, The Univ. of North Carolina, Wilmington (USA); Brian Vohnsen, Univ. College Dublin (Ireland); Qiwen Zhan, Univ. of Shanghai for Science and Technology (USA)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12214-10

#### Biologically-inspired artificial compound eyes that enable focus-tunable imaging

Author(s): Jihyun Jung, Heesang Ahn, Taerim Yoon, Hyerin Song, Taeyeon Kim, Kyujung Kim, Pusan National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

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

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Balboa

Session Chair: Kenneth R. Castle, Ruda-Cardinal, Inc. (USA)

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.

This year's speaker will be Julie L. Bentley, Univ. of Rochester (USA)

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.

### Illumination Technical Event

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Julius A. Muschaweck, JMO GmbH (Germany)

Please join us for an evening of stimulating discussion, networking, and conversation. This year we will hear from "Sir" William Cassarly of the Illumination Guild presenting his talk, "Illumination Design Problem for the International Optical Design Conference." He will give a review of the 2021 IODC Illumination Design Problem—The Curse of Prince Lambert—and unveil the 2023 version, a new tale from the Illumination Guild.

We will also hear from Simon Tsaousis, TSASPC, LLC and The University of Arizona, with his talk "Many-Core, Multi-Computer Optimization of Illumination Optics: Trace up to Billions of Rays per Second." Simon has a BS in Engineering Physics from Rose-Hulman Institute of Technology, and is currently a PhD student with Dr. Jerry Moloney at the University of Arizona solving nonlinear dynamics problems using the Semiconductor Bloch equations as well as rectifying simulation results in the lab. He also works with TSASPC, a startup, which is currently developing High Performance Computing (HPC) solutions to solve some of humanity's most daunting design challenges. Simon's love for scientific research and endeavor to advance humanity's understanding of the universe is what drives him to develop simple software solutions to solve some of the most complex problems in existence.

At the end of the presentation any member of the audience may present information within the broad field of illumination. Light refreshments will be served.

The Optical Solutions Group at



## SESSION 1: LIGHT IN ART

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 14A

Session Chair: Joseph A. A. Shaw, Montana State Univ. (USA)

### 12214-2

#### Design of immersive scenarios and pieces of light art

Author(s): Edith G. Vázquez Navarrete, Univ. Nacional Autónoma de México (Mexico); Karen P. Volke Sepúlveda, Ciudad Univ. Coyoacán (Mexico); Gerardo G. L. Martínez, Univ. Nacional Autónoma de México (Mexico)

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 14A

## SESSION 2: POLARIZED LIGHT

23 August 2022 • 9:20 AM - 11:10 AM PDT | Conv. Ctr. Room 14A

Session Chair: Katherine Creath, Optineering (USA)

### 12214-3

#### Brightness and color of the sky during the 2017 American solar eclipse

Author(s): Joseph A. Shaw, Montana State Univ. (USA); Glenn E. Shaw, Univ. of Alaska Fairbanks (USA); Bryan Scherrer, Montana State Univ. (USA); Laura Eshelman, Polaris Sensor Technologies, Inc. (USA); Stephen Turcotte, Brigham Young Univ.-Idaho (USA)

23 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 14A

### 12214-4

#### Spectropolarimetry of life: airborne measurements from a hot air balloon

Author(s): Willeke Mulder, Leiden Observatory (Netherlands), Delft Univ. of Technology (Netherlands); C. H. Lucas Patty, Stefano Spadaccia, Antoine Pommerol, Brice-Olivier Demory, Univ. Bern (Switzerland); Christoph U. Keller, Leiden Observatory (Netherlands), Lowell Observatory (USA); Jonas G. Kühn, Univ. Bern (Switzerland), Univ. de Geneve (Switzerland); Frans Snik, Leiden Observatory (Netherlands); Daphne M. Stam, Technische Univ. Delft (Netherlands)

23 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 14A

### Coffee Break 10:00 AM - 10:30 AM

### 12214-6

#### Depth-resolved color separation using diffuse reflectance polarization-based images

Author(s): Katharine L. Hanlon, Univ. of South Florida (USA); Kara N. Shah, Kenwood Dermatology (USA); James M. Grichnik, Univ. of South Florida (USA)

23 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 14A

### 12214-7

#### Compensation of off-axis aberrations using polarization-masked azimuthal Walsh filters

Author(s): Indrani Bhattacharya, Seacom Skills Univ. (India), Univ. of Calcutta (India); Kallol Bhattacharya, Univ. of Calcutta (India)

23 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 14A

### Break

### Lunch/Exhibition Break 11:10 AM - 2:15 PM

**SESSION 3: BIO-INSPIRED DESIGN**

23 August 2022 • 2:15 PM - 3:45 PM PDT | Conv. Ctr. Room 14A

Session Chair: Vasudevan Lakshminarayanan, Univ. of Waterloo (USA)

**12214-8****Structural colors of Blue butterflies: from photonic nanoarchitectures to DNA (Invited Paper)**

Author(s): Gábor Piszter, Krisztián Kertész, Ctr. for Energy Research (Hungary); Gábor Sramkó, The Univ. of Debrecen (Hungary); Zsolt Bálint, Hungarian Natural History Museum (Hungary); László P. Biró, Ctr. for Energy Research (Hungary)

23 August 2022 • 2:15 PM - 2:45 PM PDT | Conv. Ctr. Room 14A

**12214-13****Bluespotted ribbontail ray colored by quasi-ordered natural photonic structures**

Author(s): Julien Bouchat, Univ. de Namur (Belgium); Fabio Cortesi, Karen Cheney, The Univ. of Queensland (Australia); Pete Vukusic, Univ. of Exeter (United Kingdom); N. Justin Marshall, The Univ. of Queensland (Australia); Olivier Deparis, Univ. de Namur (Belgium); Sébastien R. Mouchet, Univ. de Namur (Belgium), The Univ. of Queensland (Australia), Univ. of Exeter (United Kingdom)

23 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 14A

**12214-9****Understanding the anti-reflective Glasswing butterfly for enhanced solar concentrator optics**

Author(s): Katie Shanks, Richard Ffrench-Constant, Univ. of Exeter (United Kingdom)

23 August 2022 • 3:05 PM - 3:25 PM PDT | Conv. Ctr. Room 14A

**12214-11****UV-reflecting coating for bird-safe window optimized for bird and human visual perception**

Author(s): Sébastien R. Mouchet, Univ. de Namur (Belgium), Univ. of Exeter (United Kingdom); Rémy Wauters, Emile Haye, Stéphane Lucas, Olivier Deparis, Univ. de Namur (Belgium)

23 August 2022 • 3:25 PM - 3:45 PM PDT | Conv. Ctr. Room 14A

**Break****Coffee Break 3:45 PM - 4:00 PM****OPTICAL ENGINEERING PLENARY SESSION**

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

**4:00 to 4:05 PM: Welcome and Opening Remarks****12221-501****The James Webb Space Telescope: an optical success story! (Plenary Presentation)**

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

**Lens Design Technical Event**

23 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Rich Pfisterer, Photon Engineering, LLC (USA)

**“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 speakers will be Julie L. Bentley and David H. Lippman of the University of Rochester (USA), whose talk is entitled “Freeform gradient-index materials: a new type of freeform optic.” Gradient index (GRIN) optical systems are not new, having been studied for over 50 years. However, most of this effort was focused on optical designs using conventional GRIN materials (e.g. axial or radial gradients) with rotationally invariant index of refraction profiles. Current interest in freeform surfaces has shown that they enable irregular system geometries with high optical performance by leveraging rotational variance. Recent advancements in the fabrication of GRIN materials with additive manufacturing have

enabled a new type of freeform optic using a freeform gradient index (F-GRIN) material. When variant transversely, F-GRIN behaves similarly to freeform surfaces. By introducing a longitudinal refractive index variation as well, F-GRIN optical behavior deviates from that of freeform surfaces due to the effect of volume propagation. This talk will discuss the new optical design tools developed at the Univ. of Rochester for F-GRIN imaging and illumination systems, the benefits of F-GRIN, and show exciting new results from fabricated systems.

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

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Light refreshments sponsored by:

The Optical Solutions Group at  SYNOPSYS®

# Optical Modeling and Performance Predictions XII

22 August 2022 | Conv. Ctr. Room 16A

Conference Chair: Mark A. Kahan, Synopsys, Inc. (USA)

Program Committee: George Z. Angeli, GMTO Corp. (USA); Robert P. Breault, Breault Research Organization, Inc. (USA); Robert J. Brown, Ball Aerospace (USA); Thomas G. Brown, The Institute of Optics, Univ. of Rochester (USA); Bill J. Cassarly, Synopsys, Inc. (USA); Russell A. Chipman, Wyant College of Optical Sciences (USA); Keith B. Doyle, MIT Lincoln Lab. (USA); G. Groot Gregory, Synopsys, Inc. (USA); Tony Hull, The Univ. of New Mexico (USA); Richard C. Juergens, II-VI Aerospace & Defense, Inc. (USA); Marie B. Levine-West, Jet Propulsion Lab. (USA); H. Angus Macleod, Thin Film Center, Inc. (USA); Gary W. Matthews, ATA Aerospace, LLC (USA); Gregory J. Michels, Sigmadyne, Inc. (USA); Duncan T. Moore, Univ. of Rochester (USA); David C. Redding, Jet Propulsion Lab. (USA); David A. Thomas, GMTO Corp. (USA); James C. Wyant, Wyant College of Optical Sciences (USA); Richard N. Youngworth, Riyo LLC (USA)

## Information

**Kenneth R. Castle to act as Conference Chair onsite on behalf of Mark A. Kahan.**

### SESSION 1: TESTING, PIECE-PART CHARACTERIZATIONS, AND DIGITAL CAMERA SYSTEM SIMULATIONS

22 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 16A

Session Chair: Gary W. Matthews, ATA Aerospace, LLC (USA)

#### 12215-2

##### **Impact of higher order surface irregularity on system-level wavefront variation across the field**

Author(s): Charlie Granger, Matthew Brophy, Bryan Carter, IDEX Optical Technologies (USA)

22 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 16A

#### 12215-3

##### **Axially symmetric retarder with radial retardance modulation**

Author(s): Maria J. Pérez-Mota, Oscar G. Rodríguez-Herrera, Univ. Nacional Autónoma de México (Mexico)

22 August 2022 • 8:20 AM - 8:40 AM PDT | Conv. Ctr. Room 16A

#### 12215-4

##### **Simulated formation of UV-cured polymer lenses on aqueous substrates**

Author(s): Robert Thompson, Simon Hempel-Costello, Zack Johnson, Emily K. Schwartz, Samuel Stevenson, Eleanor Weston, Martha-Elizabeth Baylor, Carleton College (USA)

22 August 2022 • 8:40 AM - 9:00 AM PDT | Conv. Ctr. Room 16A

#### 12215-5

##### **Digital camera simulations of thin filaments in non-premixed laminar methane-air coflow flames**

Author(s): Vinicius Sauer, Francisco Pelayo, California State Univ., Northridge (USA); Edison Chukwuemeka, Ingmar Schoegl, Louisiana State Univ. (USA)

22 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 16A

#### 12215-27

##### **Generating physics-based synthetic data for infrared/electro-optical system analysis and design**

Author(s): Ozgur Murat Polat, ASELSAN Inc (Turkey); Yucel Cengiz Ozer, ASELSAN A.S. (Turkey)

22 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 16A

#### 12215-28

##### **Multimodal-capable, multiphoton miniaturized microscope for mice brain imaging**

Author(s): Tayebah Sahraeibelverdi, University of Michigan -Ann Arbor (USA); Ahmad Shirazi, Univ. of Michigan (USA); Miki Lee, HaiJun Li, University of Michigan -Ann Arbor (USA); Thomas Wang, Univ. of Michigan (USA); Kenn Oldham, University of Michigan -Ann Arbor (USA)

22 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 16A

## Break

**Coffee Break 10:00 AM - 10:30 AM**

### SESSION 2: STOP

22 August 2022 • 10:30 AM - 11:30 AM PDT | Conv. Ctr. Room 16A

Session Chair: Blake G. Crowther, Synopsys, Inc. (USA)

#### 12215-6

##### **Subspace identification of low-dimensional Structural-Thermal-Optical-Performance (STOP) models of reflective optics**

Author(s): Aleksandar Haber, Rochester Institute of Technology (USA); John E. Draganov, Michael Krainak, Relative Dynamics, Inc. (USA)

22 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 16A

#### 12215-7

##### **Transient simulation of high-power dynamical-thermoelastic-optical systems**

Author(s): Luzia Hahn, Peter Eberhard, Univ. Stuttgart (Germany)

22 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 16A

#### 12215-10

##### **Tailoring the stiffness of large mirrors to reduce specific optical aberrations**

Author(s): Christopher L. Hopkins, NASA Marshall Space Flight Ctr. (USA)

22 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 16A

## Break

**Lunch Break 11:30 AM - 1:00 PM**

### SESSION 3: BRDF, POLARIZATION, AND DIFFRACTION THEORY

22 August 2022 • 1:00 PM - 2:20 PM PDT | Conv. Ctr. Room 16A

Session Chair: William J. Cassarly, Synopsys, Inc. (USA)

#### 12215-12

##### **Evaluation of microfacet BRDF solar cell model modification using experimental data**

Author(s): Madilynn Compean, Todd Small, Air Force Institute of Technology (USA)

22 August 2022 • 1:00 PM - 1:20 PM PDT | Conv. Ctr. Room 16A

#### 12215-13

##### **Determining solar cell BRDF model parameters by fitting to high-resolution out-of-plane measurement data**

Author(s): Michael Gross, Michael A. Marciniak, Samuel D. Butler, Todd V. Small, Air Force Institute of Technology (USA)

22 August 2022 • 1:20 PM - 1:40 PM PDT | Conv. Ctr. Room 16A

#### 12215-14

##### **Simulation of the polarimetric response of a microscopic semitransparent specimen with inner structure**

Author(s): Carlos E. Castañeda-Cuevas, Oscar G. Rodríguez-Herrera, Univ. Nacional Autónoma de México (Mexico)

22 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 16A

#### 12215-15

##### **Experiments supporting the momentum exchange theory description for photon diffraction**

Author(s): Michael J. Mobley, Grand Canyon Univ. (USA)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 16A

## Break

**Coffee Break 2:20 PM - 2:50 PM**

**SESSION 4: GRATINGS AND METAMATERIALS**

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 16A

Session Chair: Blake G. Crowther, Synopsys, Inc. (USA)

**12215-18****Spectral emissivity prediction in multi-resonator metamaterials**

Author(s): Romil Audhkhasi, Michelle L. Povinelli, The Univ. of Southern California (USA)

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 16A

**SESSION 5: SENSORS AND COMMUNICATION**

22 August 2022 • 3:10 PM - 3:50 PM PDT | Conv. Ctr. Room 16A

Session Chair: Richard N. Youngworth, Riyo LLC (USA)

**12215-23****Photonic millimeter wave generation through frequency octupling with RoF transmission for 5G networks**

Author(s): Sandeep Dahiya, Asha Balhara, Bhagat Phool Singh Women's Univ. (India)

22 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 16A

**12215-29****Polymer ring-resonator on a slotted membrane for ultrasound imaging**

Author(s): Tayebah Sahraeibelverdi, University of Michigan -Ann Arbor (USA); Hadi Veladi, University of Tabriz (Iran, Islamic Republic of); Ahmad Shirazi, Univ. of Michigan (USA)

22 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 16A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12215-24****Spectral characterization of the RST prism optics bandpass filters**

Author(s): Jessica Patel, Manuel Quijada, Bente Eegholm, Catherine Marx, Victor Chambers, NASA Goddard Space Flight Ctr. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12215-25****Convolution as a model of the LED irradiance pattern**

Author(s): Claudia Vidales, Iván Moreno, Univ. Autónoma de Zacatecas (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12215-26****Target anti-jamming acquisition method based on machine vision classification technology**

Author(s): Qiuping Hu, Yuanyuan Zhou, Yu Wang, Hua Zhang, Zili Tang, Huayin Ordnance Test Ctr. (China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

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

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Balboa

Session Chair: Kenneth R. Castle, Ruda-Cardinal, Inc. (USA)

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.

This year's speaker will be Julie L. Bentley, Univ. of Rochester (USA)

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.

# Novel Optical Systems, Methods, and Applications XXV

22 - 23 August 2022 | Conv. Ctr. Room 17A

Conference Chairs: Cornelius F. Hahlweg, bbw Hochschule (Germany); Joseph R. Mulley, IDEX Health & Science LLC (USA)

Program Committee: Joseph S. Choi, Raytheon Intelligence & Space (USA); Stephan Fahr, JENOPTIK Optical Systems GmbH (Germany); Peter I. Goldstein, Philips Color Kinetics (USA); G. Groot Gregory, Synopsys, Inc. (USA); Eric Herman, Zygo Corporation (USA); R. John Koshel, Wyant College of Optical Sciences (USA); Sara Madaan, The Univ. of Southern California (USA); Bharathwaj Appan Narasimhan, Limbak 4PI S.L. (Spain); S. Craig Olson, L3Harris Technologies, Inc. (USA); José M. Sasián, Wyant College of Optical Sciences (USA); Hamilton Shepard, Waymo, LLC (USA); Haiyin Sun, ChemImage Corp. (USA); Udo Zölzer, Helmut-Schmidt Univ. (Germany)

## SESSION 1: LASER APPLICATIONS

22 August 2022 • 9:30 AM - 10:30 AM PDT | Conv. Ctr. Room 17A

Session Chair: Stephan Fahr, JENOPTIK Optical Systems GmbH (Germany)

### 12216-1

#### Femtosecond laser direct writing of a gradient index Fresnel lens in a heavy oxide glass

Author(s): Pierre Deluillier, Guillaume Druart, Florence de la Barrière, ONERA (France); Matthieu Lancry, Institut de Chimie Moléculaire et des Matériaux d'Orsay, Univ. Paris-Saclay (France)

22 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 17A

### 12216-2

#### Impact of extended cavity design on output pulse properties in ultralong pulsed fiber lasers

Author(s): Inés Cáceres Pablo, Pedro Corredera Guillén, Juan Diego Ania Castañón, Consejo Superior de Investigaciones Científicas (Spain)

22 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 17A

### 12216-3

#### Beam shaping for large-area laser structuring in a roll-to-roll process

Author(s): Nicole Grubert, Oskar Hofmann, Mario Hesker, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Fraunhofer-Institut für Lasertechnik ILT (Germany), RWTH Aachen Univ. (Germany); Carlo Holly, RWTH Aachen Univ. (Germany)

22 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 17A

### Break

**Coffee Break 10:30 AM - 11:00 AM**

## SESSION 2: METROLOGY APPLICATIONS

22 August 2022 • 11:00 AM - 12:20 PM PDT | Conv. Ctr. Room 17A

Session Chair: Hamilton Shepard, Waymo, LLC (USA)

### 12216-5

#### Wave front phase imaging for silicon wafer metrology

Author(s): Juan M. Trujillo-Sevilla, Alex Roqué-Velasco, Miguel Jesús Sicilia, Óscar Casanova-González, José Manuel Rodríguez-Ramos, Jan O. Gaudestad, Miriam Velasco-Ocaña, Wootpix, S.L. (Spain)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 17A

### 12216-6

#### Remote measurement of the clinical prescription of spectacle lenses

Author(s): Yuanxin Guan, Joseph M. Miller, Erin M. Harvey, Sean Ashley, Jim Schwiegerling, The Univ. of Arizona (USA)

22 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 17A

### 12216-7

#### Characterization of Powell lens with a broadband light source input

Author(s): Justin Curtiss, DEVCOM Chemical Biological Ctr. (USA)

22 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 17A

### 12216-8

#### Surface scatter with a variable coherence polarimetry source

Author(s): Neil C. Bruce, Oscar G. Rodríguez-Herrera, Claudio N. Ramírez, Martha Rosete-Aguilar, Univ. Nacional Autónoma de México (Mexico)

22 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 17A

### Break

**Lunch Break 12:20 PM - 2:40 PM**

## SESSION 3: BIOMEDICAL AND SPECTROSCOPY APPLICATIONS I

22 August 2022 • 2:40 PM - 3:40 PM PDT | Conv. Ctr. Room 17A

Session Chair: Cornelius F. Hahlweg, bbw Hochschule (Germany)

### 12216-10

#### Automatic jewelry identification and grading based on imaging-assisted Raman spectroscopy

Author(s): Tsung-Han Tsai, Hiroshi Takahashi, Gemological Institute of America (USA)

22 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 17A

### 12216-12

#### Cavity ring-down spectroscopy for the detection of atomic beams

Author(s): Alonso Castro, Wei Wei, Los Alamos National Lab. (USA)

22 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 17A

### 12216-14

#### Snapshot image mapping spectrometer with 3D printed multifaceted mirror for biomedical applications

Author(s): Jiawei Lu, Rice Univ. (USA); Xue Wen Ng, David Piston, Washington Univ. in St. Louis (USA); Tomasz Tkaczyk, Rice Univ. (USA)

22 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 17A

### Break

**Coffee Break 3:40 PM - 4:10 PM**

## SESSION 4: BIOMEDICAL AND SPECTROSCOPY APPLICATIONS II

22 August 2022 • 4:10 PM - 4:50 PM PDT | Conv. Ctr. Room 17A

Session Chair: Joseph R. Mulley, IDEX Health & Science, LLC (USA)

### 12216-15

#### An optical device prototype for disinfecting surfaces in public transportation

Author(s): Klavs Vabulnieks, Linda Mezule, Antons Patlins, Riga Technical Univ. (Latvia)

22 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 17A

### 12216-17

#### Photoacoustic methods for direct monitoring of nanoparticle enhanced photothermal ablation in biological tissues: visualizing scattering, absorption and thermal effects

Author(s): Ivan Kosik, Univ Health Network (Canada); Brian C. Wilson, Univ. Health Network (Canada), University of Toronto (Canada); Robert A. Weersink, University of Toronto (Canada)

22 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 17A

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.



**12216-28****Upstream photonics: advanced applications of light for the energy industry**

Author(s): Damián P. San Román Alerigi, Saad M. Mutairi, Sameeh I. Batarseh, Adrian Cavazos Sepulveda, Saudi Aramco (Saudi Arabia); Jose Oliverio Álvarez, Aramco Services Co. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12216-29****Development of UV-VIS-NIR-MIR absorption spectroscopy for gemstone analysis**

Author(s): Hiroshi Takahashi, Gemological Institute of America (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12216-30****Affordable fluorescent imaging system using a microlens array and OLED screen**

Author(s): Paul Gaston, Daryl Preece, Univ. of California, Irvine (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12216-38****Assessment of blood flow index by diffuse speckle contrast analysis and blood pressure with exercise**

Author(s): YEONHEE CHANG, Cheabeom Yeo, Hanbeen Jung, Cheol Song, DGIST (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**Illumination Technical Event**

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Julius A. Muschaweck, JMO GmbH (Germany)

Please join us for an evening of stimulating discussion, networking, and conversation. This year we will hear from "Sir" William Cassarly of the Illumination Guild presenting his talk, "Illumination Design Problem for the International Optical Design Conference." He will give a review of the 2021 IODC Illumination Design Problem—The Curse of Prince Lambert—and unveil the 2023 version, a new tale from the Illumination Guild.

We will also hear from Simon Tsaousis, TSASPC, LLC and The University of Arizona, with his talk "Many-Core, Multi-Computer Optimization of Illumination Optics: Trace up to Billions of Rays per Second." Simon has a BS in Engineering Physics from Rose-Hulman Institute of Technology, and is currently a PhD student with Dr. Jerry Moloney at the University of Arizona solving nonlinear dynamics problems using the Semiconductor Bloch equations as well as rectifying simulation results in the lab. He also works with TSASPC, a startup, which is currently developing High Performance Computing (HPC) solutions to solve some of humanity's most daunting design challenges. Simon's love for scientific research and endeavor to advance humanity's understanding of the universe is what drives him to develop simple software solutions to solve some of the most complex problems in existence.

At the end of the presentation any member of the audience may present information within the broad field of illumination. Light refreshments will be served.

Light refreshments sponsored by:

The Optical Solutions Group at 

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

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Balboa

Session Chair: Kenneth R. Castle, Ruda-Cardinal, Inc. (USA)

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**SESSION 5: DESIGN, MODELING, AND COMPUTATION I**

23 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 17A

Session Chair: G. Groot Gregory, Synopsys, Inc. (USA)

**12216-18****Angular spectrum representation of vector fields for supporting metasurface analysis and design**

Author(s): Peter Muys, Lieven Penninck, PlanOpSim (Belgium)

23 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 17A

**12216-19****Deep reinforcement learning enables freeform structure optimization of 1D metagrating deflector**

Author(s): Dongjin Seo, Spidercore Inc. (Korea, Republic of); Daniel Wontae Nam, Kakao Brain Corp. (Korea, Republic of); Juho Park, KAIST (Korea, Republic of); Chan Y. Park, KC ML2 (Korea, Republic of); Min Seok Jang, KAIST (Korea, Republic of)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 17A

**12216-20****Optimizing 3-D printable refractive spherical arrays for application-specific custom lenses**

Author(s): Akila Udage, Nadarajah Narendran, Rensselaer Polytechnic Institute (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 17A

**12216-21****A mathematical approach for correcting distortions in a 2-D laser scanning system**

Author(s): Daniel Short, U.S. Army Combat Capabilities Development Command (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 17A

**12216-22****High accuracy dimensional microscopy through advanced modeling and machine learning**

Author(s): Phillip Manley, Ivan Sekulic, JCMwave GmbH (Germany)

23 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 17A

**Break**

**Coffee Break 10:10 AM - 10:40 AM**

**SESSION 6: DESIGN, MODELING, AND COMPUTATION II**

23 August 2022 • 10:40 AM - 11:40 AM PDT | Conv. Ctr. Room 17A

Session Chairs: Cornelius F. Hahlweg, bbw Hochschule (Germany), Joseph R. Mulley, IDEX Health & Science, LLC (USA)

**12216-23****Designing 3D-printed LED optics for optimizing target plane application efficacy**

Author(s): Indika U. Perera, Akila S. Udage, Nadarajah Narendran, Jean Paul Freyssinier, Rensselaer Polytechnic Institute (USA); John Trublowski, Eaton Corp. (USA)

23 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 17A

**12216-33****Novel 3D-printable internal cavity lens with refractive spherical arrays for beam shaping**

Author(s): Akila S. Udage, Nadarajah Narendran, Rensselaer Polytechnic Institute (USA)

23 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 17A

**12216-24****Continuously adjustable-resolution photoacoustic imaging based on Fourier single-pixel imaging**

Author(s): Xianlin Song, Nanchang Univ. (China)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 17A

**SESSION 7: HUMAN PERCEPTION FACTORS**

23 August 2022 • 11:40 AM - 12:40 PM PDT | Conv. Ctr. Room 17A

Session Chairs: Cornelius F. Hahlweg, bbw Hochschule (Germany), Joseph R. Mulley, IDEX Health & Science, LLC (USA)

**12216-25**

**Photometrically Consistent Projection Experience for Metaverse Screens Everywhere**

Author(s): Jae Sung Park, Jiman Kim, Younghoon Jeong, SAMSUNG Electronics Co., Ltd. (Korea, Republic of); YoungSu Moon, SAMSUNG Electronics Co. (Korea, Republic of)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 17A

**12216-26**

**One step closer to a better experience: analysis of the suitable viewing distance ranges of light field visualization usage contexts for observers with reduced visual capabilities**

Author(s): Aniko Simon, Sigma Technology (Hungary); Peter Andras Kara, Budapest Univ. of Technology and Economics (Hungary); Mary Guindy, Holografika Kft. (Hungary); Laszlo Szy, Radicon Bt. (Hungary); Tibor Balogh, Holografika Kft. (Hungary)

23 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 17A

**12216-27**

**Analysis of high dynamic range light field images in practical utilization contexts**

Author(s): Mary Guindy, Holografika Kft. (Hungary); Peter Andras Kara, Budapest Univ. of Technology and Economics (Hungary); Tibor Balogh, Holografika Kft. (Hungary); Aniko Simon, Sigma Technology (Hungary)

23 August 2022 • 12:20 PM - 12:40 PM PDT | Conv. Ctr. Room 17A

**Break**

**Lunch/Exhibition Break 12:40 PM - 4:00 PM**

**OPTICAL ENGINEERING PLENARY SESSION**

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

**4:00 to 4:05 PM: Welcome and Opening Remarks**

**12221-501**

**The James Webb Space Telescope: an optical success story! (Plenary Presentation)**

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

**Lens Design Technical Event**

23 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Rich Pfisterer, Photon Engineering, LLC (USA)

**“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 speakers will be Julie L. Bentley and David H. Lippman of the University of Rochester (USA), whose talk is entitled “Freeform gradient-index materials: a new type of freeform optic.” Gradient index (GRIN) optical systems are not new, having been studied for over 50 years. However, most of this effort was focused on optical designs using conventional GRIN materials (e.g. axial or radial gradients) with rotationally invariant index of refraction profiles. Current interest in freeform surfaces has shown that they enable irregular system geometries with high optical performance by leveraging rotational variance. Recent advancements in the fabrication of GRIN materials with additive manufacturing have enabled a new type of freeform optic using a freeform gradient index (F-GRIN) material. When variant transversely, F-GRIN behaves similarly to freeform surfaces. By introducing a longitudinal refractive index variation as well, F-GRIN optical behavior deviates from that of freeform surfaces due to the effect of volume propagation. This talk will discuss the new optical design tools developed at the Univ. of Rochester for F-GRIN imaging and illumination systems, the benefits of F-GRIN, and show exciting new results from fabricated systems.

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



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Light refreshments sponsored by:



# Current Developments in Lens Design and Optical Engineering XXIII

23 - 24 August 2022 | Conv. Ctr. Room 16A

Conference Chairs: R. Barry Johnson, Alabama A&M Univ. (USA); Virendra N. Mahajan, Wyant College of Optical Sciences (USA); 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 (USA); Florian Bociort, Technische Univ. Delft (Netherlands); Pierre H. Chavel, Institut d'Optique (France); Kit Cheong, Optical Systems Design, LLC (USA); Apostolos Deslis, JENOPTIK Light & Optics (USA); José Antonio Díaz Navas, Univ. de Granada (Spain); Sen Han, Univ. of Shanghai for Science and Technology (China); James E. Harvey, Photon Engineering LLC (USA); Lakshminarayan Hazra, Univ. of Calcutta (India); Irina L. Livshits, ITMO Univ. (Russian Federation); Pantazis Mouroulis, Jet Propulsion Lab. (USA); Jessica DeGroot Nelson, Optimax Systems, Inc. (USA); Jocelyn Parent, ImmerVision (Canada); Yuzuru Takashima, Wyant College of Optical Sciences (USA); Cornelius J. Willers, Consultant (South Africa); María Josefa Yzuel Giménez, Univ. Autònoma de Barcelona (Spain)

## POSTER SESSION

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Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12217-4

#### A new diffractive trifocal intraocular lens with kinoform fractal profile

Author(s): Walter D. Furlan, Diego Montagud-Martínez, Univ. de València (Spain); Vicente Ferrando, Univ. Politécnica de València (Spain); Anabel Martínez-Espert, Univ. de València (Spain); Juan A. Monsoriu, Univ. Politécnica de València (Spain)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12217-19

#### Method for designing optical systems from the off-the-shelf optical components

Author(s): Lev Ryzhikov, Independent Researcher (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12217-22

#### Multichannel optical prism

Author(s): Lev Ryzhikov, ASML (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12217-24

#### Design of an expander lens for an MWIR zoom camera using the third-order aberration analysis

Author(s): Sung Chan Park, Tae-Sik Ryu, Min-Seok Yun, Dankook Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12217-36

#### Golf Marrakech Observatory I69: calibration techniques at radio wavelengths

Author(s): Mohammed Sabil, Univ. Cadi Ayyad (Morocco), Univ. Sultan Moulay Slimane (Morocco); Omar Hila, Atlas Golf Marrakech (Morocco); Zouhair Benkhaldoun, Univ. Cadi Ayyad (Morocco), Oukaïmeden Observatory (Morocco)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12217-39

#### Changing field of view by applying voltage difference

Author(s): Doğan Uğur SAKARYA, ROKETSAN Inc. (Turkey)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12217-40

#### Optical design of dual mode imaging infrared system in MWIR and LWIR spectral bands

Author(s): Doruk Kucukcelebi, Doğan Uğur Sakarya, ROKETSAN Inc. (Turkey); Mehmet Caner Ismar, Roketsan A.S. (Turkey)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: THEORY AND APPLICATIONS I

23 August 2022 • 8:45 AM - 10:05 AM PDT | Conv. Ctr. Room 16A

Session Chair: Virendra N. Mahajan, Wyant College of Optical Sciences (USA)

### 12217-1

#### Simultaneous Multiple Surfaces method applied to infrared lenses

Author(s): Thibaut Mayeur, Safran (France); Guillaume Druart, Jean-Baptiste Volatier, ONERA (France); Alain Durand, Elodie Tartas, LYNRED (France); Françoise Cau, Safran (France)

23 August 2022 • 8:45 AM - 9:05 AM PDT | Conv. Ctr. Room 16A

### 12217-2

#### Through focus point spread function and modulus transfer function for multifocal lenses

Author(s): Paige Sawyers, Jim Schwiegerling, The Univ. of Arizona (USA)

23 August 2022 • 9:05 AM - 9:25 AM PDT | Conv. Ctr. Room 16A

### 12217-3

#### Multifocal lens HDR image simulation showing dysphotopsia

Author(s): Ben Cvarch, Jim Schwiegerling, The Univ. of Arizona (USA)

23 August 2022 • 9:25 AM - 9:45 AM PDT | Conv. Ctr. Room 16A

### 12217-38

#### Passive athermalization of MWIR optical designs utilizing different infrared optical materials

Author(s): Doruk Küçükcelebi, Şükrü Emre Aydemir, ROKETSAN Inc. (Turkey)

23 August 2022 • 9:45 AM - 10:05 AM PDT | Conv. Ctr. Room 16A

### Break

Coffee Break 10:05 AM - 10:35 AM

## SESSION 2: DEVELOPMENTS IN OPTICAL COMPONENTS, TECHNIQUES, AND MATERIALS

23 August 2022 • 10:35 AM - 12:05 PM PDT | Conv. Ctr. Room 16A

Session Chair: Jim Schwiegerling, Wyant College of Optical Sciences (USA)

### 12217-6

#### Optimizing sampling and padding at the pupil plane for numerical simulations of wavefront coding imaging optical systems

Author(s): Enrique González-Amador, Alfonso Padilla-Vivanco, Carina Toxqui-Quitl, Univ. Politécnica de Tulancingo (Mexico); Eva Acosta, Justo Arines, Univ. de Santiago de Compostela (Spain)

23 August 2022 • 10:35 AM - 10:55 AM PDT | Conv. Ctr. Room 16A

### 12217-7

#### Latest advancements at NILT on flat metalens based camera modules in near infrared (Invited Paper)

Author(s): Fredrik P. L. Mattinson, NIL Technology ApS (Sweden); Ulrich Quaade, Akbar Samadi, Jesper Fly, NIL Technology (Denmark); Moritz Schmidlin, NIL Technology (Switzerland)

23 August 2022 • 10:55 AM - 11:25 AM PDT | Conv. Ctr. Room 16A

## CONFERENCE 12217

### 12217-8

#### Wide aperture (50 mm), compact and high-quality continuous focus tunable gradient refractive index (GRIN) liquid crystal lenses

Author(s): Amit K. Bhowmick, Advanced Materials and Liquid Crystal Institute (USA)

23 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 16A

### 12217-9

#### Widely tunable large area thin liquid crystals lens

Author(s): Javier Pereiro García, Manuel Caño-García, Xabier Quintana Arregui, Pablo de la Rosa del Val, Morten Andreas Geday, Ctr. de Materiales y Dispositivos Avanzados para Tecnología de la Información y Comunicaciones (Spain), Escuela Tecnica Superior de Ingenieros de Telecomunicacion, Univ. Politécnica de Madrid (Spain)

23 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 16A

### Break

Lunch/Exhibition Break 12:05 PM - 1:55 PM

## SESSION 3: SIMULATION OF OPTICAL SYSTEMS

23 August 2022 • 1:55 PM - 3:35 PM PDT | Conv. Ctr. Room 16A

Session Chair: Simon Thibault, Univ. Laval (Canada)

### 12217-13

#### Accurate camera performance prediction using optical and imaging simulation pipeline for super wide-angle lens

Author(s): Julie Buquet, Raphael Larouche, Jocelyn Parent, Patrice Roulet, ImmerVision (Canada)

23 August 2022 • 1:55 PM - 2:15 PM PDT | Conv. Ctr. Room 16A

### 12217-15

#### A toolkit for multiscale optical system inverse design

Author(s): Sawyer D. Campbell, Ronald P. Jenkins, Benjamin A. Zerbe, Eric B. Whiting, Manushanker Balasubramanian, Arkaprov Das, Jacob T. Young, Douglas H. Werner, Pingjuan L. Werner, The Pennsylvania State Univ. (USA)

23 August 2022 • 2:15 PM - 2:35 PM PDT | Conv. Ctr. Room 16A

### 12217-16

#### Caustic produced by refractive conic surfaces

Author(s): María C. López-Bautista, Univ. Tecnológica de la Mixteca (Mexico), Univ. Nacional Autónoma de México (Mexico); Maximino Avendaño-Alejo, Univ. Nacional Autónoma de México (Mexico); Luis Castañeda, Universidad Estatal del Valle de Ecatepec (Mexico)

23 August 2022 • 2:35 PM - 2:55 PM PDT | Conv. Ctr. Room 16A

### 12217-17

#### Challenges using data-driven methods and deep learning in optical engineering

Author(s): Julie Buquet, Univ. Laval (Canada), ImmerVision (Canada); Jocelyn Parent, ImmerVision (Canada); Jean-François Lalonde, Simon Thibault, Univ. Laval (Canada)

23 August 2022 • 2:55 PM - 3:15 PM PDT | Conv. Ctr. Room 16A

### 12217-18

#### A file exchange site for lens designs

Author(s): Daniel J. Reiley, Caltech (USA)

23 August 2022 • 3:15 PM - 3:35 PM PDT | Conv. Ctr. Room 16A

### Break

Coffee Break 3:35 PM - 4:00 PM

## OPTICAL ENGINEERING PLENARY SESSION

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

### 4:00 to 4:05 PM: Welcome and Opening Remarks

#### 12221-501

#### The James Webb Space Telescope: an optical success story! (Plenary Presentation)

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

### Lens Design Technical Event

23 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Rich Pfisterer, Photon Engineering, LLC (USA)

#### “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 speakers will be Julie L. Bentley and David H. Lippman of the University of Rochester (USA), whose talk is entitled “Freeform gradient-index materials: a new type of freeform optic.” Gradient index (GRIN) optical systems are not new, having been studied for over 50 years. However, most of this effort was focused on optical designs using conventional GRIN materials (e.g. axial or radial gradients) with rotationally invariant index of refraction profiles. Current interest in freeform surfaces has shown that they enable irregular system geometries with high optical performance by leveraging rotational variance. Recent advancements in the fabrication of GRIN materials with additive manufacturing have enabled a new type of freeform optic using a freeform gradient index (F-GRIN) material. When variant transversely, F-GRIN behaves similarly to freeform surfaces. By introducing a longitudinal refractive index variation as well, F-GRIN optical behavior deviates from that of freeform surfaces due to the effect of volume propagation. This talk will discuss the new optical design tools developed at the Univ. of Rochester for F-GRIN imaging and illumination systems, the benefits of F-GRIN, and show exciting new results from fabricated systems.

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

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Illuminating Ideas

Light refreshments sponsored by:

The Optical Solutions Group at  SYNOPSYS®

## SESSION 4: INTEGRATION OF OPTICAL DESIGNS INTO COMPLETE INSTRUMENTS

24 August 2022 • 9:00 AM - 10:40 AM PDT | Conv. Ctr. Room 16A

Session Chair: Yeh-Wei Yu, National Central Univ. (Taiwan)

### 12217-20

#### An endoscopic lens with internal focusing

Author(s): Henning Rehn, Hans Forrer, Christian Mehne, FISBA AG (Switzerland); Alexander Betke, FISBA Photonics GmbH (Germany); Neven Bobic, Tobias Schumm, Actuator Solutions GmbH (Germany); Christian Graf, Kirsten Klein, KARL STORZ SE & Co. KG (Germany); Simon Hein, Univ. de Freiburg (Germany); Arkadiusz Miernik, University of Freiburg - Medical Centre (Germany)

24 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 16A

### 12217-21

#### A hybrid HCPV system designed for multi functions

Author(s): Chi Sun, National Yang Ming Chiao Tung Univ. (Taiwan); Chi Shou Wu, Yong-Sheng Lin, National Central Univ. (Taiwan); Shuo-Ting Fang, Yao-Hsuan Chiu, Fudan Senior High School (Taiwan); Tsung-Sheng Gao, National Yang Ming Chiao Tung Univ. (Taiwan); Ching-Cherng Sun, National Central Univ. (Taiwan)

24 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 16A

### 12217-23

#### Design of projection-based augmented reality system using holographic screen display

Author(s): Jun Nishikawa, Tomoharu Nakamura, Sony Group Corp. (Japan)

24 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 16A

- 12217-25**  
**Extended depth of field using a binary phase mask and an image fusion algorithm**  
 Author(s): José Manuel Reyes-Alfaro, Carina Toxqui-Quitl, Alfonso Padilla-Vivanco, Raúl Castro-Ortega, Enrique González Amador, Univ. Politécnica de Tulancingo (Mexico)  
 24 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 16A
- 12217-34**  
**LED metalens for uniform illumination**  
 Author(s): Ivan Moreno, Univ. Autónoma de Zacatecas (Mexico)  
 24 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 16A
- 12217-35**  
**Adjustable mini-LED array applied to low/high beam meet the K-mark regulation**  
 Author(s): Yi-Jou Lin, Xuan-Hao Lee, Ching-Cherng Sun, Shih-Kang Lin, Chi Shou Wu, Quang-Khoi Nguyen, Tsung-Hsun Yang, National Central Univ. (Taiwan); Tsung-Xian Lee, National Taiwan Univ. of Science and Technology (Taiwan); Yeh-Wei Yu, National Central Univ. (Taiwan)  
 24 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 16A
- 12217-37**  
**Generative Design and Digital Manufacturing: using AI and robots to build lightweight instrument structures**  
 Author(s): Ryan S. McClelland, NASA Goddard Space Flight Ctr (USA)  
 24 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 16A
- Break**  
**Coffee Break 10:40 AM - 11:10 AM**

## SESSION 5: THEORY AND APPLICATIONS II

- 24 August 2022 • 11:10 AM - 12:50 PM PDT | Conv. Ctr. Room 16A  
 Session Chair: Ching-Cherng Sun, National Central Univ. (Taiwan)
- 12217-26**  
**Optical design process of a human eye inspired lens**  
 Author(s): Guillaume Allain, Simon Thibault, Univ. Laval (Canada)  
 24 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 16A
- 12217-27**  
**Talbot effect of periodic Legendre structures**  
 Author(s): Alfonso Padilla-Vivanco, Carina Toxqui-Quitl, Enrique González Amador, Univ. Politécnica de Tulancingo (Mexico)  
 24 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 16A
- 12217-28**  
**Digital holography by means of the Talbot effect**  
 Author(s): Angel Daniel Lopez-Islas, Alfonso Padilla-Vivanco, Carina Toxqui-Quitl, Univ. Politécnica de Tulancingo (Mexico)  
 24 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 16A
- 12217-29**  
**Realizing low-distortion in wide-angle lens with freeform optics technique**  
 Author(s): Zhenfeng Zhuang, Jocelyn Parent, Patrice Roulet, Simon Thibault, ImmerVision (Canada)  
 24 August 2022 • 12:10 PM - 12:30 PM PDT | Conv. Ctr. Room 16A
- 12217-30**  
**TIR metalens simulation**  
 Author(s): Edgar Dávila, J. C. Basilio-Ortiz, Ivan Moreno, Unidad Académica de Ciencia y Tecnología de la Luz y la Materia (Mexico)  
 24 August 2022 • 12:30 PM - 12:50 PM PDT | Conv. Ctr. Room 16A
- Break**  
**Lunch Break 12:50 PM - 2:20 PM**

## SESSION 6: MODELING AND ILLUMINATION

- 24 August 2022 • 2:20 PM - 3:40 PM PDT | Conv. Ctr. Room 16A  
 Session Chair: Jessica DeGroote Nelson, Edmund Optics Inc. (USA)
- 12217-32**  
**Light source modeling for ultraviolet-c light-emitting diodes (UV-C LEDs) with aid of fluorescent film**  
 Author(s): Thi Thu Ngoc Le, Shih-Kang Lin, Ching-Cherng Sun, Quang-Khoi Nguyen, Chi Shou Wu, Tsung-Hsun Yang, Yeh-Wei Yu, National Central Univ. (Taiwan)  
 24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 16A
- 12217-33**  
**Achieving multiple beam patterns using 3-D printable lens by altering the positioning of LEDs**  
 Author(s): Akila S. Udage, Nadarajah Narendran, Rensselaer Polytechnic Institute (USA)  
 24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 16A



# Laser Beam Shaping XXII

23 August 2022 | Conv. Ctr. Room 17B

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 (USA); Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa); Patrick Gretzki, Fraunhofer-Institut für Lasertechnik ILT (Germany); Raul I. Hernandez-Aranda, Tecnológico de Monterrey (Mexico); Alexis V. Kudryashov, Active Optics Night N Ltd. (Russian Federation); Todd E. Lizotte, BOLD Laser Automation (USA); Dorilian Lopez-Mago, Tecnológico de Monterrey (Mexico); Daryl Preece, Beckman Laser Institute and Medical Clinic (USA); 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)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12218-19

#### Resonant micromirror with symmetrical AIN thin film actuators (Invited Paper)

Author(s): Konsta Ruotsalainen, Dmitry Morits, Oili M. E. Ylivaara, Jukka Kynnäräinen, VTT Technical Research Ctr. of Finland Ltd. (Finland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12218-20

#### Shape-invariant Bessel-Gaussian beams with fractional orbital angular momentum for deep-learning-based optical communication links (Invited Paper)

Author(s): Youngbin Na, Do-Kyeong Ko, Department of Physics and Photon Science, Gwangju Institute of Science and Technology (Korea, Republic of), Research Ctr. for Photon Science Technology, Gwangju Institute of Science and Technology (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: POLARIZATION AND VECTORIAL SHAPING AND QUANTUM OPTICS

23 August 2022 • 8:00 AM - 10:30 AM PDT | Conv. Ctr. Room 17B

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

### 12218-1

#### Recent advances in vectorial doppler metrology (Invited Paper)

Author(s): Jian Wang, Huazhong Univ. of Science and Technology (China)

23 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 17B

### 12218-2

#### Structured singular light: from customized singularity textures to optical metrology in liquid lenses (Invited Paper)

Author(s): Eileen Otte, Westfälische Wilhelms-Univ. Münster (Germany), Stanford Univ. (USA); Ramon Droop, Valeriia Bobkova, Westfälische Wilhelms-Univ. Münster (Germany); Sarah Trinschek, Fachhochschule Münster (Germany); Daniel Ehrmantraut, Cornelia Denz, Westfälische Wilhelms-Univ. Münster (Germany)

23 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 17B

### 12218-3

#### Spatial depolarization patterns generated with dynamic retardance functions (Invited Paper)

Author(s): María del Mar Sánchez-López, David Marco, Univ. Miguel Hernández (Spain); Guadalupe López-Morales, Univ. de Ciencias y Artes de Chiapas (Mexico); Ángel Lizana, Juan Campos, Univ. Autònoma de Barcelona (Spain); Ignacio Moreno, Univ. Miguel Hernández (Spain)

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 17B

### 12218-5

#### Controlling spatial and polarization structures with digital micromirror devices (Invited Paper)

Author(s): Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

23 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 17B

### 12218-6

#### Dynamic generation of polarization-spatial hybrid entangled states (Invited Paper)

Author(s): Isaac Nape, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

23 August 2022 • 9:40 AM - 10:10 AM PDT | Conv. Ctr. Room 17B

### 12218-7

#### Does quantum ghost imaging need a camera to image an object? (Invited Paper)

Author(s): Chane Moodley, Isaac M. Nape, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

23 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 17B

### Break

**Coffee Break 10:30 AM - 11:00 AM**

## SESSION 2: ADAPTIVE, DIFFRACTIVE, AND REFRACTIVE BEAM-SHAPING

23 August 2022 • 11:00 AM - 12:00 PM PDT | Conv. Ctr. Room 17B

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

### 12218-10

#### The continuous refractive beamforming surface for far-field with robustness and high efficiency (Invited Paper)

Author(s): Toshifumi Yasui, Hiroyuki Tahara, Yusuke Kono, Kohei Yamamoto, Sony Group Corp. (Japan); Tetsuaki Iwane, Sony Corp. (Japan); Yoshiki Kashihara, Masanobu Inada, Sony Global Manufacturing & Operations Corp. (Japan)

23 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 17B

### 12218-11

#### Compressive wavefront correction with Bessel beams (Invited Paper)

Author(s): Dennis Scheidt, Pedro A. Quinto-Su, Univ. Nacional Autónoma de México (Mexico)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 17B

### 12218-22

#### Efficient propagation of electromagnetic pulses through high-power solid state laser amplifiers

Author(s): Boaz Nash, David Bruhwiler, Dan Abell, RadiaSoft LLC (USA); Nicholas Goldring, State 33 (USA); Gurhar Khalsa, RadiaSoft LLC (USA); Jeroen Van Tilborg, Lawrence Berkeley National Laboratory (USA); Qian Chen, Lawrence Berkeley National Lab. (USA); Csaba Tóth, Cameron Geddes, Lawrence Berkeley National Laboratory (USA)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 17B

### Break

**Lunch/Exhibition Break 12:00 PM - 2:10 PM**

**SESSION 3: INTRA-CAVITY AND HIGH-POWER BEAM-SHAPING**

23 August 2022 • 2:10 PM - 3:20 PM PDT | Conv. Ctr. Room 17B

Session Chair: Angela L. Dudley, Univ. of the Witwatersrand, Johannesburg (South Africa)

**12218-13  
Digitally controlled multimode laser for high-resolution, robust beam shaping (Invited Paper)**

Author(s): Simon Mahler, Caltech (USA), Weizmann Institute of Science (Israel); Chene Tradonsky, Asher A. Friesem, Nir Davidson, Weizmann Institute of Science (Israel)

23 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 17B

**12218-16  
2-kW continuous wave laser demonstrator simulation using incoherent beam combining of laser diode stacks (Invited Paper)**

Author(s): Juan F. Coronel, Giuseppe Scurria, Amit Dubey, Abdellatif Bouchalkha, Layla Al Shehhi, Guillaume Matras, Chaouki Kasmi, Technology Innovation Institute (United Arab Emirates)

23 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 17B

**12218-17  
Non-diffractive and parallel spatial laser shaping for enhanced surface and bulk processing (Invited Paper)**

Author(s): Cyril Maclair, Lab. Hubert Curien (France)

23 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 17B

**Break  
Coffee Break 3:20 PM - 4:00 PM**

**OPTICAL ENGINEERING PLENARY SESSION**

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

**4:00 to 4:05 PM: Welcome and Opening Remarks**

**12221-501  
The James Webb Space Telescope: an optical success story! (Plenary Presentation)**

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

**Lens Design Technical Event**

23 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Rich Pfisterer, Photon Engineering, LLC (USA)


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

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performance by leveraging rotational variance. Recent advancements in the fabrication of GRIN materials with additive manufacturing have enabled a new type of freeform optic using a freeform gradient index (F-GRIN) material. When variant transversely, F-GRIN behaves similarly to freeform surfaces. By introducing a longitudinal refractive index variation as well, F-GRIN optical behavior deviates from that of freeform surfaces due to the effect of volume propagation. This talk will discuss the new optical design tools developed at the Univ. of Rochester for F-GRIN imaging and illumination systems, the benefits of F-GRIN, and show exciting new results from fabricated systems.

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

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# Polymer Optics and Molded Glass Optics: Design, Fabrication, and Materials 2022

22 August 2022 | Conv. Ctr. Room 14B

Conference Chairs: Alan Symmons, Vital Materials Co., Ltd. (USA); Nelson E. Claytor, Fresnel Technologies Inc. (USA)

Program Committee: Hossein Alisafae, Rose-Hulman Institute of Technology (USA); K. Brent Binkley, Dyna Technologies, Inc. (USA); Olaf Dambon, son-x GmbH (Germany); Rick Fitzpatrick, Extrude To Fill, LLC (USA); Marcel Friedrichs, Fraunhofer-Institut für Produktionstechnologie IPT (Germany); Ulf Geyer, Auer Lighting GmbH (Germany); Koji Handa, Panasonic Production Engineering Co., Ltd. (USA); David H. Krevor, Exo Imaging, Inc. (USA); Matthew Kyrish, Fresnel Technologies Inc. (USA); Oscar M. Lechuga, Fresnel Technologies Inc. (USA); Chris Morgan, Moore Nanotechnology Systems, LLC (USA); Tomofumi Morishita, Panasonic Production Engineering Co., Ltd. (Japan); Jayson J. Nelson, Edmund Optics Inc. (USA); Michael P. Schaub, Meta (USA); Ulrike Schulz, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Greg Sharp, LumenFlow Corp. (USA); Hamilton Shepard, Waymo, LLC (USA); Jan-Helge Staasmeyer, Leica Camera AG (Germany); Changxi Xue, Changchun Univ. of Science and Technology (China); Lixia Yi, Guanghao Optics (Jiangsu) Co., Ltd. (China)

## SESSION 1: GLASS MOLDED OPTICS

22 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 14B

Session Chair: Nelson E. Claytor, Fresnel Technologies Inc. (USA)

### 12219-1

#### The design of blend radii for precision glass molded lenses

Author(s): Alan Symmons, Vital Materials Co., Ltd. (USA)

22 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 14B

### 12219-2

#### Mold protective coatings for precision glass molding

Author(s): Marcel Friedrichs, Tim Grunwald, Thomas Bergs, Fraunhofer-Institut für Produktionstechnologie IPT (Germany)

22 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 14B

### 12219-3

#### Reduction of cycle time during press molding of glass lenses

Author(s): Christopher J. Morgan, Moore Nanotechnology Systems, LLC (USA); Dhanoo Bobba, The Univ. of North Carolina at Charlotte (USA)

22 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 14B

### 12219-5

#### Bio-inspired manufacturing of molded optics and optical systems

Author(s): Tim Grunwald, Fraunhofer-Institut für Produktionstechnologie IPT (Germany); Thomas Bergs, Fraunhofer-Institut für Produktionstechnologie IPT (Germany), Werkzeugmaschinenlabor, RWTH Aachen Univ. (Germany)

22 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 14B

### 12219-6

#### Laser-assisted diamond turning of tungsten carbide and the material properties required to obtain optical surface finish suitable for lens molds

Author(s): Sai Kode, Jonathan D. Ellis, Micro-LAM, Inc. (USA)

22 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 14B

### Break

**Coffee Break 10:10 AM - 10:40 AM**

## SESSION 2: INJECTION MOLDED PLASTIC OPTICS

22 August 2022 • 10:40 AM - 11:20 AM PDT | Conv. Ctr. Room 14B

Session Chair: Hafez Hemmati, Fresnel Technologies Inc. (USA)

### 12219-7

#### Injection molding of subwavelength structures over a large surface area

Author(s): Jeanette Miller, Nelson Claytor, Richard Claytor, Meg Fraelich, Hafez Hemmati, Martin Hoppe, Oscar Lechuga, Fresnel Technologies Inc. (USA)

22 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 14B

### 12219-8

#### Antireflection nanostructures for injection molded polymers and polymer resins

Author(s): Ulrike Schulz, Friedrich Rickelt, Anne Gärtner, Astrid Bingel, Nancy Gratzke, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Michael Trinkwalder, Stephan Prinz, DELO Industrie Klebstoffe GmbH & Co. KGaA (Germany)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 14B

## SESSION 3: APPLICATIONS OF MOLDED OPTICS

22 August 2022 • 11:20 AM - 12:00 PM PDT | Conv. Ctr. Room 14B

Session Chair: Alan Symmons, Vital Materials Co., Ltd. (USA)

### 12219-12

#### Monomer-based spectrometer

Author(s): Hossein Alisafae, Rose-Hulman Institute of Technology (USA)

22 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 14B

### 12219-23

#### Generation and propagation of Airy beams and one inch diameter focusing optics using 3D printed polymer optics

Author(s): Stephanie Maruca Donnelly, Evan Jones, Austin Granmoe, Mitch Wlodawski, Tyler Fenske, Muhammed Kamal, Damien Marianucci, George Fischer, US Army CCDC (USA); Charles Dupuy, Hooman Akhavan, Samuel Peter Grimm, Nanovox (USA); Frederick Long, David Dantsker, US Army CCDC (USA)

22 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 14B

### Break

**Lunch Break 12:00 PM - 1:30 PM**

## SESSION 4: GRIN

22 August 2022 • 1:30 PM - 2:10 PM PDT | Conv. Ctr. Room 14B

Session Chair: Jayson J. Nelson, Edmund Optics Inc. (USA)

### 12219-13

#### Optimization of thermal stresses in plastic molds for corrective gradient index (GRIN) optics within a lens design

Author(s): Simon P. Tsaoussis, Tsaoussis Software Programming LLC (USA)

22 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 14B

### 12219-14

#### Progress in the maturation of polymer-layered gradient index (LGRIN) optics for high performance optical system

Author(s): Guy Beadie, Rich Lepkowitz, Todd Winski, Michael Cantwell, Peak Nano Optics (USA)

22 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 14B

## SESSION 5: METROLOGY OF MOLDED OPTICS

22 August 2022 • 2:10 PM - 2:50 PM PDT | Conv. Ctr. Room 14B

Session Chair: Chris Morgan, Moore Nanotechnology Systems, LLC (USA)

### 12219-15

#### Precision measurement of molded optics including relational datum parameters by use of a scanning point multi-wavelength interferometer

Author(s): Nina Hennemann, Marc Wendel, AMETEK GmbH (Germany)

22 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 14B

## 12219-16

### Evaluation of decenter evaluation method between free-form lens surfaces

Author(s): Tomofumi Morishita, Koji Handa, Panasonic Production Engineering Co., Ltd. (Japan)

22 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 14B

## Break

**Coffee Break 2:50 PM - 3:20 PM**

## SESSION 6: AUTOMOTIVE MOLDING

22 August 2022 • 3:20 PM - 4:00 PM PDT | Conv. Ctr. Room 14B

Session Chair: Hossein Alisafae, Rose-Hulman Institute of Technology (USA)

## 12219-17

### SUPRAX glass optics for automotive application

Author(s): Ulf Geyer, Ansgar Hellwig, Marc C. Hübner, Auer Lighting GmbH (Germany)

22 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 14B

## 12219-19

### Controlled viscosity molding of polymer optics

Author(s): Rick Fitzpatrick, Extrude To Fill, LLC (USA)

22 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 14B

## SESSION 7: MOLDING FOR THE INFRARED

22 August 2022 • 4:00 PM - 4:40 PM PDT | Conv. Ctr. Room 14B

Session Chair: Alan Symmons, Vital Materials Co., Ltd. (USA)

## 12219-21

### Potential polymer viewing screens for low-energy thermal images

Author(s): Hafez Hemmati, Jeanette Miller, Oscar Lechuga, Nelson Claytor, Richard N. Claytor, Meg Fraelich, Fresnel Technologies Inc. (USA)

22 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 14B

## 12219-22

### Polycalc optics for infrared optical imaging

Author(s): Kyung-Jo Kim, Kate Newcomer, Sasaan Showghi, Jay Liebowitz, Robert A. Norwood, Norcon Technologies Holding, Inc. (USA); Heejoo Choi, The Univ. of Arizona (USA)

22 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 14B

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

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Balboa

Session Chair: Kenneth R. Castle, Ruda-Cardinal, Inc. (USA)

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.

This year's speaker will be Julie L. Bentley, Univ. of Rochester (USA)

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.

## Illumination Technical Event

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Julius A. Muschwack, JMO GmbH (Germany)

Please join us for an evening of stimulating discussion, networking, and conversation. This year we will hear from "Sir" William Cassarly of the Illumination Guild presenting his talk, "Illumination Design Problem for the International Optical Design Conference." He will give a review of the 2021 IODC Illumination Design Problem—The Curse of Prince Lambert—and unveil the 2023 version, a new tale from the Illumination Guild.

We will also hear from Simon Tsaousis, TSASPC, LLC and The University of Arizona, with his talk "Many-Core, Multi-Computer Optimization of Illumination Optics: Trace up to Billions of Rays per Second." Simon has a BS in Engineering Physics from Rose-Hulman Institute of Technology, and is currently a PhD student with Dr. Jerry Moloney at the University of Arizona solving nonlinear dynamics problems using the Semiconductor Bloch equations as well as rectifying simulation results in the lab. He also works with TSASPC, a startup, which is currently developing High Performance Computing (HPC) solutions to solve some of humanity's most daunting design challenges. Simon's love for scientific research and endeavor to advance humanity's understanding of the universe is what drives him to develop simple software solutions to solve some of the most complex problems in existence.

At the end of the presentation any member of the audience may present information within the broad field of illumination. Light refreshments will be served.

Light refreshments sponsored by:

The Optical Solutions Group at **SYNOPSYS**<sup>®</sup>

# Nonimaging Optics: Efficient Design for Illumination and Solar Concentration XVIII

21 August 2022 | Conv. Ctr. Room 14B

Conference Chairs: Roland Winston, Univ. of California, Merced (USA); R. John Koshel, Wyant College of Optical Sciences (USA); Lun Jiang, Univ. of California, Merced (USA)

Program Committee: Pablo Benítez, CeDInt-UPM (Spain); William J. Cassarly, Synopsys, Inc. (USA); Ángel García-Botella, Univ. Politécnica de Madrid (Spain); Michael W. Haney, ARPA-E (USA); Sarah R. Kurtz, Univ. of California, Merced (USA); Juan Carlos Miñano, CeDInt-UPM (Spain); Narkis E. Shatz, SureFire, LLC (USA); Eli Yablonovitch, Univ. of California, Berkeley (USA)

## SESSION 1: ILLUMINATION

21 August 2022 • 9:00 AM - 9:40 AM PDT | Conv. Ctr. Room 14B

Session Chair: Lun Jiang, Univ. of California, Merced (USA)

### 12220-1

#### What light tubes are good for: connecting theories

Author(s): Henning Rehn, FISBA AG (Switzerland); Julius Muschaweck, JMO GmbH (Germany)

21 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 14B

### 12220-2

#### How string theory solved a challenging quantum chromodynamics problem

Author(s): Davoud Masoumi, Roland Winston, James Edward Bernard, Univ. of California, Merced (USA)

21 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 14B

## SESSION 2: NUMERICAL AND FREEFORM METHODS

21 August 2022 • 9:40 AM - 10:20 AM PDT | Conv. Ctr. Room 14B

Session Chair: Lun Jiang, Univ. of California, Merced (USA)

### 12220-9

#### Tailored freeform surfaces for illumination with extended sources

Author(s): Julius A. Muschaweck, JMO GmbH (Germany)

21 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 14B

### 12220-22

#### Freeform gradient-index optics for prescribed illumination

Author(s): David H. Lippman, Rongze Xu, University of Rochester, The Institute of Optics (USA); Greg Schmidt, The Institute of Optics, Univ. of Rochester (USA)

21 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 14B

### Break

Coffee Break 10:20 AM - 10:50 AM

## SESSION 3: NEW CONCEPTS

21 August 2022 • 10:50 AM - 11:50 AM PDT | Conv. Ctr. Room 14B

Session Chair: Leonard Ferrari, Univ. of California, Santa Cruz (USA)

### 12220-5

#### In search of a sharper line focus: Rotating the étendue

Author(s): Håkon Jarand Dugstad Johnsen, Norwegian Univ. of Science and Technology (Norway); Juan C. Miñano, Cedint, Universidad Politécnica Madrid (Spain)

21 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 14B

### 12220-6

#### Application of Lorentz geometry to evaluation of irradiance patterns

Author(s): Ángel García-Botella, Univ. Politécnica de Madrid (Spain); Manuel Gutierrez, Univ. de Málaga (Spain); Lun Jiang, Univ. of California, Merced (USA)

21 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 14B

### 12220-8

#### Compound parabolic concentrators used to enhance high-intensity laser plasma interactions

Author(s): Dean R. Rusby, Andrew MacPhee, Andrew MacKinnon, Shaun Kerr, Lawrence Livermore National Lab. (USA)

21 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 14B

### Break

Lunch Break 11:50 AM - 1:40 PM

## SESSION 4: ADVANCED DEVELOPMENTS

21 August 2022 • 1:40 PM - 2:20 PM PDT | Conv. Ctr. Room 14B

Session Chair: Roland Winston, Univ. of California, Merced (USA)

### 12220-12

#### Etendue matching between radiation source and sink using flowline

Author(s): Lun Jiang, Univ. of California, Merced (USA)

21 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 14B

### 12220-14

#### Designing more-efficient automotive light guide luminaires

Author(s): Thomas L. R. Davenport, Synopsys, Inc. (USA)

21 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 14B

## SESSION 5: CONCENTRATOR DESIGNS

21 August 2022 • 2:20 PM - 3:20 PM PDT | Conv. Ctr. Room 14B

Session Chair: Bennett K. Widyolar, Univ. of California, Merced (USA)

### 12220-15

#### Design and fabrication of linear Fresnel reflectors

Author(s): Martín Jiménez-Rodríguez, Maximino Avendaño-Alejo, Ismael Velázquez-Gómez, Univ. Nacional Autónoma de México (Mexico)

21 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 14B

### 12220-16

#### Design, tolerancing and fabrication of a freeform lightguide based on the flow-line method

Author(s): Simone Sorgato, Lien Smeesters, Michael Vervaeke, Kurt Rochlitz, Dries Rosseel, Jef Verbaenen, Hugo Thienpont, Thomas Geernaert, Jürgen Van Erps, Vrije Univ. Brussel (Belgium)

21 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 14B

### 12220-17

#### How nonimaging optics entered astronomy

Author(s): Roland Winston, Lun Jiang, Univ. of California, Merced (USA)

21 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 14B

### Break

Coffee Break 3:20 PM - 3:50 PM



**SESSION 6: SOLAR APPLICATIONS**

21 August 2022 • 3:50 PM - 4:30 PM PDT | Conv. Ctr. Room 14B

Session Chair: Ángel García-Botella, Univ. Politécnica de Madrid (Spain)

**12220-18****Static flexible concentrator photovoltaics module for electric vehicles**

Author(s): Seoyong Shin, Hoang Vu, Myongji Univ. (Korea, Republic of); Nguyen V. Nhat, Ngoc H. Vu, Phenikaa Univ. (Vietnam)

21 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 14B

**12220-21****Thermal conductivity measurement of binary thermal storage particles using modulated photothermal radiometry**

Author(s): Javier Corona, Todd Otanicar, Dallin Stout, Nirmala Kandadai, Boise State Univ. (USA)

21 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 14B

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12220-4****Metalens for uniform rectangular illumination**

Author(s): Cosmy Polet Castañeda, Unidad Académica de Ciencia y Tecnología de la Luz y la Materia, Univ. Autónoma de Zacatecas (Mexico), Instituto Politécnico Nacional (Mexico); Iván Moreno, Unidad Académica de Ciencia y Tecnología de la Luz y la Materia, Univ. Autónoma de Zacatecas (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

# Optical Manufacturing and Testing XIV

22 - 24 August 2022 | Conv. Ctr. Room 15A

Conference Chairs: Daewook Kim, Wyant College of Optical Sciences (USA); Heejoo Choi, Wyant College of Optical Sciences (USA); Heidi Ottevaere, Vrije Univ. Brussel (Belgium)

Conference Co-Chair: Rolf Rascher, Technische Hochschule Deggendorf (Germany)

Program Committee: Eva Acosta Plaza, Univ. de Santiago de Compostela (Spain); Nelson E. Claytor, Fresnel Technologies Inc. (USA); Peter J. de Groot, Zygo Corporation (USA); Oliver W. Föhnle, FISBA AG (Switzerland); Gerald Fütterer, Technische Hochschule Deggendorf (Germany); Wei Gao, Tohoku Univ. (Japan); Roland Geyl, Safran Reosc (France); James P. Hamilton, Photonic Cleaning Technologies (USA); Mourad Idir, Brookhaven National Lab. (USA); Jonghan Jin, Korea Research Institute of Standards and Science (Korea, Republic of); Stephen E. Kendrick, Kendrick Aerospace Consulting LLC (USA); Huang Lei, Tsinghua Univ. (China); Jessica DeGroote Nelson, Optimax Systems, Inc. (USA); Chang Jin Oh, Wyant College of Optical Sciences (USA); Jae-Hyeong Park, Inha Univ. (Korea, Republic of); Robert E. Parks, Optical Perspectives Group, LLC (USA); Michael P. Schaub, Facebook Technologies, LLC (USA); David D. Walker, Univ. of Huddersfield (United Kingdom); Ray Williamson, Ray Williamson Consulting (USA); Kazuto Yamauchi, Osaka Univ. (Japan); Xiangchao Zhang, Fudan Univ. (China); Wenchuan Zhao, Institute of Optics and Electronics, Chinese Academy of Sciences (China); Ping Zhou, ASML US, Inc. (USA)

## SESSION 1: OPTICAL MANUFACTURING I

22 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 15A

Session Chair: Heidi Ottevaere, Vrije Univ. Brussel (Belgium)

### 12221-1

#### Prototyping, replication and metrology of freeform optical (micro-)components (Invited Paper)

Author(s): Jürgen Van Erps, Michael Vervaeke, Heidi Ottevaere, Hugo Thienpont, Vrije Univ. Brussel (Belgium)

22 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 15A

### 12221-3

#### Human machine competition in intelligent laser manufacturing in semiconductor processes

Author(s): Chung-Yuan Chang, Cheng Ching Hsu, Tejender Rawat, National Yang Ming Chiao Tung Univ. (Taiwan); Shih-Wei Chen, Taiwan Semiconductor Research Institute, National Applied Research Labs. (Taiwan); Albert Lin, National Yang Ming Chiao Tung Univ. (Taiwan)

22 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 15A

### 12221-4

#### 0.7 meter diamond turned additively manufactured extremely light weight spherical mirror

Author(s): John M. Casstevens, Dallas Optical Systems, Inc. (USA)

22 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 15A

### 12221-53

#### Polymer coating-based contaminant control/elimination for NASA's Exo-S starshade probe and space telescopes

Author(s): James P. Hamilton, Photonic Cleaning Technologies (USA); Kyle P. Horne, Mark E. Levenstein, Brandon Robinson, Alana Wakefield, Katie Lameyer, Austin Rickertsen, Univ. of Wisconsin-Platteville (USA); Madison Meuth, Univ. of Wisconsin-Platteville (USA); Noah Milder, Univ. of Wisconsin-Platteville (USA); Adam Wildman, Mary Ellen Moran, Ethan Taylor, Univ. of Wisconsin-Platteville (USA)

22 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 15A

### Break

**Coffee Break 10:00 AM - 10:50 AM**

## SESSION 2: OPTICAL MANUFACTURING II

22 August 2022 • 10:50 AM - 12:30 PM PDT | Conv. Ctr. Room 15A

Session Chair: James P. Hamilton, Univ. of Wisconsin-Platteville (USA)

### 12221-5

#### Improvement of ultrafast laser stress figuring throughput

Author(s): Kevin A. Laverty, Marcos Esparza, Ian Arnold, Daewook Kim, Brandon Chalifoux, Wyant College of Optical Sciences (USA)

22 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 15A

### 12221-6

#### Closed-loop ultrafast laser stress figuring (ULSF) using on-machine deflectometry

Author(s): Marcos A. Esparza, Kevin Laverty, Brandon Chalifoux, Daewook Kim, Wyant College of Optical Sciences (USA)

22 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 15A

### 12221-9

#### Solarization effects in optical glass from UV to blue

Author(s): Ralf Jedamzik, A13 / P14 (Germany); Volker Dietrich, Uwe Petzold, Axel Engel, SCHOTT AG (Germany)

22 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 15A

### 12221-11

#### Using ISO environmental standards in an ISO 10110 format drawing

Author(s): Eric Herman, Synopsys Inc. (USA); David M. Aikens, Savvy Optics Corp. (USA)

22 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 15A

### 12221-12

#### Novel micro-textured film offers promise in universal handling of optics

Author(s): Raj Varma, Delphon Industries, LLC (USA)

22 August 2022 • 12:10 PM - 12:30 PM PDT | Conv. Ctr. Room 15A

### Break

**Lunch Break 12:30 PM - 2:00 PM**

## SESSION 3: NAUTILUS SPACE TELESCOPE I

22 August 2022 • 2:00 PM - 3:30 PM PDT | Conv. Ctr. Room 15A

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

### 12221-13

#### Nautilus Space Observatory: A very large aperture space telescope constellation enabled by scalable optical manufacturing technologies (Invited Paper)

Author(s): Daniel Apai, Tom D. Milster, Daewook Kim, Glenn Schneider, The Univ. of Arizona (USA); Benjamin V. Rackham, Massachusetts Institute of Technology (USA); Jonathan Arenberg, Northrop Grumman Corp. (USA); Heejoo Choi, Marcos A. Esparza, Zichan Wang, Yingying Zhang, Alex Bixel, The Univ. of Arizona (USA)

22 August 2022 • 2:00 PM - 2:30 PM PDT | Conv. Ctr. Room 15A

### 12221-14

#### Type 2 longitudinal chromatic aberration from a high-harmonic MODE lens and color corrector

Author(s): Thomas D. Milster, Youngsik Kim, Zichan Wang, Wyant College of Optical Sciences (USA)

22 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 15A

### 12221-15

#### Fabrication, assembly, and testing of a MODE lens color corrector

Author(s): Zichan Wang, Youngsik Kim, Wyant College of Optical Sciences, The Univ. of Arizona (USA); Allen Yi, The Ohio State Univ. (USA); Hwanjin Choi, Korea Basic Science Institute (Korea, Republic of); Geonhee Kim, Hanbat National Univ. (Korea, Republic of); Tom D. Milster, The Univ. of Arizona (USA)

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 15A

**12221-16****Stray light analysis and testing of a MODE lens telescope**

Author(s): Youngsik Kim, Marcos Esparza, Zichan Wang, Nicholas Brar, Heejoo Choi, Daewook Kim, Wyant College of Optical Sciences, The Univ. of Arizona (USA); Daniel Apai, The Univ. of Arizona (USA); Tom Milster, Wyant College of Optical Sciences, The Univ. of Arizona (USA)

22 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 15A

**Break**

**Coffee Break 3:30 PM - 4:00 PM**

**SESSION 4: NAUTILUS SPACE TELESCOPE II**

22 August 2022 • 4:00 PM - 5:20 PM PDT | Conv. Ctr. Room 15A

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

**12221-17****Precision glass molding technology for the MODE lens telescope**

Author(s): Nick Brar, Yingying Zhang, Youngsik Kim, The Univ. of Arizona (USA); Allen Yi, Yuxin Cai, The Ohio State Univ. (USA); Geonhee Kim, Hanbat National Univ. (Korea, Republic of); Tom D. Milster, The Univ. of Arizona (USA)

22 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 15A

**12221-18****Autonomous closed-loop control for multi-segmented optic aligning and assembly**

Author(s): Heejoo Choi, Wyant College of Optical Sciences (USA), Large Binocular Telescope Observatory, The Univ. of Arizona (USA); Marcos A. Esparza, Tom Milster, Wyant College of Optical Sciences (USA); Daniel Apai, The Univ. of Arizona (USA); Daewook Kim, Wyant College of Optical Sciences (USA), Large Binocular Telescope Observatory, The Univ. of Arizona (USA)

22 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 15A

**12221-19****Automatic alignment of multi-order diffractive engineered (MODE) lens segments using the kinematically-engaged yoke system (KEYS) for optical performance testing**

Author(s): Marcos A. Esparza, Tom D. Milster, Daewook Kim, Wyant College of Optical Sciences (USA); Daniel Apai, Steward Observatory (USA); Heejoo Choi, Wyant College of Optical Sciences (USA), Large Binocular Telescope Observatory (USA)

22 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 15A

**12221-20****Initial testing of a MODE lens telescope**

Author(s): Youngsik Kim, Marcos Esparza, Zichan Wang, Nicholas Brar, Yingying Zhang, Daewook Kim, Heejoo Choi, Wyant College of Optical Sciences, The Univ. of Arizona (USA); Daniel Apai, Chuck Fellows, The Univ. of Arizona (USA); Allen Yi, Yuxin Cai, The Ohio State Univ. (USA); Geonhee Kim, Hanbat National Univ. (Korea, Republic of); Hwanjin Choi, Woojong Yeo, Korea Basic Science Institute (Korea, Republic of); Thomas Milster, Wyant College of Optical Sciences, The Univ. of Arizona (USA)

22 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 15A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12221-8****Parametric circular aperture segmentation formalism**

Author(s): Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); Sukmock Lee, Inha Univ. (Korea, Republic of); Daewook Kim, The Univ. of Arizona (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-10****CTE effects of CVD silicon carbide cladding of a silicon carbide optic**

Author(s): David Crompton, MIT Lincoln Lab. (USA); Wayne Hambek, Entegris, Inc. (USA); Keri Goris, David Klick, Mark Wilder, Gary Swanson, MIT Lincoln Lab. (USA); Hugo Vargas, Entegris (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-40****Tolerance of fabrication of Jacobi-Fourier phase masks for wavefront coding optical system**

Author(s): Enrique González-Amador, Justo Arines, Univ. de Santiago de Compostela (Spain); Alfonso Padilla Vivanco, Univ. Politécnic de Tulancingo (Mexico); Eva Acosta, Univ. de Santiago de Compostela (Spain)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-41****Correcting AI mirror figure error using deterministic polishing**

Author(s): Mark T. Stahl, NASA Marshall Space Flight Ctr. (USA); James Ross, OptiPro Systems, LLC (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-42****Rare-earth doped polycrystalline ceramics for high-energy laser applications**

Author(s): Ross E. Turner, Xingzhong Wu, Javier E. Garay, Univ. of California, San Diego (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-45****3D reconstruction of aerodynamic airfoils using computer stereo vision**

Author(s): Gabriel Castillo-Santiago, Víctor I. Moreno Oliva, Edwin Román Hernández, Univ. del Istmo (Mexico); Manuel Campos García, Maximino Avendaño Alejo, Univ. Nacional Autónoma de México (Mexico); Itza D. Aguilar Pérez, Univ. del Istmo (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-46****Developing aluminum nitride ceramics as high thermal conductivity materials for optical applications**

Author(s): Xingzhong Wu, Yasuhiro Kodera, Javier E. Garay, Univ. of California, San Diego (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-48****Improved quantitative testing of a nonsymmetric convex surface using a conical null screen**

Author(s): Manuel Campos-García, Francisco Javier Bautista-Clemente, Univ. Nacional Autónoma de México (Mexico); Ángel Sinue Cruz-Félix, Agustin Santiago-Alvarado, Univ. Tecnológica de la Mixteca (Mexico); Oliver Huerta-Carranza, Daniel Aguirre-Aguirre, Univ. Nacional Autónoma de México (Mexico); Víctor Iván Moreno-Oliva, Univ. del Istmo (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-49****Single-shot intraocular lens surface measurement with the GelSight topography system**

Author(s): Deanna Moschitta, James Schwiegerling, The Univ. of Arizona (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12221-50****On-machine laser spot diagnostics by direct linear image sensor scanning for maskless lithography system**

Author(s): Akinori Ohkubo, Jiyoung Chu, Janghwi Lee, Sunghwi Cho, Wondon Joo, Sangwoo Bae, SAMSUNG Electronics Co., Ltd. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## CONFERENCE 12221

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

22 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Balboa

Session Chair: Kenneth R. Castle, Ruda-Cardinal, Inc. (USA)

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.

This year's speaker will be Julie L. Bentley, Univ. of Rochester (USA)

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.

### SESSION 5: OPTICAL TESTING I

23 August 2022 • 9:00 AM - 10:20 AM PDT | Conv. Ctr. Room 15A

Session Chair: Heejoo Choi, Wyant College of Optical Sciences (USA)

#### 12221-24

##### Generalized surface reconstruction and fringe analysis through phase measuring deflectometry

Author(s): Rebecca Su, Jim Schwiegerling, Wyant College of Optical Sciences (USA)

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 15A

#### 12221-26

##### Conical null-screen design for evaluating a biconical surface using a smartphone-based corneal topographer

Author(s): Manuel Campos-García, Oliver Huerta-Carranza, Luis Ángel Pantoja-Arredondo, Univ. Nacional Autónoma de México (Mexico); Ángel Sinue Cruz-Félix, Agustín Santiago-Alvarado, Univ. Tecnológica de la Mixteca (Mexico); Daniel Aguirre-Aguirre, Univ. Nacional Autónoma de México (Mexico); Víctor Iván Moreno-Oliva, Univ. del Istmo (Mexico); Christian Camargo-Fierro, Instituto Politécnico Nacional (Mexico)

23 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 15A

#### 12221-27

##### Influence of lens and perspective distortion on optical surface metrology instrumentation

Author(s): Henry Quach, Joel Berkson, Wyant College of Optical Sciences (USA); Heejoo Choi, Wyant College of Optical Sciences (USA), Large Binocular Telescope Observatory, The Univ. of Arizona (USA); Daewook Kim, Wyant College of Optical Sciences (USA), Large Binocular Telescope Observatory (USA), Steward Observatory (USA)

23 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 15A

#### 12221-38

##### Measurement of non-uniform AR-coated surfaces using an optical coordinate measurement machine with coating effect error compensation

Author(s): Rens Henselmans, Matthijs Gouwerok, Gerard van den Eijkkel, Dutch United Instruments (Netherlands)

23 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 15A

#### Break

Coffee Break 10:20 AM - 10:50 AM

### SESSION 6: OPTICAL TESTING II

23 August 2022 • 10:50 AM - 12:20 PM PDT | Conv. Ctr. Room 15A

Session Chair: Heidi Ottevaere, Vrije Univ. Brussel (Belgium)

#### 12221-21

##### Snapshot measurements with CGH interferometry to support volume production of freeform optics (Invited Paper)

Author(s): James H. Burge, Shelby Ament, Jake Beverage, Arizona Optical Metrology LLC (USA)

23 August 2022 • 10:50 AM - 11:20 AM PDT | Conv. Ctr. Room 15A

#### 12221-22

##### Absolute distance measurement using polarization-based spectral-domain interferometer with dual reference path

Author(s): Jonghan Jin, Korea Research Institute of Standards and Science (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); Yeongjun Kim, Heulbi Ahn, Univ. of Science and Technology (Korea, Republic of); Jungjae Park, Korea Research Institute of Standards and Science (Korea, Republic of)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 15A

#### 12221-23

##### An interferometric method for simultaneous measurement of thickness, refractive index, and surface profile of a silicon wafer

Author(s): Jungjae Park, Korea Research Institute of Standards and Science (Korea, Republic of); Jaeseok Bae, Univ. of Science and Technology (Korea, Republic of); Yoon-Soo Jang, Korea Research Institute of Standards and Science (Korea, Republic of); Jonghan Jin, Korea Research Institute of Standards and Science (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 15A

#### 12221-39

##### Picometer-range characterization of LAM dynamics with whole-field LDV

Author(s): Vladimir . Markov, Advanced Systems & Technologies, Inc. (USA); Ron Eng, NASA Marshall Space Flight Ctr. (USA)

23 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 15A

#### Break

Lunch Break 12:20 PM - 1:50 PM

### SESSION 7: OPTICAL TESTING III

23 August 2022 • 1:50 PM - 2:50 PM PDT | Conv. Ctr. Room 15A

Session Chair: Heidi Ottevaere, Vrije Univ. Brussel (Belgium)

#### 12221-28

##### Scanning Shack-Hartmann sensor for wavefront measurements on freeform optics

Author(s): Martin E. Fuerst, Nikolaus Berlakovich, Ernst Csencsics, Georg Schitter, Technische Univ. Wien (Austria)

23 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 15A

#### 12221-30

##### Reconstruction of optical wavefronts with parallel registration algorithms

Author(s): Nikolaus Berlakovich, Martin Fuerst, Ernst Csencsics, Georg Schitter, Technische Univ. Wien (Austria)

23 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 15A

#### 12221-52

##### Measurement of inner centration of an asphere with computer generated holograms compared to an optical profiler

Author(s): Jean-Michel Asfour, Dioptric GmbH (Germany); Marc Wendel, Ametek GmbH (Germany)

23 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 15A

#### Break

Coffee/Exhibition Break 2:50 PM - 4:00 PM

## OPTICAL ENGINEERING PLENARY SESSION

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

**4:00 to 4:05 PM: Welcome and Opening Remarks**

**12221-501**

**The James Webb Space Telescope: an optical success story! (Plenary Presentation)**

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

**Lens Design Technical Event**

23 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Marina Ballroom E

Session Chair: Rich Pfisterer, Photon Engineering, LLC (USA)

**“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 speakers will be Julie L. Bentley and David H. Lippman of the University of Rochester (USA), whose talk is entitled “Freeform gradient-index materials: a new type of freeform optic.” Gradient index (GRIN) optical systems are not new, having been studied for over 50 years. However, most of this effort was focused on optical designs using conventional GRIN materials (e.g. axial or radial gradients) with rotationally invariant index of refraction profiles. Current interest in freeform surfaces has shown that they enable irregular system geometries with high optical performance by leveraging rotational variance. Recent advancements in the fabrication of GRIN materials with additive manufacturing have enabled a new type of freeform optic using a freeform gradient index (F-GRIN) material. When variant transversely, F-GRIN behaves similarly to freeform surfaces. By introducing a longitudinal refractive index variation as well, F-GRIN optical behavior deviates from that of freeform surfaces due to the effect of volume propagation. This talk will discuss the new optical design tools developed at the Univ. of Rochester for F-GRIN imaging and illumination systems, the benefits of F-GRIN, and show exciting new results from fabricated systems.

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

Cosponsored by:  Photon ENGINEERING  
Illuminating Ideas

Light refreshments sponsored by:

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## SESSION 8: OPTICAL TESTING IV

24 August 2022 • 10:00 AM - 11:40 AM PDT | Conv. Ctr. Room 15A

Session Chair: Heejoo Choi, Wyant College of Optical Sciences (USA)

**12221-32**

**Alignment process of confocal off-axis three mirror system using coordinate measuring machine**

Author(s): Jimin Han, Kyung Hee Univ. (Korea, Republic of); Joong Kyu Ham, Hanbat National Univ. (Korea, Republic of); Daewook Kim, The Univ. of Arizona (USA); Seunghyuk Chang, KAIST (Korea, Republic of); Geon Hee Kim, Jong Gyun Kang, Young Tae Kwak, Hanbat National Univ. (Korea, Republic of); Sunwoo Lee, Korea Basic Science Institute (Korea, Republic of); Woojin Park, Bongkon Moon, Dae-Hee Lee, Korea Astronomy and Space Science Institute (Korea, Republic of); Soojong Pak, Kyung Hee Univ. (Korea, Republic of)

24 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 15A

**12221-33**

**Evaluating SMR positioning with an autostigmatic microscope**

Author(s): Karlene Karrfalt, The Univ. of Arizona (USA); Robert E. Parks, Optical Perspectives Group, LLC (USA); Daewook Kim, The Univ. of Arizona (USA)

24 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 15A

**12221-34**

**Effects of alignment errors on freeform surface irregularity and system performance**

Author(s): Daniel R. Brooks, Joshua Beck, Brittany Cox, Jessica DeGroot Nelson, Optimax Systems, Inc. (USA)

24 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 15A

**12221-35**

**Absolute characterization of gravity sag for light-weighted optics**

Author(s): Tomasz M. Lis, NASA Marshall Space Flight Center (USA); Stephen Cheney, Philip Stahl, NASA Marshall Space Flight Ctr. (USA)

24 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 15A

**12221-54**

**Metrology of the critical parameters in high-aspect-ratio semiconductor microstructures such as deep trenches and deep holes**

Author(s): Wojtek J. Walecki, Optoprofilier LLC (USA)

24 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 15A



# Optical System Alignment, Tolerancing, and Verification XIV

21 August 2022 | Conv. Ctr. Room 15A

Conference Chairs: José Sasián, Wyant College of Optical Sciences (USA); Richard N. Youngworth, Riyo LLC (USA)

Program Committee: Brandon D. Chalifoux, Wyant College of Optical Sciences (USA); James A. Corsetti, NASA Goddard Space Flight Ctr. (USA); Laura E. Coyle, Ball Aerospace (USA); Blake G. Crowther, Synopsys, Inc. (USA); Matthew B. Dubin, Wyant College of Optical Sciences (USA); Jonathan D. Ellis, Clerio Vision, Inc. (USA); Ulrike Fuchs, asphericon GmbH (Germany); Sen Han, Univ. of Shanghai for Science and Technology (China); William P. Kuhn, Opt-E (USA); Chao-Wen Liang, National Central Univ. (Taiwan); Robert M. Malone, Mission Support and Test Services LLC (USA); Raymond G. Ohl, NASA Goddard Space Flight Ctr. (USA); Craig W. Pansing, Synopsys, Inc. (USA); Robert E. Parks, Optical Perspectives Group, LLC (USA); Brian C. Primeau, MIT Lincoln Lab. (USA); Dmitry Reshidko, Microsoft Corp. (USA); Martha Rosete-Aguilar, Univ. Nacional Autónoma de México (Mexico); Peng Su, ASML US, Inc. (USA); Will Zhou, ML Optic Corp. (USA)

## SESSION 1: ALIGNMENT METHODS AND APPLICATIONS I

21 August 2022 • 9:00 AM - 10:00 AM PDT | Conv. Ctr. Room 15A

Session Chair: Robert E. Parks, Optical Perspectives Group, LLC (USA)

### 12222-1

**Surface damage catalog for contact-measuring space flight optics using a coordinate measuring machine**

Author(s): Joshua Berrier, NASA Goddard Space Flight Ctr. (USA); Timothy Hahn, Tech Innovations, LLC (USA); David Kubalak, S. Bradley Cenko, Javier Del Hoyo, NASA Goddard Space Flight Ctr. (USA); Severine Tournois, Tech Innovations, LLC (USA); Raymond Ohl, NASA Goddard Space Flight Ctr. (USA)

21 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 15A

### 12222-2

**PACE OCI short-wave infrared detection assembly optical system design, alignment, and environmental test**

Author(s): James A. Champagne, Space Dynamics Lab., Utah State Univ. (USA)

21 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 15A

### 12222-4

**Design and integration of vacuum manifold for precision optical delay lines at the Navy Precision Optical Interferometer**

Author(s): Wyatt Clark, Cydney Clark, Alex McClinton, Northern Arizona Univ. (USA)

21 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 15A

### Break

**Coffee Break 10:00 AM - 10:30 AM**

## SESSION 2: ALIGNMENT METHODS AND APPLICATIONS II

21 August 2022 • 10:30 AM - 12:10 PM PDT | Conv. Ctr. Room 15A

Session Chair: José M. Sasián, Wyant College of Optical Sciences (USA)

### 12222-5

**Using image symmetries to uniquely align aspheric mirrors to a focus and axis**

Author(s): Robert E. Parks, Optical Perspectives Group, LLC (USA)

21 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 15A

### 12222-6

**Impact of the LCD monitor locations on a novel alignment method: the combination of deflectometry and the sine condition test**

Author(s): Hyemin Yoo, Matthew Dubin, Wyant College of Optical Sciences (USA)

21 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 15A

### 12222-7

**Flat target method: mitigation of errors in quad target method**

Author(s): Rupert S. Cooper, Matthew E. L. Jungwirth, CyberOptics Corp. (USA)

21 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 15A

### 12222-8

**Bifocal autocollimation head for simultaneous tilt and shift determination in multi-element lenses for ultra-precision 5D adhesive bonding**

Author(s): Christian Wilde, Patrik Langehanenberg, TRIOPTICS GmbH (Germany)

21 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 15A

### 12222-9

**Automated real-time optical detection system used for laser alignment analysis**

Author(s): F. Girard, CEA-DAM Ile-de-France (France)

21 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 15A

### Break

**Lunch Break 12:10 PM - 1:40 PM**

## SESSION 3: ALIGNMENT METHODS AND APPLICATIONS III

21 August 2022 • 1:40 PM - 3:20 PM PDT | Conv. Ctr. Room 15A

Session Chair: Blake G. Crowther, Synopsys, Inc. (USA)

### 12222-10

**Optomechanical analysis of compliant spacers in passively athermalized drop-in optical systems**

Author(s): Martin Tangari Larrategui, Victor E. Densmore, Lee Johnson, Christian Baker, Matthew Hevert, Bianka Camacho, Paul Tulungen, Peter McNiven, Kate Medicus, Kenneth R. Castle, Tilman W. Stuhlinger, Ruda-Cardinal, Inc. (USA)

21 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 15A

### 12222-11

**An optical apparatus to enable absolute angular alignment for sampling-based MTF test equipment**

Author(s): Teresa Zhang, Jiang He, Wei Zhou, MLOPTIC Corp. (USA)

21 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 15A

### 12222-12

**A self-adaptive calibration tool for periscope of AR glass binocular disparity measurement**

Author(s): Wei Zhou, Pengfei Wu, Jiang He, MLOPTIC Corp. (USA)

21 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 15A

### 12222-13

**Pose estimation of optical resonators using convolutional neural networks in a simulation environment**

Author(s): Nils Melchert, Kolja Hedrich, Leon Wiese, Lennart Hinz, Eduard Reithmeier, Leibniz Univ. Hannover (Germany)

21 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 15A

### 12222-14

**Exploiting wafer level packaging of VCSELs on silicon photonic integrated circuits (PICs) with the advantages of a novel, flip-chip bonding, active dry-alignments method on SOI up-reflecting mirrors**

Author(s): Giovanni Delrosso, VTT Technical Research Ctr. of Finland Ltd. (Finland)

21 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 15A

### Break

**Coffee Break 3:20 PM - 3:50 PM**

**SESSION 4: TOLERANCING METHODS AND APPLICATIONS**

21 August 2022 • 3:50 PM - 5:30 PM PDT | Conv. Ctr. Room 15A

Session Chair: Wei Zhou, MLOPTIC Corp. (USA)

**12222-15****How to use manufacturing statistics when tolerancing a lens system**

Author(s): Morris I. Kaufman, Robert M. Malone, Daniel K. Frayer, Gavin O. Griffin, Nevada National Security Site (USA); Brandon B. Light, Optimax Systems, Inc. (USA)

21 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 15A

**12222-17****Integrated opto-mechanical tolerance analysis**

Author(s): Frédéric Lamontagne, Nathalie Blanchard, Simon Paradis, Nichola Desnoyers, INO (Canada)

21 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 15A

**12222-16****Powerful standalone application for realistic optical tolerancing**

Author(s): Nathalie Blanchard, Frédéric Lamontagne, Simon Paradis, Nichola Desnoyers, INO (Canada)

21 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 15A

**12222-18****Analyzing error sources and error propagation in an optical scanning 3D triangulation sensor system**

Author(s): Johannes Schlarp, Ernst Csencsics, Georg Schitter, Technische Univ. Wien (Austria)

21 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 15A

**12222-19****Exact wavefront refracted through separated doublet lenses considering an incident plane wavefront**

Author(s): Ismael Velázquez-Gómez, Maximino Avendaño-Alejo, Martín Jiménez-Rodríguez, María C. López-Bautista, Univ. Nacional Autónoma de México (Mexico)

21 August 2022 • 5:10 PM - 5:30 PM PDT | Conv. Ctr. Room 15A

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12222-20****Off-axis alignment based on optical three-dimension rendering for compact adaptive optics scanning laser ophthalmoscope**

Author(s): Hang Chan Jo, Inha Univ. (Korea, Republic of); Robert J. Zawadzki, Univ. of California, Davis (USA); Dae Yu Kim, Inha Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12222-21****Machine vision system for alignment in die-to-wafer bonder**

Author(s): Jiyoung Chu, Minhwan Seo, Hyungjin Kim, Wondon Joo, Sungmin Ahn, Sangwoo Bae, SAMSUNG Electronics Co., Ltd. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12222-22****On-the-fly optimization of synchrotron beamlines using machine learning**

Author(s): T. W. Morris, M. Rakitin, A. Giles, J. Lynch, A. L. Walter, Brookhaven National Lab. (USA); B. Nash, D. Abell, P. Moeller, I. Pogorelov, RadiaSoft LLC (USA); N. Goldring, STATE33 (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

# Interferometry XXI

24 - 25 August 2022 | Conv. Ctr. Room 17A (Wed) and Room 10 (Thu)

Conference Chairs: Michael B. North-Morris, 4D Technology Corp. (USA); Katherine Creath, Optineering (USA); Rosario Porrás-Aguilar, The Univ. of North Carolina at Charlotte (USA)

Program Committee: Astrid Aksnes, Norwegian Univ. of Science and Technology (Norway); Armando Albertazzi Gonçalves, Univ. Federal de Santa Catarina (Brazil); Gastón A. Ayubi, Univ. de la República Uruguay (Uruguay); Brent C. Bergner, Mahr (USA); Jan Burke, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Peter J. de Groot, Zygo Corporation (USA); Nicholas Devaney, National Univ. of Ireland, Galway (Ireland); Konstantinos Falaggis, The Univ. of North Carolina at Charlotte (USA); Pietro Ferraro, Istituto di Scienze Applicate e Sistemi Intelligenti "Eduardo Caianiello" (Italy); Marc P. Georges, Liège Univ. (Belgium); Goldie L. Goldstein, Nikon Research Corp. of America (USA); Ulf Griesmann, National Institute of Standards and Technology (USA); Tobias Haist, Institut für Technische Optik (Germany); Sen Han, Univ. of Shanghai for Science and Technology (China); Qian Kemao, Nanyang Technological Univ. (Singapore); Dae Wook Kim, Wyant College of Optical Sciences (USA); Beiwen Li, Iowa State Univ. of Science and Technology (USA); Klaus Mantel, Max-Planck-Institut für die Physik des Lichts (Germany); Amalia Martínez-García, Ctr. de Investigaciones en Óptica, A.C. (Mexico); Kate Medicus, Ruda-Cardinal, Inc. (USA); Daniel B. Millstone, 4D Technology Corp. (USA); Jiří Novák, Czech Technical Univ. in Prague (Czech Republic); Artur G. Olszak, Apre Instruments, LLC (USA); Yukitoshi Otani, Utsunomiya Univ. (Japan); Stéphane Perrin, ICube (France); Joanna Schmit, 4D Technology Corp. (USA); Michael Schulz, Physikalisch-Technische Bundesanstalt (Germany); Adam R. Styk, Warsaw Univ. of Technology (Poland); James D. Trolinger, MetroLaser, Inc. (USA); Maciej Trusiak, Warsaw Univ. of Technology (Poland); Christopher C. Wilcox, Air Force Research Lab. (USA); Song Zhang, Purdue Univ. (USA)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12223-23

#### Investigation on output variations of ring laser gyroscope in the presence of non-ideal sinusoidal dithering

Author(s): W.-S. Choi, C.-J. Kim, Agency for Defense Development (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12223-24

#### Interference and diffraction of the laser light on a water vapor microbubble

Author(s): Ana Karen Godínez, Arturo Guzmán, José Gabriel Ortega, Alfonso Padilla, Univ. Politécnica de Tulancingo (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12223-25

#### Spatial and temporal coherence measurement by modified Michelson interferometer in a single setup

Author(s): Mohit K. Singh, Indian Institute of Science Education and Research Pune (India)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12223-27

#### Strain sensing setup based on a core-offset Mach-Zehnder interferometer with single mode fiber

Author(s): Marco Contreras, Daniel Alejandro Ramos Gonzalez, Univ. de Guanajuato (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12223-29

#### Design and implementation of a fiber-fed Fourier transform spectrograph for astronomical applications

Author(s): Pornapa Artsang, Suranaree Univ. of Technology (Thailand), National Astronomical Research Institute of Thailand (Thailand), Synchrotron Light Research Institute (Thailand); Christophe Buisset, Pakakaew Rittipruk, Sirinrat Sithajan, Supachai Awiphan, Boonrucksar Soonthornthum, Saran Poshayachinda, National Astronomical Research Institute of Thailand (Thailand); Panomsak Meemon, Suranaree Univ. of Technology (Thailand)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: ON THE FRINGE

24 August 2022 • 9:00 AM - 10:10 AM PDT | Conv. Ctr. Room 17A

Session Chair: Rosario Porrás-Aguilar, The Univ. of North Carolina at Charlotte (USA)

### 12223-1

#### Heterodyne interferometer microscopy for high precision surface measurement (Invited Paper)

Author(s): Dennis Leitz, Maxim Scomarohov, Christian Rembe, Technische Univ. Clausthal (Germany)

24 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 17A

### 12223-3

#### Wavefront sensor fusion via shallow decoder neural networks for aero-optical predictive control

Author(s): Shervin Sahba, Univ. of Washington (USA); Christopher C. Wilcox, Austin McDaniel, Benjamin D. Shaffer, Air Force Research Lab. (USA); Steven L. Brunton, J. Nathan Kutz, Univ. of Washington (USA)

24 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 17A

### 12223-4

#### Vision ray metrology: a new versatile tool for the metrology and alignment of optics

Author(s): Ana Hiza Ramirez-Andrade, Shohreh Shadalou, Dustin Gurganus, Matthew A. Davies, Thomas J. Suleski, Konstantinos Falaggis, The Univ. of North Carolina at Charlotte (USA)

24 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 17A

## Break

### Coffee Break 10:10 AM - 10:40 AM

## SESSION 2: CHARACTERIZATION AND TECHNIQUES

24 August 2022 • 10:40 AM - 12:30 PM PDT | Conv. Ctr. Room 17A

Session Chair: Malgorzata Kujawinska, Warsaw Univ. of Technology (Poland)

### 12223-6

#### Characterization of surface texture-measuring optical microscopes using a binary pseudo-random array standard (Invited Paper)

Author(s): Ulf Griesmann, National Institute of Standards and Technology (USA); Keiko Munechika, HighRI Optics, Inc. (USA); T. Brian Renegar, X. Alan Zheng, Johannes A. Soons, Thomas A. Germer, National Institute of Standards and Technology (USA); Weilun Chao, Ian Lacey, Lawrence Berkeley National Lab. (USA); Carlos Pina-Hernandez, HighRI Optics, Inc. (USA); Peter Z. Takacs, Surface Metrology Solutions, LLC (USA); Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (USA)

24 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 17A

**12223-7****Binary pseudo-random array standards for calibration of 3D optical surface profilers used for metrology with aspheric x-ray optics**

Author(s): Keiko Munechika, HighRI Optics, Inc. (USA); Simon Rochester, Rochester Scientific, LLC (USA); Scott Dhuey, The Molecular Foundry, Lawrence Berkeley National Lab. (USA); Weilun Chao, The Ctr. for X-Ray Optics, Lawrence Berkeley National Lab. (USA); Ian Lacey, Advanced Light Source, Lawrence Berkeley National Lab. (USA); Carlos Pina-Hernandez, HighRI Optics, Inc. (USA); Valeriy Yashchuk, Advanced Light Source, Lawrence Berkeley National Lab. (USA)

24 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 17A

**12223-8****Calibration, modeling, parameterization, and verification of the instrument transfer function of an interferometric microscope**

Author(s): P. Z. Takacs, Surface Metrology Solutions LLC (USA); S. Rochester, Rochester Scientific, LLC (USA); I. Lacey, Lawrence Berkeley National Lab. (USA); K. Munechika, HighRI Optics, Inc. (USA); V. V. Yashchuk, Lawrence Berkeley National Lab. (USA)

24 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 17A

**12223-9****Fast locally adaptive method for optical fringe pattern filtering**

Author(s): Mikołaj Rogalski, Jędrzej Szpygiel, Warsaw Univ. of Technology (Poland); Antonio Ciccone, Univ. degli Studi dell'Aquila (Italy); Maciej Trusiak, Warsaw Univ. of Technology (Poland)

24 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 17A

**12223-10****Determination of the characteristics of a self-built coherence scanning interferometer with a universal calibration artefact**

Author(s): Matthias Eifler, IU International Univ. of Applied Sciences (Germany); Technische Univ. Kaiserslautern (Germany); Julian Hering, Georgis Bulun, Georg von Freymann, Jörg Seewig, Technische Univ. Kaiserslautern (Germany)

24 August 2022 • 12:10 PM - 12:30 PM PDT | Conv. Ctr. Room 17A

**Break**

**Lunch Break 12:30 PM - 2:00 PM**

**SESSION 3: VIKRAM LECTURE**

24 August 2022 • 2:00 PM - 2:40 PM PDT | Conv. Ctr. Room 17A

Session Chair: Katherine Creath, Optineering (USA)

**12223-11****55 years of holographic non-destructive testing and experimental stress analysis: Is there still progress to be expected? (Invited Paper)**

Author(s): Wolfgang Osten, Institut für Technische Optik (Germany)

24 August 2022 • 2:00 PM - 2:40 PM PDT | Conv. Ctr. Room 17A

**Break**

**Coffee Break 2:40 PM - 3:10 PM**

**SESSION 4: BIOLOGICAL MEASUREMENT TECHNIQUES**

24 August 2022 • 3:10 PM - 5:20 PM PDT | Conv. Ctr. Room 17A

Session Chair: Michael B. North-Morris, 4D Technology Corp. (USA)

**12223-12****High-speed live cell interferometry for functional drug sensitivity screening of bioprinted tumor organoids (Invited Paper)**

Author(s): Bowen Wang, Univ. of California, Los Angeles (USA); Peyton J. Tebon, David Geffen School of Medicine, Univ. of California, Los Angeles (USA); Alexander L. Markowitz, David Geffen School of Medicine, Univ. of California, Los Angeles (USA); UCLA Jonsson Comprehensive Cancer Ctr. (USA); Graeme F. Murray, Virginia Commonwealth Univ. (USA); Huyen Nguyen, Nasrin Tavaniae, David Geffen School of Medicine, Univ. of California, Los Angeles (USA); Thang L. Nguyen, Univ. of California, Los Angeles (USA); Paul C. Boutros, David Geffen School of Medicine, Univ. of California, Los Angeles (USA); UCLA Jonsson Comprehensive Cancer Ctr. (USA); Alice Soragni, David Geffen School of Medicine, Univ. of

California, Los Angeles (USA); UCLA Jonsson Comprehensive Cancer Ctr. (USA); Molecular Biology Institute (USA); Michael A. Teitell, David Geffen School of Medicine, Univ. of California, Los Angeles (USA); UCLA Jonsson Comprehensive Cancer Ctr. (USA)

24 August 2022 • 3:10 PM - 3:40 PM PDT | Conv. Ctr. Room 17A

**12223-13****Metrological assessment of reconstruction accuracy in holographic tomography**

Author(s): Malgorzata Kujawinska, Michal Ziemczonok, Warsaw Univ. of Technology (Poland)

24 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 17A

**12223-14****Digital holographic microscopy for volumetric, three-dimensional characterization of bacterial motility**

Author(s): Jian Gao, MetroLaser, Inc. (USA); Jarl Carnahan, Gladys Alexandre, The Univ. of Tennessee Knoxville (USA); James Trolinger, MetroLaser, Inc. (USA)

24 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 17A

**12223-15****Longitudinal xenograft zebrafish investigation using polarization-sensitive Jones-matrix optical coherence tomography**

Author(s): Antonia Lichtenegger, Junya Tamaoki, Tomoko Mori, Pradipta Mukherjee, Lida Zhu, Lixuan Bian, Ibrahim Abd El-Sadek, Shuichi Makita, Satoshi Matsusaka, Makoto Kobayashi, Univ. of Tsukuba (Japan); Bernhard Baumann, Medizinische Univ. Wien (Austria); Yoshiaki Yasuno, Univ. of Tsukuba (Japan)

24 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 17A

**12223-16****Common-path grating-based interferometers with altered temporal and spatial coherence of illumination for quantitative phase microscopy and tomography**

Author(s): M. Trusiak, K. Patorski, P. Zdanowski, J. Winnik, W. Lipke, Warsaw Univ. of Technology (Poland)

24 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 17A

**12223-30****Single-shot quantitative phase microscopy in common path configuration**

Author(s): Brandon Norton, The Univ. of North Carolina at Charlotte (USA); Bryce Evans, The Univ. of Tennessee Knoxville (USA); Juan Viveros-Escoto, Rosario Porras-Aguilar, The Univ. of North Carolina at Charlotte (USA)

24 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 17A

**SESSION 5: NOVEL TECHNIQUES**

25 August 2022 • 9:30 AM - 11:40 AM PDT | Conv. Ctr. Room 10

Session Chair: Wolfgang Osten, Institut für Technische Optik (Germany)

**12223-17****Vibration insensitive fiber optic spectral interferometric probe for metrology of topography and thickness of multilayer samples (Invited Paper)**

Author(s): Wojtek J. Walecki, Optoprofiler LLC (USA)

25 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 10

**12223-18****New optical diagnostics tools for grading additive manufactured parts**

Author(s): James Trolinger, Jian Gao, MetroLaser, Inc. (USA); Cecil Hess, Amit Lal, OMS Corp. (USA)

25 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 10

**12223-19****Optomechanical technologies for broadband inertial sensing**

Author(s): Andrea Nelson, Texas A&M Univ. (USA); The Univ. of Arizona (USA); Adam Hines, Texas A&M Univ. (USA); Yanqi Zhang, Texas A&M Univ. (USA); The Univ. of Arizona (USA); Felipe Guzmán, Texas A&M Univ. (USA)

25 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 10

## CONFERENCE 12223

### **12223-20**

#### **A nanophotonic interferometer for small particle detection**

Author(s): A. Ghaffari, K. Do, S. Kashani, K. Weninger, R. Riehn, North Carolina State Univ. (USA)

25 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 10

### **12223-21**

#### **Variable shearing holography with geometric phase elements**

Author(s): P. Shanmugam, A. Light, A. Turley, K. Falaggis, The Univ. of North Carolina at Charlotte (USA)

25 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 10

### **12223-22**

#### **High resolution phase-stepping shearography by using 24 megapixel digital still imaging device**

Author(s): Awatef Rashid Al Jabri, Kazi Monowar Abedin, S.M. Mujibur Rahman, Sultan Qaboos Univ. (Oman)

25 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 10



# Space Systems Contamination: Prediction, Control, and Performance 2022

23 - 24 August 2022 | Conv. Ctr. Room 14B

Conference Chairs: Carlos E. Soares, Jet Propulsion Lab. (USA); Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Bruce A. Matheson, Ball Aerospace (USA)

Program Committee: Hagop Barsamian, The Aerospace Corp. (USA); Nancy Carosso, NASA Goddard Space Flight Ctr. (USA); Joanne Egges, Ball Aerospace (USA); William A. Hoey, Jet Propulsion Lab. (USA); Alvin Y. Huang, The Boeing Co. (USA); Matthew Macias, Northrop Grumman Corp. (USA); Riccardo Rampini, European Space Research and Technology Ctr. (Netherlands); Jean-Francois Roussel, ONERA (France); Antonio Saverino, Thales Alenia Space (Italy); Elaine E. Seasily, NASA (USA)

## SESSION 1: JAMES WEBB SPACE TELESCOPE: PLANNING AND PREDICTING

23 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 14B

Session Chair: Alan C. Abeel, SGT, Inc. (USA)

### 12224-1 James Webb Space Telescope (JWST) keynote (Keynote Presentation)

Author(s): Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 8:30 AM - 9:10 AM PDT | Conv. Ctr. Room 14B

### 12224-3 Numerical study of water ice and molecular contamination build up during JWST deployment

Author(s): Lubos Brieda, Marc Laugharn, Particle In Cell Consulting, LLC (USA); Michael Woronowicz, Kelly Henderson-Nelson, KBR, Inc. (USA); Christopher May, MAZE Engineering Solutions, Inc. (USA); Eve Wooldridge, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 14B

### 12224-4 Obtaining cryogenic molecular transport data for analysis

Author(s): Elaine M. Stewart, Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Michael S. Woronowicz, Kelly Henderson-Nelson, George Meadows, KBR, Inc. (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 14B

### 12224-5 Precious cargo: transporting contamination-sensitive instruments and optics

Author(s): Joseph O. Ward, Craig B. Jones, KBR, Inc. (USA); Edwin W. Goldman, Prime Science & Technology Inc. (USA)

23 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 14B

**Break**  
**Coffee Break 10:10 AM - 10:40 AM**

## SESSION 2: JAMES WEBB SPACE TELESCOPE: IMPLEMENTING I

23 August 2022 • 10:40 AM - 12:00 PM PDT | Conv. Ctr. Room 14B

Session Chair: Larkin B. Carey, Ball Aerospace (USA)

### 12224-6 Necessity for professionally trained CC technicians to support the James Webb Space Telescope integration, testing, and launch campaign

Author(s): Edwin W. Goldman, Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Kelly A. Henderson-Nelson, KBR, Inc. (USA); Colette D. Lepage, Azuka J. Harbor, Jason E. Durner, NASA Goddard Space Flight Ctr. (USA); Raymond J. LeVesque, KBR, Inc. (USA)

23 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 14B

### 12224-7 Environmental testing contamination sensitive instruments and optics in non-cleanliness-controlled facilities

Author(s): Craig B. Jones, KBR, Inc. (USA); Eve M. Wooldridge, Alan C. Abeel, NASA Goddard Space Flight Ctr. (USA); Colette D. Lepage, Peraton (USA)

23 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 14B

### 12224-32 Operating and maintaining the JWST cleanroom attached to JSC's chamber A during preparations for the OTIS cryogenic thermal vacuum test

Author(s): Kelly A. Henderson-Nelson, Joseph Ward, Jason Durner, KBR Inc (USA); Jason Brandon, KBR Inc. (USA); Edwin Goldman, Prime Scientific (USA); Zao Huang, Peraton Inc (USA); Jonathan Homan, Johnson Space Ctr. (USA)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 14B

### 12224-9 Molecular flow venting of a volume with an outgassing or desorbing source

Author(s): Michael Woronowicz, KBR, Inc. (USA)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 14B

**Break**  
**Lunch Break 12:00 PM - 1:30 PM**

## SESSION 3: JAMES WEBB SPACE TELESCOPE: IMPLEMENTING II

23 August 2022 • 1:30 PM - 2:30 PM PDT | Conv. Ctr. Room 14B

Session Chair: Marco Calcabrini, Arianespace (France)

### 12224-10 Molecular accumulation during JWST's optical telescope cryogenic thermal vacuum testing

Author(s): Kelly Henderson-Nelson, Michael Woronowicz, KBR, Inc. (USA); Carl Reis, NASA Goddard Space Flight Ctr. (USA); Jesse Huguet, L3Harris Technologies, Inc. (USA); Keith Havey, KAH Consulting (USA)

23 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 14B

### 12224-11 Evaluating the performance of portable air filter walls for the James Webb Space Telescope launch campaign

Author(s): Alan C. Abeel, NASA Goddard Space Flight Ctr. (USA); Craig B. Jones, KBR, Inc. (USA); Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Edwin W. Goldman, Prime Science & Technology, Inc. (USA); Colette D. Lepage, Peraton Corp. (USA)

23 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 14B

### 12224-12 Transforming any facility for meeting strict cleanliness requirements

Author(s): Eve M. Wooldridge, Alan C. Abeel, NASA Goddard Space Flight Ctr. (USA); Craig B. Jones, Kelly A. Henderson-Nelson, Joseph O. Ward, KBR, Inc. (USA); Elaine M. Stewart, NASA Goddard Space Flight Ctr. (USA); Edwin W. Goldman, Prime Science and Technology, Inc. (USA); Jason E. Durner, KBR, Inc. (USA); Colette D. Lepage, Azuka J. Harbor, Peraton (USA)

23 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 14B

**Break**  
**Coffee Break 2:30 PM - 3:00 PM**

## CONFERENCE 12224

### Panel Discussion on Space Systems Contamination Control

23 August 2022 • 3:00 PM - 3:45 PM PDT | Conv. Ctr. Room 14B

Session Chair: Elaine E. Seasly, NASA (USA)

This panel Session is dedicated to an interactive discussion (questions and answers) on Space Systems Contamination Control and Effects. We encourage participation and questions from new and early career professionals in related disciplines, and provide an opportunity for engagement with subject matter experts.

Panelists:

William A. Hoey, Jet Propulsion Lab. (USA)

Alvin Y. Huang, The Boeing Co. (USA)

Antonio Saverino, Thales Alenia Space (Italy)

Jean-Francois Roussel, ONERA (France)

Riccardo Rampini, European Space Research and Technology Ctr. (Netherlands)

### OPTICAL ENGINEERING PLENARY SESSION

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

**4:00 to 4:05 PM: Welcome and Opening Remarks**

**12221-501**

**The James Webb Space Telescope: an optical success story! (Plenary Presentation)**

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

### SESSION 4: JAMES WEBB SPACE TELESCOPE: LAUNCH CAMPAIGN

24 August 2022 • 9:00 AM - 10:50 AM PDT | Conv. Ctr. Room 14B

Session Chair: Olivier Schmeitzky, European Space Research and Technology Ctr. (Netherlands)

**12224-13**

**Overview of contamination control for the James Webb Space Telescope launch campaign (Invited Paper)**

Author(s): Alan C. Abeel, Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Marco Calcabrini, Arianespace (France); Joseph O. Ward, KBR, Inc. (USA); Olivier Schmeitzky, European Space Research and Technology Ctr. (Netherlands)

24 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 14B

**12224-14**

**Predicting contamination accumulation in facilities with limited data**

Author(s): Elaine M. Stewart, Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Joseph O. Ward, KBR, Inc. (USA)

24 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 14B

**12224-15**

**Development of an analytical transient evacuation model for the fairing jettison process**

Author(s): Michael Woronowicz, KBR, Inc. (USA)

24 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 14B

**12224-16**

**Establishing cleaning methods for cleanroom and safety suits at remote sites with available resources**

Author(s): Colette D. Lepage, Peraton Corp. (USA); Alan C. Abeel, Elaine M. Stewart, NASA Goddard Space Flight Ctr. (USA); Ismael Rodriguez, Ctr. Spatial Guyanais (French Guiana); Cole T. Horton, Kimberly Z. Morales, Prime Science and Technology, Inc. (USA)

24 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 14B

**12224-17**

**Clean air shower curtain for protection of contamination sensitive telescopes on the Ariane 5 launcher**

Author(s): Marco Calcabrini, Arianespace (France); Alan C. Abeel, NASA Goddard Space Flight Ctr. (USA); Amelia Simon, Arianespace (France); Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (USA); Bruno Erin, Arianespace (France)

24 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 14B

**Break**

**Coffee Break 10:50 AM - 11:20 AM**

### SESSION 5: CONTAMINATION CONTROL AND PLANETARY PROTECTION FOR SPACE MISSIONS

24 August 2022 • 11:20 AM - 12:40 PM PDT | Conv. Ctr. Room 14B

Session Chair: Jean-Francois Roussel, ONERA (France)

**12224-19**

**Particle contamination launch redistribution and effects on the low-earth-orbit infrared SPHEREx telescope**

Author(s): John M. Alred, Maxwell G. Martin, William A. Hoey, Jet Propulsion Lab. (USA); Phil Korngut, Caltech (USA); Jennifer M. Rocca, Carlos E. Soares, Jet Propulsion Lab. (USA)

24 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 14B

**12224-20**

**Contamination control program for the Psyche asteroid mission**

Author(s): Maxwell G. Martin, John M. Alred, William A. Hoey, Cynthia S. Ly, Carlos E. Soares, Jet Propulsion Lab., NASA (USA)

24 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 14B

**12224-21**

**Modeling of contamination vent path for outgassing components underneath thermal blankets on Europa Clipper**

Author(s): Valentina Ricchiuti, Daniel Fugett, Carlos Soares, Jet Propulsion Lab., NASA (USA)

24 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 14B

**12224-22**

**Development and results of APL box-level effusion cell for outgassing verification of Europa Clipper hardware**

Author(s): John Nichols, Johns Hopkins Univ. Applied Physics Lab., LLC (USA)

24 August 2022 • 12:20 PM - 12:40 PM PDT | Conv. Ctr. Room 14B

**Break**

**Lunch Break 12:40 PM - 2:10 PM**

### SESSION 6: SPACE SYSTEMS CONTAMINATION ANALYSIS AND MODELING

24 August 2022 • 2:10 PM - 3:10 PM PDT | Conv. Ctr. Room 14B

Session Chair: William A. Hoey, Jet Propulsion Lab. (USA)

**12224-24**

**Separation of contaminant species by TGA/MS in European and US approaches to outgassing**

Author(s): David Lansade, Jean-François Roussel, ONERA (France); John M. Alred, Anthony T. Wong, John R. Anderson, Carlos E. Soares, Jet Propulsion Lab. (USA); Delphine Faye, Guillaume Rioland, Ctr. National d'Études Spatiales (France)

24 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 14B

**12224-23**

**Application of contaminant species separation by TGA/MS to unraveling outgassing physics and laws**

Author(s): Jean-Francois Roussel, David Lansade, ONERA (France); John M. Alred, Jet Propulsion Lab., Caltech (USA); Anthony T. Wong, John R. Anderson, Carlos E. Soares, Jet Propulsion Lab. (USA); Delphine Faye, Guillaume Rioland, Ctr. National d'Études Spatiales (France)

24 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 14B

**12224-25****Experimental investigation of QCM-derived sticking coefficients for use in molecular transport simulations**

Author(s): Lubos Brieda, Particle In Cell Consulting, LLC (USA); Elana Helou, Tianxiang Zhao, Joseph Wang, The Univ. of Southern California (USA); Denisse Aranda, Vince Green, Syed Iqbal, Blue Origin LLC (USA)

24 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 14B

**Break**

**Coffee Break 3:10 PM - 3:40 PM**

**SESSION 7: CONTAMINATION CONTROL PRACTICES AND APPLICATIONS TO SPACE SYSTEMS**

24 August 2022 • 3:40 PM - 5:40 PM PDT | Conv. Ctr. Room 14B

Session Chair: Antonio Saverino, Thales Alenia Space (Italy)

**12224-26****Performance review of a UV/vis/IR fluorescence hyperspectral camera to detect contamination on spacecraft during integration**

Author(s): Frédéric Bourcier, LUMETIS (France); Philippe Walter, LUMETIS (France), Lab. d'Archéologie Moléculaire et Structurale (France); Delphine Faye, Guillaume Rioland, Ctr. National d'Études Spatiales (France); Fulvio Infante, LUMETIS (France), Lab. d'Archéologie Moléculaire et Structurale (France); Emmanuel Gouisset, Quentin Trecul, Intraspec Technologies (France); Rodolphe Johansson, Yassir Lairgi, Ctr. National d'Études Spatiales (France)

24 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 14B

**12224-27****The role of surface cleanliness in contamination control**

Author(s): K. Agricola, Brookhuis Applied Data Intelligence (Netherlands)

24 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 14B

**12224-28****Long term observations of molecular film accumulation**

Author(s): Jonathan W. Arenberg, Matthew J. Macias, Lauren D. White, Ricardo Lara, Northrop Grumman Systems Corp. (USA)

24 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 14B

**12224-29****Effects of space radiation and molecular contamination on optics**

Author(s): Aileen O. Hui, Abraham N. Buditama, De-Ling Liu, Diana R. Alaan, Samuel L. Dunscombe, The Aerospace Corp. (USA)

24 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 14B

**12224-30****Comparing methods for surface cleanliness characterization**

Author(s): Andrew B. Robbins, Abraham N. Buditama, The Aerospace Corp. (USA)

24 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 14B

**12224-31****Laser based cleaning and in-situ verification of bio-loading for planetary protection**

Author(s): Andrew Robbins, The Aerospace Corp. (USA); Sean Jergensen, Univ. of California, Los Angeles (USA); Meg Abraham, Henry Helvajian, The Aerospace Corp. (USA)

24 August 2022 • 5:20 PM - 5:40 PM PDT | Conv. Ctr. Room 14B

# Optics and Photonics for Information Processing XVI

24 August 2022 | Conv. Ctr. Room 14A

Conference Chairs: Abdul A. S. Awwal, Lawrence Livermore National Lab. (USA); Khan M. Iftekharruddin, Old Dominion Univ. (USA); Victor Hugo Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

Conference Co-Chair: Andrés Márquez, Univ. de Alicante (Spain)

Program Committee: Md. Zahangir Alam, St. Jude Children's Research Hospital (USA); George Barbastathis, Massachusetts Institute of Technology (USA); Juan Campos, Univ. Autònoma de Barcelona (Spain); Liangcai Cao, Tsinghua Univ. (China); Xinbin Cheng, Tongji Univ. (China); Mireya Sarai García Vázquez, CITEDIPN Chapter (Mexico); Laurence G. Hassebrook, Univ. of Kentucky (USA); Rigoberto Juarez-Salazar, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico); Mohammad Ataul Karim, Univ. of Massachusetts Dartmouth (USA); Richard R. Leach, Lawrence Livermore National Lab. (USA); Byoungcho Lee, Seoul National Univ. (Korea, Republic of); Abhijit Mahalanobis, Univ. of Central Florida (USA); Mohammad A. Matin, Univ. of Denver (USA); Osamu Matoba, Kobe Univ. (Japan); Nasser M. Nasrabadi, West Virginia Univ. (USA); Adriana Nava-Vega, Univ. Autònoma de Baja California (Mexico); Mark A. Neifeld, The Univ. of Arizona (USA); Takanori Nomura, Wakayama Univ. (Japan); Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (USA); Philippe Réfrégier, Institut Fresnel (France); Joseph Rosen, Ben-Gurion Univ. of the Negev (Israel); Manar D. Samad, Tennessee State Univ. (USA); John T. Sheridan, Univ. College Dublin (Ireland); Volker J. Sorger, The George Washington Univ. (USA); Jun Tanida, Osaka Univ. (Japan); Cardinal Warde, Massachusetts Institute of Technology (USA); Eriko Watanabe, The Univ. of Electro-Communications (Japan); Toyohiko Yatagai, Utsunomiya Univ. (Japan); María J. Yzuel, Univ. Autònoma de Barcelona (Spain)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12225-22

#### Content dependent secret hiding in visual steganography

Author(s): Marek R. Ogiela, Lidia Ogiela, AGH Univ. of Science and Technology (Poland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: NEW ARCHITECTURE AND SYSTEMS

24 August 2022 • 8:15 AM - 9:55 AM PDT | Conv. Ctr. Room 14A

Session Chair: Victor Hugo Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

### 12225-24

#### Role of template selection in aligning beams in the Optical Thomson Scattering Laser at the National Ignition Facility

Author(s): Abdul A. S. Awwal, Roger R. Lowe-Webb, Mark W. Bowers, Tracy S. Budge, Lawrence Livermore National Lab. (USA)

24 August 2022 • 8:15 AM - 8:35 AM PDT | Conv. Ctr. Room 14A

### 12225-6

#### Programming nonlinearities inside multimode fibers for optical computing

Author(s): Ilker Oguz, Jih-Liang Hsieh, Niyazi Ulas Dinc, Ugur Tegin, Mustafa Yildirim, Carlo Gigli, Christophe Moser, Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

24 August 2022 • 8:35 AM - 8:55 AM PDT | Conv. Ctr. Room 14A

### 12225-7

#### High-resolution broadband RF spectrometer based on laser speckle imaging

Author(s): Matthew J. Kelley, The Aerospace Corp. (USA); Matthew N. Ashner, The Aerospace Corp. (USA), Electromagnetic Systems Inc. (USA); Radhika Bhuckory, The Aerospace Corp. (USA), Univ. of Southern California (USA); Thomas J. Shaw, George C. Valley, The Aerospace Corp. (USA)

24 August 2022 • 8:55 AM - 9:15 AM PDT | Conv. Ctr. Room 14A

### 12225-9

#### Programmable and reconfigurable silicon photonic circuits using the low-loss phase change material Sb<sub>2</sub>Se<sub>3</sub>

Author(s): Otto L. Muskens, Matthew Delaney, Univ. of Southampton (United Kingdom); Ioannis Zeimpekis, Optoelectronics Research Ctr. (United Kingdom); Daniel Lawson, Sophie Blundell, David Thomson, Dan Hewak, Univ. of Southampton (United Kingdom)

24 August 2022 • 9:15 AM - 9:35 AM PDT | Conv. Ctr. Room 14A

### 12225-10

#### Human functional pattern recognition with focus on hand detection in egocentric vision through an artificial intelligence approach

Author(s): Eytomilayo Yemisi Babatope, Mario López-Rodríguez, Jesus Alejandro Acosta-Franco, Mireya Sarai García-Vázquez, Instituto Politécnico Nacional (Mexico); Alejandro Álvaro Ramírez-Acosta, MIRAL R&D&I Multimedia (USA)

24 August 2022 • 9:35 AM - 9:55 AM PDT | Conv. Ctr. Room 14A

### Break

Coffee Break 9:55 AM - 10:25 AM

## SESSION 2: DIGITAL OPTICAL PROCESSING

24 August 2022 • 10:25 AM - 11:45 AM PDT | Conv. Ctr. Room 14A

Session Chair: Abdul A. S. Awwal, Lawrence Livermore National Lab. (USA)

### 12225-1

#### Fourier-based convolutional neural network accelerator

Author(s): Volker J. Sorger, The George Washington Univ. (USA)

24 August 2022 • 10:25 AM - 10:45 AM PDT | Conv. Ctr. Room 14A

### 12225-2

#### Driving assistance algorithm for self-driving cars based on semantic segmentation

Author(s): Luis Rodolfo Macias, Kenia Picos, Ulises Orozco-Rosas, CETYS Univ. (Mexico)

24 August 2022 • 10:45 AM - 11:05 AM PDT | Conv. Ctr. Room 14A

### 12225-3

#### Multi-projector system for dynamic scene platform of vehicle navigation evaluation

Author(s): Juan Zheng, Rigoberto Juarez-Salazar, Victor H. Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico), Instituto Politécnico Nacional (Mexico)

24 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 14A

**12225-4****Visual localization of an omnidirectional robot using color detection by a multicamera system**

Author(s): Sofia Esquivel-Hernandez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico); Cesar I. Gonzalez Mejia, Oscar E. Garcia Vargas, Univ. de Colima (Mexico); Rigoberto Juarez-Salazar, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico); Jorge Gudiño-Lau, Univ. de Colima (Mexico)

24 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 14A

**Break**

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

### SESSION 3: IMAGE FORMING AND PROCESSING APPLICATIONS

24 August 2022 • 1:45 PM - 3:25 PM PDT | Conv. Ctr. Room 14A

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

**12225-12****Secure multi-channel scheme for optical image encryption**

Author(s): Romil Audhkhasi, Michelle L. Povinelli, The Univ. of Southern California (USA)

24 August 2022 • 1:45 PM - 2:05 PM PDT | Conv. Ctr. Room 14A

**12225-13****Multi-baseline stereo vision for three-dimensional object reconstruction**

Author(s): Martin Gonzalez-Ruiz, Victor H. Diaz-Ramirez, Rigoberto Juarez-Salazar, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

24 August 2022 • 2:05 PM - 2:25 PM PDT | Conv. Ctr. Room 14A

**12225-14****Image processing using volume reflection gratings in a photorefractive material**

Author(s): Austin Scott, Partha P. Banerjee, Univ. of Dayton (USA)

24 August 2022 • 2:25 PM - 2:45 PM PDT | Conv. Ctr. Room 14A

**12225-16****Stereo vision-based 3D pointer for virtual object interaction**

Author(s): Rigoberto Juarez-Salazar, Sofia Esquivel-Hernandez, Juan Zheng, Victor H. Diaz-Ramirez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

24 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 14A

**12225-15****An investigation of the partitioning of images with respect to compressibility and spatial complexity**

Author(s): Anjan Ghosh, Dhirubhai Ambani Institute of Information and Communication Technology (India); Tamojay Deb, TTAADC Polytechnic Institute (India)

24 August 2022 • 3:05 PM - 3:25 PM PDT | Conv. Ctr. Room 14A

**Break**

**Coffee Break 3:25 PM - 3:55 PM**

### SESSION 4: ALGORITHMS AND IMAGE ANALYSIS

24 August 2022 • 3:55 PM - 5:55 PM PDT | Conv. Ctr. Room 14A

Session Chair: Abdul A. S. Awwal, Lawrence Livermore National Lab. (USA)

**12225-17****Exploring the importance of pooling schemes for convolutional neural networks in hiragana character classification**

Author(s): Hector Osuna, Marcos Moroyoqui, David Espina, Ulises Orozco-Rosas, Kenia Picos, CETYS Univ. (Mexico)

24 August 2022 • 3:55 PM - 4:15 PM PDT | Conv. Ctr. Room 14A

**12225-18****High-speed secure optical hashing for transformational computing**

Author(s): Maria Gorgone-Solyanik, The George Washington Univ. (USA); Behrouz Movahhed Nouri, Optelligence LLC (USA); Guru V. Venkataraman, Volker J. Sorger, The George Washington Univ. (USA)

24 August 2022 • 4:15 PM - 4:35 PM PDT | Conv. Ctr. Room 14A

**12225-19****Camera pose estimation based on local image correlation**

Author(s): Victor Diaz-Ramirez, Rigoberto Juarez-Salazar, Obed Rios-Orellana, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico), Instituto Politécnico Nacional (Mexico)

24 August 2022 • 4:35 PM - 4:55 PM PDT | Conv. Ctr. Room 14A

**12225-20****GPU implementation of FSR simulations: performance improvements and limitations**

Author(s): Nils Melchert, Leibniz Univ. Hannover (Germany); Jérôme Degallaix, Lab. des Matériaux Avancés (France); Lennart Hinz, Eduard Reithmeier, Leibniz Univ. Hannover (Germany)

24 August 2022 • 4:55 PM - 5:15 PM PDT | Conv. Ctr. Room 14A

**12225-21****Malware classification through image processing with a convolutional neural network**

Author(s): David Marin, Ulises Orozco-Rosas, Kenia Picos, CETYS Univ. (Mexico)

24 August 2022 • 5:15 PM - 5:35 PM PDT | Conv. Ctr. Room 14A

**12225-23****Colorectal cancer detection on portable devices using deep learning**

Author(s): Raef Taha, The Miami Valley School (USA)

24 August 2022 • 5:35 PM - 5:55 PM PDT | Conv. Ctr. Room 14A



# Applications of Digital Image Processing XLV

22 - 24 August 2022 | Conv. Ctr. Room 15B

Conference Chairs: Andrew G. Tescher, AGT Associates (USA); Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Conference Co-Chair: Michela Testolina, 2022 Acting Conference Chair, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Program Committee: Vasudev Bhaskaran, Qualcomm Inc. (USA); Antonin Descampe, intoPIX s.a. (Belgium); Dan Grois, Comcast Corp. (USA); Ofer Hadar, Ben-Gurion Univ. of the Negev (Israel); Ioannis Katsavounidis, Facebook Inc. (USA); C.-C. Jay Kuo, The Univ. of Southern California (USA); Shan Liu, Tencent America, LLC (USA); Andre J. Oosterlinck, KU Leuven Association (Belgium); Fernando Pereira, Instituto de Telecomunicações (Portugal); Yuriy A. Reznik, Brightcove, Inc. (USA); Thomas Richter, Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany); John A. Saghi, California Polytechnic State Univ., San Luis Obispo (USA); Peter Schelkens, Vrije Univ. Brussel (Belgium); Gary J. Sullivan, Microsoft Corp. (USA); David S. Taubman, The Univ. of New South Wales (Australia); Pankaj Topiwala, FastVDO Inc. (USA)

## Information

**Michela Testolina to act as Conference Chair onsite on behalf of Andrew G. Tescher and Touradj Ebrahimi.**

### SESSION 1: COMPRESSION I

22 August 2022 • 1:00 PM - 3:00 PM PDT | Conv. Ctr. Room 15B

Session Chair: Dan Grois, Comcast Corp. (Israel)

#### 12226-1

**Joint backward and forward temporal masking for perceptually optimized x265-based video coding**

Author(s): Dan Grois, Comcast Corp. (Israel); Alex Giladi, Comcast Corp. (USA)

22 August 2022 • 1:00 PM - 1:20 PM PDT | Conv. Ctr. Room 15B

#### 12226-3

**Spatial scalability with VVC: coding performance and complexity**

Author(s): Gwenaëlle Marquant, Charles Salmon-Legagneur, Fabrice Urban, Philippe de Lagrange, InterDigital, Inc. (France)

22 August 2022 • 1:20 PM - 1:40 PM PDT | Conv. Ctr. Room 15B

#### 12226-4

**AV1 benchmarking test for 3GPP**

Author(s): Zhijun Lei, Jun Sik Song, Facebook Inc. (USA); Adrian Grange, Jingning Han, Google (USA); John Simmons, Alliance for Open Media (USA); Andrey Norkin, Netflix, Inc. (USA)

22 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 15B

#### 12226-5

**Towards effective visual information storage on DNA support**

Author(s): Touradj Ebrahimi, Davi Nachtigall Lazzarotto, Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 15B

#### 12226-6

**Direct optimization of for HDR content adaptive transcoding in AV1**

Author(s): Vibhoothi ., François Pitié, Angeliki Katsenou, Daniel Joseph Ringis, Trinity College Dublin (Ireland); Yeping Su, Neil Birkbeck, Jessie Lin, Balu Adsumilli, Google (USA); Anil Kokaram, Trinity College Dublin (Ireland)

22 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 15B

#### 12226-7

**Towards efficient multi-codec streaming**

Author(s): Yuriy A. Reznik, Karl O. Lillevold, Abhijith Jagannath, Nabajeet Barman, Brightcove, Inc. (USA)

22 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 15B

#### Break

**Coffee Break 3:00 PM - 3:30 PM**

### SESSION 2: COMPRESSION II

22 August 2022 • 3:30 PM - 5:10 PM PDT | Conv. Ctr. Room 15B

Session Chair: Yuriy A. Reznik, Brightcove, Inc. (USA)

#### 12226-8

**Improving reference picture resampling (RPR) for future video coding**

Author(s): Philippe Bordes, Hassane Guermoud, Franck Galpin, Thierry Dumas, Fabrice Urban, InterDigital, Inc. (France)

22 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 15B

#### 12226-9

**A study on flexible block partitioning for future video coding standards**

Author(s): Fabrice Urban, Karam Naser, Franck Galpin, Tangi Poirier, InterDigital, Inc. (France)

22 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 15B

#### 12226-10

**Green image codec: a lightweight learning-based image coding method**

Author(s): Yifan Wang, Zhanxuan Mei, Qingyang Zhou, The Univ. of Southern California (USA); Ioannis Katsavounidis, Meta, Inc. (USA); C.-C. Jay Kuo, The Univ. of Southern California (USA)

22 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 15B

#### 12226-11

**High efficiency imaging**

Author(s): Xiteng Liu, Advanced Micro Devices, Inc. (Canada)

22 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 15B

#### 12226-13

**Advanced video quality assessment of leading codecs: AV1, VVC, and their draft successor designs**

Author(s): P. Topiwala, W. Dai, FastVDO Inc. (USA)

22 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 15B

### POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

#### 12226-51

**Fast algorithm of point cloud recovery**

Author(s): Alexey Ruchay, Federal Research Ctr. of Biological Systems and Agrotechnologies (Russian Federation); Ramin Chelabiev, Chelyabinsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

#### 12226-52

**Compression and standardization of point clouds for livestock**

Author(s): Alexey Ruchay, Federal Research Ctr. of Biological Systems and Agrotechnologies (Russian Federation); Ramin Chelabiev, Chelyabinsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-55****Clustering in coarse registration task and extraction of common parts of point clouds**

Author(s): Sergei Voronin, Artyom Makovetskii, Chelyabinsk State Univ. (Russian Federation); Vitaly Kober, Chelyabinsk State Univ. (Russian Federation), Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Aleksei Voronin, Mikhail Turov, Chelyabinsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-56****ICP error functional using point cloud geometry**

Author(s): Artyom Makovetskii, Sergei Voronin, Chelyabinsk State Univ. (Russian Federation); Vitaly Kober, Chelyabinsk State Univ. (Russian Federation), Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Aleksei Voronin, Chelyabinsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-57****Neural network for 3D point clouds alignment**

Author(s): Sergei Voronin, Chelyabinsk State Univ. (Russian Federation); Alexander Vasilyev, Peter the Great Saint-Petersburg Polytechnic Univ. (Russian Federation); Vitaly Kober, Chelyabinsk State Univ. (Russian Federation), Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico); Artyom Makovetskii, Aleksei Voronin, Dmitrii Zhernov, Chelyabinsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-58****A comparative study of convolutional network models for the classification of abnormalities in mammograms**

Author(s): J. Manuel Valencia-Moreno, J. Alejandro Gonzalez Sarabia, J. Angel González-Fraga, Everardo Gutiérrez-Lopez, Univ. Autónoma de Baja California (Mexico); Vitaly Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-59****Fast urve skeleton extraction from point clouds of livestock**

Author(s): Alexey Ruchay, Konstantin Dorofeev, Federal Research Ctr. of Biological Systems and Agrotechnologies (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-60****2-D/3-D fusion-based robust face recognition using deep learning**

Author(s): Konstantin Dorofeev, Alexey Ruchay, Federal Research Ctr. of Biological Systems and Agrotechnologies (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-61****Cow identification based on point clouds using transfer learning**

Author(s): Alexey Ruchay, Konstantin Dorofeev, Federal Research Ctr. of Biological Systems and Agrotechnologies (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12226-62****Fast algorithm of plane projection from point cloud**

Author(s): Alexey Ruchay, Alexey Gladkov, Federal Research Ctr. of Biological Systems and Agrotechnologies (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 3: HUMAN VISUAL SYSTEM AND PERCEPTION**

23 August 2022 • 8:00 AM - 9:40 AM PDT | Conv. Ctr. Room 15B

Session Chair: Pankaj Topiwala, FastVDO Inc. (USA)

**12226-14****Towards JPEG AIC part 3: visual quality assessment of high to visually-lossless image coding**

Author(s): Touradj Ebrahimi, Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

23 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 15B

**12226-15****Detection of facial expressions through neuromorphic computing**

Author(s): Teodoro Álvarez-Sánchez, Jesús A. Álvarez-Cedillo, Roberto Herrera-Charles, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

23 August 2022 • 8:20 AM - 8:40 AM PDT | Conv. Ctr. Room 15B

**12226-16****Optimal Rendition Resolution Selection Algorithm for Web Streaming Players**

Author(s): Yuriy A. Reznik, Nabajeet Barman, Brightcove, Inc. (USA); Rahul Vanam, Amazon Prime Video (USA)

23 August 2022 • 8:40 AM - 9:00 AM PDT | Conv. Ctr. Room 15B

**12226-17****Bootstrapping HDR video quality analysis from SDR via data-adaptive grading**

Author(s): P. Topiwala, W. Dai, FastVDO Inc. (USA)

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 15B

**12226-18****Perceptually motivated deep neural network for video compression artifact removal**

Author(s): Darren Ramsook, Anil Kokaram, Trinity College Dublin (Ireland); Neil Birkbeck, Yeping Su, Balu Adsumilli, Google (USA)

23 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 15B

**Break****Coffee Break 9:40 AM - 10:30 AM****SESSION 4: IMAGING SYSTEMS**

23 August 2022 • 10:30 AM - 11:50 AM PDT | Conv. Ctr. Room 15B

Session Chair: Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

**12226-45****CLASSROOM: synthetic high dynamic range light field dataset**

Author(s): Mary Guindy, Holografika Kft. (Hungary), Pázmány Péter Catholic Univ. (Hungary); Vamsi K. Adhikarla, Pázmány Péter Catholic Univ. (Hungary); Peter A. Kara, Budapest Univ. of Technology and Economics (Hungary), Kingston Univ. (United Kingdom); Tibor Balogh, Holografika Kft. (Hungary); Aniko Simon, Sigma Technology (Hungary)

23 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 15B

**12226-21****Comparison study of adaptive RGB-D SLAM systems**

Author(s): Alejandro Gonzalez-Sarabia, Jose A. Gonzalez-Fraga, Univ. Autónoma de Baja California (Mexico); Vitaly Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico), Chelyabinsk State Univ. (Russian Federation)

23 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 15B

**12226-22****Noise removal of thermal images using deep learning approach**

Author(s): Ahmet Çapci, ASELSAN A.S. (Turkey); H. Emre Güven, Cognizen Inc. (Turkey); B. Uğur Töreyn, Istanbul Technical Univ. (Turkey)

23 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 15B

**12226-24****On combining denoising with learning-based image decoding**

Author(s): Léo Larigauderie, Michela Testolina, Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

23 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 15B

**Break****Lunch/Exhibition Break 11:50 AM - 2:00 PM**

## CONFERENCE 12226

### Panel Discussion on Advanced Video Compression and Applications

23 August 2022 • 2:00 PM - 3:00 PM PDT | Conv. Ctr. Room 15B

Moderator:

Pankaj Topiwala, FastVDO Inc. (USA)

Panelists:

Yuriy Reznik, Brightcove, Inc. (USA)

Fabien Racapé, InterDigital, Inc. (USA)

Mathias Wien, RWTH Aachen Univ. (Germany)

Simone Ferrera, V-Nova Ltd. (United Kingdom)

Michael Horowitz, Google (USA)

There is currently the widest breadth of video codecs available for the massive \$200B video services industry, comprising broadcast, streaming, and other services, in history: MPEG-2, MPEG-4, AVC, HEVC, VVC, VP8, VP9, AV1, EVC, and LC-EVC. While these codecs compete in the marketplace for share of streams, the consumer surely benefits from having advanced services at lower rates. Is 4K HDR HEVC going to become the new norm for broadcast/streaming? But this is a challenging environment for developers and service providers. In this panel, we explore the breadth of consumer services that are enabled by these technologies, including high resolution: 4K, 8K, and beyond, as well as HDR, and AR/VR – will these finally take off and fulfill their promise? And is 8K the end of the line for consumer devices such as TVs, and even computers, tablets, and smartphones?

### Break

Coffee Break 3:00 PM - 3:30 PM

## SESSION 5: NEW IMAGING STANDARDS

23 August 2022 • 3:30 PM - 5:10 PM PDT | Conv. Ctr. Room 15B

Session Chair: Thomas Richter, Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany)

### 12226-26

#### C2PA: the world's first industry standard for content provenance

Author(s): Leonard Rosenthal, Adobe Inc. (USA)

23 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 15B

### 12226-28

#### Analysis of AV1 coding tools

Author(s): Hsiao-Chiang Chuang, Zhijun Lei, Meta Platforms, Inc. (USA); Agata Opalach, Andrey Norkin, Netflix, Inc. (USA)

23 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 15B

### 12226-29

#### JPEG XS screen content coding extensions

Author(s): Thomas Richter, Siegfried Foessel, Fraunhofer-Institut für Integrierte Schaltungen IIS (Germany)

23 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 15B

### 12226-31

#### Enhancing SVT-AV1 with LCEVC to improve quality-cycles tradeoffs in VOD applications

Author(s): Foued Ben Amara, Intel Corp. (Canada); Guendalina Cobiانchi, V-Nova Ltd. (United Kingdom); Ioannis Katsavounidis, Meta (USA); Faouzi Kossentini, Intel Corp. (Canada); Stergios Poularakis, V-Nova Ltd. (United Kingdom); Cosmin Stejerean, Meta (USA); Hassene Tmar, Intel Corp. (Canada)

23 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 15B

### 12226-27

#### Benchmarking and analysis of AV1 software decoding on Android devices

Author(s): Janne Grunnaу, Jean-Baptiste Kempf, Martin Storsjo, VideoLAN (France); Jeeva Raj A., Kaustubh Patankar, Mukund Srinivasan, Ittiam Systems Pvt. Ltd. (India); Ronald S. Bultje, Henrik Gramner, Luc Trudeau, Victorien Le Couvreur Tuffet, Two Orioles, LLC (USA); Zhijun Lei, Ioannis Katsavounidis, David Ronca, Meta Platforms, Inc. (USA)

23 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 15B

## SESSION 6: IMAGING APPLICATIONS

24 August 2022 • 10:00 AM - 11:40 AM PDT | Conv. Ctr. Room 15B

Session Chair: Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

### 12226-32

#### H.264 or H.265 for lossy surveillance video transmission: a database study

Author(s): P. Topiwala, W. Dai, FastVDO Inc. (USA)

24 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 15B

### 12226-33

#### DNA fragmentation index prediction using deep learning

Author(s): Lioz Noy, Itay Barnea, Simcha Mirsky, Dotan Kamar, Mattan Levi, Natan Tzvi Shaked, Tel Aviv Univ. (Israel)

24 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 15B

### 12226-35

#### Range enhancement of a semi-flash LiDAR system using a sparse VCSEL array and depth upsampling

Author(s): Jihoon Park, Junho Choi, Changmo Jeong, Hoonil Jeong, Dong ju Jang, Chan M. Lim, Sangwoo Park, Dong Kyu Kim, Junhyun Cho, Yong Yi Lee, SOS Lab. Co., Ltd. (Korea, Republic of)

24 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 15B

### 12226-36

#### Automating sports broadcasting using ultra-high definition cameras, neural networks, and classical denoising

Author(s): Sophia Rosney, Ciarán Donegan, Meegan Gower, Wissam Jassim, Hugh Denman, Donal Scannell, Anil Kokaram, Trinity College Dublin (Ireland)

24 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 15B

### 12226-37

#### Convolutional neural networks for automatic detection of breast pathologies

Author(s): 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); Everardo Gutiérrez López, Jose A. Gonzalez Sarabia, Univ. Autónoma de Baja California (Mexico)

24 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 15B

### Break

Lunch/Exhibition Break 11:40 AM - 2:00 PM

## SESSION 7: IMAGE AND VIDEO PROCESSING

24 August 2022 • 2:00 PM - 3:40 PM PDT | Conv. Ctr. Room 15B

Session Chair: Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

### 12226-38

#### An algorithm for a quality-optimized bit rate ladder generation for video streaming services using a neural network

Author(s): Andreas Kah, Maurice Klein, Hochschule RheinMain (Germany); Christoph Burgmair, Markus Rasokat, Joyn GmbH (Germany); Wolfgang Ruppel, Matthias Narroschke, Hochschule RheinMain (Germany)

24 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 15B

### 12226-39

#### FPGA synthesis of original chaotic system with application in imagen transmission

Author(s): Roberto Herrera-Charles, Ctr. de Investigación y Desarrollo de Tecnología Digital, Instituto Politécnico Nacional (Mexico); Miguel A. Estudillo-Valdez, Jose C. Nunez-Perez, Ctr. de Investigación y Desarrollo de Tecnología Digital (Mexico)

24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 15B

### 12226-40

#### An empirical approach for estimating the effect of a transcoding aware preprocessor

Author(s): Varoun Hanooman, Trinity College Dublin (Ireland); Yeping Su, Neil Birkbeck, Balu Adsumilli, Google (USA); Anil Kokaram, Trinity College Dublin (Ireland)

24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 15B

**12226-41****Redundancy in lattice algebra-based associative neural networks for image retrieval from noisy inputs**

Author(s): Gonzalo Urcid, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); José-Angel Nieves-Vázquez, Instituto Tecnológico Superior de San Andrés Tuxtla (Mexico); Rocío Morales-Salgado, Univ. Popular Autónoma del Estado de Puebla A.C. (Mexico)

24 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 15B

**12226-43****Plutchik's parallel algorithm for detection of facial expressions in real time**

Author(s): Jesus Antonio Alvarez-Cedillo, Teodoro Álvarez-Sánchez, Raul Junior Sandoval-Gomez, Instituto Politécnico Nacional (Mexico)

24 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 15B

**Break**

**Coffee Break 3:40 PM - 4:10 PM**

**SESSION 8: NEW IMAGING MODALITIES AND APPLICATIONS**

24 August 2022 • 4:10 PM - 5:30 PM PDT | Conv. Ctr. Room 15B

Session Chair: Michela Testolina, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

**12226-44****Quantitative performance evaluation in an augmented reality view enhancement driver assistant system**

Author(s): Lukas Jütte, Leibniz Univ. Hannover (Germany); Alexander Poschke, Benjamin Küster, Institut für Integrierte Produktion Hannover gGmbH (Germany); Ludger Overmeyer, Leibniz Univ. Hannover (Germany), Institut für Integrierte Produktion Hannover gGmbH (Germany)

24 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 15B

**12226-46****Skin cancer post-operative scar evaluation using autofluorescence features**

Author(s): Marta Lange, Univ. of Latvia (Latvia); Szabolcs Bozsányi, Semmelweis Univ. (Hungary); Emilija Vija Plorina, Univ. of Latvia (Latvia); Norbert Kiss, Nora N. Varga, Semmelweis Univ. (Hungary); Ilze Lihacova, Alexey Lihachev, Univ. of Latvia (Latvia)

24 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 15B

**12226-49****Private key and password protection by steganographic image encryption**

Author(s): Debesh Choudhury, Infosensys Research and Engineering (India); Sujoy Chakraborty, Stockton Univ. (USA)

24 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 15B

**12226-48****Enhancement of the axial resolution of optical-resolution photoacoustic microscopy using u-net-based convolutional neural network**

Author(s): Xianlin Song, Nanchang Univ. (China)

24 August 2022 • 5:10 PM - 5:30 PM PDT | Conv. Ctr. Room 15B

# Applications of Machine Learning 2022

23 - 24 August 2022 | Conv. Ctr. Room 12

Conference Chairs: Michael E. Zelinski, Lawrence Livermore National Lab. (USA); Tarek M. Taha, Univ. of Dayton (USA); Jonathan Howe, NVIDIA Corp. (USA)

Conference Co-Chairs: Abdul A. S. Awwal, Lawrence Livermore National Lab. (USA); Khan M. Iftakharuddin, Old Dominion Univ. (USA)

Program Committee: Md. Zahangir Alom, St. Jude Children's Research Hospital (USA); Brent D. Bartlett, BeamIO (USA); May V. Casterline, NVIDIA Corp. (USA); Brian Giera, Lawrence Livermore National Lab. (USA); James Henrikson, Lawrence Livermore National Lab. (USA); Don Lahiru Nirmal M. Hettiarachchi, Univ. of Dayton (USA); Nathan Mundhenk, Lawrence Livermore National Lab. (USA); Barath Narayanan Narayanan, Univ. of Dayton (USA); Karl Song-Jeng Ni, Etsy, Inc. (USA); Priyadip Ray, Lawrence Livermore National Lab. (USA); Manar D. Samad, Tennessee State Univ. (USA); Amanda K. Ziemann, Los Alamos National Lab. (USA)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12227-27

#### Deep learning approach for UAV-based weed detection in horticulture using edge processing

Author(s): Leif O. Harders, Vitali Czymmek, Stephan Hussmann, Fachhochschule Westküste (Germany); Andreas Wrede, Thorsten Ufer, Landwirtschafts-kammer Schleswig-Holstein (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12227-28

#### Breast cancer detection in digital mammography using phase features and machine learning approach

Author(s): Julia Diaz-Escobar, Instituto Tecnológico de Mexicali (Mexico); Vitaly Kober, Ctr. de Investigación Científica y de Educación Superior de Ensenada B.C. (Mexico), Chelyabinsk State Univ. (Russian Federation); Arnoldo Diaz-Ramirez, Instituto Tecnológico de Mexicali (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12227-29

#### Image classification and training with severe data loss

Author(s): Dillon Marquard, Kyle Wright, Roummel Marcia, Univ. of California, Merced (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12227-32

#### Optimization of image recognition for the identification of psoriasis and eczema

Author(s): Ankita Chatterjee, Lynbrook High School (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: REMOTE SENSING

23 August 2022 • 8:30 AM - 9:30 AM PDT | Conv. Ctr. Room 12

Session Chair: Amanda K. Ziemann, Los Alamos National Lab. (USA)

### 12227-2

#### Experiments in multi-sensor anomalous change detection for remote sensing imagery: dealing with highly disparate backgrounds

Author(s): Amanda K. Ziemann, Zigfried Hampel-Arias, Los Alamos National Lab. (USA)

23 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 12

### 12227-3

#### Synthetic aperture radar inverse scattering reconstruction using convolutional neural networks

Author(s): Jacqueline Alvarez, Arnold Kim, Roummel F. Marcia, Chrysoula Tsogka, Univ. of California, Merced (USA)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 12

### 12227-4

#### Refining polarimetric classification methods for deriving sea ice labels from synthetic aperture radar data

Author(s): Elena C. Reinisch, Lauren Castro, Los Alamos National Lab. (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 12

## SESSION 2: INDUSTRY

23 August 2022 • 9:30 AM - 10:30 AM PDT | Conv. Ctr. Room 12

Session Chair: Tarek M. Taha, Univ. of Dayton (USA)

### 12227-5

#### Automated melt pool characterization for metal additive manufacturing

Author(s): Sarah P. Mantell, Adam J. Wachtor, Garrison S. Flynn, Los Alamos National Lab. (USA); Matthew A. Ryder, Diana A. Lados, Worcester Polytechnic Institute (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 12

### 12227-7

#### SAFE: a deep-learning-based software for catch-control of small-scale fishing boats in Chile

Author(s): Vincenzo Caro Fuentes, Ariel P. Torres Sánchez, Jorge E. Pezosa, Sergio N. Torres, Rosario Castillo, Rubén Escribano, Mauricio Urbina, Univ. de Concepción (Chile)

23 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 12

### 12227-37

#### Unsupervised domain adaptation using feature aligned maximum classifier discrepancy

Author(s): Prasanna Reddy Pulakurthi, Sohail A. Dianat, Majid Rabbani, Rochester Institute of Technology (USA); Suya You, Raghuvveer M. Rao, DEVCOM Army Research Lab. (USA)

23 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 12

### Break

#### Coffee Break 10:30 AM - 11:00 AM

## SESSION 3: OPTICS I

23 August 2022 • 11:00 AM - 12:40 PM PDT | Conv. Ctr. Room 12

Session Chair: Tarek M. Taha, Univ. of Dayton (USA)

### 12227-8

#### Machine learning of transient structural-thermal-optical-performance (STOP) models

Author(s): Aleksandar Haber, Rochester Institute of Technology (USA); John E. Draganov, Michael Krainak, Relative Dynamics, Inc. (USA)

23 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 12

### 12227-9

#### Reinforcement learning for guiding optimization processes in optical design

Author(s): Cailing Fu, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Carlo Holly, RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 12



**12227-10****A beta-variational autoencoder (beta-VAE) to retrieve relevant degrees of freedom in a physical system**

Author(s): Joeri Lenaerts, Vrije Univ. Brussel (Belgium); Vincent Ginis, Vrije Univ. Brussel (Belgium), Harvard Univ. (USA)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 12

**12227-11****Optical characteristics optimized for machine perception using learning-based losses backpropagation through optical simulation pipeline**

Author(s): Patrice Roulet, Julie Buquet, ImmerVision (Canada)

23 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 12

**12227-12****Methodology for the design of the emissive Ir complex with the ab-initio screening and the reinforcement learning**

Author(s): Gyuhyeong Kim, Taeryang Hong, Nayeon Lee, JoongHwan Yang, Ji-Ho Baek, Jeom-Jae Kim, Soo-Young Yoon, LG Display (Korea, Republic of)

23 August 2022 • 12:20 PM - 12:40 PM PDT | Conv. Ctr. Room 12

**Break**

**Lunch/Exhibition Break 12:40 PM - 2:20 PM**

**SESSION 4: OPTICS II**

23 August 2022 • 2:20 PM - 3:40 PM PDT | Conv. Ctr. Room 12

Session Chair: Michael E. Zelinski, Lawrence Livermore National Lab. (USA)

**12227-13****Deep learning neural network solution for predicting the refractive index structure constant**

Author(s): Shaun A. Comino, Univ. of Central Florida (USA)

23 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 12

**12227-14****Impact of optical aberrations on image classification with deep neural networks**

Author(s): Page King, Ball Aerospace (USA); R. John Koshel, Wyant College of Optical Sciences (USA)

23 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 12

**12227-15****Boosting quantum optics experiments with Bayesian optimization**

Author(s): Philipp-Immanuel Schneider, Lin Zschiedrich, Martin Hamerschmidt, Lilli Kuen, Ivan Sekulic, JCMwave GmbH (Germany), Zuse Institute Berlin (Germany); Julien Kluge, Bastian Leykauf, Markus Krutzik, Humboldt-Univ. zu Berlin (Germany); Sven Burger, JCMwave GmbH (Germany), Zuse Institute Berlin (Germany)

23 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 12

**12227-16****CNN-based binary classification of 3D optical microscopic images**

Author(s): Da-in Choi, Taejin Kwon, Jeongtae So, Sunho Lim, KAIST (Korea, Republic of); Dongjun Woo, Nosung Lee, Jaewon Kim, SAMSUNG Display Co., Ltd. (Korea, Republic of); Seungryong Cho, KAIST (Korea, Republic of)

23 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 12

**Break**

**Coffee Break 3:40 PM - 4:00 PM**

**OPTICAL ENGINEERING PLENARY SESSION**

23 August 2022 • 4:00 PM - 4:45 PM PDT | Conv. Ctr. Room 6A

Session Chair: Allison A. Barto, Ball Aerospace (USA)

**4:00 to 4:05 PM: Welcome and Opening Remarks****12221-501****The James Webb Space Telescope: an optical success story! (Plenary Presentation)**

Author(s): Lee D. Feinberg, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6A

**SESSION 5: PHYSICS**

24 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 12

Session Chair: Nathan Mundhenk, Lawrence Livermore National Lab. (USA)

**12227-21****Fast emulation of density functional theory simulations using approximate Gaussian processes**

Author(s): Steven Stetzler, Univ. of Washington (USA); Michael Grosskopf, Earl Lawrence, Los Alamos National Lab. (USA)

24 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 12

**12227-22****Leveraging ML interpretability for diagnosing simulation-experiment discrepancy and augmenting model validation**

Author(s): Michael Grosskopf, Los Alamos National Lab. (USA); Rodrigo Navarro Perez, San Diego State Univ. (USA); Nicolas Schunck, Lawrence Livermore National Lab. (USA); Earl Lawrence, Los Alamos National Lab. (USA)

24 August 2022 • 8:20 AM - 8:40 AM PDT | Conv. Ctr. Room 12

**12227-23****A hierarchical sparse Gaussian process for in situ inference in expensive physics simulations**

Author(s): Kellin Rumsey, Michael Grosskopf, Earl Lawrence, Ayan Biswas, Los Alamos National Lab. (USA); Nathan Urban, Brookhaven National Lab. (USA)

24 August 2022 • 8:40 AM - 9:00 AM PDT | Conv. Ctr. Room 12

**12227-24****Automation of submicron resolution x-ray spectroscopy measurements and analysis using supervised and unsupervised machine learning algorithms**

Author(s): Rebecca A. Coles, Biays Bowerman, Martin Schoonen, Juergen Thieme, Brookhaven National Lab. (USA); Andrew Duffin, Pacific Northwest National Lab. (USA)

24 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 12

**12227-25****Naive data mining and machine learning for high resolution, sparse x-ray spectra**

Author(s): Emily S. Teti, Los Alamos National Lab. (USA); Sebastian Salazar, Los Alamos National Lab. (USA), Columbia Univ. (USA); Matthew H. Carpenter, Los Alamos National Lab. (USA)

24 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 12

**12227-26****Process-aware circuit simulation using machine learning compact models for metal oxide semiconductor capacitors under illumination**

Author(s): Zheng Kai Yang, Ya-Wen Ho, Tejender Rawat, Chung-Yuan Chang, Albert Lin, National Yang Ming Chiao Tung Univ. (Taiwan)

24 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 12

**Break**

**Coffee Break 10:00 AM - 10:30 AM**

**SESSION 6: MEDICAL IMAGING AND BIOLOGY**

24 August 2022 • 10:30 AM - 11:50 AM PDT | Conv. Ctr. Room 12

Session Chair: Cindy Gonzales, Lawrence Livermore National Lab. (USA)

**12227-17****Assessment of unsupervised clustering algorithms for label-free x-ray fluorescence microscopy data**

Author(s): M. A. Z. Chowdhury, Argonne National Lab. (USA); K. Ok, Michigan State Univ. (USA); Y. Luo, Z. Liu, S. Chen, Argonne National Lab. (USA); T. V. O'Halloran, Michigan State Univ. (USA); R. Kettimuthu, A. Tekawade, Argonne National Lab. (USA)

24 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 12

## CONFERENCE 12227

### **12227-33**

#### **Early detection of Alzheimer's via machine learning with multi-modal data**

Author(s): Danika Gupta, The Harker School (USA)

24 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 12

### **12227-34**

#### **Transfer learning and facial landmark feature fusion for classification of child facial expressions**

Author(s): Megan A. Witherow, Old Dominion University (USA); Manar D. Samad, Tennessee State University (USA); Norou Diawara, Khan M. Iftekharruddin, Old Dominion University (USA)

24 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 12

### **12227-35**

#### **An empirical study of digital signal filtering to improve Alzheimer's disease detection**

Author(s): Cindy Gonzales, Johns Hopkins Univ. (USA), Lawrence Livermore National Lab. (USA); Benjamin M. Rodriguez, Johns Hopkins Univ. (USA), Johns Hopkins Univ. Applied Physics Lab., LLC (USA)

24 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 12

# Ultrafast Nonlinear Imaging and Spectroscopy X

21 - 22 August 2022 | Conv. Ctr. Room 18

Conference Chairs: Zhiwen Liu, The Pennsylvania State Univ. (USA); Demetri Psaltis, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Kebin Shi, Peking Univ. (China)

Program Committee: George Barbastathis, Massachusetts Institute of Technology (USA); Randy A. Bartels, Colorado State Univ. (USA); Martin Centurion, Univ. of Nebraska-Lincoln (USA); Jason M. Eichenholz, Luminar Technologies, Inc. (USA); Kenan Gundogdu, North Carolina State Univ. (USA); Hans D. Hallen, North Carolina State Univ. (USA); Iam Choon Khoo, The Pennsylvania State Univ. (USA); Zhenyu Li, The George Washington Univ. (USA); Fiorenzo Gabriele Omenetto, Tufts Univ. (USA); Michelle Y. Sander, Boston Univ. (USA); Jigang Wang, Iowa State Univ. of Science and Technology (USA); Yong Xu, Virginia Polytechnic Institute and State Univ. (USA)

## SESSION 1: NANOSCALE PHENOMENA

21 August 2022 • 8:30 AM - 12:10 PM PDT | Conv. Ctr. Room 18

Session Chairs: Christopher Kliewer, Sandia National Labs. (USA), Panagis D. Samolis, Boston Univ. (USA)

### 12228-1 Observation of room temperature superfluorescence in hybrid perovskite (Invited Paper)

Author(s): Melike Biliroglu, Gamze Findik, Juliana Mendes, Dovletgeldi Seyitliyev, Lei Lei, Qi Dong, North Carolina State Univ. (USA); Yash Mehta, North Carolina State Univ (USA); Vasily Temnov, Institut des Molécules et Matériaux du Mans (France); Franky So, Kenan Gundogdu, North Carolina State Univ. (USA)

21 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 18

### 12228-2 Importance of lattice degrees of freedom for ultrafast nonlinear Kerr index in lead halide perovskites (Invited Paper)

Author(s): Zhanybek Alpichshev, Dusan Lorenc, Artem Volosniev, Institute of Science and Technology Austria (Austria); Ayan Zhumekenov, Osman Bakr, King Abdullah Univ. of Science and Technology (Saudi Arabia); Mikhail Lemeshko, Institute of Science and Technology Austria (Austria)

21 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 18

### 12228-3 Room temperature single nanocrystal anti-stokes shifted superfluorescence (Invited Paper)

Author(s): Kory Green, North Carolina State Univ. (USA); Kai Huang, Gang Han, Univ. of Massachusetts Medical School (USA); Hans Hallen, Shuang Fang Lim, North Carolina State Univ. (USA)

21 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 18

### Coffee Break 10:00 AM - 10:30 AM

### 12228-4 Nonlocal exciton dynamics in monolayer WS<sub>2</sub> (Invited Paper)

Author(s): Hans D. Hallen, North Carolina State Univ. (USA); Landon Hernandez, Da Zhou, Mauricio Terrones, Zhiwen Liu, The Pennsylvania State Univ. (USA)

21 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 18

### 12228-5 Mapping high-order nonlinear optical responses of 2-D materials using ultrafast Fourier transform microscopy (Invited Paper)

Author(s): Kenneth L. Knappenberger, The Pennsylvania State Univ. (USA)

21 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 18

### 12228-6 Coherent phonon-induced modulation of charge transfer in two-dimensional hybrid perovskites

Author(s): Dovletgeldi Seyitliyev, Kenan Gundogdu, North Carolina State Univ. (USA); Volker Blum, David B. Mitzi, Duke Univ. (USA); Wei You, The Univ. of North Carolina at Chapel Hill (USA); Svenja Janke, Manoj K. Jana, Xixi Qin, Duke Univ. (USA)

21 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 18

### 12228-6 Nonlinear transmittance and optical power limiting properties of reduced graphene oxide-Ag/Au-Fe<sub>2</sub>O<sub>3</sub> nanocomposites

Author(s): Saravanan Mani, Anna Univ. Chennai (India); Sabari Girisun T. C., Bharathidasan Univ. (India); Vetha Potheher I, Anna Univ. Chennai (India)

21 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 18

### Break

### Lunch Break 12:10 PM - 1:40 PM

## SESSION 2: NOVEL RAMAN SPECTROSCOPY

21 August 2022 • 1:40 PM - 3:50 PM PDT | Conv. Ctr. Room 18

Session Chair: Shuang Fang Lim, North Carolina State Univ. (USA)

### 12228-8 Surface-enhanced coherent Raman scattering with dielectric antennas (Invited Paper)

Author(s): Shamsul Abedin, Eric O. Potma, Univ. of California, Irvine (USA)

21 August 2022 • 1:40 PM - 2:10 PM PDT | Conv. Ctr. Room 18

### 12228-9 The development of an optical centrifuge for chemical dynamics studies as probed through time-resolved coherent Raman scattering (Invited Paper)

Author(s): Christopher Kliewer, Sandia National Labs. (USA)

21 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 18

### 12228-10 High speed doppler Raman for ultrasensitive coherent Raman microscopy (Invited Paper)

Author(s): Randy A. Bartels, Colorado State Univ. (USA)

21 August 2022 • 2:40 PM - 3:10 PM PDT | Conv. Ctr. Room 18

### 12228-11 Properties of correlated Stokes-anti-Stokes Raman scattering from diamond

Author(s): Ado Jorio, Raul Correa, Carlos H. Monken, Tiago A. Freitas, Univ. Federal de Minas Gerais (Brazil); Lucas V. Carvalho, Univ Federal de Minas Gerais (Brazil); Alfredo Vinícius A. Guimarães, Filomeno Aguiar, Univ. Federal de Minas Gerais (Brazil); Marcelo F. Santos, Univ. Federal do Rio de Janeiro (Brazil)

21 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 18

### 12228-33 Raman spectroscopy and imaging enhanced by hybrid optoplasmonic resonance

Author(s): Wenbo Mao, Yihang Li, Washington University in St Louis (USA); Zhiwen Liu, Pennsylvania State University (USA); Lan Yang, Washington University in St Louis (USA)

21 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 18

### Break

### Coffee Break 3:50 PM - 4:20 PM

## SESSION 3: SFG/SHG SPECTROSCOPY AND IMAGING

21 August 2022 • 4:20 PM - 5:30 PM PDT | Conv. Ctr. Room 18

Session Chair: Lingyan Shi, Univ. of California, San Diego (USA)

### 12228-12 High resolution imaging of collagen architecture alterations in ovarian cancer and idiopathic pulmonary fibrosis (Invited Paper)

Author(s): Paul J. Campagnola, Darian James, Emily Shelton, Nathan Sandbo, Manish Patankar, Univ. of Wisconsin-Madison (USA)

21 August 2022 • 4:20 PM - 4:50 PM PDT | Conv. Ctr. Room 18

### 12228-13 Phase-resolved, wide-field sum-frequency generation microscopy

Author(s): Ben John, Tuhin Khan, Richarda Niemann, Alexander Paarmann, Martin Wolf, Martin Thämer, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany)

21 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 18

## CONFERENCE 12228

**12228-14**

### **IR super-resolution microscopy of phonon polariton modes using sum-frequency generation**

Author(s): Richarda Niemann, Sören Wasserroth, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany); Guanyu Lu, Vanderbilt Univ. (USA); Sandy Gewinner, Marco De Pas, Wieland Schöllkopf, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany); Joshua D. Caldwell, Vanderbilt Univ. (USA); Martin Wolf, Alexander Paarmann, Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany)

21 August 2022 • 5:10 PM - 5:30 PM PDT | Conv. Ctr. Room 18

## SUNDAY EVENING PLENARY

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

### **6:00 PM - 6:05 PM: Welcome and Opening Remarks**

**12198-501**

### **In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502**

### **Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

## SESSION 4: BIOLOGICAL APPLICATIONS

22 August 2022 • 8:30 AM - 9:30 AM PDT | Conv. Ctr. Room 18

Session Chair: William Renninger, The Institute of Optics, Univ. of Rochester (USA)

**12228-15**

### **Integrated laser-induced fluorescence spectroscopy of donor-linker-acceptor constructs for bioenvironmental sensing (Invited Paper)**

Author(s): Sarah A. Mersch, Malachy A. Brink, Rowan Simonet, Univ. of Minnesota Duluth (USA); Arnold J. Boersma, Utrecht Univ. (Netherlands); Erin D. Sheets, Ahmed A. Heikal, Univ. of Minnesota Duluth (USA)

22 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 18

**12228-16**

### **Ultrafast nonlinear multimodal metabolic imaging platform for studying aging and diseases (Invited Paper)**

Author(s): Hongje Jang, Zhi Li, Yajuan Li, Pegah Bagheri, Univ. of California, San Diego (USA); Ellen Ackerstaff, Memorial Sloan-Kettering Cancer Ctr. (USA); Jason Koutcher, Memorial Sloan-Kettering Cancer Ctr. (USA); Cornell Univ. (USA); Lingyan Shi, Univ. of California, San Diego (USA)

22 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 18

**Break**

**Coffee Break 9:30 AM - 10:00 AM**

## SESSION 5: NOVEL ULTRAFAST/NONLINEAR DEVICES AND TECHNIQUES

22 August 2022 • 10:00 AM - 11:50 AM PDT | Conv. Ctr. Room 18

Session Chair: Jesse W. Wilson, Colorado State Univ. (USA)

**12228-18**

### **Computing with non-linear interactions in multimode fibers (Invited Paper)**

Author(s): Ilker Oguz, Jih-Liang Hsieh, Mustafa Yildirim, Demetri Psaltis, Christophe Moser, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

22 August 2022 • 10:00 AM - 10:30 AM PDT | Conv. Ctr. Room 18

**12228-19**

### **Fiber Kerr resonators for customizable ultrashort pulse generation (Invited Paper)**

Author(s): William Renninger, Xue Dong, The Institute of Optics, Univ. of Rochester (USA)

22 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 18

**12228-20**

### **Time resolved mid-infrared photothermal imaging (Invited Paper)**

Author(s): Panagis Samolis, Michelle Y. Sander, Boston Univ. (USA)

22 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 18

**12228-21**

### **Divided pulse soliton self-frequency shift source for nonlinear imaging and spectroscopy**

Author(s): Landon Hernandez, Atriya Ghosh, Victor Bucklew, Cheng-Yu Wang, Chen Zhou, Zhiwen Liu, The Pennsylvania State Univ. (USA)

22 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 18

**Break**

**Lunch Break 11:50 AM - 1:10 PM**

## SESSION 6: NOVEL NONLINEAR MATERIALS

22 August 2022 • 1:10 PM - 2:30 PM PDT | Conv. Ctr. Room 18

Session Chair: Xingjie Ni, The Pennsylvania State Univ. (USA)

**12228-22**

### **Nonlinear optical properties of inhomogeneous thin films (Keynote Presentation)**

Author(s): Yeshaiah Fainman, Muhan Yang, Chenchuan Gao, H-H Lin, Alex Friedman, Dmitrii Belogolovskii, Univ. of California, San Diego (USA)

22 August 2022 • 1:10 PM - 1:50 PM PDT | Conv. Ctr. Room 18

**12228-23**

### **Dual excitation beam deflection in nonlinear epsilon-near-zero materials**

Author(s): Adam R. Ball, Ray Secondo, Dhruv Fomra, Vitaly Avrutin, Umüt Özgür, Nathaniel Kinsey, Virginia Commonwealth Univ. (USA)

22 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 18

**12228-24**

### **Tunable nonlinear vibrational response of monolayer hBN**

Author(s): Fadil Iyikanat, Andrea Konecna, Javier García de Abajo, ICFO - Institut de Ciències Fotòniques (Spain)

22 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 18

**Break**

**Coffee Break 2:30 PM - 3:00 PM**

## SESSION 7: ADVANCED IMAGING TECHNOLOGIES

22 August 2022 • 3:00 PM - 5:30 PM PDT | Conv. Ctr. Room 18

Session Chair: Zhiwen Liu, The Pennsylvania State Univ. (USA)

**12228-25**

### **Continuously streaming compressed high-speed photography using time delay integration (Invited Paper)**

Author(s): Liang Gao, UCLA Samueli School of Engineering (USA)

22 August 2022 • 3:00 PM - 3:30 PM PDT | Conv. Ctr. Room 18

**12228-26**

### **Ultrafast imaging of phase transitions and structural dynamics in matter under extreme conditions (Invited Paper)**

Author(s): Mianzhen Mo, SLAC National Accelerator Lab. (USA)

22 August 2022 • 3:30 PM - 4:00 PM PDT | Conv. Ctr. Room 18

**12228-27**

### **Space-time encoding metasurface-enabled compressive ultrahigh-speed imaging (Invited Paper)**

Author(s): Xingjie Ni, Yao Duan, Xingwang Zhang, Cheng-Yu Wang, Zhiwen Liu, The Pennsylvania State Univ. (USA)

22 August 2022 • 4:00 PM - 4:30 PM PDT | Conv. Ctr. Room 18

**12228-28****Label-free visible wavelength transient absorption imaging: mitochondrial redox contrast and unsupervised spectral learning (Invited Paper)**

Author(s): Jesse W. Wilson, Erkang Wang, Arya Mugdha, Luke Whitcomb, Adam Chicco, Colorado State Univ. (USA)

22 August 2022 • 4:30 PM - 5:00 PM PDT | Conv. Ctr. Room 18

**12228-29****Spatial frequency modulation imaging: wavelength domain and spatial domain multiplexing (Invited Paper)**

Author(s): Jeffrey A. Squier, Daniel Scarbrough, Seth Cottrell, Scott Hunter, Colorado School of Mines (USA)

22 August 2022 • 5:00 PM - 5:30 PM PDT | Conv. Ctr. Room 18

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12228-30****Ultrafast transient absorption spectroscopy based on supercontinuum generation with non-linear photonic crystal fiber**

Author(s): Wolfgang Lakata, Cristina Consani, Mario Grueneberg, Gerald Auboeck, Silicon Austria Labs. GmbH (Austria)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12228-31****Characterization of a supercontinuum source for high-repetition-rate nonlinear spectroscopies**

Author(s): C. Consani, M. Grüneberg, W. Lakata, G. Auböck, Silicon Austria Labs. GmbH (Austria)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12228-32****High temperature quantum phase transition in methylammonium lead iodide**

Author(s): Gamze Findik, Melike Biliroglu, Dovletgeldi Seyitliyev, Juliana Mendes, Andrew Barrette, Hossein Ardekani, Lei Lei, Qi Dong, Franky So, Kenan Gundogdu, North Carolina State Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1



# Photonic Fiber and Crystal Devices: Advances in Materials and Innovations in Device Applications XVI

21 August 2022 | Conv. Ctr. Room 17B

Conference Chairs: Shizhuo Yin, The Pennsylvania State Univ. (USA); Ruyan Guo, The Univ. of Texas at San Antonio (USA)

Program Committee: Manmohan D. Aggarwal, Alabama A&M Univ. (USA); Partha P. Banerjee, Univ. of Dayton (USA); Liliana Braescu, Matelligence Inc. (Canada); Liangcai Cao, Tsinghua Univ. (China); Amol Choudhary, Indian Institute of Technology Delhi (India); Ken-Yuh Hsu, National Chiao Tung Univ. (Taiwan); Rongqing Hui, The Univ. of Kansas (USA); Suganda Jutamulia, Univ. of Northern California (USA); Byoungcho Lee, Seoul National Univ. (Korea, Republic of); Carl M. Liebig, Air Force Research Lab. (USA); Sergei F. Lyuksyutov, The Univ. of Akron (USA); Paul B. Ruffin, Alabama A&M Univ. (USA); Narsingh B. Singh, Univ. of Maryland, Baltimore County (USA); Wei-Hung Su, National Sun Yat-sen Univ. (Taiwan); Ching-Cherng Sun, National Central Univ. (Taiwan); Jun Zhang, DEVCOM Army Research Lab. (USA); Xiang Zhang, Univ. of California, Berkeley (USA)

## SESSION 1: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: MATERIALS AND PROPERTIES I

21 August 2022 • 10:15 AM - 11:45 AM PDT | Conv. Ctr. Room 17B

Session Chairs: Abdalla M. Darwish, Dillard Univ. (USA), Ruyan Guo, The Univ. of Texas at San Antonio (USA)

### 12229-1 Polymer nanocomposite spectrum down-convertors for UV sensing (Invited Paper)

Author(s): Abdalla M. Darwish, Dillard Univ. (USA); Sergey S. Sarkisov, SSS Optical Technologies, LLC (USA); Darayas N. Patel, Oakwood Univ. (USA); Simeon Wilson, Rachel Jackson, Nichols Moody, Dillard Univ. (USA); Paolo Mele, Giovanna Latronico, Shibaura Institute of Technology (Japan); Brent Koplitz, Tulane Univ. (USA)

21 August 2022 • 10:15 AM - 10:45 AM PDT | Conv. Ctr. Room 17B

### 12229-2 Hollow-core photonics crystal fiber for CO<sub>2</sub> leakage monitoring

Author(s): William Delmas, Univ. of California, Merced (USA); Sarah Sahota, Allan Chang, Lawrence Livermore National Lab. (USA); Matthew Heyrich, Univ. of Colorado Boulder (USA); Victor Khitrov, Tiziana Bond, Lawrence Livermore National Lab. (USA)

21 August 2022 • 10:45 AM - 11:05 AM PDT | Conv. Ctr. Room 17B

### 12229-3 Methane and acetylene detection in an antiresonant hollow-core fiber using quartz-enhanced photothermal spectroscopy technique

Author(s): Piotr Bojes, Piotr Pokryszka, Piotr Jaworski, Wroclaw Univ. of Science and Technology (Poland); Yufei Ma, Harbin Institute of Technology (China); Pawel Koziol, Grzegorz Dudzik, Wroclaw Univ. of Science and Technology (Poland); Fei Yu, Dakun Wu, Hangzhou Institute for Advanced Study, Univ. of Chinese Academy of Sciences (China), Shanghai Institute of Optics and Fine Mechanics (China); Karol Krzempek, Wroclaw Univ. of Science and Technology (Poland)

21 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 17B

### 12229-4 Refractive index modulation of novel mid-infrared fibers using ultrafast laser ablation

Author(s): Devyn Duryea, Tevin Poudrier, Nirmala Kandadai, Boise State Univ. (USA)

21 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 17B

**Break**  
**Lunch Break 11:45 AM - 1:45 PM**

## SESSION 2: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: MATERIALS AND PROPERTIES II

21 August 2022 • 1:45 PM - 3:05 PM PDT | Conv. Ctr. Room 17B

Session Chairs: Partha P. Banerjee, Univ. of Dayton (USA), Ruyan Guo, The Univ. of Texas at San Antonio (USA)

### 12229-5 Manufacturing and testing of all-silica fibers resistant to UV and gamma radiation

Author(s): Andrey Grishchenko, Dmitrijs Saharovs, CeramOptec SIA (Latvia); Mario Paredes, Armadillo SIA (Latvia)

21 August 2022 • 1:45 PM - 2:05 PM PDT | Conv. Ctr. Room 17B

### 12229-6 Plasmonic enhanced high-Q optical cavity sensor for biomedical applications

Author(s): Seunghun Lee, Hyerin Song, Heesang Ahn, Taeyeon Kim, Kyujung Kim, Pusan National Univ. (Korea, Republic of)

21 August 2022 • 2:05 PM - 2:25 PM PDT | Conv. Ctr. Room 17B

### 12229-7 BSDF and total transmittance calibration using a SIS system

Author(s): Pin-duan Huang, Yeh-Wei Yu, Tsung-Hsun Yang, Ching-Cherng Sun, National Central Univ. (Taiwan)

21 August 2022 • 2:25 PM - 2:45 PM PDT | Conv. Ctr. Room 17B

### 12229-8 Phase shifting interferometer based on double-frequency-grating shearing interferometer

Author(s): Yeh-Wei Yu, Tsung-Yi Hou, Tsung-Hsun Yang, Ching-Cherng Sun, National Central Univ. (Taiwan)

21 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 17B

**Break**  
**Coffee Break 3:05 PM - 3:35 PM**

## SESSION 3: PHOTONIC CRYSTALS, FIBERS, AND THIN FILMS: DEVICES AND APPLICATIONS

21 August 2022 • 3:35 PM - 4:35 PM PDT | Conv. Ctr. Room 17B

Session Chairs: Paul B. Ruffin, Alabama A&M Univ. (USA), Shizhuo Yin, The Pennsylvania State Univ. (USA)

### 12229-10 Performance assessment of multispectral digital volume reflection holography

Author(s): Saleha Qissi, Partha P. Banerjee, Univ. of Dayton (USA)

21 August 2022 • 3:35 PM - 3:55 PM PDT | Conv. Ctr. Room 17B

### 12229-11 Phase imaging using modified transport of intensity and phase equations using electrically controllable optical path lengths

Author(s): Nouf Alanazi, Partha Banerjee, Univ. of Dayton (USA)

21 August 2022 • 3:55 PM - 4:15 PM PDT | Conv. Ctr. Room 17B

### 12229-15 Recent advances of KTN crystals for fast speed beam steering

Author(s): Shizhuo Yin, The Pennsylvania State Univ. (USA)

21 August 2022 • 4:15 PM - 4:35 PM PDT | Conv. Ctr. Room 17B

## SUNDAY EVENING PLENARY

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

### 6:00 PM - 6:05 PM: Welcome and Opening Remarks

#### 12198-501

##### **In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

#### 12238-502

##### **Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

#### 12229-18

##### **Mid-IR antiresonant hollow-core fiber assisted molecular dispersion spectroscopy of ethane with parts-per-trillion by volume sensitivity**

Author(s): Piotr Jaworski, Karol Krzempek, Piotr Bojes, Wroclaw Univ. of Science and Technology (Poland); Dakun Wu, Fei Yu, Hangzhou Institute for Advanced Study, Univ. of Chinese Academy of Sciences (China), Shanghai Institute of Optics and Fine Mechanics (China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

#### 12229-19

##### **Field-effect transistor based on ZnO:Li thin film with ferroelectric channel**

Author(s): A. R. Poghosyan, Institute for Physical Research, NAS RA (Armenia); R. K. Hovsepian, Institute for Physical Research, NAS RA (Armenia), Russian-Armenian Univ. (Armenia); N. R. Aghamalyan, Institute for Physical Research, NAS RA (Armenia); Y. A. Kafadaryan, Institute for Physical Research, NAS RA (Armenia), Russian-Armenian Univ. (Armenia); H. L. Ayvazyan, H. G. Mnatsakanyan, S. I. Petrosyan, Institute for Physical Research, NAS RA (Armenia)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

#### 12229-20

##### **One-transistor memory element**

Author(s): A. R. Poghosyan, R. K. Hovsepian, N. R. Aghamalyan, Y. A. Kafadaryan, H. L. Ayvazyan, H. G. Mnatsakanyan, Institute for Physical Research (Armenia)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

#### 12229-21

##### **Optical characteristics of a nanostructured core fiber**

Author(s): Abolfazl Safaei Bezagabadi, Purya Es'haghi, Mohammad Agha Bolorizadeh, Graduate Univ. of Advanced Technology - Kerman (Iran, Islamic Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

#### 12229-24

##### **Spectral and polarization filtering in negative curvature hollow core fibers**

Author(s): Jacob Gamble, Roger Williams Univ. (USA); Mustafa Ordu, Bilkent Univ. (Turkey); Ahmet Emin Akosman, Roger Williams Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

#### 12229-25

##### **Germano-borate glasses containing high Dy<sup>3+</sup> ion concentrations for Faraday device applications at 1550 nm**

Author(s): Linganna Kadathala, Gwangju Institute of Science & technology (Korea, Republic of); Ryu Yongtak, Gwangju Institute of Science & technology (Kiribati, Republic of); Han Won-Taek, Gwangju Institute of Science & technology (Korea, Republic of); Bok Hyeon Kim, Gwangju Institute of Science and Technology (Kiribati, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**Terahertz Emitters, Receivers, and Applications XIII**

21 - 22 August 2022 | Conv. Ctr. Room 16B

Conference Chairs: Manijeh Razeghi, Northwestern Univ. (USA); Alexei N. Baranov, Univ. de Montpellier (France)

Program Committee: Stefano Barbieri, Institut d'Electronique de Microélectronique et de Nanotechnologie (France); Joshua R. Freeman, Univ. of Leeds (United Kingdom); Robert J. Grasso, NASA Goddard Space Flight Ctr. (USA); Sven Höfling, Julius-Maximilians-Univ. Würzburg (Germany); Hiroshi Ito, Kitasato Univ. (Japan); Juliette Mangeney, Lab. Pierre Aigrain (France); Oleg Mitrofanov, Univ. College London (United Kingdom); Gaël Mouret, Univ. du Littoral Côte d'Opale (France); Prashant Padmanabhan, Los Alamos National Lab. (USA); Mauro F. Pereira, Institute of Physics of the CAS, v.v.i. (Czech Republic); Rohit P. Prasankumar, Los Alamos National Lab. (USA); Edik U. Rafailov, Aston Univ. (United Kingdom); Frédéric Teppe, Univ. de Montpellier (France); Dmitry Turchinovich, Univ. Bielefeld (Germany); Vladimir V. Vaks, Institute for Physics of Microstructures Russian Academy of Sciences (Russian Federation); Gintaras Valušis, Ctr. for Physical Sciences and Technology (Lithuania); Miriam S. Vitiello, Istituto Nanoscienze (Italy)

**SESSION 1: THZ DETECTION AND IMAGING**

21 August 2022 • 9:50 AM - 11:50 AM PDT | Conv. Ctr. Room 16B

Session Chair: Edik U. Rafailov, Aston Univ. (United Kingdom)

**12230-1****Terahertz scanning tunneling spectroscopy on the atomic scale (Invited Paper)**

Author(s): Spencer E. Ammerman, Vedran Jelic, Yajing Wei, Mohamed Hassan, Sheng Lee, Vivian N. Breslin, Nathan Everett, Michigan State Univ. (USA); Qiang Sun, Materials Genome Institute, Shanghai Univ. (China), EMPA (Switzerland); Carlo A. Pignedoli, Pascal Ruffieux, EMPA (Switzerland); Roman Fasel, EMPA (Switzerland), Univ. Bern (Switzerland); Tyler Cocker, Michigan State Univ. (USA)

21 August 2022 • 9:50 AM - 10:20 AM PDT | Conv. Ctr. Room 16B

**12230-2****Laser terahertz emission microscopy for silicon electronics (Invited Paper)**

Author(s): Dongxun Yang, Masayoshi Tonouchi, Osaka Univ. (Japan)

21 August 2022 • 10:20 AM - 10:50 AM PDT | Conv. Ctr. Room 16B

**12230-4****Towards terahertz optopair based on AlGaIn/GaN HEMTs (Invited Paper)**

Author(s): Maciej Sakowicz, Maksym Dub, Pavlo Sai, Dmitro B. But, Grzegorz Cywinski, CENTERA Labs., Institute of High Pressure Physics (Poland); Justinas Jorudas, Artur Šimukovic, Terahertz Photonics Lab., Ctr. for Physical Sciences and Technology (Lithuania); Pawel Prystawko, Institute of High Pressure Physics (Poland); Simonas Indrišiusas, Vitalij Kovalevskij, Terahertz Photonics Lab., Ctr. for Physical Sciences and Technology (Lithuania); Sergey Rummyantsev, CENTERA Labs., Institute of High Pressure Physics (Poland); Irmantas Kašalynas, Terahertz Photonics Lab., Ctr. for Physical Sciences and Technology (Lithuania); Wojciech Knap, CENTERA Labs., Institute of High Pressure Physics (Poland)

21 August 2022 • 10:50 AM - 11:20 AM PDT | Conv. Ctr. Room 16B

**12230-5****Low-noise terahertz-wave detection by Fermi-level managed barrier diode (Invited Paper)**

Author(s): Hiroshi Ito, Kitasato Univ. (Japan); Tadao Ishibashi, NTT Electronics Techno Corp. (Japan), Wavepackets LLC (Japan)

21 August 2022 • 11:20 AM - 11:50 AM PDT | Conv. Ctr. Room 16B

**Break****Lunch Break 11:50 AM - 2:00 PM****SESSION 2: SOURCES OF THZ RADIATION**

21 August 2022 • 2:00 PM - 3:20 PM PDT | Conv. Ctr. Room 16B

Session Chair: Olivier Spitz, Télécom Paris (France)

**12230-6****High power, room temperature, terahertz sources and frequency comb based on difference-frequency generation at CQD (Keynote Presentation)**

Author(s): Manijeh Razeghi, Northwestern Univ. (USA)

21 August 2022 • 2:00 PM - 2:40 PM PDT | Conv. Ctr. Room 16B

**12230-8****Free-bias GeSn terahertz large area emitter on Si substrate**

Author(s): Chia-Wei Chang, Wang-Chien Chen, Institute of Electronics Engineering, National Tsing Hua Univ. (Taiwan); Shang-Hua Yang, National Tsing Hua Univ. (Taiwan)

21 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 16B

**12230-19****Terahertz emission from stacked spintronic Fe/Pt layer emitters with independent direction of magnetization**

Author(s): Marco Rahm, Dominik Sokoluk, Jan Kappa, Laura Scheuer, Technische Univ. Kaiserslautern (Germany); Evangelos Th. Papaioannou, Institut für Physik, Martin-Luther-Univ. Halle-Wittenberg (Germany)

21 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 16B

**Break****Coffee Break 3:20 PM - 3:50 PM****SESSION 3: THZ AND MICROWAVE COMMUNICATIONS**

21 August 2022 • 3:50 PM - 5:40 PM PDT | Conv. Ctr. Room 16B

Session Chair: Tyler L. Cocker, Michigan State Univ. (USA)

**12230-10****Bridging the 100 GHz-10 THz domain with unipolar quantum optoelectronics (Invited Paper)**

Author(s): Frédéric Grillot, Pierre Didier, Télécom Paris (France); Hamza Dely, Ecole Normale Supérieure (France); Olivier Spitz, Elie Awwad, Télécom Paris (France); Thomas Bonazzi, Etienne Rodriguez, Djamel Gacemi, Yanko Todorov, Angela Vasanelli, Carlo Sirtori, Ecole Normale Supérieure (France)

21 August 2022 • 3:50 PM - 4:20 PM PDT | Conv. Ctr. Room 16B

**12230-11****Design Concept of a Low-Terahertz Imaging Radar**

Author(s): Amin Amineai, SRON Netherlands Institute for Space Research (Netherlands)

21 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 16B

**12230-12****Ultra-low noise 300 GHz signal generation with a Kerr soliton comb (Invited Paper)**

Author(s): Antoine Rolland, IMRA America, Inc. (USA)

21 August 2022 • 4:40 PM - 5:10 PM PDT | Conv. Ctr. Room 16B

**12230-13****Triple barrier resonant tunneling diodes for THz emission and sensing (Invited Paper)**

Author(s): W. Prost, K. Arzi, S. Clochiatti, E. Mutlu, Univ. Duisburg-Essen (Germany); S. Suzuki, M. Asada, Tokyo Institute of Technology (Japan); Nils Weimann, Univ. Duisburg-Essen (Germany)

21 August 2022 • 5:10 PM - 5:40 PM PDT | Conv. Ctr. Room 16B

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**SESSION 4: SPECTROSCOPY AND BIOMEDICAL APPLICATIONS**

22 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 16B

Session Chair: Alvydas Lisauskas, Vilnius Univ. (Lithuania)

**12230-14****On the study of the THz metamaterials to deal with the dielectric response of the cancerous biological tissues (Invited Paper)**

Author(s): Vladimir Mityushev, Cracow Univ. of Technology (Poland); Tatjana Gric, Vilnius Gediminas Technical Univ. (Lithuania), Aston Univ. (United Kingdom), Ctr. for Physical Sciences and Technology (Lithuania); Edik Rafailov, Aston Univ. (United Kingdom)

22 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 16B

**12230-16****THz emission spectroscopy of structurally chiral Weyl semimetals (Invited Paper)**

Author(s): Darius H. Torchinsky, Sujana Subedi, Temple Univ. (USA)

22 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 16B

**12230-23****Long-range electrodynamic interactions between proteins assessed by THz spectroscopy (Invited Paper)**

Author(s): Sandra Ruffenach, L2C, Univ. Montpellier, CNRS (France); Mathias Lechelon, Ctr. de Physique Théorique, Aix Marseille Univ., Univ. de Toulon, CNRS (France), CIML, Aix Marseille Univ., CNRS, INSERM (France); Yoann Meriguet, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France), L2C, Univ. Montpellier, CNRS (France), CPT, Aix Marseille Univ., Univ. de Toulon, CNRS (France); Matteo Gori, Ctr. de Physique Théorique, Aix Marseille Univ., Univ. de Toulon, CNRS (France); Quantum Biology Lab, Howard Univ. (USA); Ilaria Nardecchia, CIML, Aix Marseille Univ., CNRS, INSERM (France), Ctr. de Physique Théorique, Aix Marseille Univ., Univ. de Toulon, CNRS (France); Elena Floriani, Ctr. de Physique Théorique, Aix Marseille Univ., Univ. de Toulon, CNRS (France); Dominique Coquillat, Frédéric Teppe, L2C, Univ. Montpellier, CNRS (France); Sébastien Mailfert, Pierre Ferrier, CIML, Aix Marseille Univ., CNRS, INSERM (France); Luca Varani, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France); James Sturgis, LISM, Aix Marseille Univ., CNRS (France); Didier Marguet, CIML, Aix Marseille Univ., CNRS, INSERM (France); Marco Pettini, Ctr. de Physique Théorique, Aix Marseille Univ., Univ. de Toulon, CNRS (France); Jeremie Torres, Institut d'Électronique et des Systèmes, Univ. de Montpellier, CNRS (France)

22 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 16B

**12230-17****Analysis of urine vapors for cancer patients using terahertz high resolution spectrometer for studying the influence of chemotherapy on human organism (Invited Paper)**

Author(s): Vladimir Vaks, Institute for Physics of Microstructures (Russian Federation), Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation); Vladimir Anfertev, Institute for Physics of Microstructures (Russian Federation); Mariya Chernyaeva, Institute for Physics of Microstructures (Russian Federation), Lobachevsky State Univ. of Nizhny

Novgorod (Russian Federation); Elena Domracheva, Institute for Physics of Microstructures (Russian Federation); Anna Maslennikova, Lobachevsky State Univ. of Nizhny Novgorod (Russian Federation), Privolzhsky Research Medical Univ. (Russian Federation); Alla Zheleznyak, Nizhny Novgorod Regional Oncology Hospital (Russian Federation)

22 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 16B

**Break****Coffee Break 10:00 AM - 10:30 AM****SESSION 5: NEW TRENDS IN THZ TECHNOLOGY**

22 August 2022 • 10:30 AM - 12:00 PM PDT | Conv. Ctr. Room 16B

Session Chair: Antoine Rolland, IMRA America, Inc. (USA)

**12230-18****Recent progress in the development of grating-gate InGaAs-channel HEMTs for fast and sensitive THz detection (Invited Paper)**

Author(s): A. Satou, T. Otsuji, Tohoku Univ. (Japan)

22 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 16B

**12230-20****Silicon-based all-electronic quasi-optical pairs for THz frequency range (Invited Paper)**

Author(s): Dmytro B. But, CENTERA Labs., Institute of High Pressure Physics (Poland); Kestutis Ikamas, Albert Cesiul, Vilnius Univ. (Lithuania); Alexander Chernyadiev, Cezary Kolacinski, CENTERA Labs., Institute of High Pressure Physics (Poland); Alvydas Lisauskas, Vilnius Univ. (Lithuania), CENTERA Labs., Institute of High Pressure Physics (Poland)

22 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 16B

**12230-21****Scaling of layered hyperbolic metamaterials for applications (Invited Paper)**

Author(s): Fedor Kusmartsev, Mauro Pereira, Zihao Chen, Khalifa Univ. (United Arab Emirates)

22 August 2022 • 11:30 AM - 12:00 PM PDT | Conv. Ctr. Room 16B

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

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Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12230-22****Terahertz data analysis for the design and characterization of thin films**

Author(s): Gilberto Gutiérrez-Tadeo, Andrea Gutiérrez García, Univ. Autónoma de Aguascalientes (Mexico); Mariana Alfaro Gómez, Universidad Autónoma de Aguascalientes (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12230-15****Optical properties in the THz band of polymeric materials under different 3D printing specifications**

Author(s): Andrea Gutiérrez García, Univ. Autónoma de Aguascalientes (Mexico); Daniel A. May-Arrijo, Centro de Investigaciones en Óptica, A.C. (Mexico); Mariana Alfaro Gómez, Univ. Autónoma de Aguascalientes (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1



# ODS 2022: Industrial Optical Devices and Systems

21 August 2022 | Conv. Ctr. Room 17A

Conference Chairs: Ryuichi Katayama, Fukuoka Institute of Technology (Japan); Yuzuru Takashima, Wyant College of Optical Sciences (USA)  
 Program Committee: Pierre-Alexandre J. Blanche, Wyant College of Optical Sciences (USA); Min Gu, Univ. of Shanghai for Science and Technology (China); Thomas D. Milster, Wyant College of Optical Sciences (USA); Kimihiro Saito, Kindai Univ. Technical College (Japan); Luping Shi, Tsinghua Univ. (China); Xiaodi Tan, Fujian Normal Univ. (China); Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China); Kazuyoshi Yamazaki, Hitachi, Ltd. (Japan)

## SESSION 1: MATERIALS AND FABRICATION

21 August 2022 • 8:30 AM - 9:30 AM PDT | Conv. Ctr. Room 17A

Session Chair: Ryuichi Katayama, Fukuoka Institute of Technology (Japan)

### 12231-3

#### Flying spot scanner: high-speed OCT imaging for thickness and topography in industry

Author(s): Markus Kogel-Hollacher, Precitec Optronik GmbH (Germany)

21 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 17A

### 12231-4

#### Effect of thermal polymerization temperature and time of PQ/PMMA on the holographic data storage

Author(s): Mingyong Chen, Zuoyu Zhang, Po Hu, Junchao Jin, Jinhong Li, Jie Liu, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

21 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 17A

### 12231-5

#### Dual-channel recording of polarization holography using PQ/PMMA material

Author(s): Shenghui Ke, Shujun Zheng, Xianmiao Xu, Jinyu Wang, Yi Yang, Yuanying Zhang, Zhiyun Huang, Xiaodi Tan, Fujian Normal Univ. (China)

21 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 17A

### Break

Coffee Break 9:30 AM - 10:00 AM

## SESSION 2: OPTICAL DESIGN

21 August 2022 • 10:00 AM - 11:50 AM PDT | Conv. Ctr. Room 17A

Session Chair: Yuzuru Takashima, Wyant College of Optical Sciences (USA)

### 12231-7

#### Simulation on metal-dielectric hybrid nano-antenna attached to semiconductor ring resonator for heat-assisted magnetic recording

Author(s): Ryuichi Katayama, Jinghan Chen, Fukuoka Institute of Technology (Japan); Satoshi Sugiura, Innova Stella Co., Ltd. (Japan)

21 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 17A

### 12231-8

#### Holographic curved waveguide combiner for AR/HUD with 2D pupil expansion

Author(s): Pierre-Alexandre Blanche, Tianyao Zhang, Craig Draper, Univ. of Arizona (USA)

21 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 17A

### 12231-9

#### Camera feedback optimization of computer-generated holograms displayed by the Texas Instruments phase light modulator for AR/HUD applications

Author(s): Remington S. Ketchum, Tianyao Zhang, Pierre-Alexandre Blanche, Univ. of Arizona (USA)

21 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 17A

### 12231-10

#### Imaging through curved glass: windshield optical impact on automotive cameras

Author(s): Korbinian Weikl, Technische Univ. München (Germany), BMW Group (Germany); Jeppe Revall Frisvad, Technical Univ. of Denmark (Denmark); Damien Schroeder, BMW Group (Germany); Walter Stechele, Technische Univ. München (Germany)

21 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 17A

### 12231-6

#### Autonomous sensing by intelligent meta-lens array (Invited Paper)

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

21 August 2022 • 11:20 AM - 11:50 AM PDT | Conv. Ctr. Room 17A

### Break

Lunch Break 11:50 AM - 1:40 PM

## SESSION 3: KEYNOTE SESSION

21 August 2022 • 1:40 PM - 2:20 PM PDT | Conv. Ctr. Room 17A

Session Chair: Yuzuru Takashima, Wyant College of Optical Sciences (USA)

### 12231-11

#### High dimensional optical meta-devices: classical to quantum (Keynote Presentation)

Author(s): Mu Ku Chen, Borui Leng, Yubin Fan, Jin Yao, Yao Liang, Jingcheng Zhang, Xiaoyuan Liu, Linshan Sun, Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China)

21 August 2022 • 1:40 PM - 2:20 PM PDT | Conv. Ctr. Room 17A

## SESSION 4: IMAGING AND SENSING

21 August 2022 • 2:20 PM - 3:50 PM PDT | Conv. Ctr. Room 17A

Session Chairs: Yuzuru Takashima, Wyant College of Optical Sciences (USA), Ryuichi Katayama, Fukuoka Institute of Technology (Japan)

### 12231-12

#### Application and experimental verification of phase-shift approach with rectangular-wave illumination for defect-inspection apparatus (Invited Paper)

Author(s): Yoshito Onishi, Yoshiho Seo, Hitachi, Ltd. (Japan); Masaaki Matsuoka, Hitachi High-Tech Corporation (Japan); Shigeru Serikawa, Hitachi High-Tech Fine Systems Corp. (Japan); Ken Tsugane, Hitachi High-Tech Corporation (Japan)

21 August 2022 • 2:20 PM - 2:50 PM PDT | Conv. Ctr. Room 17A

### 12231-13

#### Computational method for optical diffraction tomography using a series of point sources

Author(s): Kimihiro Saito, Kindai Univ. Technical College (Japan)

21 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 17A

### 12231-15

#### Large etendue laser beam steering by 2D MEMS resonant mirror and digital micromirror device for time-of-flight lidar and AR display

Author(s): Viveka Bhupasamudram Raghu, Xianyue Deng, Eunmo Kang, Chin-I Tang, Yuzuru Takashima, The Univ. of Arizona (USA)

21 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 17A

### 12231-16

#### DMD-based diffractive FOV expansion for real-time flash lidar with 2D multi-pixel photon counter

Author(s): Jeff Ching-Wen Chan, Chin-I Tang, Xianyue Deng, Yuzuru Takashima, The Univ. of Arizona (USA)

21 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 17A

### Break

Coffee Break 3:50 PM - 4:20 PM



**SESSION 5: OPTICAL DATA STORAGE**

21 August 2022 • 4:20 PM - 5:10 PM PDT | Conv. Ctr. Room 17A

Session Chair: Din Ping Tsai, City Univ. of Hong Kong (Hong Kong, China)

**12231-20****Data reconstruction based on deep learning in holographic data storage (Invited Paper)**

Author(s): Xiao Lin, Jianying Hao, Yongkun Lin, Hongjie Liu, Ruixian Chen, Xiaodi Tan, Fujian Normal Univ. (China)

21 August 2022 • 4:20 PM - 4:50 PM PDT | Conv. Ctr. Room 17A

**12231-21****Decoding method in the amplitude-modulated collinear holographic data storage system**

Author(s): Hongjie Liu, Shujun Zheng, Haiyang Song, Yongkun Lin, Xiao Lin, Xiaodi Tan, Fujian Normal Univ. (China)

21 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 17A

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks****12198-501****In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502****Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12231-22****Development of sealing glass and fiber type sealant for laser sealing**

Author(s): So Young Kim, Ka Ram Han, Seon Hoon Kim, Ju Hyeon Choi, Korea Photonics Technology Institute (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12231-23****Benchmark 129Xe optical polarizer for NMR applications**

Author(s): D. Radnatarov, S. Kobtsev, V. Andryushkov, Novosibirsk State Univ. (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

# Earth Observing Systems XXVII

23 - 25 August 2022 | Conv. Ctr. Room 16B (Tue/Wed) and Room 8 (Thu)

Conference Chairs: James J. Butler, NASA Goddard Space Flight Ctr. (USA); **Xiaoxiong (Jack) Xiong**, NASA Goddard Space Flight Ctr. (USA); Xingfa Gu, Institute of Remote Sensing and Digital Earth, CAS (China)

Program Committee: Amit Angal, Science Systems and Applications, Inc. (USA); Jeffrey S. Czaplak-Myers, Wyant College of Optical Sciences (USA); Armin Doerry, Sandia National Labs. (USA); Christopher N. Durell, Labsphere, Inc. (USA); Bertrand Fougny, EUMETSAT (Germany); Joel McCorkel, NASA Goddard Space Flight Ctr. (USA); Vijay Murgai, Raytheon Intelligence & Space (USA); Thomas S. Pagano, Jet Propulsion Lab. (USA); Jeffery J. Puschell, Raytheon Intelligence & Space (USA)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12232-4

#### Pre-launch characterization of VIIRS straylight

Author(s): Qiang Ji, Jeffrey McIntire, Daniel Link, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12232-53

#### Early prediction of rice yields using deep learning method and geostationary satellite image over North Korea

Author(s): Jong-Min Yeom, Seungtaek Jeong, Jong-Sung Ha, Korea Aerospace Research Institute (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12232-54

#### Improvements in the identification of CTIA saturation in NASA VIIRS L1B

Author(s): Amit Angal, Junqiang Sun, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA); Sherry Li, Carlos Pérez Díaz, Xu Geng, Science Systems and Applications, Inc. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12232-55

#### Assessment of VIIRS DNB on-orbit calibration performance using Dome C observations

Author(s): Ashish Shrestha, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA); Sherry Li, Truman Wilson, Science Systems and Applications, Inc. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12232-56

#### Retrieval of aerosol optical thickness using GK-2A AMI satellite imager incorporating with BRDF-based background reflectance over East Asia

Author(s): Jong-Sung Ha, Jong-Min Yeom, Korea Aerospace Research Institute (Korea, Republic of); Kwon-ho Lee, Gangneung-Wonju National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12232-58

#### JPSS-4 VIIRS polarization sensitivity performance comparison with heritage VIIRS sensors

Author(s): David I. Moyer, The Aerospace Corp. (USA); Jeffrey McIntire, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: PRELAUNCH CALIBRATION

23 August 2022 • 8:30 AM - 9:50 AM PDT | Conv. Ctr. Room 16B

Session Chair: Christopher N. Durell, Labsphere, Inc. (USA)

### 12232-1

#### Comparison of Lamp and Detector-based Integrating Sphere Radiance Calibrations Using the NASA GSFC Filter Radiometer Monitoring System (FRMS)

Author(s): Elaine N. Lalanne, Fibertek, Inc. (USA); James J. Butler, NASA Goddard Space Flight Ctr. (USA); Leibo Ding, John Cooper, Nathan E. Kelley, Science Systems and Applications, Inc. (USA)

23 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 16B

### 12232-2

#### Comparison of BRDF results from two different scatterometers for instrument validation in support of satellite instrumentation

Author(s): Jinan Zeng, James J. Butler, Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 16B

### 12232-3

#### Assessment of the pre-launch JPSS-4 VIIRS near-field response in an ambient environment

Author(s): Daniel O. Link, Thomas Schwarting, Amit Angal, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 16B

### 12232-5

#### Mitigation of sample dependent non-linearity in JPSS VIIRS day-night band radiometric calibration

Author(s): Thomas A. Schwarting, Daniel Link, Science Systems and Applications, Inc. (USA); Chengbo Sun, Global Science & Technology, Inc. (USA); Jeffrey McIntire, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 16B

### Break

#### Coffee Break 9:50 AM - 10:20 AM

## SESSION 2: NEW INSTRUMENTS AND TECHNOLOGIES

23 August 2022 • 10:20 AM - 12:00 PM PDT | Conv. Ctr. Room 16B

Session Chair: Armin W. Doerry, Sandia National Labs. (USA)

### 12232-6

#### In-orbit real-time CMOS TDI detector validation and control to meet constant imaging quality over the mission life time

Author(s): Johannes Buschek, Kristian Manthey, Andreas Eckardt, Ralf Reulke, Deutsches Zentrum für Luft (Germany); Gerhard Kahmen, Leibniz Institute for High Performance Microelectronics (Germany)

23 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 16B

### 12232-7

#### Polarization uncertainty and error equivalent radiance for an ultra-broadband, wide field-of-view push-broom imaging radiometer

Author(s): Jason Mudge, Golden Gate Light Optimization, LLC (USA); Adam Phenix, AMP Optics, LLC (USA); Andrew Nichols, Alicia Maccarrone, Alexander Cheff Halterman, Quartus Engineering Inc. (USA)

23 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 16B

**12232-8****Ultra-wideband photonic spectrometer for PBL sensing**

Author(s): Mehmet Ogut, Sidharth Misra, Shannon Brown, Siamak Forouhar, Jet Propulsion Lab. (USA); Janusz Murakowski, Phase Sensitive Innovations, Inc. (USA); Michael Gehl, Sandia National Labs. (USA)

23 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 16B

**12232-9****Development and test of 3-mirror freeform telescope for Earth remote sensing applications**

Author(s): Thomas U. Kampe, Isaiah Franka, JC Soto, John Fleming, Ball Aerospace & Space Technologies Corp. (USA); Peter Spuhler, Ball Aerospace & Space Technologies Corp., (USA); Jerold Cole, Natalie Fan, Zachary Ferkel, Timothy Finch, Ball Aerospace & Space Technologies Corp. (USA)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 16B

**12232-10****Improved radiometric calibration of land imaging systems (IRIS) for civil and commercial space**

Author(s): Stephen J. Schiller, Jeffery J. Puschell, Raytheon Intelligence & Space (USA)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 16B

**Break**

**Lunch/Exhibition Break 12:00 PM - 1:30 PM**

**SESSION 3: EOS INSTRUMENTS: MODIS AND AIRS**

23 August 2022 • 1:30 PM - 3:50 PM PDT | Conv. Ctr. Room 16B

Session Chair: Jeffery J. Puschell, Raytheon Intelligence & Space (USA)

**12232-11****Trends in 20 years of AIRS data: indications of climate change?**

Author(s): Hartmut H. Aumann, Steven E. Broberg, Evan M. Manning, Thomas S. Pagano, Robert C. Wilson, Jet Propulsion Lab. (USA)

23 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 16B

**12232-12****AIRS polarization and radiometric calibration update using data from the Aqua Deep Space Maneuver**

Author(s): Thomas S. Pagano, Steven E. Broberg, Evan M. Manning, Hartmut H. Aumann, California Institute of Technology (USA)

23 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 16B

**12232-13****Lunar calibration enhancements for MODIS collection 7**

Author(s): Truman M. Wilson, Amit Angal, Junqiang Sun, Xu Geng, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 16B

**12232-14****MODIS solar diffuser calibration strategies for the post orbital drift era**

Author(s): Gal Sarid, Kevin A. Twedt, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 16B

**12232-15****Assessment of polarization sensitivity of Aqua MODIS using co-incident POLDER-3 polarized measurements over marine stratocumulus clouds**

Author(s): Brent McBride, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA); Aisheng Wu, Science Systems and Applications, Inc. (USA)

23 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 16B

**12232-16****The MODIS reflective solar band short-term stability assessment using the Spectro-Radiometric Calibration Assembly**

Author(s): Emily J. Aldoretta, Daniel Link, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 16B

**12232-17****Detector linearity assessment of MODIS reflective solar bands using on-board calibrators**

Author(s): Kevin A. Twedt, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

23 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 16B

**Break**

**Coffee Break 3:50 PM - 4:20 PM**

**SESSION 4: DATA PROCESSING AND ANALYTICAL TECHNIQUES**

23 August 2022 • 4:20 PM - 5:40 PM PDT | Conv. Ctr. Room 16B

Session Chair: Xingfa Gu, Institute of Remote Sensing and Digital Earth, CAS (China)

**12232-18****Use of GIMS-technology in remote monitoring of aquatic ecosystems**

Author(s): Ferdenant A. Mkrtchyan, Kotelnikov Institute of Radio Engineering and Electronics (Russian Federation)

23 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 16B

**12232-19****Assessing urban greenery using remote sensing**

Author(s): Blanca Arellano, Josep Roca, Univ. Politècnica de Catalunya (Spain)

23 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 16B

**12232-20****Remote monitoring of the arctic zone based on big data processing algorithms and environmental indicators**

Author(s): Ferdenant A. Mkrtchyan, Kotelnikov Institute of Radio Engineering and Electronics (Russian Federation)

23 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 16B

**12232-59****Temporally adjusted atmospheric compensation for space-based multispectral imagery**

Author(s): Michael G. Gartley, Emmett Ientilucci, James Albano, Sarvani Bhamidi, Rochester Institute of Technology (USA)

23 August 2022 • 5:20 PM - 5:40 PM PDT | Conv. Ctr. Room 16B

**SESSION 5: SNPP, JPSS, AND GOES-R MISSIONS I**

24 August 2022 • 8:15 AM - 9:55 AM PDT | Conv. Ctr. Room 16B

Session Chair: Thomas S. Pagano, Jet Propulsion Lab. (USA)

**12232-22****Initial investigation of straylight contaminations in SNPP VIIRS RSB on-orbit calibrator views**

Author(s): Ning Lei, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 8:15 AM - 8:35 AM PDT | Conv. Ctr. Room 16B

**12232-23****Impact of SNPP VIIRS SDSM detector spectral response function uncertainty on LIB products**

Author(s): Ning Lei, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 8:35 AM - 8:55 AM PDT | Conv. Ctr. Room 16B

**12232-24****Striping analysis and correction for Suomi NPP VIIRS reflective solar bands**

Author(s): Khalil Ahmad, Global Science & Technology, Inc. (USA), NOAA Ctr. for Satellite Applications and Research (USA); Wenhui Wang, Univ. of Maryland (USA), NOAA Ctr. for Satellite Applications and Research (USA); Slawomir Blonski, Global Science & Technology, Inc. (USA), NOAA Ctr. for Satellite Applications and Research (USA); Xi Shao, Univ. of Maryland (USA), NOAA Ctr. for Satellite Applications and Research (USA)

24 August 2022 • 8:55 AM - 9:15 AM PDT | Conv. Ctr. Room 16B

## CONFERENCE 12232

### 12232-25

#### Uncertainty analysis for SNPP and NOAA-20 VIIRS day-night band

Author(s): Junqiang Sun, Hongda Chen, Gal Sarid, Science Systems and Applications, Inc. (USA); Chengbo Sun, Global Science & Technology, Inc. (USA); Daniel Link, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 9:15 AM - 9:35 AM PDT | Conv. Ctr. Room 16B

### 12232-26

#### SNPP and NOAA-20 VIIRS day-night band on-orbit calibration and performance

Author(s): Hongda Chen, Science Systems and Applications, Inc. (USA), NASA (USA); Chengbo Sun, Global Science & Technology, Inc. (USA); Daniel Link, Gal Sarid, Junqiang Sun, Science Systems and Applications, Inc. (USA), NASA (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 9:35 AM - 9:55 AM PDT | Conv. Ctr. Room 16B

#### Break

Coffee Break 9:55 AM - 10:25 AM

## SESSION 6: SNPP, JPSS, AND GOES-R MISSIONS II

24 August 2022 • 10:25 AM - 11:45 AM PDT | Conv. Ctr. Room 16B

Session Chair: Jeffrey S. Czaplá-Myers, Wyant College of Optical Sciences (USA)

### 12232-27

#### NOAA-20 VIIRS operational radiometric calibration updates for the reflective solar bands

Author(s): Taeyoung J. Choi, Slawomir Blonski, NOAA National Environmental Satellite, Data, and Information Service (USA); Xi Shao, Wenhui Wang, Sirish Uprety, Bin Zhang, Univ. of Maryland, College Park (USA); Khalil Ahmad, Global Science & Technology, Inc. (USA), NOAA National Environmental Satellite, Data, and Information Service (USA); Yan Bai, Univ. of Maryland, College Park (USA)

24 August 2022 • 10:25 AM - 10:45 AM PDT | Conv. Ctr. Room 16B

### 12232-28

#### Calibration of NOAA-20 VIIRS reflective solar bands with combined solar diffuser and lunar data for NASA Collection 2 L1B

Author(s): Kevin Twedt, Tiejun Chang, Amit Angal, Ning Lei, Junqiang Sun, Science Systems and Applications, Inc. (USA); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 10:45 AM - 11:05 AM PDT | Conv. Ctr. Room 16B

### 12232-29

#### Operational calibration of GOES ABI visible and near infrared channels

Author(s): Xiangqian Wu, National Oceanic and Atmospheric Administration (USA); Fangfang Yu, Haifeng Qian, Hyelim Yoo, Univ. of Maryland, College Park (USA)

24 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 16B

### 12232-30

#### On-orbit radiometric calibration performances of GOES-16/17 ABI IR channels

Author(s): Fangfang Yu, Univ. of Maryland, College Park (USA); Xiangqian Wu, NOAA Ctr. for Weather and Climate Prediction (NCWCP) (USA); Hyelim Yoo, Haifeng Qian, Univ. of Maryland, College Park (USA)

24 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 16B

#### Break

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

## SESSION 7: LANDSAT 9

24 August 2022 • 1:45 PM - 3:45 PM PDT | Conv. Ctr. Room 16B

Session Chair: Jeffrey S. Czaplá-Myers, Wyant College of Optical Sciences (USA)

### 12232-31

#### Early radiometric performance of Landsat-9 Thermal Infrared Sensor

Author(s): Julia A. Barsi, Science Systems and Applications, Inc. (USA); Esad Micijevic, U.S. Geological Survey (USA); Matthew Montanaro, NASA Goddard Space Flight Ctr. (USA); Simon J. Hook, NASA (USA), Jet Propulsion Lab. (USA); Nina G. Raqueno, Rochester Institute of Technology (USA); Kurtis Thome, NASA Goddard Space Flight Ctr. (USA); Cody Anderson, U.S. Geological Survey (USA)

24 August 2022 • 1:45 PM - 2:05 PM PDT | Conv. Ctr. Room 16B

### 12232-32

#### Early Landsat 9 geometric performance

Author(s): Michael J. Choate, U.S. Geological Survey (USA); Rajagopalan Rengarajan, Jim Storey, Mark Lubke, KBR, Inc. (USA)

24 August 2022 • 2:05 PM - 2:25 PM PDT | Conv. Ctr. Room 16B

### 12232-33

#### Radiometric performance of the Landsat 9 Operational Land Imager 2 over the first 8 months on orbit

Author(s): Esad Micijevic, U.S. Geological Survey (USA); Julia Barsi, NASA Goddard Space Flight Ctr. (USA), Science Systems and Applications, Inc. (USA); Md. Obaidul Haque, U.S. Geological Survey (USA), KBR, Inc. (USA); Raviv Levy, NASA Goddard Space Flight Ctr. (USA), Science Systems and Applications, Inc. (USA); Cody Anderson, U.S. Geological Survey (USA); Kurtis Thome, NASA Goddard Space Flight Ctr. (USA); Dennis Helder, U.S. Geological Survey (USA), KBR, Inc. (USA)

24 August 2022 • 2:25 PM - 2:45 PM PDT | Conv. Ctr. Room 16B

### 12232-34

#### Landsat 9 Operational Land Imager2 (OLI2) on-orbit results of new special characterizations

Author(s): Raviv Levy, Science Systems and Applications, Inc. (USA); Kurtis J. Thome, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 16B

### 12232-35

#### Inter-calibration of Landsat 8 and 9 Operational Land Imagers

Author(s): Norvik Voskanian, Brian Wenny, Mohammad Tahersima, NASA Goddard Space Flight Ctr. (USA), Science Systems and Applications, Inc. (USA); Kurtis Thome, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 3:05 PM - 3:25 PM PDT | Conv. Ctr. Room 16B

### 12232-36

#### Operational Land Imager 2 (OLI-2) telescope post-alignment performance

Author(s): Thomas U. Kampe, Laura Coyle, Ball Aerospace (USA)

24 August 2022 • 3:25 PM - 3:45 PM PDT | Conv. Ctr. Room 16B

#### Break

Coffee Break 3:45 PM - 4:15 PM

## SESSION 8: PACE OCI

24 August 2022 • 4:15 PM - 5:15 PM PDT | Conv. Ctr. Room 16B

Session Chair: Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

### 12232-38

#### Infrared spectral responses of the Ocean Color Instrument (OCI) pre-assembly and integration

Author(s): Jacob K. Hedelius, Kenneth J. Squire, James Q. Peterson, Utah State Univ. (USA); Branimir Blagojević, NASA Goddard Space Flight Ctr. (USA); Ulrik B. Gliese, KBR Inc. (USA); Eric T. Gorman, NASA Goddard Space Flight Ctr. (USA); David K. Moser, Zakk Rhodes, Utah State Univ. (USA); Pedro Sevilla, Space Dynamics Lab. (USA); Gerhard Meister, Goddard Space Flight Ctr. (USA)

24 August 2022 • 4:15 PM - 4:35 PM PDT | Conv. Ctr. Room 16B

**12232-39****Spatial characterization of PACE OCI ETU using time-delay mode**

Author(s): Hyeungu Choi, Global Science & Technology, Inc. (USA); Jeff McIntire, Samuel Kitchen-McKinley, Science Systems and Applications, Inc. (USA); Gerhard Meister, NASA Goddard Space Flight Ctr. (USA); Leland Chemerys, Science Systems and Applications, Inc. (USA); Shihyan Lee, SAIC (USA)

24 August 2022 • 4:35 PM - 4:55 PM PDT | Conv. Ctr. Room 16B

**12232-40****PACE OCI short-wave infrared detection assembly frequency-dependent linearity characterization and uncertainty analysis**

Author(s): Kenneth J. Squire, Jacob K. Hedelius, James Q. Peterson, Space Dynamics Lab. (USA); Eric T. Gorman, Gerhard Meister, NASA Goddard Space Flight Ctr. (USA)

24 August 2022 • 4:55 PM - 5:15 PM PDT | Conv. Ctr. Room 16B

**SESSION 9: VICARIOUS CALIBRATION I**

25 August 2022 • 8:30 AM - 9:50 AM PDT | Conv. Ctr. Room 8

Session Chair: Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

**12232-41****FLARE Landsat 8/9 and Sentinel 2A/B point source archive results**

Author(s): Brandon Russell, Christopher N. Durell, Jeffrey Holt, Labsphere, Inc. (USA); David N. Conran, Rochester Institute of Technology (USA); Stephen Schiller, Raytheon Technologies Corp. (USA)

25 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 8

**12232-42****Preliminary evaluation of the mirror-based empirical line method using FLARE system**

Author(s): Cibele Teixeira Pinto, Pedro Valle de Carvalho e Oliveira, David Aaron, South Dakota State Univ. (USA); Jeff Holt, Brandon Russell, Chris Durell, Labsphere, Inc. (USA); Larry Leigh, South Dakota State Univ. (USA)

25 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 8

**12232-43****Ground viewing radiometer equipped with autonomous linear motion: two year field deployment summary and analysis**

Author(s): Rantaj Singh, Jeffrey Czaplá-Myers, Nikolaus Anderson, The Univ. of Arizona (USA)

25 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 8

**12232-44****Development of a commercial micro-spectrometer for remote field deployment**

Author(s): Rantaj Singh, Jeffrey Czaplá-Myers, Nikolaus Anderson, The Univ. of Arizona (USA)

25 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 8

**Break**

**Coffee Break 9:50 AM - 10:20 AM**

**SESSION 10: VICARIOUS CALIBRATION II**

25 August 2022 • 10:20 AM - 11:40 AM PDT | Conv. Ctr. Room 8

Session Chair: Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (USA)

**12232-45****The University of Arizona's Radiometric Calibration Test Site (RadCaTS): lessons learned after 10 years in operation at Railroad Valley, Nevada**

Author(s): Jeffrey S. Czaplá-Myers, Nikolaus J. Anderson, Wyant College of Optical Sciences (USA)

25 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 8

**12232-46****Intercomparison of Landsat and Joint Polar Satellite System using RadCalNet**

Author(s): Mohammad H. Tahersima, Brian N. Wenny, Norvik Voskanian, Science Systems and Applications, Inc. (USA), NASA Goddard Space Flight Ctr. (USA); Kurtis Thome, NASA Goddard Space Flight Ctr. (USA)

25 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 8

**12232-47****Additional characterization of Libya-4 in support of post-launch vicarious calibration of satellite imagers**

Author(s): David R. Doelling, NASA Langley Research Ctr. (USA); Prathana Khakurel, Science Systems and Applications, Inc. (USA); Rajendra Bhatt, NASA Langley Research Ctr. (USA); Conor Haney, Benjamin Scarino, Arun Gopalan, Science Systems and Applications, Inc. (USA)

25 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 8

**12232-48****Evaluation of spectral band adjustment factors for cross-calibration of visible imagers**

Author(s): David R. Doelling, NASA Langley Research Ctr. (USA); Conor Haney, Science Systems and Applications, Inc. (USA); Rajendra Bhatt, NASA Langley Research Ctr. (USA); Benjamin Scarino, Arun Gopalan, Prathana Khakurel, Science Systems and Applications, Inc. (USA)

25 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 8



# Infrared Remote Sensing and Instrumentation XXX

22 - 23 August 2022 | Conv. Ctr. Room 19

Conference Chair: Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)

Program Committee: Gabriele E. Arnold, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Gerald T. Fraser, National Institute of Standards and Technology (USA); Guillermo García-Torales, Univ. de Guadalajara (Mexico); Sarath D. Gunapala, Jet Propulsion Lab. (USA); Sven Höfling, Julius-Maximilians-Univ. Würzburg (Germany)

## SESSION 1: EXPLORING BODIES IN OUR SOLAR SYSTEM IN IR

22 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 19

Session Chairs: Jörn Helbert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany), Gabriele E. Arnold, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

### 12233-1

#### **TMAP: designing a thermal infrared multi-spectral imager for an Io mission (Invited Paper)**

Author(s): Jörn Helbert, Alessandro Maturilli, Ingo Walter, Thomas Säuberlich, Martin Pertenais, Jörg Knollenberg, Gisbert Peter, Matthias Grott, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

22 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 19

### 12233-2

#### **The Venus Emissivity Mapper: implementation for flight on the NASA VERITAS mission (Invited Paper)**

Author(s): Jörn Helbert, Martin Pertenais, Ingo Walter, Gisbert Peter, Thomas Säuberlich, Andrei Cacovean, Alessandro Maturilli, Giulia Alemanno, Bernd Zender, Carlos Arcos Carrasco, Patrick Dern, Andreas Pohl, Simone Del Togno, Steve Rockstein, Yaquelin M. Rosas-Ortiz, Sergio Rufini Mastropasqua, Dennis Wendler, Karsten Westerdorff, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Jean-Michel Réess, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique, Observatoire de Paris (France); Jerome Carron, CNES (France); Tristan Buey, Thomas Widemann, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Thomas Behnke, Friederike Wolff, Solmaz Adeli, Mario D'Amore, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Melinda D. Dyar, Planetary Science Institute (USA), Mount Holyoke College (USA)

22 August 2022 • 9:00 AM - 9:30 AM PDT | Conv. Ctr. Room 19

### 12233-3

#### **First results of MIR spectroscopic investigations of the Venusian atmosphere by MERTIS during the two Venus flybys of the BepiColombo spacecraft (Invited Paper)**

Author(s): Gabriele E. Arnold, Rainer Haus, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Jörn Helbert, Institut für Planetenforschung, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Mario D'Amore, Alessandro Maturilli, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Harald Hiesinger, Institute für Planetologie, Westfälische Wilhelms-Univ. Münster (Germany)

22 August 2022 • 9:30 AM - 10:00 AM PDT | Conv. Ctr. Room 19

### Break

**Coffee Break 10:00 AM - 10:30 AM**

## SESSION 2: INSTRUMENTS FOR IR REMOTE SENSING I

22 August 2022 • 10:30 AM - 12:20 PM PDT | Conv. Ctr. Room 19

Session Chairs: Josef Vojtech, CESNET z.s.p.o. (Czech Republic), Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)

### 12233-5

#### **DWTS: first sensor to use Doppler scanning with a gas filter (DSGF) to observe wind and temperature from orbit (Invited Paper)**

Author(s): Larry L. Gordley, Benjamin T. Marshall, Jeff France, Joseph Gubeli, GATS, Inc. (USA)

22 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 19

### 12233-6

#### **CO2Image: the design of an imaging spectrometer for CO2 point source quantification (Invited Paper)**

Author(s): David Krutz, Ingo Walter, Anke Roiger, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Andre Butz, Ruprecht-Karls-Univ. Heidelberg (Germany); Claas Köhler, Ilse Sebastian, Carsten Paproth, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Thomas Peschel, Christoph Damm, Stefan Risse, Henrik von Lukowicz, Fraunhofer Institute for Applied Optics and Precision Engineering (Germany)

22 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 19

### 12233-7

#### **Study of adapted instrumentation architectures and measurements post-processing approaches for infrared thermography applied to thermal monitoring in outdoor conditions (Invited Paper)**

Author(s): Jean Dumoulin, Thibaud Toullier, Univ. Gustave Eiffel (France); Laurent Mevel, Institut National de Recherche en Informatique et en Automatique (France)

22 August 2022 • 11:30 AM - 12:00 PM PDT | Conv. Ctr. Room 19

### 12233-8

#### **Temperature mapping of nanocrystalline diamond foil under intense hydrogen ion beam**

Author(s): Abdurahim Rakhman, Willem Blokland, Nicholas Evans, Oak Ridge National Lab. (USA)

22 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 19

### Break

**Lunch Break 12:20 PM - 1:50 PM**

## SESSION 3: INSTRUMENTS FOR IR REMOTE SENSING II

22 August 2022 • 1:50 PM - 3:30 PM PDT | Conv. Ctr. Room 19

Session Chairs: Sarath D. Gunapala, Jet Propulsion Lab. (USA), Gabriele E. Arnold, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

### 12233-10

#### **Real time monitoring of vapor fluctuations through snapshot imaging by short wave IR TuLiPSS**

Author(s): Desheng Zheng, Christopher Flynn, Razvan I. Stoian, Rice Univ. (USA); Bruce C. Kindel, Univ. of Colorado (USA); Ethan Gutmann, National Ctr. for Atmospheric Research (USA); David Alexander, Tomasz S. Tkaczyk, Rice Univ. (USA)

22 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 19

### 12233-11

#### **Automated characterization techniques and testbeds for event-based cameras (Invited Paper)**

Author(s): Peter N. McMahon-Crabtree, Wellesley Pereira, Air Force Research Lab. (USA); Robert Crow, Richard Preston, Sensing Strategies, Inc. (USA); Lucas Kulesza, Air Force Research Lab. (USA); Ryan Crowell, Sensing Strategies, Inc. (USA); Christian P. Morath, Diana Maestas, Zachry Theis, Patricia Sablan, Air Force Research Lab. (USA)

22 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 19

### 12233-12

#### **National research infrastructure for clock network services - CITAF (Invited Paper)**

Author(s): Josef Vojtech, Ondrej Havlis, Martin Slapak, Vladimir Smotlacha, Radek Velc, Jan Kundrát, Lada Altmannova, Rudolf Vohnout, CESNET z.s.p.o. (Czech Republic); Martin Cizek, Jan Hrabina, Simon Rerucha, Lenka Pravdova, Josef Lazar, Ondrej Cip, ISI (Czech Republic); Lukas Slodicka, University Palacky (Czech Republic)

22 August 2022 • 2:40 PM - 3:10 PM PDT | Conv. Ctr. Room 19

**12233-30****A fiber-loop based test setup for lidar range measurement and calibration**

Author(s): Nan Luo, Barton Goldstein, Wolfgang Schulz, Continental (USA)  
22 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 19

**Break**

**Coffee Break 3:30 PM - 4:00 PM**

**SESSION 4: DETECTOR TECHNOLOGY FOR IR REMOTE SENSING**

22 August 2022 • 4:00 PM - 5:30 PM PDT | Conv. Ctr. Room 19

Session Chair: Wellesley Pereira, Air Force Research Lab. (USA)

**12233-14****MWIR and LWIR focal planes for SmallSat applications (Invited Paper)**

Author(s): Sarath D. Gunapala, Jet Propulsion Lab. (USA)  
22 August 2022 • 4:00 PM - 4:30 PM PDT | Conv. Ctr. Room 19

**12233-15****6.1 angstrom family based mid-infrared light emitters and detectors (Invited Paper)**

Author(s): Fabian Hartmann, Andreas Bader, Fauzia Jabeen, Julius-Maximilians-Univ. Würzburg (Germany); Andreas Pfenning, The Univ. of British Columbia (Canada); Sven Höfiling, Julius-Maximilians-Univ. Würzburg (Germany)

22 August 2022 • 4:30 PM - 5:00 PM PDT | Conv. Ctr. Room 19

**12233-16****Where lies the quantumness behind detecting electromagnetic waves for frequencies from infrared and up? (Invited Paper)**

Author(s): ChandraSekhar Roychoudhuri, Gayanath Fernando, Univ. of Connecticut (USA); Narasimha S. Prasad, NASA Langley Research Ctr. (USA)

22 August 2022 • 5:00 PM - 5:30 PM PDT | Conv. Ctr. Room 19

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12233-26****Infrared pixel based on Seebeck nanoantennas for focal plane array detectors**

Author(s): Juan Roberto Moreno García, Francisco Javier González Contreras, Lab. Nacional de Ciencia y Tecnología de Terahertz (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12233-28****Assessment of diffuse reflectance spectra of leaves through moisture measurement using an indirect method based on meteorological factors**

Author(s): Cesar A. Ramirez-Banda, R. C. Barragán, Guillermo García-Torales, J. L. Flores N., Univ. de Guadalajara (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12233-29****Measuring of signal to noise ratio of a faint signal immersed in a highly noisy background using a rotationally shearing interferometer**

Author(s): Manuel Montes-Flores, Guillermo García-Torales, Univ. de Guadalajara (Mexico); Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 5: COMPONENTS, MODELING, AND THEORY IN IR REMOTE SENSING**

23 August 2022 • 8:00 AM - 9:50 AM PDT | Conv. Ctr. Room 19

Session Chairs: Jean Dumoulin, Univ. Gustave Eiffel (France), Narasimha S. Prasad, NASA Langley Research Ctr. (USA)

**12233-17****1D and 2D galvanometer scanning: multi-parameter analysis and optimization (Invited Paper)**

Author(s): Virgil-Florin Duma, Univ. "Aurel Vlaicu" din Arad (Romania), Univ. Politehnica Timisoara (Romania)

23 August 2022 • 8:00 AM - 8:30 AM PDT | Conv. Ctr. Room 19

**12233-18****3D printed Risley prism scanner**

Author(s): Beethoven Bravo-Medina, Univ. de Guadalajara (Mexico)

23 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 19

**12233-21****Electro-optical modulator as controlled spark pre-ionizer for CO<sub>2</sub>-TEA lasers pulse shutter**

Author(s): Taieb Gasmi, Saint Louis Univ.-Madrid Campus (Spain)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 19

**12233-23****Wavefront deformation in a rotational shearing interferometer when it no longer finds a derivative**

Author(s): Marija Strojnik, Centro de Investigaciones en Óptica, A.C. (Mexico)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 19

**12233-24****Study the wildfire impacts on surface UV irradiance by ground measurement**

Author(s): Joey Paulson, Natural Resource Ecology Lab., Colorado State Univ. (USA); Zhibin Sun, Maosi Chen, Wei Gao, USDA UV-B Monitoring and Research Program (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 19

# Infrared Sensors, Devices, and Applications XII

24 - 25 August 2022 | Conv. Ctr. Room 7B

Conference Chairs: Priyalal Wijewarnasuriya, Teledyne Imaging Sensors (USA); Arvind I. D'Souza, Leonardo DRS (USA); Ashok K. Sood, Magnolia Optical Technologies, Inc. (USA)

Program Committee: Sachidananda R. Babu, NASA Earth Science Technology Office (USA); Enrico Bellotti, Boston Univ. (USA); Vincent M. Cowan, Air Force Research Lab. (USA); Nibir K. Dhar, Virginia Commonwealth Univ. (USA); Sarath D. Gunapala, Jet Propulsion Lab. (USA); Vaikunth Khalap, Leonardo DRS (USA); Paul D. LeVan, Air Force Research Lab. (Retired) (USA); Gananath Wijeratne, HRL Labs., LLC (USA)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12234-26

#### Multispectral laser system for non-invasive rapid analysis of tissue microcirculation of patients with diabetes

Author(s): Volodymyr S. Pavlov, Vinnytsia National Technical Univ. (Ukraine); Liudmyla Shkilniak, Vinnytsia National Medical Univ. (Ukraine); Zhanna Khomenko, Vinnytsia National Technical Univ. (Ukraine); Tetiana Kanishyna, Vinnytsia National Medical Univ. (Ukraine); Olha Komarova, National Technical Univ. of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (Ukraine); PSME "Fotonika Plus" (Ukraine); Nataliia Zabolotna, Vinnytsia National Technical Univ. (Ukraine)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12234-27

#### Study of Ge-As-Se system with high refractive index for infrared glass molded lens

Author(s): Seon Hoon Kim, Taeyeon Lee, Soyoung Kim, Karam Han, Jung-Hwan In, Doo Gun Kim, Ju Hyeon Choi, Korea Photonics Technology Institute (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12234-28

#### Consistency analysis method of optical multispectral imaging based on wake simulation

Author(s): Qiuping Hu, Yu Wang, Hua Zhang, Bin Li, Biao Liu, Yuanyuan Zhou, Huayin Ordnance Test Ctr. (China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12234-30

#### Fabrication and characterization of stretchable photosensor with highly crystalline InN nanowires and graphene

Author(s): Jaehyeok Shin, Sangmoon Han, Siyun Noh, Jeonbuk National Univ. (Korea, Republic of); Mee-Yi Ryu, Kangwon National Univ. (Korea, Republic of); Jin Soo Kim, Jeonbuk National Univ. (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12234-34

#### Self-powered near-infrared organic photodiode with functional interlayer

Author(s): Yongju Lee, Univeristy of Seoul (Korea, Republic of); Hyejeong Choi, The Univ. of Seoul (Korea, Republic of); Hyeok Kim, Univeristy of Seoul (Korea, Republic of)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: INFRARED TECHNOLOGY OVERVIEW

24 August 2022 • 8:00 AM - 10:10 AM PDT | Conv. Ctr. Room 7B

Session Chairs: Priyalal S. Wijewarnasuriya, Teledyne Imaging Sensors (USA), Arvind I. D'Souza, Leonardo DRS (USA)

### 12234-1

#### Teledyne's II-VI infrared technology overview (Keynote Presentation)

Author(s): Mike S. Carmody, Teledyne Imaging Sensors (USA)

24 August 2022 • 8:00 AM - 8:40 AM PDT | Conv. Ctr. Room 7B

### 12234-2

#### The future of NASA's Advanced Component Technologies Program for Earth science remote sensing (Invited Paper)

Author(s): Amber Emory, NASA Earth Science Technology Office (USA)

24 August 2022 • 8:40 AM - 9:10 AM PDT | Conv. Ctr. Room 7B

### 12234-3

#### Development of high-performance focal plane detectors for space telescopes at Teledyne (Invited Paper)

Author(s): Eric C. Piquette, Teledyne Imaging Sensors (USA)

24 August 2022 • 9:10 AM - 9:40 AM PDT | Conv. Ctr. Room 7B

### 12234-4

#### Colloidal quantum dot SWIR sensors: recent advances in bandwidth, QE, and thermal stability (Invited Paper)

Author(s): Ethan Klem, SWIR Vision Systems (USA)

24 August 2022 • 9:40 AM - 10:10 AM PDT | Conv. Ctr. Room 7B

### Break

**Coffee Break 10:10 AM - 10:40 AM**

## SESSION 2: IMAGING FOCAL PLANE ARRAYS

24 August 2022 • 10:40 AM - 12:00 PM PDT | Conv. Ctr. Room 7B

Session Chairs: Gan Wijeratne, HRL Labs., LLC (USA), Arvind I. D'Souza, Leonardo DRS (USA)

### 12234-5

#### Performance of very long wavelength planar P+/n devices (Invited Paper)

Author(s): Priyalal S. Wijewarnasuriya, Bo Shojaei, Mike Carmody, Teledyne Imaging Sensors (USA)

24 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 7B

### 12234-6

#### Development of T2SLS LWIR focal plane arrays for the Hyperspectral Thermal Imager (HyTI) (Invited Paper)

Author(s): Sarath D. Gunapala, David Z. Ting, Sir B. Rafol, Alexander Soibel, Sam A. Keo, Arezou Khoshakhlagh, Brian J. Pepper, Anita M. Fisher, Cory J. Hill, Jet Propulsion Lab. (USA); Paul Lucey, Robert Wright, Miguel Nunes, Luke Flynn, Univ. of Hawai'i at Manoa (USA); Ashok Sood, Magnolia Optical Technologies, Inc. (USA); Sachidananda Babu, Parminder Ghuman, NASA Earth Science Technology Office (USA)

24 August 2022 • 11:10 AM - 11:40 AM PDT | Conv. Ctr. Room 7B

### 12234-8

#### Near-infrared QW LED spectroscopy for viral infections detection and analysis

Author(s): Abdullah J. Zakariya, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA), Ministry of Interior - State of Kuwait (Kuwait); Husain A. Naqi, Ministry of Interior - State of Kuwait (Kuwait)

24 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 7B

**Break**  
**Lunch/Exhibition Break 12:00 PM - 1:50 PM**

### SESSION 3: NOVEL IR DETECTORS AND MATERIALS I

24 August 2022 • 1:50 PM - 3:40 PM PDT | Conv. Ctr. Room 7B

Session Chairs: Priyalal S. Wijewarnasuriya, Teledyne Imaging Sensors (USA); Ashok K. Sood, Magnolia Optical Technologies, Inc. (USA)

#### 12234-9

##### **Extremely broadband calibrated bolometers and microbolometer arrays for Earth radiation budget measurements**

Author(s): Michelle S. Stephens, Chris Yung, Nathan Tomlin, National Institute of Standards and Technology (USA); Dave Harber, Lab. for Atmospheric and Space Physics, Univ. of Colorado Boulder (USA); Cameron Straatsma, Lab. for Atmospheric and Space Physics (USA); Atasi Dan, Erica Freire Antunes, National Institute of Standards and Technology (USA); Peter Pilewski, Odele Coddington, Lab. for Atmospheric and Space Physics (USA); John H. Lehman, National Institute of Standards and Technology (USA)

24 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 7B

#### 12234-10

##### **Performance of thermoelectrically cooled and vacuum packaged 320 x256 InGaAs array with dark pixel mask for The Atmospheric Waves Experiment (Invited Paper)**

Author(s): Kai Song, Teledyne Judson Technologies (USA)

24 August 2022 • 2:10 PM - 2:40 PM PDT | Conv. Ctr. Room 7B

#### 12234-11

##### **TaAs Weyl semimetal full-Stokes integrated polarimeter**

Author(s): Yufei Jia, Fugu Tian, The Univ. of Southern California (USA); Haokun Luo, Univ. of Central Florida (USA); Hasitha Suriya Arachchige, The Univ. of Tennessee Knoxville (USA); David Mandrus, The Univ. of Tennessee Knoxville (USA), Oak Ridge National Lab. (USA); Demetrios Christodoulides, Univ. of Central Florida (USA); Mercedeh Khajavikhan, The Univ. of Southern California (USA)

24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 7B

#### 12234-12

##### **Demonstrating the thermoradiative diode: generating electrical power through radiative emission**

Author(s): Michael P. Nielsen, Andreas Pusch, Muhammad H. Sazzad, Phoebe M. Pearce, Peter J. Reece, Nicholas J. Ekins-Daukes, The Univ. of New South Wales (Australia)

24 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 7B

#### 12234-33

##### **HOT LWIR multi-junction cascade photovoltaic detectors based on InAs/InAsSb superlattices**

Author(s): Łukasz Kubiszyn, Krystian Michalczewski, Jarosław Jureńczyk, Waldemar Gawron, Józef Piotrowski, VIGO Photonics (Poland)

24 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 7B

**Break**

**Coffee Break 3:40 PM - 4:10 PM**

### SESSION 4: NOVEL IR DETECTORS AND MATERIALS II

24 August 2022 • 4:10 PM - 5:40 PM PDT | Conv. Ctr. Room 7B

Session Chair: Vaikunth Khalap, Leonardo DRS (USA)

#### 12234-13

##### **A quantum dot infrared photodetector with an epitaxially regrown sidewall heterojunction**

Author(s): Guiru Gu, Stonehill College (USA)

24 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 7B

#### 12234-14

##### **Conductivity and low frequency noise in VOx thin films**

Author(s): Michael S. Harcrow, Usha Philipose, Christopher Littler, Brianna Western, Vincent C. Lopes, Athanasios J. Syllaios, Univ. of North Texas (USA)

24 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 7B

#### 12234-15

##### **Material considerations for vertical integration of IRFPAs**

Author(s): Sushant Sonde, EPIR, Inc. (USA); Kiran Sasikumar, Argonne National Lab. (USA); Yong Chang, EPIR, Inc. (USA); Subramanian KRS Sankaranarayanan, Argonne National Lab. (USA); Silviu Velicu, EPIR, Inc. (USA)

24 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 7B

#### 12234-16

##### **low persistence HIRG InGaAs FPA development for Micro-Cam (Invited Paper)**

Author(s): Henry Yuan, Jongwoo Kim, Teledyne Judson Technologies (USA); Michael Grzesik, Chanh Nguyen, Teledyne Imaging Sensors (USA)

24 August 2022 • 5:10 PM - 5:40 PM PDT | Conv. Ctr. Room 7B

### SESSION 5: CHARACTERIZATION AND FABRICATION I

25 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 7B

Session Chair: Gan Wijeratne, HRL Labs., LLC (USA)

#### 12234-17

##### **Low SWaP-C MWIR sensor platform for commercial space applications (Invited Paper)**

Author(s): Atul Joshi, SAAZ Micro Inc. (USA)

25 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 7B

#### 12234-18

##### **Radiometric measurements for characterizing single photon avalanche diodes**

Author(s): Alex Skender, Univ. of Dayton (USA); Joshua Duran, Air Force Research Lab. (USA); Partha P. Banerjee, Univ. of Dayton (USA)

25 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 7B

#### 12234-19

##### **Radiation testing of 2.4 micron wavelength extended InGaAs photodiodes for 100 MeV/n carbon ions**

Author(s): Abhay M. Joshi, Shubhaschish Datta, Jeff Mertz, Nilesh Soni, Discovery Semiconductors, Inc. (USA); Michael Sivertz, Adam Rusek, Trevor Olsen, NASA Space Radiation Lab. (USA); James Jardine, Brookhaven National Lab. (USA)

25 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 7B

#### 12234-20

##### **Enhancement of the detection limit of the metal-semiconductor silicon-based photodetector in the mid-infrared range**

Author(s): Deepali Sinha, Ruei-Lien Sun, Ching-Fuh Lin, Ashish Gaurav, National Taiwan Univ. (Taiwan)

25 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 7B

**Break**

**Coffee Break 10:00 AM - 10:30 AM**

### SESSION 6: CHARACTERIZATION AND FABRICATION II

25 August 2022 • 10:30 AM - 11:30 AM PDT | Conv. Ctr. Room 7B

Session Chairs: Vaikunth Khalap, Leonardo DRS (USA), Ashok K. Sood, Magnolia Optical Technologies, Inc. (USA)

#### 12234-21

##### **Material and device characterization of monolithic two-color short-wavelength InGaAs infrared photodetectors**

Author(s): Suho Park, Korea Research Institute of Standards and Science (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of); Jiyeon Jeon, Byoung Sun Chun, Korea Research Institute of Standards and Science (Korea, Republic of); Yeongho Kim, Sang Jun Lee, Korea Research Institute of Standards and Science (Korea, Republic of), Univ. of Science and Technology (Korea, Republic of)

25 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 7B

#### 12234-22

##### **Rapid space qualification of MWIR FPA based camera system**

Author(s): Atul Joshi, SAAZ Micro Inc. (USA)

25 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 7B

## CONFERENCE 12234

### 12234-23

#### **Free carrier absorption-assisted photodetection using a waveguide-integrated bolometer with flat spectral response for integrated optical sensors**

Author(s): Joonsup Shim, Jinha Lim, Dae-Myeong Geum, KAIST (Korea, Republic of); Jong-Bum You, National Nanofab Ctr. (Korea, Republic of); Hyeonho Yoon, Joon Pyo Kim, Woo Jin Baek, KAIST (Korea, Republic of); Jae-Hoon Han, Korea Institute of Science and Technology (Korea, Republic of); Sanghyeon Kim, KAIST (Korea, Republic of)

25 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 7B

#### **Break**

**Lunch/Exhibition Break 11:30 AM - 1:00 PM**

### **SESSION 7: NOVEL DETECTOR CONCEPTS AND APPLICATIONS**

25 August 2022 • 1:00 PM - 2:20 PM PDT | Conv. Ctr. Room 7B

Session Chairs: Vaikunth Khalap, Leonardo DRS (USA), Arvind I. D'Souza, Leonardo DRS (USA)

### 12234-24

#### **Nanostructured antireflection coating technology for enhanced MWIR and LWIR band sensing performance**

Author(s): Ashok K. Sood, John W. Zeller, Magnolia Optical Technologies, Inc. (USA); Parminder Ghuman, Sachidananda R. Babu, NASA Earth Science Technology Office (USA); Sarath Gunapala, Jet Propulsion Lab., Caltech (USA); Latika S. Chaudhary, Harry Efstathiadis, SUNY Polytechnic Institute (USA); Alexander Soibel, David Z. Ting, Jet Propulsion Lab. (USA)

25 August 2022 • 1:00 PM - 1:20 PM PDT | Conv. Ctr. Room 7B

### 12234-25

#### **High-performance graphene-enhanced HgCdTe mid-wave infrared photodetector development**

Author(s): Ashok K. Sood, John W. Zeller, Magnolia Optical Technologies, Inc. (USA); Parminder Ghuman, Sachidananda R. Babu, NASA Earth Science Technology Office (USA); Nibir Dhar, Virginia Commonwealth Univ. (USA); Randy N. Jacobs, U.S. Army CCDC C5ISR Ctr. Night Vision & Electronic Sensors Directorate (USA); Latika S. Chaudhary, Harry Efstathiadis, SUNY Polytechnic Institute (USA)

25 August 2022 • 1:20 PM - 1:40 PM PDT | Conv. Ctr. Room 7B

### 12234-31

#### **Multispectral imaging in the SWIR: theory, practical approach, and expected performance**

Author(s): Martin Gerken, Harry Schlemmer, HENSOLDT Optronics GmbH (Germany)

25 August 2022 • 1:40 PM - 2:00 PM PDT | Conv. Ctr. Room 7B

### 12234-32

#### **Design and development of innovative vanadium oxide, CNT, and graphene based high-performance microbolometer**

Author(s): Ashok K. Sood, John W. Zeller, Magnolia Optical Technologies Inc (USA); Usha Philipose, Department of Physics, University of North Texas, Denton, TX 75077, USA (USA); Athanasios J. Syllaios, Department of Physics, University of North Texas (USA); Latika S. Chaudhary, Harry Efstathiadis, College of Nanoscale Science and Engineering (USA)

25 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 7B



# Imaging Spectrometry XXV: Applications, Sensors, and Processing

22 August 2022 | Conv. Ctr. Room 12

Conference Chairs: Emmett J. Ientilucci, Rochester Institute of Technology (USA); Christine L. Bradley, Jet Propulsion Lab. (USA)  
 Program Committee: Robert D. Fiete, L3Harris Technologies, Inc. (USA); Ronald B. Lockwood, MIT Lincoln Lab. (USA); Pantazis Mouroulis, Jet Propulsion Lab. (USA); Mario Parente, Univ. of Massachusetts Amherst (USA); Torbjørn Skauli, Univ. of Oslo (Norway); Robert Sundberg, Spectral Sciences, Inc. (USA)

## SESSION 1: IMAGING SPECTROMETERS

22 August 2022 • 8:00 AM - 9:40 AM PDT | Conv. Ctr. Room 12

Session Chair: Christine L. Bradley, Jet Propulsion Lab. (USA)

### 12235-1

#### Laboratory alignment and calibration of Earth Surface Mineral Dust Source Investigation (EMIT) imaging spectrometer

Author(s): Christine L. Bradley, Robert O. Green, Harrison Herzog, Cole Meyers, Pantazis Mouroulis, Zachary Small, Lucas Shaw, Erik Thingvold, David R. Thompson, Jet Propulsion Lab. (USA)

22 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 12

### 12235-2

#### Design, alignment, and laboratory calibration of the Compact Wide Swath Imaging Spectrometer II (CWIS-II)

Author(s): Lucas Shaw, Sven Geier, Ian Mckinley, Michael A. Bernas, Jet Propulsion Lab. (USA); Mikael Gharakhanian, Ara Dergevorkian, Sierra Lobo, Inc. (USA); Michael L. Eastwood, Pantazis Mouroulis, Robert O. Green, Jet Propulsion Lab. (USA)

22 August 2022 • 8:20 AM - 8:40 AM PDT | Conv. Ctr. Room 12

### 12235-3

#### Optical design and performance of the Lunar Trailblazer High-resolution Volatiles and Minerals Moon Mapper (HVM3)

Author(s): Holly A. Bender, Pantazis Mouroulis, Jet Propulsion Lab. (USA); Christopher D. Smith, Sierra Lobo, Inc. (USA); David R. Thompson, Jet Propulsion Lab. (USA); Bethany L. Ehlmann, Caltech (USA)

22 August 2022 • 8:40 AM - 9:00 AM PDT | Conv. Ctr. Room 12

### 12235-4

#### The visible mid-wave Dyson imaging spectrometer (VMDIS)

Author(s): Quentin Vinckier, Robert O. Green, Pantazis Mouroulis, Peter Sullivan, California Institute of Technology (USA); Christopher Smith, Timothy Lin, Sierra Lobo, Inc. (USA); Mason Mok, Daniel Preston, Cole Meyers, Holly A. Bender, Zachary Small, Bethany L. Ehlmann, Abigail A. Fraeman, California Institute of Technology (USA)

22 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 12

### 12235-5

#### Optical design of the Carbon Plume Mapper (CPM) imaging spectrometer

Author(s): Sander R. Zandbergen, Jet Propulsion Lab. (USA); Riley Duren, Carbon Mapper, Inc. (USA), The Univ. of Arizona (USA); Robert O. Green, Lori Moore, Lucas Shaw, Pantazis Mouroulis, Jet Propulsion Lab. (USA)

22 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 12

### Break

Coffee Break 9:40 AM - 10:10 AM

## SESSION 2: SPECTROMETERS AND HARDWARE

22 August 2022 • 10:10 AM - 12:10 PM PDT | Conv. Ctr. Room 12

Session Chair: Robert Sundberg, Spectral Sciences, Inc. (USA)

### 12235-6

#### HEIFTS 2: two new optical geometries for Imaging Fourier Transform Spectrometers

Author(s): Richard F. Horton, ad hoc Optics (USA)

22 August 2022 • 10:10 AM - 10:30 AM PDT | Conv. Ctr. Room 12

### 12235-7

#### LiNbO<sub>3</sub> Fabry-Perot etalons for solar near-infrared narrow-passband tunable filtergraph

Author(s): Yoshinori Suematsu, Tomoya Iju, Kazuya Shinoda, Masaaki Hagino, National Astronomical Observatory of Japan (Japan); Satoru Ueno, Kyoto Univ. (Japan)

22 August 2022 • 10:30 AM - 10:50 AM PDT | Conv. Ctr. Room 12

### 12235-9

#### An adaptive spectropolarimetry technology for identification of pollutants on the water surface

Author(s): Ferdenant A. Mkrtchyan, Kotelnikov Institute of Radio Engineering and Electronics (Russian Federation)

22 August 2022 • 10:50 AM - 11:10 AM PDT | Conv. Ctr. Room 12

### 12235-10

#### Using barrier infrared focal plane technology in an imaging spectrometer

Author(s): William R. Johnson, Jet Propulsion Lab. (USA)

22 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 12

### 12235-24

#### An efficient high-etendue spectrometer

Author(s): James P. McGuire, Jet Propulsion Lab. (USA); Erika T. Hamden, Steward Observatory (USA)

22 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 12

### 12235-8

#### Compact multimodal multispectral sensor system for tactical reconnaissance

Author(s): Trym V. Haavardsholm, Norwegian Defence Research Establishment (Norway), Norwegian Univ. of Science and Technology (Norway); Thomas O. Opsahl, Torbjørn Skauli, Norwegian Defence Research Establishment (Norway); Annette Stahl, Norwegian Univ. of Science and Technology (Norway)

22 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 12

### Break

Lunch Break 12:10 PM - 1:30 PM

## SESSION 3: ALGORITHMS AND DETECTION

22 August 2022 • 1:30 PM - 2:30 PM PDT | Conv. Ctr. Room 12

Session Chair: Emmett J. Ientilucci, Rochester Institute of Technology (USA)

### 12235-11

#### Iterative R&R (rotation and remarginalization) for detecting targets in spectral imagery

Author(s): James P. Theiler, Christopher X. Ren, Los Alamos National Lab. (USA)

22 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 12

### 12235-12

#### Target detection modeling under poorly illuminated conditions

Author(s): Sandra Wiseman, Robert Sundberg, Timothy Perkins, Spectral Sciences, Inc. (USA)

22 August 2022 • 1:50 PM - 2:10 PM PDT | Conv. Ctr. Room 12

### 12235-13

#### Empirical validation of a hyperspectral systems model for subpixel target detection using data from a new UAS field collection

Author(s): Chase Cañas, John P. Kerekes, Emmett J. Ientilucci, Scott D. Brown, Rochester Institute of Technology (USA)

22 August 2022 • 2:10 PM - 2:30 PM PDT | Conv. Ctr. Room 12

## CONFERENCE 12235

### SESSION 4: STANDARDS, WORKFLOWS, AND SIMULATIONS

22 August 2022 • 2:30 PM - 3:30 PM PDT | Conv. Ctr. Room 12

Session Chair: Emmett J. Ientilucci, Rochester Institute of Technology (USA)

#### 12235-14

##### **An overview of the emerging IEEE P4001 hyperspectral standard**

Author(s): Christopher N. Durell, Labsphere, Inc. (USA)

22 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 12

#### 12235-16

##### **Image simulation of HSI systems**

Author(s): Bradley Paul, Adam J. Rossi, L3Harris Technologies, Inc. (USA)

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 12

#### 12235-17

##### **A detector-based absolute radiometric calibration simulation for a climate-quality imaging spectrometer**

Author(s): Zhipeng Wang, Science Systems and Applications, Inc. (USA); Kurtis Thome, NASA Goddard Space Flight Ctr. (USA); Ronald Lockwood, MIT Lincoln Lab. (USA); Brian N. Wenny, Science Systems and Applications, Inc. (USA)

22 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 12

#### **Break**

**Coffee Break 3:30 PM - 4:00 PM**

### SESSION 5: REMOTE SENSING, SOIL, AND GAS DETECTION

22 August 2022 • 4:00 PM - 5:20 PM PDT | Conv. Ctr. Room 12

Session Chair: Christine L. Bradley, Jet Propulsion Lab. (USA)

#### 12235-19

##### **Comparison of methane plume detection using shortwave and longwave infrared hyperspectral sensors under varying environmental conditions**

Author(s): Lucy A. Zimmerman, John Kerekes, Rochester Institute of Technology (USA)

22 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 12

#### 12235-21

##### **Forest soil contamination determination based on national spectral data and machine learning**

Author(s): Asa Gholizadeh, Czech Univ. of Life Sciences (Czech Republic); Mohammadmehdi Saberioon, Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ (Germany); Eyal Ben-Dor, Tel Aviv Univ. (Israel); Raphael Viscarra Rossel, Curtin Univ. (Australia); Lubos Boruvka, Czech Univ. of Life Sciences (Czech Republic)

22 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 12

#### 12235-22

##### **Imaging trace gas concentrations with a compact snapshot device that converts their spectral features into a polarization signal**

Author(s): Floor M. Derkink, David S. Doelman, Dirk M. van Dam, Leiden Observatory, Leiden Univ. (Netherlands); Bart Speet, Benjamin J. M. Brenny, TNO (Netherlands); Christoph U. Keller, Frans Snik, Leiden Observatory, Leiden Univ. (Netherlands)

22 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 12

#### 12235-23

##### **Development and field test results of a novel multispectral imaging system for natural gas leak detection**

Author(s): Jason Bylisma, Fred Coburn, Kuva Systems (USA); Thomas McArthur, Kuva Systems (Canada)

22 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 12

# CubeSats and SmallSats for Remote Sensing VI

21 August 2022 | Conv. Ctr. Room 16A

Conference Chairs: Sachidananda R. Babu, NASA Earth Science Technology Office (USA); Charles D. Norton, Jet Propulsion Lab. (USA)  
 Program Committee: William J. Blackwell, MIT Lincoln Lab. (USA); Pamela E. Clark, Jet Propulsion Lab. (USA); Marco Esposito, cosine Remote Sensing B.V. (Netherlands); Martin Kaufmann, Forschungszentrum Jülich GmbH (Germany); Thomas S. Pagano, Jet Propulsion Lab. (USA); Massimiliano Pastena, European Space Research and Technology Ctr. (Netherlands); Jeffery J. Puschell, Raytheon Intelligence & Space (USA); Steven C. Reising, Colorado State Univ. (USA); Roger Walker, European Space Research and Technology Ctr. (Netherlands)

## SESSION 1: MISSION OBSERVATIONS

21 August 2022 • 10:30 AM - 11:50 AM PDT | Conv. Ctr. Room 16A

Session Chairs: Sachidananda R. Babu, NASA Earth Science Technology Office (USA), Parminder Ghuman, NASA Earth Science Technology Office (USA)

### 12236-1 Temporal observations of cloud and precipitation processes from CubeSats & SmallSats: perspectives from the 3-year TEMPEST-D on-orbit demonstration and follow-on missions (Invited Paper)

Author(s): Steven C. Reising, V. Chandrasekar, Christian Kummerow, Colorado State Univ. (USA); Shannon T. Brown, Todd C. Gaier, NASA (USA), Caltech (USA), Jet Propulsion Lab. (USA); Wesley Berg, Colorado State Univ. (USA); Sharmila Padmanabhan, NASA (USA), Caltech (USA), Jet Propulsion Lab. (USA); Chandrasekar Radhakrishnan, Colorado State Univ. (USA); Matthew Pallas, Doug Laczkowski, Nancy Gaytan, Blue Canyon Technologies Inc. (USA)

21 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 16A

### 12236-2 On-orbit results from the NASA TROPICS Mission (Invited Paper)

Author(s): William J. Blackwell, Andrew Cunningham, Michael DiLiberto, Shawn Donnelly, James Eshbaugh, Vincent Leslie, Nicholas Zorn, MIT Lincoln Lab. (USA)

21 August 2022 • 11:00 AM - 11:30 AM PDT | Conv. Ctr. Room 16A

### 12236-3 Bad pixel detection for on-board data quality improvement of remote sensing instruments in CubeSats

Author(s): Josua Florczak, Konstantin Ntokas, Tom Neubert, Egon Zimmermann, Heinz Rongen, Uwe Clemens, Martin Kaufmann, Forschungszentrum Jülich GmbH (Germany); Stefan van Waasen, Forschungszentrum Jülich GmbH (Germany), Univ. Duisburg-Essen (Germany)

21 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 16A

**Break**  
**Lunch Break 11:50 AM - 1:30 PM**

## SESSION 2: UPCOMING MISSIONS AND INSTRUMENTS

21 August 2022 • 1:30 PM - 3:30 PM PDT | Conv. Ctr. Room 16A

Session Chairs: Sachidananda R. Babu, NASA Earth Science Technology Office (USA), Parminder Ghuman, NASA Earth Science Technology Office (USA)

### 12236-6 Advanced Technology Land Imaging Spectroradiometer-Prototype (ATLIS-P) advanced technology demonstration (Invited Paper)

Author(s): Jeffery J. Puschell, John Schlaerth, Lacy Cook, John P. Schaefer, Kushal Mehta, Joseph Choi, Kyle Heideman, Raytheon Intelligence & Space (USA)

21 August 2022 • 1:30 PM - 2:00 PM PDT | Conv. Ctr. Room 16A

### 12236-7 Evolution of Earth radiation budget observations from flagship missions to agile sensorcraft (Invited Paper)

Author(s): Kory J. Priestley, NASA Langley Research Ctr. (USA)

21 August 2022 • 2:00 PM - 2:30 PM PDT | Conv. Ctr. Room 16A

### 12236-8 VanZyl-1: demonstrating SmallSat measurement capabilities for land surface temperature and evapotranspiration

Author(s): Kevin Lalli, Scott Soenen, Joshua B. Fisher, Tania Kleynhans, Joseph McGlinchy, Hydrosat (USA); Louis M. Moreau, ABB Inc. (Canada)

21 August 2022 • 2:30 PM - 2:50 PM PDT | Conv. Ctr. Room 16A

### 12236-9 Retrieval of gravity wave parameters using half interferograms measured by CubeSats

Author(s): Konstantin Ntokas, Martin Kaufmann, Jörn Ungermann, Peter Preusse, Martin Riese, Forschungszentrum Jülich GmbH (Germany)

21 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 16A

### 12236-10 Lunar Volatiles and Mineralogy Mapper (LVMM) payload for the lunar Volatile and Mineralogy Mapping Orbiter (VMMO)

Author(s): Roman Kruzelecky, Piotr Murzionak, Qi-Yang Peng, Ian Sinclair, Michel Corriveau, MPB Communications Inc. (Canada); Edward Cloutis, Alexis Parkinson, Brynn Dagdick, Univ. of Winnipeg (Canada); Amélie St-Amour, NGC Aerospace Ltd. (Canada); Yang Gao, Chris Bridges, Nicola Baresi, Andrea Lucca Fabris, Univ. of Surrey (United Kingdom); Samantha Rowe, Surrey Satellite Technology Ltd. (United Kingdom); Nuno Silva, European Union Agency for the Space Programme (Portugal); Paulo Rosa, Deimos Engenharia S.A. (Portugal); Mauro Gameiro, Critical Software (Portugal); Roger Walker, Johan Vennekens, European Space Research and Technology Ctr. (Netherlands), European Space Agency (Netherlands)

21 August 2022 • 3:10 PM - 3:30 PM PDT | Conv. Ctr. Room 16A

**Break**  
**Coffee Break 3:30 PM - 4:00 PM**

## SESSION 3: PLATFORM AND SUBSYSTEM TECHNOLOGIES

21 August 2022 • 4:00 PM - 5:40 PM PDT | Conv. Ctr. Room 16A

Session Chairs: Sachidananda R. Babu, NASA Earth Science Technology Office (USA), Steven C. Reising, Colorado State Univ. (USA)

### 12236-11 Towards vision-based self-navigating CubeSats in cislunar and deep space missions

Author(s): Tiago S. C. Hormigo, Carlos Mano, Pedro Pinheiro, André Santos, Francisco Camara, Spin.Works, Lda. (Portugal)

21 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 16A

### 12236-12 Thermal management of a 6U CubeSat with a high-power R-LEMA laser experiment payload using finite difference method

Author(s): Ricardo S. Bittencourt, Univ. Federal de Santa Catarina (Brazil); Gary Hughes, Univ. of California, Santa Barbara (USA); Kleber de Paiva, Carlos Eduardo Bibow Corrêa, Univ. Federal de Santa Catarina (Brazil)

21 August 2022 • 4:20 PM - 4:40 PM PDT | Conv. Ctr. Room 16A

### 12236-13 Improved Radiometric calibration of Imaging Systems (IRIS) for next generation small satellite imagers

Author(s): Jeffery J. Puschell, Stephen Schiller, Raytheon Intelligence & Space (USA)

21 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 16A

## CONFERENCE 12236

### **12236-14**

#### **End-to-end compressed design for on-chip pixel-wise hyperspectrometry**

Author(s): Thijs Stockmans, Leiden Observatory (Netherlands); Chris van Dijk, Marco Esposito, cosine Remote Sensing B.V. (Netherlands); Frans Snik, Christoph Keller, Leiden Observatory (Netherlands)

21 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 16A

### **12236-15**

#### **Hyperspectral camera with zoom optics for CubeSats**

Author(s): Rami Mannila, Harri Ojanen, Antti Näsilä, Ingmar Stuns, Kari Rainio, VTT Technical Research Ctr. of Finland Ltd. (Finland)

21 August 2022 • 5:20 PM - 5:40 PM PDT | Conv. Ctr. Room 16A

## **SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

### **6:00 PM - 6:05 PM: Welcome and Opening Remarks**

### **12198-501**

#### **In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

### **12238-502**

#### **Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

# Laser Communication and Propagation through the Atmosphere and Oceans XI

22 - 23 August 2022 | Conv. Ctr. Room 10

Conference Chairs: Jaime A. Anguita, Univ. de los Andes (Chile); Jeremy P. Bos, Michigan Technological Univ. (USA); David T. Wayne, Naval Information Warfare Ctr. Pacific (USA)

Program Committee: Larry C. Andrews, Univ. of Central Florida (USA); Shlomi Arnon, Ben-Gurion Univ. of the Negev (Israel); Sukanta Basu, Technische Univ. Delft (Netherlands); Matthew M. Bold, Lockheed Martin Space Systems Co. (USA); Mikhail I. Charnotskii, MC Consulting (USA); Gang Chen, Univ. of California, Riverside (USA); Christopher C. Davis, Univ. of Maryland, College Park (USA); Szymon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); Stephen Hammel, Naval Information Warfare Ctr. Pacific (USA); Vladimir B. Markov, Advanced Systems & Technologies, Inc. (USA); Ronald L. Phillips, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA); William S. Rabinovich, U.S. Naval Research Lab. (USA); 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 (USA); Thomas Weyrauch, Univ. of Dayton (USA); Otakar Wilfert, Brno Univ. of Technology (Czech Republic)

## SESSION 1: OPTICAL COMMUNICATIONS IN THE ATMOSPHERE

22 August 2022 • 10:30 AM - 12:20 PM PDT | Conv. Ctr. Room 10

Session Chairs: Kari Moran, Naval Information Warfare Ctr. Pacific (USA), David T. Wayne, Naval Information Warfare Ctr. Pacific (USA)

### 12237-1

#### Measuring the effect of real atmospheric turbulence on coherent free-space optical communications links (Invited Paper)

Author(s): Douglas McDonald, Raphael Bellossi, Szymon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

22 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 10

### 12237-2

#### Common analog and digital design for flexible radio and optical wireless systems

Author(s): Olivier Bouchet, Marc Lanoiselée, Orange Labs (France); Guillaume Vercasson, B-COM (France); Rodolphe Legouable, Orange Labs (France), B-COM (France); Rafael Pérez, Víctor Guerra, Univ. de Las Palmas de Gran Canaria (Spain)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 10

### 12237-3

#### Adaptive optics for daytime deep-space optical communications

Author(s): Szymon Gladysz, Andreas Zepp, Raphael Bellossi, Max Segel, Douglas McDonald, Karin Stein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

22 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 10

### 12237-4

#### LDPC-coded BPSK covert free-space optical communication with adaptive optics

Author(s): Vijay Nafria, The Univ. of Arizona (USA)

22 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 10

### 12237-5

#### Experimental Study on the Effects of Turbulence Induced Scintillations on a Practical Free-Space Communication Link at High Bandwidth

Author(s): Vijit Bedi, Air Force Research Lab. (USA); Vladimir V. Nikulin, Binghamton Univ. (USA); Kathy-Anne Soderberg, John E. Malowicki, Air Force Research Lab. (USA)

22 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 10

### Break

Lunch Break 12:20 PM - 2:00 PM

## SESSION 2: ADVANCED TOPICS ON LASER PROPAGATION

22 August 2022 • 2:00 PM - 3:00 PM PDT | Conv. Ctr. Room 10

Session Chairs: Jeremy P. Bos, Michigan Technological Univ. (USA), Jaime E. Cisternas, Univ. de los Andes (Chile)

### 12237-6

#### Two-frequency laser pulse train for ultra-broadband IR generation in air

Author(s): Vladimir B. Markov, Advanced Systems & Technologies, Inc. (USA); Gavin Blair, Phillip Sprangle, Univ. of Maryland, College Park (USA), Institute for Research in Electronics & Applied Physics (USA)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 10

### 12237-7

#### Free-space, pulsed optical time transfer through turbid water

Author(s): Kari Moran, Nathan Barnwell, Jonathan Itschner, Lachelle McMahon, Kevin Stanzione, Taneka Lewis, Li Sun, Elizabeth Izaguirre, Arusyak Hovhannesian, Veronica Valeriano, Naval Information Warfare Ctr. Pacific (USA)

22 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 10

### 12237-8

#### Optimal transport theory for processing and classifying OAM superpositions distorted by turbulence

Author(s): Jaime E. Cisternas, Jaime A. Anguita, Univ. de los Andes (Chile)

22 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 10

### Break

Coffee Break 3:00 PM - 3:30 PM

## SESSION 3: TURBULENCE EFFECTS ON LASER PROPAGATION: MODELING AND SIMULATION

22 August 2022 • 3:30 PM - 4:10 PM PDT | Conv. Ctr. Room 10

Session Chairs: Melissa Beason, Univ. of Central Florida (USA), Kyle R. Drexler, Naval Information Warfare Ctr. Pacific (USA)

### 12237-10

#### Simulations of uplink precompensation for laser communications

Author(s): Erkin Sidick, Lewis C. Roberts, Victor A. Vilnrotter, Jet Propulsion Lab. (USA)

22 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 10

### 12237-11

#### Long-term beam size analysis in the focal plane for atmospheric turbulence-affected laser beams

Author(s): Italo Toselli, Szymon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

22 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 10



**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12237-24**

**Generation of orbital angular momentum in a C-band laser**

Author(s): Samuel Mellon, Robert Younts, Naval Information Warfare Ctr. Atlantic (USA); Eric Johnson, Clemson Univ. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12237-27**

**Analysis of atmospheric conditions for optimizing optical communications**

Author(s): Mohamed Baghdady, NIWC Atlantic (USA); Samuel Mellon, Robert Younts, Francisco Aberg Cobo, Naval Information Warfare Ctr. Atlantic (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12237-28**

**Laser propagation in atmospheric aerosol and crystal clouds: light scattering data base**

Author(s): Alexander V. Konoshonkin, Natalia V. Kustova, Victor A. Shishko, Dmitriy N. Timofeev, V.E. Zuev Institute of Atmospheric Optics (Russian Federation)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 4: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION I: JOINT SESSION WITH CONFERENCES 12237 AND 12239**

23 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 10

Session Chairs: Jeremy P. Bos, Michigan Technological Univ. (USA), Jaime A. Anguita, Univ. de los Andes (Chile)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

**12237-14**

**Characterization of C-band laser transmitter through atmosphere in littoral environment**

Author(s): Nathan S. Barnwell, Sean Burk, Galen Cauble, Kyle Drexler, Dan Frey, Conor Pogue, Joshua Rudiger, Sean Stanko, Barry Tidmore, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 10

**12237-15**

**Low-altitude laser propagation link over a marine surface**

Author(s): Sven van Binsbergen, Peter van den Berg, Loes Scheers, Jari Blom, Alexander M. J. van Eijk, Arthur Vromans, TNO (Netherlands)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 10

**12237-16**

**Digital adaptive optics for turbulence mitigation with QR codes**

Author(s): Kyle R. Drexler, Skylar Lilledahl, Benjamin Laxton, Burton Neuner, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 10

**12237-17**

**Reduction of scintillation using broad spectrum optical source for use in FSO**

Author(s): Conor M. Pogue, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 10

**12237-18**

**Experimental campaign for the propagation and measurement of OAM beams over a 1-km terrestrial range**

Author(s): Jaime A. Anguita, Carlos Pirela, Univ. de los Andes (Chile), Millennium Institute for Research in Optics (Chile); Jaime E. Cisternas, Univ. de los Andes (Chile)

23 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 10

**Break**

**Coffee Break 10:10 AM - 10:40 AM**

**SESSION 5: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION II: JOINT SESSION WITH CONFERENCES 12237 AND 12239**

23 August 2022 • 10:40 AM - 11:50 AM PDT | Conv. Ctr. Room 10

Session Chairs: Santasri R. Bose-Pillai, Air Force Institute of Technology (USA), Italo Toselli, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

**12239-1**

**Non-classical models of optical turbulence (Invited Paper)**

Author(s): Andreas Muschinski, NorthWest Research Associates (USA)

23 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 10

**12239-2**

**Estimating the turbulence profile with differential scintillations measured by a Shack-Hartmann wave front sensor**

Author(s): Denis W. Oesch, Leidos, Inc. (USA); Michael Sexauer, Air Force Research Lab. (USA)

23 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 10

**12239-4**

**Quantifying surface layer moisture flux from MWIR imagery**

Author(s): Steven T. Fiorino, Yogendra Raut, Anthony Erickson, Jaclyn Schmidt, Kevin Keefer, Jack E. McCrae, Air Force Institute of Technology (USA)

23 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 10

**Break**

**Lunch/Exhibition Break 11:50 AM - 1:50 PM**

**SESSION 6: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION III: JOINT SESSION WITH CONFERENCES 12237 AND 12239**

23 August 2022 • 1:50 PM - 3:00 PM PDT | Conv. Ctr. Room 10

Session Chair: Conor M. Pogue, Naval Information Warfare Ctr. Pacific (USA)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

**12237-19**

**Comparison of power spectrum and structure function methods to calculate turbulence parameters from sonic anemometer data (Invited Paper)**

Author(s): Melissa Beason, Air Force Research Lab. (USA); Santasri Bose-Pillai, Jack McCrae, Kevin Keefer, Benjamin Wilson, Air Force Institute of Technology (USA); Stephen Shock, Leidos, Inc. (USA)

23 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 10

**12237-22**

**TISTEF Camera and Anemometer Turbulence System (T-CATS) for estimating Cn2 with ground temperature**

Author(s): Matthew B. Salfer-Hobbs, Univ. of Central Florida (USA)

23 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 10

**12237-23****Impact of rainfall on the propagation of 1.5um**

Author(s): Kevin Book, David T. Wayne, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 10

**Break**

**Coffee Break 3:00 PM - 3:30 PM**

**SESSION 7: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION IV: JOINT SESSION WITH CONFERENCES 12237 AND 12239**

23 August 2022 • 3:30 PM - 4:30 PM PDT | Conv. Ctr. Room 10

Session Chairs: Mark F. Spencer, Air Force Research Lab. (USA), Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (USA)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

**12239-5****Profiling atmospheric turbulence using a non-cooperative target and a camera bank and validating with sonic anemometers**

Author(s): Benjamin Wilson, Santasri Bose-Pillai, Air Force Institute of Technology (USA); Cruz Garcia, University of Rochester (USA); Jack McCrae, Kevin Keefer, Steven Fiorino, Air Force Institute of Technology (USA)

23 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 10

**12239-6****Inner scale measurements with SMASH: Small Mobile Atmospheric Sensing Hartmann**

Author(s): Denis W. Oesch, Leidos, Inc. (USA); Melissa Beason, Michael Sexauer, Air Force Research Lab. (USA)

23 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 10

**12239-7****Comparison between SODAR and anemometer-based turbulence measurements**

Author(s): Jack E. McCrae, Santasri R. Bose-Pillai, Yogendra Raut, Benjamin Wilson, Steven Fiorino, Air Force Institute of Technology (USA)

23 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 10

# Quantum Communications and Quantum Imaging XX

21 - 22 August 2022 | Conv. Ctr. Room 14A

Conference Chairs: Keith S. Deacon, DEVCOM Army Research Lab. (USA); Ronald E. Meyers, DEVCOM Army Research Lab. (USA)

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. (USA); Mark T. Gruneisen, Air Force Research Lab. (USA); Richard J. Hughes, Los Alamos National Lab. (Retired) (USA); Yoon-Ho Kim, Pohang Univ. of Science and Technology (Korea, Republic of); William J. Munro, NTT Basic Research Labs. (Japan); Kae Nemoto, National Institute of Informatics (Japan); Todd B. Pittman, Univ. of Maryland, Baltimore County (USA); Barry C. Sanders, Univ. of Calgary (Canada); Alexander V. Sergienko, Boston Univ. (USA); Oliver Slattery, National Institute of Standards and Technology (USA); Dmitry V. Strelakov, Jet Propulsion Lab. (USA); Shigeki Takeuchi, Kyoto Univ. (Japan)

## SESSION 1: QUANTUM IMAGING AND QUANTUM SENSING

21 August 2022 • 8:15 AM - 12:35 PM PDT | Conv. Ctr. Room 14A

Session Chairs: Keith S. Deacon, DEVCOM Army Research Lab. (USA), Ronald E. Meyers, DEVCOM Army Research Lab. (USA)

### 12238-1 Fluorescent diamond and phosphor nanoparticles for quantum-enhanced biosensing (Invited Paper)

Author(s): Philip R. Hemmer, Texas A&M Univ. (USA)

21 August 2022 • 8:15 AM - 8:45 AM PDT | Conv. Ctr. Room 14A

### 12238-2 Zeno effect assisted noise reduction and diagnostics (Invited Paper)

Author(s): Marco Genovese, Alessio Avella, Istituto Nazionale di Ricerca Metrologica (Italy)

21 August 2022 • 8:45 AM - 9:15 AM PDT | Conv. Ctr. Room 14A

### 12238-3 Quantum-enhanced plenoptic imaging (Invited Paper)

Author(s): Gianlorenzo Massaro, Univ. degli Studi di Bari Aldo Moro (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Francesco Di Lena, Istituto Nazionale di Fisica Nucleare - sezione di Bari (Italy); Davide Giannella, Univ. degli Studi di Bari Aldo Moro (Italy), Istituto Nazionale di Fisica Nucleare - sezione di Bari (Italy); Francesco Scattarella, Milena D'Angelo, Univ. degli Studi di Bari Aldo Moro (Italy)

21 August 2022 • 9:15 AM - 9:45 AM PDT | Conv. Ctr. Room 14A

### 12238-4 Quantum imaging gets super smart (Invited Paper)

Author(s): Chané S. Moodley, Isaac M. Nape, Andrew Forbes, Univ. of the Witwatersrand, Johannesburg (South Africa)

21 August 2022 • 9:45 AM - 10:15 AM PDT | Conv. Ctr. Room 14A

### Coffee Break 10:15 AM - 10:45 AM

### 12238-5 Frequency-entangled photon sources and their application to quantum sensing (Invited Paper)

Author(s): Shigeki Takeuchi, Kyoto Univ. (Japan)

21 August 2022 • 10:45 AM - 11:15 AM PDT | Conv. Ctr. Room 14A

### 12238-6 Investigation of propagation characteristics of laser light and squeezed light in fog (Invited Paper)

Author(s): Genta Masada, Tamagawa Univ. (Japan)

21 August 2022 • 11:15 AM - 11:45 AM PDT | Conv. Ctr. Room 14A

### 12238-7 Hyperspectral photon-counting optical time domain reflectometry

Author(s): Anouar Rahmouni, Thomas Gerrits, Oliver Slattery, National Institute of Standards and Technology (USA); Samprity Saha, Virginia Commonwealth University (USA)

21 August 2022 • 11:45 AM - 12:05 PM PDT | Conv. Ctr. Room 14A

### 12238-10

#### Correlation light-field microscopy (Invited Paper)

Author(s): Davide Giannella, Univ. degli Studi di Bari (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Gianlorenzo Massaro, Univ. degli Studi di Bari Aldo Moro (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Francesco Di Lena, Istituto Nazionale di Fisica Nucleare (Italy); Francesco Scattarella, Alessio Scagliola, Univ. degli Studi di Bari Aldo Moro (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Sergii Vasiukov, Istituto Nazionale di Fisica Nucleare (Italy); Augusto Garuccio, Francesco V. Pepe, Milena D'Angelo, Univ. degli Studi di Bari Aldo Moro (Italy), Istituto Nazionale di Fisica Nucleare (Italy)

21 August 2022 • 12:05 PM - 12:35 PM PDT | Conv. Ctr. Room 14A

### Break

Lunch Break 12:35 PM - 2:05 PM

## SESSION 2: QUANTUM TECHNOLOGY AND QUANTUM INFORMATION SCIENCE I

21 August 2022 • 2:05 PM - 5:45 PM PDT | Conv. Ctr. Room 14A

Session Chairs: Keith S. Deacon, DEVCOM Army Research Lab. (USA), Ronald E. Meyers, DEVCOM Army Research Lab. (USA)

### 12238-11

#### Quantum amplitude amplification operators: exact quantum search (Invited Paper)

Author(s): Hyeokjea Kwon, Joonwoo Bae, KAIST (Korea, Republic of)

21 August 2022 • 2:05 PM - 2:35 PM PDT | Conv. Ctr. Room 14A

### 12238-12

#### Probing the path information hidden in the quantum fluctuations of interference patterns (Invited Paper)

Author(s): Holger F. Hofmann, Tomonori Matsushita, Shunichi Kuroki, Masataka Iinuma, Hiroshima Univ. (Japan)

21 August 2022 • 2:35 PM - 3:05 PM PDT | Conv. Ctr. Room 14A

### 12238-13

#### Assessing the Stability of Noisy Quantum Computation (Invited Paper)

Author(s): Travis S. Humble, Samudra Dasgupta, Oak Ridge National Lab. (USA)

21 August 2022 • 3:05 PM - 3:35 PM PDT | Conv. Ctr. Room 14A

### Coffee Break 3:35 PM - 4:05 PM

### 12238-14

#### Efficient embedding towards a near-term quantum linear systems problem solution

Author(s): Sean T. Crowe, Ramiro Rodriguez, Naval Information Warfare Ctr. Pacific (USA); Daniel Gunlycke, U.S. Naval Research Lab. (USA); Fernando Escobar, Joanna N. Ptasinski, Naval Information Warfare Ctr. Pacific (USA)

21 August 2022 • 4:05 PM - 4:25 PM PDT | Conv. Ctr. Room 14A

### 12238-15

#### Quantum state engineering by zero-photon subtraction (Invited Paper)

Author(s): Cory M. Nunn, Saurabh U. Shringarpure, James D. Franson, Todd B. Pittman, Univ. of Maryland, Baltimore County (USA)

21 August 2022 • 4:25 PM - 4:55 PM PDT | Conv. Ctr. Room 14A

### 12238-16

**Towards entangled photon pair generation from SiC-based microring resonator (Invited Paper)**

Author(s): Anouar Rahmouni, Lijun Ma, National Institute of Standards and Technology (USA); Lutong Cai, Carnegie Mellon Univ. (USA); Xiao Tang, Thomas Gerrits, National Institute of Standards and Technology (USA); Qing Li, Carnegie Mellon Univ. (USA); Oliver Slattery, National Institute of Standards and Technology (USA)

21 August 2022 • 4:55 PM - 5:25 PM PDT | Conv. Ctr. Room 14A

**12238-17 Thermoelectric photodetectors for low power and quantum light**

Author(s): Astghik A. Kuzanyan, Institute for Physical Research, NAS RA (Armenia), Univ. of California, Los Angeles (USA); Artur Davoyan, Univ. of California, Los Angeles (USA); Vahan Nikoghosyan, Institute for Physical Research, NAS RA (Armenia); Armen Kuzanyan, Sergey Harutyunyan, Institute for Physical Research, NAS RA (Armenia), Russian-Armenian Univ. (Armenia)

21 August 2022 • 5:25 PM - 5:45 PM PDT | Conv. Ctr. Room 14A

**SUNDAY EVENING PLENARY**

21 August 2022 • 6:00 PM - 7:25 PM PDT | Conv. Ctr. Room 6A

Session Chair: Anita Mahadevan-Jansen, SPIE 2022 President, Vanderbilt Univ. (USA)

**6:00 PM - 6:05 PM: Welcome and Opening Remarks**

**12198-501 In Memoriam, 2022 SPIE Gold Medal Winner Michael W. Berns: Using the photonic toolbox to study chromosomes: 50 years in search of an answer! (Plenary Presentation)**

Author(s): Michael W. Berns, Beckman Laser Institute and Medical Clinic (USA)

21 August 2022 • 6:05 PM - 6:35 PM PDT | Conv. Ctr. Room 6A

**12238-502 Quantum science and metrology (Plenary Presentation)**

Author(s): Jun Ye, JILA, Univ. of Colorado (USA)

21 August 2022 • 6:45 PM - 7:15 PM PDT | Conv. Ctr. Room 6A

**NANOSCIENCE + ENGINEERING PLENARY**

22 August 2022 • 8:30 AM - 10:05 AM PDT | Conv. Ctr. Room 6A

Session Chair: Gennady Shvets, Cornell Univ. (USA)

**8:30 AM - 8:35 AM: Welcome and Opening Remarks**

**12203-501 Colorimetric metasurfaces for next-generation, on-chip imaging of tissue microstructure (Plenary Presentation)**

Author(s): Lisa V. Poulikakos, Univ. of California, San Diego (USA)

22 August 2022 • 8:35 AM - 9:10 AM PDT | Conv. Ctr. Room 6A

**12204-502 Petascale photonic connectivity for energy efficient AI computing (Plenary Presentation)**

Author(s): Keren Bergman, Columbia Univ. (USA)

22 August 2022 • 9:20 AM - 9:55 AM PDT | Conv. Ctr. Room 6A

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

**SESSION 3: QUANTUM TECHNOLOGY AND QUANTUM INFORMATION SCIENCE II**

22 August 2022 • 10:30 AM - 12:30 PM PDT | Conv. Ctr. Room 14A

Session Chairs: Keith S. Deacon, DEVCOM Army Research Lab. (USA), Ronald E. Meyers, DEVCOM Army Research Lab. (USA)

**12238-18 Optimal single-error-type entanglement generation via coherent-state transmission (Invited Paper)**

Author(s): Koji Azuma, NTT Basic Research Labs. (Japan)

22 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 14A

**12238-19 Enabling technologies for cold atom quantum systems**

Author(s): Christina C. C. Willis, ColdQuanta, Inc. (USA)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 14A

**12238-20 Investigation of Microwave Transducers for Linearity Dependence and Applications in Quantum Networking**

Author(s): Summer Bolton, The Univ. of Alabama (USA); Joseph Lukens, Oak Ridge National Lab. (USA); Maddy Woodson, Steven Estrella, Freedom Photonics, LLC (USA); Patrick Kung, Seongsin M. Kim, The Univ. of Alabama (USA)

22 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 14A

**12238-21 Superconducting nanowire single-photon detectors made of NbTiN and MoSi**

Author(s): Lucio Zugliani, Rasmus Flaschmann, Christian Schmid, Stefan Strothauer, Fabian Wietschorke, Stefanie Grotowski, Simone Spedicato, Sven Ernst, Fabian Flassig, Technische Univ. München (Germany); Matthias Althammer, Rudolf Gross, Walther-Meissner-Institute (Germany); Jonathan Finley, Kai Müller, Technische Univ. München (Germany)

22 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 14A

**12238-24 Unbiased quantum random-number generation by number-resolving detection of up to 100 photons (Invited Paper)**

Author(s): Miller Eaton, Amr Hossameldin, Univ. of Virginia (USA); Christopher C. Gerry, Richard J. Birrittella, Lehman College (USA); Paul M. Alsing, Air Force Research Lab. (USA); Olivier Pfister, Univ. of Virginia (USA)

22 August 2022 • 12:00 PM - 12:30 PM PDT | Conv. Ctr. Room 14A

**Break  
Lunch Break 12:30 PM - 1:30 PM**

**SESSION 4: QUANTUM NETWORKING AND QUANTUM COMMUNICATIONS**

22 August 2022 • 1:30 PM - 5:20 PM PDT | Conv. Ctr. Room 14A

Session Chairs: Keith S. Deacon, DEVCOM Army Research Lab. (USA), Ronald E. Meyers, DEVCOM Army Research Lab. (USA)

**12238-25 Towards quantum networking using collective Rydberg qubits (Invited Paper)**

Author(s): Yefeng Mei, Yin Li, Huy N. Nguyen, Brian Yang, Paul R. Berman, Alex Kuzmich, Univ. of Michigan (USA)

22 August 2022 • 1:30 PM - 2:00 PM PDT | Conv. Ctr. Room 14A

**12238-26 Investigating absorption and scattering effects of turbulent atmosphere on entangled photon pairs propagating through free-space**

Author(s): Vijit Bedi, Air Force Research Lab. (USA); Vladimir V. Nikulin, Binghamton Univ. (USA); Kathy-Anne Soderberg, Paul Alsing, Laura A. Wessing, John E. Malowicki, Air Force Research Lab. (USA)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 14A

**12238-27 Teleportation in quantum edge networks (Invited Paper)**

Author(s): William J. Munro, NTT Basic Research Labs. (Japan); Yi-Han Luo, Ming-Cheng Chen, Univ. of Science and Technology of China (China); Manuel Erhard, Österreichische Akademie der Wissenschaften (Austria); Han-Sen Zhong, Dian Wu, Hao-Yang Tang, Qi Zhao, Xi-Lin Wang, Univ. of Science and Technology of China (China); Keisuke Fujii, Osaka Univ. (Japan); Li Li, Nai-Le Liu, Univ. of Science and Technology of China (China); Kae Nemoto, National Institute of Informatics (Japan); Chao-Yang Lu, Univ. of Science and Technology of China (China); Anton Zeilinger, Österreichische Akademie der Wissenschaften (Austria); Jian-Wei Pan, Univ. of Science and Technology of China (China)

22 August 2022 • 2:20 PM - 2:50 PM PDT | Conv. Ctr. Room 14A

## CONFERENCE 12238

### 12238-28

#### **Time bin quantum key distribution protocols for free space communications**

Author(s): Alfonso Tello Castillo, Elizabeth Eso, Ross Donaldson, Heriot-Watt Univ. (United Kingdom)

22 August 2022 • 2:50 PM - 3:10 PM PDT | Conv. Ctr. Room 14A

### 12238-29

#### **Hybrid quantum edge computing network (Invited Paper)**

Author(s): Lijun Ma, National Institute of Standards and Technology (USA); Leah Ding, American Univ. (USA)

22 August 2022 • 3:40 PM - 4:10 PM PDT | Conv. Ctr. Room 14A

### 12238-30

#### **Optimizing all-fiber nonlocal dispersion compensation for quantum communication networks: strategies and tools (Invited Paper)**

Author(s): RuiMing Chua, Technology Innovation Institute (United Arab Emirates), National Univ. of Singapore (Singapore); Alexander Ling, Ctr. for Quantum Technologies (Singapore), National Univ. of Singapore (Singapore); James A. Grieve, Technology Innovation Institute (United Arab Emirates), Ctr. for Quantum Technologies (Singapore)

22 August 2022 • 4:10 PM - 4:40 PM PDT | Conv. Ctr. Room 14A

### 12238-31

#### **First Cross-Border Trial of Quantum Key Distribution Sharing Fiber Line with Data and Accurate Time Transmissions**

Author(s): Josef Vojtech, Rudolf Vohnout, Ondrej Havlis, Petr Pospisil, Martin Slapak, Radek Velc, Lada Altmannová, Tomas Horvath, Jan Kundrat, Michal Hazlinsky, CESNET z.s.p.o. (Czech Republic)

22 August 2022 • 4:40 PM - 5:00 PM PDT | Conv. Ctr. Room 14A

### 12238-35

#### **Coherent phase transfer for real-world twin-field quantum key distribution**

Author(s): Salvatore Virzi, Cecilia Clivati, Alice Meda, Simone Donadello, Istituto Nazionale di Ricerca Metrologica (Italy); Marco Genovese, Istituto Nazionale di Ricerca Metrologica (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Filippo Levi, Alberto Mura, Istituto Nazionale di Ricerca Metrologica (Italy); Ivo Degiovanni, Istituto Nazionale di Ricerca Metrologica (Italy), Istituto Nazionale di Fisica Nucleare (Italy); Davide Calonico, Istituto Nazionale di Ricerca Metrologica (Italy)

22 August 2022 • 5:00 PM - 5:20 PM PDT | Conv. Ctr. Room 14A

### 12238-33

#### **Realization of two-qubit quantum gate operation of photonic qubits via cavity QED**

Author(s): Ziqiu Zhang, Shiqing Tang, Hengyang Normal Univ. (China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

### 12238-34

#### **Portable polarization-entangled photon source & receiver toolset for quantum network metrology**

Author(s): Anouar Rahmouni, Thomas Gerrits, Oliver Slattery, Paulina Kuo, Reddy Dileep V., Ma Lijun, Tang Xiao, National Institute of Standards and Technology (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12238-32

#### **Cavity-QED-based three-qubit quantum conditional phase gate through dispersive interaction**

Author(s): Si Luo, Shiqing Tang, Hengyang Normal Univ. (China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1



# Unconventional Imaging and Adaptive Optics 2022

23 - 24 August 2022 | Conv. Ctr. Room 10

Conference Chairs: Jean J. Dolne, The Boeing Co. (USA); Mark F. Spencer, Air Force Research Lab. (USA)

Conference Co-Chair: Santasri R. Bose-Pillai, Air Force Institute of Technology (USA)

Program Committee: James R. Fienup, The Institute of Optics, Univ. of Rochester (USA); Victor L. Gamiz, Tau Technologies LLC (USA); Kenneth J. Jerkatis, Ball Aerospace (USA); Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (USA); Matthew Kemnetz, Air Force Research Lab. (USA); Casey J. Pellizzari, U.S. Air Force Academy (USA); Cameron J. Radosevich, Sandia National Labs. (USA); Italo Toselli, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany); David G. Voelz, New Mexico State Univ. (USA)

## POSTER SESSION

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

### 12239-27

#### Wide field of view and high central brightness of single crystal phosphor converter layer for smart headlights

Author(s): Yung-Peng Chang, National Chung Hsing Univ. (Taiwan), Taiwan Color Optics, Inc. (Taiwan); Hsing-Kun Shih, Chun-Nien Liu, Wood-Hi Cheng, National Chung Hsing Univ. (Taiwan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

## SESSION 1: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION I: JOINT SESSION WITH CONFERENCES 12237 AND 12239

23 August 2022 • 8:30 AM - 10:10 AM PDT | Conv. Ctr. Room 10

Session Chairs: Jeremy P. Bos, Michigan Technological Univ. (USA), Jaime A. Anguita, Univ. de los Andes (Chile)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

### 12237-14

#### Characterization of C-band laser transmitter through atmosphere in littoral environment

Author(s): Nathan S. Barnwell, Sean Burk, Galen Cauble, Kyle Drexler, Dan Frey, Conor Pogue, Joshua Rudiger, Sean Stanko, Barry Tidmore, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 8:30 AM - 8:50 AM PDT | Conv. Ctr. Room 10

### 12237-15

#### Low-altitude laser propagation link over a marine surface

Author(s): Sven van Binsbergen, Peter van den Berg, Loes Scheers, Jari Blom, Alexander M. J. van Eijk, Arthur Vromans, TNO (Netherlands)

23 August 2022 • 8:50 AM - 9:10 AM PDT | Conv. Ctr. Room 10

### 12237-16

#### Digital adaptive optics for turbulence mitigation with QR codes

Author(s): Kyle R. Drexler, Skylar Lilledahl, Benjamin Laxton, Burton Neuner, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 9:10 AM - 9:30 AM PDT | Conv. Ctr. Room 10

### 12237-17

#### Reduction of scintillation using broad spectrum optical source for use in FSO

Author(s): Conor M. Pogue, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 9:30 AM - 9:50 AM PDT | Conv. Ctr. Room 10

### 12237-18

#### Experimental campaign for the propagation and measurement of OAM beams over a 1-km terrestrial range

Author(s): Jaime A. Anguita, Carlos Pirela, Univ. de los Andes (Chile), Millennium Institute for Research in Optics (Chile); Jaime E. Cisternas, Univ. de los Andes (Chile)

23 August 2022 • 9:50 AM - 10:10 AM PDT | Conv. Ctr. Room 10

### Break

**Coffee Break 10:10 AM - 10:40 AM**

## SESSION 2: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION II: JOINT SESSION WITH CONFERENCES 12237 AND 12239

23 August 2022 • 10:40 AM - 11:50 AM PDT | Conv. Ctr. Room 10

Session Chairs: Santasri R. Bose-Pillai, Air Force Institute of Technology (USA), Italo Toselli, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

### 12239-1

#### Non-classical models of optical turbulence (Invited Paper)

Author(s): Andreas Muschinski, NorthWest Research Associates (USA)

23 August 2022 • 10:40 AM - 11:10 AM PDT | Conv. Ctr. Room 10

### 12239-2

#### Estimating the turbulence profile with differential scintillations measured by a Shack-Hartmann wave front sensor

Author(s): Denis W. Oesch, Leidos, Inc. (USA); Michael Sexauer, Air Force Research Lab. (USA)

23 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 10

### 12239-4

#### Quantifying surface layer moisture flux from MWIR imagery

Author(s): Steven T. Fiorino, Yogendra Raut, Anthony Erickson, Jaclyn Schmidt, Kevin Keefer, Jack E. McCrae, Air Force Institute of Technology (USA)

23 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 10

### Break

**Lunch/Exhibition Break 11:50 AM - 1:50 PM**

## SESSION 3: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION III: JOINT SESSION WITH CONFERENCES 12237 AND 12239

23 August 2022 • 1:50 PM - 3:00 PM PDT | Conv. Ctr. Room 10

Session Chair: Conor M. Pogue, Naval Information Warfare Ctr. Pacific (USA)

**This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022**

## CONFERENCE 12239

### 12237-19

#### Comparison of power spectrum and structure function methods to calculate turbulence parameters from sonic anemometer data (Invited Paper)

Author(s): Melissa Beason, Air Force Research Lab. (USA); Santasri Bose-Pillai, Jack McCrae, Kevin Keefer, Benjamin Wilson, Air Force Institute of Technology (USA); Stephen Shock, Leidos, Inc. (USA)

23 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 10

### 12237-22

#### TISTEF Camera and Anemometer Turbulence System (T-CATS) for estimating Cn2 with ground temperature

Author(s): Matthew B. Salfer-Hobbs, Univ. of Central Florida (USA)

23 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 10

### 12237-23

#### Impact of rainfall on the propagation of 1.5um

Author(s): Kevin Book, David T. Wayne, Naval Information Warfare Ctr. Pacific (USA)

23 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 10

### Break

Coffee Break 3:00 PM - 3:30 PM

### SESSION 4: ATMOSPHERIC PROPAGATION AND CHARACTERIZATION IV: JOINT SESSION WITH CONFERENCES 12237 AND 12239

23 August 2022 • 3:30 PM - 4:30 PM PDT | Conv. Ctr. Room 10

Session Chairs: Mark F. Spencer, Air Force Research Lab. (USA), Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (USA)

This Session is of related interest to Conference 12237: Laser Communication and Propagation through the Atmosphere and Oceans XI and Conference 12239: Unconventional Imaging and Adaptive Optics 2022

### 12239-5

#### Profiling atmospheric turbulence using a non-cooperative target and a camera bank and validating with sonic anemometers

Author(s): Benjamin Wilson, Santasri Bose-Pillai, Air Force Institute of Technology (USA); Cruz Garcia, University of Rochester (USA); Jack McCrae, Kevin Keefer, Steven Fiorino, Air Force Institute of Technology (USA)

23 August 2022 • 3:30 PM - 3:50 PM PDT | Conv. Ctr. Room 10

### 12239-6

#### Inner scale measurements with SMASH: Small Mobile Atmospheric Sensing Hartmann

Author(s): Denis W. Oesch, Leidos, Inc. (USA); Melissa Beason, Michael Sexauer, Air Force Research Lab. (USA)

23 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 10

### 12239-7

#### Comparison between SODAR and anemometer-based turbulence measurements

Author(s): Jack E. McCrae, Santasri R. Bose-Pillai, Yogendra Raut, Benjamin Wilson, Steven Fiorino, Air Force Institute of Technology (USA)

23 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 10

### SESSION 5: UNCONVENTIONAL ADAPTIVE OPTICS

24 August 2022 • 8:30 AM - 10:00 AM PDT | Conv. Ctr. Room 10

Session Chairs: Matthew R. Kemnetz, Air Force Research Lab. (USA), Mark F. Spencer, Air Force Research Lab. (USA)

### 12239-8

#### Influence of bandwidth error on the performance of adaptive optics systems for uncooperative beacons: plane and spherical wave analysis (Invited Paper)

Author(s): Italo Toselli, Szymon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB (Germany)

24 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 10

### 12239-9

#### Efficient image-based wavefront correction using phase diversity and SPGD optimization for high-resolution optical remote sensing

Author(s): Makoto Hirose, Japan Aerospace Exploration Agency (Japan); Norihide Miyamura, Meisei Univ. (Japan); Seichi Sato, Tadahito Mizutani, Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan)

24 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 10

### 12239-10

#### Solving coherent-imaging inverse problems using deep neural networks: An experimental demonstration

Author(s): Casey J. Pellizzari, Timothy Bate, U.S. Air Force Academy (USA); Mark Spencer, Air Force Research Lab. (USA)

24 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 10

### 12239-11

#### Dynamic aberration correction using a deformable mirror and double-helix point spread function for flow metrology

Author(s): Jürgen W. Czarske, Lars Buettner, Clemens Bilsing, TU Dresden (Germany)

24 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 10

### Break

Coffee Break 10:00 AM - 10:30 AM

### SESSION 6: DIGITAL HOLOGRAPHY AND LADAR

24 August 2022 • 10:30 AM - 11:40 AM PDT | Conv. Ctr. Room 10

Session Chairs: Cameron J. Radosevich, Sandia National Labs. (USA), Kenneth J. Jerkatis, Ball Aerospace (USA)

### 12239-12

#### Effects of speckle decorrelation on motion-compensated, multi-wavelength, 3D digital holography (Invited Paper)

Author(s): Matthias T. Banet, James R. Fienup, Univ. of Rochester (USA)

24 August 2022 • 10:30 AM - 11:00 AM PDT | Conv. Ctr. Room 10

### 12239-14

#### Experimental validation of model-based digital holographic imaging using multi-shot data

Author(s): Timothy Bate, Daniel O'Keefe, U.S. Air Force Academy (USA); Mark Spencer, Air Force Research Lab. (USA); Casey Pellizzari, U.S. Air Force Academy (USA)

24 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 10

### 12239-15

#### Laser range profiling: concept, simulation, and target identification

Author(s): Gérard Berginc, Thales LAS France SAS (France)

24 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 10

### Break

Lunch/Exhibition Break 11:40 AM - 1:30 PM

### SESSION 7: AERO EFFECTS

24 August 2022 • 1:30 PM - 3:20 PM PDT | Conv. Ctr. Room 10

Session Chairs: Casey J. Pellizzari, U.S. Air Force Academy (USA), Santasri R. Bose-Pillai, Air Force Institute of Technology (USA)

### 12239-19

#### Modal analysis of pressure fields on and around turrets with different protrusions

Author(s): Timothy Bukowski, Univ. of Notre Dame (USA); Matthew Kalensky, Integrated Engagement Systems Department, Naval Surface Warfare Center Dahlgren Division (USA); Stanislav Gordeyev, Univ. of Notre Dame (USA); Matthew Kemnetz, U.S. Air Force Research Laboratory (USA)

24 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 10

### 12239-16

#### The story of the Airborne Aero-Optics Laboratory (Invited Paper)

Author(s): Eric J. Jumper, Univ. of Notre Dame (USA)

24 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 10

**12239-17****Neural network forecasting of transonic turbulent flow for adaptive optics control**

Author(s): Benjamin D. Shaffer, Jeremy R. Vorenberg, Chris C. Wilcox, Austin J. McDaniel, Air Force Research Lab. (USA)

24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 10

**12239-18****Effects of shock-related discontinuities on SHWFS measurements: experimental results**

Author(s): Matthew Kemnetz, Air Force Research Lab. (USA); Matthew Kalensky, Naval Surface Warfare Ctr., Dahlgren Division (USA); Aaron Roeder, Applied Technology Associates, a BlueHalo Co. (USA); Zareb Noel, Univ. of Notre Dame (USA)

24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 10

**12239-20****Effects of shock-related discontinuities on SHWFS measurements: modeling and simulation**

Author(s): Matthew Kalensky, Naval Surface Warfare Ctr. Dahlgren Div. (USA); Matthew R. Kemnetz, Mark F. Spencer, Air Force Research Lab. (USA)

24 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 10

**Break**

**Coffee Break 3:20 PM - 3:50 PM**

**SESSION 8: UNCONVENTIONAL IMAGING**

24 August 2022 • 3:50 PM - 5:10 PM PDT | Conv. Ctr. Room 10

Session Chairs: Jean J. Dolne, The Boeing Co. (USA), Victor L. Gamiz, Tau Technologies LLC (USA)

**12239-22****Bridging the gap between electron and optical microscopy through neural network enabled training and imaging**

Author(s): Mahirah Zaini, University of Alberta (Canada); Joshua Perkins, Haoyang Cheng, Behrad Gholipour, Univ. of Alberta (Canada)

24 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 10

**12239-23****Digital optical-resolution photoacoustic microscopy for deep learning**

Author(s): Xianlin Song, Nanchang Univ. (China)

24 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 10

**12239-24****Statistical and imaging comparisons of FFT-based phase screens and fractal-based phase screens**

Author(s): Richard B. Holmes, nLIGHT | Nutronics (USA); Venkata Gudimetla, Air Force Research Lab. (USA); Daniel Abercrombie, The Boeing Co. (USA)

24 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 10

**12239-29****Semi-analytical angular spectrum method in lensless digital inline holography: effects on resolution and detection of microparticles**

Author(s): Pablo Etchepareborda, Department of Earth and Environmental Sciences, University of Manchester (United Kingdom); Paul Connolly, The Univ. of Manchester (United Kingdom); Jan Henneberger, Institute for Atmospheric and Climate Science, ETH Zurich (Switzerland); Jonathan Crosier, The Univ. of Manchester (United Kingdom)

24 August 2022 • 4:50 PM - 5:10 PM PDT | Conv. Ctr. Room 10

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

22 - 23 August 2022 | Conv. Ctr. Room 7A

Conference Chairs: Ali M. Khounsary, Illinois Institute of Technology (USA); Hidekazu Mimura, The Univ. of Tokyo (Japan); Christian Morawe, European Synchrotron Radiation Facility (France)

Conference Co-Chair: Daniele Spiga, INAF - Osservatorio Astronomico di Brera (Italy)

Program Committee: Bernhard W. Adams, Research Instruments Corp. (USA); Lucia Alianelli, Diamond Light Source Ltd. (United Kingdom); Lahsen Assoufid, Argonne National Lab. (USA); Stefan Braun, Westsächsische Hochschule Zwickau (Germany); Daniele Cocco, Lawrence Berkeley National Lab. (USA); Raymond P. Conley, Argonne National Lab. (USA); Christian David, Paul Scherrer Institut (Switzerland); Shunji Goto, RIKEN SPring-8 Ctr. (Japan); Hans M. Hertz, KTH Royal Institute of Technology (Sweden); Yoshio Ichii, JTEC Corp. (Japan); Werner H. Jark, Elettra-Sincrotrone Trieste S.C.p.A. (Italy); George A. Kyrala, Los Alamos National Lab. (USA); Eric Louis, Univ. of Twente (Netherlands); Patrick P. Naulleau, The Ctr. for X-Ray Optics (USA); Haruhiko Ohashi, RIKEN SPring-8 Ctr. (Japan); Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic); Michael J. Pivovarov, SLAC National Accelerator Lab. (USA); Yuriy Y. Platonov, Rigaku Innovative Technologies, Inc. (USA); Regina Soufli, Lawrence Livermore National Lab. (USA); Stanislav Stoupin, Cornell Univ. (USA); Mau-Tsu Tang, National Synchrotron Radiation Research Ctr. (Taiwan); Giovanni Volpe, Göteborgs Univ. (Sweden); Zhanshan Wang, Tongji Univ. (China); Makina Yabashi, RIKEN SPring-8 Ctr. (Japan); Kazuto Yamauchi, Osaka Univ. (Japan); Brian W. Yates, Canadian Light Source Inc. (Canada)

**SESSION 1: REFLECTIVE OPTICS**

22 August 2022 • 8:00 AM - 10:00 AM PDT | Conv. Ctr. Room 7A

Session Chairs: Hidekazu Mimura, The Univ. of Tokyo (Japan), Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic)

**12240-1****Development of adaptive multilayer mirror optics for sub-5 nm focusing of a hard X-ray**

Author(s): Takato Inoue, Osaka Univ. (Japan); Satoshi Matsuyama, Nagoya Univ. (Japan); Yuto Tanaka, Atsuki Ito, Osaka Univ. (Japan); Yoshio Ichii, JTEC Corp. (Japan); Jumpei Yamada, RIKEN SPring-8 Ctr. (Japan); Yasuhisa Sano, Osaka Univ. (Japan); Yoshiki Kohmura, Makina Yabashi, RIKEN SPring-8 Ctr. (Japan); Kazuto Yamauchi, Osaka Univ. (Japan)

22 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 7A

**12240-2****The new ESRF compact multilayer coating system**

Author(s): Christian Morawe, Patrice Bras, Cyril Guilloud, Sylvain Labouré, Jean-Christophe Peffen, European Synchrotron Radiation Facility (France)

22 August 2022 • 8:20 AM - 8:40 AM PDT | Conv. Ctr. Room 7A

**12240-3****Diagnostics of KB mirrors misalignments using Zernike rectangular polynomials and neural networks.**

Author(s): Sergio A. L. Luiz, Lab. Nacional de Luz Sincrotron (Brazil), Univ. of Campinas (Brazil); Cassiano S. N. C. Bueno, Lab. Nacional de Luz Sincrotron (Brazil); Francisco M. C. Silva, Lab. Nacional de Luz Sincrotron (Brazil), Univ. of Campinas (Brazil); Alessandra Tomal, Univ. of Campinas (Brazil); Carlos S. B. Dias, Karlsruhe Institut für Technologie (Germany); Rafael Celestre, European Synchrotron Radiation Facility (France); Helio C. N. Tolentino, Lab. Nacional de Luz Sincrotron (Brazil), Univ. of Campinas (Brazil); Regis Oliveira, Bernd C. Meyer, Ctr. Nacional de Pesquisa em Energia e Materiais (Brazil)

22 August 2022 • 8:40 AM - 9:00 AM PDT | Conv. Ctr. Room 7A

**12240-4****Design of soft x-ray fluorescence microscopy beyond 100-nm spatial resolution with an ultrashort Kirkpatrick-Baez mirror**

Author(s): Takenori Shimamura, The Univ. of Tokyo (Japan), Japan Synchrotron Radiation Research Institute (Japan); Yoko Takeo, The Univ. of Tokyo (Japan), Japan Synchrotron Radiation Research Institute (Japan); Fumika Moriya, The Univ. of Tokyo (Japan); Takashi Kimura, The Institute for Solid State Physics, The Univ. of Tokyo (Japan); Mari Shimura, National Ctr. for Global Health and Medicine (Japan); Yasunori Senba, Hikaru Kishimoto, Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan); Kenta Shimba, Yasuhiko Jimbo, Hidekazu Mimura, The Univ. of Tokyo (Japan)

22 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 7A

**12240-5****Multilayer coating design methods for complex requirements in a high-energy X-ray imaging optic**

Author(s): Christopher C. Walton, Lawrence Livermore National Lab. (USA); Jeffrey R. Fein, Sandia National Labs. (USA); Bernard Koziemiński, Lawrence Livermore National Lab. (USA); Suzanne Romaine, Harvard-Smithsonian Ctr. for Astrophysics (USA); Julia Vogel, Lawrence Livermore National Lab. (USA)

22 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 7A

**12240-34****Fabrication of rhodium-coated Kirkpatrick-Baez X-ray mirrors using profile coating method**

Author(s): Bing Shi, Raymond Conley, Jun Qian, Xianbo Shi, Argonne National Lab (USA); Steve Heald, Argonne National Lab. (USA); Deming Shu, Argonne National Lab (USA); Lahsen Assoufid, Argonne National Lab. (USA)

22 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 7A

**Break****Coffee Break 10:00 AM - 10:25 AM****SESSION 2: SOURCES**

22 August 2022 • 10:25 AM - 11:45 AM PDT | Conv. Ctr. Room 7A

Session Chairs: Christian Morawe, European Synchrotron Radiation Facility (France), Ali M. Khounsary, Illinois Institute of Technology (USA)

**12240-6****Design and fabrication of multi-metal patterned target anodes for improved quality of hyperspectral X-ray radiography and computed tomography imaging systems**

Author(s): Courtney Hummell, Noelle M. Collins, Gabriella Dalton, Kyle R. Thompson, Edward S. Jimenez, Sandia National Labs. (USA)

22 August 2022 • 10:25 AM - 10:45 AM PDT | Conv. Ctr. Room 7A

**12240-7****Electric discharge relevant to pyroelectric spontaneous polarization inducing irreproducibility of pyroelectric X-ray generation**

Author(s): Masayuki Naito, Hiroki Kusano, National Institutes for Quantum and Radiological Science and Technology (Japan); Hiroshi Nagaoka, RIKEN (Japan); Nobuyuki Hasebe, Waseda Univ. (Japan); Satoshi Kodaira, National Institutes for Quantum and Radiological Science and Technology (Japan)

22 August 2022 • 10:45 AM - 11:05 AM PDT | Conv. Ctr. Room 7A

**12240-8****Increasing resolution of X-ray imaging at high acceleration voltages**

Author(s): Emil Espes, Excillum AB (Sweden); Anasuya Adibhatla, Excillum Inc. (USA); Till Dreier, Lund Univ. (Sweden), Excillum AB (Sweden)

22 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 7A

**12240-9****MetalJet X-ray tube for high speed CT**

Author(s): Anasuya Adibhatla, Excillum Inc. (USA); Emil Espes, Excillum AB (Sweden)

22 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 7A

**Break****Lunch Break 11:45 AM - 12:55 PM**



**SESSION 3: DIFFRACTIVE OPTICS**

22 August 2022 • 12:55 PM - 2:35 PM PDT | Conv. Ctr. Room 7A

Session Chairs: Christian G. Schroer, Deutsches Elektronen-Synchrotron (Germany), Yuriy Y. Platonov, Rigaku Innovative Technologies, Inc. (USA)

**12240-13****Fabrication of low blaze angle gratings by replication and plasma etch**

Author(s): Sooyeon Park, Dmitriy L. Voronov, Antoine Wojdyla, Eric M. Gullikson, Fahard Salmassi, Howard A. Padmore, Lawrence Berkeley National Lab. (USA)

22 August 2022 • 12:55 PM - 1:15 PM PDT | Conv. Ctr. Room 7A

**12240-14****Advanced nanolithography: unlocking unprecedented potential of nanostructured optical elements**

Author(s): Florian Döring, Adam Kubec, Florian Sander, Christin Döring, Ethouba Al Jassin, Jan Erjawetz, XRnanotech (Switzerland)

22 August 2022 • 1:15 PM - 1:35 PM PDT | Conv. Ctr. Room 7A

**12240-15****Maximized X-ray flux from MEMS devices for timing applications**

Author(s): Donald A. Walko, Jinxing Jiang, Jian Zhou, Jin Wang, Argonne National Lab. (USA)

22 August 2022 • 1:35 PM - 1:55 PM PDT | Conv. Ctr. Room 7A

**12240-16****A novel X-ray beam monitoring and wavelength calibration using four-beam diffraction: theory and experiments**

Author(s): XianRong Huang, Lahsen Assoufid, Xianbo Shi, Argonne National Lab. (USA)

22 August 2022 • 1:55 PM - 2:15 PM PDT | Conv. Ctr. Room 7A

**12240-17****Fabrication of ultra-thin single crystal diamond membrane by using laser ablation**

Author(s): Paresh Pradhan, Argonne National Lab. (USA); Sergey Antipov, PALM Scientific (USA); Yuri Shvyd ko, Argonne National Lab. (USA)

22 August 2022 • 2:15 PM - 2:35 PM PDT | Conv. Ctr. Room 7A

**Break****Coffee Break 2:35 PM - 3:00 PM****SESSION 4: ADAPTIVE OPTICS AND NEW APPLICATIONS**

22 August 2022 • 3:00 PM - 4:20 PM PDT | Conv. Ctr. Room 7A

Session Chairs: Bernhard W. Adams, Research Instruments Corp. (Germany), Christopher C. Walton, Lawrence Livermore National Lab. (USA)

**12240-18****Active X-ray optics for tailoring the time structure of synchrotron beams**

Author(s): Daniel Schmidt, Peter Gaal, TXproducts UG (Germany)

22 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 7A

**12240-19****PicoSwitch: active X-Ray optics for hard X-Ray pulse shortening**

Author(s): Mathias Sander, Paul Scherrer Institut (Switzerland); Daniel Schmidt, Peter Gaal, TXproducts UG (Germany)

22 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 7A

**12240-20****Magnetic smart material application to synchrotron X-ray optics: prospects and current progress**

Author(s): Melville P. Ulmer, Daniel Quispe, Jian Cao, Yip-Wah Chung, Donald B. Buchholz, Northwestern Univ. (USA); Lahsen Assoufid, Raymond P. Conley, Argonne National Lab. (USA)

22 August 2022 • 3:40 PM - 4:00 PM PDT | Conv. Ctr. Room 7A

**12240-21****High-speed imaging of metal drilling using 100-keV X-rays at SPring-8**

Author(s): Hidekazu Mimura, The Univ. of Tokyo (Japan); Gota Yamaguchi, RIKEN SPring-8 Ctr. (Japan); Keito Tamura, The Univ. of Tokyo (Japan); Hirokatsu Yumoto, Takahisa Koyam, Japan Synchrotron Radiation Research Institute (Japan); Hidekazu Takano, Yujiro Hayashi, Makina Yabashi, RIKEN SPring-8 Ctr. (Japan); Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan)

22 August 2022 • 4:00 PM - 4:20 PM PDT | Conv. Ctr. Room 7A

**X-Ray, Gamma-Ray, and Particle Technologies Plenary**

22 August 2022 • 4:30 PM - 5:25 PM PDT | Conv. Ctr. Room 6A

Session Chairs: Ralph B. James, Savannah River National Lab. (USA), Ali M. Khounsary, Illinois Institute of Technology (USA)

**4:30 PM - 4:35 PM: Welcome and Opening Remarks****12241-501****Toward new frontiers: Encounters and synergies with state-of-the-art astronomical X-ray detectors (Plenary Presentation)**

Author(s): Tadayuki Takahashi, The Univ. of Tokyo (Japan)

22 August 2022 • 4:35 PM - 5:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12240-33****System design of single-mask edge-illumination X-ray phase contrast imaging**

Author(s): Jingcheng Yuan, Mini Das, Univ. of Houston (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12240-35****Linear canonical transform library for use as online model for X-ray beamline control**

Author(s): Boaz Nash, Dan Abell, Ilya Pogorelov, RadiaSoft LLC (USA); Nicholas Goldring, State33 (USA); Maksim Rakitin, Abigail Giles, Joshua Lynch, Thomas Morris, Brookhaven National Laboratory (USA); Paul Moeller, RadiaSoft LLC (USA); Walter Andrew, Brookhaven National Lab. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 5: METROLOGY I**

23 August 2022 • 9:00 AM - 10:40 AM PDT | Conv. Ctr. Room 7A

Session Chairs: Lahsen Assoufid, Argonne National Lab. (USA), Kazuto Yamauchi, Osaka Univ. (Japan)

**12240-23****The ALS interferometric microscope upgraded for measurements with large X-ray optics and optical assemblies**

Author(s): Ian Lacey, Lawrence Berkeley National Lab. (USA); Kevan Anderson, Harold Barnard, Damon English, Lawrence Berkeley National Laboratory (USA); Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (USA)

23 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 7A

**12240-24****Fabrication for a 400 mm long glue-free deformable mirror**

Author(s): Yoshio Ichii, Hiromi Okada, Shinsaku Shiroma, Shinya Aono, Masahiko Kanaoka, JTEC Corp. (Japan); Takato Inoue, Satoshi Matsuyama, Nagoya Univ. (Japan); Kazuto Yamauchi, Osaka Univ. (Japan)

23 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 7A



## CONFERENCE 12240

### 12240-25

#### **Reliability investigation of the instrument transfer function calibration technique based on binary pseudo-random array standards**

Author(s): Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (USA); Keiko Munechika, HighRI Optics, Inc. (USA); Simon Rochester, Rochester Scientific, LLC (USA); Weilun Chao, Ian Lacey, Lawrence Berkeley National Lab. (USA); Carlos Pina-Hernandez, HighRI Optics, Inc. (USA); Peter Z. Takacs, Surface Metrology Solutions LLC (USA)

23 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 7A

### 12240-26

#### **Super-resolution interferometric microscope measurements with X-ray variable-line-spacing diffraction gratings**

Author(s): Simon Rochester, Rochester Scientific, LLC (USA); Damon English, Ian Lacey, Lawrence Berkeley National Lab. (USA); Keiko Munechika, HighRI Optics, Inc. (USA); Valeriy V. Yashchuk, Lawrence Berkeley National Lab. (USA)

23 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 7A

### 12240-27

#### **Dimensional and optical metrology of ultra-stable exactly-constrained KB mirror sets**

Author(s): Yuri R. Tonin, Cassiano Bueno, Izabela Zamboti do Lago, Julia Carina dos Santos Carvalho, Francesco Rossi Lena, Bernd Christian Meyer, Eduardo Xavier Silva Miqueles, Renan Ramalho Gerales, Gabriel Barros Zanon Lopes Moreno, Ctr. Nacional de Pesquisa em Energia e Materiais (Brazil)

23 August 2022 • 10:20 AM - 10:40 AM PDT | Conv. Ctr. Room 7A

### Break

**Coffee Break 10:40 AM - 11:10 AM**

## SESSION 6: METROLOGY II

23 August 2022 • 11:10 AM - 11:50 AM PDT | Conv. Ctr. Room 7A

Session Chairs: Ali M. Khounsary, Illinois Institute of Technology (USA), Bernhard W. Adams, Research Instruments Corp. (Germany)

### 12240-28

#### **Surface evaluation of high-precision monolithic mirror for soft X-ray focusing**

Author(s): Takehiro Kume, Yusuke Matsuzawa, Kentaro Hiraguri, Natsume Optical Corp. (Japan); Yoko Takeo, Takashi Kimura, The Univ. of Tokyo (Japan); Hikaru Kishimoto, Yasunori Senba, Haruhiko Ohashi, Japan Synchrotron Radiation Research Institute (Japan); Hirokazu Hashizume, Natsume Optical Corp. (Japan); Hidekazu Mimura, The Univ. of Tokyo (Japan)

23 August 2022 • 11:10 AM - 11:30 AM PDT | Conv. Ctr. Room 7A

### 12240-30

#### **Advanced variable-resolution at-wavelength metrology with a coded-mask-based X-ray wavefront sensor**

Author(s): Xianbo Shi, Zhi Qiao, Matthew Highland, Matthew Frith, Luca Rebuffi, Lahsen Assoufid, Argonne National Lab. (USA)

23 August 2022 • 11:30 AM - 11:50 AM PDT | Conv. Ctr. Room 7A

## SESSION 7: REFRACTIVE OPTICS

23 August 2022 • 11:50 AM - 12:50 PM PDT | Conv. Ctr. Room 7A

Session Chairs: Ali M. Khounsary, Illinois Institute of Technology (USA), Bernhard W. Adams, Research Instruments Corp. (Germany)

### 12240-10

#### **Hard X-ray wavefront engineering for aberration correction and shaping of nanobeams**

Author(s): Christian G. Schroer, Frank Seiboth, Dennis Brückner, Andreas Schropp, Mikhail Lyubormirskiy, Jan Garrevoet, Gerald Falkenberg, Deutsches Elektronen-Synchrotron (Germany); Frieder Koch, Christian David, Paul Scherrer Institut (Switzerland); Dmitry Dzhigaev, Maik Kahnt, Lund Univ. (Sweden); Martin Seyrich, Deutsches Elektronen-Synchrotron (Germany); Christoph Rau, Darren Batey, Diamond Light Source Ltd. (United Kingdom); Felix Wittwer, NERSC, Berkeley Lab. (USA); Tobias Ullsperger, Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany)

23 August 2022 • 11:50 AM - 12:10 PM PDT | Conv. Ctr. Room 7A

### 12240-11

#### **Coherent X-ray beam expander for advanced synchrotron sources**

Author(s): Anatoly Snigirev, Immanuel Kant Baltic Federal Univ. (Russian Federation); Irina Snigireva, European Synchrotron Radiation Facility (France); Mikhail Sorokovikov, Immanuel Kant Baltic Federal Univ. (Russian Federation); Vyacheslav Yunkin, Sergey Kuznetsov, Institute of Microelectronics Technology and High Purity Materials RAS (Russian Federation); Dmitrii Zverev, Immanuel Kant Baltic Federal Univ (Russian Federation)

23 August 2022 • 12:10 PM - 12:30 PM PDT | Conv. Ctr. Room 7A

### 12240-32

#### **The large offset double-crystal monochromator for LCLS-HE upgrade**

Author(s): Xianchao Cheng, Daniel Morton, Rebecca Armenta, Diling Zhu, SLAC National Accelerator Lab (USA); Robert Alan Baker, SLAC National Accelerator Lab. (USA); Lin Zhang, SLAC National Accelerator Lab (USA)

23 August 2022 • 12:30 PM - 12:50 PM PDT | Conv. Ctr. Room 7A

### Workshop on X-Ray Optics

23 August 2022 • 8:00 PM - 10:00 PM PDT | Marriott Marquis, Balboa

Session Chairs: Ali M. Khounsary, Illinois Institute of Technology (USA), Ladislav Pina, Czech Technical Univ. in Prague (Czech Republic)

**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. Topics for discussion can be e-mailed to the organizer, Dr. Ali Khounsary (amk@iit.edu), prior to the meeting.**

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

22 - 23 August 2022 | Conv. Ctr. Room 6E

Conference Chairs: Nerine J. Cherepy, Lawrence Livermore National Lab. (USA); Michael Fiederle, Freiburger Materialforschungszentrum (Germany); Ralph B. James, Savannah River National Lab. (USA)

Program Committee: Toru Aoki, Shizuoka Univ. (Japan); Gerard Ariño-Estrada, Univ. of California, Davis (USA); Tim Aucott, Savannah River National Lab. (USA); Jim E. Bacia, Univ. of Florida (USA); Aleksey E. Bolotnikov, Brookhaven National Lab. (USA); Arnold Burger, Fisk Univ. (USA); Raymond Cao, The Ohio State Univ. (USA); Henry Chen, Consulting LLC (USA); Jeffrey J. Derby, Univ. of Minnesota, Twin Cities (USA); Mao-Hua Du, Oak Ridge National Lab. (USA); Anna Erickson, Georgia Institute of Technology (USA); Petro Fochuk, Chernivtsi National Univ. Y. Fedkovich (Ukraine); Jan Franc, Charles Univ. (Czech Republic); Larry Franks, Consultant (USA); Volodymyr A. Gnatyuk, V. E. Lashkaryov Institute of Semiconductor Physics NASU (Ukraine); Amber L. Guckes, Univ. of Nevada, Las Vegas (USA); Zhong He, Univ. of Michigan (USA); Keitaro Hitomi, Tohoku Univ. (Japan); Kris Iniewski, Redlen Technologies (Canada); Alan Janos, U.S. Dept. of Homeland Security (USA); Mercuri Kanatzidis, Northwestern Univ. (USA); KiHyun Kim, Korea Univ. (Korea, Republic of); Krishna C. Mandal, Univ. of South Carolina (USA); Shariar Motakef, CapeSym, Inc. (USA); Sanjoy Mukhopadhyay, International Atomic Energy Agency (USA); Madan Niraula, Nagoya Institute of Technology (Japan); Stephen A. Payne, Lawrence Livermore National Lab. (USA); Utpal N. Roy, Brookhaven National Lab. (USA); Arie Ruzin, Tel Aviv Univ. (Israel); Michael R. Squillante, Radiation Monitoring Devices, Inc. (USA); Ashley C. Stowe, Y-12 National Security Complex (USA); Sergey E. Ulin, National Research Nuclear Univ. MEPhI (Russian Federation); Edgar V. van Loef, Radiation Monitoring Devices, Inc. (USA); Richard S. Woolf, U.S. Naval Research Lab. (USA); Ge Yang, North Carolina State Univ. (USA); Ren-Yuan Zhu, Caltech (USA); Mariya Zhuravleva, The Univ. of Tennessee Knoxville (USA)

**SESSION 1: INORGANIC SCINTILLATORS**

22 August 2022 • 8:30 AM - 10:30 AM PDT | Conv. Ctr. Room 6E

Session Chair: Nerine J. Cherepy, Lawrence Livermore National Lab. (USA)

**12241-1****Activator-doped Hg<sub>2</sub>Br<sub>2</sub> as next generation high performance scintillator for high energy physics research and other scientific and imaging applications**

Author(s): Henry Chen, Brimrose Technology Corp. (USA); Joo-Soo Kim, Brimrose Corp. of America (USA); Priyanthi Amarasinghe, Siva Swaminathan, Julie Q. Wen, Susan Kutcher, Sudhir Trivedi, Brimrose Technology Corp. (USA)

22 August 2022 • 8:30 AM - 8:45 AM PDT | Conv. Ctr. Room 6E

**12241-2****Bulk growth and performance of intrinsic mixed halide Cs<sub>2</sub>HfX<sub>6</sub>, Tl<sub>2</sub>HfX<sub>6</sub>, and Tl<sub>2</sub>ZrX<sub>6</sub> scintillators**

Author(s): Elsa Ariesanti, Rastgo Hawrami, Arnold Burger, Fisk Univ. (USA); Shariar Motakef, CapeSym, Inc. (USA)

22 August 2022 • 8:45 AM - 9:00 AM PDT | Conv. Ctr. Room 6E

**12241-3****Crystal growth and characterization of Cu-containing halide scintillators. (Invited Paper)**

Author(s): Luis Stand, The Univ. of Tennessee, Scintillator Materials Research Ctr. (USA); Daniel Rutstrom, The Univ. of Tennessee, Scintillation Materials Research Ctr. (USA); Ketaki Joshi, The Univ. of Tennessee, Scintillation Materials Research Ctr. (USA); Merry Koschan, The Univ. of Tennessee Knoxville, Scintillation Materials Research Ctr. (USA); Lakshmi Soundara-Pandian, Guido Ciampi, Radiation Monitoring Devices, Inc. (USA); Charles Melcher, The Univ. of Tennessee Knoxville, Scintillation Materials Research Ctr. (USA); Jaroslav Glodo, Kanai Shah, Edgar van Loef, Radiation Monitoring Devices, Inc. (USA); Mariya Zhuravleva, The Univ. of Tennessee Knoxville, Scintillation Materials Research Ctr. (USA)

22 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 6E

**12241-4****Scintillation mechanisms in inorganic scintillators: an excitonic and alkali halides focused review (Invited Paper)**

Author(s): Henry Chen, Henry Chen Consulting, LLC (USA)

22 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 6E

**12241-5****Melt growth vs. ceramic fabrication for advanced inorganic scintillators (Invited Paper)**

Author(s): Rastgo Hawrami, Fisk Univ. (USA), Xtallized Intelligence, Inc. (USA); Elsa Ariesanti, Arnold Burger, Fisk Univ. (USA)

22 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 6E

**12241-6****PbWO<sub>4</sub> (Lead tungstate) scintillator crystal production and evaluation for the electron ion collider electron endcap electromagnetic calorimeter (EEMCal)**

Author(s): Jindřich Houžvicka, Jan Polák, Silvia Sýkorová, CRYTUR spol s.r.o. (Czech Republic); Tanja Horn, The Catholic Univ. of America (USA), Jefferson Lab. (USA); Vladimir Berdnikov, Jefferson Lab. (USA); Olivier Philip, Irina Shestakova, CRYTUR USA (USA)

22 August 2022 • 10:00 AM - 10:15 AM PDT | Conv. Ctr. Room 6E

**12241-7****Large transparent ceramic garnet scintillator module**

Author(s): Nerine J. Cherepy, Lawrence Livermore National Lab. (USA); Felix Liang, Teledyne FLIR LLC (USA); David Hook, CoorsTek, Inc. (USA); Sean O'Neal, Ross Osborne, Lawrence Livermore National Lab. (USA); Hartmut Brands, Les Hoy, Teledyne FLIR LLC (USA); Logan Ruthardt, CoorsTek, Inc. (USA); Tyler Wineger, Zachary Seeley, Colby McNamee, Stephen Payne, Lawrence Livermore National Lab. (USA)

22 August 2022 • 10:15 AM - 10:30 AM PDT | Conv. Ctr. Room 6E

**Break****Coffee Break 10:30 AM - 11:00 AM****SESSION 2: ORGANIC SCINTILLATORS**

22 August 2022 • 11:00 AM - 12:25 PM PDT | Conv. Ctr. Room 6E

Session Chair: Michael Fiederle, FMF - Freiburger Materialforschungszentrum (Germany)

**12241-11****Nanocomposite scintillators: from liquid to monolith (Invited Paper)**

Author(s): Qibing Pei, Univ. of California, Los Angeles (USA)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 6E

**12241-12****Loading fluorene compounds to enhance light yields of plastic scintillators**

Author(s): Ziqing Han, Hao Yu, Qibing Pei, Univ. of California, Los Angeles (USA)

22 August 2022 • 11:20 AM - 11:35 AM PDT | Conv. Ctr. Room 6E

**12241-13****Advantages of bismuth loaded plastic scintillators (Invited Paper)**

Author(s): Sean P. O'Neal, Nerine Cherepy, Saphon Hok, Robert Sanner, Steven Payne, Lawrence Livermore National Lab. (USA)

22 August 2022 • 11:35 AM - 11:55 AM PDT | Conv. Ctr. Room 6E

**12241-14****Pulse shape discrimination of fast neutron and gamma interactions at low energies using Stilbene and EJ-276 coupled to a SiPM**

Author(s): Billy Boxer, Jyothisraj Johnson, Mani Tripathi, Univ. of California, Davis (USA); Carl Grace, Lawrence Berkeley National Lab. (USA)

22 August 2022 • 11:55 AM - 12:10 PM PDT | Conv. Ctr. Room 6E

**12241-15**

**A highly tunable ASIC prototype for reading out scintillators and providing pulse shape discrimination in real time**

Author(s): Jyothisraj Johnson, Billy Boxer, Mani Tripathi, Univ. of California, Davis (USA); Carl R. Grace, Lawrence Berkeley National Lab. (USA)

22 August 2022 • 12:10 PM - 12:25 PM PDT | Conv. Ctr. Room 6E

**Break**

**Lunch Break 12:25 PM - 1:55 PM**

**SESSION 3: SEMICONDUCTORS**

22 August 2022 • 1:55 PM - 3:40 PM PDT | Conv. Ctr. Room 6E

Session Chair: Ralph B. James, Savannah River National Lab. (USA)

**12241-16**

**Low temperature photoluminescence (PL) and high-resolution X-ray diffraction study of traveling heater method (THM) grown Cd<sub>0.9</sub>Zn<sub>0.1</sub>Te<sub>0.98</sub>Se<sub>0.02</sub> crystals (Invited Paper)**

Author(s): Utpal N. Roy, Jonathon N. Baker, Savannah River National Lab. (USA); Giuseppe S. Camarda, Yonggang Cui, Brookhaven National Lab. (USA); Ge Yang, North Carolina State Univ. (USA); Ralph B. James, Savannah River National Lab. (USA)

22 August 2022 • 1:55 PM - 2:15 PM PDT | Conv. Ctr. Room 6E

**12241-17**

**Native defect chemistry of THM-grown CdxZn1-xTeySe1-y from first principles**

Author(s): Jonathon N. Baker, Utpal N. Roy, Savannah River National Lab. (USA)

22 August 2022 • 2:15 PM - 2:30 PM PDT | Conv. Ctr. Room 6E

**12241-18**

**Improved performance and longevity of large volume thallium bromide devices**

Author(s): Hadong Kim, Leonard Cirignano, James F. Christian, Yaroslav Ogorodnik, Suyoung Kim, Michael Squillante, Kanai Shah, Radiation Monitoring Devices, Inc. (USA); Alireza Kargar, Radiation Monitoring Devices (USA)

22 August 2022 • 2:30 PM - 2:45 PM PDT | Conv. Ctr. Room 6E

**12241-19**

**High-resolution radiation detection using 4H-SiC epitaxial layer detectors (Invited Paper)**

Author(s): Krishna C. Mandal, Sandeep K. Chaudhuri, Joshua W. Kleppinger, Omerfaruk Karadavut, Ritwik Nag, Univ. of South Carolina (USA)

22 August 2022 • 2:45 PM - 3:05 PM PDT | Conv. Ctr. Room 6E

**12241-20**

**High accuracy gamma-ray detection using Cherenkov charge induction sensors**

Author(s): Gerard Ariño-Estrada, Justin R. Ellin, Univ. of California, Davis (USA)

22 August 2022 • 3:05 PM - 3:20 PM PDT | Conv. Ctr. Room 6E

**12241-21**

**Electrophysical properties of photosensors based on radiation-resistant Hg<sub>2</sub>MnInTe<sub>6</sub> crystals (Invited Paper)**

Author(s): Conner Brown, Radiation Monitoring Devices, Inc. (USA); Gabriella Carini, Brookhaven National Lab. (USA); James Christian, Leonard Cirignano, Radiation Monitoring Devices, Inc. (USA); Connie-Rose Deane, Alfred Dellapenna, Grzegorz Deptuch, Jack Fried, Sven Herrmann, Brookhaven National Lab. (USA); Hadong Kim, Giovanni Pinaroli, Alireza Kargar, Radiation Monitoring Devices, Inc. (USA); Martin Koslowsky, Bubble Technology Industries, Inc. (Canada); Piotr Maj, Victor Manthena, Brookhaven National Lab. (USA); Alexander Miller, Bubble Technology Industries, Inc. (Canada); Sandeep Miriala, Radiation Monitoring Devices, Inc. (USA); Eric Raguzina, Brookhaven National Lab. (USA); Kanai Shah, Michael Squillante, Radiation Monitoring Devices, Inc. (USA); Martin Smith, Andrew Valente, Bubble Technology Industries, Inc. (Canada); Evan Weststrate, Radiation Monitoring Devices, Inc. (USA); Aleksey E. Bolotnikov, Brookhaven National Lab (USA)

22 August 2022 • 3:20 PM - 3:40 PM PDT | Conv. Ctr. Room 6E

**Break**

**Coffee/Exhibition Break 3:40 PM - 4:30 PM**

**X-Ray, Gamma-Ray, and Particle Technologies Plenary**

22 August 2022 • 4:30 PM - 5:25 PM PDT | Conv. Ctr. Room 6A

Session Chairs: Ralph B. James, Savannah River National Lab. (USA), Ali M. Khounsary, Illinois Institute of Technology (USA)

**4:30 PM - 4:35 PM: Welcome and Opening Remarks**

**12241-501**

**Toward new frontiers: Encounters and synergies with state-of-the-art astronomical X-ray detectors (Plenary Presentation)**

Author(s): Tadayuki Takahashi, The Univ. of Tokyo (Japan)

22 August 2022 • 4:35 PM - 5:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12241-38**

**Electrophysical properties of photosensors based on radiation-resistant Hg<sub>2</sub>MnInTe<sub>6</sub> crystals**

Author(s): V. Sklyarchuk, Chernivtsi National Univ. (Ukraine); P. Fochuk, Chernivtsi National Univ. (Ukraine); V. Pylypko, Chernivtsi National Univ. (Ukraine); A. E. Bolotnikov, Brookhaven National Lab. (USA); R. B. James, Savannah River Lab. (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12241-39**

**Characterization of CdTe-based p-n junction-diode X/ -ray detectors formed by frontside laser irradiation**

Author(s): Volodymyr A. Gnatyuk, V.E. Lashkaryov Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine (Ukraine); Olena Maslyanchuk, Yuriy Fedkovych Chernivtsi National University (Ukraine); Oleksandr Kulyk, V.N. Karazin Kharkiv National University (Ukraine); Sergiu Shishyanu, Moldova State University (Moldova); Toru Aoki, Research Institute of Electronics, Shizuoka University (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12241-40**

**Features of electrical and spectrometric properties of series connected CdTe-based Schottky-diode X/ -ray detectors**

Author(s): Valeriy Sklyarchuk, Yuriy Fedkovych Chernivtsi National University (Ukraine); Volodymyr Gnatyuk, V.E. Lashkaryov Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine (Ukraine); Toru Aoki, Research Institute of Electronics, Shizuoka University (Japan)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12241-41**

**Growth and characterization of Cs<sub>2</sub>AgBiBr<sub>6</sub> double perovskite single crystals**

Author(s): Michael Fiederle, Valeria Murgulov, Michael Daub, Harald Hillebrecht, FMF - Freiburger Materialforschungszentrum (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12241-42**

**Growth and characterization of (Cd,Mn)Te crystals**

Author(s): Michael Fiederle, Alex Fauler, Jiaona Zou, FMF - Freiburger Materialforschungszentrum (Germany)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12241-43**

**Using a data-driven approach to improve simulations of neutron and gamma induced waveforms from Stilbene and EJ-276.**

Author(s): Rishita Khandwala, Billy Boxer, Univ. of California, Davis (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12241-44****Evaluating the performance of the PSD\_CHIP v1 in a bench test**

Author(s): Benjamin Godfrey, Billy Boxer, Jyothisraj Johnson, Mani Tripathi, Univ. of California, Davis (USA); Carl Grace, Lawrence Berkeley National Lab. (USA); Rishita Khandwala, Sukhraj Singh, Univ. of California, Davis (USA)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 4: PEROVSKITES AND HALIDES**

23 August 2022 • 9:15 AM - 10:05 AM PDT | Conv. Ctr. Room 6E

Session Chair: Luis Stand, The Univ. of Tennessee Knoxville (USA)

**12241-8****Perovskite CsPbBr<sub>3</sub> single crystal detector for high flux X-ray photon counting and synchrotron X-ray detection**

Author(s): Lei Pan, Indra Pandey, Vladislav V. Klepov, Northwestern Univ. (USA); Antonino Miceli, Argonne National Lab. (USA); Yihui He, Michael C. De Siena, Northwestern Univ. (USA); Duck Young Chung, Argonne National Lab. (USA); Mercouri G. Kanatzidis, Northwestern Univ. (USA)

23 August 2022 • 9:15 AM - 9:30 AM PDT | Conv. Ctr. Room 6E

**12241-9****Folded perovskite X-ray detector with high sensitivity and high spatial resolution**

Author(s): Henning Mescher, Fabian Schackmar, Robert Huber, Helge Eggers, Marcus Zuber, Elias Hamann, Georg Gramlich, Julian Dangelmaier, Qiaoshuang Zhang, Andres Rösch, Thomas Zwick, Gerardo Hernandez-Sosa, Ulrich Paetzold, Uli Lemmer, Karlsruher Institut für Technologie (Germany)

23 August 2022 • 9:30 AM - 9:45 AM PDT | Conv. Ctr. Room 6E

**12241-10****FA3Bi2I9: An emerging lead-free perovskite for radiation detection (Invited Paper)**

Author(s): Doup Kim, Ge Yang, North Carolina State Univ. (USA); Ralph B. James, Savannah River National Lab. (USA)

23 August 2022 • 9:45 AM - 10:05 AM PDT | Conv. Ctr. Room 6E

**Break**

**Coffee Break 10:05 AM - 10:35 AM**

**SESSION 5: NEUTRON DETECTION**

23 August 2022 • 10:35 AM - 12:00 PM PDT | Conv. Ctr. Room 6E

Session Chair: Sean P. O'Neal, Lawrence Livermore National Lab. (USA)

**12241-22****Thermal neutron detection with lithium based semiconductors**

Author(s): Alireza Kargar, Huicong Hong, Joshua Tower, Radiation Monitoring Devices, Inc. (USA); Paul Guggenheim, Radiation Monitoring Devices Inc. (USA); Conner Brown, Mathew Breen, James Christian, Michael Squillante, Kanai Shah, Radiation Monitoring Devices, Inc. (USA); Eric Lukosi, Robert Golduber, Jake Gallagher, Amine Benkechache, The Univ. of Tennessee Knoxville (USA); Mercouri Kanatzidis, Northwestern Univ. (USA); Eric Qian, Department of Chemistry, Northwestern Univ. (USA)

23 August 2022 • 10:35 AM - 10:50 AM PDT | Conv. Ctr. Room 6E

**12241-23****Review of direct neutron conversion and detection processes**

Author(s): Sanjoy Mukhopadhyay, Nevada National Security Site (USA)

23 August 2022 • 10:50 AM - 11:05 AM PDT | Conv. Ctr. Room 6E

**12241-24****Performance assessment of a compact neutron detector module based on scintillating composites**

Author(s): Cameron G. Richards, Brenden W. Wiggins, Metodi Iliev, Andrea Favalli, Thomas McLean, Los Alamos National Lab. (USA); Alexander Gomez, The Univ. of Texas at El Paso (USA); Markus P. Hehlen, Los Alamos National Lab. (USA)

23 August 2022 • 11:05 AM - 11:20 AM PDT | Conv. Ctr. Room 6E

**12241-25****Fast- and thermal-neutron detection with common NaI(Tl) detectors (Invited Paper)**

Author(s): Guntram Pausch, Achim Kreuels, Falko Scherwinski, Yong Kong, Mathias Küster, Ralf Lentering, Andreas Wolf, Jürgen R. Stein, Target Systemelektronik GmbH & Co. KG (Germany)

23 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 6E

**12241-26****Neutron time correlations with neutron and gamma sensitive scintillators (Invited Paper)**

Author(s): Sean Walston, Lawrence Livermore National Lab. (USA)

23 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 6E

**Break**

**Lunch/Exhibition Break 12:00 PM - 1:30 PM**

**SESSION 6: SOURCES, RADIOGRAPHY, AND CT**

23 August 2022 • 1:30 PM - 2:50 PM PDT | Conv. Ctr. Room 6E

Session Chair: Raymond Cao, The Ohio State Univ. (USA)

**12241-27****Design, optimization, and uses of compact laser-compton X-ray and gamma-ray sources (Invited Paper)**

Author(s): Christopher P. J. Barty, Univ. of California, Irvine (USA)

23 August 2022 • 1:30 PM - 1:50 PM PDT | Conv. Ctr. Room 6E

**12241-28****Comparison of thermal and fast neutron computed tomography of complex objects**

Author(s): Ibrahim Oksuz, Matthew Bisbee, The Ohio State Univ. (USA); Nerine Cherepy, Andrew Townsend, James Hall, Lawrence Livermore National Lab. (USA); Lei Cao, The Ohio State Univ. (USA)

23 August 2022 • 1:50 PM - 2:05 PM PDT | Conv. Ctr. Room 6E

**12241-29****Experimental x-Ray and fast neutron CT comparative analysis**

Author(s): Matthew G. Bisbee, The Ohio State Univ. (USA); Anthony J. Hardy, Joel V. Bernier, Kyle M. Champley, Kathryn J. Harke, Andrew P. Townsend, Joseph Tringe, Lawrence Livermore National Lab. (USA); Ibrahim Oksuz, Raymond L. Cao, The Ohio State Univ. (USA); Nerine J. Cherepy, Seemeen Karimi, Lawrence Livermore National Lab. (USA)

23 August 2022 • 2:05 PM - 2:20 PM PDT | Conv. Ctr. Room 6E

**12241-30****Estimation of scatter contributions in laser- and reactor-produced fast neutron radiography (FNR) using Monte Carlo and ray tracing methods**

Author(s): Anthony J. Hardy, Matt McMahon, Lawrence Livermore National Lab. (USA); Matthew Bisbee, Ibrahim Oksuz, The Ohio State Univ. (USA); Maurice Aufderheide, Lawrence Livermore National Lab. (USA); Lei Cao, The Ohio State Univ. (USA); Joseph Tringe, Lawrence Livermore National Lab. (USA)

23 August 2022 • 2:20 PM - 2:35 PM PDT | Conv. Ctr. Room 6E

**12241-31****Hard X-rays measurements using a scintillator-array calorimeter in high-intensity laser-plasma experiments**

Author(s): Valeria Istoksaia, ELI Beamlines, Institute of Physics of the CAS, v.v.i. (Czech Republic), Czech Technical Univ. in Prague (Czech Republic); Vojtěch Stránský, ELI Beamlines (Czech Republic), Czech Technical Univ. in Prague (Czech Republic); Benoit Lefebvre, Lorenzo Giuffrida, ELI Beamlines (Czech Republic); Roberto Versaci, ELI Beamlines (Czech Republic); Veronika Olšovcová, ELI Beamlines (Czech Republic); Daniele Margarone, Ctr. for Plasma Physics, Queen's Univ. Belfast (United Kingdom), ELI Beamlines (Czech Republic)

23 August 2022 • 2:35 PM - 2:50 PM PDT | Conv. Ctr. Room 6E

**Break**

**Coffee Break 2:50 PM - 3:20 PM**



**SESSION 7: INSTRUMENTATION**

23 August 2022 • 3:20 PM - 5:05 PM PDT | Conv. Ctr. Room 6E

Session Chair: Nerine J. Cherepy, Lawrence Livermore National Lab. (USA)

**12241-32**

**An Advanced Design for the Gamma-RAY Polarimeter Experiment (GRAPE)**

Author(s): Karla Oñate Melecio, The Univ. of New Hampshire (USA); Camden Ertley, Southwest Research Institute (USA); Jason Legere, The Univ. of New Hampshire (USA); Mark McConnell, The Univ. of New Hampshire (USA), Southwest Research Institute (USA); Fabian Kislak, The Univ. of New Hampshire (USA); Steve Longworth, Southwest Research Institute (USA); James Ryan, The Univ. of New Hampshire (USA)

23 August 2022 • 3:20 PM - 3:35 PM PDT | Conv. Ctr. Room 6E

**12241-33**

**Ongoing advancement of free-moving radiation imaging (Invited Paper)**

Author(s): Brian Quiter, Mark S. Bandstra, Joshua W. Cates, Reynold J. Cooper, Joseph C. Curtis, Daniel Hellfeld, Ryan T. Pavlovsky, Tenzing H. Y. Joshi, Marco Salathe, Jayson R. Vavrek, Kai Vetter, Lawrence Berkeley National Lab. (USA)

23 August 2022 • 3:35 PM - 3:55 PM PDT | Conv. Ctr. Room 6E

**12241-34**

**Longevity evaluation of SiC based alpha voltaic batteries with surface alpha sources (Invited Paper)**

Author(s): Raymond Cao, The Ohio State Univ. (USA); Sha R. Xue, AwareAbility Technologies, LLC (USA); Daryl Giglio, Praneeth Kandlakunta, The Ohio State Univ. (USA); Henry Spitz, Katie Hoffman, Univ. of Cincinnati (USA); Greg Downing, Vasil Hlinka, AwareAbility Technologies, LLC (USA)

23 August 2022 • 3:55 PM - 4:15 PM PDT | Conv. Ctr. Room 6E

**12241-35**

**Radiation hardness of polycrystalline ceramic scintillators for radioisotope batteries (Invited Paper)**

Author(s): Joshua T. Jarrell, Nerine Cherepy, Zachary Seeley, Erik Swanberg, Lars Voss, Clint Frye, Rebecca Nikolic, Lawrence Livermore National Lab. (USA)

23 August 2022 • 4:15 PM - 4:35 PM PDT | Conv. Ctr. Room 6E

**12241-36**

**Radiation detection system integration using multiple input, multiple output radios on a mobile ad hoc network**

Author(s): Sanjoy Mukhopadhyay, Mark B. Biery, Ronald S. Wolff, Johnny Grimes, Nevada National Security Site (USA)

23 August 2022 • 4:35 PM - 4:50 PM PDT | Conv. Ctr. Room 6E

**12241-37**

**Characterization of scintillators for portable radiation detection**

Author(s): Gabriel Stevens, Hatem ElBidweihy, Brian Jenkins, Deborah Mechtel, U.S. Naval Academy (USA)

23 August 2022 • 4:50 PM - 5:05 PM PDT | Conv. Ctr. Room 6E



# Developments in X-Ray Tomography XIV

22 - 24 August 2022 | Conv. Ctr. Room 6F

Conference Chairs: Bert Müller, Univ. Basel (Switzerland); Ge Wang, Rensselaer Polytechnic Institute (USA), Program Committee: Felix Beckmann, Helmholtz-Zentrum Geesthacht (Germany); Graham R. Davis, Queen Mary, Univ. of London (United Kingdom); Francesco De Carlo, Argonne National Lab. (USA); Julia Herzen, Technische Univ. München (Germany); Atsushi Momose, Tohoku Univ. (Japan); Kaye Morgan, Monash Univ. (Australia); Stuart R. Stock, Northwestern Univ. (USA)

Conference Co-Sponsor



## SESSION 1: APPLICATIONS I: TRENDS IN X-RAY TOMOGRAPHY WITH FOCUS ON STAINS

22 August 2022 • 8:00 AM - 9:50 AM PDT | Conv. Ctr. Room 6F

Session Chair: Stuart R. Stock, Northwestern Univ. (USA)

### 12242-1

#### Recent trends in hard X-ray tomographic imaging

Author(s): Bert Müller, Univ. Basel (Switzerland)

22 August 2022 • 8:00 AM - 8:20 AM PDT | Conv. Ctr. Room 6F

### 12242-2

#### Radiopaque dyes allow vessel imaging in lung tissue using laboratory phase contrast micro-CT

Author(s): Till Dreier, Gustaf Bernström, Sahel Ganji, Christian Norvik, Karin Tran-Lundmark, Martin Bech, Lund Univ. (Sweden)

22 August 2022 • 8:20 AM - 8:40 AM PDT | Conv. Ctr. Room 6F

### 12242-3

#### Neodymium acetate as a contrast agent for X-ray phase-contrast tomography

Author(s): Jakob Reichmann, Georg-August-Univ. Göttingen (Germany); Torben Ruhwedel, Wiebke Möbius, Max-Planck-Institut für Multidisziplinäre Naturwissenschaften (Germany); Tim Salditt, Georg-August-Univ. Göttingen (Germany)

22 August 2022 • 8:40 AM - 9:00 AM PDT | Conv. Ctr. Room 6F

### 12242-4

#### Tomographic imaging of microvasculature with a purpose-designed, polymeric X-ray contrast agent

Author(s): Willy Kuo, Ngoc An Le, Bernhard Spingler, Univ. Zürich (Switzerland); Georg Schulz, Bert Müller, Univ. Basel (Switzerland); Vartan Kurtcuoglu, Univ. Zürich (Switzerland)

22 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 6F

### 12242-5

#### Investigation of X-ray stains with near-field ptychographic computed tomography (Invited Paper)

Author(s): Kirsten Taphorn, Madleen Busse, Johannes Brantl, Benedikt Günther, Technische Univ. München (Germany); Ana Diaz, Mirko Holler, Paul Scherrer Institut (Switzerland); Martin Dierolf, Technische Univ. München (Germany); Doris Mayr, Institut für Pathologie, Ludwig-Maximilians-Univ. München (Germany); Franz Pfeiffer, Julia Herzen, Technische Univ. München (Germany)

22 August 2022 • 9:20 AM - 9:50 AM PDT | Conv. Ctr. Room 6F

### Break

Coffee Break 9:50 AM - 10:10 AM

## SESSION 2: INSTRUMENTATION I: ALTERNATIVE AND COMPLEMENTARY CONTRAST MECHANISMS

22 August 2022 • 10:10 AM - 12:00 PM PDT | Conv. Ctr. Room 6F

Session Chair: Bert Müller, Univ. Basel (Switzerland)

### 12242-6

#### SAXS tensor tomography: 3D reciprocal space map reconstructions within 3D specimens (Invited Paper)

Author(s): Marianne Liebi, Paul Scherrer Institut (Switzerland)

22 August 2022 • 10:10 AM - 10:40 AM PDT | Conv. Ctr. Room 6F

### 12242-7

#### 3D scanning coherent microscopy at PtyNAMI

Author(s): Andreas Schropp, Silvio Achilles, Svenja Patjens, Deutsches Elektronen-Synchrotron (Germany); Frank Seiboth, Deutsches Elektronen-Synchrotron (Germany); Michael E. Stükelberger, Deutsches Elektronen-Synchrotron (Germany); Zhimin Jiang, James H. Pikul, Univ. of Pennsylvania (USA); Christian G. Schroer, Deutsches Elektronen-Synchrotron (Germany)

22 August 2022 • 10:40 AM - 11:00 AM PDT | Conv. Ctr. Room 6F

### 12242-8

#### X-ray dark-field tomography using edge-illumination

Author(s): Adam Doherty, Savvis Savidis, Alberto Astolfo, Lorenzo Massimi, Nargiza Djurabekova, Carlos Navarrete Leon, Mattia F. M. Gerli, Francesco Iacoviello, Paul Shearing, Univ. College London (United Kingdom); Danielle Norman, Mark A. Williams, The Univ. of Warwick (United Kingdom); Alessandro Olivo, Marco Endrizzi, Univ. College London (United Kingdom)

22 August 2022 • 11:00 AM - 11:20 AM PDT | Conv. Ctr. Room 6F

### 12242-9

#### Modulation-based dark-field for in vivo detection of lung injury

Author(s): Laurene Quenot, Institut National de la Santé et de la Recherche Médicale (France), Univ. Grenoble Alpes (France); Alberto Bravin, Univ. degli Studi di Milano-Bicocca (Italy); Sylvain Bohic, Sam Bayat, Emmanuel C. Brun, Institut National de la Santé et de la Recherche Médicale (France)

22 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 6F

### 12242-10

#### Multiscale characterization of nanostructure and dynamic processes in nanoporous composite materials using a correlative approach with ptychographic X-ray tomography and scanning small-angle X-ray scattering

Author(s): Christian Appel, Zirui Gao, Paul Scherrer Institut (Switzerland); Bastian J.M. Etzold, Technische Univ. Darmstadt (Germany); Marianne Liebi, Paul Scherrer Institut (Switzerland), Ecole Polytechnique Fédérale de Lausanne (Switzerland); Manuel Guizar-Sicairos, Paul Scherrer Institut (Switzerland)

22 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 6F

### Break

Lunch Break 12:00 PM - 1:30 PM

## SESSION 3: INSTRUMENTATION II: ADVANCED TOMOGRAPHY USING SYNCHROTRON RADIATION

22 August 2022 • 1:30 PM - 3:20 PM PDT | Conv. Ctr. Room 6F

Session Chair: Francesco De Carlo, Argonne National Lab. (USA)

### 12242-11

#### Real-time micro-CT reconstruction with zooming to features of interest (Invited Paper)

Author(s): Viktor V. Nikitin, Argonne National Lab. (USA)

22 August 2022 • 1:30 PM - 2:00 PM PDT | Conv. Ctr. Room 6F

### 12242-12

#### Radiation dose optimized microtomography using synchrotron radiation at beamlines P05/PETRA III and P07/PETRA III

Author(s): Felix Beckmann, Julian Moosmann, Joerg Hammel, Fabian Wilde, Imke Greving, Lars Lottermoser, Mirko Riedel, Pidassa Bidola, Hilmar Burmester, Helmholtz-Zentrum Hereon GmbH (Germany)

22 August 2022 • 2:00 PM - 2:20 PM PDT | Conv. Ctr. Room 6F

**12242-13**

**Practical implementations of speckle-based phase-retrieval methods in Python and GPU for tomography**

Author(s): Nghia T. Vo, Diamond Light Source Ltd. (United Kingdom), Brookhaven National Lab. (USA); Hongchang Wang, Lingfei Hu, Diamond Light Source Ltd. (United Kingdom); Tunhe Zhou, Stockholm Univ. (Sweden); Marie-Christine A. Zdora, Paul Scherrer Institut (Switzerland); Hans Deyhle, Robert C. Atwood, Diamond Light Source Ltd. (United Kingdom)

22 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 6F

**12242-14**

**Reconstruction, processing and analysis of tomography data at the Hereon beamlines P05/P07 at PETRA III**

Author(s): Julian P. Moosmann, Felix Beckmann, Jörg U. Hammel, Fabian Wilde, Imke Greving, Mirko Riedel, Silja Flenner, Stefan Bruns, Helmholtz-Zentrum Hereon GmbH (Germany); Johannes Hagemann, Philipp Heuser, Ivo Baltruschat, Sahar Kakavand, Frank Schluenzen, Deutsches Elektronen-Synchrotron (Germany); Bashir Kazimi, Christian Lucas, Hanna Cwieka, Diana Krüger, Berit Zeller-Plumhoff, Sarah Irvine, Vojtech Kulvait, Dawit Hailu, Thomas Jentschke, Helmholtz-Zentrum Hereon GmbH (Germany)

22 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 6F

**12242-64**

**DIAD: A new instrument for Dual Imaging and Diffraction at Diamond Light Source**

Author(s): Sharif Ahmed, Hans Deyhle, Diamond Light Source (United Kingdom); Andrew James, James Le Houx, Peter Garland, Diamond Light Source Ltd. (United Kingdom); Michael Drakopoulos, National Synchrotron Light Source II, Brookhaven National Lab. (USA); Christina Reinhard, Diamond Light Source (United Kingdom); Navid Aslani, Diamond Light Source Ltd. (United Kingdom)

22 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 6F

**Break**

**Coffee Break 3:20 PM - 3:35 PM**

**SESSION 4: ALGORITHMS I: IMAGE RECONSTRUCTION**

22 August 2022 • 3:35 PM - 4:15 PM PDT | Conv. Ctr. Room 6F

Session Chair: Ge Wang, Rensselaer Polytechnic Institute (USA)

**12242-15**

**Self-Supervised Dual-Domain network for low-dose CT denoising**

Author(s): Chuang Niu, Mengzhou Li, Xiaodong Guo, Ge Wang, Rensselaer Polytechnic Institute (USA)

22 August 2022 • 3:35 PM - 3:55 PM PDT | Conv. Ctr. Room 6F

**12242-16**

**CoCoDiff: A Contextual Conditional Diffusion Model for Low-dose CT Image Denoising**

Author(s): Qi Gao, Hongming Shan, Fudan Univ. (China)

22 August 2022 • 3:55 PM - 4:15 PM PDT | Conv. Ctr. Room 6F

**X-Ray, Gamma-Ray, and Particle Technologies Plenary**

22 August 2022 • 4:30 PM - 5:25 PM PDT | Conv. Ctr. Room 6A

Session Chairs: Ralph B. James, Savannah River National Lab. (USA), Ali M. Khounsary, Illinois Institute of Technology (USA)

**4:30 PM - 4:35 PM: Welcome and Opening Remarks**

**12241-501**

**Toward new frontiers: Encounters and synergies with state-of-the-art astronomical X-ray detectors (Plenary Presentation)**

Author(s): Tadayuki Takahashi, The Univ. of Tokyo (Japan)

22 August 2022 • 4:35 PM - 5:15 PM PDT | Conv. Ctr. Room 6A

**POSTER SESSION**

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

Conference attendees are invited to view a collection of posters within the topics of Nanoscience + Engineering, Organic Photonics + Electronics, and Optical Engineering + Applications. 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 session.

Poster authors, visit Poster Presentation Guidelines for set-up instructions.

**12242-55**

**Evaluation of deeply supervised neural networks for 3D pore segmentation in additive manufacturing**

Author(s): Domenico Iuso, imec-Vision Lab, Univ. of Antwerp (Belgium), DynXlab (Belgium); Soumick Chatterjee, Otto von Guericke Univ. (Germany); Rob Heylen, Flanders Make vzw. (Belgium); Sven Cornelissen, Materialize NV. (Belgium); Jan De Beenhouwer, Jan Sijbers, imec-Vision Lab, Univ. of Antwerp (Belgium), DynXlab (Belgium)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-56**

**Mosaic microtomography of a full mouse brain with sub-micron pixel size**

Author(s): Griffin Rodgers, Christine Tanner, Georg Schulz, Univ. Basel (Switzerland); Timm Weitkamp, Mario Scheel, Synchrotron SOLEIL (France); Marta Girona-Alarcon, Univ. Zürich (Switzerland); Vartan Kurtcuoglu, Univ. Zürich (Switzerland), National Ctr. of Competence in Research (Switzerland); Bert Müller, Univ. Basel (Switzerland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-57**

**Imaging of photon-counting CT from single energy bin based on deep learning**

Author(s): Xiaodong Guo, Rensselaer Polytechnic Institute (USA); Yikun Qian, Peng He, Chongqing Univ. (China)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-58**

**Comparison of a historical museum's endocast with a 3D digital model generated by hard X-ray microtomography**

Author(s): Loïc Costeur, Naturhistorisches Museum Basel (Switzerland); Georg Schulz, Univ. Basel (Switzerland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-59**

**Tomographic imaging of unique objects: annual layers in tooth cementum of Anna Catharina Bischoff born 1719**

Author(s): Jeannette Von Jackowski, Univ. Basel (Switzerland); Gerhard Hotz, Naturhistorisches Museum Basel (Switzerland); Christine Tanner, Georg Schulz, Griffin Rodgers, Univ. Basel (Switzerland); Ursula Wittwer-Backofen, Biologischen Anthropologie, Univ. of Freiburg (Germany); Timm Weitkamp, Synchrotron SOLEIL (France); Bert Müller, Univ. Basel (Switzerland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-60**

**Three-dimensional imaging of teeth: an in vitro study of dental fillings**

Author(s): Andres Izquierdo, Georg Schulz, Christine Tanner, Jeannette von Jackowski, Griffin Rodgers, Univ. Basel (Switzerland); Felix Beckmann, Helmholtz-Zentrum Hereon GmbH (Germany); Bert Müller, Univ. Basel (Switzerland)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-63**

**Shallow U-Net deep learning approach for phase retrieval in propagation-based phase-contrast Imaging**

Author(s): Samuel Z. Li, Princeton Univ. (USA); Matthew G. French, The Univ. of Auckland (New Zealand); Konstantin M. Pavlov, Heyang Thomas Li, University of Canterbury (New Zealand)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**12242-65****DIAD's GUI: a user interface for multi-modal data acquisition for combined X-ray diffraction and tomography**

Author(s): Hans Deyhle, Diamond Light source (United Kingdom); Andrew James, Douglas Winter, James Le Houx, Jacob Filik, Keith Ralphs, Diamond Light Source Ltd. (United Kingdom); Christina Reinhard, Axilon AG (Germany); Michael Drakopoulos, National Synchrotron Light Source II, Brookhaven National Lab. (USA); Sharif Ahmed, Diamond Light source (United Kingdom)

22 August 2022 • 5:30 PM - 7:30 PM PDT | Conv. Ctr. Exhibit Hall B1

**SESSION 5: ALGORITHMS II: IMAGE QUALITY ENHANCEMENT**

23 August 2022 • 8:45 AM - 10:15 AM PDT | Conv. Ctr. Room 6F

Session Chair: Felix Beckmann, Helmholtz-Zentrum Hereon GmbH (Germany)

**12242-19****Machine learning denoising for nanotomography enabling in situ experiments (Invited Paper)**

Author(s): Silja Flenner, Helmholtz-Zentrum Hereon GmbH (Germany); Elena Longo, Elettra-Sincrotrone Trieste S.C.p.A. (Italy); Stefan Bruns, Martin Müller, Imke Greving, Helmholtz-Zentrum Hereon GmbH (Germany)

23 August 2022 • 8:45 AM - 9:15 AM PDT | Conv. Ctr. Room 6F

**12242-20****Fully automated deep learning based resolution recovery**

Author(s): Matthew Andrew, Andriy Andreyev, Faguo Yang, Carl Zeiss X-ray Microscopy, Inc. (USA)

23 August 2022 • 9:15 AM - 9:35 AM PDT | Conv. Ctr. Room 6F

**12242-21****GPU-accelerated coupled ptychographic tomography**

Author(s): Silvio Achilles, Deutsches Elektronen-Synchrotron (Germany); Simeon Ehrig, Nico Hoffmann, Helmholtz-Zentrum Dresden-Rossendorf e. V. (Germany); Maik Kahnt, Max IV Lab. (Sweden); Johannes Becher, Karlsruher Institut für Technologie (Germany); Yakub Fam, Deutsches Elektronen-Synchrotron (Germany); Thomas Sheppard, Karlsruher Institut für Technologie (Germany); Dennis Brückner, Andreas Schropp, Christian Schroer, Deutsches Elektronen-Synchrotron (Germany)

23 August 2022 • 9:35 AM - 9:55 AM PDT | Conv. Ctr. Room 6F

**12242-22****Joint reconstruction of attenuation, refraction and dark field X-ray phase contrasts using split Barzilai-Borwein steps**

Author(s): Nathanaël Six, Jens Renders, Jan De Beenhouwer, Jan Sijbers, Univ. Antwerpen (Belgium)

23 August 2022 • 9:55 AM - 10:15 AM PDT | Conv. Ctr. Room 6F

**Break**

**Coffee Break 10:15 AM - 10:45 AM**

**SESSION 6: APPLICATIONS II: MECHANICALLY LOADED TISSUES AND MATERIALS**

23 August 2022 • 10:45 AM - 12:15 PM PDT | Conv. Ctr. Room 6F

Session Chair: Julian P. Moosmann, Helmholtz-Zentrum Hereon GmbH (Germany)

**12242-23****X-ray phase contrast and darkfield imaging of osteoarticular diseases: from synchrotron to conventional X-ray sources: the random modulation strategy**

Author(s): Emmanuel C. Brun, Institut National de la Santé et de la Recherche Médicale (France)

23 August 2022 • 10:45 AM - 11:05 AM PDT | Conv. Ctr. Room 6F

**12242-25****Nano-tomography of dental composites with wide color matching**

Author(s): Mattia Humbel, Bert Müller, Biomaterials Science Ctr., Univ. Basel (Switzerland)

23 August 2022 • 11:05 AM - 11:25 AM PDT | Conv. Ctr. Room 6F

**12242-26****Hierarchical imaging of African bovid tooth cementum using X-ray microtomography**

Author(s): Adriana Velasco Guadarrama, Univ. of Wisconsin-Madison (USA); Christine Tanner, Georg Schulz, Griffin Rodgers, Mattia Humbel, Jeannette von Jackowski, Univ. Basel (Switzerland); Timm Weitkamp, Synchrotron SOLEIL (France); Henry T. Bunn, University of Wisconsin (USA); Bert Müller, Univ. Basel (Switzerland)

23 August 2022 • 11:25 AM - 11:45 AM PDT | Conv. Ctr. Room 6F

**12242-27****Growth bands in dogfish spines (Invited Paper)**

Author(s): Stuart R. Stock, Victoria Cooley, Northwestern Univ. (USA); Cindy Tribuzio, Alaska Fisheries Science Ctr., NOAA Fisheries (USA); Luxi Li, Viktor Nikitin, Advanced Photon Source, Argonne National Lab. (USA)

23 August 2022 • 11:45 AM - 12:15 PM PDT | Conv. Ctr. Room 6F

**Break**

**Lunch/Exhibition Break 12:15 PM - 2:05 PM**

**SESSION 7: ALGORITHMS III: EFFICIENT ALGORITHMS FOR QUANTIFICATION**

23 August 2022 • 2:05 PM - 3:35 PM PDT | Conv. Ctr. Room 6F

Session Chair: Seemeen Karimi, Lawrence Livermore National Lab. (USA)

**12242-28****Registration of microtomography images: challenges and approaches (Invited Paper)**

Author(s): Christine Tanner, Univ. Basel (Switzerland)

23 August 2022 • 2:05 PM - 2:35 PM PDT | Conv. Ctr. Room 6F

**12242-29****A real-time porosity mapping solution for synchrotron micro-CT of large 3D printed parts**

Author(s): Aniket Tekawade, Viktor Nikitin, Zhengchun Liu, Xuan Zhang, Peter Kenesei, Francesco De Carlo, Rajkumar Kettimuthu, Ian Foster, Argonne National Lab. (USA)

23 August 2022 • 2:35 PM - 2:55 PM PDT | Conv. Ctr. Room 6F

**12242-30****Fiber orientation estimation by constrained spherical deconvolution of the anisotropic edge illumination X-ray dark field signal**

Author(s): Ben Huyge, Ben Jeurissen, Jan De Beenhouwer, Jan Sijbers, Univ. Antwerpen (Belgium)

23 August 2022 • 2:55 PM - 3:15 PM PDT | Conv. Ctr. Room 6F

**12242-31****Efficient X-ray projection of triangular meshes based on ray tracing and rasterization**

Author(s): Pavel Paramonov, Jens Renders, Tim Elberfeld, Jan De Beenhouwer, Jan Sijbers, Univ. Antwerpen (Belgium)

23 August 2022 • 3:15 PM - 3:35 PM PDT | Conv. Ctr. Room 6F

**Break**

**Coffee Break 3:35 PM - 4:05 PM**

**SESSION 8: INSTRUMENTATION III: PROGRESS IN THREE-DIMENSIONAL IMAGING**

23 August 2022 • 4:05 PM - 5:55 PM PDT | Conv. Ctr. Room 6F

Session Chair: Hans Deyhle

**12242-32****Three-dimensional X-ray thermography using crystal-based X-ray interferometry (Invited Paper)**

Author(s): Akio Yoneyama, SAGA-LS (Japan)

23 August 2022 • 4:05 PM - 4:35 PM PDT | Conv. Ctr. Room 6F

**12242-33**

**Motion correction for robot-based X-ray photon-counting CT at ultrahigh resolution**

Author(s): Mengzhou Li, Rensselaer Polytechnic Institute (USA); Josef Uher, Radalytica a.s. (Czech Republic); Wenxiang Cong, Rensselaer Polytechnic Institute (USA); Jay Rubinstein, Univ. of Washington (USA); Ge Wang, Rensselaer Polytechnic Institute (USA)

23 August 2022 • 4:35 PM - 4:55 PM PDT | Conv. Ctr. Room 6F

**12242-34**

**Alternative grating designs for cone-beam edge illumination X-ray phase contrast imaging**

Author(s): Pieter-Jan Vanthienen, Jonathan Sanctorum, Ben Huyge, Nathanaël Six, Jan Sijbers, Jan De Beenhouwer, Univ. Antwerpen (Belgium)

23 August 2022 • 4:55 PM - 5:15 PM PDT | Conv. Ctr. Room 6F

**12242-35**

**Recent progress in grating-based microscopic X-ray phase tomography**

Author(s): Atsushi Momose, Ryosuke Ueda, Mingjian Cai, Zhuoxuan Zhao, Tohoku Univ. (Japan); Sam Kalirai, Jeff Irwin, Carl Zeiss X-ray Microscopy, Inc. (USA); Koichi Matsuo, Keio Univ. (Japan); Hiroki Kawakami, Hamamatsu Photonics K.K. (Japan); Pouria Zangi, Pascal Meyer, Martin Börner, Karlsruhe Institut für Technologie (Germany); Otto Markus, Microworks GmbH (Germany); Joachim Schulz, microworks GmbH (Germany)

23 August 2022 • 5:15 PM - 5:35 PM PDT | Conv. Ctr. Room 6F

**12242-62**

**Single grating phase contrast micro-CT**

Author(s): Martin Bech, Lund Univ (Sweden)

23 August 2022 • 5:35 PM - 5:55 PM PDT | Conv. Ctr. Room 6F

**SESSION 9: APPLICATIONS III: IMAGING BIOLOGICAL CELLS IN TISSUE CONTEXT**

24 August 2022 • 8:30 AM - 10:20 AM PDT | Conv. Ctr. Room 6F

Session Chair: Martin Bech, Lund Univ. (Sweden)

**12242-36**

**X-ray phase-contrast CT as a complementary histology method (Invited Paper)**

Author(s): Jenny Romell, KTH Royal Institute of Technology (Sweden), Exciscope AB (Sweden); Carlos Fernández Moro, Karolinska Univ. Hospital (Sweden), Karolinska Institute (Sweden); William Twengström, Jakob C. Larsson, Exciscope AB (Sweden), KTH Royal Institute of Technology (Sweden); Ernesto Sparrelid, Karolinska Institute (Sweden); Mikael Björnstedt, Karolinska Univ. Hospital (Sweden), Karolinska Institute (Sweden); Hans M. Hertz, KTH Royal Institute of Technology (Sweden)

24 August 2022 • 8:30 AM - 9:00 AM PDT | Conv. Ctr. Room 6F

**12242-37**

**Quantitative phase-contrast X-ray micro CT for visualization of mouse lymph nodes**

Author(s): Mirko Riedel, Helmholtz-Zentrum hereon GmbH (Germany), Technische Univ. München (Germany); Jörg U. Hammel, Julian P. Moosmann, Felix Beckmann, Helmholtz-Zentrum hereon GmbH (Germany); Florian L. Schwarzenberg, Paul Schuetz, Stephan Henne, Clemens Wülfing, INI-Research gGmbH (Germany); Madleen Busse, Julia Herzen, Technische Univ. München (Germany)

24 August 2022 • 9:00 AM - 9:20 AM PDT | Conv. Ctr. Room 6F

**12242-38**

**Imaging of excised cochleae by micro-CT: staining, liquid embedding and image modalities**

Author(s): Jannis Justus Schaeper, Tim Salditt, Georg-August-Univ. Göttingen (Germany)

24 August 2022 • 9:20 AM - 9:40 AM PDT | Conv. Ctr. Room 6F

**12242-39**

**Three-dimensional imaging of porcine joints down to the subcellular level**

Author(s): Georg Schulz, Griffin Rodgers, Christine Tanner, Univ. Basel (Switzerland); Timm Weitkamp, Synchrotron SOLEIL (France); Andrea Barbero, Francine Wolf, Univ. Basel (Switzerland); Daniel Beer, AOT AG (Switzerland); Bert Müller, Univ. Basel (Switzerland)

24 August 2022 • 9:40 AM - 10:00 AM PDT | Conv. Ctr. Room 6F

**12242-40**

**Monitoring the fate of stem cells and encapsulating hydrogel intraarticularly injected in mice knees using Synchrotron K-edge subtraction computed tomography**

Author(s): Clément Tavakoli, Univ. Grenoble Alpes (France), Univ. Claude Bernard Lyon 1 (France); Moustoifa Said, Ctr. de Recherches sur les Macromolécules Vegetales, Univ. Grenoble Alpes (France); Karine Toupet, Univ. de Montpellier (France); Johoon Kim, Univ. of Pennsylvania (USA); Bertrand Favier, Techniques de l'Ingénierie Médicale et de la Complexité-Info Mathématiques et Applications, Grenoble, Univ. Grenoble Alpes (France); David Cormode, Univ. of Pennsylvania (USA); Nora Collomb, Univ. Grenoble Alpes (France); Emmanuel Barbier, Univ. Grenoble Alpes (USA); Claire Rome, Univ. Grenoble Alpes (France); Rachel Auzely, Ctr. de Recherches sur les Macromolécules Végétales, Univ. Grenoble Alpes (France); Daniel Noel, Univ. de Montpellier (France); Helene Elleaume, Univ. Grenoble Alpes (France); Marlene Wiart, CarMeN Lab., Univ. Claude Bernard Lyon 1 (France); Emmanuel Brun, Univ. Grenoble Alpes (France)

24 August 2022 • 10:00 AM - 10:20 AM PDT | Conv. Ctr. Room 6F

**Break**

**Coffee Break 10:20 AM - 10:50 AM**

**SESSION 10: INSTRUMENTATION IV: PROTOCOLS FOR SYSTEM AUGMENTATION**

24 August 2022 • 10:50 AM - 12:20 PM PDT | Conv. Ctr. Room 6F

Session Chair: William Twengström, KTH Royal Institute of Technology (Sweden)

**12242-41**

**X-ray dissectography improves lung nodule detection (Invited Paper)**

Author(s): Chuang Niu, Rensselaer Polytechnic Institute (USA); Giridhar Dasegowda, Massachusetts General Hospital, Harvard Medical School (USA); Pingkun Yan, Rensselaer Polytechnic Institute (USA); Mannudeep K. Kalra, Massachusetts General Hospital (USA); Ge Wang, Rensselaer Polytechnic Institute (USA)

24 August 2022 • 10:50 AM - 11:20 AM PDT | Conv. Ctr. Room 6F

**12242-42**

**Augmenting a conventional X-ray scanner with edge illumination-based phase contrast imaging: how to design the gratings?**

Author(s): Jonathan Sanctorum, Nathanaël Six, Jan Sijbers, Jan De Beenhouwer, Univ. Antwerpen (Belgium)

24 August 2022 • 11:20 AM - 11:40 AM PDT | Conv. Ctr. Room 6F

**12242-43**

**Optimization of a multi-source rectangular X-ray CT geometry for inline inspection**

Author(s): Caroline Bossuyt, Jan De Beenhouwer, Jan Sijbers, imec-Visionlab, Univ. Antwerpen (Belgium)

24 August 2022 • 11:40 AM - 12:00 PM PDT | Conv. Ctr. Room 6F

**12242-44**

**Cross-talk and Spatial Resolution in a CT Scanner with a Flat Panel Detector**

Author(s): Seemeen Karimi, Andrew Townsend, Joseph W. Tringe, Lawrence Livermore National Lab. (USA)

24 August 2022 • 12:00 PM - 12:20 PM PDT | Conv. Ctr. Room 6F

**Break**

**Lunch/Exhibition Break 12:20 PM - 1:50 PM**



**SESSION 11: APPLICATIONS IV: CHALLENGING RESEARCH QUESTIONS**

24 August 2022 • 1:50 PM - 3:20 PM PDT | Conv. Ctr. Room 6F

Session Chair: Willy Kuo, Univ. Zürich (Switzerland)

**12242-45****Pre-clinical phase-contrast imaging of the whole brain in situ: from traumatic to diffuse white matter injury (Invited Paper)**

Author(s): Linda Croton, Monash Univ. (Australia); Kelly Crossley, Courtney McDonald, Hudson Institute of Medical Research (Australia), Monash Univ. (Australia); Kaye Morgan, Monash Univ. (Australia); Tayla Penny, Robert Galinsky, Stuart Hooper, Hudson Institute of Medical Research (Australia), Monash Univ. (Australia); Gary Ruben, Australian Nuclear Science and Technology Organisation (Australia), Monash Univ. (Australia); James Pollock, Monash Univ. (Australia); Florian Schaff, Technische Univ. München (Germany), Monash Univ. (Australia); Michelle Croughan, Monash Univ. (Australia); Amy Sutherland, Hudson Institute of Medical Research (Australia), Monash Univ. (Australia); Marcus Kitchen, Monash Univ. (Australia)

24 August 2022 • 1:50 PM - 2:20 PM PDT | Conv. Ctr. Room 6F

**12242-46****Intra-operative assessment of cancer with X-ray phase contrast computed tomography (PC-CT)**

Author(s): Thomas Partridge, Lorenzo Massimi, Paul Wolfson, Jinxing Jiang, Univ. College London (United Kingdom); Alberto Astolfo, Univ. College London (United Kingdom), Nikon Metrology UK Ltd. (United Kingdom); Tamara Suaris, St. Bartholomew's Hospital (United Kingdom); Glafkos Havariyou, Savvas Savvidis, Charlotte J. Maughan Jones, Nargiza Djurabekova, Univ. College London (United Kingdom); Sam P. M. Hawker, Nikon Metrology UK Ltd. (United Kingdom); Bennie Smit, Oliver J. Larkin, Edward Millard, Wilf Shorrock, Richard Waltham, Nikon X-Tek Systems Ltd. (United Kingdom); Kai Man Alexander Ho, Hazel McBain, Ash Wilson, Harry Delaney, Ama Liyadipita, Adam P. Lavine, Univ. College London (United Kingdom); Anthony Peel, St. Bartholomew's Hospital (United Kingdom); Zoheb Shah, Rachel L. Nelan, Queen Mary Univ. of London (United Kingdom); Khaled Dawas, Borzoueh Mohammadi, Yassar Qureshi, Univ. College Hospital (United Kingdom); Manil D. Chouhan, Stuart A. Taylor, Univ. College London (United Kingdom); Muntzer Mughal, Univ. College Hospital (United Kingdom); Marco Endrizzi, Charlotte K. Hagen, Peter R. T. Munro, Univ. College London (United Kingdom); Stephen W. Duffy, St. Bartholomew's Hospital (United Kingdom); Louise J. Jones, Queen Mary Univ. of London (United Kingdom); Marco Novelli, Univ. College Hospital (United Kingdom); Laurence B. Lovat, Univ. College London (United Kingdom); Ian G. Haig, Nikon X-Tek Systems Ltd. (United Kingdom); David Bate, Nikon X-Tek Systems Ltd. (United Kingdom), Univ. College London (United Kingdom); Alessandro Olivo, Univ. College London (United Kingdom)

24 August 2022 • 2:20 PM - 2:40 PM PDT | Conv. Ctr. Room 6F

**12242-47****Evaluating inflammations in high-resolution X-ray phase contrast images of SKG spondylarthritis mice models**

Author(s): Shifali Singh, Xavier Romand, Univ. Grenoble Alpes (France); Ludovic Broche, European Synchrotron Radiation Facility (France); Bertrand Favier, Athan Baillet, Emmanuel Brun, Univ. Grenoble Alpes (France)

24 August 2022 • 2:40 PM - 3:00 PM PDT | Conv. Ctr. Room 6F

**12242-49****Cone-beam computed laminography for flexible three-dimensional analysis of stacked microvias in multilayer printed circuit boards**

Author(s): Cale E. Lewis, Neil Ives, Gary Stupian, The Aerospace Corp. (USA)

24 August 2022 • 3:00 PM - 3:20 PM PDT | Conv. Ctr. Room 6F

**Break****Coffee Break 3:20 PM - 3:50 PM****SESSION 12: ALGORITHMS IV: ARTIFACT COMPENSATION**

24 August 2022 • 3:50 PM - 5:40 PM PDT | Conv. Ctr. Room 6F

Session Chair: Atsushi Momose, Tohoku Univ. (Japan)

**12242-51****An accelerated motion-compensated iterative reconstruction technique for dynamic computed tomography**

Author(s): Anh-Tuan Nguyen, Jens Renders, Univ. of Antwerp (Belgium); Jeroen Soete, Martine Wevers, KU Leuven (Belgium); Jan Sijbers, Jan De Beenhouwer, Univ. of Antwerp (Belgium)

24 August 2022 • 3:50 PM - 4:10 PM PDT | Conv. Ctr. Room 6F

**12242-52****Spatially variant optimization of an empirical beam-hardening correction algorithm**

Author(s): Andriy Andreyev, Faguo Yang, Matthew Andrew, Lars Omlor, Herminso Villarraga Gomez, Carl Zeiss X-ray Microscopy, Inc. (USA)

24 August 2022 • 4:10 PM - 4:30 PM PDT | Conv. Ctr. Room 6F

**12242-53****Metal pin artifact reduction with masked iterative nano-CT reconstruction**

Author(s): Mengzhou Li, Rensselaer Polytechnic Institute (USA); Victoria Cooley, Northwestern Univ. (USA); Viktor Nikitin, Argonne National Lab. (USA); Stuart R. Stock, Northwestern Univ. (USA); Ge Wang, Rensselaer Polytechnic Institute (USA)

24 August 2022 • 4:30 PM - 4:50 PM PDT | Conv. Ctr. Room 6F

**12242-54****High brightness multi-spectral laboratory X-ray sources for imaging applications (Invited Paper)**

Author(s): Wenbing Yun, Sigray, Inc. (USA)

24 August 2022 • 4:50 PM - 5:20 PM PDT | Conv. Ctr. Room 6F

**12242-61****A Data Generation Pipeline for Cardiac Vessel Segmentation and Motion Artifact Grading**

Author(s): Asif Shahriyar Sushmit, Ge Wang, Olivia Mariani, Rensselaer Polytechnic Institute (USA); Hengyong Yu, University of Massachusetts Lowell (USA); Yongshun Xu, Univ. of Massachusetts Lowell (USA); Christopher Wiedeman, Qing Lyu, Rensselaer Polytechnic Institute (USA); Ying Li, Ximiao Cao, Jonathan Maltz, GE Healthcare (USA)

24 August 2022 • 5:20 PM - 5:40 PM PDT | Conv. Ctr. Room 6F

**Award Ceremony**

24 August 2022 • 5:40 PM - 5:45 PM PDT | Conv. Ctr. Room 6F

**Best Student Poster Award will be presented.**



