
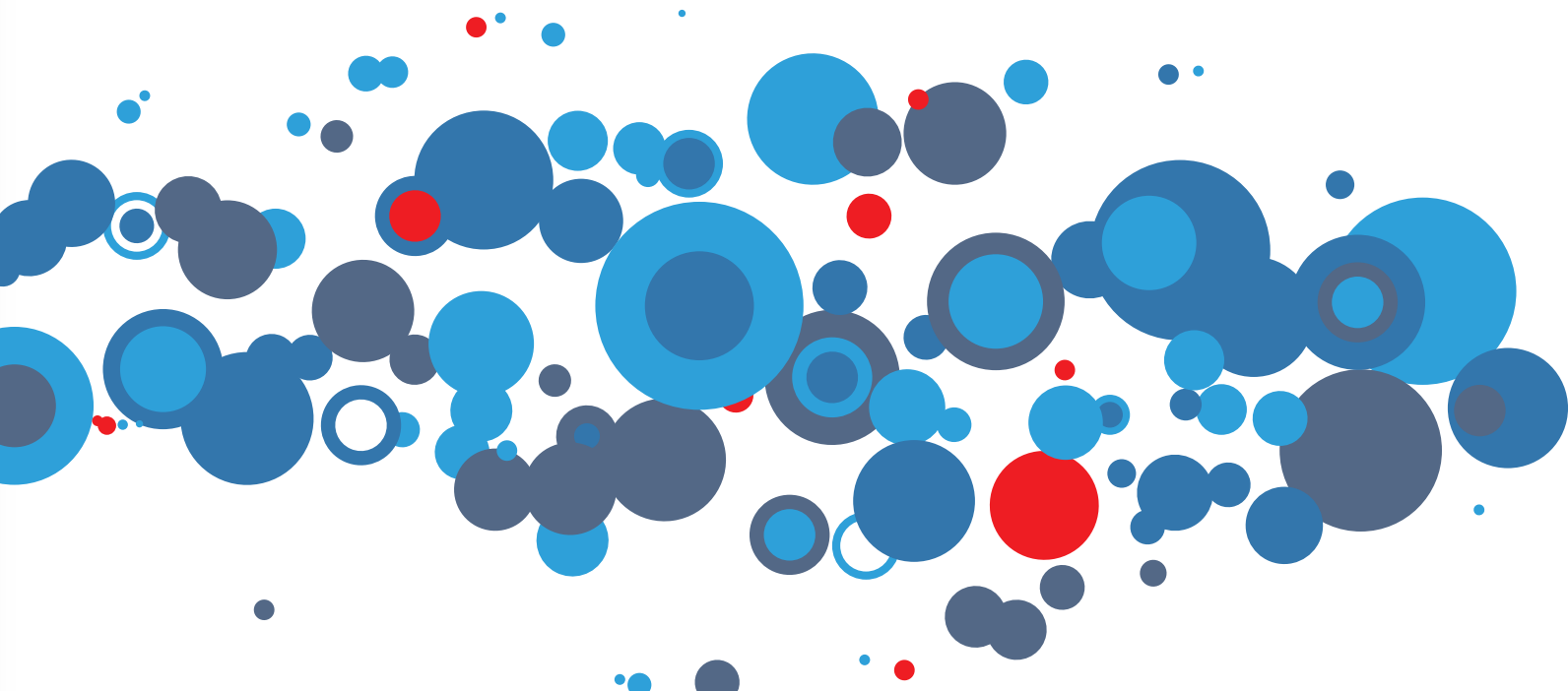


SPIE 
Astronomical
Instrumentation

Observational Frontiers of Astronomy for the New Decade



Cooperating
Organizations:

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Astronomical Society**

**Association of
Universities for Research
in Astronomy**

**Atacama Large
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**Ball Aerospace &
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**Canadian Astronomical
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**Commissariat à l'Energie
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**European Organisation
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Research in the
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**SOFIA—Stratospheric
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**Thirty Meter Telescope
Project**

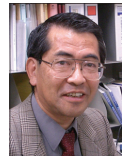
W. M. Keck Observatory

Welcome!

Astronomy is a technology-driven field of science. Making large advancements scientifically in the future will require technical advancements which carry ever increasing amounts of risk. In turn, this risk must be managed proactively to help ensure that the astronomy community succeeds, long term, in a cost constrained environment. Preparing for this revolution and broadening the community's understanding of future challenges in science, technology, project risks and management, to yield the optimal blend of ground and space based astronomy resources, is the focus of the 2010 SPIE Astronomical Telescopes and Instrumentation conference.

During this conference the well established synergies which guided the transformation of many ground based 2-4 m class telescopes in the arena of 8-10 m telescopes over the past decade will be explored as a segue to the next decade. Today's giant telescopes will eventually be reconfigured to support an even broader and more powerful set of new facilities. In addition, the long standing distinction between a telescope and its instrumentation will be blurred somewhat in future generations of observing systems, which will be designed end-to-end with highly integrated adaptive optics, focal plane arrays, and sophisticated data systems to yield near real time data for rapid analysis and follow-up. In fact, future trend lines point toward instruments which could match the cost and complexity of the telescopes they are mounted on, which represents a paradigm shift in the funding, design, management, and construction of these new systems. In parallel, future trends in space observatories point toward ever larger apertures from X-ray to infrared wavelengths with active optical systems akin to those used on the ground. Instrumentation featuring large focal planes and advanced imaging and spectroscopy systems are also on the horizon for these space systems. All of this activity and much more will be included at SPIE Conference on Astronomical Telescopes and Instrumentation 2010.

Symposium Chairs:



Masanori Iye,
National Astronomical Observatory
of Japan (Japan)



Douglas A. Simons,
Gemini Observatory (USA)

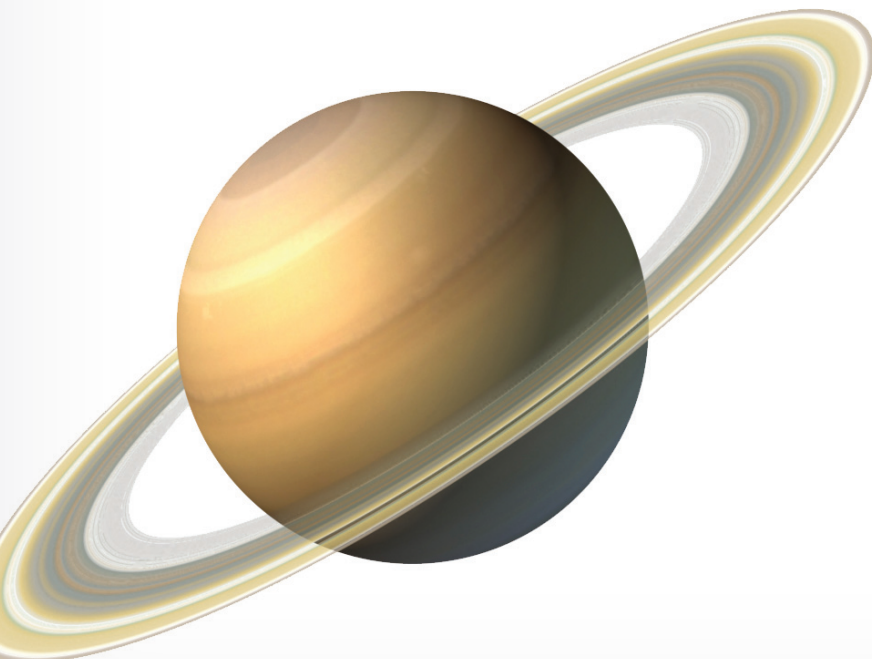
Symposium Cochairs:




Mark M. Casali,
European Organisation for
Astronomical Research in the
Southern Hemisphere (Germany)



Kathryn A. Flanagan,
Space Telescope Science
Institute (USA)



SPIE 
Astronomical
Instrumentation

Technical Program

Conferences + Courses: 27 June – 2 July 2010
Exhibition: 29 June – 1 July 2010
Town and Country Resort & Convention Center
San Diego, California, USA

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Courses

Sun	WS1002	The Galileoscope: Bringing Telescope Optics Down To Earth (Pompea, Sparks) 1:30 to 3:30 pm, \$65 / \$65,	p. 108
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SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, program committees, session chairs, and authors who have so generously given their time and advice to make this symposium possible.

The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members. This program is based on commitments received up to the time of publication and is subject to change without notice.

Plenary Session

Monday Welcome and Plenary Session • Room: Golden Ballroom

Monday 28 June 8:30 to 9:40 am

8:40 am



Unknowns and unknown unknowns: from dark sky to dark matter and dark energy

Yasushi Suto, The Univ. of Tokyo

Abstract: Answering well-known fundamental questions is usually regarded as the major goal of science. Even more important, however, should be discovery of another unknown and fundamental question. A mere recognition that

we didn't know anything is the basic scientific driver in the next generation. Cosmology indeed enjoys such an exciting epoch.

What is the composition of our universe? This is one of the well-known fundamental questions that philosophers, astronomers and physicists have tried to answer for centuries. Around the end of the last century, cosmologists finally recognized that "We didn't know anything". Except for atoms that comprise slightly less than 5% of the universe, our universe is apparently dominated by unknown components; 23% is the known unknown (dark matter), and 72% is the unknown unknown (dark energy).

In the course of answering a known fundamental question, we have now discovered an unknown, even more fundamental, question "What is dark matter? What is dark energy?" There are a variety of realistic particle physics models for dark matter, and its experimental detection may be within reach. On the other hand, it is fair to say that there is no widely accepted theoretical framework to describe the nature of dark energy. This is exactly why astronomical observations will play a key role in unveiling its nature. I will review our current understanding of dark matter and dark energy, and then discuss on-going and future attempts to discover even more unexpected questions.

Biography: **Yasushi Suto** received his BSc and ph.D from Department of Physics, the University of Tokyo. After spending a couple of years as a Miller fellow at UC Berkeley, he joined the faculty at Ibaraki University, Hiroshima University, Kyoto University and the University of Tokyo where he is a professor in Department of Physics. He is currently a Global Scholar at Department of Astrophysical Sciences, Princeton University as well. He is interested in working on known unknowns and unknown unknowns including exoplanets, dark baryons, and dark energy.

9:10 am



Optical synoptic telescopes: new science frontiers

J. Anthony Tyson, Univ. of California, Davis

Abstract: Over the past decade, sky surveys such as the Sloan Digital Sky Survey have proven the power of large data sets for answering fundamental astrophysical questions. This observational progress, based on a synergy of

advances in telescope construction, detectors, and information technology, has had a dramatic impact on nearly all fields of astronomy, and areas of fundamental physics. The next-generation instruments, and the surveys that will be made with them, will maintain this revolutionary progress. The hardware and computational technical challenges and the exciting science opportunities are attracting scientists and engineers from astronomy, optics, low-light-level detectors, high-energy physics, statistics, and computer science.

The history of astronomy has taught us repeatedly that there are surprises whenever we view the sky in a new way. This will be particularly true of discoveries emerging from a new generation of sky surveys. Imaging data from large ground-based active optics telescopes with sufficient étendue (30-300 m²deg²) can address many scientific missions simultaneously. These new investigations will rely on the statistical precision obtainable with billions of objects. For the first time, the full sky will be surveyed deep and fast, opening a new window on a universe of faint moving and distant exploding objects.

After reviewing the new generation sky survey telescopes and cameras, I will describe some breakthrough science enabled by these surveys: from mapping the inner and outer solar system, to exploring the transient universe, to unraveling the mystery of dark energy.

Biography: **Tony Tyson** is Distinguished Professor of Physics at University of California, Davis. His current research is in cosmology: dark matter, gravitational lensing, and the nature of dark energy. He directs a national effort to build the Large Synoptic Survey Telescope.

Tyson received his B.S. in Physics from Stanford in 1962 and Ph.D. from University of Wisconsin at Madison in 1967. He is a Fellow of the American Physical Society and the American Academy of Arts and Sciences, and a member of the National Academy of Sciences and the American Philosophical Society.

Facility Map

See page 143.

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Tuesday Plenary Session • Room: Golden Ballroom

Observational Frontiers for the New Decade

Tuesday 29 June 8:30 am to 12:30 pm

8:30 am

**ELTs science vision****Roberto Gilmozzi**, European Southern Observatory

Abstract: A number of Extremely Large Telescopes may see first light in the second half of this decade. Their designs are driven by a number of fundamental scientific questions that are well outside the reach of current instrumentation and telescopes. I will review these key science

goals, ranging from the quest for Earth-like exoplanets to the detailed study of the first objects in the Universe, and show how they set the requirements for the ELTs and their instruments. I will also discuss the synergies between ELTs and other contemporary future facilities (e.g. ALMA, JWST, SKA), and highlight the ELTs' potential for new discoveries thanks to both their large light collecting power and high spatial resolution.

Biography: **Roberto Gilmozzi** is Head of ESO's Telescope Division and Principal Investigator of the E-ELT. He was Director of the Paranal Observatory from 1999 to 2005. Before joining ESO in 1994 as head of the Optical Instrumentation Department he worked for ESA, at IUE (1983-88) and HST (1988-94). He was educated at the University of Rome. His research interests include novae, supernovae, their remnants, and their connection to the cosmic star formation history.

9:00 am

**Science with ALMA: a supersharper view of the nurseries of galaxies, stars and planets****Ewine van Dishoeck**, Leiden Observatory and Max Planck Institute für Extraterrestrische Physik

Abstract: Galaxies, stars and planets are born in the tenuous clouds in space. Because of dust obscuration, such regions can only be studied at long wavelengths. The

Atacama Large Millimeter/submillimeter Array (ALMA), under construction in Chile and planned to be fully operational in 2013, will consist of 54×12m and 12×7m telescopes and will operate from 0.3-7 mm. The main observing modes involve broadband thermal dust continuum emission studies and high resolution spectral line observations with resolving powers >10⁷. Thanks to the orders of magnitude increase in sensitivity and spatial resolution compared with previous instruments, ALMA will have an impact on virtually all topics in astronomy. Specifically, it can detect dusty galaxies throughout the universe and zoom into the terrestrial planet-forming zones of disks around young stars. In star-forming regions, ALMA will detect and image thousands of lines of complex, perhaps even prebiotic, molecules. In this lecture, a brief overview of the main ALMA science drivers will be given.

Biography: **Ewine F. van Dishoeck** is a full professor of astronomy at Leiden University, the Netherlands, where she received her PhD in 1984 cum laude. From 1984-1990, she held positions at Harvard, Princeton and Caltech before moving back to Leiden in 1990. As of 2008, she is also an external scientific member of the Max Planck Institut für Extraterrestrische Physik in Garching. Her research group focuses on the astrochemical evolution from interstellar clouds to planet-forming disks and the importance of molecules as diagnostics of the star- and planet formation process, using observations at submillimeter and infrared wavelengths. She holds many national and international science policy functions, including member of the ALMA Board. She has received various honors and awards for her research.

9:30 am

**The ESA space science and robotic exploration programme****Mark McCaughrean**, European Space Agency/ESTEC

Abstract: I will present an overview of the ESA space science and robotic exploration programme. The talk will focus on key science results from missions currently in operation, including the astronomy missions Herschel, Planck, XMM-Newton, Integral, and HST, and the scientific promise of those in preparation, namely LISA Pathfinder, GAIA, JWST, BepiColombo, and the ExoMars missions. Finally, I will discuss the missions currently under study as part of the Cosmic Vision programme, and the roadmap for new opportunities over the coming decade.

Biography: **Mark McCaughrean** is Head of the Research & Scientific Support Department of the European Space Agency, based at ESTEC in The Netherlands. He obtained his PhD in 1988 from the University of Edinburgh, working on one of the first infrared camera systems for astronomy. He subsequently worked in the US, Germany, and UK helping develop ground- and space-based optical/IR instrumentation and telescopes, and using them to study the formation of stars and their planetary systems. He is an Interdisciplinary Scientist on the Science Working Group for the NASA/ESA/CSA JWST and a member of the ESO E-ELT Science Working Group.

11:00 am

**The ESA Herschel Space Observatory: first year achievements and early science results****Göran Pilbratt**, Herschel Space Observatory

Abstract: The Herschel Space Observatory was successfully launched on 14 May 2009, carried into space by an Ariane 5 ECA launcher together with the second passenger Planck, both spacecraft being injected into transfer orbits towards L2 with exquisite precision. Herschel is the most recent observatory mission in the European Space Agency (ESA) science programme. It carries a 3.5 meter diameter Cassegrain passively cooled monolithic silicon carbide telescope. The focal plane units of the science payload complement - two cameras/medium resolution imaging spectrometers, the Photodetector Array Camera and Spectrometer (PACS) and Spectral and Photometric Imaging REceiver (SPIRE), and the very high resolution Heterodyne Instrument for the Far-Infrared (HIFI) spectrometer - are housed in a superfluid helium cryostat.

Herschel is the first large aperture space infrared observatory; it builds on previous infrared space missions including the ESA ISO and NASA Spitzer observatories, by offering a much larger telescope and pushes towards longer wavelengths. It will perform imaging photometry and spectroscopy in the far infrared and sub-millimeter part of the spectrum, covering approximately the 55-672 micron range. I will describe Herschel and its science capabilities putting it into perspective. Herschel is designed to observe the 'cool universe'; the key science objectives include star and galaxy formation and evolution, and in particular the physics, dynamics, and chemistry of the interstellar medium and its molecular clouds, the wombs of the stars and planets.

Herschel is currently opening a new window to study how the universe has evolved to become the universe we see today, and how our star the sun, our planet the earth, and we ourselves fit in. I will outline the early in-flight operations of Herschel and the transition from launch and early operational phases into the routine science phase. I will present the demonstrated science capabilities and provide examples of scientific highlights to date.

Plenary Session

Herschel has been designed to offer a minimum of 3 years of routine science observations. Nominally ~20,000 hours will be available for astronomy, 32% is guaranteed time (GT) and the remainder is open time (OT) offered to the general astronomical community through a standard competitive proposal procedure. The time allocation for both GT and OT Key Programs was been concluded before the launch. I will describe future observing opportunities at the time of the meeting the OT part of the next AO will be ongoing.

Biography: **Göran Pilbratt** obtained a Ph.D. in radio astronomy from Chalmers University of Technology, Göteborg, Sweden, in 1986, and joined ESA as Research Fellow. He obtained a Staff Scientist position in 1988, initially worked on studies of space VLBI missions, was appointed Study Scientist for Herschel (then FIRST) in 1991, and has been the Herschel Project Scientist since 1995.

11:30 am



High-resolution imaging of extraterrestrial planetary surfaces

Alfred McEwen, Lunar and Planetary Lab., The Univ. of Arizona

Abstract: There have been significant improvements in recent years in high-resolution imaging of planetary surfaces beyond Earth. Three examples are described here:

the narrow-angle camera (NAC) of the Imaging Science Subsystem (ISS) of Cassini at Saturn [1], the High Resolution Imaging Science Experiment (HiRISE) on Mars Reconnaissance Orbiter [2], and the NAC of the Lunar Reconnaissance Orbiter Camera (LROC) on LRO [3]. Each of these cameras was designed according to the constraints and science objectives of its mission. The ISS-NAC, built at the Jet Propulsion Laboratory, is optimized for imaging a diverse array of targets, typically at large ranges, and with high priorities given to multispectral imaging (via two 12-slot filter wheels) and movies with high time resolution. ISS images in framing mode (1024 × 1024 pixels, 0.35° field of view, 6 μrad/pixel). ISS was not optimized for the highest spatial resolution during the brief close flybys, but with spacecraft target motion compensation has been able to acquire a few unsmear images at scales of only a few meters/pixel. In contrast to Cassini, MRO and LRO are in tight circular orbits suitable for pushbroom imaging to optimize spatial resolution. MRO orbits at an altitude near 300 km, about as low as practical given the Mars atmosphere, whereas LRO orbits at near 50 km altitude. Hence, although the instantaneous fields of view (IFOV) differ by a factor of 10 (1 μrad/ pixel for HiRISE; 10 μrad/ pixel for LROC), the mapping scales are similar (0.3 m/pixel for HiRISE; 0.5 m/pixel for LROC). The FOVs are 1.14° for HiRISE and 2.85° for each of two LROC NACs, for a combined FOV of 5.58°. Maximum images sizes are 20,048 × 118,000 pixels for HiRISE and 5,000 × 52,200 pixels for each LROC-NAC. HiRISE, built at Ball Aerospace and Technology Corp., uses time-delay integration (TDI) with up to 128 lines to achieve a high signal:noise ratio, essential for high-quality imaging through the dusty atmosphere, but which places tight constraints on spacecraft pointing stability. Color imaging cannot be achieved on HiRISE or LROC via separate images through a movable filter wheel given the fast ground speeds and narrow FOVs; HiRISE acquires 3-color coverage over 20% of the swath width via additional CCDs with filter covers. There are two LROC NACs, built at Malin Space Science Systems, used to double the swath width, yet the combined mass (16.4 kg) is still significantly less than that of ISS (30.5 kg) or HiRISE (65 kg).

[1] Porco, C.C. et al., 2004, *Space Science Reviews* 115, 363-497

[2] McEwen, A.S. et al., 2007, *J. Geophys. Res.* 112, E05S02.

[3] Robinson, M.S. et al., submitted.

Biography: **Dr. Alfred S. McEwen** is Professor in the Department of Planetary Sciences, University of Arizona, and Director of the Planetary Image Research Lab (PIRL). He has studied planetary surfaces for more than 25 years, including time at the U.S. Geological Survey prior to joining UA in 1996. Current research interests include volcanology, cratering, and remote sensing of planetary surfaces.

His experience with spacecraft science experiments includes: 1989: Guest Investigator with the Voyager imaging team at Neptune; 1990-2002: Galileo Interdisciplinary Scientist (IDS) associated with the Solid State Imaging (SSI) team; lead sequence planning and science analyst for SSI observations of Io; 1991-present: Cassini Imaging Science Subsystem (ISS) team member; 1992-98: Mars Observer/Mars Global Surveyor Participat-

ing Scientist for Mars Orbital Camera (MOC); 1992-94: Clementine advisory committee and science team; 2001-present: Participating Scientist on Mars Odyssey THEMIS; 2001-present: PI of High Resolution Imaging Science Experiment, Mars Reconnaissance Orbiter; 2005-present: Co-I on Lunar Reconnaissance Orbiter Camera (LROC)

12:00 pm



Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond

Sara Seager, Massachusetts Institute of Technology

Abstract: For thousands of years people have wondered, “Are we alone?” Out of the over 400 planets discovered to orbit nearby stars, well over 50 transit their host stars.

The transiting planets are “goldmines” for astronomers, because the planetary sizes, masses, and atmospheres can be routinely measured. NASA’s Kepler is further revolutionizing transiting exoplanet studies with its unprecedented photometric precision. Highlights of transiting planet studies and recent Kepler discoveries will fuel the search for life on other worlds.

Biography: **Professor Sara Seager** is a planetary scientist and astrophysicist at MIT. She holds the Ellen Swallow Richards Associate Professor chair. Professor Seager’s research focuses on exoplanets. She develops theoretical computer models of atmospheres and interiors of all kinds of exoplanets, to make predictions and interpret data, with a prime interest in “biosignature” atmospheric gases. Her research has helped to form the field of exoplanet characterization, including work that led to the first detection of an exoplanet atmosphere. Professor Seager is a member of the Kepler Science Team, the EPOXI Team, and has been actively involved in a number of exoplanet space mission concept studies.

Thursday Plenary Session • Room: Golden Ballroom

Thursday 1 July 8:30 to 10:00 am

8:30 am

**Hinode: a new solar observatory in space**

Saku Tsuneta, Hinode Science Center, National Astronomical Observatory of Japan

Abstract: It is a fascinating fact that a solitary star like the Sun emits intense X-rays from its outer atmosphere. Observations with the Japan-US Yohkoh satellite showed that all the sporadic heating from X-class flares to ubiquitous

tiny bursts in the solar corona is due to magnetic reconnection; a process to efficiently annihilate magnetic fields with opposite direction and generating jets, heats and non-thermal particles.

These activities on the surface of the star are driven by magnetic fields created by the interaction of flow and seed magnetic fields inside the Sun (dynamo mechanism). The magnetic field strength on the surface of the Sun exceeds 1kG, while that at the bottom of the convection zone may exceed 100kG. They are too strong, far stronger than the equi-partition magnetic field strength, the energy of which is the same as that of the local convection motion. Though a dynamo mechanism can amplify field strength up to the equi-partition field strength, it is perceived possible to have field strength beyond that threshold. Such too-strong magnetic fields can be found elsewhere in the universe, namely pulsars (10¹²G), magnetars (10¹⁵G), galaxies and clusters of galaxies (a few micro G), which is again too strong in terms of that in early universe (<10⁻¹⁵G). The dynamo mechanism for the sun and these objects is poorly understood. The Hinode spacecraft was successfully launched in September 2006 using a JAXA's M-V launch vehicle. It comprises an observatory style set of instruments that function together to answer the fundamental questions of how magnetic fields are formed and how they dissipate to create the solar corona. This subsequently addresses all the phenomena that have an impact on the Sun-Earth system, such as the formation of the solar winds, triggering of flares with intense non-thermal acceleration and coronal mass ejections, and formation and maintenance of filaments and prominences. The concept of Hinode is that two X-ray and EUV telescopes observe the dissipation part of the magnetic life-cycle, while the visible light telescope simultaneously observes the generation and transport of magnetic field. Hinode is the Japan's third solar mission with participation of NASA and UK STFC (then PPARC) and subsequently ESA. Hinode has higher temporal, spatial and velocity resolution than any satellite previously and is probing wavelength regimes that have never had such continuous time coverage available. This has allowed us to discover waves in spicules, prominences and on the photosphere, ubiquitous jets in chromospheres, ubiquitous transient horizontal magnetic fields on the photosphere suggesting turbulent dynamo process, supersonic down-flow and convective collapse resulting in super equi-partition magnetic field strength, emergence of large-scale flux rope from below the photosphere, kG-magnetic patches in the polar regions, identification of the origin of slow solar wind, and enigmatic fine-scale flows in the prominence. This talk summarizes how these new results from Hinode are addressing these critical questions as well as probing fundamental physical processes that will have applications in many other scenarios across the universe.

Biography: **Saku Tsuneta** is a professor of the National Astronomical Observatory of Japan (NAOJ) with research interest in space instrumentation and solar physics from space. He is the director of the Hinode Science Center, and the director of the Advanced Technology Center of NAOJ. He is the principal Investigator for Solar Optical Telescope aboard Hinode and the co-manager for the entire Hinode mission. He took his PhD in astronomy in 1983 at the University of Tokyo.

9:00 am

**Gamma ray satellite GLAST**

Steven Ritz, Fermi's Large Area Telescope and Univ. of California, Santa Cruz

Abstract: Not available at this time.

Biography: **Steven Ritz** is the Deputy Principal Investigator for Fermi's Large Area Telescope (LAT) and a Professor of Physics at the University of California, Santa Cruz. He is

also Associate Director for the university's Santa Cruz Institute for Particle Physics.

Ritz has been involved with Fermi -- originally known as the Gamma-ray Large Area Telescope, or GLAST -- since 1996. Two years later, he was the GLAST Large Area Telescope (LAT) Instrument Scientist, and since 2004 has been a LAT Deputy Principal Investigator. His involvement in GLAST deepened in 2000, when he was named the GLAST Deputy Project Scientist. In 2003, he was promoted to the position of GLAST Project Scientist, a role he occupied until 2009.

9:30 am

**X-ray missions: 10 years of Chandra, Newton, and Future**

Stephen Murray, Harvard-Smithsonian Ctr. for Astrophysics

Abstract: Not available at this time.

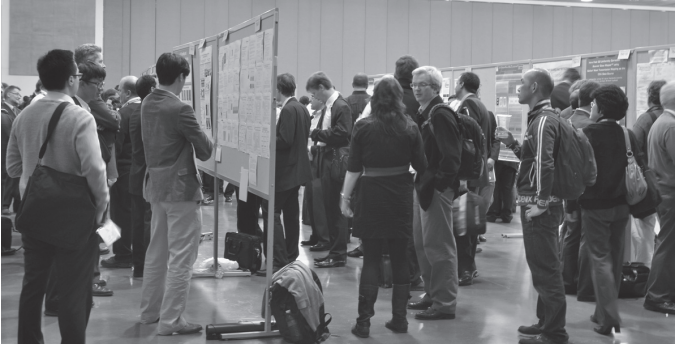
Biography: I am an Astrophysicist at the Harvard-Smithsonian Center for Astrophysics. My areas of interest are High

Energy Astrophysics - mainly x-ray astronomy, observational techniques (i.e., detectors), clusters of galaxies and large scale structures. I have done some work on data and information systems. I am currently the Associate Director of the High Energy Astrophysics Division, and the Principal Investigator for the High Resolution Camera for the Chandra X-ray Observatory (formally known as the Advanced X-Ray Astrophysics Facility). I also am PI for the Astrophysics Data System (ADS) that operates an on-line abstract and literature service for astronomy.

All Plenary Sessions are included with your technical conference registration.

Daily Schedule

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		<i>Plenary Session: The ESA space science and robotic exploration programme</i> (McCaughrean), 9:30 to 10:00 am, p. 3	<i>Plenary Session: The ESA Herschel Space Observatory: first year achievements and early science results</i> (Pilbratt), 11:00 to 11:30 am, p. 3			<i>Plenary Session: High-resolution imaging of extraterrestrial planetary surfaces</i> (McEwen), 11:30 am to 12:00 pm, p. 4
		<i>Plenary Session: Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond</i> (Seager), 12:00 to 12:30 pm, p. 4	<i>All-Conference Dinner and Presentation: Four Hundred Years Through the Eye of the Telescope</i> (Nelson) 7:00 to 9:00 pm, p. 7			
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7736 Adaptive Optics Systems II (Ellerbroek, Hart, Hubin, Wizinowich), p. 62						
7737 Observatory Operations: Strategies, Processes, and Systems III (Silva, Peck, Soifer), p. 72						
7738 Modeling, Systems Engineering, and Project Management for Astronomy IV (Angeli, Dierickx), p. 76						
7739 Modern Technologies in Space- and Ground-based Telescopes and Instrumentation (Atad-Ettedgui, Lemke), p. 80						
7740 Software and Cyberinfrastructure for Astronomy (Radziwill, Bridger), p. 87						
7741 Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy V (Holland, Zmuidzinas), p. 93						
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Poster Sessions

Grand Exhibit Hall

Conference attendees are invited to attend the poster sessions on Sunday, Monday, Wednesday, and Thursday. See conference program for a list of the posters in each session.

Each day will represent a different set of conference poster presentations. Come view the posters, ask questions, and enjoy light refreshments. Authors of poster papers will be present during the Interactive Poster Sessions to answer questions concerning their papers.

As part of the technical program, poster sessions are for paid registrants only. Attendees are required to wear their conference registration badges to the poster sessions.

Poster Set-Up - 10:00 am to 5:00 pm

Extended Poster Viewing from 10:00 am to 5:00 pm; 6:00 to 9:00 pm

Interactive Poster Sessions

Sunday 6:00 to 7:30 pm

Monday 5:30 to 7:00 pm (followed by Welcome Reception)

Wednesday 6:00 to 7:30 pm

Thursday 6:00 to 7:30 pm

Posters must be removed at the end of the extended viewing. Posters not removed will be considered unwanted and will be discarded.

Poster Previews

The Ground-based and Airborne Instrumentation for Astronomy III conference will include short oral poster previews. Authors are encouraged to check the conference schedule for times and instructions on how to be involved.

Palomar Observatory Tours

Sunday 28 June and Thursday 1 July 1:00 to 6:00 pm

Palomar Observatory's 200-inch Hale Telescope has been in continuous operation for 62 years. It is no longer the world's largest telescope but it is still used nightly for a wide-range of research programs involving new, world-class instrumentation. Join other conference attendees for a close look at the history and current operations of the Hale Telescope.

Please note that the interior of the dome is kept at nighttime temperatures (for an elevation of 5,500 feet!). Dress accordingly. High-heeled shoes are not recommended for the tour.

Sign-up required at the SPIE Registration Desk by noon on the day of departure. Limited space available. \$10 transportation fee required.

Lunch with the Experts - A Student Networking Event

Monday 28 June 12:30 to 1:30 pm

See Ticket for Location.

Seating is Limited.

Combine food, fun, and valuable networking opportunities at this complimentary event hosted by SPIE Student Services. Join experts willing to share their collective wisdom and experience at this casual and lively event. Students receive one complimentary ticket with registration.

All-Symposium Welcome Reception

Tiki Pavilion Terrace

Monday 28 June 7:00 to 8:30 pm

Please join your colleagues in a great networking event. Enjoy traditional California cuisine and listen to your favorite California surf music. Wear your surfing clothes and enter a contest for best 'surfer dude' costume! Please wear your technical badge.

Guest tickets may be purchased for \$35 at the SPIE Registration Desk during registration hours.

All-Conference Dinner and Presentation

Tuesday 29 June 6:30 to 9:00 pm

All attendees are invited to attend the All-Conference Dinner and Presentation on Tuesday at "The Prado" in beautiful Balboa Park. The evening will begin with a reception from 6:30 to 7:00 pm.

Transportation will be departing from the Atlas Foyer of the Town & Country Convention Center starting at 6 pm.

Tickets for the banquet are not included in the registration fee. Based on availability, tickets must be purchased no later than Monday 28 June at noon to guarantee your seat.



Dinner Speaker: Jerry Nelson,
Univ. of California, Santa Cruz (United States)

Four Hundred Years Through the Eye of the Telescope

Abstract: Not since the time of Copernicus and Galileo has our view of the Universe and physics in general been so challenged by the discoveries of modern telescopes. In the

year we celebrate the four hundredth anniversary of the filing of the patent for the telescope, and having just passed the 50th anniversary of the space program, this talk will attempt to reflect on how telescopes have changed science and society. How the great telescope quest like few others has brought together scientists, engineers, philanthropists, governments and the public around the globe, unified by an over-arching curiosity to see deeper and further. What are the lessons from the last four hundred years, and where do we go next? Somewhat dangerously, given we are on the cusp of asking some of the most profound questions a sentient species is probably ever confronted with, I will attempt to give some pointers, cautioned by Martin Harwit's words that "astronomy is a luxury that society can afford only when it has provided people with life's primary needs - food, shelter, security."

Biography: Dr. Jerry Nelson is Professor of Astronomy and Astrophysics at the University of California, Santa Cruz, and Astronomer, UC Observatories/Lick Observatory. He received his B.S. at the California Institute of Technology and his Ph.D. at the University of California, Berkeley. His research interests include the CfAO, which is concerned with using adaptive optics to do astronomical science and vision science, and with spreading the appropriate observing techniques to the broad community. The Center also supports the development of new scientific instrumentation that uses adaptive optics. In addition, advanced AO technology is supported, with the aim of producing more capable AO systems in the future, both for giant telescopes where AO is particularly effective, and in vision science, where more compact and user/patient friendly AO systems will help the study of the human retina.

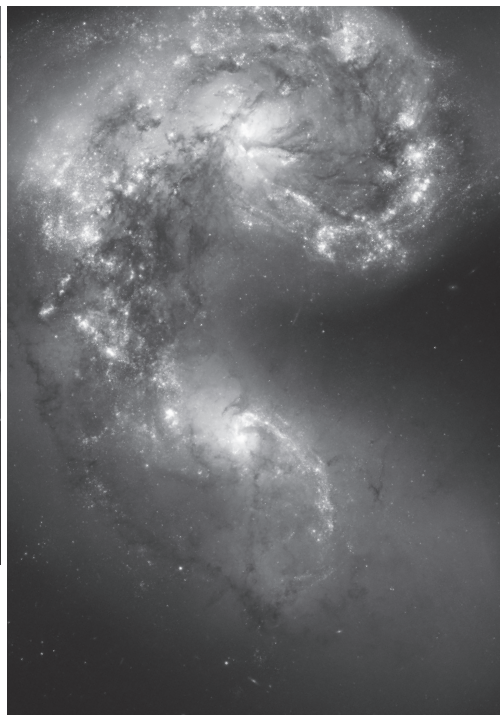
Dr. Nelson is actively involved in the design of future giant telescopes. He is the Keck Observatory Scientist, having been involved with the design of the two Keck telescopes. He is also involved in the adaptive optics system being used and developed at Keck. The Keck AO system can make diffraction limited images at wavelengths as short as 1 micron, producing image resolution as good as 0.02 arc seconds. When complete, the Keck AO system will use a Na laser guide star to dramatically increase sky coverage over that available with natural guide stars.

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at the premier meeting for ground- and space-based telescopes

Tuesday-Thursday: 29 June – 1 July 2010

10:00 am to 4:00 pm



Exhibitor List - As of 21 May 2010

4D Technology Corp.
 ALPAO
 AMOS (Advanced Mechanical and Optical Systems)
 Apogee Instruments, Inc.
 Asahi Spectra USA Inc.
 ASTELCO Sytems GmbH
 Astronomical Research Cameras, Inc.
 ATK Space Structures
 Australian Centre for Precision Optics
 CEDRAT Technologies
 CeramOptec Industries, Inc.
 ColdEdge Technologies
 COM DEV
 Cryoconnect Division:
 Tekdata Interconnections Ltd.
 CSEM SA
 Durham Precision Optics
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 EOS Technologies, Inc.
 ESDI
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 Fibertech Optica
 First Light Imaging
 General Dynamics SATCOM Technologies
 Giant Magellan Telescope Project

Hextek Corporation
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 Jet Propulsion Laboratory - Exoplanet Exploration Program
 Large Synoptic Survey Telescope (LSST)
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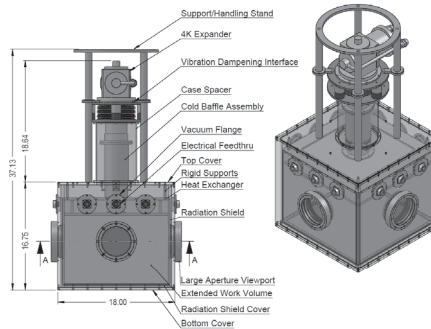
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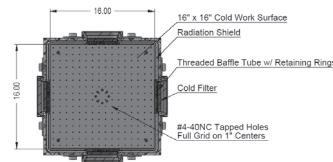


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Space Telescopes and Instrumentation 2010: Optical, Infrared, and Millimeter Wave

Conference Chairs: **Jacobus M. Oschmann, Jr.**, Ball Aerospace & Technologies Corp.; **Mark C. Clampin**, NASA Goddard Space Flight Ctr.; **Howard A. MacEwen**, ManTech SRS Technologies

Conference Co-Chairs: **Giovanni G. Fazio**, Harvard-Smithsonian Ctr. for Astrophysics; **Takao Nakagawa**, Japan Aerospace Exploration Agency (Japan)

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Sunday 27 June

SESSION 1

Room: San Diego. Sun. 9:00 to 10:20 am

Strategies

Session Chair: **Jacobus M. Oschmann, Jr.**, Ball Aerospace & Technologies Corp.

9:00 am: **Key enabling technologies for the next generation of space telescopes**, Charles F. Lillie, Ronald S. Polidan, Dean R. Dailey, Northrop Grumman Aerospace Systems (United States) [7731-01]

9:20 am: **Early results from NASA's assessment of satellite servicing**, Harley A. Thronson, Jr., Mansoor Ahmed, Jacqueline A. Townsend, Arthur O. Whipple, William R. Oegerle, Benjamin B. Reed, NASA Goddard Space Flight Ctr. (United States) [7731-02]

9:40 am: **Preliminary multivariable cost model for space telescopes**, H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States) [7731-03]

10:00 am: **International Space Station Observatory**, Joseph J. Green, Benjamin Haber, Catherine M. Ohara, David C. Redding, Fang Shi, Mitchell Troy, J. Kent Wallace, Jet Propulsion Lab. (United States) [7731-04]

Coffee Break 10:20 to 10:50 am

SESSION 2

Room: San Diego. Sun. 10:50 am to 12:10 pm

JWST I

Session Chair: **Eric P. Smith**, NASA Headquarters

10:50 am: **Science with the James Webb Space Telescope**, Jonathan P. Gardner, NASA Goddard Space Flight Ctr. (United States) [7731-05]

11:10 am: **Overview of the James Webb Space Telescope Observatory**, Mark C. Clampin, NASA Goddard Space Flight Ctr. (United States) [7731-06]

11:30 am: **The James Webb Space Telescope integrated science instrument module**, Matthew A. Greenhouse, Michael P. Drury, Jamie L. Dunn, Stuart D. Glazer, Eric L. Johnson, Ray A. Lundquist, John C. McCloskey, Raymond G. Ohl IV, Robert A. Rashford, Mark F. Voyton, NASA Goddard Space Flight Ctr. (United States) [7731-07]

11:50 am: **James Webb Space Telescope (JWST) project overview and status**, Phillip A. Sabelhaus, NASA Goddard Space Flight Ctr. (United States) [7731-08]

Lunch Break 12:10 to 1:30 pm

SESSION 3

Room: San Diego. Sun. 1:30 to 3:30 pm

JWST II

Session Chair: **Mark C. Clampin**, NASA Goddard Space Flight Ctr.

1:30 pm: **Results, status, and plans for the James Webb Space Telescope optical telescope element**, Lee D. Feinberg, Ritva A. Keski-Kuha, NASA Goddard Space Flight Ctr. (United States); Scott C. Texter, Charlie B. Atkinson, Northrop Grumman Aerospace Systems (United States) [7731-09]

1:50 pm: **Optical performance for the actively controlled James Webb Space Telescope**, Paul A. Lightsey, Daniel S. Acton, Allison A. Barto, Robert J. Brown, David Chaney, Benjamin B. Gallagher, Scott Knight, Jackson A. Lewis, Noah J. Siegel, Koby Z. Smith, Christopher K. Stewart, Ball Aerospace & Technologies Corp. (United States) [7731-10]

2:10 pm: **NIRCam: development and testing of the JWST near-infrared camera**, Thomas P. Greene, NASA Ames Research Ctr. (United States); Marcia J. Rieke, The Univ. of Arizona (United States); Charles A. Beichman, California Institute of Technology (United States); Scott D. Horner, Lockheed Martin Space Systems Co. (United States); Daniel T. Jaffe, The Univ. of Texas at Austin (United States); Douglas M. Kelly, The Univ. of Arizona (United States) [7731-11]

2:30 pm: **Status of the JWST NIRSpec instrument**, Stephan M. Birkmann, Torsten Böker, Peter Jakobsen, Guido de Marchi, Marco Sirianni, Giorgio Bagnasco, Peter L. Jensen, Maurice B. J. te Plate, Peter Rumler, Jean-Christophe Salvignol, Paolo Strada, European Space Research and Technology Ctr. (Netherlands); Manfred-Georg Kolm, Xavier Gnata, Karl Honnen, Jess Köhler, Robert Lemke, Marc Maschmann, Markus Melf, EADS Astrium GmbH (Germany); Pierre Ferruit, Bernhard Dörner, Observatoire de Lyon (France) [7731-12]

2:50 pm: **Progress with the design and development of MIRI, the mid-IR instrument for JWST**, Gillian S. Wright, UK Astronomy Technology Ctr. (United Kingdom); George H. Rieke, The Univ. of Arizona (United States); Philip Barella, Jet Propulsion Lab. (United States); Torsten Böker, European Space Research and Technology Ctr. (Netherlands); Luis Colina, Consejo Superior de Investigaciones Científicas (Spain); Ewine F. van Dishoeck, Leiden Univ. (Netherlands); Phillip A. Driggers, NASA Goddard Space Flight Ctr. (United States); Scott D. Friedman, Space Telescope Science Institute (United States); Alistair C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); Gregory B. Goodson, Jet Propulsion Lab. (United States); Thomas P. Greene, NASA Ames Research Ctr. (United States); Manuel Guedel, ETH Zürich (Switzerland); Astrid Heske, European Space Research and Technology Ctr. (Netherlands); Thomas F. E. Henning, Max-Planck-Institut für Astronomie (Germany); Pierre-Olivier Lagage, Commissariat à l'Énergie Atomique (France); Margaret Meixner, Space Telescope Science Institute (United States); Hans Ulrik Nørgaard-Nielsen, DTU Space (Denmark); Goran Olofsson, Stockholm Univ. (Sweden); Tom Ray, The Dublin Institute for Advanced Studies (Malta); Michael E. Ressler, Jet Propulsion Lab. (United States); John Thatcher, EADS Astrium Ltd. (United Kingdom); Christoffel Waelkens, Katholieke Univ. Leuven (Belgium); David Wright, EADS Astrium Ltd. (United Kingdom); The MIRI Team, UK Astronomy Technology Ctr. (United Kingdom) [7731-13]

3:10 pm: **The JWST tunable filter imager (TFI)**, René Doyon, Univ. de Montréal (Canada); John B. Hutchings, National Research Council Canada (Canada); Neil Rowlands, COM DEV Canada (Canada); Mathilde Beaulieu, David Lafrenière, Univ. de Montréal (Canada); Roberto Abraham, Univ. of Toronto (Canada); Pierre Chayer, Space Telescope Science Institute (Canada); Laura Ferrarese, National Research Council Canada (Canada); Alex W. Fullerton, Space Telescope Science Institute (Canada); Ray Jayawardhana, Univ. of Toronto (Canada); Doug Johnstone, National Research Council Canada (Canada); Andre' R. Martel, Space Telescope Science Institute (Canada); Micheal Meyer, ETH Zürich (Switzerland); Judith L. Pipher, Univ. of Rochester (United States); Marcin Sawicki, Saint Mary's Univ. (Canada); Anand Sivaramakrishnan, American Museum of Natural History (United States); Kevin Volk, Space Telescope Science Institute (Canada); Karl Saad, Canadian Space Agency (Canada) [7731-14]

Coffee Break 3:30 to 4:00 pm

SESSION 4

Room: San Diego Sun. 4:00 to 6:00 pm

JWST III

Session Chair: Lee D. Feinberg, NASA Goddard Space Flight Ctr.

- 4:00 pm: **Design status and performance of the James Webb Space Telescope**, Jonathan W. Arenberg, Northrop Grumman Aerospace Systems (United States) [7731-15]
- 4:20 pm: **Phase retrieval for characterizing the optical performance of the James Webb Space Telescope (JWST) integrated science instrument module (ISIM)**, David L. Aronstein, Jeffrey S. Smith, Bruce H. Dean, Randal C. Telfer, Pamela S. Davila, Brent J. Bos, Scott R. Antonille, Raymond G. Ohl IV, NASA Goddard Space Flight Ctr. (United States); Renee M. Gracey, Ball Aerospace & Technologies Corp. (United States) [7731-16]
- 4:40 pm: **Successful production of the engineering development unit (EDU) primary mirror segment and flight unit tertiary mirror for JWST**, Andrea Arneson, Christopher R. Alongi, Robert J. Bernier, Edward Boese, Jay Daniel, Lee R. Dettmann, Robert S. Garfield, Holger K. Glatzel, John M. Kincade, Patrick J. Johnson, Allen Lee, Adam Magruder, Ankit Patel, Martin A. Seilonen, Gary Surges, L-3 Communications Tinsley Labs. Inc. (United States); Mark J. Bergeland, Robert J. Brown, Benjamin B. Gallagher, Ball Aerospace & Technologies Corp. (United States); Andrew G. McKay, Northrop Grumman Aerospace Systems (United States); Lester M. Cohen, Smithsonian Astrophysical Observatory (United States) [7731-17]
- 5:00 pm: **First results from JWST/MIRIM flight model testing: high-resolution PSF analysis at 5.6 microns**, Pierre Guillard, Institut d'Astrophysique Spatiale (France) [7731-18]
- 5:20 pm: **The throughput and sensitivity of the JWST mid-infrared instrument**, Alistair C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); Eva Bauwens, Katholieke Univ. Leuven (Belgium); Jeroen Bouwman, Oers H. Detre, Max-Planck-Institut für Astronomie (Germany); Sebastian Fischer, Macarena Garcia-Marín, Univ. zu Köln (Germany); Kay Justannont, Chalmers Univ. of Technology (Sweden); Alvaro Labiano, European Space Agency (Spain); Theodoros Nakos, Univ. Gent (Belgium); Silvia Scheithauer, Max-Planck-Institut für Astronomie (Germany); Michael E. Ressler, Jet Propulsion Lab. (United States); George H. Rieke, The Univ. of Arizona (United States); Gillian S. Wright, UK Astronomy Technology Ctr. (United Kingdom). [7731-19]
- 5:40 pm: **Testing a critical stray light path of the James Webb Space Telescope**, Tony L. Whitman, ITT Corp. (United States) [7731-20]

Sunday Poster Session

Room: Grand Exhibit Hall Sun. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Sunday. The interactive poster session with authors in attendance will be Sunday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

AKARI

AKARI infrared bright source catalogues, Shinki Oyabu, Japan Aerospace Exploration Agency (Japan) [7731-95]

ATLAST

Spacecraft conceptual design for the 8-meter Advanced Technology Large Aperture Space Telescope (ATLAST), Randall C. Hopkins, H. Philip Stahl, Pete Capizzo, Linda Hornsby, David Jones, NASA Marshall Space Flight Ctr. (United States); Gary E. Mosier, NASA Goddard Space Flight Ctr. (United States); Herbert D. Thomas, NASA Marshall Space Flight Ctr. (United States) [7731-96]

Thermal analysis of the Advanced Technology Large Aperture Space Telescope (ATLAST): 8 meter primary mirror, Linda Hornsby, Jacobs Engineering Group Inc. (United States); H. Philip Stahl, Randall C. Hopkins, NASA Marshall Space Flight Ctr. (United States) [7731-97]

Coronagraphic wavefront control for the ATLAST Telescope, Richard G. Lyon, William R. Oegerle, Lee D. Feinberg, Matthew R. Bolcar, Bruce H. Dean, Gary E. Mosier, NASA Goddard Space Flight Ctr. (United States) [7731-98]

Euclid

Euclid ENIS spectrograph focal-plane design, Favio Bortoletto, Carlotta Bonoli, Osservatorio Astronomico di Padova (Italy); Leonardo Corcione, Osservatorio Astronomico di Torino (Italy); Vincenzo De Caprio, INAF - IASF Milano (Italy); Enrico Giro, Osservatorio Astronomico di Padova (Italy); Sebastiano Ligori, Osservatorio Astronomico di Torino (Italy) [7731-99]

A frame simulator for data produced by 'multi-accumulation' readout detectors, Carlotta Bonoli, Favio Bortoletto, Osservatorio Astronomico di Padova (Italy); Leonardo Corcione, Osservatorio Astronomico di Torino (Italy); Enrico Giro, Osservatorio Astronomico di Padova (Italy); Sebastiano Ligori, Osservatorio Astronomico di Torino (Italy) [7731-100]

The Euclid near-infrared calibration source, Rory Holmes, Peter Bizenberger, Oliver Krause, Max-Planck-Institut für Astronomie (Germany); Mario Schweitzer, Max-Planck-Institut für extraterrestrische Physik (Germany); Adrian M. Glauser, UK Astronomy Technology Ctr. (United Kingdom) [7731-101]

The data handling unit of the Euclid imaging channels: from the observational requirements to the unit architecture, Anna M. Di Giorgio, Istituto di Fisica dello Spazio Interplanetario (Italy); Paolo H. Leutenegger, Arnaldo Bonati, Thales Alenia Space Italia S.p.A. (Italy); Roberto Scaramella, Osservatorio Astronomico di Roma (Italy); Alexandre Refregier, Jérôme Amiaux, Christophe Cara, Jean-Louis Auguères, Commissariat à l'Énergie Atomique (France); Mario Schweitzer, Max-Planck-Institut für extraterrestrische Physik (Germany) [7731-102]

The ground support equipment for the E-NIS instrument on-board the ESA-Euclid Dark Energy Mission, Massimo Trifoglio, Andrea A. Bulgarelli, Fulvio Gianotti, Enrico Franceschi, Luca Valenziano, INAF - IASF Bologna (Italy) [7731-103]

EUCLID: design of the prism DMD NIR spectrograph, Robert Content, Ray M. Sharples, Simon Blake, Robert G. Talbot, Durham Univ. (United Kingdom) [7731-104]

Opto-mechanical design of a DMD multislit spectrograph for the ESA Euclid Mission, Robert Grange, Frederic Zamkotsian, Laurent Martin, Tony Pamplona, Olivier C. Le Fèvre, Observatoire Astronomique de Marseille-Provence (France); Luca Valenziano, INAF - IASF Bologna (Italy); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Andrea Cimatti, Univ. degli Studi di Bologna (Italy) [7731-105]

Space evaluation of 2048x1080 mirrors DMD chip for ESA EUCLID Mission, Frederic Zamkotsian, Patrick Lanzoni, Emmanuel Grassi, Rudy Barette, Christophe Fabron, Lab. d'Astrophysique de Marseille (France); Kyrre Tangen, Visitech AS (Norway); Luca Valenziano, INAF - IASF Bologna (Italy); Laurent Marchand, Ludovic Duvet, European Space Agency (Netherlands) [7731-106]

GAIA

AIM software tool for GAIA data reduction: challenges and implementation, Deborah Busonero, Osservatorio Astronomico di Torino (Italy) [7731-107]

Towards a demonstrator for autonomous object detection on board GAIA, Shan B. Mignot, Philippe Laporte, Gilles Fasola, Observatoire de Paris à Meudon (France) [7731-108]

Monitoring, diagnostic, and calibration of the astrometric response of the GAIA astro instrument within the astrometric verification unit, Deborah Busonero, Mario Gai, Mario G. Lattanzi, Osservatorio Astronomico di Torino (Italy) [7731-109]

Herschel

The data processing pipeline for the Herschel/SPIRE imaging Fourier transform spectrometer, Trevor R. Fulton, Blue Sky Spectroscopy Inc. (Canada); David A. Naylor, Univ. of Lethbridge (Canada); Jean-Paul Baluteau, Observatoire Astronomique de Marseille-Provence (France); Matthew J. Griffin, Cardiff Univ. (United Kingdom); Peter Imhof, Blue Sky Spectroscopy Inc. (Canada); Bruce M. Swinyard, Tanya L. Lim, Science and Technology Facilities Council (United Kingdom); Christian Surace, Observatoire Astronomique de Marseille-Provence (France); Pasquale Panuzzo, Rene Gastaud, Commissariat à l'Énergie Atomique (France); Edward T. Polehampton, Univ. of Lethbridge (Canada) and Science and Technology Facilities Council (United Kingdom); Steve Guest, Science and Technology Facilities Council (United Kingdom); Nanyao Lu, Arnold Schwartz, Kevin Xu, California Institute of Technology (United States) [7731-110]

In-flight characterisation of Herschel-SPIRE optical performances, Marc Ferlet, Rutherford Appleton Lab. (United Kingdom) [7731-111]

Status of the SPIRE photometer data processing pipeline during the early phases of the Herschel Mission, C. Darren Dowell, Jet Propulsion Lab. (United States); Matthew J. Griffin, Cardiff Univ. (United Kingdom) [7731-112]

Characterization of the Herschel Space Observatory Telescope using a Hartmann wavefront sensor, Guillaume Dovillaire, Imagine Optic SA (France); Jérôme Ballesta, Imagine Optic Inc. (United States) [7731-196]

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Design and implementation of the NUV/optical widefield star formation camera for the Theia Observatory, Paul A. Scowen, Rolf H. Jansen, Arizona State Univ. (United States); Matthew N. Beasley, Univ. of Colorado at Boulder (United States); Daniella Calzetti, Univ. of Massachusetts Amherst (United States); Steve Desch, Arizona State Univ. (United States); Alex W. Fullerton, Space Telescope Science Institute (United States); John S. Gallagher III, Univ. of Wisconsin-Madison (United States); P. Douglas Lisman, Steven A. Macenka, Jet Propulsion Lab. (United States); Sangeeta Malhotra, Arizona State Univ. (United States); Mark J. McCaughrean, The Univ. of Exeter (United Kingdom); Shouleh Nikzad, Jet Propulsion Lab. (United States); Robert W. O'Connell, Univ. of Virginia (United States); Sally Oey, Univ. of Michigan (United States); Deborah L. Padgett, California Institute of Technology (United States); James E. Rhoads, Arizona State Univ. (United States); Aki Roberge, NASA Goddard Space Flight Ctr. (United States); Oswald H. W. Siegmund, Univ. of California, Berkeley (United States); Stuart B. Shaklan, Jet Propulsion Lab. (United States); Nathan Smith, Univ. of California, Berkeley (United States); Daniel Stern, Jet Propulsion Lab. (United States); Jason Tumlinson, Space Telescope Science Institute (United States); Rogier A. Windhorst, Arizona State Univ. (United States); Robert A. Woodruff, Lockheed Martin Space Systems Co. (United States) [7731-186]

Orbiting starshade's performance in observations of potential Earth-like planets, Steven H. Pravdo, Stuart Shaklan, P. Douglas Lisman, Jet Propulsion Lab. (United States) [7731-187]

Error analysis on the NWO starshade, Tiffany Glassman, Adam M. J. Johnson, Amy S. Lo, Northrop Grumman Aerospace Systems (United States); Webster C. Cash, Jr., Univ. of Colorado at Boulder (United States) [7731-188]

An experimental approach to starshades, Rocco Samuele, Tiffany Glassman, Adam M. J. Johnson, Timothy P. Johnson, Rupal Varshneya, Northrop Grumman Aerospace Systems (United States) [7731-189]

Performance verification for stationkeeping control of O₃, Dan Sirbu, N. Jeremy D. Kasdin, Princeton Univ. (United States) [7731-190]

Occulting Ozone Observatory starshade design and development, Mark W. Thomson, P. Douglas Lisman, Jet Propulsion Lab. (United States) [7731-191]

WFSC

First steps of the development of a piston sensor for large aperture space telescopes, Géraldine Guerri, Stéphane Roose, Yvan Stockman, Jean M. Surdej, Jean-Marc Defise, Univ. de Liège (Belgium) [7731-192]

Angular DFS: a dispersed fringe sensing algorithm insensitive to small rotational calibration errors, Joshua A. Spechler, Daniel J. Hoppe, Norbert Sigrist, Fang Shi, Jet Propulsion Lab. (United States) [7731-193]

False diamond turning artifacts in phase retrieval results, Thomas P. Zielinski, James R. Fienup, Univ. of Rochester (United States) [7731-194]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 5

Room: San Diego. Mon. 10:10 to 10:50 am

AKARI/Spitzer

Session Chair: Jonathan W. Arenberg, Northrop Grumman Aerospace Systems

10:10 am: **AKARI warm mission**, Takashi Onaka, The Univ. of Tokyo (Japan); Hideo Matsuhara, Takehiko Wada, Japan Aerospace Exploration Agency (Japan); Daisuke Ishihara, Nagoya Univ. (Japan); Yoshifusa Ita, National Astronomical Observatory of Japan (Japan); Youichi Ohyama, Academia Sinica (Taiwan); Takafumi Ootsubo, Shinkai Oyabu, Japan Aerospace Exploration Agency (Japan); Itsuki Sakon, Takashi Shimomishi, The Univ. of Tokyo (Japan); Satoshi Takita, Fumihiko Usui, Hiroshi Murakami, Japan Aerospace Exploration Agency (Japan) [7731-21]

10:30 am: **Calibration and data quality of warm IRAC**, Sean J. Carey, Jason A. Surace, William J. Glaccum, James Ingalls, Jessica Krick, California Institute of Technology (United States); Mark D. Lacy, National Radio Astronomy Observatory (United States); Patrick J. Lowrance, Seppo J. Laine, JoAnn C. O'Linger, John R. Stauffer, California Institute of Technology (United States); Steven P. Willner, Joseph L. Hora, Harvard-Smithsonian Ctr. for Astrophysics (United States); William F. Hoffmann, The Univ. of Arizona (United States); Matthew L. N. Ashby, Jiasheng Huang, Harvard-Smithsonian Ctr. for Astrophysics (United States); Massimo Marengo, Iowa State Univ. (United States); Michael A. Pahre, Zhong Wang, Harvard-Smithsonian Ctr. for Astrophysics (United States); Michael W. Werner, Jet Propulsion Lab. (United States); Giovanni G. Fazio, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7731-22]

SESSION 6

Room: San Diego. Mon. 10:50 am to 12:10 pm

SPICA I

Session Chair: James B. Breckinridge, College of Optical Sciences, The Univ. of Arizona

10:50 am: **The next-generation infrared astronomy mission SPICA**, Takao Nakagawa, Japan Aerospace Exploration Agency (Japan) [7731-23]

11:10 am: **System requirements and design concept of the SPICA Mission**, Nobuhiro Takahashi, Takao Nakagawa, Hiroshi Murakami, Hideo Matsuhara, Hiroyuki Sugita, Toshihiko Yamawaki, Japan Aerospace Exploration Agency (Japan) [7731-24]

11:30 am: **Conceptual design for the mid-infrared medium-resolution Echelle spectrometer (MIRMES) on SPICA Mission**, Itsuki Sakon, The Univ. of Tokyo (Japan); Yuji Ikeda, Photocoding (Japan); Naofumi Fujishiro, Cybernet System Co. Ltd. (Japan); Hirokazu Kataza, Japan Aerospace Exploration Agency (Japan) [7731-25]

11:50 am: **The SAFARI far infrared imaging Fourier transform spectrometer for the SPICA Mission**, Bruce M. Swinyard, SRON Netherlands Institute for Space Research (Netherlands) [7731-26]

Lunch Break 12:10 to 1:40 pm

SESSION 7

Room: San Diego. Mon. 1:40 to 3:20 pm

SPICA II

Session Chair: Takao Nakagawa, Japan Aerospace Exploration Agency (Japan)

1:40 pm: **The background-limited infrared-submillimeter spectrograph (BLISS) for SPICA: a design study**, Charles M. Bradford, James J. Bock, Warren A. Holmes, Matthew E. Kenyon, Andrew D. Beyer, Jet Propulsion Lab. (United States); Philip N. Appleton, Lee Armus, Andrew Blain, California Institute of Technology (United States); Hsiao-Mei Cho, National Institute of Standards and Technology (United States); Daniel A. Dale, Univ. of Wyoming (United States); Eiichi Egami, The Univ. of Arizona (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Uma Gorti, NASA Ames Research Ctr. (United States); Martin Harwit, Cornell Univ. (United States); George Helou, California Institute of Technology (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); Daniel F. Lester, The Univ. of Texas at Austin (United States); Matthew Malkan, Univ. of California, Los Angeles (United States); George H. Rieke, The Univ. of Arizona (United States); John-David T. Smith, The Univ. of Toledo (United States); Gordon J. Stacey, Cornell Univ. (United States); Michael W. Werner, Jet Propulsion Lab. (United States) [7731-27]

2:00 pm: **WISPIR: a wide-field imaging spectrograph for the infrared for the SPICA Observatory**, Dominic J. Benford, NASA Goddard Space Flight Ctr. (United States); Lee G. Mundy, Univ. of Maryland, College Park (United States) [7731-28]

2:20 pm: **Mid-InfRAred Camera w/o LEnS (MIRACLE) for SPICA**, Takehiko Wada, Hirokazu Kataza, Japan Aerospace Exploration Agency (Japan) [7731-29]

2:40 pm: **Optical testing activities for the SPICA Telescope**, Hidehiro Kaneda, Nagoya Univ. (Japan); Takashi Onaka, The Univ. of Tokyo (Japan); Takao Nakagawa, Keigo Enya, Yoshio Tange, Tadashi Imai, Haruyoshi Katayama, Masahiro Suganuma, Masataka Naitoh, Masashi Miyamoto, Japan Aerospace Exploration Agency (Japan) [7731-30]

3:00 pm: **SPICA coronagraph instrument for the direct imaging and spectroscopy of exo-planets**, Keigo Enya, Japan Aerospace Exploration Agency (Japan) [7731-31]

Coffee Break 3:20 to 3:50 pm

SESSION 8

Room: San Diego. Mon. 3:50 to 4:30 pm

WISE

Session Chair: Richard W. Capps, Jet Propulsion Lab.

3:50 pm: **Pre-launch characterization of the WISE payload**, Harri M. Latvakoski, Mark F. Larsen, Joel G. Cardon, John D. Elwell, Utah State Univ. (United States) [7731-32]

4:10 pm: **Hardware results for the Wide-field Infrared Survey Explorer (WISE) Telescope and scanner**, Mark Schwalm, Alan D. Akerstrom, Mark Barry, James J. Guregian, Peter Laquidara, James P. Regan, Virginia Ugolini, L-3 Communications SSG-Tinsley (United States) [7731-33]

SESSION 9

Room: San Diego. Mon. 4:30 to 5:40 pm

Hubble

Session Chair: Marc Postman, Space Telescope Science Institute

4:30 pm: **On-orbit performance of HST/wide field camera 3 (Invited Paper)**, John W. MacKenty, Space Telescope Science Institute (United States); Randy A. Kimble, NASA Goddard Space Flight Ctr. (United States); Robert W. O'Connell, Univ. of Virginia (United States); Jacqueline A. Townsend, NASA Goddard Space Flight Ctr. (United States) [7731-34]

5:00 pm: **On orbit performance of the cosmic origins spectrograph**, James C. Green, Cynthia S. Froning, Steven N. Osterman, Univ. of Colorado at Boulder (United States) [7731-35]

5:20 pm: **The feasibility of exoplanet coronagraphy with the Hubble Space Telescope**, Richard G. Lyon, NASA Goddard Space Flight Ctr. (United States); Robert A. Woodruff, Lockheed Martin Space Systems Co. (United States); Robert A. Brown, Space Telescope Science Institute (United States); M. Charley Noecker, Ball Aerospace & Technologies Corp. (United States); Edward S. Cheng, Conceptual Analytics, LLC (United States) [7731-36]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: **Mark M. Casali**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7731-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: **Mark M. Casali**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 10

Room: San Diego Tues. 1:50 to 3:40 pm

Herschel

Session Chair: **Mark J. McCaughrean**, European Space Research and Technology Ctr. (Netherlands)

1:50 pm: **Herschel-HIFI: design, in orbit performance, and scientific capabilities** (*Presentation Only*), Frank Helmich, SRON Netherlands Institute for Space Research (Netherlands) [7731-37]

2:10 pm: **The Herschel photodetector array camera and spectrometer (PACS): design and in-flight operation and scientific performance**, Albrecht Poglitsch, Max-Planck-Institut für extraterrestrische Physik (Germany) [7731-38]

2:30 pm: **Herschel-SPIRE: design, in-flight performance and scientific capabilities**, Matthew J. Griffin, Cardiff Univ. (United Kingdom) [7731-39]

3:00 pm: **In-flight commissioning and calibration of the Herschel SPIRE instrument**, Bruce M. Swinyard, Rutherford Appleton Lab. (United Kingdom) [7731-40]

3:20 pm: **In-orbit performance of the Herschel/SPIRE imaging Fourier transform spectrometer**, David A. Naylor, Univ. of Lethbridge (Canada); Jean-Paul Baluteau, Observatoire Astronomique de Marseille-Provence (France); Mike J. Barlow, Univ. College London (United Kingdom); Dominique Benielli, Observatoire Astronomique de Marseille-Provence (France); Marc Ferlet, Rutherford Appleton Lab. (United Kingdom); Trevor R. Fulton, Blue Sky Spectroscopy Inc. (Canada); Matthew J. Griffin, Cardiff Univ. (United Kingdom); Timothy Grundy, Rutherford Appleton Lab. (United Kingdom); Peter Imhof, Blue Sky Spectroscopy Inc. (Canada); Scott Jones, Univ. of Lethbridge (Canada); Ken King, Rutherford Appleton Lab. (United Kingdom); Sarah J. Leeks, European Space Astronomy Ctr. (United Kingdom); Tanya L. Lim, Rutherford Appleton Lab. (United Kingdom); Nanyao Lu, California Institute of Technology (United States); Edward T. Polehampton, Univ. of Lethbridge (Canada); Giorgio Savini, Univ. College London (United Kingdom); Sunil D. Sidher, Rutherford Appleton Lab. (United Kingdom); Locke D. Spencer, Cardiff Univ. (United Kingdom); Christian Surace, Observatoire Astronomique de Marseille-Provence (France); Bruce M. Swinyard, Rutherford Appleton Lab. (United Kingdom); Roger Wesson, Univ. College London (United Kingdom) [7731-41]

Coffee Break 3:40 to 4:00 pm

SESSION 11

Room: San Diego Tues. 4:00 to 4:20 pm

Kepler

Session Chair: **James C. Green**, Univ. of Colorado at Boulder

4:00 pm: **Kepler instrument performance: an in-flight update**, Douglas A. Caldwell, Jeffrey E. Van Cleve, NASA Ames Research Ctr. (United States); Vic S. Argabright, Ball Aerospace & Technologies Corp. (United States); Jeffery J. Kolodziejczak, NASA Marshall Space Flight Ctr. (United States); Jon M. Jenkins, NASA Ames Research Ctr. (United States); Edward W. Dunham, Lowell Observatory (United States); John C. Geary, Harvard-Smithsonian Ctr. for Astrophysics (United States); Peter Tenenbaum, Hema Chandrasekaran, Jie Li, Hayley Wu, NASA Ames Research Ctr. (United States); Jason Von Wilpert, Univ. of California, Santa Cruz (United States) [7731-42]

SESSION 12

Room: San Diego Tues. 4:20 to 5:40 pm

Solar Planetary

Session Chair: **David W. Miller**, Massachusetts Institute of Technology

4:20 pm: **ASPIICS: a giant coronagraph for the ESA/PROBA-3 Formation Flying Mission**, Philippe L. Lamy, Observatoire Astronomique de Marseille-Provence (France); Luc Damé, Service d'aéronomie (France) [7731-44]

4:40 pm: **The narrow angle camera of the MPCES suite for the MarcoPolo ESA Mission: requirements and optical design solutions**, Vania Da Deppo, Consiglio Nazionale delle Ricerche (Italy); Gabriele Cremonese, Osservatorio Astronomico di Padova (Italy); Giampiero Naletto, Univ. degli Studi di Padova (Italy) and Consiglio Nazionale delle Ricerche (Italy) [7731-45]

5:00 pm: **Stray light characterization of the LORRI Telescope on New Horizons**, Andrew F. Cheng, Harold A. Weaver, Steve J. Conard, Matthew W. Noble, The Johns Hopkins Univ. (United States) [7731-46]

5:20 pm: **SPEX: the spectropolarimeter for planetary exploration**, Frans Snik, Christoph U. Keller, Gerard van Harten, Utrecht Univ. (Netherlands); Daphne M. Stam, J. Martijn Smit, Jeroen H. H. Rietjens, Theodora Karalidi, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); Erik C. Laan, Ad L. Verlaan, TNO (Netherlands); Rik ter Horst, Ramón Navarro, ASTRON (Netherlands); Klaas Wielinga, MECON Engineering B.V. (Netherlands) [7731-47]

Wednesday 30 June

SESSION 13

Room: San Diego Wed. 8:00 to 8:30 am

GAIA

Session Chair: **Suzanne Casement**, Northrop Grumman Aerospace Systems

8:00 am: **1000 million stars with 100 CCD detectors** (*Invited Paper*), Ralf Kohley, ESA/ESAC (Spain); Jos H. J. de Bruijne, European Space Research and Technology Ctr. (Netherlands) [7731-48]

SESSION 14

Room: San Diego Wed. 8:30 to 9:50 am

JDEM

Session Chair: **Suzanne Casement**, Northrop Grumman Aerospace Systems

8:30 am: **Joint Dark Energy Mission optical design studies**, David A. Content, NASA Goddard Space Flight Ctr. (United States); Michael G. Dittman, Ball Aerospace & Technologies Corp. (United States); Joseph M. Howard, Clifton E. Jackson, NASA Goddard Space Flight Ctr. (United States); John P. Lehan, Univ. of Maryland, Baltimore County (United States); John E. Mentzell, Bert A. Pasquale, NASA Goddard Space Flight Ctr. (United States); Michael J. Sholl, Univ. of California, Berkeley (United States); Robert A. Woodruff, Lockheed Martin Space Systems Co. (United States) [7731-49]

8:50 am: **Optical performance budgeting for JDEM weak-lensing measurements**, M. Charley Noecker, Ball Aerospace & Technologies Corp. (United States) [7731-50]

9:10 am: **Multiple plate scales for wide-field NIR and visible spaceborne telescopes**, Michael J. Sholl, Univ. of California, Berkeley (United States); David A. Content, NASA Goddard Space Flight Ctr. (United States) [7731-51]

9:30 am: **Off-axis telescopes for dark energy investigations**, Michael L. Lampton, Michael J. Sholl, Univ. of California, Berkeley (United States) [7731-52]

Coffee Break 9:50 to 10:20 pm

SESSION 15

Room: San Diego. Wed. 10:20 am to 12:20 pm

Euclid

Session Chair: Jean-Pierre Maillard,
Institut d'Astrophysique de Paris (France)

10:20 am: **The Euclid Mission**, René J. Laureijs, Ludovic Duvet, Philippe Gondoin, David H. Lumb, Gonzalo Saavedra Criado, European Space Research and Technology Ctr. (Netherlands). [7731-53]

10:40 am: **Euclid imaging channels: from science to system requirements**, Jérôme Amiaux, Jean-Louis Auguères, Olivier Boulade, Christophe Cara, Stéphane Paulin-Henriksson, Alexandre Refregier, Samuel Ronayette, Commissariat à l'Énergie Atomique (France); Adam Amara, Adrian M. Glauser, ETH Zürich (Switzerland); Cydalise Dumesnil, Univ. Paris-Sud 11 (France); Anna M. Di Giorgio, Istituto di Fisica dello Spazio Interplanetario (Italy); Jeffrey T. Booth, Jet Propulsion Lab. (United States); Mario Schweitzer, Rory Holmes, Max-Planck-Institut für extraterrestrische Physik (Germany); Mark Cropper, Univ. College London (United Kingdom); Eli Atad-Ettedgui, UK Astronomy Technology Ctr. (United Kingdom) [7731-54]

11:00 am: **VIS: the visible imager for Euclid**, Mark Cropper, Univ. College London (United Kingdom); Alexandre Refregier, Commissariat à l'Énergie Atomique (France); Phil R. Guttridge, Univ. College London (United Kingdom); Olivier Boulade, Jérôme Amiaux, Commissariat à l'Énergie Atomique (France); David M. Walton, Phil D. Thomas, Kerrin J. Rees, Univ. College London (United Kingdom); Peter J. Pool, James Endicott, e2v technologies plc (United Kingdom); Andrew D. Holland, Jason P. D. Gow, Neil J. Murray, The Open Univ. (United Kingdom); Adam Amara, ETH Zurich (Switzerland); David H. Lumb, Ludovic Duvet, European Space Research and Technology Ctr. (Netherlands); Richard E. Cole, Univ. College London (United Kingdom); Jean-Louis Auguères, Commissariat à l'Énergie Atomique (France); Gordon R. Hopkinson, Surrey Satellite Technology Ltd. (United Kingdom) . . [7731-55]

11:20 am: **NIP: the near-infrared imaging photometer for Euclid**, Mario Schweitzer, Ralf Bender, Reinhard O. Katterloher, Frank Eisenhauer, Reiner Hofmann, Max-Planck-Institut für extraterrestrische Physik (Germany); Rory Holmes, Oliver Krause, Hans-Walter Rix, Max-Planck-Institut für Astronomie (Germany); Jeffrey T. Booth, Parker Fagrelis, Jason D. Rhodes, Suresh Seshadri, Jet Propulsion Lab. (United States); Alexandre Refregier, Jérôme Amiaux, Jean-Louis Auguères, Olivier Boulade, Christophe Cara, Commissariat à l'Énergie Atomique (France); Adam Amara, Simon J. Lilly, ETH Zürich (Switzerland); Eli Atad-Ettedgui, The Royal Observatory, Edinburgh (United Kingdom); Anna M. Di Giorgio, Istituto di Fisica dello Spazio Interplanetario (Italy); Ludovic Duvet, European Space Research and Technology Ctr. (Netherlands); Christopher Kuehl, Mohsin Syed, Astrium GmbH (Germany) [7731-56]

11:40 pm: **The E-NIS instrument on-board the ESA Euclid Dark Energy Mission: a general view**, Luca Valenziano, INAF - IASF Bologna (Italy); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Andrea Cimatti, Univ. degli Studi di Bologna (Italy) [7731-58]

Lunch/Exhibition Break 12:00 to 1:50 pm

SESSION 16

Room: San Diego. Wed. 1:50 to 3:30 pm

Systems Concepts I

Session Chair: H. Philip Stahl, NASA Marshall Space Flight Ctr.

1:50 pm: **Phase A/B1 activities for ESA Cosmic Vision Mission**, Anamarija Stankov, Ronnie N. Lindberg, Osvaldo Piersanti, Malcolm C. V. Fridlund, European Space Research and Technology Ctr. (Netherlands) [7731-59]

2:10 pm: **A 4-meter, wide-field coronagraph space telescope for general astrophysics and exoplanet observations**, Roger P. Angel, The Univ. of Arizona (United States); Olivier Guyon, National Astronomical Observatory of Japan/Subaru Telescope (United States); James H. Burge, College of Optical Sciences, The Univ. of Arizona (United States); Ann Zabludoff, The Univ. of Arizona (United States); Domenick J. Tenerelli, Lockheed Martin Space Systems Co. (United States); Robert M. Egerman, ITT Corp. (United States) [7731-60]

2:30 pm: **A space imaging concept based on a 4m structured spun-cast borosilicate monolithic primary mirror**, Steven C. West, S. Hop Bailey, The Univ. of Arizona (United States); Steven Bauman, Canada-France-Hawaii Telescope (United States); Brian Cuerden, Blain H. Olbert, The Univ. of Arizona (United States); Zachary A. Granger, Lockheed Martin Space Systems Co. (United States). [7731-61]

2:50 pm: **GPA-SS: an approach to low-cost space telescope design using space-qualified ground telescopes**, Natasha Bosanac, Sydney Do, Hui Ying Wen, Anthony C. Wicht, Massachusetts Institute of Technology (United States) [7731-62]

3:10 pm: **WISH: wide-field imaging surveyor at high redshift**, Toru Yamada, Tohoku Univ. (Japan); Ikuru Iwata, Tomoki Morokuma, Saku Tsuneta, National Astronomical Observatory of Japan (Japan); Hideo Matsuhara, Takehiko Wada, Shinkai Oyabu, Japan Aerospace Exploration Agency (Japan); Kouji Ohta, Kiyoto Yabe, Kyoto Univ. (Japan); Nobuyuki Kawai, Tokyo Institute of Technology (Japan); Chihiro Tokoku, Tohoku Univ. (Japan); Akio Inoue, Osaka Sangyo Univ. (Japan); Yuji Ikeda, Photocoding (Japan); Satoru Iwamura, Montgomery, Rennie & Jonson, LPA (Japan). [7731-63]

Coffee Break 3:30 to 4:00 pm

SESSION 17

Room: San Diego. Wed. 4:00 to 5:40 pm

Systems Concepts II

Session Chair: Giovanni G. Fazio,
Harvard-Smithsonian Ctr. for Astrophysics

4:00 pm: **The experimental probe of inflationary cosmology intermediate mission concept**, James J. Bock, Jet Propulsion Lab. (United States). [7731-64]

4:20 pm: **The absolute spectrum polarimeter (ASP)**, Alan J. Kogut, David T. Chuss, NASA Goddard Space Flight Ctr. (United States); Jessie L. Dotson, NASA Ames Research Ctr. (United States); Dale J. Fixsen, Univ. of Maryland (United States); Mark Halpern, The Univ. of British Columbia (Canada); Gary F. Hinshaw, NASA Goddard Space Flight Ctr. (United States); Stephan S. Meyer, The Univ. of Chicago (United States); S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States); Michael D. Seiffert, Jet Propulsion Lab. (United States); David N. Spergel, Princeton Univ. (United States); Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7731-65]

4:40 pm: **LEGOLAS (localizing evidence of gravitational waves by observations of light source astrometric signature)**, Alberto Riva, Deborah Busonero, Mario Gai, Maria Teresa Crosta, Alberto Vecchiato, Mario G. Lattanzi, Osservatorio Astronomico di Torino (Italy). [7731-66]

5:00 pm: **Design of a four mirror astrometric telescope for light bending measurements**, Davide Loreggia, Sebastiano Ligori, Mario Gai, Alberto Vecchiato, Mario G. Lattanzi, Osservatorio Astronomico di Torino (Italy). [7731-67]

5:20 pm: **Achieving high-precision pointing stability on ExoplanetSat**, Christopher M. Pong, David W. Miller, Sara Seager, Matthew W. Smith, Joel S. Villaseñor, George R. Ricker, Jr., Massachusetts Institute of Technology (United States) [7731-68]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space (Presentation Only)**, Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST (Presentation Only)**, Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future (Presentation Only)**, Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States). [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 18

Room: San Diego. Thurs. 10:30 am to 12:30 pm

Systems Concepts III

Session Chair: Wesley A. Traub, Jet Propulsion Lab.

10:30 am: **System design of a compact IR space imaging system, MIRIS**, Wonyong Han, Dae-Hee Lee, Youngsik Park, Woong-Seob Jeong, Chang-Hee Ree, Bongkon Moon, Sang-Mok Cha, Sung-Joon Park, Jang-Hyun Park, Uk-Won Nam, Nung-Hyun Ka, Mi Hyun Lee, Korea Astronomy and Space Science Institute (Korea, Republic of); Duk-Hang Lee, Korea Astronomy and Space Science Institute (Korea, Republic of) and Univ. of Science and Technology (Korea, Republic of); Sun Choel Yang, Korea Basic Science Institute (Korea, Republic of); Seung-Woo Rhee, Jong-Oh Park, Korea Aerospace Research Institute (Korea, Republic of); Hyung-Mok Lee, Seoul National Univ. (Korea, Republic of); Toshio Matsumoto, Seoul National Univ. (Korea, Republic of) and Institute of Space and Astronautical Science (Japan). [7731-69]

Conference 7731

10:50 am: **The design and capabilities of the EXIST optical and Infra-Red Telescope (IRT)**, Alexander S. Kuttyrev, NASA Goddard Space Flight Ctr. (United States) and Univ. of Maryland, College Park (United States); Joshua S. Bloom, Univ. of California, Berkeley (United States); Neil A. Gehrels, Qian Gong, NASA Goddard Space Flight Ctr. (United States); Jonathan E. Grindlay, Harvard-Smithsonian Ctr. for Astrophysics (United States); S. Harvey Moseley, Bruce E. Woodgate, NASA Goddard Space Flight Ctr. (United States) [7731-70]

11:10 am: **Actuated mirrors for space telescopes**, David C. Redding, Gregory S. Hickey, Stephen C. Unwin, Jet Propulsion Lab. (United States) [7731-71]

11:30 am: **Shape correction of thin mirrors in a reconfigurable space telescope array**, Keith Patterson, Sergio Pellegrino, California Institute of Technology (United States) [7731-72]

11:50 am: **Minimizing actuator-induced errors in active space telescope primary mirrors**, Matthew W. Smith, David W. Miller, Massachusetts Institute of Technology (United States) [7731-73]

12:10 pm: **Membrane photon sieve telescopes**, Geoff P. Andersen, U.S. Air Force Academy (United States) [7731-74]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 19

Room: San Diego. Thurs. 2:00 to 3:20 pm

Systems Concepts IV

Session Chair: Matthew J. Griffin, Cardiff Univ. (United Kingdom)

2:00 pm: **PLATO: detailed design of the telescope optical units**, Demetrio Magrin, Roberto Ragazzoni, Jacopo Farinato, Marco Dima, Giorgia Gentile, Valentina Viotto, Carmelo Arcidiacono, Osservatorio Astronomico di Padova (Italy); Daniele Piazza, Univ. Bern (Switzerland); Isabella Pagano, Salvatore Scuderi, Matteo Munari, Osservatorio Astrofisico di Catania (Italy); Mauro Ghigo, Stefano Basso, Osservatorio Astronomico di Brera (Italy); Giampaolo Piotto, Univ. degli Studi di Padova (Italy); Emanuele Pace, Univ. degli Studi di Firenze (Italy); Lisa Gambicorti, Istituto Nazionale di Ottica Applicata (Italy); Wolfgang Zima, Katholieke Univ. Leuven (Belgium); Claude Català, Observatoire de Paris à Meudon (France) [7731-75]

2:20 pm: **THESIS: the terrestrial habitable-zone exoplanet spectroscopy infrared spacecraft**, Mark R. Swain, Gautam Vasisht, Jet Propulsion Lab. (United States) [7731-76]

2:40 pm: **Polarimetric and spectral characterization of exoplanets with small space telescopes**, Raphaël Galicher, Jean L. Schneider, Pierre Baudoz, Anthony Boccaletti, Observatoire de Paris à Meudon (France) [7731-77]

3:00 pm: **ExoplanetSat: detecting and monitoring exoplanets using a low-cost, CubeSat platform**, Matthew W. Smith, Sara Seager, Christopher M. Pong, Joel S. Villaseñor, George R. Ricker, Jr., David W. Miller, Mary E. Knapp, Grant T. Farmer, Massachusetts Institute of Technology (United States) [7731-78]

Coffee Break 3:20 to 3:50 pm

SESSION 20

Room: San Diego. Thurs. 3:50 to 5:50 pm

TPF Coronagraph

Session Chair: Domenick J. Tenerelli, Lockheed Martin Space Systems Co.

3:50 pm: **ACCESS: a concept study for the direct imaging and spectroscopy of exoplanetary systems**, John T. Trauger, Karl R. Stapelfeldt, Wesley A. Traub, John E. Krist, Dwight C. Moody, Eugene Serabyn, Dimitri P. Mawet, Laurent A. Pueyo, Stuart B. Shaklan, Curtis A. Henry, Peggy H. Park, Robert O. Gappinger, Paul B. Brugarolas, James W. Alexander, Virgil Mireles, Olivia Dawson, Jet Propulsion Lab. (United States); Olivier Guyon, National Astronomical Observatory of Japan/Subaru Telescope (United States); N. Jeremy D. Kasdin, Robert J. Vanderbei, David N. Spergel, Princeton Univ. (United States); Ruslan Belikov, NASA Ames Research Ctr. (United States); Geoffrey W. Marcy, Univ. of California, Berkeley (United States); Robert A. Brown, Space Telescope Science Institute (United States); Jean L. Schneider, Observatoire de Paris à Meudon (France); Bruce E. Woodgate, NASA Goddard Space Flight Ctr. (United States); Gary M. Matthews, Robert M. Egerman, Perry Voyer, Phillip Vallone, Jason Elias, Yves Conturie, ITT Corp. (United States); Ronald S. Polidan, Charles F. Lillie, Connie Spittler, David Lee, Reem Hejal, Allen Bronowick, Nick Saldivar, Northrop Grumman Aerospace Systems (United States); Mark Ealey, Thomas R. Price, Xinetics, Inc. (United States) and Northrop Grumman Corp. (United States) [7731-79]

4:10 pm: **The pupil mapping exoplanet coronagraphic observer (PECO)**, Olivier Guyon, The Univ. of Arizona (United States) and Subaru Telescope (United States); Stuart B. Shaklan, Marie B. Levine, Jet Propulsion Lab. (United States); Kerri L. Cahoy, NASA Ames Research Ctr. (United States); Domenick J. Tenerelli, Lockheed Martin Space Systems Co. (United States); Ruslan Belikov, NASA Ames Research Ctr. (United States); Brian D. Kern, Jet Propulsion Lab. (United States) [7731-80]

4:30 pm: **Optical design of dilute aperture visible nulling coronagraph imaging (DAVINCI)**, Robert A. Woodruff, Lockheed Martin Space Systems Co. (United States); Michael Shao, B. Martin Levine, Jet Propulsion Lab. (United States); Richard G. Lyon, NASA Goddard Space Flight Ctr. (United States); Gopal Vasudevan, Nagarjuna Acu, Lockheed Martin Space Systems Co. (United States); Keith A. Havey, Jr., Jeffrey A. Wynn, ITT Corp. (United States) [7731-81]

4:50 pm: **Visible nulling coronagraphy testbed development for exoplanet detection**, Richard G. Lyon, Mark C. Clampin, NASA Goddard Space Flight Ctr. (United States); Robert A. Woodruff, Gopal Vasudevan, Lockheed Martin Space Systems Co. (United States); Andrew Chen, Lockheed Martin Corp. (United States); Peter Petrone III, Andrew J. Booth, Sigma Space Corp. (United States); Timothy J. Madison, Matthew R. Bolcar, NASA Goddard Space Flight Ctr. (United States); Gary J. Melnick, Volker Toll, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7731-82]

5:10 pm: **Single aperture imaging astrometry with a diffracting pupil: application to exoplanet mass measurement with a small coronagraphic space telescope**, Olivier Guyon, National Astronomical Observatory of Japan/Subaru Telescope (United States) and The Univ. of Arizona (United States); Michael Shao, Stuart B. Shaklan, Bijan Nemati, Marie B. Levine, Jet Propulsion Lab. (United States) [7731-83]

5:30 pm: **Laboratory demonstration of high-contrast imaging at 2 ID enabled by temperature stabilization of the testbed**, Ruslan Belikov, Eugene Pluzhnik, Michael S. Connelley, Fred C. Witteborn, Thomas P. Greene, Dana H. Lynch, Peter T. Zell, NASA Ames Research Ctr. (United States); Olivier Guyon, The Univ. of Arizona (United States) [7731-84]

Friday 2 July

SESSION 21

Room: San Diego. Fri. 8:00 to 10:10 am

TPF Occulter

Session Chair: Gillian S. Wright, UK Astronomy Technology Ctr. (United Kingdom)

8:00 am: **The new worlds probe**, Amy S. Lo, Northrop Grumman Aerospace Systems (United States); Webster C. Cash, Jr., Univ. of Colorado at Boulder (United States); Remi Soummer, Space Telescope Science Institute (United States); Ronald S. Polidan, Northrop Grumman Aerospace Systems (United States) [7731-85]

8:20 am: **Demonstration of polychromatic suppression and occulter position sensing at the Princeton occulter testbed**, Eric J. Cady, Princeton Univ. (United States); Kunjithapatham Balasubramanian, Jet Propulsion Lab. (United States); Michael A. Carr, Princeton Univ. (United States); Matthew R. Dickie, Pierre M. Echternach, Jet Propulsion Lab. (United States); N. Jeremy D. Kasdin, Dan Sirbu, Princeton Univ. (United States); Victor White, Jet Propulsion Lab. (United States) [7731-86]

8:40 am: **Error budgeting and tolerancing of starshades for exoplanet detection (Invited Paper)**, Stuart B. Shaklan, Jet Propulsion Lab. (United States); M. Charley Noecker, Ball Aerospace & Technologies Corp. (United States); Amy S. Lo, Tiffany Glassman, Northrop Grumman Aerospace Systems (United States); Philip J. Dumont, Elizabeth O. Jordan, Jet Propulsion Lab. (United States); N. Jeremy D. Kasdin, Princeton Univ. (United States); Webster C. Cash, Jr., Univ. of Colorado at Boulder (United States); Eric J. Cady, Princeton Univ. (United States); Peter R. Lawson, Jet Propulsion Lab. (United States) [7731-87]

9:10 am: **Occulting ozone observatory science overview**, Dmitry Savransky, David N. Spergel, N. Jeremy D. Kasdin, Eric J. Cady, Princeton Univ. (United States); P. Douglas Lisman, Steven H. Pravdo, Stuart B. Shaklan, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); Yuka Fujii, The Univ. of Tokyo (Japan) [7731-88]

9:30 am: **Direct imaging and spectroscopy of terrestrial planets using a starshade with JWST**, Remi Soummer, Space Telescope Science Institute (United States); Webster C. Cash, Jr., Univ. of Colorado at Boulder (United States); Robert A. Brown, Ian J. E. Jordan, C. Matt Mountain, Marc Postman, Space Telescope Science Institute (United States); Aki Roberge, NASA Goddard Space Flight Ctr. (United States); Tiffany Glassman, Amy S. Lo, Northrop Grumman Aerospace Systems (United States); Sara Seager, Massachusetts Institute of Technology (United States); Margaret C. Turnbull, Gopal Science Institute (United States) [7731-89]

9:50 am: **Alternative starshade missions**, Webster C. Cash, Jr., Univ. of Colorado at Boulder (United States); Amy S. Lo, Tiffany Glassman, Northrop Grumman Aerospace Systems (United States); Remi Soummer, Space Telescope Science Institute (United States) [7731-90]

Coffee Break 10:10 to 10:40 pm

SESSION 22

Room: San Diego Fri. 10:40 am to 12:00 pm

ATLAST

Session Chair: Gary M. Matthews, ITT Corp.

10:40 am: **Science flowdown requirements for ATLAST: implications for technology development and synergies with other future facilities**, Marc Postman, Space Telescope Science Institute (United States); Wesley A. Traub, Jet Propulsion Lab. (United States); William R. Oegerle, NASA Goddard Space Flight Ctr. (United States); Thomas M. Brown, Space Telescope Science Institute (United States); H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States); Daniella Calzetti, Mauro Giavalisco, Univ. of Massachusetts Amherst (United States); Dennis C. Ebbets, Ball Aerospace & Technologies Corp. (United States); Ronald S. Polidan, Northrop Grumman Aerospace Systems (United States) [7731-91]

11:00 am: **Comparative concepts for ATLAST optical designs**, Bert A. Pasquale, NASA Goddard Space Flight Ctr. (United States); H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States); Joseph M. Howard, David L. Aronstein, Lee D. Feinberg, Qian Gong, NASA Goddard Space Flight Ctr. (United States) [7731-92]

11:20 am: **ATLAST-9.2m: a large aperture deployable space telescope**, William R. Oegerle, Lee D. Feinberg, Lloyd R. Purves, Tristram T. Hyde, Harley A. Thronson, Jr., Jacqueline A. Townsend, NASA Goddard Space Flight Ctr. (United States); Marc Postman, Space Telescope Science Institute (United States); Matthew R. Bolcar, Jason G. Budinoff, Bruce H. Dean, Mark C. Clampin, NASA Goddard Space Flight Ctr. (United States); Dennis C. Ebbets, Ball Aerospace & Technologies Corp. (United States); Qian Gong, Theodore R. Gull, Joseph M. Howard, Andrew L. Jones, Richard G. Lyon, Bert A. Pasquale, Charles Perrygo, Jeffrey S. Smith, Patrick L. Thompson, Bruce E. Woodgate, NASA Goddard Space Flight Ctr. (United States) [7731-93]

11:40 am: **ATLAST-8 Mission concept study for 8-meter Monolithic UV/Optical Space Telescope**, H. Philip Stahl, NASA Marshall Space Flight Ctr. (United States) [7731-94]

SESSION 23

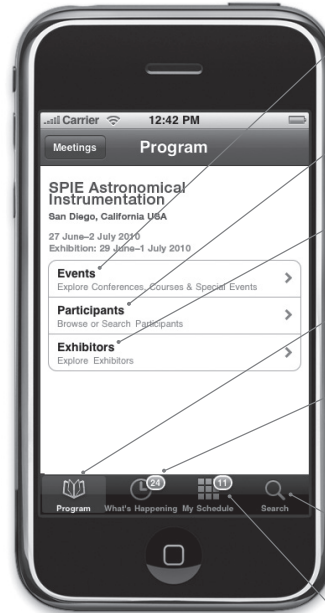
Room: San Diego Fri. 12:00 to 12:30 pm

Late Breaking News

Session Chair: Howard A. MacEwen, ManTech SRS Technologies (United States)

12:00 pm: **The potential of small space telescopes for exoplanet observations**, Eugene Serabyn, Jet Propulsion Lab. (USA) [7731-197]

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Space Telescopes and Instrumentation 2010: Ultraviolet to Gamma Ray

Conference Chairs: **Monique Arnaud**, Commissariat à l'Énergie Atomique (France); **Stephen S. Murray**, Harvard-Smithsonian Ctr. for Astrophysics; **Tadayuki Takahashi**, Japan Aerospace Exploration Agency (Japan)

Program Committee: **Xavier Barcons**, Instituto de Fisica de Cantabria CSIC-UC (Spain); **Martin A. Barstow**, Univ. of Leicester (United Kingdom); **Marshall W. Bautz**, Massachusetts Institute of Technology; **Angela Bazzano**, Istituto Nazionale di Astrofisica (Italy); **Steven E. Boggs**, Univ. of California, Berkeley; **Enrico Costa**, Istituto Nazionale di Astrofisica (Italy); **Enectali Figueroa-Feliciano**, Massachusetts Institute of Technology; **Neil A. Gehrels**, NASA Goddard Space Flight Ctr.; **Paolo Giommi**, Agenzia Spaziale Italiana (Italy); **James C. Green**, Univ. of Colorado at Boulder; **Fiona A. Harrison**, California Institute of Technology; **Jelle S. Kaastra**, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); **Caroline A. Kilbourne**, NASA Goddard Space Flight Ctr.; **Michael P. Kowalski**, U.S. Naval Research Lab.; **Hideyo Kunieda**, Nagoya Univ. (Japan); **D. Christopher Martin**, California Institute of Technology; **Kirpal Nandra**, Imperial College London; **Takaya Ohashi**, Tokyo Metropolitan Univ. (Japan); **Giovanni Pareschi**, Osservatorio Astronomico di Brera (Italy); **Arvind N. Parmar**, European Space Research and Technology Ctr. (Netherlands); **Mikhail N. Pavlinsky**, Space Research Institute (Russian Federation); **Peter Predehl**, Max-Planck-Institut für extraterrestrische Physik (Germany); **Hiroshi Tsunemi**, Osaka Univ. (Japan); **Peter von Ballmoos**, Ctr. d'Étude Spatiale des Rayonnements (France); **Martin C. Weisskopf**, NASA Marshall Space Flight Ctr.; **Nicholas E. White**, NASA Goddard Space Flight Ctr.; **Richard Willingale**, Univ. of Leicester (United Kingdom)

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: **Douglas A. Simons**, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 1

Room: Sunrise Mon. 10:10 am to 12:10 pm

UV Missions and Technologies

Session Chair: **Michael P. Kowalski**, U.S. Naval Research Lab.

10:10 am: **Fabrication of FORTIS**, Stephan R. McCandliss, Brian Fleming, Mary Elizabeth Kaiser, Jeffrey W. Kruk, Paul D. Feldman, The Johns Hopkins Univ. (United States); Alexander S. Kutryev, Mary Li, Phillip A. Goodwin, David A. Rapchun, Eric I. Lyness, Ari-David Brown, S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States); Oswald H. W. Siegmund, John V. Vallergera, Univ. of California, Berkeley (United States) [7732-01]

10:30 am: **Large-format, high-spatial, and temporal resolution cross-strip readout MCP detectors for UV astronomy**, John V. Vallergera, Jason B. McPhate, Oswald H. W. Siegmund, Anton S. Tremsin, Univ. of California, Berkeley (United States); Gary Varner, Univ. of Hawai'i (United States) [7732-02]

10:50 am: **Ultraviolet detectors for low surface brightness astronomy**, Patrick Morrissey, D. Christopher Martin, California Institute of Technology (United States); Shouleh Nikzad, Jet Propulsion Lab. (United States); Nicole R. Lingner, California Institute of Technology (United States); David Schiminovich, Erika Hamden, Columbia Univ. (United States) [7732-03]

11:10 am: **FIREBALL-the faint intergalactic redshifted emission balloon: an overview**, Bruno Milliard, Observatoire Astronomique de Marseille-Provence (France); David Schiminovich, Columbia Univ. (United States); Jean Evrard, Ctr. National d'Études Spatiales (France); D. Christopher Martin, California Institute of Technology (United States); Patrick Blanchard, Observatoire Astronomique de Marseille-Provence (France); Jean-Claude Carrere, Ctr. National d'Études Spatiales (France); Robert G. Chave, Robert Chave Applied Physics Inc. (United States); Simon Conseil, Observatoire Astronomique de Marseille-Provence (France); Robert Crabill, California Institute of Technology (United States); Jean-Michel Deharveng, Marina Ellouzi, Stephan Frank, Observatoire Astronomique de Marseille-Provence (France); Albert Gomes, Ctr. National d'Études Spatiales (France); Robert Grange, Observatoire Astronomique de Marseille-Provence (France); Stephen Kaye, California Institute of Technology (United States); Laurent Martin, Observatoire Astronomique de Marseille-Provence (France); Mateusz Matuszewski, Ryan McLean, California Institute of Technology (United States); Frederi Mirc, Ctr. National d'Études Spatiales (France); Celine Peroux, Observatoire Astronomique de Marseille-Provence (France); Shahinur Rahman, California Institute of Technology (United States); Alexandre Richard, Ctr. National d'Études Spatiales (France); Christelle Rossin, Observatoire Astronomique de Marseille-Provence (France); Gordon Tajiri, Columbia Univ. (United States); et al. [7732-04]

11:30 am: **The Colorado high-resolution Echelle stellar spectrograph (CHESS) concept and design**, Matthew N. Beasley, Eric B. Burgh, Kevin France, James C. Green, Univ. of Colorado at Boulder (United States) [7732-05]

11:50 am: **The diffuse interstellar cloud experiment: integration and first-look data**, Eric R. Schindhelm, Robert Kane, Brennan L. Gantner, Sarah A. LeVine, Matthew N. Beasley, James C. Green, Univ. of Colorado at Boulder (United States) [7732-06]

Lunch Break 12:10 to 1:30 pm

SESSION 2

Room: Sunrise Mon. 1:30 to 3:40 pm

X-Ray Observatories and Optics

Session Chair: **Giovanni Pareschi**, Osservatorio Astronomico di Brera (Italy)

1:30 pm: **XMM-Newton: ESA's X-ray Observatory ready for the next decade**, Marcus G. F. Kirsch, European Space Operations Ctr. (Germany); Konrad Dennerl, Max-Planck-Institut für extraterrestrische Physik (Germany); Matteo Guainazzi, European Space Astronomy Ctr. (Spain); Frank Haberl, Max-Planck-Institut für extraterrestrische Physik (Germany); Juan-Manuel Martin-Fleitas, Mauro Pantaleoni, European Space Operations Ctr. (Germany); Andrew M. T. Pollock, European Space Astronomy Ctr. (Spain); Steven F. Sembay, Univ. of Leicester (United Kingdom); Frederic Schmidt, European Space Operations Ctr. (Germany); Antonio Talavera Iniesta, European Space Astronomy Ctr. (Spain); Detlef Webert, Uwe Weissmann, European Space Operations Ctr. (Germany) [7732-07]

1:50 pm: **X-ray telescope design and technology: what the future may hold (Invited Paper)**, Richard Willingale, Univ. of Leicester (United Kingdom) [7732-08]

2:20 pm: **Foil x-ray mirrors for astronomical observations: still an evolving technology**, Peter J. Serlemitsos, Yang Soong, Takashi Okajima, NASA Goddard Space Flight Ctr. (United States) [7732-09]

2:40 pm: **Light-weight optics made by thermal glass forming for future x-ray telescopes**, Anita M. Winter, Monika Vongehr, Peter Friedrich, Max-Planck-Institut für extraterrestrische Physik (Germany) [7732-10]

3:00 pm: **Hot slumping glass technology for the grazing incidence optics for future missions**, Mauro Ghigo, Stefano Basso, Paolo Conconi, Oberto Citterio, Osservatorio Astronomico di Brera (Italy); Marta Civitani, Osservatorio Astronomico di Brera (Italy) and Insubria Univ. (Italy); Giovanni Pareschi, Osservatorio Astronomico di Brera (Italy); Laura Proserpio, Osservatorio Astronomico di Brera (Italy) and Insubria Univ. (Italy); Daniele Spiga, Gianpiero Tagliaferri, Alberto Zambra, Osservatorio Astronomico di Brera (Italy); Peter Friedrich, Monika Vongehr, Anita M. Winter, Max-Planck-Institut für extraterrestrische Physik (Germany); Marcos Bavdaz, Benedikt Guldemann, European Space Research and Technology Ctr. (Netherlands) . [7732-11]

3:20 pm: **Design and development by direct polishing of the polynomial mirror shells**, Laura Proserpio, Osservatorio Astronomico di Brera (Italy) and Insubria Univ. (Italy); Sergio Campana, Oberto Citterio, Marta M. Civitani, Paolo Conconi, Vincenzo Cotroneo, Osservatorio Astronomico di Brera (Italy); Enrico Mattaini, INAF - IASF Milano (Italy); Giovanni Pareschi, Osservatorio Astronomico di Brera (Italy); Giancarlo Parodi, BCV Progetti S.r.l. (Italy); Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy); Richard R. Freeman, Roger Morton, Zeeko Ltd. (United Kingdom) . [7732-12]

Coffee Break 3:40 to 4:10 pm

SESSION 3

Room: Sunrise Mon. 4:10 to 5:10 pm

X-Ray Polarimetry

Session Chair: Enrico Costa, Istituto Nazionale di Astrofisica (Italy)

4:10 pm: **Figures of merit for detection and measurement of x-ray polarization**, Martin C. Weisskopf, Ronald F. Elsner, Stephen L. O'Dell, NASA Marshall Space Flight Ctr. (United States) [7732-13]

4:30 pm: **Broad-band soft x-ray polarimetry**, Herman L. Marshall, Norbert S. Schulz, Ralf K. Heilmann, Kendrah D. Murphy, Massachusetts Institute of Technology (United States) [7732-14]

4:50 pm: **Hard x-ray polarimetry with HX-POL**, Alfred B. Garson III, Kuen Lee, Jerrad Martin, Matthias Beilicke, Henric S. Krawczynski, Washington Univ. in St. Louis (United States); Eric Wulf, Elena Novikova, U.S. Naval Research Lab. (United States) [7732-15]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 4

Room: Sunrise Tues. 2:00 to 3:30 pm

Gamma-Ray Observatories

Session Chair: Nicholas E. White, NASA Goddard Space Flight Ctr.

2:00 pm: **The building of Fermi-LAT** (*Invited Paper*), W. Neil Johnson, Naval Research Lab. (USA) [7732-16]

2:30 pm: **The tracker of the Fermi Large Area Telescope**, Johan Breggeon, Istituto Nazionale di Fisica Nucleare (Italy) [7732-17]

2:50 pm: **The calorimeter for the Fermi Large Area Telescope**, J. Eric Grove, W. Neil Johnson III, U.S. Naval Research Lab. (United States) [7732-18]

3:10 pm: **Performance of the anti-coincidence detector for the Fermi Large Area Telescope**, Elizabeth Hays, NASA Goddard Space Flight Ctr. (United States) and Fermi LAT Collaboration (United States) [7732-19]

Coffee Break 3:30 to 4:00 pm

SESSION 5

Room: Sunrise Tues. 4:00 to 6:00 pm

Astrophysical Science Drivers for New Observatories

Session Chair: Takaya Ohashi, Tokyo Metropolitan Univ. (Japan)

4:00 pm: **The origin of the elements as seen through supernova remnants** (*Invited Paper*), Anne C. Decourchelle, Commissariat à l'Énergie Atomique (France) . [7732-20]

4:30 pm: **Black hole astrophysics: future perspectives** (*Invited Paper*), Kirpal Nandra, Imperial College London (United Kingdom) [7732-21]

5:00 pm: **What we do not know yet, and need to know, about clusters of galaxies** (*Invited Paper*), Maxim L. Markevitch, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7732-22]

5:30 pm: **Annihilation of positrons in the galaxy: new physics or conventional astrophysics?** (*Invited Paper*), Eugene Churazov, Max-Planck-Institut für Astrophysik (Germany) [7732-23]

Wednesday 30 June

SESSION 6

Room: Sunrise Wed. 9:00 to 10:00 am

Solar Missions and Technologies

Session Chair: Angela Bazzano, Istituto di Fisica dello Spazio Interplanetario (Italy)

9:00 am: **First lights of SWAP on-board PROBA2**, Jean-Philippe A. Hain, Ctr. Spatial de Liège (Belgium); David Berghmans, Royal Observatory of Belgium (Belgium); Jean-Marc Defise, Etienne Renotte, Tanguy Thibert, Emmanuel Mazy, Pierre L. P. M. Rochus, Ctr. Spatial de Liège (Belgium); Bogdan Nicula, Anik De Groof, Royal Observatory of Belgium (Belgium); Udo H. Schühle, Max-Planck-Institut für Sonnensystemforschung (Germany); Marie-Françoise Ravet-Krill, Institut d'Optique (France) [7732-24]

9:20 am: **Development of double-sided silicon strip detectors for solar hard x-ray observation**, Shinya Saito, Ishikawa Shin-nosuke, Japan Aerospace Exploration Agency (Japan) and The Univ. of Tokyo (Japan); Shin Watanabe, Japan Aerospace Exploration Agency (Japan); Hirokazu Odaka, Soichiro Sugimoto, Taro Fukuyama, Japan Aerospace Exploration Agency (Japan) and The Univ. of Tokyo (Japan); Motohide Kokubun, Japan Aerospace Exploration Agency (Japan); Tadayuki Takahashi, Japan Aerospace Exploration Agency (Japan) and The Univ. of Tokyo (Japan); Yukikatsu Terada, Saitama Univ. (Japan); Hiroyasu Tajima, Takaaki Tanaka, Stanford Univ. (United States); Sam Krucker, Univ. of California, Berkeley (United States); Steven Christe, NASA Goddard Space Flight Ctr. (United States); Steve McBride, Lindsay Glesener, Univ. of California, Berkeley (United States) . . . [7732-25]

9:40 am: **The technical challenges of the solar-orbiter EU1 instrument**, Jean-Philippe A. Hain, Pierre L. P. M. Rochus, Lionel Jacques, Etienne Renotte, Ctr. Spatial de Liège (Belgium); David Berghmans, Jean-François Hochedez, Andrei Zhukov, Erik Plyser, Royal Observatory of Belgium (Belgium); Udo H. Schühle, Max-Planck-Institut für Sonnensystemforschung (Germany); Louise Harra, Tom E. Kennedy, Mullard Space Science Lab. (United Kingdom); Thierry P. Appourchaux, Frédéric Auchère, Institut d'Astrophysique Spatiale (France) [7732-26]

Coffee Break 10:00 to 10:30 am

SESSION 7

Room: Sunrise Wed. 10:30 am to 12:30 pm

Medium X-Ray Observatories I

Session Chair: Hiroshi Tsunemi, Osaka Univ. (Japan)

10:30 am: **The nuclear spectroscopic telescope array (NuSTAR)**, Fiona A. Harrison, California Institute of Technology (United States); Steven E. Boggs, Univ. of California, Berkeley (United States); Finn E. Christensen, DTU Space (Denmark); William W. Craig, Univ. of California, Berkeley (United States); Charles J. Hailey, Columbia Univ. (United States); Daniel Stern, Jet Propulsion Lab. (United States) [7732-27]

10:50 am: **The nuclear spectroscopic telescope array (NuSTAR): optics overview and current status**, HongJun An, Kenneth L. Blaedel, Columbia Univ. (United States); Nicolai F. Brejnholt, Finn E. Christensen, DTU Space (Denmark); William W. Craig, Univ. of California, Berkeley (United States); Jeremy Cushman, Todd A. Decker, Melania Doll, Lisa Fishenfeld, Charles J. Hailey, Columbia Univ. (United States); Carsten Jensen, DTU Space (Denmark); Jason E. Koglin, Kaya Mori, Columbia Univ. (United States); Michael J. Pivovarov, Lawrence Livermore National Lab. (United States); Marcela Stern, Gordon Tajiri, Columbia Univ. (United States); William W. Zhang, NASA Goddard Space Flight Ctr. (United States) [7732-28]

11:10 am: **eROSITA on SRG**, Peter Predehl, Max-Planck-Institut für extraterrestrische Physik (Germany) [7732-29]

11:30 am: **Studying neutron stars with IXO and eROSITA**, Werner Becker, Max-Planck-Institut für extraterrestrische Physik (Germany) [7732-30]

11:50 am: **The gravity and extreme magnetism small explorer**, Keith Jahoda, NASA Goddard Space Flight Ctr. (United States) [7732-31]

12:10 pm: **The GEMS photoelectric x-ray polarimeters**, J. Kevin Black, Rock Creek Scientific (United States) and NASA Goddard Space Flight Ctr. (United States); Robert G. Baker, Philip V. Deines-Jones, NASA Goddard Space Flight Ctr. (United States); Edward E. Faust, SGT, Inc. (United States) and NASA Goddard Space Flight Ctr. (United States); Kyle J. Gregory, NASA Goddard Space Flight Ctr. (United States); Joanne E. Hill, CRESST & Univ. Space Research Association (United States) and NASA Goddard Space Flight Ctr. (United States); Keith M. Jahoda, Patrick J. Jordan, NASA Goddard Space Flight Ctr. (United States); Philip Kaaret, Zachary R. Prieskorn, The Univ. of Iowa (United States); Jean H. Swank, NASA Goddard Space Flight Ctr. (United States) [7732-32]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 8

Room: Sunrise Wed. 2:00 to 3:10 pm

Medium X-Ray Observatories II

Session Chair: Kirpal Nandra, Imperial College London (United Kingdom)

2:00 pm: **Fast results of MAXI (monitor of all-sky x-ray image) on ISS** (*Invited Paper*), Masaru Matsuoka, Japan Aerospace Exploration Agency (Japan) . . [7732-33]

2:30 pm: **The ASTRO-H Mission**, Tadayuki Takahashi, Kazuhisa Mitsuda, Japan Aerospace Exploration Agency (Japan); Richard Kelley, NASA Goddard Space Flight Ctr. (United States) [7732-34]

2:50 pm: **Soft x-ray imager (SXI) onboard ASTRO-H**, Hiroshi Tsunemi, Osaka Univ. (Japan); Tadayasu Dotani, Japan Aerospace Exploration Agency (Japan); Takeshi G. Tsuru, Kyoto Univ. (Japan); Kiyoshi Hayashida, Osaka Univ. (Japan) [7732-35]

Coffee Break 3:10 to 3:40 pm

SESSION 9

Room: Sunrise Wed. 3:40 to 5:40 pm

Medium X-Ray Observatories III

Session Chair: Fiona A. Harrison, California Institute of Technology

3:40 pm: **The high-resolution x-ray microcalorimeter spectrometer system for the SXS on ASTRO-H**, Kazuhisa Mitsuda, Japan Aerospace Exploration Agency (Japan); Richard L. Kelley, Kevin R. Boyce, Michael J. DiPirro, NASA Goddard Space Flight Ctr. (United States); Yuichiro Ezo, Tokyo Metropolitan Univ. (Japan); Ryuichi Fujimoto, Kanazawa Univ. (Japan); Jan-Willem A. den Herder, SRON Netherlands Institute for Space Research (Netherlands); Yoshitaka Ishisaki, Tokyo Metropolitan Univ. (Japan); Madoka Kawaharada, RIKEN (Japan); Shunji Kitamoto, Rikkyo Univ. (Japan); Caroline A. Kilbourne, NASA Goddard Space Flight Ctr. (United States); Dan McCammon, Univ. of Wisconsin-Madison (United States); Hiroshi Murakami, Rikkyo Univ. (Japan); Masahide Murakami, Univ. of Tsukuba (Japan); Takaya Ohashi, Tokyo Metropolitan Univ. (Japan); Martin Pohl, Stéphane Paltani, Univ. of Geneva (Switzerland); Frederick S. Porter, NASA Goddard Space Flight Ctr. (United States); Kosuke Sato, Kanazawa Univ. (Japan); Yoichi Sato, Japan Aerospace Exploration Agency (Japan); Peter J. Shirron, NASA Goddard Space Flight Ctr. (United States); Keisuke Shinozaki, Japan Aerospace Exploration Agency (Japan); Gary A. Sneiderman, NASA Goddard Space Flight Ctr. (United States); Hiroyuki Sugita, Japan Aerospace Exploration Agency (Japan); Andrew E. Szymkowiak, Yale Univ. (United States); Yoh Takei, Japan Aerospace Exploration Agency (Japan); Toru Tamagawa, RIKEN (Japan); Makoto Tashiro, Yukikatsu Terada, Saitama Univ. (Japan); Masahiro Tsujimoto, Japan Aerospace Exploration Agency (Japan); et al. [7732-36]

4:00 pm: **Design of a 3-stage ADR for the soft x-ray spectrometer instrument on the ASTRO-H Mission**, Peter J. Shirron, Mark Kimball, Donald Wegel, Edgar Canavan, Michael J. DiPirro, NASA Goddard Space Flight Ctr. (United States) [7732-37]

4:20 pm: **Filters and calibration sources for the soft x-ray spectrometer (SXS) instrument on ASTRO-H**, Cor P. de Vries, Jan-Willem A. den Herder, Elisa Costantini, Henri J. M. Aarts, Paul Lowes, Jelle S. Kaastra, SRON Netherlands Institute for Space Research (Netherlands); Richard L. Kelley, Keith C. Gendreau, Zaven Arzoumanian, Richard G. Koenecke, NASA Goddard Space Flight Ctr. (United States); Daniel A. Haas, Stéphane Paltani, Univ. of Geneva (Switzerland); Kazu Mitsuda, Noriko Y. Yamasaki, Institute of Space and Astronautical Science (Japan) [7732-38]

4:40 pm: **Current status of the Hard X-ray Telescope onboard ASTRO-H**, Hisamitsu Awaki, Ehime Univ. (Japan); Hideyo Kunieda, Akihiro Furuzawa, Takuya Miyazawa, Yuzuru Tawara, Yoshito Haba, Nagoya Univ. (Japan); Takashi Okajima, NASA Goddard Space Flight Ctr. (United States); Manabu Ishida, Yoshitomo Maeda, Keisuke Tamura, Japan Aerospace Exploration Agency (Japan); Yoshiharu Namba, Chubu Univ. (Japan); Kentaro Uesugi, Yoshio Suzuki, Japan Synchrotron Radiation Research Institute (Japan); Keiji Ogi, Ehime Univ. (Japan); Tatsuro Kosaka, Osaka City Univ. (Japan); Shigeo Yamauchi, Nara Women's Univ. (Japan); Masayuki Itoh, Kobe Univ. (Japan); Hiroshi Tsunemi, Osaka Univ. (Japan); Yasushi Ogasaka, Koujun Yamashita, Japan Science and Technology Agency (Japan) [7732-39]

5:00 pm: **Hard x-ray imager for the ASTRO-H Mission**, Motohide Kokubun, Shin Watanabe, Masayuki Ohta, Tadayuki Takahashi, Japan Aerospace Exploration Agency (Japan); Kazuhiro Nakazawa, The Univ. of Tokyo (Japan); Yasushi Fukazawa, Tsunefumi Mizuno, Hiromitsu Takahashi, Hiroshima Univ. (Japan); Jun Kataoka, Waseda Univ. (Japan); Yukikatsu Terada, Saitama Univ. (Japan); Hiroyasu Tajima, Takaaki Tanaka, Stanford Univ. (United States); Kazutaka Yamaoka, Aoyama Gakuin Univ. (Japan); Kazuo Makishima, The Univ. of Tokyo (Japan) [7732-40]

5:20 pm: **Soft gamma-ray detector for the ASTRO-H Mission**, Hiroyasu Tajima, SLAC National Accelerator Lab. (United States) and Stanford Univ. (United States); Yasushi Fukazawa, Hiroshima Univ. (Japan); Jun Kataoka, Waseda Univ. (Japan); Motohide Kokubun, Japan Aerospace Exploration Agency (Japan); Greg Madejski, SLAC National Accelerator Lab. (United States); Kazuo Makishima, The Univ. of Tokyo (Japan); Tsunefumi Mizuno, Hiroshima Univ. (Japan); Kazuhiro Nakazawa, The Univ. of Tokyo (Japan); Hiromitsu Takahashi, Hiroshima Univ. (Japan); Tadayuki Takahashi, Japan Aerospace Exploration Agency (Japan); Takaaki Tanaka, SLAC National Accelerator Lab. (United States); Makoto S. Tashiro, Yukikatsu Terada, Saitama Univ. (Japan); Yasunobu Uchiyama, SLAC National Accelerator Lab. (United States); Shin Watanabe, Japan Aerospace Exploration Agency (Japan); Kazutaka Yamaoka, Aoyama Gakuin Univ. (Japan) [7732-41]

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Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 10

Room: Sunrise Thurs. 11:00 am to 12:20 pm

Medium X-Ray Observatories IV

Session Chair: Peter Predehl,
Max-Planck-Institut für extraterrestrische Physik (Germany)

11:00 am: **NHXM: a New Hard X-ray Imaging and Polarimetric Mission**, Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy); Andrea Argan, INAF - IASF Roma (Italy); Ronaldo Bellazzini, Istituto Nazionale di Fisica Nucleare (Italy); Osvaldo Catalano, INAF - IASF Palermo (Italy); Elisabetta Cavazzuti, ASI Science Data Ctr. (Italy); Enrico Costa, INAF - IASF Roma (Italy); Giancarlo Cusumano, INAF - IASF Palermo (Italy); Fabrizio Fiore, Osservatorio Astronomico di Roma (Italy); Carlo E. Fiorini, Politecnico di Milano (Italy); Paolo Giommi, ASI Science Data Ctr. (Italy); Giuseppe Malaguti, INAF - IASF Bologna (Italy); Giorgio Matt, Univ. degli Studi di Roma Tre (Italy); Sandro Mereghetti, INAF - IASF Milano (Italy); Giuseppina Micela, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy); Giovanni Pareschi, Osservatorio Astronomico di Brera (Italy); Giuseppe Cesare Perola, Univ. degli Studi di Roma Tre (Italy); Gabriele E. Villa, INAF - IASF Milano (Italy) [7732-42]

11:20 am: **The optics system of the New Hard X-ray Mission: design and development**, Giovanni Pareschi, Stefano Basso, Oberto Citterio, Daniele Spiga, Gianpiero Tagliaferri, Marta Civitani, Lorenzo Raimondi, Osservatorio Astronomico di Brera (Italy); Barbara Negri, Agenzia Spaziale Italiana (Italy); Giuseppe Borghi, Alessandro Orlandi, Dervis Vernani, Media Lario Technologies (Italy); Giorgia Sironi, Osservatorio Astronomico di Brera (Italy); Giuseppe Valsecchi, Enrico Boscolo, Media Lario Technologies (Italy); Vincenzo Cotroneo, Osservatorio Astronomico di Brera (Italy) [7732-43]

11:40 am: **The NHXM spectral-imaging cameras**, Osvaldo Catalano, INAF - IASF Palermo (Italy); Andrea Argan, INAF - IASF Roma (Italy); Ronaldo Bellazzini, Alessandro Brez, Istituto Nazionale di Fisica Nucleare (Italy); Enrico Costa, INAF - IASF Roma (Italy); Carlo E. Fiorini, Politecnico di Milano (Italy); Giuseppe Malaguti, INAF - IASF Bologna (Italy); Giovanni Pareschi, Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy); Gabriele E. Villa, INAF - IASF Milano (Italy) [7732-44]

12:00 pm: **Polarimetry with the New Hard X-ray Mission**, Enrico Costa, Paolo Soffitta, Fabio Muleri, Sergio Di Cosimo, Francesco Lazzarotto, Alda Rubini, INAF - IASF Roma (Italy); Ronaldo Bellazzini, Alessandro Brez, Massimo Minuti, Michele Pinchera, Gloria Spandre, Istituto Nazionale di Fisica Nucleare (Italy); Andrea Argan, Istituto Nazionale di Astrofisica (Italy); Giorgio Matt, Univ. degli Studi di Roma Tre (Italy) [7732-45]

Lunch/Exhibition Break 12:20 to 1:20 pm

SESSION 11

Room: Sunrise Thurs. 1:20 to 3:10 pm

Large X-Ray Observatories I

Session Chair: Martin C. Weisskopf, NASA Marshall Space Flight Ctr.

1:20 pm: **An overview of the International X-ray Observatory (IXO)** (*Invited Paper*), Jay A. Bookbinder, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7732-46]

1:50 pm: **ESA assessment study activities on the International X-ray Observatory**, Nicola A. Rando, Didier D. E. Martin, Peter Verhoeve, Tim Oosterbroek, Gonzalo Saavedra Criado, Marcos Bavdaz, Philippe Gondoin, European Space Research and Technology Ctr. (Netherlands) [7732-47]

2:10 pm: **Payload study activities on the International X-ray Observatory**, Didier D. E. Martin, Nicola A. Rando, Peter Verhoeve, Tim Oosterbroek, Gonzalo Saavedra Criado, Marcos Bavdaz, Philippe Gondoin, European Space Research and Technology Ctr. (Netherlands) [7732-48]

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2:30 pm: **ESA optics technology preparation for IXO**, Marcos Bavdaz, Eric Wille, Kotska Wallace, Benedikt Guldemann, David H. Lumb, Didier D. E. Martin, Nicola A. Rando, European Space Research and Technology Ctr. (Netherlands) [7732-49]

2:50 pm: **Silicon pore x-ray optics for IXO**, Maximilien J. Collon, Ramses Günther, Marcelo D. Ackermann, Rakesh Partapsing, Giuseppe Vacanti, Marco W. Beijersbergen, cosine Research B.V. (Netherlands); Marcos Bavdaz, Eric Wille, Kotska Wallace, European Space Research and Technology Ctr. (Netherlands); Mark B. Olde Riekerink, Micronit Microfluidics BV (Netherlands); Coen van Baren, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); Peter Müller, Michael K. Krummy, Physikalisch-Technische Bundesanstalt (Germany); Michael Freyberg, Max-Planck-Institut für extraterrestrische Physik (Germany) [7732-50]

Coffee Break 3:10 to 3:40 pm

SESSION 12

Room: Sunrise Thurs. 3:40 to 6:00 pm

Large X-Ray Observatories II

Session Chair: Monique Arnaud,
Commissariat à l'Énergie Atomique (France)

3:40 pm: **Fabrication of glass mirror segments for the International X-ray Observatory**, William W. Zhang, NASA Goddard Space Flight Ctr. (United States) [7732-51]

4:00 pm: **The x-ray microcalorimeter spectrometer onboard of IXO**, Jan-Willem A. den Herder, SRON Netherlands Institute for Space Research (Netherlands); Richard L. Kelley, NASA Goddard Space Flight Ctr. (United States); Kazuhisa Mitsuda, Japan Aerospace Exploration Agency (Japan); Luigi Piro, INAF - IASF Roma (Italy); Simon R. Bandler, NASA Goddard Space Flight Ctr. (United States); Paolo Bastia, Thales Alenia Space (Italy); Kevin R. Boyce, NASA Goddard Space Flight Ctr. (United States); Marcel Bruijn, SRON Netherlands Institute for Space Research (Netherlands); James A. Chervenak, NASA Goddard Space Flight Ctr. (United States); Luca Colasanti, INAF - IASF Roma (Italy); W. Bertrand Dorise, National Institute of Standards and Technology (United States); Michael J. DiPirro, Megan E. Eckart, NASA Goddard Space Flight Ctr. (United States); Yuichiro Ezoe, Tokyo Metropolitan Univ. (Japan); Lorenza Ferrari, Univ. degli Studi di Genova (Italy); Enectali Figueroa-Feliciano, Massachusetts Institute of Technology (United States); Ryuichi Fujimoto, Kanazawa Univ. (Japan); Flavio Gatti, Univ. degli Studi di Genova (Italy); Keith C. Gendreau, NASA Goddard Space Flight Ctr. (United States); Luciano Gottardi, Roland H. den Hartog, SRON Netherlands Institute for Space Research (Netherlands); Gene C. Hilton, National Institute of Standards and Technology (United States); Henk F. C. Hoovers, SRON Netherlands Institute for Space Research (Netherlands); Kent D. Irwin, National Institute of Standards and Technology (United States); et al. [7732-52]

4:20 pm: **A wide field imager for IXO: status and future activities**, Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany) [7732-53]

4:40 pm: **Critical-angle transmission grating spectrometer for high-resolution soft x-ray spectroscopy on the International X-ray Observatory**, Ralf K. Heilmann, Minseung Ahn, Marshall W. Bautz, John E. Davis, Daniel Dewey, Richard F. Foster, David P. Huenemoerder, Herman L. Marshall, Pran Mukherjee, David Robinson, Mark L. Schattenburg, Norbert S. Schulz, Massachusetts Institute of Technology (United States) [7732-54]

5:00 pm: **Developments of the off-plane x-ray grating spectrometer for the International X-ray Observatory**, Randall L. McEntaffer, Ted Schultz, The Univ. of Iowa (United States); Webster C. Cash, Jr., Ann F. Shipley, Univ. of Colorado at Boulder (United States); Charles F. Lillie, Suzanne Casement, Northrop Grumman Aerospace Systems (United States); Andrew D. Holland, Neil J. Murray, Simeon J. Barber, The Open Univ. (United Kingdom); Mathew Page, David M. Walton, Univ. College London (United Kingdom); Peter J. Pool, e2v technologies plc (United Kingdom) [7732-55]

5:20 pm: **The hard x-ray imager onboard IXO**, Kazuhiro Nakazawa, The Univ. of Tokyo (Japan); Tadayuki Takahashi, Japan Aerospace Exploration Agency (Japan); Olivier Limousin, Commissariat à l'Énergie Atomique (France); Motohide Kokubun, Shin Watanabe, Japan Aerospace Exploration Agency (Japan); Philippe Laurent, Commissariat à l'Énergie Atomique (France); Hiroyasu Tajima, SLAC National Accelerator Lab. (United States) [7732-56]

5:40 pm: **The high time-resolution spectrometer of the International X-ray Observatory**, Didier Barret, Laurent Ravera, Carine Amoros, Martin Boutelier, J. M. Glorian, Olivier Godet, Karine Lacombe, Roger Pons, Damien Rambaud, Pascale Ramon, Souad Ramchoun, Ctr. d'Étude Spatiale des Rayonnements (France); Pierre Bodin, M. Belasic, Rodolphe Clédassou, Benjamin Pouilloux, Ctr. National d'Études Spatiales (France); Peter H. Lechner, Adrian Niculae, PNSensor GmbH (Germany); Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany); Eckhard Kendziorra, Christoph Tenzer, Eberhard Karls Univ. Tübingen (Germany); Jörn Wilms, Ingo Kreykenbohm, Christian Schmid, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Stéphane Paltani, Franck Cadoux, Univ. of Geneva (Switzerland); Carlo E. Fiorini, Politecnico di Milano (Italy); Mariano Méndez, Univ. of Groningen (Netherlands); Sandro Mereghetti, INAF - IASF Milano (Italy) [7732-57]

Thursday Poster Session

Room: Grand Exhibit Hall Thurs. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Thursday. The interactive poster session with authors in attendance will be Thursday evening from 6:00 to 7:30 pm. Posters should remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

UV Missions and Technology

FIREBALL: integral field spectrograph, Sarah E. Tuttle, David Schiminovich, Columbia Univ. (United States); Bruno Milliard, Robert Grange, Jean-Michel Deharveng, Observatoire Astronomique de Marseille-Provence (France); D. Christopher Martin, Mateusz Matuszewski, Shahinur Rahman, California Institute of Technology (United States); Robert G. Chave, Robert Chave Applied Physics Inc. (United States). [7732-78]

FIREBALL: flight 2 data analysis and results, Shahinur Rahman, Mateusz Matuszewski, California Institute of Technology (United States); Sarah E. Tuttle, Columbia Univ. (United States); Stephan Frank, Celine Peroux, Didier Vibert, Jean-Michel Deharveng, Observatoire Astronomique de Marseille-Provence (France); D. Christopher Martin, California Institute of Technology (United States); Bruno Milliard, Observatoire Astronomique de Marseille-Provence (France); David Schiminovich, Columbia Univ. (United States); Frederic Mirc, Ctr. National d'Études Spatiales (France). [7732-79]

FIREBALL: telescope pointing and aspect reconstruction, Mateusz Matuszewski, California Institute of Technology (United States); Jean Evrard, Frederic Mirc, Ctr. National d'Études Spatiales (France); Bruno Milliard, Observatoire Astronomique de Marseille-Provence (France); David Schiminovich, Columbia Univ. (United States); Shahinur Rahman, California Institute of Technology (United States); Sarah E. Tuttle, Columbia Univ. (United States); Stephan Frank, Observatoire Astronomique de Marseille-Provence (France); D. Christopher Martin, Ryan McLean, California Institute of Technology (United States). [7732-80]

Earth-orbiting Extreme Ultraviolet Spectroscopic Mission, Ichiro Yoshikawa, The Univ. of Tokyo (Japan); Atsushi Yamazaki, Japan Aerospace Exploration Agency (Japan); Kazuo Yoshioka, Go Murakami, The Univ. of Tokyo (Japan); Munetaka Ueno, Japan Aerospace Exploration Agency (Japan). [7732-81]

Efficient EUV transmission gratings for plasma diagnostics, Christoph Braig, Ernst-Bernhard Kley, Friedrich-Schiller-Univ. Jena (Germany). [7732-82]

Description and ray-tracing simulations of HYPE: a far-ultraviolet polarimetric spatial-heterodyne spectrometer, Yan Betremieux, Univ. of California, Davis (United States); Jason B. Corliss, Univ. of Wisconsin-Madison (United States); Mark B. Vincent, Univ. of California, Davis (United States); Frederic E. Vincent, Institut d'Astrophysique de Paris (France) and Univ. of California, Davis (United States); Fred L. Roesler, Univ. of Wisconsin-Madison (United States); Walter M. Harris, Univ. of California, Davis (United States). [7732-83]

Visible and UV Fresnel imagers, Laurent Koehlin, Truswin Raksataya, Paul Deba, Observatoire Midi-Pyrénées (France); Jean-Pierre Rivet, René Gilli, Observatoire de la Côte d'Azur (France); Denis Serre, Leiden Observatory (Netherlands). [7732-85]

It's time for a new EUV mission, Michael P. Kowalski, Kent S. Wood, U.S. Naval Research Lab. (United States); Martin A. Barstow, Univ. of Leicester (United Kingdom); Raymond G. Cruddace, U.S. Naval Research Lab. (United States). [7732-86]

FIRE: a Far-Ultraviolet Imaging Sounding Rocket Telescope, Brennan L. Gantner, James C. Green, Matthew N. Beasley, Robert Kane, Univ. of Colorado at Boulder (United States). [7732-87]

Improving EUV filter transmission by cleaning with activated species, Bruce Lairson, David A. Grove, Ryan Smith, Heidi Lopez, Travis Ayers, Luxel Corp. (United States); Brennan L. Gantner, Matthew N. Beasley, Univ. of Colorado at Boulder (United States). [7732-88]

HST-COS FUV detector initial on-orbit performance, Jason B. McPhate, John V. Vallega, Oswald H. W. Siegmund, Univ. of California, Berkeley (United States); David J. Sahnou, The Johns Hopkins Univ. (United States); Steven V. Penton, Univ. of Colorado at Boulder (United States); Thomas B. Ake, Space Telescope Science Institute (United States); Kevin France, Univ. of Colorado at Boulder (United States); Derck Massa, Space Telescope Science Institute (United States); Steven N. Osterman, Stephane Beland, Univ. of Colorado at Boulder (United States); Brian R. York, Alan Welty, Space Telescope Science Institute (United States). [7732-89]

X-Ray Observatories and Optics

Using ACIS on the Chandra X-ray Observatory as a particle radiation monitor, Catherine E. Grant, Beverly J. LaMarr, Marshall W. Bautz, Massachusetts Institute of Technology (United States); Stephen L. O'Dell, NASA Marshall Space Flight Ctr. (United States). [7732-90]

On-orbit calibration status of the hard x-ray detector (HXD) onboard Suzaku, Sho Nishino, Yasushi Fukazawa, Tunefumi Mizuno, Hiromitsu Takahashi, Katsuhiro Hayashi, Kazuyoshi Hiragi, Hiroshima Univ. (Japan); Shinya Yamada, Kazuhiro Nakazawa, The Univ. of Tokyo (Japan); Motohide Kokubun, Shin Watanabe, Japan Aerospace Exploration Agency (Japan); Takaaki Tanaka, Stanford Univ. (United States); Yukikatsu Terada, Saitama Univ. (Japan); Madoka Kawaharada, RIKEN (Japan). [7732-91]

Computation and optimization of the off-axis effective area of Wolter-I x-ray mirrors: an analytical approach, Daniele Spiga, Vincenzo Cotroneo, Osservatorio Astronomico di Brera (Italy). [7732-92]

Methods of optimizing x-ray optical prescriptions for wide-field applications, Ronald F. Elsner, Stephen L. O'Dell, Brian D. Ramsey, Martin C. Weisskopf, NASA Marshall Space Flight Ctr. (United States). [7732-93]

Multiband imaging with Fresnel x-ray telescopes, Christoph Braig, Friedrich-Schiller-Univ. Jena (Germany); Peter Predehl, Max-Planck-Institut für extraterrestrische Physik (Germany). [7732-94]

Fresnel telescope arrays for x-ray imaging spectroscopy, Christoph Braig, Friedrich-Schiller-Univ. Jena (Germany); Peter Predehl, Max-Planck-Institut für extraterrestrische Physik (Germany). [7732-95]

High-energy astrophysics at the diffraction limit, Christoph Braig, Friedrich-Schiller-Univ. Jena (Germany); Peter Predehl, Max-Planck-Institut für extraterrestrische Physik (Germany). [7732-96]

Effects of the coating optimization on the field of view for a Wolter X-ray Telescope, Vincenzo Cotroneo, Giovanni Pareschi, Daniele Spiga, Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy). [7732-97]

Self-consistent treatment of figure errors and scattering in the angular resolution degradation of x-ray mirrors, Lorenzo Raimondi, Osservatorio Astronomico di Bologna (Italy); Daniele Spiga, Osservatorio Astronomico di Brera (Italy). [7732-98]

Thin gold layer in NiCo and Ni electroforming process: optical surface characterization, Giorgia Sironi, Osservatorio Astronomico di Brera (Italy) and Media Lario Technologies (Italy) and Univ. degli Studi dell'Insubria (Italy); Daniele Spiga, Giovanni Pareschi, Osservatorio Astronomico di Brera (Italy); Nadia Missaglia, Media Lario Technologies (Italy); Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy); Giuseppe Valsecchi, Media Lario Technologies (Italy); Barbara Negri, Agenzia Spaziale Italiana (Italy). [7732-99]

Wavefront sensing of x-ray telescopes, Timo T. Saha, Scott Rohrbach, Theodore J. Hadjimichael, William W. Zhang, NASA Goddard Space Flight Ctr. (United States). [7732-100]

Improving the ruggedness of silicon pore optics, Marcelo D. Ackermann, Maximilien J. Collon, Ramses Günther, Rakesh Partapsing, Giuseppe Vacanti, Marco W. Beijersbergen, cosine Research B.V. (Netherlands); Marcos Bavdaz, Eric Wille, Kotska Wallace, European Space Research and Technology Ctr. (Netherlands); Coen van Baren, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); Markus Erhard, Dirk Kampf, Johannes Kolmeder, Kayser-Threde GmbH (Germany). [7732-103]

Lunar liquid mirror telescope: structural concepts, Peter Klimas, Neil Rowlands, COM DEV Canada (Canada); Paul Hickson, The Univ. of British Columbia (Canada); Ermanno F. Borra, Simon Thibault, Univ. Laval (Canada). [7732-104]

Effects of contamination upon the performance of x-ray telescopes, Stephen L. O'Dell, Ronald F. Elsner, NASA Marshall Space Flight Ctr. (United States); Tim Oosterbroek, European Space Research and Technology Ctr. (Netherlands). [7732-105]

Uniform coating of high aspect ratios surface through atomic layer deposition, Brian J. Shortt, Marcos Bavdaz, European Space Research and Technology Ctr. (Netherlands); Ian M. Povey, Martyn E. Pemble, Mark Nolan, Simon Elliot, Nicolas Cordero, Tyndall National Institute (Ireland). [7732-106]

X-Ray Polarimetry

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Concept for an innovative wide-field camera for x-ray astronomy, Riccardo Campana, Istituto Nazionale di Astrofisica (Italy); Marco Feroci, INAF - IASF Roma (Italy); Andrea Vacchi, Istituto Nazionale de Fisica Nucleare (Italy); Claudio Labanti, INAF - IASF Bologna (Italy); Gianluigi Zampa, Istituto Nazionale di Fisica Nucleare (Italy); Ettore Del Monte, Yuri Evangelista, Fabio Muleri, Luigi Pacciani, Alda Rubini, Paolo Soffitta, Enrico Costa, Immacolata Donnarumma, Francesco Lazzarotto, Marcello Mastropietro, INAF - IASF Roma (Italy); Ennio Morelli, INAF - IASF Bologna (Italy); Massimo Rapisarda, ENEA (Italy); Fabio Fuschino, Martino Marisaldi, INAF - IASF Bologna (Italy); Walter Bonvicini, Alexander Rashevsky, Nicola Zampa, Istituto Nazionale di Fisica Nucleare (Italy); Riccardo Campana, Istituto Nazionale di Astrofisica (Italy); Ettore Del Monte, Yuri Evangelista, Fabio Muleri, Luigi Pacciani, Alda Rubini, Paolo Soffitta, Enrico Costa, Immacolata Donnarumma, Francesco Lazzarotto, Marcello Mastropietro, INAF - IASF Roma (Italy); Ennio Morelli, INAF - IASF Bologna (Italy); Massimo Rapisarda, ENEA (Italy); Fabio Fuschino, Martino Marisaldi, INAF - IASF Bologna (Italy); Luca Picolli, Marco Grassi, Piero Malcovati, Univ. degli Studi di Pavia (Italy) [7732-166]

X-ray imaging and spectroscopy performance of a large area silicon drift chamber for wide-field x-ray astronomy applications, Gianluigi Zampa, Andrea Vacchi, Istituto Nazionale di Fisica Nucleare (Italy); Marco Feroci, INAF - IASF Roma (Italy); Claudio Labanti, INAF - IASF Bologna (Italy); Walter Bonvicini, Alexander Rashevsky, Nicola Zampa, Istituto Nazionale di Fisica Nucleare (Italy); Riccardo Campana, Istituto Nazionale di Astrofisica (Italy); Ettore Del Monte, Yuri Evangelista, Fabio Muleri, Luigi Pacciani, Alda Rubini, Paolo Soffitta, Enrico Costa, Immacolata Donnarumma, Francesco Lazzarotto, Marcello Mastropietro, INAF - IASF Roma (Italy); Ennio Morelli, INAF - IASF Bologna (Italy); Massimo Rapisarda, ENEA (Italy); Fabio Fuschino, Martino Marisaldi, INAF - IASF Bologna (Italy); Luca Picolli, Marco Grassi, Piero Malcovati, Univ. degli Studi di Pavia (Italy) [7732-167]

EUV spectroscopy of high-redshift x-ray objects, Michael P. Kowalski, Michael T. Wolff, Kent S. Wood, U.S. Naval Research Lab. (United States); Troy W. Barbee, Jr., Lawrence Livermore National Lab. (United States); Martin A. Barstow, Univ. of Leicester (United Kingdom) [7732-168]

X-ray pencil beam facility for optics characterization, Michael K. Krumrey, Levent Cibik, Peter Müller, Physikalisch-Technische Bundesanstalt (Germany); Marcos Bavdaz, European Space Research and Technology Ctr. (Netherlands); Maximilien J. Collon, European Space Agency (Netherlands) [7732-169]

Research and development of a gamma-ray imaging spectrometer in the MeV range in Barcelona, José-Luis Gálvez, José-Manuel Álvarez, Margarida Hernanz, Jordi Isern, Consejo Superior de Investigaciones Científicas (Spain); Manuel Lozano, Giulio Pellegrini, Ctr. Nacional de Microelectrónica (Spain); Mokhtar Chmeissani, Institut de Física d'Altes Energies (Spain) [7732-170]

The Livermore calibration facility, Gregory V. Brown, Peter Beiersdorfer, Edward Magee, Jaebum Park, Elmar Träbert, Marilyn Schneider, Lawrence Livermore National Lab. (United States); Frederick S. Porter, Caroline A. Kilbourne, Richard Kelley, NASA Goddard Space Flight Ctr. (United States) [7732-171]

Reflectivity and polarization sensitivity of a bended crystal with DLC deposition, Ryo Iizuka, Shingo Kusunoki, Seiya Takeda, Atsushi Tokuno, Satoshi Yamamuro, Yokho Tsuboi, Chuo Univ. (Japan); Hiroki Akasaka, Nagaoka Univ. of Technology (Japan); Naoto Ohtake, Masanori Saito, Tokyo Institute of Technology (Japan) [7732-172]

A numerical tool for the simulation of next generation x-ray telescopes, Maxime Chauvin, Ctr. d'Etude Spatiale des Rayonnements (France) [7732-173]

Gallium nitride photocathodes for imaging photon counters, Oswald H. W. Siegmund, Anton S. Tremsin, Jason B. McPhate, Jeffrey S. Hull, Univ. of California, Berkeley (United States) [7732-175]

Friday 2 July

SESSION 13

Room: Sunrise Fri. 9:00 to 10:30 am

Low-Temperature Detectors

Session Chair: Richard Willingale, Univ. of Leicester (United Kingdom)

9:00 am: **An overview of high-resolution, non-dispersive, imaging spectrometers for high-energy photons** (*Invited Paper*), Caroline A. Kilbourne, NASA Goddard Space Flight Ctr. (United States) [7732-58]

9:30 am: **MIS micro-calorimeters arrays: an alternative to IXO/XMS TES/Squids baseline**, Abdelkader Aliane, Jean-Luc Sauvageot, Claude Pigot, Johannes Goupy, Xavier de la Broïse, Emile Grémion, Virginie Szefflinski, Patrick Agnese, Commissariat à l'Énergie Atomique (France) [7732-59]

9:50 am: **Progress on the Micro-X Sounding Rocket X-ray Telescope: completion of flight hardware**, Patrick Wikus, Massachusetts Institute of Technology on behalf of the Micro-X collaboration (United States) [7732-60]

10:10 am: **High-resolution microcalorimeter development for gamma-ray astronomy**, Joel N. Ullom, James A. Beall, Douglas Bennett, W. Bertrand Dorise, Gene C. Hilton, Robert Horansky, Kent D. Irwin, Vince Kotsubo, Daniel Swetz, Leila R. Vale, National Institute of Standards and Technology (United States); Andrew Hoover, Nate Hotelling, Michael Rabin, Los Alamos National Lab. (United States); Al Betz, Rita Boreiko, Univ. of Colorado at Boulder (United States) [7732-61]

Coffee Break 10:30 to 11:00 am

SESSION 14

Room: Sunrise Fri. 11:00 am to 1:00 pm

New X-Ray/Gamma-Ray Missions I

Session Chair: Caroline A. Kilbourne, NASA Goddard Space Flight Ctr.

11:00 am: **Spectrum from the extended x-ray off-plane spectrometer (EXOS) sounding rocket payload**, Phillip H. Oakley, Univ. of Colorado at Boulder (United States); Randall L. McEntaffer, The Univ. of Iowa (United States); Webster C. Cash, Jr., Benjamin R. Zeiger, Mike Kaiser, Univ. of Colorado at Boulder (United States); Ted Schultz, The Univ. of Iowa (United States); Ann F. Shipley, Univ. of Colorado at Boulder (United States) [7732-62]

11:20 am: **DIOS: the diffuse intergalactic oxygen surveyor: status and prospects**, Takaya Ohashi, Tokyo Metropolitan Univ. (Japan); Yuzuru Tawara, Nagoya Univ. (Japan); Kazuhisa Mitsuda, Noriko Y. Yamasaki, Japan Aerospace Exploration Agency (Japan); Yasushi Suto, The Univ. of Tokyo (Japan); Nobuyuki Kawai, Tokyo Institute of Technology (Japan) [7732-63]

11:40 am: **Xenia: cosmo-chemical evolution of the Universe**, David N. Burrows, The Pennsylvania State Univ. (United States); Chryssa Kouveliotou, NASA Marshall Space Flight Ctr. (United States); Luigi Piro, INAF - IASF Roma (Italy); Jan-Willem A. den Herder, SRON Netherlands Institute for Space Research (Netherlands); Takaya Ohashi, Tokyo Metropolitan Univ. (Japan); Dieter H. Hartmann, Clemson Univ. (United States) [7732-64]

12:00 pm: **JANUS: exploring the high redshift universe**, David N. Burrows, The Pennsylvania State Univ. (United States) [7732-65]

12:20 pm: **LOFT: a large observatory for x-ray timing**, Marco Feroci, INAF - IASF Roma (Italy); Luigi Stella, Osservatorio Astronomico di Roma (Italy); Andrea Vacchi, Istituto Nazionale di Fisica Nucleare (Italy); Claudio Labanti, INAF - IASF Bologna (Italy); Massimo Rapisarda, ENEA (Italy); Enrico Costa, INAF - IASF Roma (Italy); Primo Attina, Thales Alenia Space (Italy); Walter Bonvicini, Istituto Nazionale di Fisica Nucleare (Italy); Riccardo Campana, Istituto Nazionale di Astrofisica (Italy); Ettore Del Monte, Immacolata Donnarumma, Yuri Evangelista, INAF - IASF Roma (Italy); Fabio Fuschino, INAF - IASF Bologna (Italy); Francesco Lazzarotto, INAF - IASF Roma (Italy); Martino Marisaldi, INAF - IASF Bologna (Italy); Fabio Muleri, Luigi Pacciani, INAF - IASF Roma (Italy); Alexander Rashevsky, Istituto Nazionale di Fisica Nucleare (Italy); Paolo Soffitta, INAF - IASF Roma (Italy); Gianluigi Zampa, Nicola Zampa, Istituto Nazionale di Fisica Nucleare (Italy); Tomaso M. Belloni, Osservatorio Astronomico di Brera (Italy); Enrico Bozzo, Osservatorio Astronomico di Roma (Italy); Luciano Burderi, Univ. degli Studi di Cagliari (Italy); Sergio Campana, Stefano Covino, Osservatorio Astronomico di Brera (Italy); Domitilla de Martino, Osservatorio Astronomico di Capodimonte (Italy); Tiziana Di Salvo, Univ. degli studi di Palermo (Italy); Gian Luca Israel, Osservatorio Astronomico di Roma (Italy); Andrea Possenti, Osservatorio Astronomico di Cagliari (Italy); Roberto Turolla, Univ. degli Studi di Padova (Italy); Luca Zampieri, Osservatorio Astronomico Padova (Italy) [7732-66]

12:40 pm: **The Wide Field X-ray Telescope (WFXT) Mission**, Stephen S. Murray, Harvard-Smithsonian Ctr. for Astrophysics (United States); Riccardo Giacconi, Andrew Ptak, The Johns Hopkins Univ. (United States); Piero Rosati, European Southern Observatory (Germany); Martin C. Weisskopf, NASA Marshall Space Flight Ctr. (United States); Christine Jones, William Forman, Harvard-Smithsonian Ctr. for Astrophysics (United States); Stefano Borgani, Univ. of Trieste (Italy); Paolo Tozzi, Osservatorio Astronomico di Trieste (Italy); Giovanni Parasci, Gianpiero Tagliaferri, Sergio Campana, Osservatorio Astronomico di Brera (Italy); Marshall W. Bautz, Massachusetts Institute of Technology (United States) [7732-67]

Lunch Break 1:00 to 2:00 pm

SESSION 15

Room: Sunrise Fri. 2:00 to 3:20 pm

New X-Ray/Gamma-Ray Missions II

Session Chair: Stephen S. Murray,
Harvard-Smithsonian Ctr. for Astrophysics

2:00 pm: **Hard x-ray imaging scanning-sky surveys: from the farthest to nearest black holes to EXIST**, Jonathan E. Grindlay, Jae Sub Hong, Harvard-Smithsonian Ctr. for Astrophysics (United States); Scott D. Barthelmy, Neil A. Gehrels, S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States); Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy); Joshua S. Bloom, Univ. of California, Berkeley (United States); Paolo Coppi, Yale Univ. (United States); Alicia Soderberg, Harvard-Smithsonian Ctr. for Astrophysics (United States); Gabriele Ghisellini, Osservatorio Astronomico di Brera (Italy); Roberto Della Ceca, Osservatorio Astronomico di Brera (United States); Pietro Ubertini III, INAF - IASF Roma (Italy) [7732-68]

2:20 pm: **The proposed High-Energy Telescope (HET) for EXIST**, Jae Sub Hong, Jonathan E. Grindlay, Branden T. Allen, Harvard-Smithsonian Ctr. for Astrophysics (United States); Gerald Skinner, Scott D. Barthelmy, Neil A. Gehrels, NASA Goddard Space Flight Ctr. (United States); Henric S. Krawczynski, Alfred B. Garson III, Washington Univ. in St. Louis (United States); Lorenzo Natalucci, Pietro Ubertini III, INAF - IASF Roma (Italy); Gianpiero Tagliaferri, Osservatorio Astronomico di Brera (Italy) [7732-69]

2:40 pm: **Design and scientific performance of the soft x-ray imager on board EXIST**, Lorenzo Natalucci, Gianpiero Tagliaferri, Angela Bazzano, INAF - IASF Roma (Italy); Patrizia A. Caraveo, INAF - IASF Milano (Italy); Roberto Della Ceca, Osservatorio Astronomico di Brera (Italy); Jonathan E. Grindlay, Harvard-Smithsonian Ctr. for Astrophysics (Italy); Giovanni Pareschi, Osservatorio Astronomico di Brera (Italy); Brian D. Ramsey, NASA Marshall Space Flight Ctr. (United States); Pietro Ubertini III, INAF - IASF Roma (Italy); Michela C. A. Uslenghi, Gabriele E. Villa, INAF - IASF Milano (Italy) [7732-70]

3:00 pm: **EXIST deep observations of the Galactic Center Region**, Mariateresa Focchi, Lorenzo Natalucci, INAF - IASF Roma (Italy); Jonathan E. Grindlay, Harvard Univ. (United States); Pietro Ubertini III, INAF - IASF Roma (Italy) [7732-71]

Coffee Break 3:20 to 3:50 pm

SESSION 16

Room: Sunrise Fri. 3:50 to 5:50 pm

New X-Ray/Gamma-Ray Missions III

Session Chair: Tadayuki Takahashi,
Japan Aerospace Exploration Agency (Japan)

3:50 pm: **Development of a telescope for medium-energy gamma-ray astronomy**, Stanley D. Hunter, Seunghee Son, Georgia A. DeNolfo, Michael M. Dion, NASA Goddard Space Flight Ctr. (United States) [7732-72]

4:10 pm: **A fast scintillator Compton Telescope for medium-energy gamma-ray astronomy**, Peter F. Bloser, James M. Ryan, Jason S. Legere, Manuel Julien, Christopher M. Bancroft, Mark L. McConnell, The Univ. of New Hampshire (United States); Mark Wallace, Richard M. Kippen, Shawn Torga, Los Alamos National Lab. (United States) [7732-73]

4:30 pm: **Balloon-borne sub-MeV/MeV gamma-ray observation using a Compton camera with a gaseous TPC and a scintillation camera**, Shunsuke Kurosawa, Hidetoshi Kubo, Kaori Hattori, Chihiro Ida, Satoru Iwaki, Naoki Higashi, Shigeto Kabuki, Kentaro Miuchi, Kiseki Nakamura, Hironobu Nishimura, Joseph Parker, Tatsuya Sawano, Kyoto Univ. (Japan); Atsushi Takada, Japan Aerospace Exploration Agency (Japan); Michiaki Takahashi, Toru Tanimori, Kojiro Taniue, Kazuki Ueno, Kyoto Univ. (Japan) [7732-74]

4:50 pm: **The spring 2010 balloon flight of the Nuclear Compton Telescope**, Eric C. Bellm, Univ. of California, Berkeley (United States); Jeng-Lun Chiu, National Tsing Hua Univ. (Taiwan); Steven E. Boggs, Univ. of California, Berkeley (United States); Hsiang-Kuang Chang, National Tsing Hua Univ. (Taiwan); Yuan-Hann Chang, National Central Univ. (Taiwan); Minghuey A. Huang, National United Univ. (Taiwan); Mark S. Amman, Lawrence Berkeley National Lab. (United States); Mark S. Bandstra, Univ. of California, Berkeley (United States); Wei-Che Hung, National Central Univ. (Taiwan); Pierre Jean, Ctr. d'Etude Spatiale des Rayonnements (France); Jau-Shian Liang, National Tsing Hua Univ. (Taiwan); Chih-Hsun Lin, Academia Sinica (Taiwan); Zhong-Kai Liu, National Central Univ. (Taiwan); Paul N. Luke, Lawrence Berkeley National Lab. (United States); Daniel Perez-Becker, Univ. of California, Berkeley (United States); Ray-Shine Run, National United Univ. (Taiwan); Andreas Zoglauer, Univ. of California, Berkeley (United States) [7732-75]

5:10 pm: **ECLAIRs: the X- and Gamma-ray Telescope for the SVOM mission**, Henri E. Triou, Aymeric Sauvageon, Bertrand Cordier, Diego Gotz, Stéphane Schanne, Commissariat à l'Énergie Atomique (France); Pierre Mandrou, Roger Pons, Didier Barret, Olivier Godet, Nadege Remoué, Ctr. d'Etude Spatiale des Rayonnements (France); François Gonzalez, Martine Jouret, Ctr. National d'Études Spatiales (France); Jean-Luc Atteia, Lab. Astrophysique de Toulouse - Tarbes (France) [7732-76]

5:30 pm: **Development of efficient Laue lenses: experimental results and projects**, Nicolas M. Barrière, John A. Tomsick, Steven E. Boggs, Univ. of California, Berkeley (United States) [7732-77]

Papers available in 2-4 weeks.

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Ground-based and Airborne Telescopes III

Conference Chairs: **Larry M. Stepp**, Thirty Meter Telescope Project; **Roberto Gilmozzi**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Helen J. Hall**, Stratospheric Observatory for Infrared Astronomy

Program Committee: **Torben E. Andersen**, Lund Observatory (Sweden); **Matthew Colless**, Anglo-Australian Observatory (Australia); **Jean-Gabriel Cuby**, Observatoire Astronomique de Marseille-Provence (France); **Xiangqun Cui**, Nanjing Institute of Astronomical Optics & Technology (China); **Philippe Dierickx**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Richard F. Green**, Large Binocular Telescope Observatory and The Univ. of Arizona; **Frank W. Kan**, Simpson Gumpertz & Heger Inc.; **Richard J. Kurz**, Joint ALMA Observatory (Chile); **Simon J. E. Radford**, California Institute of Technology; **Göran Sandell**, SOFIA/Universities Space Research Association; **Thomas A. Sebring**, Cornell Caltech Atacama Telescope Project; **Jason Spyromilio**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Donald W. Sweeney**, LSST Corp.; **Tomonori Usuda**, National Astronomical Observatory of Japan/Subaru Telescope; **Jeremy J. Wagner**, National Solar Observatory

Sunday 27 June

SESSION 1

Room: Golden Ballroom Sun. 8:30 am to 12:20 pm

Project Reviews

Session Chair: **Larry M. Stepp**, Thirty Meter Telescope Project

8:30 am: **The GTC project, from commissioning to regular science operation: current performance and first science results** (*Invited Paper*), Pedro R. Alvarez Martin, José Miguel Rodríguez Espinosa, F. Javier Castro López-Tarruella, Martí Pi Puig, Lluís Cavaller-Marquéz, Germán Prieto Labra, Javier Pancorbo Garcia, Rene G. M. Rutten, Michiel van der Hoeven, Instituto de Astrofísica de Canarias [7733-01]

9:00 am: **VISTA: status and performance** (*Invited Paper*), James P. Emerson, William J. Sutherland, Queen Mary, Univ. of London (United Kingdom) [7733-02]

9:30 am: **The compact, low scattered-light 2m Wendelstein Fraunhofer Telescope**, Ulrich Hopp, Ralf Bender, Frank U. Grupp, Heinz Barwig, Claus A. Gössl, Florian Lang-Bardl, Wolfgang Mitsch, Univ.-Sternwarte München (Germany); Hans Thiele, Kayser-Threde GmbH (Germany); Peter Aniol, ASTELCO Systems GmbH (Germany); Markus Schmidt, Schmidt Instruments (Germany); Michael Hartl, Dirk Kampf, Roland Schögl, Kayser-Threde GmbH (Germany) [7733-03]

9:50 am: **The University of Tokyo Atacama Observatory 6.5m Telescope project**, Yuzuru Yoshii, Tsutomu Aoki, Mamoru Doi, Toshihiro Handa, Kimiaki Kawara, Daisuke Kato, Kotaro Kohno, Masahiro Konishi, Shintaro Koshida, Takeo Minezaki, Natsuko Mitani, Takashi Miyata, Kentaro Motohara, Shigeyuki Sako, Takao Soyano, Toshihiko Tanabe, Masuo Tanaka, Ken'ichi Tarusawa, The Univ. of Tokyo (Japan); Leonardo Bronfman, Maria T. Ruiz, Mario Hamuy, Univ. de Chile (Chile) [7733-04]
Coffee Break 10:10 to 10:40 am

10:40 am: **The optical performance of LAMOST Telescope** (*Invited Paper*), Xiangqun Cui, Nanjing Institute of Astronomical Optics & Technology (China); Ding-qiang Su, Nanjing Univ. (China); Guoping Li, Ya-nan Wang, Genrong Liu, Yong Zhang, Yeping Li, Nanjing Institute of Astronomical Optics & Technology (China) [7733-05]

11:10 am: **The Discovery Channel Telescope: early integration** (*Invited Paper*), Byron W. Smith, Tomas Chytek, Bill DeGroot, Lowell Observatory (United States); David T. Finley, General Dynamics SATCOM Technologies (United States); Jeffrey Hall, Paul J. Lotz, Lowell Observatory (United States); Brad A. McCreight, General Dynamics SATCOM Technologies (United States); Alexander Venetiu, Lowell Observatory (United States) [7733-06]

11:40 am: **Southern LAMOST for all sky spectroscopic survey**, Shouguan Wang, National Astronomical Observatories (China); Ding-qiang Su, Nanjing Univ. (China); Xiangqun Cui, Nanjing Institute of Astronomical Optics & Technology (China); Yongheng Zhao, National Astronomical Observatories (China); Yaoquan Chu, Univ. of Science and Technology of China (China); Guoping Li, Nanjing Institute of Astronomical Optics & Technology (China) [7733-07]

12:00 pm: **The Large Binocular Telescope**, John M. Hill, Richard F. Green, David S. Ashby, Joar G. Brynnel, Norman J. Cushing, John Little, James H. Slagle, R. Mark Wagner, Large Binocular Telescope Observatory (United States) [7733-08]

Lunch Break 12:20 to 1:40 pm

SESSION 2

Room: Golden Ballroom Sun. 1:40 to 3:00 pm

Synoptic Survey Telescopes

Session Chair: **Jeremy J. Wagner**, National Solar Observatory

1:40 pm: **The Large Synoptic Survey Telescope preliminary design overview** (*Invited Paper*), Victor L. Krabbendam, National Optical Astronomy Observatory (United States); Donald W. Sweeney, Lawrence Livermore National Lab. (United States) [7733-09]

2:10 pm: **The Pan-STARRS wide-field optical/NIR imaging survey** (*Invited Paper*), Nicholas Kaiser, Univ. of Hawai'i (United States) [7733-10]

2:40 pm: **LSST telescope mount and pier design overview**, Douglas R. Neill, Victor Krabbendam, National Optical Astronomy Observatory (United States) [7733-11]

Coffee Break 3:00 to 3:30 pm

SESSION 3

Room: Golden Ballroom Sun. 3:30 to 5:40 pm

Solar Telescopes

Session Chair: **Richard F. Green**, Large Binocular Telescope Observatory and The Univ. of Arizona

3:30 pm: **Advanced Technology Solar Telescope: beginning construction of the world's largest solar telescope** (*Invited Paper*), Thomas R. Rimmele, Jeremy J. Wagner, Stephen L. Keil, David F. Elmore, Bret D. Goodrich, Eric R. Hansen, Stephen L. Hegwer, Robert P. Hubbard, Kit Richards, Mark Wagner, National Solar Observatory (United States) [7733-12]

4:00 pm: **European Solar Telescope: project status**, Manuel Collados Vera, Instituto de Astrofísica de Canarias (Spain); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Lluís Cavaller-Marquéz, Grantecan, S.A. (Spain); Ilaria Ermolli, Osservatorio Astronomico di Roma (Italy); Bernard F. Gelly, Themis S.L. (Spain); Christine Grivel-Gelly, Rosario Ángeles M. Pérez de Taoro, Héctor Socas-Navarro, Instituto de Astrofísica de Canarias (Spain); Dirk Soltau, Reiner Volkmer, Albert-Ludwigs-Univ. Freiburg (Germany) [7733-13]

4:20 pm: **NLST: the Indian National Large Solar Telescope**, Siraj Hasan, Indian Institute of Astrophysics (India); Dirk Soltau, Albert-Ludwigs-Univ. Freiburg (Germany); Hans J. Kärcher, Martin Süß, MT Mechatronics GmbH (Germany); Thomas Berkefeld, Albert-Ludwigs-Univ. Freiburg (Germany) [7733-14]

4:40 pm: **Mechanical design of a completely open-foldable dome for EST in the range of 20- to 30m diameter with optional an effective semitransparent windscreen for telescope protection**, Robert H. Hammerschlag, Utrecht Univ. (Netherlands); Johannes N. M. Kammers, Hankom Engineering (Netherlands); Simon J. van Leverink, Machinefabriek P.M. Duyvis (Netherlands); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Simon Visser, Poly-Ned BV (Netherlands); Aswin P. L. Jägers, Guus Slieden, Utrecht Univ. (Netherlands) [7733-15]

5:00 pm: **GREGOR Telescope: start of commissioning**, Reiner Volkmer, Oskar F. H. von der Luehe II, Albert-Ludwigs-Univ. Freiburg (Germany); Carsten J. Denker, Astrophysikalisches Institut Potsdam (Germany); Sami K. Solanki, Max-Planck-Institut für Sonnensystemforschung (Germany); Horst Balthasar, Astrophysikalisches Institut Potsdam (Germany); Thomas Berkefeld, Peter Caligari, Albert-Ludwigs-Univ. Freiburg (Germany); Manuel Collados Vera, Instituto de Astrofísica de Canarias (Spain); Clemens Halbgewachs, Frank Heidecke, Albert-Ludwigs-Univ. Freiburg (Germany); Axel Hofmann, Astrophysikalisches Institut Potsdam (Germany); Miroslav Klvana, Astronomical Institute of the ASCR, v.v.i. (Czech Republic); Franz Kneer, Georg-August-Univ. Göttingen (Germany); Andreas Lagg, Max-Planck-Institut für Sonnensystemforschung (Germany); Wolfgang Schmidt, Albert-Ludwigs-Univ. Freiburg (Germany); Michal Sobotka, Astronomical Institute of the ASCR, v.v.i. (Czech Republic); Dirk Soltau, Albert-Ludwigs-Univ. Freiburg (Germany); Klaus G. Strassmeier, Astrophysikalisches Institut Potsdam (Germany) [7733-16]

5:20 pm: **The multi-application solar telescope of the Udaipur Solar Observatory**, Parameshwaran Venkatakrishnan, Physical Research Lab. (India) [7733-17]

Sunday Poster Session

Room: Grand Exhibit Hall Sun. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Sunday. The interactive poster session with authors in attendance will be Sunday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Project Reviews

Session Chair: Larry M. Stepp, Thirty Meter Telescope Project

The Robotic Earthshine Telescope, Ahmad Darudi, Mette Owner-Petersen, Lund Observatory (Sweden); Peter Thejll, Hans Gleisner, Danmarks Meteorologiske Institut (Denmark); Dave Taylor, Majid Ale-Ebrahim, Torben E. Andersen, Lund Observatory (Sweden) [7733-101]

Synoptic Survey Telescopes

Session Chair: Jeremy J. Wagner, National Optical Astronomy Observatory

Update and image quality error budget for the LSST camera optical design, Brian J. Bauman, Lawrence Livermore National Lab. (United States); Gordon B. Bowden, John Ku, Martin Nordby, SLAC National Accelerator Lab. (United States); Scot S. Olivier, Vincent J. Riot, Lawrence Livermore National Lab. (United States); Andrew P. Rasmussen, SLAC National Accelerator Lab. (United States); Lynn G. Seppala, Lawrence Livermore National Lab. (United States); Nadine Nurita, David K. Gilmore, Steven M. Kahn, SLAC National Accelerator Lab. (United States) . [7733-102]

LCOGT Telescope network capabilities, Andrew J. Pickles, Timothy M. Brown, Wayne Rosing, John De Vera, Matthew A. Dubberley, Benjamin J. Haldeman, Rachel M. Haynes, Annie Hjelstrom, Rich Lobdill, Vincent Posner, Joseph R. Tufts, Las Cumbres Observatory Global Telescope Network (United States) [7733-103]

Solar Telescopes

Session Chair: Richard F. Green, Large Binocular Telescope Observatory and The Univ. of Arizona

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Lessons Learned During Integration and Commissioning

Session Chair: Simon J. E. Radford, California Institute of Technology

The Discovery Channel Telescope optical coating system, Heather K. Marshall, National Solar Observatory (United States) and Lowell Observatory (United States); Gary S. Ash, William F. Parsley, DynaVac (United States) [7733-190]

The University of Tokyo Atacama 1.0-m Telescope, Takeo Minezaki, Daisuke Kato, Shigeyuki Sako, Masahiro Konishi, Shintaro Koshida, Natsuko Mitani, Tsutomu Aoki, Mamoru Doi, Toshihiro Handa, The Univ. of Tokyo (Japan); Yoshifusa Ita, National Astronomical Observatory of Japan (Japan); Kimiaki Kawara, Kotaro Kohno, Takashi Miyata, Kentaro Motohara, Takao Soyano, Toshihiko Tanabe, Masuo Tanaka, Ken'ichi Tarusawa, Yuzuru Yoshii, The Univ. of Tokyo (Japan); Leonardo Bronfman, Maria T. Ruiz, Mario Hamuy, Univ. de Chile (Chile) [7733-191]

The opto-mechanical alignment procedure of the VLT Survey Telescope, Carmelo Arcidiacono, Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Gabriele Umbriaco, Univ. degli Studi di Padova (Italy); Jacopo Farinato, Demetrio Magrin, Osservatorio Astronomico di Padova (Italy) [7733-192]

Performance of the Large Binocular Telescope's hydrostatic bearing system, James Howard, David S. Ashby, Large Binocular Telescope Observatory (United States); Jonathan Kern, Giant Magellan Telescope Organisation (United States) [7733-193]

The VST auxiliary units: a status report before their commissioning in Paranal, Jacopo Farinato, Osservatorio Astronomico di Padova (Italy); Pietro Schipani, Osservatorio Astronomico di Capodimonte (Italy); Carmelo Arcidiacono, Osservatorio Astronomico di Padova (Italy); Massimo Capaccioli, Osservatorio Astronomico di Capodimonte (Italy); Alessandro Da Ronco, Tomelleri s.r.l. (Italy); Giacinto De Paris, Istituto Nazionale di Astrofisica (Italy); Sergio D'Orsi, Luigi Ferragina, Davide Fierro, Osservatorio Astronomico di Capodimonte (Italy); Demetrio Magrin, Osservatorio Astronomico di Padova (Italy); Laurent Marty, Osservatorio Astronomico di Capodimonte (Italy); Francesco Perina, Tomelleri s.r.l. (Italy); Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Stefano Recchia, Pierfrancesco Rossettini, Tomelleri s.r.l. (Italy); Gabriele Umbriaco, Univ. degli Studi di Padova (Italy); Raffaele Tomelleri, Tomelleri s.r.l. (Italy) [7733-194]

Performance and results from the commissioning of the first acquisition, guiding, and wavefront sensing units for the Large Binocular Telescope, Jesper Storm, Astrophysikalisches Institut Potsdam (Germany); John M. Hill, Douglas L. Miller, Andrew Rakich, David J. Thompson, Joar G. Brynnel, The Univ. of Arizona (United States); Thomas Hahn, Astrophysikalisches Institut Potsdam (Germany); Jochen Heidt, Ruprecht-Karls-Univ. Heidelberg (Germany); Emil Popow, Astrophysikalisches Institut Potsdam (Germany) [7733-195]

Engineering within the assembly, verification, and integration process in ALMA, Bernhard Lopez, Joseph McMullin, Nick Whyborn, Eugene Duvall, Atacama Large Millimeter Array (Chile) [7733-196]

Design of Telescope Subsystems

Session Chair: Frank W. Kan, Simpson Gumpertz & Heger Inc.

Design and construction of the Discovery Channel Telescope enclosure, Heather K. Marshall, National Solar Observatory (United States) and Lowell Observatory (United States); Kevin Bond, BEC Southwest Inc. (United States); Jose U. Teran, M3 Engineering & Technology Corp. (United States) [7733-98]

Control strategies and algorithms for large astronomical optical telescope, Shihai Yang, Nanjing Institute of Astronomical Optics & Technology (China)[7733-198]

The UCAM CCD system for LAMOST, Jia Lei, National Astronomical Observatories (China); Mingzhi Wei, Univ. of California, Santa Cruz (United States); Sicheng Zou, Yu Luo, National Astronomical Observatories (China) [7733-199]

Review and new thinking on LAMOST focal plate support structure, Guomin Wang, Kun Zhang, Nanjing Institute of Astronomical Optics & Technology (China) [7733-200]

Design and development of a high-precision, high-payload telescope dual-drive system, Michael S. Worthington, Timothy A. Beets, John M. Good, Brian T. Murphy, Brian J. South, Joseph H. Beno, The Univ. of Texas at Austin (United States) [7733-201]

Super hardpoints for the Large Binocular Telescope, Robert L. Meeks, David S. Ashby, Christopher Biddick, Large Binocular Telescope Observatory (United States); Joseph R. De Vries, Large Synoptic Survey Telescope (United States); Michael Gusick, Large Binocular Telescope Observatory (United States); Jonathan Kern, Giant Magellan Telescope Organisation (United States) [7733-202]

The finite element modeling and thermal analysis of the special focal plane of The LAMOST, Heng Zuo, Dehua Yang, Guoping Li, Nanjing Institute of Astronomical Optics & Technology (China) [7733-205]

Telescope Optics

Session Chair: Philippe Dierickx, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

Field of view of an off-axis two-mirror system, Jingquan Cheng, National Radio Astronomy Observatory (United States) [7733-203]

Alignment of LBT optics using a laser tracker, Andrew Rakich, The Univ. of Arizona (United States) [7733-204]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: Welcome and Introduction

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: Unknowns and unknown unknowns: from dark sky to dark matter and dark energy, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: Optical synoptic telescopes: new science frontiers, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:30 am

SESSION 4

Room: Golden Ballroom Mon. 10:30 am to 12:20 pm

Airborne Telescopes I

Session Chair: Helen J. Hall,
Stratospheric Observatory for Infrared Astronomy

10:30 am: **SOFIA progress to initial science flights** (*Invited Paper*), Erick T. Young, Eric Becklin, SOFIA / USRA (United States); Pamela Marcum, NASA Ames Research Ctr. (United States); Alfred Krabbe, Deutsches SOFIA Institut (Germany); Helen J. Hall, SOFIA / USRA (United States) [7733-18]

11:00 am: **The Stratospheric THz Observatory (STO)**, Christopher K. Walker, Craig A. Kulesa, The Univ. of Arizona (United States); Pietro N. Bernasconi, The Johns Hopkins Univ. (United States); Jonathan H. Kawamura, Jet Propulsion Lab. (United States); Christopher E. Groppi, Arizona State Univ. (United States); Antony A. Stark, Smithsonian Astrophysical Observatory (United States); Christopher Martin, Oberlin College (United States); Juergen Stutzki, Univ. zu Köln (Germany); Gordon J. Stacey, Cornell Univ. (United States) [7733-19]

11:20 am: **Successful flight of the Sunrise Balloon-borne Solar Observatory**, Peter Barthol, Achim M. Gandorfer, Sami K. Solanki, Max-Planck-Institut für Sonnensystemforschung (Germany); Wolfgang Schmidt, Albert-Ludwigs-Univ. Freiburg (Germany); Valentin Martinez Pillet, Instituto de Astrofísica de Canarias (Spain); Michael Knoelker, National Ctr. for Atmospheric Research (United States); Alan M. Tittle, Lockheed Martin Space Systems Co. (United States) [7733-20]

11:40 am: **A fast EM-CCD camera as performance monitor for the SOFIA Telescope with science capabilities**, Jürgen Wolf, NASA Ames Research Ctr. (United States); Hans-Peter Roeser, Alfred Krabbe, Univ. Stuttgart (Germany); Enrico H. Pfüller, NASA Ames Research Ctr. (United States) [7733-21]

12:00 pm: **Improvement of the SOFIA secondary mirror controller**, Andreas Reinacher, Hans-Peter Roeser, Univ. Stuttgart (Germany) [7733-22]

Lunch Break 12:20 to 1:40 pm

SESSION 5

Room: Golden Ballroom Mon. 1:40 to 2:40 pm

Airborne Telescopes II

Session Chair: Richard J. Kurz, Joint ALMA Observatory (Chile)

1:40 pm: **Design and simulation of a sub-arcsecond high-altitude balloon pointing system for astrophysics missions**, Jeffrey T. Booth, Jack B. Aldrich, James W. Alexander, Alexander R. Abramovici, Paul B. Brugarcas, Jet Propulsion Lab. (United States) [7733-23]

2:00 pm: **Preparation of the pointing and control system of the SOFIA Airborne Telescope for early science missions**, Ulrich Lampater, Hans-Peter Roeser, Univ. Stuttgart (Germany) [7733-24]

2:20 pm: **Optical measurement of the pointing stability of the SOFIA Telescope using a fast EM-CCD camera**, Enrico H. Pfüller, SOFIA Science Ctr. (United States) and DSI (Germany); Jürgen Wolf, Martin Burgdorf, SOFIA Science Ctr. (United States); Ulrich Lampater, Andreas Reinacher, SOFIA Airborne Systems Operations Ctr. (United States); Hans-Peter Roeser, Univ. Stuttgart (Germany) [7733-25]

SESSION 6

Room: Golden Ballroom Mon. 2:40 to 3:40 pm

New Telescope Designs I

Session Chair: Richard J. Kurz, Joint ALMA Observatory (Chile)

2:40 pm: **Opening a new window for ground-based astrophysics: the Cherenkov Telescope Array (CTA) Observatory**, Stefan J. Wagner, Ruprecht-Karls-Univ. Heidelberg (Germany) [7733-26]

3:00 pm: **Multi-objective transforming telescope for wide-field optical monitoring of the sky with high-temporal resolution**, Grigory Beskin, Special Astrophysical Observatory (Russian Federation); Sergey Bondar, Institute for Precise Instrumentation (Russian Federation); Sergey Karpov, Vladimir Plokhotnichenko, Special Astrophysical Observatory (Russian Federation); Adriano Guarneri, Corrado Bartolini, Giuseppe Greco, Univ. degli Studi di Bologna (Italy) [7733-27]

3:20 pm: **Path to the stars: the evolution of the species in the hunting to the GRBs**, Fabrizio Vitali, Osservatorio Astronomico di Roma (Italy); Guido Chincarini, Univ. degli Studi di Milano-Bicocca (Italy) and Osservatorio Astronomico di Brera (Italy); Mario Zannoni, Univ. degli Studi di Milano-Bicocca (Italy); Stefano Covino, Osservatorio Astronomico di Brera (Italy); Emilio Molinari, Telescopio Nazionale Galileo (Spain); Stefano Benetti, Carlotta Bonoli, Favio Bortoletto, Osservatorio Astronomico di Padova (Italy); Enrico Cascone, Osservatorio Astronomico di Capodimonte (Italy); Rosario Cosentino, Telescopio Nazionale Galileo (Spain); Francesco D'Alessio, Osservatorio Astronomico di Roma (Italy); Paolo D'Avanzo, Univ. degli Studi di Milano-Bicocca (Italy) and Osservatorio Astronomico di Brera (Italy); Vincenzo De Caprio, INAF - IASF Milano (Italy); Massimo Della Valle, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Alberto Fernandez-Soto, Univ. de Cantabria (Spain); Dino Fugazza, Osservatorio Astronomico di Brera (Italy); Enrico Giro, Demetrio Molinari, Osservatorio Astronomico di Padova (Italy); Giuseppe Malaspina, Osservatorio Astronomico di Brera (Italy); Lech Mankiewicz, Andrzej Soltan Institute for Nuclear Studies (Poland); Raffaella Margutti, Univ. degli Studi di Milano-Bicocca (Italy); Ruben R. Mazzoleni, Osservatorio Astronomico di Brera (Italy); Luciano Nicastro, INAF - IASF Bologna (Italy); Alberto Riva, Osservatorio Astronomico di Torino (Italy); Marco Riva, Politecnico di Milano (Italy); et al. [7733-28]

Coffee Break 3:40 to 4:00 pm

SESSION 7

Room: Golden Ballroom Mon. 4:00 to 5:40 pm

New Telescope Designs II

Session Chair: Torben E. Andersen, Lund Observatory (Sweden)

4:00 pm: **Mechanical design considerations for a 3m class fast pointing telescope**, Marco Riva, Osservatorio Astronomico di Brera (Italy); Favio Bortoletto, Carlotta Bonoli, Osservatorio Astronomico di Padova (Italy); Vincenzo De Caprio, Paolo Spanò, Stefano Covino, Osservatorio Astronomico di Brera (Italy); Emilio Molinari, Telescopio Nazionale Galileo (Spain); Fabrizio Vitali, Osservatorio Astronomico di Roma (Italy); Mario Zannoni, Guido Chincarini, Univ. degli Studi di Milano-Bicocca (Italy) [7733-29]

4:20 pm: **Future ground-based telescopes design requirements**, Michael J. Ramsay, Robert Sobek, Blaise Canzian, Jeffrey Maloney, L-3 Brashear (United States) [7733-30]

4:40 pm: **QUIJOTE telescope opto-mechanics design and manufacturing**, Alberto Gomez, Gaizka Murga Llano, Borja Etxeita, Rubén Sanquircé, IDOM (Spain); Rafael Reboló Lopez, Jose Alberto Rubiño-Martin, José-Miguel Herreros, Roger Hoyland, Francisca Gomez, Ricardo T. Genova, Instituto de Astrofísica de Canarias (Spain); Lucio Piccirillo, Bruno Maffei, Robert Watson, The Univ. of Manchester (United Kingdom) [7733-31]

5:00 pm: **The science and design of the AGIS Observatory**, Hiroyasu Tajima, SLAC National Accelerator Lab. (United States); James H. Buckley, Washington Univ. in St. Louis (United States); Karen Byrum, Argonne National Lab. (United States); Seth Digel, SLAC National Accelerator Lab. (United States); Gary Drake, Argonne National Lab. (United States); Abraham D. Falcone, The Pennsylvania State Univ. (United States); Lucy Fortson, Adler Planetarium & Astronomy Museum (United States); Stefan Funk, SLAC National Accelerator Lab. (United States); David Hanna, McGill Univ. (Canada); Jamie Holder, Univ. of Delaware (United States); Deirdre Horan, Argonne National Lab. (United States); Philip Kaaret, The Univ. of Iowa (United States); Niklas Karlsson, Adler Planetarium & Astronomy Museum (United States); Alex Konopelko, Pittsburg State Univ. (United States); David B. Kieda, Univ. of Utah (United States); Henric S. Krawczynski, Washington Univ. (United States); Frank Krennrich, Iowa State Univ. (United States); Gernot Maier, McGill Univ. (Canada); Reshmi Mukherjee, Columbia Univ. (United States); Rene Ong, Univ. of California, Los Angeles (United States); Nepomuk Otte, Univ. of California, Santa Cruz (United States); Martin Schroedter, Iowa State Univ. (United States); Simon Swordy, Univ. of Chicago (United States); Vladimir V. Vassiliev, Univ. of California, Los Angeles (United States); Robert Wagner, Argonne National Lab. (United States); Scott Wakely, Univ. of Chicago (United States); et al. [7733-32]

5:20 pm: **Optical design of the CCD/Transit Instrument with Innovative Instrumentation (CTI-II) Telescope**, Mark R. Ackermann, Sandia National Labs. (United States); John T. McGraw, Malcolm J. McFarlane, Tom Williams, Peter C. Zimmer, Walter H. Gerstle, Francisco Roybal, The Univ. of New Mexico (United States) [7733-33]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:40 pm

SESSION 8

Room: Golden Ballroom Tues. 1:40 to 3:10 pm

Radio Telescopes

Session Chair: Simon J. E. Radford, California Institute of Technology

1:40 pm: **The Large Millimeter Telescope** (*Invited Paper*), David H. Hughes, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) [7733-34]

2:10 pm: **Experimental study on the damping of FAST cabin suspension**, Hui Li, National Astronomical Observatories (China) [7733-35]

2:30 pm: **The European ALMA Project: manufacturing, on-site assembly, and performances**, Gianpietro Marchiori, Francesco Rampini, European Industrial Engineering s.r.l. (Italy) [7733-36]

2:50 pm: **High-precision pointing with the Sardinia Radio Telescope**, Sergio Poppi, Claudio Pernechele, Tonino Pisanu, Marco Morsiani, Osservatorio Astronomico di Cagliari (Italy) [7733-37]

Coffee Break 3:10 to 3:40 pm

SESSION 9

Room: Golden Ballroom Tues. 3:40 to 5:40 pm

Radio Telescope Arrays

Session Chair: Göran Sandell,
SOFIA/Universities Space Research Association

3:40 pm: **ALMA: status report on construction and early results from commissioning** (*Invited Paper*), Richard E. Hills, Richard J. Kurz, Alison B. Peck, Atacama Large Millimeter Array (Chile) [7733-38]

4:10 pm: **The square kilometre array** (*Invited Paper*), Richard T. Schilizzi, The Univ. of Manchester (United Kingdom); T. Joseph W. Lazio, U.S. Naval Research Lab. (United States); Peter E. Dewdney, National Research Council Canada (Canada) [7733-39]

4:40 pm: **Combined array for research in millimeter-wave astronomy: capabilities for the future**, Lee G. Mundy, Univ. of Maryland, College Park (United States) [7733-40]

5:00 pm: **The expanded very large array**, Mark M. McKinnon, Richard A. Perley, James M. Jackson, Bryan J. Butler, Michael P. Rupen, Barry Clark, National Radio Astronomy Observatory (United States) [7733-41]

5:20 pm: **Heterogeneous array imaging with the CARMA Telescope**, Melvyn C. H. Wright, Univ. of California, Berkeley (United States) [7733-43]

Wednesday 30 June

SESSION 10

Room: Golden Ballroom Wed. 8:30 to 10:10 am

**Control of Telescope Disturbances—
Wind, Vibration, and Thermal**

Session Chair: Tomonori Usuda,
National Astronomical Observatory of Japan/Subaru Telescope

8:30 am: **Thermal imaging of the Large Millimeter Telescope structure**, David R. Smith, MERLAB, P.C. (United States) [7733-44]

8:50 am: **Wind-induced pointing errors and surface deformation of a 10-m submillimeter antenna**, Nobuharu Ukita, Hajime Ezawa, Sachiko Onodera, Masao Saito, National Astronomical Observatory of Japan (Japan) [7733-45]

9:10 am: **LSST primary/tertiary mirror thermal control system**, Douglas R. Neill, National Optical Astronomy Observatory (United States) [7733-46]

9:30 am: **Vibration suppression for the Gemini Planet Imager**, Joseph R. Maly, Timothy J. Pargett, CSA Engineering, Inc. (United States); Darren A. Erickson, National Research Council Canada (Canada) [7733-146]

9:50 am: **Main axes control of E-ELT**, Babak Sedghi, Michael Müller, Toomas M. Erm, Nicola Di Lieto, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7733-48]

Coffee Break 10:10 to 10:40 am

SESSION 11

Room: Golden Ballroom Wed. 10:40 am to 12:00 pm

Observatory Upgrade Programs

Session Chair: Jeremy J. Wagner, National Solar Observatory

10:40 am: **The development of high-precision hexapod actuators for the Hobby-Eberly Telescope dark energy experiment (HETDEX)**, Joseph J. Zierer, Jr., Jason R. Mock, Joseph H. Beno, The Univ. of Texas at Austin (United States); Paolo G. Lazzarini, Pierluigi Fumi, Vincenzo Anacleto, A.D.S. International S.r.l. (Italy); John M. Good, The Univ. of Texas at Austin (United States) [7733-49]

11:00 am: **The Magellan Telescopes: a performance update**, Povilas Palunas, Glenn C. Eychaner, Carnegie Observatories (United States); David Floyd, Univ. of Melbourne (Australia); David J. Osip, Carnegie Observatories (United States); Paul Schechter, Massachusetts Institute of Technology (United States) [7733-50]

11:20 am: **Development of a wide-field spherical aberration corrector for the Hobby Eberly Telescope**, James H. Burge, Scott D. Benjamin, Matthew B. Dubin, Stacie M. Manuel, Matthew J. Novak, Chang Jin Oh, Martin J. Valente, Chunyu Zhao, College of Optical Sciences, The Univ. of Arizona (United States); John A. Booth, John M. Good, Gary J. Hill, Hanshin Lee, Phillip J. MacQueen, Marc D. Rafal, Richard D. Savage, Michael P. Smith, Brian L. Vattiat, The Univ. of Texas at Austin (United States) [7733-51]

11:40 am: **New phase compensating secondary mirrors or the NASA Infrared Telescope**, Eric V. Tollestrup, Gemini Observatory (United States); Alan T. Tokunaga, Univ. of Hawai'i (United States) [7733-52]

Lunch/Exhibition Break 12:00 to 1:20 pm

SESSION 12

Room: Golden Ballroom Wed. 1:20 to 3:00 pm

Site Testing and Characterization I

Session Chair: Jean-Gabriel Cuby,
Observatoire Astronomique de Marseille-Provence (France)

1:20 pm: **Giant Magellan Telescope site testing summary**, Joanna E. Thomas-Osip, Las Campanas Observatory (Chile); Patrick J. McCarthy, Carnegie Observatories (United States); Gabriel Prieto, Mark M. Phillips, Las Campanas Observatory (Chile); Matt W. Johns, Carnegie Observatories (United States) [7733-53]

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1:40 pm: **Support for site testing of the European Extremely Large Telescope: precipitable water vapor over Paranal**, Florian Kerber, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Richard R. Quere, Univ. of Lethbridge (Canada); Reinhard W. Hanuschik, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Arlette Chacon, Marta Caneo, Lissette Cortes, Michel Cure, Lizett Illanes, Univ. de Valparaíso (Chile); David A. Naylor, Univ. of Lethbridge (Canada); Alain Smette, Marc S. Sarazin, David Rabanus, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Gregory J. Tompkins, Univ. of Lethbridge (Canada) [7733-54]

2:00 pm: **Where is the surface-layer turbulence?**, Andrei A. Tokovinin, National Optical Astronomy Observatory (United States) [7733-55]

2:20 pm: **Site testing at Jbel Aklim in Moroccan Anti-Atlas as a potential site for the E-ELT**, Abdelmajid M. Benhida, Mohammed Sabil II, Youssef Hach, Mohamed Lazrek, Zouhair Z. Benkhaldoun, Abdelfettah Habib, Univ. Cadi Ayyad (Morocco) [7733-56]

2:40 pm: **Mt. Graham: optical turbulence vertical distribution with standard and high resolution**, Elena Masciadri, Jeffrey A. Stoesz, Susanna Hagelin, Franck Lascaux, Osservatorio Astrofisico di Arcetri (Italy) [7733-57]

Coffee Break 3:00 to 3:30 pm

SESSION 13

Room: Golden Ballroom Wed. 3:30 to 4:30 pm

Site Testing and Characterization II

Session Chair: Xiangqun Cui,
Nanjing Institute of Astronomical Optics & Technology (China)

3:30 pm: **Optical turbulence above mountains seen in 3D**, Sebastian G. Els, Gaia Data Analysis and Processing Consortium (Spain); Konstantinos Vogiatzis, Angel Otarola, TMT Observatory Corp. (United States); Matthias Schoeck, TMT Observatory Corp. (Canada); Tony Travouillon, Reed L. Riddle, Warren A. Skidmore, TMT Observatory Corp. (United States) [7733-58]

3:50 pm: **Boundary layer seeing measurements in the Canadian High Arctic**, Paul Hickson, The Univ. of British Columbia (Canada); Raymond G. Carlberg, Univ. of Toronto (Canada); Thomas Pfrommer, The Univ. of British Columbia (Canada); Matthias Schoeck, Thirty Meter Telescope Project (Canada); Eric Steinbring, National Research Council Canada (Canada); Tony Travouillon, Thirty Meter Telescope Project (United States) [7733-59]

4:10 pm: **The Gattini Antarctic cameras**, Anna M. Moore, Caltech Optical Observatories (United States); Eric Aristidi, Univ. de Nice Sophia Antipolis (France); Michael C. B. Ashley, The Univ. of New South Wales (Australia); Runa Briguglio, Osservatorio Astrofisico di Arcetri (Italy); Maurizio Busso, Univ. degli Studi di Perugia (Italy); Xiangqun Cui, Nanjing Institute of Astronomical Optics & Technology (China); Longlong Feng, Purple Mountain Observatory (China); Xuefei Gong, Nanjing Institute of Astronomical Optics & Technology (China); Jon S. Lawrence, Macquarie Univ. (Australia); Daniel M. Luong-Van, The Univ. of New South Wales (Australia); D. Christopher Martin, California Institute of Technology (United States); Cyprien Pouzenc, Lab. Fizeau (France); Reed L. Riddle, Caltech Optical Observatories (United States); Lucia Sabbatini, Univ. degli Studi di Roma Tre (Italy); Piero Salinari, Osservatorio Astrofisico di Arcetri (Italy); John W. V. Storey, Nick F. H. Tothill, The Univ. of New South Wales (Australia); Tony Travouillon, California Institute of Technology (United States); Lifan Wang, Texas A&M Univ. (United States); Ji Yang, Purple Mountain Observatory (China); Huigen Yang, Polar Research Institute of China (China); Xu Zhou, National Astronomical Observatories (China); Zhengxi Zhu, Purple Mountain Observatory (China) [7733-60]

SESSION 14

Room: Golden Ballroom Wed. 4:30 to 5:50 pm

Design of Antarctic Telescopes

Session Chair: Xiangqun Cui,
Nanjing Institute of Astronomical Optics & Technology (China)

4:30 pm: **Performance of the autonomous PLATO Antarctic Observatory over two full years**, Daniel M. Luong-Van, Michael C. B. Ashley, The Univ. of New South Wales (Australia); Xiangqun Cui, Nanjing Institute of Astronomical Optics & Technology (China); Jon R. Everett, The Univ. of New South Wales (Australia); Longlong Feng, Purple Mountain Observatory (China); Xuefei Gong, Nanjing Institute of Astronomical Optics & Technology (China); Shane Hengst, The Univ. of New South Wales (Australia); Jon S. Lawrence, Macquarie Univ. (Australia); John W. V. Storey, The Univ. of New South Wales (Australia); Lifan Wang, Texas A&M Univ. (United States); Huigen Yang, Polar Research Institute of China (China); Ji Yang, Purple Mountain Observatory (China); Xu Zhou, National Astronomical Observatories (China); Zhengxi Zhu, Purple Mountain Observatory (China) [7733-61]

4:50 pm: **Antarctic Infra-Red Telescope with a 40cm primary mirror (AIRT40): development and improvement**, Hirohumi Okita, Takashi Ichikawa, Tomohiro Yoshikawa, Ramsey G. Lundock, Kentaro Kurita, Tohoku Univ. (Japan) [7733-62]

5:10 pm: **Progress of Antarctic Schmidt Telescopes (AST3) for Dome A**, Xiangyan Yuan, Nanjing Institute of Astronomical Optics & Technology (China) and Chinese Ctr. for Antarctic Astronomy (China); Xiangqun Cui, Xuefei Gong, Daxing Wang, Zhengqiu Yao, Nanjing Institute of Astronomical Optics & Technology (China) [7733-63]

5:30 pm: **Thermal design and de-icing system for the Antarctic Telescope ICE-T**, Klaus G. Strassmeier, Astrophysikalisches Institut Potsdam (Germany); Hans J. Kärcher, Jürgen Kühn, MT Mechatronics GmbH (Germany); Igor DiVarano, Astrophysikalisches Institut Potsdam (Germany) [7733-64]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space (Presentation Only)**, Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST (Presentation Only)**, Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future (Presentation Only)**, Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 15

Room: Golden Ballroom Thurs. 10:30 am to 12:00 pm

Future Giant Telescopes I

Session Chair: Roberto Gilmozzi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

10:30 am: **The Cornell Caltech Atacama Telescope: progress and plans 2010 (Invited Paper)**, Thomas A. Sebring, Cornell Univ. (United States) [7733-65]

11:00 am: **GMT overview (Invited Paper)**, Stephen A. Shectman, Matt W. Johns, Carnegie Observatories (United States) [7733-66]

11:30 am: **E-ELT Telescope: the status at the end of detailed design (Invited Paper)**, Jason Spyromilio, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7733-67]

Lunch/Exhibition Break 12:00 to 1:10 pm

SESSION 16

Room: Golden Ballroom Thurs. 1:10 to 2:00 pm

Future Giant Telescopes II

Session Chair: Roberto Gilmozzi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

1:10 pm: **Pancake ELT: a practical design for an extremely large telescope**, Mark R. Ackermann, Sandia National Labs. (United States); John T. McGraw, Peter C. Zimmer, The Univ. of New Mexico (United States) [7733-68]

1:30 pm: **The status of the Thirty Meter Telescope Project (Invited Paper)**, Gary H. Sanders, Thirty Meter Telescope Project (United States); Jerry E. Nelson, Univ. of California, Santa Cruz (United States) [7733-69]

SESSION 17

Room: Golden Ballroom Wed. 2:00 to 3:20 pm

Technology for Future Giant Telescopes I

Session Chair: Philippe Dierickx, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

2:00 pm: **Enclosure design for Thirty Meter Telescope**, Nathan P. Loewen, Dynamic Structures Ltd. (Canada) [7733-70]

2:20 pm: **The E-ELT Project: the Dome design status**, Gianpietro Marchiori, Simone de Lorenzi, Andrea Busatta, European Industrial Engineering s.r.l. (Italy) [7733-71]

2:40 pm: **Detail design and construction plans for a dome for the European Extremely Large Telescope (E-ELT)**, Gaizka Murga Liano, Armando Bilbao, Alberto Vizcargüenaga, IDOM (Spain); Michael W. Schneermann, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7733-72]
 3:00 pm: **Seismic analysis of Giant Magellan Telescope (GMT)**, Frank W. Kan, Andrew T. Sarawit, Simpson Gumpertz & Heger Inc. (United States) [7733-73]
 Coffee Break 3:20 to 3:50 pm

SESSION 18

Room: Golden Ballroom Thurs. 3:50 to 5:50 pm

Technology for Future Giant Telescopes II

Session Chair: Thomas A. Sebring,
 Cornell Caltech Atacama Telescope Project

3:50 pm: **Modeling a large submillimeter-wave observatory**, John Z. Lou, David C. Redding, Andrew Kissil, Scott A. Basinger, Jet Propulsion Lab. (United States) [7733-74]
 4:10 pm: **Giant Magellan Telescope primary mirror cell**, Charlie L. Hull, John Bagnasco, Carnegie Observatories (United States); Steven M. Gunnels, Paragon Engineering (United States); Jonathan Kern, Matt W. Johns, Stephen A. Shectman, Amnon Talmor, Michael Ward, Carnegie Observatories (United States) [7733-75]
 4:30 pm: **Tinsley progress on stress mirror polishing (SMP) for the Thirty Meter Telescope (TMT) primary mirror segments II**, Jay Daniel, Ulrich Mueller, Tracy Peters, Stephen F. Sporer, John M. Barentine, Tony B. Hull, L-3 Communications Tinsley Labs. Inc. (United States) [7733-76]
 4:50 pm: **Wavefront controls for a large submillimeter-wave observatory**, David C. Redding, John Z. Lou, Andrew Kissil, Scott A. Basinger, Jet Propulsion Lab. (United States). [7733-77]
 5:10 pm: **Analysis of Giant Magellan Telescope (GMT) off axis primary mirror**, Frank W. Kan, Andrew T. Sarawit, Simpson Gumpertz & Heger Inc. (United States); Steven M. Gunnels, Paragon Engineering (United States) [7733-78]
 5:30 pm: **CFRP truss for the CCAT 25m diameter submillimeter-wave telescope**, David P. Woody, Stephen Padin, California Institute of Technology (United States); Thomas A. Sebring, Cornell Univ. (United States). [7733-79]

Friday 2 July

SESSION 19

Room: Golden Ballroom Fri. 8:50 to 10:10 am

Segmented Mirror Control I

Session Chair: Jason Spyromilio, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:50 am: **Shack-Hartmann phasing of segmented telescopes using Fresnel diffraction**, Mitchell Troy, Jet Propulsion Lab. (United States); Gary A. Chanan, Univ. of California, Irvine (United States); Philip J. Dumont, Jennifer E. Roberts, Jet Propulsion Lab. (United States). [7733-81]
 9:10 am: **Edge sensors for controlling segmented mirrors: a full industrial and turnkey product solution**, Bruno Luong, Christian Néel, Ambroise Périn, Didier Rozière, FOGALE nanotech (France) [7733-82]
 9:30 am: **Dynamical aspects in control of E-ELT segmented primary mirror (M1)**, Babak Sedghi, Michael Müller, Martin Dimmler, Bertrand Bauvir, Toomas M. Erm, Henri Bonnet, Marc Cayrel, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7733-83]
 9:50 am: **Servo design and analysis for the Thirty Meter Telescope primary mirror actuators**, Peter M. Thompson, Systems Technology, Inc. (United States); Douglas G. MacMynowski, California Institute of Technology (United States); M. Mark Colavita, Martin W. Regehr, Jet Propulsion Lab. (United States); Mark J. Sirota, TMT Observatory Corp. (United States) [7733-84]
 Coffee Break 10:10 to 10:40 am

SESSION 20

Room: Golden Ballroom Fri. 10:40 am to 12:00 pm

Segmented Mirror Control II

Session Chair: Torben E. Andersen, Lund Observatory (Sweden)

10:40 am: **Dynamic characterization of a prototype of the Thirty Meter Telescope primary segment assembly**, Martin W. Regehr, Jet Propulsion Lab. (United States); Peter M. Thompson, Systems Technology, Inc. (United States); M. Mark Colavita, Jet Propulsion Lab. (United States). [7733-85]

11:00 am: **Meeting highest performance requirements for lowest price and mass for the M1 segment support unit for E-ELT**, Jan R. Nijenhuis, Roger F. M. M. Hamelinck, TNO (Netherlands) [7733-87]

11:20 am: **Results of the wind evaluation breadboard for ELT primary mirror control**, Marcos Reyes Garcia-Talavera, Teodora A. Viera-Curbelo, Miguel Núñez, Instituto de Astrofísica de Canarias (Spain); Marco Quattri, Toomas M. Erm, Babak Sedghi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7733-88]

11:40 am: **Robustness of Thirty Meter Telescope primary mirror control**, Douglas G. MacMynowski, California Institute of Technology (United States); Peter M. Thompson, Systems Technology, Inc. (United States); J. Chris Shelton, Lewis C. Roberts, Jr., Jet Propulsion Lab. (United States) [7733-189]

Lunch Break 12:00 to 1:10 pm

SESSION 21

Room: Golden Ballroom Fri. 1:10 to 2:30 pm

Lessons Learned During Integration and Commissioning

Session Chair: Simon J. E. Radford, California Institute of Technology

1:10 pm: **Commissioning results from the Large Binocular Telescope**, Joar G. Brynnel, Norman J. Cushing, Richard F. Green, John M. Hill, Douglas L. Miller, Andrew Rakich, David J. Thompson, Large Binocular Telescope Observatory (United States) [7733-89]
 1:30 pm: **VISTA Telescope opto-mechanical integration**, Paul F. Jeffers, National Solar Observatory (United States); David M. Henry, UK Astronomy Technology Ctr. (United Kingdom). [7733-90]
 1:50 pm: **Main axis control of the Large Millimeter Telescope**, David R. Smith, MERLAB, P.C. (United States); Kamal Souccar, Univ. of Massachusetts Amherst (United States). [7733-91]
 2:10 pm: **Friction compensation strategies in large telescopes**, David R. Smith, MERLAB, P.C. (United States); Kamal Souccar, Univ. of Massachusetts Amherst (United States). [7733-92]

SESSION 22

Room: Golden Ballroom Fri. 2:30 to 4:40 pm

Design of Telescope Subsystems

Session Chair: Frank W. Kan, Simpson Gumpertz & Heger Inc.

2:30 pm: **Mechanical principles for large mirror supports**, Hans J. Kärcher, Peter Eisenträger, Martin Süß, MT Mechatronics GmbH (Germany) [7733-93]
 2:50 pm: **VISTA M1 support system**, Brian Stobie, UK Astronomy Technology Ctr. (United Kingdom); Paul F. Jeffers, Advanced Technology Solar Telescope (United States); Malcolm Stewart, Sulaire Systems (United Kingdom); Andy Foster, Observatory Sciences Ltd. (United Kingdom); Juan Delgadillo, Vertex RSI (United States) [7733-94]
 3:10 pm: **LSST Telescope primary/tertiary mirror cell assembly**, Douglas R. Neill, Edward A. Hileman, National Optical Astronomy Observatory (United States)[7733-95]
 Coffee Break 3:30 to 4:00 pm
 4:00 pm: **Six degrees of freedom, sub-micrometer positioning system for secondary mirrors**, Ryan C. Sneed, Michael F. Cash, Trevor S. Chambers, Paul C. Janzen, CSA Engineering, Inc. (United States) [7733-96]
 4:20 pm: **An alternative architecture and control strategy for hexapod positioning systems to simplify structural design and improve accuracy**, Joseph H. Beno, John A. Booth, Jason R. Mock, The Univ. of Texas at Austin (United States) [7733-97]

SESSION 23

Room: Golden Ballroom Fri. 4:40 to 5:20 pm

Telescope Optics

Session Chair: Philippe Dierickx, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

4:40 pm: **Using nodal aberration theory of higher order field aberrations in the initial alignment of the Large Synoptic Survey Telescope**, Tobias Schmid, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Kevin P. Thompson, Optical Research Associates (United States); Jannick P. Rolland, Univ. of Rochester (United States); Douglas R. Neill, Jacques Sebago, William J. Gressler, Large Synoptic Survey Telescope (United States) [7733-99]
 5:00 pm: **A 2-mirror unobscured wide-field telescope and autocollimator design**, Richard F. Horton, Thomas W. Peck, Art Colgate, ad hoc Optics (United States) [7733-100]

Optical and Infrared Interferometry II

Conference Chairs: **William C. Danchi**, NASA Goddard Space Flight Ctr.; **Françoise Delplancke**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Jayadev K. Rajagopal**, National Optical Astronomy Observatory and Cerro Tololo Inter-American Observatory

Program Committee: **Rachel L. Akeson**, California Institute of Technology; **Eric J. Bakker**, Magdalena Ridge Observatory; **Joshua A. Eisner**, The Univ. of Arizona Steward Observatory; **Christopher A. Haniff**, Univ. of Cambridge (United Kingdom); **Michael J. Ireland**, The Univ. of Sydney (Australia); **Pierre Y. Kern**, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); **Bruno Lopez**, Observatoire de la Côte d'Azur (France); **Harold A. McAlister**, Georgia State Univ.; **Antoine Mérand**, European Organisation for Astronomical Research in the Southern Hemisphere (Chile); **Markus Schoeller**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Hiroshi Shibai**, Osaka Univ. (Japan); **Christopher Tycner**, Central Michigan Univ.

Sunday 27 June

SESSION 1

Room: California Sun. 9:00 to 10:30 am

Current and Planned Facilities: Ground I

Session Chair: **Eric J. Bakker**,
New Mexico Institute of Mining and Technology

9:00 am: **Recent progress at the Keck interferometer** (*Invited Paper*), Sam Ragland, W. M. Keck Observatory (United States); Rachel L. Akeson, NASA Exoplanet Science Institute (United States); M. Mark Colavita, Jet Propulsion Lab. (United States); Rafael Millan-Gabet, NASA Exoplanet Science Institute (United States); Julien M. Woillez, Peter L. Wizinowich, Eric Appleby, Benjamin C. Berkey, Andrew Cooper, Wayne Dahl, W. M. Keck Observatory (United States); Claude Felizardo, Jennifer Herstein, NASA Exoplanet Science Institute (United States); Michael A. Hrynivych, Drew W. Medeiros, Doug Morrison, Tatyana Panteleva, Jörg-Uwe Pott, Brett Smith, Kellee R. Summers, Kevin Tsubota, Colette T'yaou, Edward Wetherell, W. M. Keck Observatory (United States) [7734-01]

9:30 am: **An update on the CHARA array** (*Invited Paper*), Theo A. ten Brummelaar, Harold A. McAlister, Georgia State Univ. (United States); Stephen T. Ridgway, National Optical Astronomy Observatory (United States); Douglas R. Gies, Nils H. Turner, Judit Sturmman, Laszlo Sturmman, Gail H. Schaefer, Christopher D. Farrington, Larry Webster, P. J. Goldfinger, Georgia State Univ. (United States) [7734-02]

10:00 am: **The Very Large Telescope interferometer: 2010 edition** (*Invited Paper*), Pierre Haguenuer, European Southern Observatory (Chile) [7734-03]

Coffee Break 10:30 to 11:00 am

SESSION 2

Room: California Sun. 11:00 am to 12:30 pm

Current and Planned Facilities: Ground II

Session Chair: **Harold A. McAlister**, Mount Wilson Institute

11:00 am: **Instrumental developments for the Sydney University stellar interferometer** (*Invited Paper*), Michael J. Ireland, William J. Tango, John Davis, J. Gordon Robertson, Peter G. Tuthill, Andrew P. Jacob, The Univ. of Sydney (Australia); Theo A. ten Brummelaar, The CHARA Array (United States) [7734-04]

11:30 am: **Magdalena Ridge Observatory interferometer: advancing to first light and new science** (*Invited Paper*), Michelle J. Creech-Eakman, Van D. Romero, Charles Cormier, New Mexico Institute of Mining and Technology (United States); Christopher A. Haniff, David F. Buscher, John S. Young, Univ. of Cambridge (United Kingdom); Dave J. Westpfahl, New Mexico Institute of Mining and Technology (United States) [7734-05]

12:00 pm: **Imaging beyond the fringe: an update on the LINC-NIRVANA Fizeau interferometer for the LBT** (*Invited Paper*), Thomas M. Herbst, Max-Planck-Institut für Astronomie (Germany); Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Andreas Eckart, Univ. zu Köln (Germany); Gerd P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) [7734-06]

Lunch Break 12:30 to 2:00 pm

SESSION 3

Room: California Sun. 2:00 to 3:40 pm

Current and Planned Facilities: Ground III

Session Chair: **Rachel L. Akeson**, California Institute of Technology

2:00 pm: **First results from VLTI near-infrared interferometry on high-mass protostars** (*Invited Paper*), Stefan Kraus, Univ. of Michigan (United States) [7734-07]

2:30 pm: **Mid-infrared stellar interferometry with high spectral resolution** (*Invited Paper*), Edward H. Wishnow, Charles H. Townes, Walter Fitelson, Sean Lockwood, William Mallard, Dan Wertheimer, Univ. of California, Berkeley (United States) [7734-08]

3:00 pm: **Stellar intensity interferometry: astrophysical targets for sub-milliarcsecond imaging**, Dainis Dravins, Hannes Jensen, Lund Observatory (Sweden); Stephan L. LeBohec, The Univ. of Utah (United States) [7734-09]

3:20 pm: **Adaptive optics for the CHARA array II**, Stephen T. Ridgway, National Optical Astronomy Observatory (United States); Theo A. ten Brummelaar, Judit Sturmman, Laszlo Sturmman, Nils H. Turner, Harold A. McAlister, Georgia State Univ. (United States); Michael J. Ireland, Peter G. Tuthill, The Univ. of Sydney (Australia); John D. Monnier, Univ. of Michigan (United States); Derek J. Coburn, Christopher J. Dainty, Nicholas Devaney, Alexander V. Goncharov, National Univ. of Ireland, Galway (Ireland) [7734-10]

Coffee Break 3:40 to 4:10 pm

SESSION 4

Room: California Sun. 4:10 to 5:50 pm

Current and Planned Instruments: Ground

Session Chair: **Christopher A. Haniff**,
Univ. of Cambridge (United Kingdom)

4:10 pm: **Recent science highlights from the Keck interferometer**, Rachel L. Akeson, California Institute of Technology (United States); M. Mark Colavita, Jet Propulsion Lab. (United States); Rafael Millan-Gabet, California Institute of Technology (United States); Sam Ragland, Peter L. Wizinowich, Julien M. Woillez, W. M. Keck Observatory (United States) [7734-11]

4:30 pm: **Performances and first science results with the VEGA/CHARA visible instrument**, Denis Mourard, Philippe Béro, Alain Blazit, Daniel Bonneau, Marcelo Borges, Olivier Chesneau, Jean-Michel Clausse, Omar Delaa, Observatoire de la Côte d'Azur (France); Anthony Meiland, Max-Planck-Institut für Radioastronomie (Germany); Nicolas Nardetto, Observatoire de la Côte d'Azur (France); Karine Rousselot-Perraut, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Alain Spang, Philippe Stee, Observatoire de la Côte d'Azur (France); Isabelle Tallon-Bosc, Michel Tallon, Ctr. de Recherche Astronomique de Lyon (France); Harold A. McAlister, Theo A. ten Brummelaar, Judit Sturmman, Laszlo Sturmman, Nils H. Turner, Christopher D. Farrington, P. J. Goldfinger, Mount Wilson Institute (United States) [7734-12]

4:50 pm: **AMBER/VLTI performances final update from experimental results**, Romain G. Petrov, Univ. de Nice Sophia Antipolis (France) [7734-13]

5:10 pm: **Status of PRIMA for the VLTI or the quest for user-friendly fringe tracking**, Christian Schmid, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Roberto N. Abuter, European Organization for Astronomical Research in the Southern Hemisphere (Germany); Serge Ménardi, Luigi Andolfato, Françoise Delplancke, Frédéric Derie, Nicola Diliato, Robert Frahm, Philippe B. Gitton, Nuno Gomes, Pierre Haguenuer, Samuel A. Lévêque, Sébastien Morel, Andre Mueller, Thanh Phan Duc, Eszter Pozna, Johannes Sahlmann, Nicolas Schuhler, Gerard T. van Belle, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7734-14]

5:30 pm: **MI-6: Michigan interferometry with six telescopes**, John D. Monnier, David H. Berger, Tobias A. Eckhause, Matt Anderson, Xiao Che, Fabien Baron, Stefan Kraus, Univ. of Michigan (United States); Ettore Pedretti, Nathalie D. Thureau, Univ. of St. Andrews (United Kingdom); Rafael Millan-Gabet, California Institute of Technology (United States); Theo A. ten Brummelaar, Georgia State Univ. (United States) [7734-15]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 5

Room: California Mon. 10:10 am to 12:00 pm

Current and Planned Facilities and Instruments: Space I

Session Chair: Joshua A. Eisner, The Univ. of Arizona

10:10 am: **The SIM-Lite astrometric observatory: progress report** (*Invited Paper*), James C. Marr IV, Renaud Goullioud, Michael Shao, Jet Propulsion Lab. (United States) [7734-16]

10:40 am: **Potential of balloons payloads for in-flight validation of direct and nulling interferometry concepts**, Marc Ollivier, Univ. Paris-Sud 11 (France); Vincent Coudé du Foresto, Observatoire de Paris à Meudon (France); Thien Lam Trong, Ctr. National d'Études Spatiales (France) [7734-17]

11:00 am: **Far-infrared interferometric telescope experiment: FITE** (*Invited Paper*), Hiroshi Shibai, Misato Fukagawa, Eri Kato, Tetsuo Kanoh, Tsunehito Kohyama, Yusuke Itoh, Mina Shimoura, Osaka Univ. (Japan); Mitsunobu Kawada, Toyoki Watabe, Asami Nakashima, Kodai Yamamoto, Nagoya Univ. (Japan); Masanao Narita, Tetsuya Yoshida, Yoshitaka Saito, Japan Aerospace Exploration Agency (Japan); Taro Matsuo, National Astronomical Observatory of Japan (Japan); Antonio M. Magalhaes, Univ. de São Paulo (Brazil); José W. dos Santos Villas-Boas, Instituto Nacional de Pesquisas Espaciais (Brazil) [7734-18]

11:30 am: **The Balloon Experimental Twin Telescope for infrared interferometry (BETTII)** (*Invited Paper*), Stephen A. Rinehart, NASA Goddard Space Flight Ctr. (United States) [7734-19]

Lunch Break 12:00 to 1:30 pm

SESSION 6

Room: California Mon. 1:30 to 3:00 pm

Current and Planned Facilities and Instruments: Space II

Session Chair: Françoise Delplancke, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

1:30 pm: **Direct imaging of Earth-like planets: why we care about exozodis** (*Invited Paper*), Olivier Absil, Lab. d'Astrophysique de l'Observatoire de Grenoble (Belgium); Denis Defrère, Univ. de Liège (Belgium); Vincent Coudé du Foresto, Observatoire de Paris à Meudon (France); Charles P. Hanot, Univ. de Liège (Belgium); Aki Roberge, NASA Goddard Space Flight Ctr. (United States); Christopher Stark, Univ. of Maryland, College Park (United States); Jean M. Surdej, Univ. de Liège (Belgium) [7734-20]

2:00 pm: **The Fourier-Kelvin stellar interferometer (FKSI): infrared detection and characterization of exozodiacal dust to super-Earths, a progress report**, William C. Danchi, Richard K. Barry, NASA Goddard Space Flight Ctr. (United States) [7734-21]

2:20 pm: **First results with MANIC: a monolithic nulling interferometer for characterizing extrasolar environments**, Brian A. Hicks, Timothy A. Cook, Boston Univ. (United States); Benjamin F. Lane, The Charles Stark Draper Lab., Inc. (United States); Supriya Chakrabarti, Boston Univ. (United States) [7734-22]

2:40 pm: **SIM-Lite narrow-angle modeling and processing**, Mark H. Milman, David W. Murphy, David L. Meier, Mehrdad Moshir, Jet Propulsion Lab. (United States) [7734-23]

Coffee Break 3:00 to 3:20 pm

SESSION 7

Room: California Mon. 3:20 to 6:00 pm

Observing Techniques I

Session Chair: Jayadev K. Rajagopal, National Optical Astronomy Observatory

3:20 pm: **First Keck interferometer measurements in self-phase referencing mode: spatially resolving circum-stellar line emission of 48 Lib**, Jörg-Uwe Pott, W. M. Keck Observatory (United States) and Max-Planck-Institut für Astronomie (Germany); Julien M. Willez, Sam Ragland, Peter L. Wizinowich, W. M. Keck Observatory (United States); Rachel L. Akeson, California Institute of Technology (United States); Benjamin C. Berkey, W. M. Keck Observatory (United States); M. Mark Colavita, Jet Propulsion Lab. (United States); Andrew Cooper, W. M. Keck Observatory (United States); Joshua A. Eisner, The Univ. of Arizona (United States); Andrea M. Ghez, Univ. of California, Los Angeles (United States); James R. Graham, Univ. of California, Berkeley (United States); Michael A. Hrynevych, Drew W. Medeiros, W. M. Keck Observatory (United States); Rafael Millan-Gabet, California Institute of Technology (United States); John D. Monnier, Univ. of Michigan (United States); Doug Morrison, Tatyana Panteleeva, Brett Smith, Kellee R. Summers, Kevin Tsubota, Edward Wetherell, W. M. Keck Observatory (United States) [7734-24]

3:40 pm: **Eight years of operations at the VLTI**, Andres Pino, Angela Cortes, Stephane Brillant, European Southern Observatory (Chile) [7734-25]

4:00 pm: **Configuration of the auxiliary telescopes at VLTI: a status report**, Stephane Brillant, Jean-Baptiste Le Bouquin, European Southern Observatory (Chile); Markus Wittkowski, European Southern Observatory (Germany); Pierre Haguenauer, Antoine Mérand, Stan Stefl, European Southern Observatory (Chile); Gerard T. van Belle, European Southern Observatory (Germany); Fabien Patru, European Southern Observatory (Chile) [7734-26]

4:20 pm: **AMBER current performances and prospects**, Antoine Mérand, Jean-Baptiste Le Bouquin, Pierre Bourget, Andres Ramirez, Pierre Haguenauer, Stephane Brillant, Fabien Patru, Stan Stefl, European Southern Observatory (Chile) [7734-27]

4:40 pm: **Keck interferometer nuller instrument performance**, M. Mark Colavita, Eugene Serabyn, Jet Propulsion Lab. (United States); Sam Ragland, W. M. Keck Observatory (United States); Rafael Millan-Gabet, Rachel L. Akeson, California Institute of Technology (United States) [7734-28]

5:00 pm: **Phase closure nulling: results from the 2009 observing campaign**, Alain E. Chelli, Gilles Duvert, Fabien Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Rafael Millan-Gabet, California Institute of Technology (United States); John D. Monnier, Univ. of Michigan (United States); Gail H. Schaefer, Mount Wilson Institute (United States) [7734-29]

5:20 pm: **Emerging capabilities of the Magdalena Ridge Observatory interferometer: commissioning and science readiness**, Eric J. Bakker, Andres Olivares, Fernando G. Santoro, Ifan Payne, Robert J. Selina, Daniel A. Klingsmith III, Allen R. Farris, Ronald King, Colby A. Jurgenson, New Mexico Institute of Mining and Technology (United States) [7734-30]

5:40 pm: **PACMAN: the PRIMA astrometric instrument software**, Roberto N. Abuter, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Johannes Sahlmann, Observatoire de Genève (Switzerland); Robert Frahm, Eszter Pozna, Dan Popovic, Luigi Andolfato, Thanh Phan Duc, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7734-31]

Facility Map
See page 143.

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 8

Room: California Tues. 2:00 to 3:40 pm

Facilities—Future: Ground I

Session Chair: Markus Schoeller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

2:00 pm: **Signatures of strong gravity with GRAVITY**, Andreas Eckart, Mohammad Zamaninasab, Christian Straubmeier, Sebastian Fischer, Constanza Araujo-Hauck, Macarena García-Marín, Michael Wiest, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Thibaut Paumard, Observatoire de Paris à Meudon (France) [7734-32]

2:20 pm: **GRAVITY: a four telescope beam combiner instrument for the VLTI**, Stefan Gillessen, Max-Planck-Institut für extraterrestrische Physik (Germany); Antonio Amorim, Univ. de Lisboa (Portugal); Constanza Araujo-Hauck, Univ. zu Köln (Germany); Hendrik Bartko, Max-Planck-Institut für extraterrestrische Physik (Germany); Harald Baumeister, Max-Planck-Institut für Astronomie (Germany); Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Pedro Carvas, Univ. de Lisboa (Portugal); Frédéric Cassaing, Elodie Choquet, Yann Clenet, Claude Collin, Observatoire de Paris à Meudon (France); Katie Dodds-Eden, Max-Planck-Institut für extraterrestrische Physik (Germany); Andreas Eckart, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Pierre Fedou, Observatoire de Paris à Meudon (France); Sebastian Fischer, Max-Planck-Institut für extraterrestrische Physik (Germany); Éric Gendron, Observatoire de Paris à Meudon (France); Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany); Philippe B. Gitton, European Southern Observatory (Chile); Frédéric Y. J. Gontte, European Southern Observatory (Germany); Alex P. Gräter, Nico Hamaus, Max-Planck-Institut für extraterrestrische Physik (Germany); Xavier Haubois, Observatoire de Paris à Meudon (France); Marcus Haug, Max-Planck-Institut für extraterrestrische Physik (Germany); Stefan Hippler, Max-Planck-Institut für Astronomie (Germany); et al. [7734-33]

2:40 pm: **MATISSE: perspective of imaging in the mid-infrared at the VLTI**, Bruno Lopez, Observatoire de la Côte d'Azur (France) [7734-34]

3:00 pm: **The potential performance of the mid-infrared second-generation VLTI instrument MATISSE**, Romain G. Petrov, Univ. de Nice Sophia Antipolis (France) [7734-35]

3:20 pm: **Science with the Keck interferometer ASTRA program**, Joshua A. Eisner, The Univ. of Arizona (United States); Julien M. Woillez, Peter L. Wizinowich, W. M. Keck Observatory (United States); Rachel L. Akeson, NASA Exoplanet Science Institute (United States); M. Mark Colavita, Jet Propulsion Lab. (United States); Andrea M. Ghez, Univ. of California, Los Angeles (United States); James R. Graham, Univ. of California, Berkeley (United States); Lynne Hillenbrand, California Institute of Technology (United States); Rafael Millan-Gabet, NASA Exoplanet Science Institute (United States); John D. Monnier, Univ. of Michigan (United States); Jörg-Uwe Pott, Max-Planck-Institut für Astronomie (Germany); Sam Ragland, W. M. Keck Observatory (United States) [7734-36]

Coffee Break 3:40 to 4:00 pm

SESSION 9

Room: California Tues. 4:00 to 5:40 pm

Facilities—Future: Ground II

Session Chair: Bruno Lopez, Observatoire de la Côte d'Azur (France)

4:00 pm: **ASTRA: the astrometric and phase-referencing astronomy upgrade for the Keck interferometer**, Julien M. Woillez, W. M. Keck Observatory (United States); Rachel L. Akeson, California Institute of Technology (United States); M. Mark Colavita, Jet Propulsion Lab. (United States); Joshua A. Eisner, The Univ. of Arizona (United States); Andrea M. Ghez, Univ. of California, Los Angeles (United States); Lynne Hillenbrand, Rafael Millan-Gabet, California Institute of Technology (United States); John D. Monnier, Univ. of Michigan (United States); Jörg-Uwe Pott, Max-Planck-Institut für Astronomie (Germany); Sam Ragland, Peter L. Wizinowich, W. M. Keck Observatory (United States) [7734-37]

4:20 pm: **Magdalena Ridge interferometer: assembly, integration, and testing of the unit telescopes**, Olivier Pirnay, Maxime Pierard, Peter Verheyden, AMOS Ltd. (Belgium) [7734-38]

4:40 pm: **Magdalena Ridge Observatory interferometer automated alignment system**, Alisa V. Shtromberg, Colby A. Jurgenson, Heather H. Bloemhard, New Mexico Institute of Mining and Technology (United States); David F. Buscher, Univ. of Cambridge (United Kingdom); Allen R. Farris, New Mexico Institute of Mining and Technology (United States); Christopher A. Haniff, Univ. of Cambridge (United Kingdom); Krista M. McCord, Andres Olivares, Nicolas Torres, Fernando G. Santoro, New Mexico Institute of Mining and Technology (United States) [7734-39]

5:00 pm: **The GRAVITY acquisition and guiding system**, Antonio Amorim, Jorge Lima, Univ. de Lisboa (Portugal); Oliver Pfuhl, Frank Eisenhauer, Stefan Kellner, Marcus Haug, Markus Thiel, Max-Planck-Institut für extraterrestrische Physik (Germany); Pedro Carvas, Univ. de Lisboa (Portugal); Guy S. Perrin, Observatoire de Paris à Meudon (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Christian Straubmeier, Univ. zu Köln (Germany); Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-40]

5:20 pm: **Fibered optical functions for GRAVITY**, Guy S. Perrin, Observatoire de Paris à Meudon (France) [7734-41]

Wednesday 30 June

SESSION 10

Room: California Wed. 8:30 to 10:10 am

Observing Techniques II

Session Chair: William C. Danchi, NASA Goddard Space Flight Ctr.

8:30 am: **The Fomalhaut debris disk seen from every angle with interferometry**, Olivier Absil, Lab. d'Astrophysique de l'Observatoire de Grenoble (Belgium); Bertrand P. Mennesson, Jet Propulsion Lab. (United States); Jean-Charles Augereau, Jean-Baptiste Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Rafael Millan-Gabet, California Institute of Technology (United States); Eugene Serabyn, M. Mark Colavita, Jet Propulsion Lab. (United States) [7734-42]

8:50 am: **Image reconstruction in optical interferometry: applications to the inner regions of protoplanetary disks**, Stéphanie Renard, Fabien Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Éric M. Thiébaud, Ctr. de Recherche Astrophysique de Lyon (France); Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Myriam Benisty, Osservatorio Astrofisico di Arcetri (Italy) [7734-43]

9:10 am: **PSF and field of view characteristics of imaging and nulling interferometers**, François Hénault, Observatoire de la Côte d'Azur (France) [7734-44]

9:30 am: **Closure phase calibration studies toward detection of hot Jupiters**, Ming Zhao, Jet Propulsion Lab. (United States); John D. Monnier, Xiao Che, Univ. of Michigan (United States); Theo A. ten Brummelaar, The CHARA Array (United States); Ettore Pedretti, Nathalie D. Thureau, Univ. of St. Andrews (United Kingdom) [7734-45]

9:50 am: **Speckle imaging with the SOAR and the very large telescopes**, Sridharan Rengaswamy, Julien H. Girard, Guillaume Montagnier, European Southern Observatory (Chile) [7734-46]
 Coffee Break 10:10 to 10:40 am

SESSION 11

Room: California Wed. 10:40 am to 12:20 pm

Observing Techniques III

Session Chair: Hiroshi Shibai, Osaka Univ. (Japan)

10:40 am: **Stellar intensity interferometry: imaging capabilities of air Cherenkov telescope arrays**, Paul D. Nunez, Stephan L. LeBohec, David B. Kieda, The Univ. of Utah (United States); Richard Holmes, Nutronics Inc. (United States); Dainis Dravins, Hannes Jensen, Lund Observatory (Sweden) [7734-47]

11:00 am: **Stellar intensity interferometry: experimental steps toward long-baseline observations**, Stephan L. LeBohec, Paul D. Nunez, David B. Kieda, The Univ. of Utah (United States); Dainis Dravins, Hannes Jensen, Lund Observatory (Sweden) [7734-48]

11:20 am: **The potential of rotating-baseline nulling interferometers operating within single telescope apertures**, Eugene Serabyn, Bertrand P. Mennesson, Jet Propulsion Lab. (United States); Charles P. Hanot, Univ. de Liège (Belgium) [7734-49]

11:40 am: **Wide-field imaging interferometry image construction algorithms**, Richard G. Lyon, Stephen A. Rinehart, David T. Leisawitz, Nargess Memarsadeghi, NASA Goddard Space Flight Ctr. (United States) [7734-50]

12:00 pm: **Direct imaging with a hypertelescope: array configuration versus science cases**, Fabien Patru, European Southern Observatory (Chile); Denis Mourard, Nassima Tarmoul, Lab. Fizeau (France); Andrea Chiavassa, Max Planck Institute for Astrophysics (Germany) [7734-51]

Lunch/Exhibition Break 12:20 to 1:50 pm

SESSION 12

Room: California Wed. 1:50 to 3:30 pm

Space Interferometer Technologies I

Session Chair: Pierre Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France)

1:50 pm: **Systems engineering and application of system performance modeling in SIM-Lite Mission**, Mehrdad Moshir, David W. Murphy, David L. Meier, Mark H. Milman, Jet Propulsion Lab. (United States) [7734-52]

2:10 pm: **On-orbit dynamics and controls system architecture for SIM-Lite**, Oscar S. Alvarez-Salazar, Jet Propulsion Lab. (United States) [7734-53]

2:30 pm: **SIM-Lite instrument calibration sensitivities and refinements**, Chengxing Zhai, Xin An, Renaud Goullioud, Bijan Nemati, Michael Shao, Tsae-Pyng J. Shen, Xu Wang, Udo J. Wehmeier, Mark A. Weilert, Thomas A. Werne, Janet P. Wu, Jet Propulsion Lab. (United States) [7734-54]

2:50 pm: **SIM-Lite: ground alignment of the instrument**, Frank G. Dekens, Renaud Goullioud, Mauricio J. Morales, Fabien Nicaise, Gary M. Kuan, Robert O. Gappinger, Jet Propulsion Lab. (United States) [7734-55]

3:10 pm: **SIM-Lite Guide-2 Telescope system identification, control design, and pointing performance evaluation**, Joel F. Shields, Dhemitrio Boussalis, Nanaz Fathpour, Mark Wielert, Inseob Hahn, Asif Ahmed, Jet Propulsion Lab. (United States) [7734-56]

Coffee Break 3:30 to 4:00 pm

SESSION 13

Room: California Wed. 4:00 to 6:00 pm

Space Interferometer Technologies II

Session Chair: Christopher Tycner, Central Michigan Univ.

4:00 pm: **The SIM-Lite Astrometric Observatory: engineering risk reduction activity**, Renaud Goullioud, Frank G. Dekens, Bijan Nemati, Xin An, Larry E. Hovland, Inseob Hahn, Jet Propulsion Lab. (United States) [7734-62]

4:20 pm: **SIM interferometer testbed (SCDU) status and recent results**, Bijan Nemati, Xin An, Renaud Goullioud, Michael Shao, Tsae-Pyng J. Shen, Udo J. Wehmeier, Xu Wang, Mark A. Weilert, Thomas A. Werne, Janet P. Wu, Chengxing Zhai, Jet Propulsion Lab. (United States) [7734-57]

4:40 pm: **Flight qualification and performance testing of SIM precision optical mechanisms**, Robert F. Smythe, Jet Propulsion Lab. (United States) [7734-58]

5:00 pm: **Photonic technologies for a pupil remapping interferometer**, Peter G. Tuthill, The Univ. of Sydney (Australia); Sylvestre Lacour, Observatoire de Paris à Meudon (France); Michael J. Ireland, J. Gordon Robertson, The Univ. of Sydney (Australia); Jon S. Lawrence, Michael J. Withford, Graham Marshall, Martin Ams, Macquarie Univ. (Australia) [7734-59]

5:20 pm: **Using point diffraction interferometer (PDI) for on-orbit wavefront sensing**, Qian Gong, NASA Goddard Space Flight Ctr. (United States); Daniel S. Acton, Ball Aerospace & Technologies Corp. (United States); Bruce H. Dean, Lee D. Feinberg, Douglas B. Leviton, William R. Oegerle, NASA Goddard Space Flight Ctr. (United States) [7734-60]

5:40 pm: **Picometer stable scan mechanism for gravitational wave detection in space**, Joep Pijenburg, Niek Rijnveld, TNO (Netherlands) [7734-61]

Special Session: Interferometry in the Community - Serving the Community Better - The IAU Interferometry Commission Roles and Activities

Room: California Wed. 6:30 to 8:00 pm

Panel Moderators: Douglas R. Gies, Georgia State Univ.; Rachel L. Akeson, California Institute of Technology; Stephen T. Ridgway, National Optical Astronomy Observatory

For a long time stellar interferometry was perceived as a niche technique that appealed to a very restricted community of experts. In the past few years with the operation of facilities accessible to a larger number of users, interferometry is starting to be more widely used. However due to its technical complexity in observation preparation and data reduction, its community remains limited.

In these three special sessions we will discuss the following topics:

- Evaluate where interferometry is today, what is its current science productivity and impact and how accessible is it to a larger community. We will compare it with radio-interferometry, millimeter-wave interferometry and adaptive optics;
- Propose ways of serving the community better by improving public access, developing new facilities, organizing summer schools, and by providing more support for general users. The goal is to engage users from the broad community and especially theorists in using interferometric data;
- Discuss the role of the IAU Interferometry Commission in the service to the community: how working groups and web pages can better support the users, how to sponsor meetings and summer schools, how to increase the number of papers with interferometric results presented at scientific conferences.

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan, Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space (Presentation Only)**, Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST (Presentation Only)**, Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future (Presentation Only)**, Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 14

Room: California Thurs. 10:30 to 11:50 am

Current and Planned Facilities

Session Chair: Markus Schoeller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

10:30 am: **MATISSE cold optics opto-mechanical design**, Niels Tromp III, Florence Rigal, Eddy Elswijk, Ramón Navarro, ASTRON (Netherlands); Werner Laun, Max-Planck-Institut für Astronomie (Germany); Yves Bresson, Observatoire de la Côte d'Azur (France) [7734-63]

10:50 am: **Stellar intensity interferometry: optimizing air Cherenkov telescope array layouts**, Hannes Jensen, Dainis Dravins, Lund Observatory (Sweden); Stephan L. LeBohec, Paul D. Nunez, The Univ. of Utah (United States) [7734-64]

11:10 am: **Optimal control loop design for the piston correction actuator of the LINC-NIRVANA instrument**, Mario Brix, Jörg-Uwe Pott, Thomas Bertram, Max-Planck-Institut für Astronomie (Germany); Steffen Rost, Univ. zu Köln (Germany); Jose Luis Borelli, Thomas M. Herbst, Martin Kuerster, Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany) [7734-65]

11:30 am: **The LINC-NIRVANA fringe and flexure tracker: control design overview**, Steffen Rost, Andreas Eckart, Matthew Horrobin, Bettina Lindhorst, Uwe Lindhorst, Lydia Moser, Christian Straubmeier, Evangelia Tremou, Imke Wank, Jens Zuther, Univ. zu Köln (Germany); Thomas Bertram, Max-Planck-Institut für Astronomie (Germany) [7734-66]

SESSION 15

Room: California Thurs. 11:50 am to 12:30 pm

Critical Subsystems I

Session Chair: Markus Schoeller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:50 am: **Testing and alignment of the LBTI**, Jihun Kim, Philip M. Hinz, Olivier Durney, Thomas E. Connors, The Univ. of Arizona (United States); Christian Schwab, Landessternwarte Heidelberg (Germany) [7734-67]

12:10 pm: **Fringe detection and piston variability in LINC-NIRVANA**, Matthew Horrobin, Andreas Eckart, Bettina Lindhorst, Uwe Lindhorst, Lydia Moser, Steffen Rost, Christian Straubmeier, Evangelia Tremou, Imke Wank, Jens Zuther, Univ. zu Köln (Germany) [7734-68]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 16

Room: California Thurs. 2:00 to 3:40 pm

Critical Subsystems II

Session Chair: Eric J. Bakker,
New Mexico Institute of Mining and Technology

2:00 pm: **OPD models for the VLTI**, Stephane Brillant, Bruno Gilli, Philippe B. Gitton, Antoine Mérand, European Southern Observatory (Chile) [7734-69]

2:20 pm: **GRAVITY: design and performance of the fringe tracker**, Elodie Choquet, Observatoire de Paris à Meudon (France); Julien Lozi, Frédéric Cassaing, ONERA (France); Guy S. Perrin, Sylvestre Lacour, Observatoire de Paris à Meudon (France); Frank Eisenhauer, Stefan Gillessen, Max-Planck-Institut für extraterrestrische Physik (Germany); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Christian Straubmeier, Univ. zu Köln (Germany) [7734-70]

2:40 pm: **Baseline definitions for the astrometric mode of the GRAVITY instrument**, Sylvestre Lacour, Guy S. Perrin, Observatoire de Paris à Meudon (France); Stefan Gillessen, Max-Planck-Institut für extraterrestrische Physik (Germany); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Christian Straubmeier, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany) [7734-71]

3:00 pm: **The fringe detection laser metrology for the GRAVITY interferometer at the VLTI**, Hendrik Bartko, Stefan Gillessen, Sebastian Rabien, Markus Thiel, Alex P. Gräter, Marcus Haug, Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Sylvestre Lacour, Observatoire de Paris à Meudon (France); Christian Straubmeier, Univ. zu Köln (Germany); Jean-Philippe Berger, Laurent Jocou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Wael Chibani, Severin Luest, Wolfgang Fabian, Max-Planck-Institut für extraterrestrische Physik (Germany); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Guy S. Perrin, Observatoire de Paris à Meudon (France); Antonio Amorim, Univ. de Lisboa (Portugal) [7734-72]

3:20 pm: **First results from fringe tracking with the PRIMA fringe sensor unit**, Johannes Sahlmann, Observatoire de Genève (Switzerland) and European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Roberto N. Abuter, Serge Ménardi, Christian Schmid, Nicola Di Lieto, Françoise Delplancke, Robert Frahm, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Philippe B. Gitton, European Southern Observatory (Chile); Nuno Gomes, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Pierre Haguenaer, European Southern Observatory (Chile); Samuel A. Lévesque, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Sébastien Morel, European Southern Observatory (Chile); Andre Mueller, Thanh Phan Duc, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Nicolas Schuhler, European Southern Observatory (Chile); Gerard T. van Belle, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7734-73]

Coffee Break 3:40 to 4:10 pm

SESSION 17

Room: California Thurs. 4:10 to 5:30 pm

Critical Subsystems III

Session Chair: Christopher Tycner, Central Michigan Univ.

4:10 pm: **The polarization-based collimated beam combiner and the proposed NOVA fringe tracker (NFT) for the VLTI**, Jeffrey A. Meisner, Walter J. Jaffe, Leiden Univ. (Netherlands); Rudolf S. Le Poole, Leiden Univ. (Netherlands) and TNO Science and Industry (Netherlands); Sylvania F. Pereira, Technische Univ. Delft (Netherlands); Andreas Quirrenbach, Landessternwarte Heidelberg (Germany); David Raban, Amir Vosteen, TNO Science and Industry (Netherlands) [7734-74]

4:30 pm: **The planar optics phase sensor: an answer for the VLTI second-generation fringe tracker**, Nicolas Blind, Laurent Jocou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Olivier Absil, Univ. de Liège (Belgium); Jean-Philippe Berger, Eric Tatulli, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Jean-Baptiste Le Bouquin, European Southern Observatory (Chile); Philippe Feautrier, Lionel Vincent, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Nassima Tarmoul, Denis Mourard, François Hénault, Univ. de Nice Sophia Antipolis (France); Denis Defrère, Alain Sarlette, Univ. de Liège (Belgium); Karine Rousselet-Perraut, Fabien Malbet, Pierre Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-76]

4:50 pm: **Multi-axial integrated optics solution for POPS, a second-generation VLTI fringe tracker**, Nassima Tarmoul, François Hénault, Denis Mourard, Observatoire de la Côte d'Azur (France); Jean-Philippe Berger, Laurent Jocou, Pierre Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Olivier Absil, Institut d'Astrophysique et de Géophysique (Belgium) [7734-77]

5:10 pm: **Coherent integration: To real time or not to real time? That is the question**, Anders M. Jorgensen, New Mexico Institute of Mining and Technology (United States); David Mozurkewich, Seabrook Engineering (United States) . [7734-78]

Thursday Poster Session

Room: Grand Exhibit Hall Thurs. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Thursday. The interactive poster session with authors in attendance will be Thursday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Current and Planned Facilities and Instruments

Review of OCA activities on nulling testbench PERSEE, François Hénault, Paul Girard, Aurélie Marcotto, Nicolas Mauclert, Christophe Baillet, Jean-Michel Clause, Denis Mourard, Yves Rabbia, Alain Roussel, Observatoire de la Côte d'Azur (France); Marc Barillot, Thales Alenia Space (France); Jean-Michel Le Duigou, Ctr. National d'Études Spatiales (France) [7734-103]

Upgrade of Michigan infrared combiner (MIRC), Xiao Che, John D. Monnier, Univ. of Michigan (United States); Ettore Pedretti, Nathalie D. Thureau, Univ. of St. Andrews (United Kingdom); Theo A. ten Brummelaar, Georgia State Univ. (United States) [7734-104]

Measuring the effective wavelength of CHARA classic, Emily C. Bowsher, Harold A. McAlister, Theo A. ten Brummelaar, Georgia State Univ. (United States) [7734-105]

The LINC-NIRVANA fringe and flexure tracker: first measurements of the testbed interferometer, Lydia Moser, Andreas Eckart, Matthew Horrobin, Bettina Lindhorst, Steffen Rost, Christian Straubmeier, Evangelia Tremou, Imke Wank, Jens Zuther, Univ. zu Köln (Germany); Thomas Bertram, Max-Planck-Institut für Astronomie (Germany) [7734-106]

OVMS: the optical path difference and vibration monitoring system for the LBT and its interferometers, Martin Kuerster, Thomas Bertram, Jose Luis Borelli, Mario Brix, Wolfgang Gässler, Thomas M. Herbst, Vianak Naranjo, Jörg-Uwe Pott, Max-Planck-Institut für Astronomie (Germany); Thomas E. Connors, Philip M. Hinz, Thomas J. McMahon, David S. Ashby, Joar G. Brynne, Tony Edgin, Jorge D. Esguerra, Richard F. Green, Joseph Kraus, John Little, Norman J. Cushing, The Univ. of Arizona (United States); Udo Beckmann, Gerd P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) [7734-107]

GRAVITY spectrometer: metrology laser blocking strategy at OD=12, Constanza Araujo-Hauc, Sebastian Fischer, Univ. zu Köln (Germany); Hendrik Bartko, Stefan Gillessen, Max-Planck-Institut für extraterrestrische Physik (Germany); Christian Straubmeier, Michael Wiest, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Guy S. Perrin, Observatoire de Paris à Meudon (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Andreas Eckart, Univ. zu Köln (Germany) [7734-108]

Development of the integrated optics beam combiner assembly for GRAVITY/ VLTI, Laurent Jocou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-109]

Prototyping a new data acquisition system for the NPOI, Daniel DeVargas, Anders M. Jorgensen, New Mexico Institute of Mining and Technology (United States); Tim Buschmann, U.S. Naval Observatory (United States); J. Thomas Armstrong, U.S. Naval Research Lab. (United States); David Mozurkewich, Seabrook Engineering (United States); Sergio R. Restaino, U.S. Naval Research Lab. (United States) [7734-110]

The GRAVITY spectrometers: optical design and principle of operation, Christian Straubmeier, Sebastian Fischer, Constanza Araujo-Hauck, Michael Wiest, Andreas Eckart, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Guy S. Perrin, Observatoire de Paris à Meudon (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany) [7734-111]

The case for a 6 to 8 telescope imager at VLTI: status of the VSI instrument, Fabien Malbet, Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Paulo J. V. Garcia, Univ. do Porto (Portugal); David F. Buscher, Univ. of Cambridge (United Kingdom); Mario Gai, Osservatorio Astronomico di Torino (Italy); Josef Hron, Univ. Wien (Austria); Ralph Neuhaeuser, Friedrich-Schiller-Univ. Jena (Germany); Jean M. Surdej, Univ. de Liège (Belgium); Gerd P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) [7734-112]

The hydrogen emission of young stellar objects: key science for next-generation instruments and facilities, Paulo J. V. Garcia, Univ. do Porto (Portugal) and Observatoire de Grenoble (France); Catherine Dougados, Observatoire de Grenoble (France); Fabrizio Massi, Myriam Benisty, F. Bacciotti, Osservatorio Astrofisico di Arcetri (Italy); Jean-Baptiste Le Bouquin, European Southern Observatory (Chile); Fabien Malbet, Observatoire de Grenoble (France); L. Podio, Kapteyn Astronomical Institute (Netherlands); Stéphanie Renard, E. Whelam, Observatoire de Grenoble (France) [7734-113]

PIONIER a visitor instrument for VLTI, Jean-Philippe Berger, Gérard Zins, Bernard Lazareff, Laurent Jocou, Pierre Y. Kern, Sylvain Rochat, Fabien Malbet, Jean-Baptiste Le Bouquin, David Gillier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Rafael Millan-Gabet, California Institute of Technology (United States); Wesley A. Traub, Jet Propulsion Lab. (United States) [7734-114]

Facility Issues

Evaluation of performance of the MACAO systems at the VLTI, Sridharan Rengaswamy, Stephane Brillant, Pierre Haguenuer, Stephane Guisard, European Southern Observatory (Chile); Jerome Paufigue, European Southern Observatory (Germany); Julien H. Girard, Andres Pino, Angela Cortes, European Southern Observatory (Chile) [7734-115]

Observing Techniques

Status of the VLTI-UT performances with regards to vibrations, Sebastien Poupau, Pierre Haguenuer, European Southern Observatory (Chile) [7734-116]

Comparison between closure phase and phase referenced interferometric image reconstructions, Nuno Gomes, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) and Univ. do Porto (Portugal) and Lab. de Sistemas Instrumentação Modelação em Ciências e Tecnologias do Ambiente e Espaço (Portugal); Paulo J. V. Garcia, Univ. do Porto (Portugal) and Lab. d'Astrophysique, Observatoire de Grenoble (France); Éric M. Thiébaud, Observatoire de Lyon (France); Mercedes Filho, Univ. do Porto (Portugal); Stéphanie Renard, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-117]

The effects of atmospheric calibration errors on source model parameters, Christopher Tycner, Central Michigan Univ. (United States); Donald J. Hutter, Robert T. Zavala, U. S. Naval Observatory (United States) [7734-118]

Dual three-way infrared beam combiner at the CHARA array, Judit Sturmman, Theo A. ten Brummelaar, Laszlo Sturmman, Harold A. McAlister, Mount Wilson Institute (United States) [7734-119]

Probing Cepheid stars with AMBER: the case of X Sgr, Simone Antonucci, Gianluca Li Causi, Osservatorio Astronomico di Roma (Italy); Florentin A. Millour, Max-Planck-Institut für Radioastronomie (Germany); Giuseppe Bono, Univ. degli Studi di Roma Tor Vergata (Italy); Teresa Giannini, Dario Lorenzetti, Brunella Nisini, Osservatorio Astronomico di Roma (Italy) [7734-120]

Detection of a geostationary satellite with the Navy prototype optical interferometer, J. Thomas Armstrong, Robert B. Hindsley, U.S. Naval Research Lab. (United States); Henrique R. Schmitt, Interferometrics Inc. (United States); Frederick J. Vrba, James A. Benson, Donald J. Hutter, Robert T. Zavala, U.S. Naval Observatory (United States) [7734-121]

Imaging simulations of selected science with the Magdalena Ridge Observatory interferometer, Michelle J. Creech-Eakman, New Mexico Institute of Mining and Technology (United States); Martin Elvis, Harvard-Smithsonian Ctr. for Astrophysics (United States); David F. Buscher, Christopher A. Haniff, John S. Young, Univ. of Cambridge (United Kingdom) [7734-122]

A survey of the NPOI data archive, Thomas Hall, Anders M. Jorgensen, New Mexico Institute of Mining and Technology (United States); Elynn K. Baines, U.S. Naval Research Lab. (United States); Henrique R. Schmitt, U.S. Naval Research Lab. (United States) and Interferometrics, Inc. (United States); J. Thomas Armstrong, Robert B. Hindsley, U.S. Naval Research Lab. (United States) [7734-123]

A publication database for optical long baseline interferometry, Fabien Malbet, Guillaume Mella, Sylvain Lafrasse, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Esther Taillifet, Univ. Joseph Fourier (France); Peter R. Lawson, Jet Propulsion Lab. (United States) [7734-124]

Observations of binaries with the NPOI, Henrique R. Schmitt, J. Thomas Armstrong, U.S. Naval Research Lab. (United States); Anders M. Jorgensen, New Mexico Institute of Mining and Technology (United States); Elynn K. Baines, Robert B. Hindsley, U.S. Naval Research Lab. (United States) [7734-125]

SIM-Lite detection of habitable planets in P-type binary-planetary systems, Xiaopei Pan, Michael Shao, Stuart B. Shaklan, Renaud Goullioud, Jet Propulsion Lab. (United States) [7734-126]

Homothetic apodization of circular aperture HACA: simulation results, Ossama Azagrouze, Abdelkettah Habib, Youssef Elazhari, Mohamed Lazrek, Zouhair Z. Benkhalidoun, Univ. Cadi Ayyad (Morocco) [7734-127]

Tunable spatial heterodyne spectroscopy (TSHS): a new technique for broadband visible interferometry, S. Sona Hosseini, Walter M. Harris, Dustin M. Ruth, Aaron C. Gong, Hector A. Baldis, Univ. of California, Davis (United States) [7734-128]

From fringes to the USNO Navy prototype optical interferometer astrometric catalog, James A. Benson, Donald J. Hutter, Robert T. Zavala, Hugh C. Harris, Paul D. Shankland, Kenneth J. Johnston, U.S. Naval Observatory (United States) [7734-129]

First results from MIDI observation with PRIMA FSU as a fringe sensor, Andre Mueller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) and Max-Planck-Institut für Astronomie (Germany); Sébastien Morel, European Southern Observatory (Chile); Gerard T. van Belle, Roberto N. Abuter, Françoise Delplancke, Samuel A. Lévêque, Christian Schmid, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7734-130]

Limb-darkened angular diameters of stars using infrared and optical interferometry, Elynn K. Baines, J. Thomas Armstrong, U.S. Naval Research Lab. (United States) [7734-131]

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A very wide-field wavefront sensor for a very narrow-field interferometer, Valentina Viotto, Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Carmelo Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); Maria Bergomi, Osservatorio Astronomico di Padova (Italy); Alessandro Brunelli, Univ. degli Studi di Padova (Italy); Marco Dima, Jacopo Farinato, Giorgia Gentile, Demetrio Magrin, Osservatorio Astronomico di Padova (Italy); Giuseppe Cosentino, Univ. degli Studi di Bologna (Italy); Emiliano Diolaiti, Italo Foppiani, Matteo Lombini, Osservatorio Astronomico di Bologna (Italy); Laura Schreiber, Univ. degli Studi di Bologna (Italy); Thomas Bertram, Peter Bizenberger, Fulvio De Bonis, Wolfgang Gässler, Thomas M. Herbst, Martin Kuerster, Lars Mohr, Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany) [7734-132]

A monolithic Michelson interferometer as a wavelength reference source for high-precision RV measurements, Xiaoke Wan, Jian C. Ge, Univ. of Florida (United States) [7734-133]

Development of a high-dynamic range imaging instrument for a single telescope by a pupil remapping system, Takayuki Kotani, Japan Aerospace Exploration Agency (Japan); Sylvestre Lacour, Elodie Choquet, Guy S. Perrin, Pierre Fedou, Observatoire de Paris à Meudon (France); Franck Marchis, SETI Institute (United States) and Univ. of California, Berkeley (United States); Gaspard Duchene, SETI Institute (United States); Éric M. Thiébaud, Ctr. de Recherche Astrophysique de Lyon (France); Julien M. Woillez, W. M. Keck Observatory (United States); Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Pascal J. Bordé, Institut d'Astrophysique Spatiale (France); Olivier Chesneau, Observatoire de la Côte d'Azur (France); Pierre Kervella, Observatoire de Paris à Meudon (France); Olivier Lai, Canada-France-Hawaii Telescope (United States); Stephen T. Ridgway, National Optical Astronomy Observatory (United States); Daniel Rouan, Observatoire de Paris à Meudon (France); Alain Lecavelier des Etangs, Institut d'Astrophysique de Paris (France); Alfred Vidal-Madjar, Institut d'Astrophysique Spatiale (France) [7734-134]

Three-dimensional photonic combiner for optical astro interferometry, Stefano Minardi, Thomas Pertsch, Ralph Neuhaeuser, Friedrich-Schiller-Univ. Jena (Germany) [7734-136]

Design, fabrication, and testing of a super stable monolithic interferometer for infrared exoplanet tracker, Ji Wang, Xiaoke Wan, Jian C. Ge, Univ. of Florida (United States) [7734-137]

Mid-infrared waveguides for interferometric beam combiners, Guillermo Martin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Lucas Labadie, Instituto de Astrofísica de Canarias (Spain); Romain Grille, Alain Delboulbé, Brahim Arezki, Pierre Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-138]

Feeding the wavefront sensors of LINC-NIRVANA: the dedicated patrol camera, Dario Lorenzetti, Francesco D'Alessio, Gianluca Li Causi, Fabrizio Vitali, Mauro Centrone, Roberto Speziali, Osservatorio Astronomico di Roma (Italy); Emiliano Diolaiti, Osservatorio Astronomico di Bologna (Italy); Jacopo Farinato, Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Thomas Bertram, Florian R. Briegel, Fulvio De Bonis, Wolfgang Gaessler, Thomas M. Herbst, Martin Kuerster, Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany) [7734-139]

A new embedded control system for SUSI, William J. Tango, Michael J. Ireland, The Univ. of Sydney (Australia) [7734-140]

Custom beamsplitter and AR coatings for interferometry, Colby A. Jurgenson, New Mexico Institute of Mining and Technology (United States); David F. Buscher, Christopher A. Haniff, Univ. of Cambridge (United Kingdom); Jeff Lewis, Reed Schmall, Optical Surface Technologies, LLC (United States) [7734-141]

Fringe modulation for an MROI beam combiner, Tyler M. McCracken, Colby A. Jurgenson, John Seamons, Krista M. McCord, New Mexico Institute of Mining and Technology (United States); David F. Buscher, Christopher A. Haniff, John S. Young, Univ. of Cambridge (United Kingdom) [7734-142]

Fresnel diffraction in an interferometer: application to MATISSE, Sylvie Robbe-Dubois, Yves Bresson, Stéphane Lagarde, Bruno Lopez, Romain G. Petrov, Pierre Antonelli, Observatoire de la Côte d'Azur (France) [7734-143]

Hybrid sol gel technology for fast prototyping of integrated optic devices used in astronomical interferometry, Askari Ghasempour, António Leite, Univ. do Porto (Portugal); François Reynaud, XLIM Institut de Recherche (France); Paulo Marques, Paulo J. V. Garcia, Univ. do Porto (Portugal) [7734-144]

MAMMUT: mirror vibration metrology for VLTi, Izabela Spaleniak, Frank Giessler, Reinhard Geiss, Stefano Minardi, Thomas Pertsch, Ralph Neuhaeuser, Friedrich-Schiller-Univ. Jena (Germany); Martin Becker, Manfred Rothhardt, IPHT Jena (Germany); Françoise Delplancke, Andrea Richichi, Serge Ménardi, Christian Schmid, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7734-145]

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The atmospheric piston simulator as an integral part of the calibration unit of LINC-NIRVANA, Roman Follert, Fulvio De Bonis, Thomas M. Herbst, Peter Bizenberger, Max-Planck-Institut für Astronomie (Germany) [7734-146]

A real-time signal processing concept for an accelerometer-based calculation of telescope-induced optical-path-difference vibrations at the LBT, Mario Brix, Jörg-Uwe Pott, Thomas Bertram, Max-Planck-Institut für Astronomie (Germany); Steffen Rost, Univ. zu Köln (Germany); Jose Luis Borelli, Max-Planck-Institut für Astronomie (Germany); Jorge D. Eguerra, The Univ. of Arizona (United States); Wolfgang Gässler, Thomas M. Herbst, Martin Kuerster, Vianak Naranjo, Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany) [7734-147]

The LINC-NIRVANA fringe and flexure tracker: laboratory tests, Evangelia Tremou, Andreas Eckart, Matthew Horrobin, Bettina Lindhorst, Lydia Moser, Steffen Rost, Christian Straubmeier, Imke Wank, Jens Zuther, Univ. zu Köln (Germany); Thomas Bertram, Max-Planck-Institut für Astronomie (Germany) [7734-148]

PhaseCam: the phase sensing facility for the LBT interferometer, Philip M. Hinz, Olivier Durney, Jihun Kim, The Univ. of Arizona (United States) [7734-149]

Interferometry with a large number of apertures, David Mozurkewich, Seabrook Engineering (United States); Aboubakar Traore, Sigma Space Corp. (United States) [7734-150]

Mechanical design of the Magdalena Ridge Observatory interferometer, Fernando G. Santoro, Andres Olivares, Chris Salcido, Stephen Jimenez, New Mexico Institute of Mining and Technology (United States); Xiaowei Sun, Christopher A. Haniff, David F. Buscher, Univ. of Cambridge (United Kingdom); Michelle J. Creech-Eakman, Colby A. Jurgenson, Alisa V. Shtromberg, Eric J. Bakker, New Mexico Institute of Mining and Technology (United States); John S. Young, Martin Fisher, Donald M. A. Wilson, Univ. of Cambridge (United Kingdom) [7734-151]

Modified telescope alignment procedure improves CHARA Telescope beam quality, Laszlo Sturmman, Judit Sturmman, Theo A. ten Brummelaar, Harold A. McAlister, Georgia State Univ. (United States) [7734-152]

The MROI fringe tracker: laboratory fringes and progress toward first light, Colby A. Jurgenson, Fernando G. Santoro, Tyler M. McCracken, Krista M. McCord, New Mexico Institute of Mining and Technology (United States); David F. Buscher, Christopher A. Haniff, John S. Young, Univ. of Cambridge (United Kingdom); Michelle J. Creech-Eakman, New Mexico Institute of Mining and Technology (United States) [7734-153]

A new control architecture for multi-beam fringe tracker, Lionel Vincent, Univ. of Grenoble (France) and Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Mazen Alami, Univ. of Grenoble (France); Jean-Baptiste Le Bouquin, European Southern Observatory (Chile); Laurent Jocou, Karine Rousselet-Perraut, Pierre Y. Kern, Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-154]

The LINC-NIRVANA fringe and flexure tracker: an update of the opto-mechanical system, Jens Zuther, Andreas Eckart, Matthew Horrobin, Bettina Lindhorst, Uwe Lindhorst, Lydia Moser, Steffen Rost, Christian Straubmeier, Evangelia Tremou, Imke Wank, Univ. zu Köln (Germany); Thomas Bertram, Max-Planck-Institut für Astronomie (Germany) [7734-155]

Design of the MROI delay line optical path compensator, Martin Fisher, Roger C. Boysen, David F. Buscher, Christopher A. Haniff, Eugene B. Seneta, Xiaowei Sun, Donald M. A. Wilson, John S. Young, Univ. of Cambridge (United Kingdom) [7734-156]

Software

Bias-free imaging at low light levels, James A. Gordon, David F. Buscher, Univ. of Cambridge (United Kingdom); Fabien Baron, Univ. of Michigan (United States) [7734-157]

The data-reduction software for micro-arcsecond astrometry with PRIMA at the VLT, Rainer Koehler, Ingo Stiltz, Andreas Quirrenbach, Adrian Kaminski, Landessternwarte Heidelberg (Germany); Tim Schulze-Hartung, Ralf Launhardt, Max-Planck-Institut für Astronomie (Germany); Nicholas M. Elias II, National Radio Astronomy Observatory (United States); Thomas Henning, Max-Planck-Institut für Astronomie (Germany); Didier Queloz, Univ. of Geneva (Switzerland) [7734-158]

The third version of the AMBER data reduction software, Fabien Malbet, Gilles Duvert, Jean-Baptiste Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Florentin A. Millour, Max-Planck-Institut für Radioastronomie (Germany); Guillaume Mella, Sylvain Lafrasse, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-159]

GPU-accelerated image reconstruction for optical/infrared interferometry, Fabien Baron, Univ. of Michigan (United States); Brian K. Kloppenburg, Univ. of Denver (United States) [7734-160]

Building the 'JMJC bright star diameter catalog' using the SearchCal VO service, Sylvain Lafrasse, Guillaume Mella, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Daniel Bonneau, Observatoire de la Côte d'Azur (France); Gilles Duvert, Alain E. Chelli, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-161]

SCDU testbed automated in-situ alignment, data acquisition, and analysis, Thomas A. Werne, Udo J. Wehmeier, Xin An, Renaud Goullioud, Bijan Nemati, Michael Shao, Tsae-Pyng J. Shen, Xu Wang, Mark A. Weibert, Janet P. Wu, Chengxing Zhai, Jet Propulsion Lab. (United States) [7734-162]

Space Interferometer Technology

Development of a celestial infrared nuller experiment (CELINE) for broadband nulling and new single-mode fiber testing, Charles P. Hanot, Pierre Riaud, Univ. de Liège (Belgium); Dimitri P. Mawet, Jet Propulsion Lab. (United States); Jean M. Surdej, Serge L. Habraken, Univ. de Liège (Belgium) [7734-163]

The fulfillment of two-level close-loop control in optical delay line of Michelson stellar interferometer, Li Chao, National Astronomical Observatories (China) and Key Lab. of Astronomical Optics & Technology (China) and Graduate Univ. of Chinese Academy of Sciences (China); Wu Zhen, National Astronomical Observatories (China) and Key Lab. of Astronomical Optics & Technology (China); Jianing Wang, Nanjing Institute of Astronomical Optics & Technology (China); Liu Yi, Nanjing Univ. of Science & Technology (China); Yi Chen, Nanjing Institute of Astronomical Optics & Technology (China) [7734-164]

Results of the Guide-2 Telescope testbed for the SIM-Lite Astrometric Observatory, Inseob Hahn, Mark A. Weibert, Jagmit S. Sandhu, Xu Wang, Robert F. Smythe, Erik Hovland, Frank M. Loya, Joel F. Shields, Dhemitrio Boussalis, Nanaz Fathpour, Bryan H. Kang, Asif Ahmed, Glenn A. Macala, Fabien Nicaise, Mauricio J. Morales, Frank G. Dekens, Renaud Goullioud, Jet Propulsion Lab. (United States) [7734-165]

Mitigation of angle tracking errors due to color dependent centroid shifts in SIM-Lite, Bijan Nemati, Jet Propulsion Lab. (United States) [7734-166]

SCDU testbed narrow angle astrometric performance, Xu Wang, Xin An, Renaud Goullioud, Bijan Nemati, Michael Shao, Tsae-Pyng J. Shen, Udo J. Wehmeier, Mark A. Weibert, Thomas A. Werne, Janet P. Wu, Chengxing Zhai, Jet Propulsion Lab. (United States) [7734-167]

Progress on SIM-Lite brassboard interferometer integration and test, Inseob Hahn, Mark A. Weibert, Xin An, Gary M. Kuan, Larry E. Hovland, Robert F. Smythe, Erik Hovland, Robert J. Krylo, Melanie L. Fisher, Zensheu Chang, Juan Cepeda-Rizo, Joel F. Shields, Asif Ahmed, Nanaz Fathpour, Johnathan W. Carson, Fabien Nicaise, Mauricio J. Morales, Frank G. Dekens, Renaud Goullioud, Jet Propulsion Lab. (United States) [7734-168]

SIM brassboard astrometric beam combiner (ABC) integration and performance testing, Xin An, Gary M. Kuan, Douglas M. Moore, Hong Tang, Mark A. Weillert, Eric E. Bloemhof, Norman A. Page, James D. Moore, Lung-Sheng Lin, Zensheu Chang, Larry E. Hovland, Kristen K. Sutherland, Rami A. Wehbe, Randall D. Bartos, Robert P. Zimmer, Bruno M. Jau, Brian P. Trease, Wesley P. Schmitgal, Muthu Jeganathan, Frank G. Dekens, Renaud Goullioud, Jet Propulsion Lab. (United States). . . [7734-169]

Exoplanet detection performance of the terrestrial Planet Finder interferometer beam combiner, Stefan R. Martin, Jet Propulsion Lab. (United States); Andrew J. Booth, Sigma Space Corp. (United States); Oliver P. Lay, Peter R. Lawson, Jet Propulsion Lab. (United States). [7734-170]

Friday 2 July

SESSION 18

Room: California Fri. 8:00 to 10:00 am

Technologies I

Session Chair: Antoine Mérand, European Southern Observatory (Chile)

8:00 am: **The 2008-2009 outburst of the young binary system Z CMa unraveled by interferometry with medium and high spectral resolution**, Fabien Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Myriam Benisty, Osservatorio Astrofisico di Arcetri (Italy); Catherine Dougados, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Antonella Natta, Osservatorio Astrofisico di Arcetri (Italy); Jean-Baptiste Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Fabrizio Massi, Osservatorio Astrofisico di Arcetri (Italy); Jérôme Bouvier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Konstantin Grankin, Crimean Astrophysical Observatory (Ukraine); Mickaël Bonnefoy, Lab. d'Astrophysique de l'Observatoire de Grenoble (France). [7734-79]

8:20 am: **Implementation of the chromatic phase diversity method on the SIRIUS test bench: results and performances of this cophasing method**, Nassima Tarmoul, Denis Mourard, François Hénault, Alain Spang, Jean-Michel Clause, Aurélie Marcotto, Alain Roussel, Paul Girard, Nicolas Mauclert, Yves Rabbia, Observatoire de la Côte d'Azur (France) [7734-80]

8:40 am: **Wavefront calibration and correction of an optical train path: a compliant static deformable mirror approach**, James H. Clark III, U.S. Naval Research Lab. (United States); F. Ernesto Penado, Northern Arizona Univ. (United States); Frank Cornelius, Interferometrics Inc. (United States) [7734-81]

9:00 am: **The fiber coupler subsystem of the future VLT instrument GRAVITY**, Oliver Pfuhl, Frank Eisenhauer, Markus Haug, Markus Thiel, Stefan Kellner, Max-Planck-Institut für extraterrestrische Physik (Germany); Antonio Amorim, Univ. de Lisboa (Portugal); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Jean-Philippe Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Guy S. Perrin, Observatoire de Paris à Meudon (France); Christian Straubmeier, Univ. zu Köln (Germany); Stefan Gillessen, Hendrik Bartko, Alex P. Gräter, Max-Planck-Institut für extraterrestrische Physik (Germany) [7734-82]

9:20 am: **Reliable optical pump architecture for highly coherent lasers used in space metrology applications**, Hernan Erlig, Yueming Qiu, Ilya Poberezhskiy, Patrick L. Meras, Jr., James Wu, Jet Propulsion Lab. (United States) [7734-83]

9:40 am: **'OHANA-Iki: a testbed for the 'OHANA beam combiner and delay line at CFHT**, Marc R. Baril, Olivier Lai, Canada-France-Hawaii Telescope (United States); Flora Bouchacourt, George Zahariade, Ecole Polytechnique (France); Guy S. Perrin, Observatoire de Paris à Meudon (France); Julien M. Woillez, W. M. Keck Observatory (United States); Pierre Fedou, Observatoire de Paris à Meudon (France) . . . [7734-84]
Coffee Break 10:00 to 10:30 am

SESSION 19

Room: California Fri. 10:30 to 11:10 am

Technologies II

Session Chair: Joshua A. Eisner, The Univ. of Arizona

10:30 am: **The wide-field imaging interferometry testbed (WIIT): recent progress**, Stephen A. Rinehart, David T. Leisawitz, Matthew R. Bolcar, Kara Chaprnka, Richard G. Lyon, NASA Goddard Space Flight Ctr. (United States); Stephen F. Maher, Science Systems and Applications, Inc. (United States); Nargess Memarsadeghi, NASA Goddard Space Flight Ctr. (United States); Evan A. Sinukoff, McMaster Univ. (Canada) [7734-85]

10:50 am: **Recent progress on the NULLIMATE test bench**, Peter A. Schuller, Olivier Demangeon, Alain M. Léger, Institut d'Astrophysique Spatiale (France); Bruno Chazelas, Observatoire de Genève (Switzerland); Michel Decaudin, Philippe Duret, Pavel Gabor, Institut d'Astrophysique Spatiale (France); Jean Gay, Observatoire de la Côte d'Azur (France); Alain M. Labèque, Institut d'Astrophysique Spatiale (France); Ralf Launhardt, Max-Planck-Institut für Astronomie (Germany); Yves Rabbia, Observatoire de la Côte d'Azur (France); Zoran Sodnik, European Space Research and Technology Ctr. (Netherlands) [7734-86]

SESSION 20

Room: California Fri. 11:10 am to 12:10 pm

Software I

Session Chair: Joshua A. Eisner, The Univ. of Arizona

11:10 am: **Estimating the phase in interferometry: performances comparison between single-mode and multimode schemes and application to fringe tracking techniques**, Eric Tatulli, Nicolas Blind, Jean-Philippe Berger, Alain E. Chelli, Fabien Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France)[7734-87]

11:30 am: **Analysis of LBT LINC-NIRVANA simulated images with the software package AIRY-LN**, Paolo Ciliegi, Osservatorio Astronomico di Bologna (Italy); Andrea La Camera, Univ. degli Studi di Genova (Italy); Simone Antonucci, Osservatorio Astronomico di Roma (Italy); Gabriele Desidera, Mario Bertero, Patrizia Boccacci, Univ. degli Studi di Genova (Italy); Marcel Carbillet, Univ. de Nice Sophia Antipolis (France); Emiliano Diolaiti, Osservatorio Astronomico di Bologna (Italy); Italo Foppiani, Univ. degli Studi di Bologna (Italy); Matteo Lombini, Dario Lorenzetti, Brunella Nisini, Osservatorio Astronomico di Bologna (Italy); Laura Schreiber, Univ. degli Studi di Bologna (Italy) [7734-88]

11:50 am: **A novel imaging algorithm for broadband aperture synthesis data**, Christian A. Hummel, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Roberto Baena Galle, Univ. de Barcelona (Spain) [7734-89]

Lunch Break 12:10 to 1:20 pm

SESSION 21

Room: California Fri. 1:20 to 2:00 pm

Software II

Session Chair: Françoise Delplancke, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

1:20 pm: **A novel image reconstruction software for optical/infrared interferometry**, Fabien Baron, John D. Monnier, Univ. of Cambridge (United States) [7734-90]

1:40 pm: **On the use of spectral regularization and parcimonious representation bases for improving the image reconstruction from interferometric data**, Martin Vannier, David Mary, Romain G. Petrov, Celine Theys, Univ. de Nice Sophia Antipolis (France) [7734-91]

SESSION 22

Room: California Fri. 2:00 to 3:00 pm

Space Interferometer Technologies III

Session Chair: Françoise Delplancke, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

2:00 pm: **New concept for direct detection and spectra of exoplanets**, Taro Matsuo, National Astronomical Observatory of Japan (Japan); Wesley A. Traub, Jet Propulsion Lab. (United States); Makoto Hattori, Tohoku Univ. (Japan); Motohide Tamura, National Astronomical Observatory of Japan (Japan); Michael Shao, Jet Propulsion Lab. (United States). [7734-92]

2:20 pm: **Integrated optics for nulling interferometry in the thermal infrared: progress and recent achievements**, Marc Barillot, Thales Alenia Space (France); Eleonore Barthelemy, Univ. Montpellier 2 (France); Lionel Bastard, Jean E. Broquin, Ecole Nationale Supérieure d'Electronique et de Radioélectrique de Grenoble (France); Gary J. Hawkins, The Univ. of Reading (United Kingdom); Volker Kirschner, European Space Research and Technology Ctr. (Netherlands); Stéphane Menard, Thales Alenia Space (France); Gilles Parent, Lab. d'Energétique et de Mécanique Théorique et Appliquée (France); Annie Pradel, Caroline Vigreux, Univ. Montpellier 2 (France); Shaoqian Zhang, Xianghua Zhang, Univ. de Rennes 1 (France) . . . [7734-93]

2:40 pm: **PERSEE: experimental results on the cophased nulling bench**, Julien Lozi, Frédéric Cassaing, ONERA (France) and GIS PHASE between ONERA, Observatoire de Paris, CNRS and Université Paris Diderot (France); Jean-Michel Le Duigou, Ctr. National d'Études Spatiales (France); Kamel Houairi, Beatrice Sorrente, Joseph Montri, ONERA (France) and GIS PHASE between ONERA, Observatoire de Paris, CNRS and Université Paris Diderot (France); Sophie Jacquino, Institut d'Astrophysique Spatiale d'Orsay (France); Jean-Michel Réess, Laurie Pham, Emilie Lhome, Tristan Buey, Observatoire de Paris à Meudon (France) and GIS PHASE between ONERA, Observatoire de Paris, CNRS and Université Paris Diderot (France); François Hénault, Aurélie Marcotto, Paul Girard, Nicolas Mauclet, Observatoire de la Côte d'Azur (France); Marc Barillot, Thales Alenia Space (France); Vincent Coudé du Foresto, Observatoire de Paris à Meudon (France) and GIS PHASE between ONERA, Observatoire de Paris, CNRS and Université Paris Diderot (France); Marc Ollivier, Institut d'Astrophysique Spatiale d'Orsay (France) [7734-95]
 Coffee Break 3:00 to 3:30 pm

SESSION 23

Room: California Fri. 3:30 to 5:50 pm

Observing Technologies

Session Chair: William C. Danchi, NASA Goddard Space Flight Ctr.

3:30 pm: **The 2010 interferometric imaging beauty contest**, Fabien Malbet, Gilles Duvert, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); William D. Cotton, National Radio Astronomy Observatory (United States); Peter R. Lawson, Jet Propulsion Lab. (United States); Karl-Heinz Hofmann, Gerd P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); John Young, Mullard Radio Astronomy Observatory (United Kingdom); Fabien Baron, Univ. of Michigan (United States); David F. Buscher, Mullard Radio Astronomy Observatory (United Kingdom); Brian K. Kloppenborg, Univ. of Denver (United States); Eric M. Thiébaud, Ctr. de Recherche Astrophysique de Lyon (France); Stéphanie Renard, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Sridharan Rengaswamy, European Southern Observatory (Germany); Martin Vannier, Univ. de Nice Sophia Antipolis (France); Laurent M. Mugnier, ONERA (France); John D. Monnier, Univ. of Michigan (United States) [7734-96]

3:50 pm: **Optical long baseline interferometry news (OLBIN)**, Peter R. Lawson, Jet Propulsion Lab. (United States); Fabien Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7734-97]

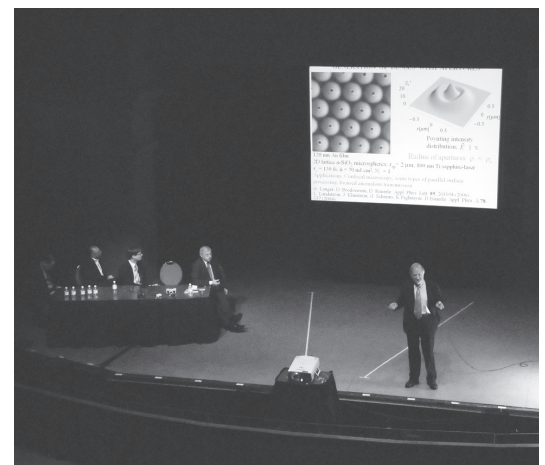
4:10 pm: **Developing achromatic coronagraphic optics for LMIRCam and the LBT**, Matthew A. Kenworthy, Leiden Observatory (Netherlands) and The Univ. of Arizona (United States); Philip M. Hinz, Johanan L. Codona, The Univ. of Arizona (United States); John C. Wilson, Michael F. Skrutskie, Univ. of Virginia (United States); Elliott Solheid, The Univ. of Arizona (United States) [7734-98]

4:30 pm: **Coherent integration results from the NPOI**, Anders M. Jorgensen, New Mexico Institute of Mining and Technology (United States); Henrique R. Schmitt, U.S. Naval Research Lab. (United States) and Interferometrics, Inc. (United States); J. Thomas Armstrong, U.S. Naval Research Lab. (United States); David Mozurkewich, Seabrook Engineering (United States); Ellyn K. Baines, Robert B. Hindsley, U.S. Naval Research Lab. (United States); Donald J. Hutter, U.S. Naval Observatory (United States); Sergio R. Restaino, U.S. Naval Research Lab. (United States) [7734-99]

4:50 pm: **Toward the stability required for Darwin/TPF-I**, Olivier Demangeon, Peter A. Schuller, Alain M. Léger, Institut d'Astrophysique Spatiale (France); Bruno Chazelas, Observatoire de Genève (Switzerland); Michel Decaudin, Philippe Duret, Pavel Gabor, Institut d'Astrophysique Spatiale (France); Jean Gay, Observatoire de la Côte d'Azur (France); Alain M. Labèque, Institut d'Astrophysique Spatiale (France); Yves Rabbia, Observatoire de la Côte d'Azur (France); Zoran Sodnik, European Space Research and Technology Ctr. (Netherlands) [7734-100]

5:10 pm: **Improving null depth measurements with statistics: theory and first results with the Palomar fiber nuller**, Charles P. Hanot, Univ. de Liège (Belgium); Bertrand P. Mennesson, Eugene Serabyn, Stefan R. Martin, Kurt M. Liewer, Frank M. Loya, Jet Propulsion Lab. (United States); Pierre Riaud, Olivier Absil, Univ. de Liège (Belgium) [7734-101]

5:30 pm: **Integrated optic beam combiners for stellar interferometry and nulling at near- and mid-infrared wavelengths**, Hsien-kai Hsiao, Kim A. Winick, John D. Monnier, Univ. of Michigan (United States) [7734-102]



**See all the Special Events at SPIE
 Astronomical Instrumentation**
 See all special events, p. 7.

Facility Map
 See page 143.

Ground-based and Airborne Instrumentation for Astronomy III

Conference Chairs: **Ian S. McLean**, Univ. of California, Los Angeles; **Suzanne K. Ramsay**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Hideki Takami**, National Astronomical Observatory of Japan/Subaru Telescope

Program Committee: **Samuel C. Barden**, Anglo-Australian Observatory (Australia); **David Crampton**, NRC Dominion Astrophysics Observatory (Canada); **Stephen S. Eikenberry**, Univ. of Florida; **Christopher J. Evans**, UK Astronomy Technology Ctr. (United Kingdom); **Ramón J. García López**, Instituto de Astrofísica de Canarias (Spain); **Maureen L. Savage**, NASA Univ. Space Research Association; **Oskar F. H. von der Luehe II**, Kiopenheuer Institut für Sonnenphysik (Germany)

Sunday 27 June

SESSION 1

Room: Town & Country. Sun. 9:00 am to 12:20 pm

Instrument Overviews at Large Facilities

Session Chair: **Suzanne K. Ramsay**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

9:00 am: **Advances in instrumentation at the W. M. Keck Observatory** (*Invited Paper*), Sean M. Adkins, Taft Armandroff, Hilton A. Lewis, W. M. Keck Observatory (United States); D. Christopher Martin, California Institute of Technology (United States); Ian S. McLean, Univ. of California, Los Angeles (United States); Constance M. Rockosi, Lick Observatory (United States); Peter Wizinowich, W. M. Keck Observatory (United States) [7735-01]

9:30 am: **ESO instrumentation for the La Silla/Paranal Observatory** (*Invited Paper*), Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-02]

Coffee Break 10:00 to 10:30 am

10:30 am: **Instrumentation at the Subaru Telescope** (*Invited Paper*), Naruhisa Takato, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7735-03]

11:00 am: **Gemini Observatory instrumentation: a review of the past, present, and future on our 10th anniversary** (*Invited Paper*), Eric V. Tollestrup, Scot J. Kleinman, Stephen J. Goodsell, Gemini Observatory (United States); Gustavo Arriagada, Manuel Lazo, Rolando Rogers, Ramon L. Galvez, Gemini Observatory (Chile); John K. White, Gemini Observatory (United States) [7735-04]

11:30 am: **An overview of instrumentation for the Large Binocular Telescope** (*Invited Paper*), R. Mark Wagner, The Univ. of Arizona (United States) [7735-05]

12:00 pm: **Instrumentation suite at the MMT Observatory**, Morag A. Hastie, G. Grant Williams, MMT Observatory (United States) [7735-06]

Lunch Break 12:20 to 1:30 pm

SESSION 2

Room: Town & Country. Sun. 1:30 to 5:00 pm

Ground-based Optical Instruments I

Session Chair: **Ian S. McLean**, Univ. of California, Los Angeles

1:30 pm: **The second-generation VLT instrument MUSE**, Roland M. Bacon, Observatoire de Lyon (France) [7735-07]

1:50 pm: **HERMES: revisions in the design for a high-resolution multi-element spectrograph for the AAT**, Samuel C. Barden, Anglo-Australian Observatory (Australia); Damien J. Jones, Prime Optics (Australia); Stuart I. Barnes, Jeroen Heijmans, Anthony Heng, Anglo-Australian Observatory (Australia); Greg Knight, Sinclair Knight Merz Ltd. (Australia); David R. Orr, Greg A. Smith, Vladimir Churilov, Lewis G. Waller, Keith Shortridge, Anthony J. Horton, Don Mayfield, Roger Haynes, Dionne M. Haynes, Denis Whittard, Michael Goodwin, Scott Smedley, Ian Saunders, Peter R. Gillingham, Ed Penny, Tony J. Farrell, Minh Vuong, Ron Heald, Steve Lee, Rolf Muller, Anglo-Australian Observatory (Australia); Ken Freeman, Australian National Univ. (Australia); Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Daniel F. Zucker, Anglo-Australian Observatory (Australia) [7735-08]

2:10 pm: **The multi-object double spectrographs for the Large Binocular Telescope**, Richard W. Pogge, Bruce Atwood, David F. Brewer, Paul L. Byard, Mark A. Derwent, Raymond Gonzalez, Paul Martini, Jerry A. Mason, Thomas P. O'Brien, Patrick S. Osmer, Daniel P. Pappalardo, David P. Steinbrecher, Edward J. Teiga, Ross Zhelem, The Ohio State Univ. (United States) [7735-09]

2:30 pm: **SITELLE: a wide-field imaging Fourier transform spectrometer for the Canada-France-Hawaii Telescope**, Laurent Drissen, Univ. Laval (Canada); Frédéric J. Grandmont, ABB Inc. (Canada); Jean-Pierre Maillard, Institut d'Astrophysique de Paris (France); Carmelle Robert, Gilles Joncas, Simon Thibault, Univ. Laval (Canada); Luc Simard, National Research Council Canada (Canada); Daniel Devost, Canada-France-Hawaii Telescope (United States); Daniel Durand, National Research Council Canada (Canada); François Boulanger, Institut d'Astrophysique Spatiale (France); Juan Zorec, Institut d'Astrophysique de Paris (France) [7735-10]

2:50 pm: **Performance and sensitivity of low-resolution spectrographs(LRS) for LAMOST**, Yong-Hui Hou, Yongtian Zhu, Zhongwen Hu, Lei Wang, Jianing Wang, Nanjing Institute of Astronomical Optics & Technology (China) [7735-11]

Coffee Break 3:10 to 3:40 pm

3:40 pm: **Status of the dark energy survey camera (DECam) project**, Brenna L. Flaugher, Fermi National Accelerator Lab. (United States) [7735-12]

4:00 pm: **ADFOSC: a new optical instrument for the 3.6m Devasthal Optical Telescope**, Soumen Mondal, Ramakant S. Yadav, Mahendra Singh, Aryabhata Research Institute of Observational Sciences (India) [7735-13]

4:20 pm: **ESPRESSO: the Echelle spectrograph for rocky exoplanets and stable spectroscopic observations**, Francesco A. Pepe, Observatoire de Genève (Switzerland); Stefano Cristiani, Osservatorio Astronomico di Trieste (Italy); Rafael Rebolo Lopez, Instituto de Astrofísica de Canarias (Spain); Nuno C. Santos, Univ. do Porto (Portugal); Maria Rosa Zapatero Osorio, Ctr. de Astrobiología (Spain); Danuta Sosnowska, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Gerardo Avila, Bernard Belabre, Olaf Iwert, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Gaspard Lo Curto, European Organisation for Astronomical Research in the Southern Hemisphere (Chile); Antonio Manescau, Luca Pasquini, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Ramón J. García López, José-Miguel Herreros, José L. Rasilla, Samuel Santana Tschudi, Fabio Tenegi-Sangines, Instituto de Astrofísica de Canarias (Spain); Michel Fleury, Ian Hughes, Christophe Lovis, Denis Mégevand, Didier Queloz, Stéphane Udry, Observatoire de Genève (Switzerland); Vincenzo De Caprio, Paolo Spanò, Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Piercarlo Bonifacio, Osservatorio Astronomico di Trieste (France); Roberto Cirami, Maurizio Comari, Igor Coretti, Paolo Di Marcantonio, Valentina D'Odorico, Paolo P. Molaro, Paolo Santin, Eros Vanzella, Matteo Viel, Osservatorio Astronomico di Trieste (Italy); Willy Benz, Christoph Mordasini, Univ. Bern (Switzerland); et al. [7735-14]

4:40 pm: **The WIYN one degree imager: project update 2010**, Daniel R. Harbeck, Pierre Martin, WIYN Observatory (United States); John Cavin, Univ. of Wisconsin-Madison (United States); George H. Jacoby, National Optical Astronomy Observatory (United States); Gary Muller, Andrey Yeatts, WIYN Observatory (United States); Rick McCloskey, National Optical Astronomy Observatory (United States); John W. Ivens, Charles Corson, WIYN Observatory (United States) [7735-15]

Poster Previews

Room: Town & Country. Sun. 5:10 to 5:30 pm

Poster authors have been selected to make brief previews of their presentations.

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: Welcome and Introduction

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: Unknowns and unknown unknowns: from dark sky to dark matter and dark energy, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: Optical synoptic telescopes: new science frontiers, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 3

Room: Town & Country Mon. 10:10 am to 12:10 pm

Ground-based Optical Instruments II

Session Chair: Samuel C. Barden, Anglo-Australian Observatory (Australia)

10:10 am: Design, performance, and early results from extremely high Doppler precision instruments in a global network, Jian C. Ge, Univ. of Florida (United States) [7735-16]

10:30 am: 'Imaka: a one-degree high-resolution facility for the Canada-France-Hawaii Telescope, Mark R. Chun, Univ. of Hawai'i (United States); Raymond G. Carlberg, Univ. of Toronto (Canada); Harvey B. Richer, The Univ. of British Columbia (Canada); Yannick Mellier, Institut d'Astrophysique de Paris (France); Pierre Astier, IN2P3 (France); Olivier Lai, Derrick A. Salmon, Jean-Charles Cuillandre, Canada-France-Hawaii Telescope (United States); David Andersen, Jean-Pierre Véran, National Research Council Canada (Canada); Gregory A. Barrick, Steven Bauman, Kevin K. Ho, Canada-France-Hawaii Telescope (United States); Remy Avila, Univ. Nacional Autónoma de México (Mexico); Richard W. Wilson, Timothy Butterley, Durham Univ. (United Kingdom) [7735-17]

10:50 am: Design and development of the 3.2 gigapixel camera for the Large Synoptic Survey Telescope, Steven M. Kahn, Nadine Kurita, David K. Gilmore, Martin Nordby, Rafe H. Schindler, SLAC National Accelerator Lab. (United States); Paul O'Connor, Brookhaven National Lab. (United States); John Oliver, Harvard Univ. (United States); Richard Van Berg, Univ. of Pennsylvania (United States); Scot S. Olivier, Vincent J. Riot, Lawrence Livermore National Lab. (United States); Pierre Antilogus, Institut National de Physique Nucléaire et de Physique des Particules (France); Terry Schalk, SLAC National Accelerator Lab. (United States) [7735-18]

11:10 am: The ESPRESSO spectrograph optical design for a very high-resolution spectrograph for the combined focus of the VLT, Paolo Spanò, INAF, Osservatorio Astronomico di Brera (Italy); Denis Mégevand, Univ. de Genève, Observatoire Astronomique 51 (Switzerland); José-Miguel Herreros, Instituto de Astrofísica de Canarias (Spain); Filippo Maria Zerbi, INAF, Osservatorio Astronomico di Brera (Italy); Alexandre P. Cabral, Univ. de Lisboa (Portugal); Paolo Di Marcantonio, INAF, Osservatorio Astronomico di Trieste (Italy); Christophe Lovis, Observatoire de Genève (Switzerland); Stefano Cristiani, INAF, Osservatorio Astronomico di Trieste (Italy); Rafael Reboló Lopez, Instituto de Astrofísica de Canarias (Spain); Nuno C. Santos, Univ. do Porto (Portugal); Francesco A. Pepe, Univ. de Genève, Observatoire Astronomique 51 (Switzerland) [7735-20]

11:30 am: VIRUS: a massively replicated 33k fiber integral field spectrograph for the upgraded Hobby-Eberly Telescope, Gary J. Hill, Joshua J. Adams, Guillermo Blanc, The Univ. of Texas at Austin (United States); John A. Booth, McDonald Observatory, The Univ. of Texas at Austin (United States); Taylor S. Chonis, The Univ. of Texas at Austin (United States); Mark E. Cornell, McDonald Observatory, The Univ. of Texas at Austin (United States); Darren L. DePoy, Texas A&M Univ. (United States); Niv Drory, Max-Planck-Institut für extraterrestrische Physik (Germany); Karl Gebhardt, John M. Good, The Univ. of Texas at Austin (United States); Frank U. Grupp, Univ.-Sternwarte München (Germany); Andreas Kelz, Astrophysikalisches Institut Potsdam (Germany); Hanshin Lee, The Univ. of Texas at Austin (United States); Jennifer L. Marshall, Texas A&M Univ. (United States); Phillip J. MacQueen, Nicholas T. Mollison, Jeremy D. Murphy, Marc D. Rafal, The Univ. of Texas at Austin (United States); Martin M. Roth, Astrophysikalisches Institut Potsdam (Germany); Richard D. Savage, The Univ. of Texas at Austin (United States); Michael P. Smith, Univ. of Wisconsin-Madison (United States); Brian L. Vattiat, The Univ. of Texas at Austin (United States) [7735-21]

11:50 am: The Keck cosmic web imager, D. Christopher Martin, Anna M. Moore, California Institute of Technology (United States); Sean M. Adkins, W. M. Keck Observatory (United States); Daphne Y. Chang, Alex Delacroix, California Institute of Technology (United States); Harland W. Epps, Lick Observatory (United States); Mateusz Matuszewski, Patrick Morrissey, Shahinur Rahman, California Institute of Technology (United States) [7735-22]

Lunch Break 12:10 to 1:30 pm

SESSION 4

Room: Town & Country Mon. 1:30 to 5:00 pm

Techniques and Components I

Session Chair: Suzanne K. Ramsay, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

1:30 pm: PIMMS: photonic integrated multimode microspectrograph, Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Jon S. Lawrence, Macquarie Univ. (Australia); J. Gordon Robertson, The Univ. of Sydney (Australia); Roger Haynes, Anglo-Australian Observatory (Australia); Sergio G. Leon-Saval, Sam Campbell, The Univ. of Sydney (Australia); Nick Cvetojevic, Macquarie Univ. (Australia) . . . [7735-23]

1:50 pm: Hexabundles: first results, Julia Bryant, John W. O'Byrne, Joss Bland-Hawthorn, Sergio G. Leon-Saval, The Univ. of Sydney (Australia) [7735-24]

2:10 pm: The cosmic web imager integral field spectrograph design and first results, Daphne Y. Chang, D. Christopher Martin, Mateusz Matuszewski, Patrick Morrissey, Anna M. Moore, Shahinur Rahman, Robert Crabill, California Institute of Technology (United States) [7735-25]

2:30 pm: Engineering a highly segmented, very wide-field spectrograph, Roberto Ragazzoni, Adriano Fontana, Osservatorio Astronomico di Padova (Italy); Dario Maccagni, Istituto di Fisica Spaziale e Fisica Cosmica (Italy); Andrea Baruffolo, Osservatorio Astronomico di Padova (Italy); Andrea G. Bianco, Istituto di Fisica Spaziale e Fisica Cosmica (Italy); Andrea Di Paola, Jacopo Farinato, Giorgia Gentile, Emanuele Giallongo, Fernando Pedichini, Roberto Speziali, Vincenzo Testa, Osservatorio Astronomico di Padova (Italy) [7735-26]

2:50 pm: The low-resolution imaging spectrograph red channel CCD upgrade: fully depleted, high-resistivity CCDs for Keck, Constance M. Rockosi, Richard Stover, Robert I. Kibrick, Christopher Lockwood, Michael Peck, David J. Cowley, Michael Bolte, Lick Observatory (United States); Sean M. Adkins, W. M. Keck Observatory (United States); Barry Alcott, Steven L. Allen, William E. Brown, Gerald F. Cabak, William T. S. Deich, David F. Hilyard, Lick Observatory (United States); Marc F. Kassis, W. M. Keck Observatory (United States); Kyle Lanclos, Jeffrey P. Lewis, Terry Pfister, Andrew C. Phillips, Lloyd Robinson, Michael Saylor, Matthew Thompson, James Ward, Mingzhi Wei, Christopher A. Wright, Lick Observatory (United States) [7735-27]

Coffee Break 3:10 to 3:40 pm

3:40 pm: High-resolution imaging and spectroscopy in the visible from large ground-based telescopes with natural guide stars, Craig D. Mackay, Timothy D. Staley, Univ. of Cambridge (United Kingdom) [7735-28]

4:00 pm: High-precision calibration of spectrographs using laser frequency combs, Tobias Wilken, Max-Planck-Institut für Quantenoptik (Germany); Christophe Lovis, Observatoire de Genève (Switzerland); Antonio Manescau, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Tilo Steinmetz, Max-Planck-Institut für Quantenoptik (Germany) and Menlo Systems GmbH (Germany); Luca Pasquini, Gaspare Lo Curto, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Ronald Holzwarth, Max-Planck-Institut für Quantenoptik (Germany) and Menlo Systems GmbH (Germany); Theodor W. Haensch, Thomas Udem, Max-Planck-Institut für Quantenoptik (Germany) [7735-29]

4:20 pm: A new method to quantitatively compare focal ratio degradation due to different end termination techniques, Claire L. Poppett, Jeremy R. Allington-Smith, Durham Univ. (United Kingdom) [7735-30]

4:40 pm: SPHERE IFS: the spectro differential imager of the VLT for exoplanets search, Riccardo U. Claudi, Enrico Giro, Osservatorio Astronomico di Padova (Italy); Massimo Turatto, Osservatorio Astronomico di Catania (Italy); Umberto Anselmi, Osservatorio Astronomico di Padova (Italy); Pietro Bruno, Osservatorio Astronomico di Catania (Italy); Enrico Cascone, Osservatorio Astronomico di Capodimonte (Italy); Vincenzo De Caprio, Osservatorio Astronomico di Brera (Italy); Silvano Desidera, Osservatorio Astronomico di Padova (Italy); Reinhold J. Dorn, Gert Finger, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Raffaele G. Gratton, Luigi Lessio, Osservatorio Astronomico di Padova (Italy); Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Dino Mesa, Osservatorio Astronomico di Padova (Italy); Salvatore Scuderi, Osservatorio Astronomico di Catania (Italy); Jacopo Antichi, Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Pascal Puget, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Norbert Hubin, Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-19]

Poster Previews

Room: Town & Country. Mon. 5:00 to 5:20 pm

Poster authors have been selected to make brief previews of their presentations.

Monday Poster Session

Room: Grand Exhibit Hall Mon. 5:30 to 7:00 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Monday. The interactive poster session with authors in attendance will be Monday evening from 5:30 to 7:00 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Converting a liquid nitrogen-cooled CCD to closed-cycle cooling, Tom Benedict, Gregory A. Barrick, Jeff Ward, Canada-France-Hawaii Telescope (United States) [7735-92]

Integration and characterization of HAWAII-1RG detector with FORCAST fast-readout electronics for LMIRCam, Jarron M. Leisenring, Michael F. Skrutskie, Matthew J. Nelson, Andre Wong, Univ. of Virginia (United States) [7735-93]

Readout electronics for DECam, Javier Castilla, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Otger Ballester, Laia Cardiel-Sas, Institut de Física d'Altes Energies (Spain); Steve Chappa, Fermi National Accelerator Lab. (United States); Juan de Vicente, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Scott Holm, David Huffman, Mark M. Kozlovsky, Fermi National Accelerator Lab. (United States); Gustavo Martinez, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Jamieson T. Olsen, Theresa M. Shaw, Walter Stuermer, Fermi National Accelerator Lab. (United States) [7735-94]

Hyper Suprime-Cam: the development of the CCD readout electronics, Hidehiko Nakaya, National Astronomical Observatory of Japan (Japan) [7735-95]

Implementation of the control electronics for KMOS instrument, Hans-Joachim Hess, Ivica Ilijevski, Helmut Kravcar, Josef Rühfel, Christoph Schwab, Univ.-Sternwarte München (Germany) [7735-96]

An optical frequency comb for infrared spectrograph calibration, Gabriel Ycas, Univ. of Colorado at Boulder (United States) and National Institute for Standards and Technology (United States); Franklyn J. Quinlan, National Institute of Standards and Technology (United States); Steven N. Osterman, Ctr. for Astrophysics and Space Astronomy (United States); Scott Diddams, National Institute of Standards and Technology (United States) [7735-97]

Comprehensive transient-state study for CARMENES high-thermal stability, Santiago Becerril, Miguel A. Sánchez Carrasco, Pedro José Amado, María Concepción Cárdenas Vázquez, Ovidio Rabaza, Alejandro Ramón, Miguel Abril, Luis Pedro Costillo, Rafael Morales, Alicia Rodríguez, Instituto de Astrofísica de Andalucía (Spain) [7735-98]

FOROS: Fresnel optical propagation code for SPHERE, Natalia Yaitskova, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Patrick Rabou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Anthony Boccaletti, Observatoire de Paris à Meudon (France); Marcel Caribillet, Univ. de Nice Sophia Antipolis (France); Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus E. Kasper, Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-99]

NIR polarimetry with SPHERE-IRDIS, Maud P. Langlois, Ctr. de Recherche Astronomique de Lyon (France); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Hans Martin Schmid, ETH Zürich (Switzerland); Jean-Charles Augereau, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7735-100]

The performance of the calibration module for SPHERE, François P. Wildi, Observatoire de Genève (Switzerland); Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7735-101]

Manufacturing and integration of the IRDIS dual-imaging camera and spectrograph for SPHERE, Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France) and Univ. de Provence (France) and CNRS (France); Michel Saisse, Observatoire Astronomique de Marseille-Provence (France); Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-102]

Comparison of methods for detection and characterization of exoplanets with SPHERE/IRDIS, Arthur Vigan, Claire Moutou, Observatoire Astronomique de Marseille-Provence (France); Maud Langlois, Ctr. de Recherche Astronomique de Lyon (France); Anthony Boccaletti, Observatoire de Paris à Meudon (France); Marcel Caribillet, Univ. de Nice Sophia Antipolis (France); Joseph C. Carson, Max-Planck-Institut für Astronomie (Germany); Alberto Cornia, ONERA (France); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); André Ferrari, Univ. de Nice Sophia Antipolis (France); David Mouillet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Laurent Mugnier, ONERA (France); Isabelle Smith, Univ. de Nice Sophia Antipolis (France); Christian Thalmann, Max-Planck-Institut für Astronomie (Germany) [7735-103]

Half-toning for high-contrast imaging: developments for the SPHERE and EPICS instruments, Patrice Martinez, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Christophe Dorner, Aktiwave LLC (United States); Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Anthony Boccaletti, LESIA, Observatoire de Paris à Meudon (France); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Emmanuel Aller-Carpentier, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-104]

Diffraction and scattered light on coronagraphic IFU reconstructed images: the case of FRIDA, Salvador Cuevas, Univ. Nacional Autónoma de México (Mexico); Mamadou NDiaye, Kjetil Dohlen, Univ. de Provence (France); Stephen S. Eikenberry, Univ. of Florida (United States); Remy Avila, Univ. Nacional Autónoma de México (Mexico) [7735-105]

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Production-line assembly of 150+ VIRUS spectrographs, Jennifer L. Marshall, Texas A&M Univ. (United States); Brian L. Vattiat, The Univ. of Texas at Austin (United States); Darren L. DePoy, Texas A&M Univ. (United States); Gary J. Hill, The Univ. of Texas at Austin (United States); Amanda D. Collins, Texas A&M Univ. (United States); Hanshin Lee, The Univ. of Texas at Austin (United States); Richard D. Allen, Texas A&M Univ. (United States); Andreas Kelz, Svend M. Bauer, Emil Popow, Astrophysikalisches Institut Potsdam (Germany) [7735-163]

A radial velocity spectrometer for the Automated Planet Finder Telescope at Lick Observatory, Matthew Radovan, Gerald F. Cabak, Lee Laiterman, Christopher Lockwood, Steven S. Vogt, Lick Observatory (United States) [7735-164]

OSMOS: The Ohio State multi-object spectrograph, Rebecca Stoll, Paul Martini, Mark A. Derwent, Ross Zhelem, Man-Hong Wong, Daniel P. Pappalardo, Raymond Gonzalez, Richard W. Pogge, The Ohio State Univ. (United States) [7735-165]

NEFER: a high-resolution scanning Fabry-Perot spectrograph II; scanning Fabry-Perot testing, Abel Bernal, Margarita Rosado, Luis A. Martinez, Univ. Nacional Autónoma de México (Mexico) [7735-166]

First light results from PARAS: the PRL echelle spectrograph, Abhijit G. Chakraborty, Physical Research Lab. (India); Suvrath Mahadevan, The Pennsylvania State Univ. (United States); Fazalahmed M. Pathan, Vishal M. Shah, Physical Research Lab. (India); Arpita Roy, The Pennsylvania State Univ. (United States); Eric H. Richardson, Univ. of Victoria (Canada); Rajesh R. Shah, Girish P. Ubale, Physical Research Lab. (India) [7735-167]

Astro-comb calibration of an Echelle spectrograph, Chih-Hao Li, Harvard-Smithsonian Ctr. for Astrophysics (United States); Andrew J. Benedict, Guoqing Chang, Li-Jin Chen, Massachusetts Institute of Technology (United States); Claire E. Cramer, Gabor Furesz, Alexander G. Glenday, Harvard-Smithsonian Ctr. for Astrophysics (United States); Franz X. Kärtner, Massachusetts Institute of Technology (United States); Sylvain Korzennik, David F. Phillips, Dimitar D. Sasselov, Andrew Szentgyorgyi, Ronald L. Walsworth, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7735-168]

Analyzing the MUSE opto-mechanics serving as an optical bench in 3D space, Harald E. Nicklas, Georg-August-Univ. Göttingen (Germany); Wenli Xu, Optical System Engineering (Germany); Christof Köhler, Georg-August-Univ. Göttingen (Germany) [7735-169]

Fiber-stabilized PSF for sub-m/s Doppler precision at Lick Observatory, Julien F. P. Spronck, Yale Univ. (United States); Christian Schwab, Landessternwarte Heidelberg (Germany); Debra A. Fischer, Yale Univ. (United States) [7735-170]

Manufacturing and integration of the IFS integral spectrograph for SPHERE, Vincenzo De Caprio, INAF - IASF Milano (Italy); Enrico Giro, Riccardo U. Claudi, Umberto Anselmi, Osservatorio Astronomico di Padova (Italy); Jacopo Antichi, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Pietro Bruno, Osservatorio Astrofisico di Catania (Italy); Enrico Cascone, Osservatorio Astronomico di Capodimonte (Italy); Silvano Desidera, Daniela Fantinel, Raffaele G. Gratton, Osservatorio Astronomico di Padova (Italy); Markus E. Kasper, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Dino Mesa, Osservatorio Astronomico di Padova (Italy); Salvo Scuderi, Massimo Turatto, Osservatorio Astrofisico di Catania (Italy); Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); François P. Wildi, Observatoire de Genève (Switzerland) [7735-171]

PUCHEROS: a low-cost fiber-fed echelle spectrograph for the visible spectral range, Leonardo Vanzi, Juan A. Chacon, Maurizio Baffico, Pontificia Univ. Católica de Chile (Chile); Gerardo Avila, Thomas Rivinius, Dietrich Baade, European Southern Observatory (Germany) [7735-172]

Design of Echelle spectrograph for small telescopes with commercially available components, Juan A. Chacon, Leonardo Vanzi, Pontificia Univ. Católica de Chile (Chile); Gerardo Avila, European Southern Observatory (Germany) [7735-173]

A near-infrared spectrometer to measure zodiacal light absorption spectrum, Alexander S. Kutryev, Richard G. Arendt, Eliahu Dwek, S. Harvey Moseley, David A. Rapchun, Robert F. Silverberg, Corey Tucker, NASA Goddard Space Flight Ctr. (United States) [7735-175]

Science capabilities of the Robert Stobie spectrograph on the SALT Telescope, Andrew I. Sheinis, Marsha J. Wolf, Matthew A. Bershad, Kenneth H. Nordsieck, Ryan L. Doering, Univ. of Wisconsin-Madison (United States); Ted B. Williams, Rutgers, The State Univ. of New Jersey (United States) [7735-177]

Production and performance of replicable integral field units for VIRUS, Andreas Kelz, Martin M. Roth, Svend M. Bauer, Yazmin Padilla, Emil Popow, Astrophysikalisches Institut Potsdam (Germany); Gary J. Hill, Brian L. Vattiat, John M. Good, Jeremy D. Murphy, Richard D. Savage, Ian M. Soukup, Nicholas T. Mollison, The Univ. of Texas at Austin (United States) [7735-178]

Design of the fiber optic support system and fiber bundle accelerated life test for VIRUS, Ian M. Soukup, Nicholas T. Mollison, Jason R. Mock, Joseph H. Beno, Gary J. Hill, John M. Good, Brian L. Vattiat, Jeremy D. Murphy, Seth C. Anderson, Eric P. Fahrenthold, The Univ. of Texas at Austin (United States); Andreas Kelz, Martin M. Roth, Svend M. Bauer, Astrophysikalisches Institut Potsdam (Germany) [7735-180]

A Fabry-Perot calibrator of the HARPS radial velocity spectrograph: performance report, François P. Wildi, Francesco A. Pepe, Observatoire de Genève (Switzerland) [7735-181]

ESPRESSO: projecting a rocky exoplanet hunter for the VLT, Denis Mégevand, Observatoire de Genève (Switzerland); José-Miguel Herreros, Instituto de Astrofísica de Canarias (Spain); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Alexandre P. Cabral, Univ. de Lisboa (Portugal); Paolo Di Marcantonio, Osservatorio Astronomico di Trieste (Italy); Christophe Lovis, Francesco A. Pepe, Observatoire de Genève (Switzerland); Stefano Cristiani, Osservatorio Astronomico di Trieste (Italy); Rafael Rebolo Lopez, Instituto de Astrofísica de Canarias (Spain); Nuno C. Santos, Univ. do Porto (Portugal) [7735-182]

KMOS pick-off arm optical alignment, calibration, and testing, Philip Rees II, Richard J. Bennett, George H. Davidson, Stephen P. Todd, UK Astronomy Technology Ctr. (United Kingdom) [7735-183]

Development of the prototype integral field unit for prompt follow-up spectroscopy of gamma-ray bursts, Shinobu Ozaki, Ikuru Iwata, Eiji Kambe, Michitoshi Yoshida, Kiichi Okita, National Astronomical Observatory of Japan (Japan); Fumihide Iwamura, Hajime Sugai, Kouji Ohta, Kyoto Univ. (Japan) [7735-184]

KMOS: assembly, integration, and testing of three 0.8-2.5 micron spectrographs, Richard J. Masters, Ian J. Lewis, Univ. of Oxford (United Kingdom); Ian A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); Mathias Tecza, James Lynn, Robert E. J. Watkins, Andrew Clack, Roger L. Davies, Niranjan A. Thatte, Mike Tacon, Rick Makin, Jon Temple, Univ. of Oxford (United Kingdom); Alan Pearce, Rutherford Appleton Lab. (United Kingdom) [7735-185]

The calibration unit and detector system tests for MUSE, Andreas Kelz, Svend M. Bauer, Indraneil Biswas, Thomas Hahn, Jean-Christophe Olaya, Martin M. Roth, Astrophysikalisches Institut Potsdam (Germany); Roland M. Bacon, Florence Laurent, Magali Loupias, Observatoire de Lyon (France); Jean-Louis Lizon, Roland Reiss, Gero Rupprecht, European Southern Observatory (Germany) [7735-186]

The Carnegie planet finder spectrograph: integration and commissioning, Jeffrey D. Crane, Stephen A. Shectman, R. Paul Butler, Ian B. Thompson, Gregory S. Burley, Christoph Birk, Carnegie Observatories (United States); Patricio Jones, Las Campanas Observatory (Chile) [7735-187]

Design of a near-IR Doppler instrument for planet searches, Bo Zhao, Jian C. Ge, Univ. of Florida (United States) [7735-188]

Science with GYES: a multifibre high-resolution spectrograph for the prime focus of the Canada-France Hawaii Telescope, Piercarlo Bonifacio, Frédéric Arenou, Carine Babusiaux, Chantal Balkowski, Observatoire de Paris à Meudon (France); Olivier Bienaymé, Univ. de Strasbourg (France); Elisabetta Caffau, Observatoire de Paris à Meudon (France); Patrick de Laverny, Observatoire de la Côte d'Azur (France); Misha Haywood, Observatoire de Paris à Meudon (France); Vanessa Hill, Observatoire de la Côte d'Azur (France); Patrick François, Observatoire de Paris à Meudon (France); Yves Frémat, Royal Observatory of Belgium (Belgium); Ana Gomez, David Katz, Observatoire de Paris à Meudon (France); Rosine Lallement, Service d'aéronomie (France); Christophe Martayan, European Southern Observatory (Chile); Denis Mourard, Nicolas Nardetto, Alejandra Recio Blanco, Observatoire de la Côte d'Azur (France); Noël Robichon, Observatoire de Paris à Meudon (France); Annie Robin, Observatoire de Besançon (France); Frédéric Royer, Observatoire de Paris à Meudon (France); Caroline Soubiran, Univ. Bordeaux 1 (France); Catherine Turon, Yves Viala, Observatoire de Paris à Meudon (France) [7735-189]

Application of fixed delay Michelson interferometer for radial velocity measurement, Kai Zhang, Nanjing Institute of Astronomical Optics & Technology (China) and Graduate Univ. of Chinese Academy of Sciences (China); Yongtian Zhu, Nanjing Institute of Astronomical Optics & Technology (China); Mingda Jiang, Nanjing Institute of Astronomical Optics & Technology (China) and Graduate Univ. of Chinese Academy of Sciences (China) [7735-190]

Extreme multiplex spectrograph: a high-demanding mechanical design, Santiago Becerril, Instituto de Astrofísica de Andalucía (Spain); Cornelis M. Dubbeldam, Robert Content, Durham Univ. (United Kingdom); Klaus Meisenheimer, Max-Planck-Institut für Astronomie (Germany); Francisco Prada, Instituto de Astrofísica de Andalucía (Spain); Tom Shanks, Ray M. Sharples, Durham Univ. (United Kingdom) [7735-191]

Toward the commissioning of the GIANO-TNG spectrometer, Ernesto Oliva, Osservatorio Astrofisico di Arcetri (Italy); Livia Origlia, Osservatorio Astronomico di Bologna (Italy); Carlo Baffa, Valdemaro Biliotti, Osservatorio Astrofisico di Arcetri (Italy); Pietro Bruno, Osservatorio Astrofisico di Catania (Italy); Ciro Del Vecchio, Gilberto Falcini, Elisabetta Giani, Osservatorio Astrofisico di Arcetri (Italy); Manuel Gonzalez, Telescopio Nazionale Galileo (Spain); Franco Leone, Osservatorio Astrofisico di Catania (Italy); Marcello Lodi, Telescopio Nazionale Galileo (Spain); Roberto Maiolino, Osservatorio Astronomico di Roma (Italy); Filippo Mannucci, Gianni Marucci, Iacopo Mochi, Osservatorio Astrofisico di Arcetri (Italy); Paolo Montegriffo, Osservatorio Astronomico di Bologna (Italy); Emanuel Rossetti, Univ. degli Studi di Bologna (Italy); Salvo Scuderi, Osservatorio Astrofisico di Catania (Italy); Mauro Sozzi, Andrea Tozzi, Osservatorio Astrofisico di Arcetri (Italy) [7735-192]

The fiber positioning system of LAMOST with 4000 positioner, Zhai Chao, Univ. of Science and Technology of China (China) [7735-193]

Time resolved astronomy with the SALT, David A. H. Buckley, Steven M. Crawford, Amanda A. S. Gulbis, South African Astronomical Observatory (South Africa); Jason B. McPhate, Univ. of California, Berkeley (United States); Kenneth H. Nordsieck, Univ. of Wisconsin-Madison (United States); Stephen B. Potter, Darragh E. O'Donoghue, South African Astronomical Observatory (South Africa); Oswald H. W. Siegmund, Univ. of California, Berkeley (United States); Pim Schellart, South African Astronomical Observatory (South Africa); Barry Y. Welsh, Univ. of California, Berkeley (United States). [7735-195]

A new MOS mask cutter facility at Gemini/Cerro Tololo observatories, Robert T. Wyman, Gemini Observatory (United States); Gelys Trancho, Gemini Observatory (Chile); Roberto Tigue, Cerro Tololo Inter-American Observatory (Chile) . . . [7735-196]

The differential tip-tilt sensor of SPHERE, Pierre Baudoz, Observatoire de Paris à Meudon (France); Reinhold J. Dorn, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Thierry Fusco, ONERA (France); Julien Charton, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7735-197]

Automated characterization of CCD detectors for DECam, Donna Kubik, Fermi National Accelerator Lab. (United States); Juan Cruz Estrada, Fermi National Accelerator Lab. (United States) and for the DES Collaboration (United States) [7735-311]

Imaging polarimetry of circumstellar environments with the Extreme Polarimeter: results, performance analysis and data reduction techniques, Michiel Rodenhuis, Hector Canovas, Sandra V. Jeffers, Christoph U. Keller, Utrecht Univ. (Netherlands) [7735-312]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 5

Room: Town & Country. Tues. 2:00 to 5:00 pm

Instrumentation and Techniques for Exoplanet Detection

Session Chair: Stephen S. Eikenberry, Univ. of Florida

2:00 pm: **CYCLOPS 'a better way to find extrasolar planets': an optical fiber system for UCLES at the AAT**, Roger Haynes, Anglo-Australian Observatory (Australia); Chris G. Tinney, Univ. of New South Wales (Australia); Anthony J. Horton, Stan Miziarski, Jurek K. Brzeski, Lewis G. Waller, Minh Vuong, Ed Penny, Anglo-Australian Observatory (Australia) [7735-31]

2:20 pm: **High-spatial resolution and high contrast in speckle imaging for the search of nearby companions in the optical regime**, Lucas Labadie, Rafael Rebolo Lopez, Bruno Femenía, Jorge Andrés Pérez Prieto, Instituto de Astrofísica de Canarias (Spain); Isidro Villo Pérez, Anastasio Díaz Sánchez, Antonio Pérez Garrido, Univ. Politécnica de Cartagena (Spain); Sergy R. Hildebrandt, Victor Sanchez Bejar, Alejandro Oscoz, Roberto L. López, Instituto de Astrofísica de Canarias (Spain) [7735-32]

2:40 pm: **SPHERE: a planet imager for the VLT**, Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus Feldt, Max-Planck-Institut für Astronomie (Germany); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); David Mouillet, Pascal Puget, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); François P. Wildi, Observatoire de Genève (Switzerland); Markus E. Kasper, European Southern Observatory (Germany); And the SPHERE Consortium, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7735-33]

3:00 pm: **In the path toward extremely precise radial velocity measurements**, Gaspare Lo Curto, European Organisation for Astronomical Research in the Southern Hemisphere (Chile) [7735-34]

Coffee Break 3:20 to 3:40 pm

3:40 pm: **The prototype design of most powerful exoplanet tracker based on LAMOST**, Kai Zhang, Nanjing Institute of Astronomical Optics & Technology (China) and Graduate Univ. of Chinese Academy of Sciences (China); Yongtian Zhu, Lei Wang, Nanjing Institute of Astronomical Optics & Technology (China) [7735-35]

4:00 pm: **High-contrast imaging within the diffraction limit: an overview of the Palomar fiber nuller first astronomical results**, Bertrand P. Mennesson, Jet Propulsion Lab. (United States) [7735-36]

4:20 pm: **Impact of calibration on extrasolar planets direct imaging with the infrared dual-imaging camera and spectrograph for SPHERE**, Maud P. Langlois, Ctr. de Recherche Astronomique de Lyon (France); Arthur Vigan, Claire Moutou, Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France) [7735-37]

4:40 pm: **CARMENES: Calar Alto high-resolution search for M dwarfs with exo-earths with a near-infrared Echelle spectrograph**, Andreas Quirrenbach, Landessternwarte Heidelberg (Germany); CARMENES Consortium CARMENES Consortium, Germany/Spain (Germany) [7735-38]

Poster Previews

Room: Town & Country. Tues. 5:10 to 5:30 pm

Poster authors have been selected to make brief previews of their presentations.

Wednesday 30 June

SESSION 6

Room: Town & Country. Wed. 8:30 am to 12:20 pm

Ground-based Infrared Instruments I

Session Chair: Hideki Takami, National Astronomical Observatory of Japan/Subaru Telescope

8:30 am: **The FIRE infrared echelle spectrometer at Magellan: construction and commissioning**, Robert A. Simcoe, Massachusetts Institute of Technology (United States); Rebecca A. Bernstein, Bruce C. Bigelow, Lick Observatory (United States); John J. Bochanski, Jr., Massachusetts Institute of Technology (United States); Adam J. Burgasser, Univ. of California, San Diego (United States); Jason Fisher, Massachusetts Institute of Technology (United States); William J. Forrest, Craig W. McMurtry, Judith L. Pipher, Univ. of Rochester (United States); Paul Schechter, Matthew J. Smith, Massachusetts Institute of Technology (United States) . . [7735-39]

8:50 am: **Recent progress on the KMOS multi-object integral-field spectrograph for ESO VLT**, Ray M. Sharples, Durham Univ. (United Kingdom); Ralf Bender, Univ.-Sternwarte München (Germany) and Max-Planck-Institut für Extraterrestrische Physik (Germany); Richard J. Bennett, UK Astronomy Technology Ctr. (United Kingdom); Nicolas Bouche, Max-Planck-Institut für extraterrestrische Physik (Germany); Michele Cirasuolo, UK Astronomy Technology Ctr. (United Kingdom); Paul Clark, Durham Univ. (United Kingdom); Richard I. Davies, Max-Planck-Institut für extraterrestrische Physik (Germany); Roger L. Davies, Univ. of Oxford (United Kingdom); Cornelis M. Dobbeldam, Durham Univ. (United Kingdom); Alasdair E. Fairley, UK Astronomy Technology Ctr. (United Kingdom); Gert Finger, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany); Hans-Joachim Hess, Univ.-Sternwarte München (Germany); Ian J. Lewis, Univ. of Oxford (United Kingdom); Bernard Muschielok, Univ.-Sternwarte München (Germany); Jean-Francois Pirard, Suzanne K. Ramsay, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Philip Rees II, UK Astronomy Technology Ctr. (United Kingdom); David J. Robertson, Durham Univ. (United Kingdom); Ian Robson, UK Astronomy Technology Ctr. (United Kingdom); Stephen Rolt, Durham Univ. (United Kingdom); Mathias Tecza, Univ. of Oxford (United Kingdom); Michael Wegner, Univ.-Sternwarte München (Germany) [7735-40]

9:10 am: **GNOSIS: a fully funded, photonic OH-suppression near-infrared spectrograph**, Simon C. Ellis, Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Anthony J. Horton, Roger Haynes, Anglo-Australian Observatory (Australia); Hans-Gerd Löhmannsröben, Martin M. Roth, Univ. Potsdam (Germany) [7735-41]

9:30 am: **Spectropolarimetry with the SALT RSS**, Janus D. Brink, David A. H. Buckley, South African Astronomical Observatory (South Africa); Kenneth H. Nordsieck, Univ. of Wisconsin-Madison (United States); Stephen B. Potter, South African Astronomical Observatory (South Africa) [7735-42]

9:50 am: **ARCHONS: a highly multiplexed superconducting optical to near-IR camera**, Kieran O'Brien, Benjamin A. Mazin, Sean McHugh, Andrew Merrill, Bruce A. Bumble, Univ. of California, Santa Barbara (United States) [7735-43]

Coffee Break 10:10 to 10:40 am

10:40 am: **NESSI: the New Mexico Tech extrasolar spectroscopic survey instrument**, Colby A. Jurgenson, Fernando G. Santoro, Michelle J. Creech-Eakman, Kamel Houairi, Heather H. Bloemhard, New Mexico Institute of Mining and Technology (United States); Gautam Vasisht, Mark R. Swain, Pieter D. Deroo, Jet Propulsion Lab. (United States); Charles B. Moore, Dan Rodeheffer, Penny Boston, New Mexico Institute of Mining and Technology (United States); Pin Chen, Jet Propulsion Lab. (United States) [7735-44]

11:00 am: **Commissioning of the infrared imaging survey (IRIS) system**, Klaus W. Hodapp, Univ. of Hawai'i (United States); Rolf Chini, Ruhr-Univ. Bochum (Germany); Bo Reipurth, Univ. of Hawai'i (United States); Miguel G. Murphy, Univ. Católica del Norte (Chile); Roland Lemke, Ruhr-Univ. Bochum (Germany); Shane M. Jacobson, Univ. of Hawai'i (United States); Karsten Bischoff, Halfmann Teleskoptechnik GmbH & Co. KG (Germany); Taylor S. Chonis, Denny K. Dement, Ryan Terrien, Sydney Provence, Univ. of Hawai'i (United States); Ramon Watermann, Ruhr-Univ. Bochum (Germany) [7735-45]

11:20 am: **Development of the mid-IR Echelle high-dispersion spectrograph employing the germanium immersion grating**, Yasuhiro Hirahara, Tsuyoshi Hirao, Yoshio Tatamitani, Tomohisa Yonezu, Noboru Ebizuka, Nagoya Univ. (Japan); Kentaro Kawaguchi, Okayama Univ. (Japan); Hitoshi Tokoro, Tomomichi N. Oka, Nagoya Univ. (Japan) [7735-46]

11:40 am: **The Apache Point Observatory galactic evolution experiment (APOGEE) high-resolution near-infrared multi-object fiber spectrograph**, John C. Wilson, Fred R. Hearty, Michael F. Skrutskie, Steven Majewski, Univ. of Virginia (United States); Ricardo Schiavon, Gemini Observatory (United States); Charles P. Henderson, Basil Blank, PulseRay (United States); Robert H. Barkhouser, The Johns Hopkins Univ. (United States); Greg J. Fitzgerald, Todd M. Stolberg, New England Optical Systems (United States); Stephen A. Smee, The Johns Hopkins Univ. (United States); Matthew J. Nelson, Sophia D. Brunner, Adam Burton, Eric Walker, Univ. of Virginia (United States); French Leger, Larry N. Carey, Univ. of Washington (United States); James E. Gunn, Princeton Univ. (United States); Daniel J. Eisenstein, Paul A. Maseman, Steward Observatory, The Univ. of Arizona (United States); Albert Harding, The Johns Hopkins Univ. (United States); Todd Horne, Steward Observatory, The Univ. of Arizona (United States); Erick T. Young, SOFIA / USRA (United States); Marcia J. Rieke, George H. Rieke, Steward Observatory, The Univ. of Arizona (United States); Thomas P. O'Brien, The Ohio State Univ. (United States); Jeffrey D. Crane, Carnegie Observatories (United States); Jon Holtzman, New Mexico State Univ. (United States); Matthew D. Shetrone, The Univ. of Texas at Austin (United States); Carlos Allende-Prieto, Univ. College London (United Kingdom); Dmitry Bizyaev, Bruce Gillespie, Apache Point Observatory (United States) [7735-47]

12:00 pm: **On-sky performance of FLAMINGOS-2: the facility wide-field near-infrared imager and multi-object spectrograph for Gemini**, Stephen S. Eikenberry, Richard J. Elston, Steven N. Raines, Craig D. Warner, Kevin T. Hanna, Reba M. Bandyopadhyay, J. Greg Bennett, Aaron Bessoff, Matthew Branch, Richard Corley, John-David Eriksen, Curtis Dewitt, Skip Frommeyer, Anthony Gonzalez, Michael D. Herlevich, David B. Hon, Antonio Marin-Franch, Jeffrey A. Julian, Roger E. Julian, Jose Marti, Charles Murphey, William Rambold, D. Scott Powell, David Rashkin, Univ. of Florida (United States); Brian M. Leckie, W. Rusty Gardhouse, J. Murray Fletcher, Jennifer Dunn, Tim Hardy, Robert Wooff, John S. Pazder, National Research Council Canada (Canada) [7735-48]

Lunch/Exhibition Break 12:20 to 1:40 pm

SESSION 7

Room: Town & Country. Wed. 1:40 to 5:00 pm

Ground-based Infrared Instruments II

Session Chair: Christopher J. Evans,
UK Astronomy Technology Ctr. (United Kingdom)

1:40 pm: **Design and development of MOSFIRE: the multi-object spectrometer for infrared exploration at the Keck Observatory**, Ian S. McLean, Univ. of California, Los Angeles (United States); Charles C. Steidel, California Institute of Technology (United States); Harland W. Epps, Lick Observatory (United States); Keith Y. Matthews, California Institute of Technology (United States); Sean M. Adkins, W. M. Keck Observatory (United States) [7735-49]

2:00 pm: **OCTOCAM: a fast multi-channel imager and spectrograph for the 10.4m GTC**, Antonio de Ugarte Postigo, Osservatorio Astronomico di Brera (Italy); Javier U. Gorosabel, Instituto de Astrofísica de Andalucía (Spain); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Alberto J. Castro-Tirado, Instituto de Astrofísica de Andalucía (Spain); Michael I. Andersen, Univ. of Copenhagen (Denmark); Paolo Spanò, Osservatorio Astronomico di Brera (Italy); Ovidio Rabaza Castillo, Ronan Cunniffe, Instituto de Astrofísica de Andalucía (Spain); Alberto Fernandez-Soto, Instituto de Física de Cantabria (Spain); Vincenzo De Caprio, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); Marco Riva, Osservatorio Astronomico di Brera (Italy); Petr Kubanek, Instituto de Astrofísica de Andalucía (Spain); Alberto Riva, Osservatorio Astronomico di Torino (Italy); Martin Jelínek, Instituto de Astrofísica de Andalucía (Spain) [7735-50]

2:20 pm: **First end-end performance testing and results for KMOS**, Philip Rees II, UK Astronomy Technology Ctr. (United Kingdom); Cornelis M. Dobbeldam, Durham Univ. (United Kingdom); Ian J. Lewis, Univ. of Oxford (United Kingdom) . . . [7735-51]

2:40 pm: **Early Linc-Nirvana science: a bridge between current AO- and future ELT-imaging**, Jörg-Uwe Pott, Thomas Bertram, Wolfgang Gaessler, Thomas M. Herbst, Martin Kuerster, Eva Schinnerer, Max-Planck-Institut für Astronomie (Germany); Andreas Eckart, Univ. zu Köln (Germany); Udo Beckmann, Karl-Heinz Hofmann, Dieter Schertl, Gerd P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); Paolo Ciliegi, Osservatorio Astronomico di Bologna (Italy); Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy) [7735-52]

3:00 pm: **Performance of X-shooter: the new wide-band intermediate resolution spectrograph at the VLT**, Joel Vernet, Hans Dekker, Sandro D'Odorico, Elena Mason, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Paolo Di Marcantonio, Osservatorio Astronomico di Trieste (Italy); Mark D. Downing, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Eddy Elswijk, ASTRON (Netherlands); Gert Finger, Gerhard Fischer, Florian Kerber, Lothar Kern, Jean-Louis Lizon, Christian Lucuix, Vincenzo Mainieri, Andrea Modigliani, Ferdinando Patat, Suzanne K. Ramsay, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Paolo Santin, Marzio Vidali, Osservatorio Astronomico di Trieste (Italy); Paul Groot, Radboud Univ. Nijmegen (Netherlands); Isabelle Guinouard, Jean-François Hammer, Observatoire de Paris à Meudon (France); Lex Kaper, Niels Bohr Institute for Astronomy (Netherlands); Per Kjærgaard-Rasmussen, Univ. of Copenhagen (Denmark); Ramón Navarro, ASTRON (Netherlands); Sofia Randich, Osservatorio Astrofisico di Arcetri (Italy); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy) [7735-53]

Coffee Break 3:20 to 3:40 pm

3:40 pm: **Commissioning the VISTA infrared camera**, Gavin B. Dalton, Rutherford Appleton Lab. (United Kingdom); William J. Sutherland, James P. Emerson, Queen Mary, Univ. of London (United Kingdom); Guy F. W. Woodhouse, David L. Terrett, Rutherford Appleton Lab. (United Kingdom) [7735-54]

4:00 pm: **FMOS the fibre multiple-object spectrograph, part VIII: current performances and results of the engineering observations**, Masahiko Kimura, National Astronomical Observatory of Japan/Subaru Telescope (Japan); Fumihide Iwamura, Toshinori Maihara, Kyoto Univ. (Japan); Gavin B. Dalton, Univ. of Oxford (United Kingdom); Masayuki Akiyama, Tohoku Univ. (Japan); Naoyuki Tamura, Naruhisa Takato, Philip Tait, National Astronomical Observatory of Japan/Subaru Telescope (Japan); Graham J. Murray, Durham Univ. (United Kingdom); Scott Smedley, Anglo-Australian Observatory (Australia); Kouji Ohta, Shigeru Eto, Kaori Kawate, Yuuki Moritani, Masanao Sumiyoshi, Kiyoto Yabe, Kyoto Univ. (Japan) [7735-55]

4:20 pm: **LUCIFER1 commissioning at the LBT**, Nancy Ageorges, Max-Planck-Institut für extraterrestrische Physik (Germany); Walter Seifert, Landessternwarte Heidelberg (Germany); Julette Marcus, Volker Knierim, Ruhr-Univ. Bochum (Germany); Michael Lehmitz, Max-Planck-Institut für Astronomie (Germany); Peter Buschkamp, Max-Planck-Institut für extraterrestrische Physik (Germany); Kai Polsterer, Ruhr-Univ. Bochum (Germany) [7735-56]

4:40 pm: **Preliminary design of IGRINS (immersion grating infrared spectrometer)**, In-Soo Yuk, Korea Astronomy and Space Science Institute (Korea, Republic of); Daniel T. Jaffe, S. Barns, The Univ. of Texas at Austin (United States); Moo-Young Chun, Chan Park, Sungho Lee, Korea Astronomy and Space Science Institute (Korea, Republic of); H. Lee, Weisong Wang, The Univ. of Texas at Austin (United States); Kwi-Jong Park, Korea Astronomy and Space Science Institute (Korea, Republic of); S. Pak, Kyeong Hee Univ. (Korea, Republic of); Joseph Strubhar, Casey P. Deen, The Univ. of Texas at Austin (United States); Heeyoung Oh, Haingja Seo, Kyeong Hee Univ. (Korea, Republic of); Tae-Soo Pyo, National Astronomical Observatory of Japan/Subaru Telescope (United States); Won-Kee Park, Seoul National Univ. (Korea, Republic of); John H. Lacy, John A. Goertz, Jared Rand, Michael Gully-Santiago, The Univ. of Texas at Austin (United States) [7735-68]

Poster Previews

Room: Town & Country. Wed. 5:00 to 5:40 pm

Poster authors have been selected to make brief previews of their presentations.

Wednesday Poster Session

Room: Grand Exhibit Hall Wed. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Wednesday. The interactive poster session with authors in attendance will be Wednesday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Science requirements and performances for EAGLE for the E-ELT, Christopher J. Evans, UK Astronomy Technology Ctr. (United Kingdom); Matthew Lehnert, Observatoire de Paris à Meudon (France); Jean-Gabriel Cuby, Observatoire Astronomique de Marseille-Provence (France); Simon M. Morris, Durham Univ. (United Kingdom); Mathieu Puech, Observatoire de Paris à Meudon (France); Mark Swinbank, David M. Alexander, Durham Univ. (United Kingdom); Niraj Welikala, Observatoire Astronomique de Marseille-Provence (France); Annette Ferguson, The Univ. of Edinburgh (United Kingdom); Thibaut Paumard, Yann Clenet, Observatoire de Paris à Meudon (France) [7735-198]

EAGLE ISS: a modular twin-channel integral-field near-IR spectrograph, Peter R. Hastings, UK Astronomy Technology Ctr. (United Kingdom); Sébastien Vivès, Pascal Vola, Observatoire Astronomique de Marseille-Provence (France); Martyn Wells, UK Astronomy Technology Ctr. (United Kingdom) [7735-199]

METIS (cryogenic) optomechanical design and packaging study, Gabby Kroes, Rik ter Horst, Ronald Roelfsema, Lars B. Venema, ASTRON (Netherlands); Rainer Lenzen, Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany); Gilles A. Durand, Eric J. Pantin, Samuel Ronayette, Commissariat à l'Énergie Atomique (France); Stephen P. Todd, Richard J. Bennett, Alistair C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); Joris Blommaert, Katholieke Univ. Leuven (Belgium); Bernhard R. Brandl, Leiden Univ. (Netherlands) [7735-200]

Mid-infrared astronomy with the E-ELT: performance of METIS, Sarah Kendrew, Laurent Jollissaint, Bernhard Brandl, Leiden Univ. (Netherlands); Lars B. Venema, ASTRON (Netherlands) [7735-201]

MICADO: optical configuration, performance, and folding, Demetrio Magrin, Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); David E. L. Freeman, Engineering Consultant (United Kingdom); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Niels Tromp, Marco Drost, Ramón Navarro, ASTRON (Netherlands); Richard I. Davies, Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany) [7735-202]

Expected performance and simulated observations of the instrument HARMONI at the European Extremely Large Telescope (E-ELT), Santiago Arribas, Consejo Superior de Investigaciones Científicas (Spain); Niranjan A. Thatte, Timothy M. Goodsall, Mathias Tecza, Fraser Clarke, Univ. of Oxford (United Kingdom); Roland M. Bacon, Observatoire de Lyon (France) [7735-203]

The cryo-mechanical system of SIMPLE E-ELT, Ernesto Oliva, Ciro Del Vecchio, Osservatorio Astrofisico di Arcetri (Italy); Livia Origlia, Osservatorio Astronomico di Bologna (Italy); Luca Roccia, Omicron Sistemi (Italy); Guido Roveta, Criotec Impianti s.r.l. (Italy) [7735-204]

CODEX optics, Bernard Delabre, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-205]

Web-based scientific simulation tools for E-ELT instruments, Mathieu Puech, Yanbin Yang, Hector Flores, Observatoire de Paris à Meudon (France) [7735-206]

OPTIMOS-EVE design tradeoff analysis, Fanny Chemla, Observatoire de Paris à Meudon (France); Gavin B. Dalton, Eric C. Sawyer, Rutherford Appleton Lab. (United Kingdom); Johannes H. Pragt, ASTRON (Netherlands); Paolo Spanò, Osservatorio Astronomico di Brera (Italy); Ian A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); Isabelle Guinouard, Observatoire de Paris à Meudon (France); Michael I. Andersen, Univ. of Copenhagen (Denmark); Ramón Navarro, ASTRON (Netherlands); Jean-François Hammer, Observatoire de Paris à Meudon (France); Lex Kapser, Univ. van Amsterdam (Netherlands) [7735-207]

The infrared imaging spectrograph (IRIS) for TMT: the science case, Elizabeth J. Barton, Univ. of California, Irvine (United States); James E. Larkin, Univ. of California, Los Angeles (United States); Anna M. Moore, California Institute of Technology (United States); Shelley A. Wright, Univ. of California, Berkeley (United States); David Crampton, Luc Simard, National Research Council Canada (Canada) [7735-208]

The science calibration system for the TMT NFIRAOS and client instruments: requirements and design studies, Dae-Sik Moon, Univ. of Toronto (Canada); Luc Simard, National Research Council Canada (Canada); Dafna Sussman, Univ. of Toronto (Canada); David Crampton, National Research Council Canada (Canada); Max Millar-Blanchaer, Queen's Univ. (Canada); Raymond G. Carlberg, Vainatey Kulkarni, Muhammad O. Khan, Univ. of Toronto (Canada); Evgeny Gorelik, Andy Kim, McMaster Univ. (Canada); Marc A. Roxas, Univ. of Toronto (Canada); Jeffrey Osborne, Queen's Univ. (Canada); Glen Herriot, National Research Council Canada (Canada); James E. Larkin, Univ. of California, Los Angeles (United States); David LaFrenière, Univ. of Toronto (Canada) [7735-209]

The science drivers for a mid-infrared instrument for the TMT, Yoshiko K. Okamoto, Ibaraki Univ. (Japan); Christopher C. Packham, Univ. of Florida (United States); Alan T. Tokunaga, Univ. of Hawai'i (United States); Mitsuhiro Honda, Kanagawa Univ. (Japan); Itsuki Sakon, The Univ. of Tokyo (Japan); John S. Carr, U.S. Naval Research Lab. (United States); Masashi Chiba, Tohoku Univ. (Japan); Mark R. Chun, Univ. of Hawai'i (United States); Hideaki Fujiwara, The Univ. of Tokyo (Japan); Takuya Fujiyoshi, National Astronomical Observatory of Japan/Subaru Telescope (United States); Masatoshi Imanishi, Yoshifusa Ita, National Astronomical Observatory of Japan (Japan); Hirokazu Kataza, Japan Aerospace Exploration Agency (Japan); Nancy A. Levenson, Gemini Observatory (Chile); Mikako Matsuura, Univ. College London (United Kingdom); Takeo Minezaki, The Univ. of Tokyo (Japan); Joan R. Najita, National Optical Astronomy Observatory (United States); Takashi Onaka, The Univ. of Tokyo (Japan); Takafumi Ootsubo, Japan Aerospace Exploration Agency (Japan); Matthew J. Richter, Univ. of California, Davis (United States); Michihiro Takami, Academia Sinica (Taiwan); Charles M. Telesco, Univ. of Florida (United States); Christopher M. Wright, UNSW@ADFA (Australia); Takuya Yamashita, National Astronomical Observatory of Japan (Japan) [7735-210]

An infrared multi-object spectrograph (IRMS) with adaptive optics for TMT: the science case, Bahram Mobasher, Univ. of California, Riverside (United States); Bob Weber, California Institute of Technology (United States); David Crampton, Luc Simard, National Research Council Canada (Canada); Nick Konidaris, California Institute of Technology (United States) [7735-211]

The infrared imaging spectrograph (IRIS) for TMT: the atmospheric dispersion corrector, Andrew C. Phillips, Lick Observatory (United States); Brian J. Bauman, Lawrence Livermore National Lab. (United States); James E. Larkin, Univ. of California, Los Angeles (United States); Anna M. Moore, California Institute of Technology (United States); Cynthia N. Niehaus, Univ. of California, Los Angeles (United States); David Crampton, Luc Simard, National Research Council Canada (Canada) [7735-212]

Science flow down for the Thirty Meter Telescope, Luc Simard, David Crampton, National Research Council Canada (Canada) [7735-213]

The infrared imaging spectrograph (IRIS) for TMT: imager design, Ryuji Suzuki, Tomonori Usuda, National Astronomical Observatory of Japan/Subaru Telescope (United States); David Crampton, National Research Council Canada (Canada); James E. Larkin, Univ. of California, Los Angeles (United States); Anna M. Moore, Caltech Optical Observatories (United States); Luc Simard, National Research Council Canada (Canada) [7735-214]

Conceptual design phase stray light analysis of the MOBIE imaging spectrograph for TMT, K. Scott Ellis, Photon Engineering LLC (United States); Rebecca A. Bernstein, Bruce C. Bigelow, Univ. of California, Santa Cruz (United States) [7735-215]

Instrumentation at Paranal Observatory, Gordon Gillet, José Luis Alvarez, Juan Beltrán, Pierre Bourget, Roberto Castillo, Álvaro Diaz, Nicholas Haddad, Alfredo Leiva, Pedro Mardones, Jared O'Neal, Mauricio A. Ribes, Miguel Riquelme, Pascal Robert, Chester Rojas, Javier Valenzuela, European Southern Observatory (Chile) [7735-216]

Nasmyth focus instrumentation of the New Solar Telescope at Big Bear Solar Observatory, Wenda Cao, Nicolas Goerx, Aaron Coulter, Big Bear Solar Observatory (United States); Friedrich Woeger, National Solar Observatory (United States); Kwangsu Ahn, Roy Coulter, Big Bear Solar Observatory (United States) [7735-217]

- Instrumentation at the Magellan Telescopes**, David J. Osip, Francesco Di Mille, Shane Walsh, Gabriel Martin, Mauricio Navarrete, Victor Merino, Jorge Bravo, Las Campanas Observatory (Chile) [7735-218]
- SOFIA image motion compensation**, Edward W. Dunham, Peter L. Collins, Lowell Observatory (United States); Ulrich Lampater, Andreas Reinacher, Univ. Stuttgart (Germany) [7735-219]
- Infrared imaging magnetograph of the New Solar Telescope at Big Bear Solar Observatory**, Wenda Cao, Kwangsu Ahn, Nicolas Gorceix, Big Bear Solar Observatory (United States) [7735-220]
- Data reduction strategies for lucky imaging**, Timothy D. Staley, Craig D. Mackay, Univ. of Cambridge (United Kingdom) [7735-221]
- A broadband imager for the European Solar Telescope**, Matteo Munari, Salvo Scuderi, Osservatorio Astrofisico di Catania (Italy); Massimo Ceconi, Istituto Nazionale di Astrofisica (Italy) [7735-222]
- MiniTAO/MAX38 first light: 30-micron band observations from the ground-based telescope**, Tomohiko Nakamura, Takashi Miyata, Shigeyuki Sako, Kentaro Asano, Mizuho Uchiyama, Toshihiko Tanabe, The Univ. of Tokyo (Japan); Mizuki Yoneda, Tohoku Univ. (Japan); Yoshifusa Ita, National Astronomical Observatory of Japan (Japan); Takashi Onaka, The Univ. of Tokyo (Japan); Hirokazu Kataza, Japan Aerospace Exploration Agency (Japan); Tsutomu Aoki, Mamoru Doi, Toshihiro Handa, Daisuke Kato, Kimiaki Kawara, Kotaro Kohno, Masahiro Konishi, Shintaro Koshida, Takeo Minezaki, Natsuko Mitani, Kentaro Motohara, Ryo Ohsawa, Takao Soyano, Masuo Tanaka, Ken'ichi Tarusawa, Koji Toshikawa, Yuzuru Yoshii, The Univ. of Tokyo (Japan) [7735-223]
- Fast photometry mode possibilities for the Canarias infrared camera experiment (IRICE)**, Nestor M. Lasso Cabrera, Kevin T. Hanna, Stephen S. Eikenberry, Miguel V. Charcos-Llorens, Michelle L. Edwards, Univ. of Florida (United States); Antonio Marin-Franch, Instituto de Astrofisica de Canarias (Spain) [7735-224]
- A new two-degree FOV prime focus corrector and ADC concept for the 4.2m WHT**, Tibor Agocs, Marc Balcells, Chris R. Benn, Don Carlos Abrams, Diego Cano Infantes, Isaac Newton Group of Telescopes (Spain) [7735-225]
- Spectrophotometric calibration system for DECam**, Jean-Philippe Rheault, Darren L. DePoy, Tyler W. Behm, Eric W. Kylberg, Kris A. Cabral, Richard D. Allen, Jennifer L. Marshall, Texas A&M Univ. (United States) [7735-226]
- Improved REM telescope interface with a new simultaneous multiband visible camera**, Vincenzo De Caprio, Paolo Spanò, Osservatorio Astronomico di Brera (Italy); Marco La Foresta, Instituto de Astrofisica de Canarias (Spain); Emilio Molinari, Osservatorio Astronomico di Brera (Italy); Gino Tosti, Univ. degli Studi di Perugia (Italy); Enrico Mattaini, Osservatorio Astronomico di Brera (Italy) [7735-227]
- Self-coherent camera: first results of a high-contrast imaging bench in visible light**, Marion Mas, Pierre Baudoz, Gerard C. Rousset, Raphaël Galicher, Jacques Baudrand, François Assémat, Observatoire de Paris à Meudon (France) [7735-228]
- A high-efficiency fibre double-scrambler prototype**, Stuart I. Barnes, Anglo-Australian Observatory (Australia) and McDonald Observatory, The Univ. of Texas at Austin (United States); Phillip J. MacQueen, McDonald Observatory, The Univ. of Texas at Austin (United States) [7735-229]
- MANIFEST: a many instrument fiber positioning system for GMT**, William Saunders, Ian Saunders, Matthew Colless, Jeroen Heijmans, Jurek K. Brzeski, Andrew Hopkins, Michael Goodwin, Tony J. Farrell, Anglo-Australian Observatory (Australia) [7735-230]
- APOGEE cryostat design**, Fred R. Hearty, Univ. of Virginia (United States); Charles P. Henderson, Cornell Univ. (United States); Basil Blank, PulseRay (United States); John C. Wilson, Steven Majewski, Michael F. Skrutskie, Univ. of Virginia (United States); Stephen A. Smea, The Johns Hopkins Univ. (United States); Ricardo Sciaapon, NOAO Gemini Science Ctr. (United States) [7735-231]
- APOGEE fiber-feed prototype testing**, Sophia D. Brunner, Univ. of Virginia (United States); Jeffrey D. Crane, Carnegie Observatories (United States); Adam Burton, Univ. of Virginia (United States); Bo Zhao, Univ. of Florida (United States); Fred R. Hearty, John C. Wilson, Univ. of Virginia (United States); Larry N. Carey, French Leger, Univ. of Washington (United States); Michael F. Skrutskie, Steve Majewski, Univ. of Virginia (United States); Ricardo Schiavon, Gemini Observatory (United States) [7735-232]
- Nulling interferometry for lateral shearing by use of double Fresnel rhombs**, Naoshi Baba, Keita Kobayashi, Naoshi Murakami, Hokkaido Univ. (Japan) [7735-233]
- Multiband filters for near-infrared astronomical applications**, James E. Rhoads, Sangeeta Malhotra, Paul A. Scowen, Arizona State Univ. (United States); Ronald G. Probst, National Optical Astronomy Observatory (United States); Donald W. McCarthy, Jr., Steward Observatory, The Univ. of Arizona (United States) [7735-234]
- Chilled water glycol system for CANOPUS at Gemini South**, Gaston Gausachs, Ramon L. Galvez, Matthieu Bec, Gemini Observatory (Chile) [7735-235]
- DMD-based MOS demonstrator on Galileo Telescope**, Frederic Zamkotsian, Observatoire Astronomique de Marseille-Provence (France); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Patrick Lanzoni, Observatoire Astronomique de Marseille-Provence (France); Luca Valenziano, INAF - IASF Bologna (Italy); Paolo Spanò, Osservatorio Astronomico di Brera (Italy) [7735-236]
- The solar seeing monitor MISOLFA: presentation and first results**, Abdanour A. Irbah, Ctr. National de la Recherche Scientifique (France); Thierry Corbard, Pierre Assus, Observatoire de la Côte d'Azur (France); Julien Borgnino, Univ. de Nice Sophia Antipolis (France); Christophe Dufour, Ctr. National de la Recherche Scientifique (France); Ikhlef Rabah, Ctr. de Recherche en Astronomie, Astrophysique et Géophysique (Algeria); François Martin, Univ. de Nice Sophia Antipolis (France); Mustapha M. Meftah, Ctr. National de la Recherche Scientifique (France); Frédéric Morand, Univ. de Nice Sophia Antipolis (France); Catherine Renaud, Observatoire de la Côte d'Azur (France); Erwan Simon, Univ. de Nice Sophia Antipolis (France) [7735-237]
- EPOL: the exoplanet polarimeter for EPICS at the E-ELT**, Christoph U. Keller, Utrecht Univ. (Netherlands); Hans Martin Schmid, ETH Zürich (Switzerland); Lars B. Venema, ASTRON (Netherlands); Hector Canovas, Utrecht Univ. (Netherlands); Hiddo H. Hanenburg, Riëks Jager, ASTRON (Netherlands); Sandra V. Jeffers, Utrecht Univ. (Netherlands); Markus E. Kasper, European Southern Observatory (Germany); Michiel Min, Utrecht Univ. (Netherlands); Florence Rigal, ASTRON (Netherlands); Michiel Rodenhuis, Utrecht Univ. (Netherlands); Ronald Roelfsema, ASTRON (Netherlands); Frans Snik, Utrecht Univ. (Netherlands); Daphne M. Stam, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); Christophe Verinaud, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7735-239]
- HAWCPol: a first-generation far-infrared polarimeter for SOFIA**, C. Darren Dowell, Brant T. Cook, Jet Propulsion Lab. (United States); D. Al Harper, The Univ. of Chicago (United States); Lung-Sheng Lin, Jet Propulsion Lab. (United States); Leslie W. Looney, Univ. of Illinois at Urbana-Champaign (United States); Giles Novak, Northwestern Univ. (United States); Ian Stephens, Univ. of Illinois (United States); David T. Chuss, NASA Goddard Space Flight Ctr. (United States); Richard M. Crutcher, Univ. of Illinois at Urbana-Champaign (United States); Jessie L. Dotson, NASA Ames Research Ctr. (United States); Roger H. Hildebrand, The Univ. of Chicago (United States); Martin Houde, Univ. of Western Ontario (Canada); Terry J. Jones, Univ. of Minnesota, Twin Cities (United States); Alexander Lazarian, Univ. of Wisconsin-Madison (United States); John E. Vaillancourt, SOFIA / USRA (United States); Michael W. Werner, Jet Propulsion Lab. (United States) [7735-240]
- The polarization optics for the European Solar Telescope (EST)**, Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Alex Feller, Max-Planck-Institut für Sonnensystemforschung (Germany); Bernard F. Gelly, Themis S.L. (Spain); Christoph U. Keller, Utrecht Univ. (Netherlands); Thomas J. Kentischer, Albert-Ludwigs-Univ. Freiburg (Germany); Arturo López Ariste, Themis S.L. (Spain); Oksana Pleier, Max-Planck-Institut für Sonnensystemforschung (Germany); Héctor Socas-Navarro, Instituto de Astrofisica de Canarias (Spain) [7735-241]
- Progress on MMT-POL: a 1-5µm adaptive optics optimized polarimeter for the MMT**, Christopher C. Packham, Univ. of Florida (United States); Terry J. Jones, Megan Krejny, Kathleen DeWhal, Univ. of Minnesota, Twin Cities (United States); Enrique Lopez Rodriguez, Craig D. Warner, Univ. of Florida (United States) [7735-242]
- Laboratory performance of a lenslet-based dual-beam imaging polarimeter**, Sandie L. Bouchard, René Doyon, Univ. de Montréal (Canada) [7735-243]
- A method to subtract the skylight for the multi-fiber instrument E-ELT/OPTIMOS-EVE**, Myriam Rodrigues, Hector Flores, Matthieu Puech, Yanbin Yang, Frédéric Royer, Observatoire de Paris à Meudon (France) [7735-244]
- The GREGOR Fabry-Perot interferometer: a new instrument for high-resolution solar observations**, Carsten J. Denker, Horst Balthasar, Axel Hofmann, Astrophysikalisches Institut Potsdam (Germany); Nazaret Bello Gonzalez, Reiner Volkmer, Albert-Ludwigs-Univ. Freiburg (Germany) [7735-245]
- Progress report on FORCAST grism spectroscopy as a future general observer instrument mode on SOFIA**, Luke D. Keller, Ithaca College (United States); Casey P. Deen, The Univ. of Texas at Austin (United States); Kimberly A. Ennico, NASA Ames Research Ctr. (United States); Daniel T. Jaffe, The Univ. of Texas at Austin (United States); Thomas P. Greene, NASA Ames Research Ctr. (United States); Joseph D. Adams, Terry L. Herter, Gregory C. Sloan, Cornell Univ. (United States) [7735-246]
- E-ELT instrument study for first light, OPTIMOS-DIORAMAS: mechanical concept study for slit masks system**, Vincenzo De Caprio, Dario Maccagni, Enrico Mattaini, Emilio Sant'Ambrogio, Salvatore Incorvaia, Lucio Chiappetti, Bianca Garilli, INAF - IASF Milano (Italy); Lucien Hill, Marc Jaquet, Laurent Martin, Alain Origne, David Le Mignant, Olivier C. Le Fèvre, Observatoire Astronomique de Marseille-Provence (France) [7735-247]
- OPTIMOS-EVE optical design of a very efficient, high-multiplex, large spectral coverage, fiber-fed spectrograph at EELT**, Paolo Spanò, Osservatorio Astronomico di Brera (Italy); Ian A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); Fanny Chemla, Observatoire de Paris à Meudon (France) [7735-248]
- Status of the echelon-cross-echelle spectrograph for SOFIA**, Matthew J. Richter, Univ. of California, Davis (United States); Kimberly A. Ennico, Mark E. McKelvey, NASA Ames Research Ctr. (United States); Andreas Seifahrt, Univ. of California, Davis (United States) [7735-249]

Mechanical design of (SIFS) SOAR integral field unit spectrograph, Vanessa B. P. Macanhan, Fernando G. Santoro, Clemens D. Gneiding, Antonio C. de Oliveira, Fernando Lourenço, Lab. Nacional de Astrofísica (Brazil); Beatriz Barbu, Jacques Lepine, Militao Figueiredo, Univ. de São Paulo (Brazil); Paulo Silva, Bruno V. Castilho, Flavio F. Ribeiro, Marcio de Arruda, Arturo Gutierrez, Luiz Renato Zambretti, Francisco Rodrigues, Henrique Di Pintor Da Luz, Jose Magno da Silva, Lab. Nacional de Astrofísica (Brazil) [7735-250]

The optical design of wide integral field infrared spectrograph, Chueh-Yi Chou, Dae-Sik Moon, Univ. of Toronto (Canada); Stephen S. Eikenberry, Univ. of Florida (United States) [7735-251]

Design and status of a near-infrared multi-object spectrograph for the TAO 6.5-m Telescope, Masahiro Konishi, Kentaro Motohara, Mamoru Doi, Shigeyuki Sako, Koji Toshikawa, Natsuko Mitani, Tsutomu Aoki, Toshihiro Handa, The Univ. of Tokyo (Japan); Yoshifusa Ita, National Astronomical Observatory of Japan (Japan); Daisuke Kato, Kimiaki Kawara, Kotaro Kohno, Shintaro Koshida, Takeo Minezaki, Takashi Miyata, Takao Soyano, Toshihiko Tanabe, Masuo Tanaka, Ken'ichi Tarusawa, Yuzuru Yoshii, The Univ. of Tokyo (Japan) [7735-252]

Design inputs for a high-performance high-resolution near-infrared spectrograph, Kenneth H. Hinkle, Joseph R. De Vries, Richard R. Joyce, Joan R. Najita, David Sprayberry, National Optical Astronomy Observatory (United States) [7735-253]

KMOS data flow: reconstructing data cubes in a single step, Richard I. Davies, Max-Planck-Institut für extraterrestrische Physik (Germany) [7735-254]

MIRADAS: a proposal for an intermediate dispersion NIR spectrograph for the GTC, Stephen S. Eikenberry, Univ. of Florida (United States); Francisco Garzón López, Instituto de Astrofísica de Canarias (Spain); Christopher C. Packham, Univ. of Florida (United States); Peter L. Hammersley, Maider Insausti, Instituto de Astrofísica de Canarias (Spain) [7735-255]

The habitable zone planet finder: a proposed high-resolution NIR spectrograph for the HET to discover low-mass exoplanets around M stars, Suvrath Mahadevan, Lawrence W. Ramsey, Jason T. Wright, Alex Wolszczan, The Pennsylvania State Univ. (United States); Michael Endl, The Univ. of Texas at Austin (United States) [7735-256]

Characterizing the Robert Stobie spectrograph's near-infrared detector, Ryan L. Doering, Andrew I. Sheinis, Donald J. Thielman, Marsha J. Wolf, Univ. of Wisconsin-Madison (United States) [7735-257]

Fourier transform spectroscopy on very large telescopes, Stephen T. Ridgway, Kenneth H. Hinkle, National Optical Astronomy Observatory (United States) [7735-258]

Quick-look reduction software for FORCAST Grism mode on SOFIA, Casey P. Deen, The Univ. of Texas at Austin (United States); Luke D. Keller, Ithaca College (United States); Daniel T. Jaffe, The Univ. of Texas at Austin (United States); Kimberly A. Ennico, Thomas P. Greene, NASA Ames Research Ctr. (United States); Joseph D. Adams, Terry L. Herter, Gregory C. Sloan, Cornell Univ. (United States) [7735-259]

The Pathfinder testbed: exploring techniques for achieving precision radial velocities in the near infrared, Lawrence W. Ramsey, The Pennsylvania State Univ. (United States) and Ctr. for Exoplanets and Habitable Worlds, Pennsylvania State Univ. (United States); Stephen Redman, The Pennsylvania State Univ. (United States); Suvrath Mahadevan, The Pennsylvania State Univ. (United States) and Ctr. for Exoplanets and Habitable Worlds, Pennsylvania State Univ. (United States); Stephanie Zonak, The Pennsylvania State Univ. (United States); Steinn Sigurdsson, Alex Wolszczan, The Pennsylvania State Univ. (United States) and Ctr. for Exoplanets and Habitable Worlds, Pennsylvania State Univ. (United States) [7735-260]

Spectral resolution and scattered light properties for high-resolution and high signal-to-noise ratio spectroscopy in the infrared, Hans-Ulrich Käufel, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Geronimo Villanueva, NASA Goddard Space Flight Ctr. (United States); Alain Smette, European Organisation for Astronomical Research in the Southern Hemisphere (Chile); Michael J. Mumma, NASA Goddard Space Flight Ctr. (United States) [7735-261]

Pressure and temperature stabilization of an existing Echelle spectrograph, Frank U. Grupp, Max-Planck-Institut für extraterrestrische Physik (Germany); Thomas Udem, Max-Planck-Institut für Quantenoptik (Germany); Ronald Holzwarth, Menlo Systems GmbH (Germany); Florian Lang-Bardl, Shao-Ming Hu, Univ.-Sternwarte München (Germany); Liang Wang, National Astronomical Observatories (China); Ralf Bender, Max-Planck-Institut für extraterrestrische Physik (Germany) [7735-262]

Development of VIRUS alignment and assembly fixtures, Amanda D. Collins, Texas A&M Univ. (United States); Brian L. Vattiat, The Univ. of Texas at Austin (United States); Jennifer L. Marshall, Texas A&M Univ. (United States); Gary J. Hill, The Univ. of Texas at Austin (United States); Darren L. DePoy, Texas A&M Univ. (United States); Hanshin Lee, The Univ. of Texas at Austin (United States); Richard D. Allen, Steven Villanueva, Jr., Texas A&M Univ. (United States) [7735-263]

Mechanical design evolution of the VIRUS instrument for volume production and deployment, Brian L. Vattiat, Gary J. Hill, The Univ. of Texas at Austin (United States); Jennifer L. Marshall, Darren L. DePoy, Texas A&M Univ. (United States); Michael P. Smith, Univ. of Wisconsin-Madison (United States); Svend M. Bauer,

Andreas Kelz, Astrophysikalisches Institut Potsdam (Germany); Marc D. Rafal, Richard D. Savage, John M. Good, John A. Booth, The Univ. of Texas at Austin (United States) [7735-264]

Development of a cryogenic system for the VIRUS array of 150 spectrographs for the Hobby-Eberly Telescope, Taylor S. Chonis, The Univ. of Texas at Austin (United States); Kris A. Cabral, Jennifer L. Marshall, Texas A&M Univ. (United States); Brian L. Vattiat, McDonald Observatory, The Univ. of Texas at Austin (United States); Michael P. Smith, Univ. of Wisconsin System (United States); Gary J. Hill, McDonald Observatory, The Univ. of Texas at Austin (United States); Darren L. DePoy, Texas A&M Univ. (United States); Marc D. Rafal, John M. Good, John A. Booth, Richard D. Savage, McDonald Observatory, The Univ. of Texas at Austin (United States) [7735-265]

iSHELL: a 1-5 micron cross-dispersed R=70,000 immersion grating Echelle spectrograph for IRTF, John T. Rayner, Timothy W. Bond, Alan T. Tokunaga, Univ. of Hawai'i (United States); Daniel T. Jaffe, The Univ. of Texas at Austin (United States); Michael J. Mumma, NASA Goddard Space Flight Ctr. (United States) [7735-266]

The Hobby Eberly Telescope high-resolution spectrograph upgrade, Phillip J. MacQueen, McDonald Observatory, The Univ. of Texas at Austin (United States); Stuart I. Barnes, Anglo-Australian Observatory (Australia) and McDonald Observatory, The Univ. of Texas at Austin (United States) [7735-267]

The LUCIFER MOS: a full cryogenic mask handling unit for a near-infrared multi-object spectrograph, Peter Buschkamp, Hans Gemperlein, Reiner Hofmann, Max-Planck-Institut für extraterrestrische Physik (Germany); Kai Polsterer, Ruhr-Universität Bochum (Germany); Nancy Ageorges, Frank Eisenhauer, Reinhard Lederer, Mathias Honsberg, Marcus Haug, Johann Eibl, Max-Planck-Institut für extraterrestrische Physik (Germany); Walter Seifert, Landessternwarte Heidelberg (Germany); Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany) [7735-268]

Correcting METIS spectra for telluric absorption lines: maximising spectral fidelity, Stefan Uttenthaler, Katholieke Univ. Leuven (Belgium); Andreas Seifahrt, Univ. of California, Davis (United States); Klaus Pontoppidan, California Institute of Technology (United States); Joris Blommaert, Katholieke Univ. Leuven (Belgium); Eric J. Pantin, Commissariat à l'Énergie Atomique (France); Bernhard R. Brandl, Leiden Univ. (Netherlands); Frank Molster, Netherlands Research School for Astronomy, NOVA (Netherlands); Lars B. Venema, ASTRON (Netherlands); Rainer Lenzen, Max-Planck-Institut für Astronomie (Germany); Philip M. Parr-Burman, UK Astronomy Technology Ctr. (United Kingdom) [7735-269]

Design study of an image slicer-based integral-field spectrograph for EPICS, Mathias Tecza, Niranjan A. Thatte, Fraser Clarke, Graeme S. Salter, Univ. of Oxford (United Kingdom) [7735-270]

Using the X-shooter physical model to understand instrument flexure, Paul Bristow, Florian Kerber, Joel Vernet, Sabine Moehler, Andrea Modigliani, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-271]

The upgraded WIYN bench spectrograph, Patricia M. Knezek, WIYN Observatory (United States) and National Optical Astronomy Observatory (United States); Matthew A. Bershad, Univ. of Wisconsin-Madison (United States); Daryl W. Willmarth, John W. Glaspey, Gary A. Poczulp, National Optical Astronomy Observatory (United States); Daniel R. Bianco, WIYN Observatory (United States); Lana Britanik, National Optical Astronomy Observatory (United States); Eugene McDougall, WIYN Observatory (United States); Charles Corson, Ming Liang, National Optical Astronomy Observatory (United States); Joseph T. Keyes, WIYN Observatory (United States) and Univ. of Arizona (United States); George H. Jacoby, National Optical Astronomy Observatory (United States) [7735-272]

Gemini multi-object spectrograph focal plane CCD upgrade, Kei Szeto, Richard G. Mrowinski, Andre Anthony, Jennifer Dunn, Darren A. Erickson, J. Murray Fletcher, Tim Hardy, National Research Council Canada (Canada) [7735-273]

Mechanical design of the near-infrared arm of the Robert Stobie spectrograph for SALT, Michael P. Smith, Univ. of Wisconsin-Madison (United States); Jeffrey P. Wong, Paradigm Design Inc. (United States); William P. Mason, Douglas P. Adler, Allen R. Rogers, Andrew I. Sheinis, Marsha J. Wolf, Donald J. Thielman, Mark P. Mulligan, Jeffrey W. Percival, Univ. of Wisconsin-Madison (United States) [7735-274]

Design drivers for a wide-field multi-object spectrograph for the WHT, Marc Balcells, Isaac Newton Group of Telescopes (Spain) and Instituto de Astrofísica de Canarias (Spain); Chris R. Benn, Don Carlos Abrams, Diego Cano Infantes, Tibor Agocs, Isaac Newton Group of Telescopes (Spain); David Carter, Liverpool John Moores Univ. (United Kingdom); Gavin B. Dalton, Univ. of Oxford (United Kingdom); Reynier F. Peletier, Univ. of Groningen (Netherlands); Ismael Perez-Fouron, Instituto de Astrofísica de Canarias (Spain); Ray M. Sharples, Durham Univ. (United Kingdom); Scott C. Trager, Univ. of Groningen (Netherlands); Ignacio Trujillo, Instituto de Astrofísica de Canarias (Spain); Mark A. W. Verheijen, Univ. of Groningen (Netherlands) [7735-275]

LRS2: a new low-resolution spectrograph for the Hobby-Eberly Telescope and its application to scalable spectrographs for the future extremely large telescopes, Hanshin Lee, Taylor S. Chonis, Gary J. Hill, The Univ. of Texas at Austin (United States); Darren L. DePoy, Jennifer L. Marshall, Texas A&M Univ. (United States); Brian L. Vattiat, The Univ. of Texas at Austin (United States) [7735-276]

- High-stability light injection in optical fibers for ultra-high stability spectrographs: the pilot case of CODEX**, Filippo Maria Zerbi, Paolo Spanò, Marco Riva, Osservatorio Astronomico di Brera (Italy); Antonio Manescau, Luca Pasquini, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-277]
- Diverse field spectroscopy: instrument concepts**, Graham J. Murray, Jeremy R. Allington-Smith, Simon Blake, Robert Content, Claire L. Poppett, Durham Univ. (United Kingdom) [7735-278]
- High-contrast observations with slicer-based integral field spectrographs (simulations)**, Graeme S. Salter, Niranjana A. Thatte, Mathias Tecza, Fraser Clarke, Univ. of Oxford (United Kingdom); Christophe Verinaud, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-279]
- High-contrast observations with slicer-based integral field spectrographs (experimental tests)**, Graeme S. Salter, Niranjana A. Thatte, Mathias Tecza, Univ. of Oxford (United Kingdom); Fraser Clarke, Oxford Univ. (United Kingdom); Christophe Verinaud, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-280]
- The design of dispersing elements for a highly segmented, very wide-field spectrograph**, Andrea G. Bianco, Dario Maccagni, INAF - IASF Milano (Italy); Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Adriano Fontana, Osservatorio Astronomico di Roma (Italy); Andrea Baruffolo, Marco Dima, Osservatorio Astronomico di Padova (Italy); Andrea DiPaola, Osservatorio Astronomico di Roma (Italy); Jacopo Farinato, Giorgia Gentile, Osservatorio Astronomico di Padova (Italy); Emanuele Giallongo, Fernando Pedichini, Roberto Speziali, Vincenzo Testa, Osservatorio Astronomico di Roma (Italy) [7735-281]
- New generation multichannel subtractive double pass for EST imaging spectropolarimetry**, Frédéric N. Sayède, Pierre Mein, Observatoire de Paris à Meudon (France) [7735-282]
- METIS: system engineering and optical design of the mid-infrared E-ELT instrument**, Rainer Lenzen, Max-Planck-Institut für Astronomie (Germany); Bernhard R. Brandl, Leiden Observatory (Netherlands); Joris Blommaert, Katholieke Univ. Leuven (Belgium); Alistair C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); Eric J. Pantin, Service d'Astrophysique (France); Lars B. Venema, ASTRON (Netherlands); Frank Molster, Netherlands Research School for Astronomy, NOVA (Netherlands); Ralf Siebenmorgen, Hans-Ulrich Käufel, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Stefan Hippler, Max-Planck-Institut für Astronomie (Germany); Rik ter Horst, ASTRON (Netherlands); Laurent Jollissaint, Sarah Kendrew, Leiden Observatory (Netherlands); Gabby Kroes, Ronald Roelfsema, ASTRON (Netherlands); Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany) [7735-283]
- The infrared imaging spectrograph (IRIS) for TMT: sensitivities and simulations**, Shelley A. Wright, Univ. of California, Berkeley (United States); Elizabeth J. Barton, Univ. of California, Irvine (United States); James E. Larkin, Univ. of California, Los Angeles (United States); Anna M. Moore, California Institute of Technology (United States); David Crampton, Luc Simard, National Research Council Canada (Canada) [7735-284]
- TMT infrared imaging spectrograph (IRIS): wavefront sensing and AO interface**, David Loop, Vladimir A. Reshetov, J. Murray Fletcher, Robert Wooff, Jennifer Dunn, National Research Council Canada (Canada); Anna M. Moore, Roger M. Smith, David D. S. Hale, Richard G. Dekany, Caltech Optical Observatories (United States); Lianqi Wang, Brent L. Ellerbroek, TMT Observatory Corp. (United States); Luc Simard, David Crampton, National Research Council Canada (Canada) [7735-285]
- A proposal for an upgrade of the VISIR mid-IR instrument at the VLT**, Florian Kerber, Hans-Ulrich Kaeuffl, Mario van den Ancker, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Pedro Baksai, European Southern Observatory (Chile); Didier Dubreuil, Gilles A. Durand, CEA Saclay (France); Danuta Dobrzycka, Gert Finger, Christian A. Hummel, Derek J. Ives, Gerd H. Jakob, Paul Jolley, Lars K. Lundin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Gianni Marconi, Margaret M. Moerchen, Yazan Momany, Dieter Nuernberger, European Southern Observatory (Chile); Eric J. Pantin, CEA Saclay (France); Miquel Riquelme, European Southern Observatory (Chile); Ralf Siebenmorgen, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Alain Smette, European Southern Observatory (Chile); Lars B. Venema, ASTRON (Netherlands); Ueli Weilenmann, European Southern Observatory (Chile) [7735-286]
- A high-performance imager and integral field spectrograph for the W. M. Keck Observatory's next-generation adaptive optics facility**, Sean M. Adkins, James M. Bell, Albert Conrad, W. M. Keck Observatory (United States); Michael Fitzgerald, Univ. of California, Los Angeles (United States); Renate Kupke, Univ. of California, Santa Cruz (United States); James E. Larkin, Univ. of California, Los Angeles (United States); James Lyke, W. M. Keck Observatory (United States); Claire E. Max, Elizabeth J. McGrath, Univ. of California, Santa Cruz (United States); Sandrine J. Thomas, Lick Observatory (United States); Peter Wizinowich, W. M. Keck Observatory (United States) [7735-287]
- The error analysis and improvement scheme of large scale CCD measuring system in LAMOST field environment**, Zeng Xiang Zhou, Chao Zhai, Jin Yi, Xiaozheng Xing, Univ. of Science and Technology of China (China) [7735-289]
- Data simulator for the HERMES instrument**, Michael Goodwin, Scott Smedley, Stuart I. Barnes, Tony J. Farrell, Samuel C. Barden, Anglo-Australian Observatory (Australia) [7735-290]
- Performance predictions for the Robert Stobie spectrograph near-infrared arm on SALT**, Marsha J. Wolf, Andrew I. Sheinis, Univ. of Wisconsin-Madison (United States); Ted B. Williams, Rutgers, The State Univ. of New Jersey (United States); Kenneth H. Nordsieck, Matthew A. Bershad, Univ. of Wisconsin-Madison (United States) [7735-291]
- Results of LUCIFER1 commissioning**, Walter Seifert, Landessternwarte Heidelberg (Germany); Nancy Ageorges, Max-Planck-Institut für extraterrestrische Physik (Germany); Michael Lehmitz, Max-Planck-Institut für Astronomie (Germany); Peter Buschkamp, Max-Planck-Institut für extraterrestrische Physik (Germany); Volker Kriemir, Kai Polsterer, Ruhr-Univ. Bochum (Germany); Andre Germeroth, Landessternwarte Heidelberg (Germany) [7735-292]
- Precise infrared radial velocimetry with the triplespec exoplanet discovery instrument: current performance and results**, Philip S. Muirhead, Cornell Univ. (United States); Jerry Edelstein, Univ. of California, Berkeley (United States); Jason T. Wright, The Pennsylvania State Univ. (United States); David J. Erskine, Lawrence Livermore National Lab. (United States); Matthew W. Mutterspaugh, Tennessee State Univ. (United States); Kevin R. Covey, Cornell Univ. (United States); Mario R. Marckwordt, Samuel Halverson, Daniel Mondo, Univ. of California, Berkeley (United States); James P. Lloyd, Cornell Univ. (United States) [7735-293]
- The Oxford SWIFT spectrograph: first commissioning and on-sky results**, Niranjana A. Thatte, Mathias Tecza, Fraser Clarke, Timothy M. Goodsall, Ryan Houghton, Lisa M. Fogarty, Graeme S. Salter, Roger L. Davies, Susan Kassim, Univ. of Oxford (United Kingdom); Antonin H. Bouchez, Richard G. Dekany, California Institute of Technology (United States) [7735-294]
- Mechanical configuration of the re-ionization and transients infrared camera (RATIR)**, Farah Alejandro-Simon, Everardo J. Barojas, Univ. Nacional Autónoma de México (Mexico) [7735-295]
- Schedule and commissioning plans for the upgraded GMOS-N science detectors**, Katherine C. Roth, Scot J. Kleinman, Gemini Observatory (United States); Rodrigo Carrasco, Gemini Observatory (Chile); Timothy J. Davidge, National Research Council Canada (Canada); Roberto Abraham, Univ. of Toronto (Canada) [7735-296]
- Experimental results of multi four-quadrant phase mask**, Pierre Baudoz, François Assémat, Raphaël Galicher, Jacques Baudrand, LESIA, Observatoire de Paris à Meudon (France) [7735-297]
- Ultraviolet compatibility tests of lens coupling fluids used in astronomical instrumentation**, Kenneth H. Nordsieck, Univ. of Wisconsin-Madison (United States); Frenk Nosan, J. Alan Schier, The Pilot Group (United States) [7735-298]
- Infrared radial velocimetry with TEDI: performance development**, Jerry Edelstein, Univ. of California, Berkeley (United States); Philip S. Muirhead, Cornell Univ. (United States); Jason T. Wright, The Pennsylvania State Univ. (United States); Kevin R. Covey, Cornell Univ. (United States); David J. Erskine, Lawrence Livermore National Lab. (United States); Matthew W. Mutterspaugh, Tennessee State Univ. (United States); James P. Lloyd, Cornell Univ. (United States); Samuel Halverson, Mario R. Marckwordt, Daniel Mondo, Univ. of California, Berkeley (United States) [7735-299]
- Second-earth imager for TMT: SEIT**, Taro Matsuo, Motohide Tamura, National Astronomical Observatory of Japan (Japan) [7735-300]
- The Irkutsk Barium filter at the Dutch Open Telescope for narrow-band wide-field high-resolution solar images**, Robert H. Hammerschlag, Utrecht Univ. (Netherlands); Valery I. Skomorovsky, Institute of Solar-Terrestrial Physics (Russian Federation); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Galina I. Kushtal, Institute of Solar-Terrestrial Physics (Russian Federation); Vyacheslav L. Olshevsky, Main Astronomical Observatory (Ukraine); Robert J. Rutten, Utrecht Univ. (Netherlands) and Univ. of Oslo (Norway); Aswin P. L. Jägers, Guus Sliepen, Utrecht Univ. (Netherlands) [7735-301]
- Gemini planet imager coronagraph testbed results**, Anand Sivaramkrishnan, American Museum of Natural History (United States); Remi Soummer, Space Telescope Science Institute (United States); Ben R. Oppenheimer, Robin Roberts, Douglas S. Brenner, American Museum of Natural History (United States); Alexis Carlotti, Princeton Univ. (United States); Laurent A. Pueyo, Jet Propulsion Lab. (United States) [7735-302]
- The experimental results of APIC: absolute position interfero-coronagraph for direct exoplanet detection**, Fatmé Allouche, Univ. de Nice Sophia Antipolis (France); Andreas Glindemann, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Eric Aristidi, Farokh Vakili, Univ. de Nice Sophia Antipolis (France) [7735-303]
- Results on fibre scrambling for high accuracy radial velocity measurements**, Gerardo Avila, Paul Singh, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-304]

Coronagraphic capability for HARMONI at the E-ELT, Szymon Gladysz, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Niranjana A. Thatte, Fraser Clarke, Mathias Tecza, Graeme S. Salter, Univ. of Oxford (United Kingdom). [7735-305]

Oukaimeden Observatory: detection of exoplanets by the transit method, Ahmed Daassouli, Mohammed Sabli, Zouhair Z. Benkhaldoun, Abdelkettah Habib, Youssef Elazhari, Univ. Cadi Ayyad (Morocco). [7735-306]

Direct imaging of exo-planets and zodiacal disks in the thermal regime with the E-ELT/METIS instrument, Eric J. Pantin, Céline Cavarroc, Commissariat à l'Énergie Atomique (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Frank Molster, Netherlands Research School for Astronomy, NOVA (Netherlands); Pierre-Olivier Lagage, Commissariat à l'Énergie Atomique (France); Joris Blommaert, Katholieke Univ. Leuven (Belgium). [7735-307]

The visible spectro-polarimeter for the ATST, Roberto Casini, Peter G. Nelson, National Ctr. for Atmospheric Research (United States). [7735-308]

Space-based photometric precision from ground-based telescopes, Peter C. Zimmer, John T. McGraw, Mark R. Ackermann, The Univ. of New Mexico (United States); Steven W. Brown, Gerald T. Fraser, National Institute of Standards and Technology (United States); Dean C. Hines, The Univ. of New Mexico (United States); Anthony B. Hull, L-3 Communications Tinsley Labs. Inc. (United States); Keith R. Lykke, Allan W. Smith, National Institute of Standards and Technology (United States); Christopher W. Stubbs, Harvard Univ. (United States); Jonathan H. Turner, The Univ. of New Mexico (United States); John T. Woodward, National Institute of Standards and Technology (United States); Daniel C. Zirzow, The Univ. of New Mexico (United States). [7735-309]

Testing of a transmission-filter coronagraph for ground-based imaging of exoplanets, Jiangpei Dou, Nanjing Institute of Astronomical Optics & Technology (China); Deqing Ren, California State Univ., Northridge (United States) and Nanjing Institute of Astronomical Optics & Technology (China); Yongtian Zhu, Nanjing Institute of Astronomical Optics & Technology (China); Xi Zhang, Xue Wang, Nanjing Institute of Astronomical Optics & Technology (China) and Graduate School of the Chinese Academy of Sciences (China). [7735-310]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan). . . . [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States). [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States). [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 8

Room: Town & Country. Thurs. 10:30 am to 12:30 pm

Techniques and Components II

Session Chair: Ramón J. García López,
Instituto de Astrofísica de Canarias (Spain)

10:30 am: **GPI: cryogenic spectrograph optics performances**, Simon Thibault, Univ. Laval (Canada); Philippe Vallée, René Doyon, Jean-François Lavigne, Univ. de Montréal (Canada); James E. Larkin, Univ. of California, Los Angeles (United States). [7735-57]

10:50 am: **Sparse aperture masking (SAM) at NAOS/CONICA on the VLT**, Peter G. Tuthill, The Univ. of Sydney (Australia); Paola Amico, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Sylvestre Lacour, Observatoire de Paris à Meudon (France); Michael J. Ireland, Tom Evans, Paul Stewart, The Univ. of Sydney (Australia); Adam Kraus, California Institute of Technology (United States); Christopher Lidman, Anglo-Australian Observatory (Australia); Emanuela Pompei, Nicholas Kornweibel, European Southern Observatory (Chile). [7735-58]

11:10 am: **The first VisAO-fed integral field spectrograph: MagAO IFS**, Katherine Brutlag, Laird M. Close, Derek A. Kopon, Jared R. Males, Victor Gasho, Steward Observatory, The Univ. of Arizona (United States); Alan Uomoto, Carnegie Observatories (United States). [7735-59]

11:30 am: **XMS: the extreme multiplex spectrograph for wide-field multi-object spectroscopy**, Robert Content, Durham Univ. (United Kingdom); Santiago Becerril, Instituto de Astrofísica de Andalucía (Spain); Armin Boehm, Max-Planck-Institut für Astronomie (Germany); Paul Clark, Durham Univ. (United Kingdom); Luis Pedro Costillo, Instituto de Astrofísica de Andalucía (Spain); Cornelis M. Dubbeldam, Durham Univ. (United Kingdom); Klaus Meisenheimer, Max-Planck-Institut für Astronomie (Germany); Nikolaos Nikoloudakis, Durham Univ. (United Kingdom); Francisco Prada, Instituto de Astrofísica de Andalucía (Spain); Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany); Tom Shanks, Ray M. Sharples, Durham Univ. (United Kingdom); Karl Wagner, Max-Planck-Institut für Astronomie (Germany). [7735-60]

11:50 am: **Focal plane detectors for the dark energy survey**, Juan Cruz Estrada, Fermi National Accelerator Lab. (United States). [7735-61]

12:10 pm: **On-sky demonstration of optical speckle stabilization using the SPIFS prototype**, Mark S. Keremedjiev, Stephen S. Eikenberry, Univ. of Florida (United States); Joseph C. Carson, Max-Planck-Institut für Astronomie (Germany). . . [7735-62]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 9

Room: Town & Country. Thurs. 1:50 to 3:10 pm

Airborne instrumentation

Session Chair: Maureen L. Savage, NASA Ames Research Ctr.

1:50 pm: **FIFI LS getting ready to fly aboard SOFIA**, Randolf Klein, Univ. of California, Berkeley (United States); Albrecht Poglitsch, Norbert Geis, Max-Planck-Institut für extraterrestrische Physik (Germany); Leslie W. Looney, Univ. of Illinois at Urbana-Champaign (United States); Walfried Raab, Fabio Fumi, Max-Planck-Institut für extraterrestrische Physik (Germany); Murad Hamidouche, NASA Ames Research Ctr. (United States); Rainer Hönl, Max-Planck-Institut für extraterrestrische Physik (Germany); Kaori Nishikida, Univ. of California, Berkeley (United States); Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany); Thomas Henning, Max-Planck-Institut für Astronomie (Germany). [7735-63]

2:10 pm: **FORCAST: a 'first light' facility instrument for SOFIA**, Joseph D. Adams, Terry L. Herter, George E. Gull, Justin Schoenwald, Charles P. Henderson, Cornell Univ. (United States); Luke D. Keller, Ithaca College (United States); Gordon J. Stacey, Thomas Nikola, Cornell Univ. (United States). [7735-64]

2:30 pm: **CASIMIR: a FIR/sub-mm heterodyne spectrometer for SOFIA**, Michael L. Edgar, Martin Emprechtinger, Alexandre Karpov, California Institute of Technology (United States); Robert Lin, Sean Lin, Frank Maiwald, Imran Mehdi, Jet Propulsion Lab. (United States); David Miller, Simon J. E. Radford, Frank R. Rice III, California Institute of Technology (United States); John S. Ward, Raytheon Co. (United States); Jonas Zmuidzinas, California Institute of Technology (United States). [7735-65]

2:50 pm: **The cosmic infrared background experiment (CIBER): instrumentation and first results**, Michael Zemcov, California Institute of Technology (United States) and Jet Propulsion Lab. (United States); John O. Battle, Jet Propulsion Lab. (United States); James J. Bock, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); Asantha Cooray, Univ. of California, Irvine (United States); Viktor V. Hristov, California Institute of Technology (United States); Brian G. Keating, Univ. of California, San Diego (United States); Dae-Hee Lee, Korea Astronomy and Space Science Institute (Korea, Republic of); Louis Levenson, Peter V. Mason, California Institute of Technology (United States); Toshio Matsumoto, Seoul National Univ. (Korea, Republic of); Shuji Matsuura, Institute of Space and Astronautical Science (Japan); Uk-Won Nam, Korea Astronomy and Space Science Institute (Korea, Republic of); Thomas Renbarger, Univ. of California, San Diego (United States); Ian Sullivan, California Institute of Technology (United States); Kohji Tsumura, The Univ. of Tokyo (Japan) and Institute of Space and Astronautical Science (Japan); Takehiko Wada, Institute of Space and Astronautical Science (Japan). [7735-66]

Coffee Break 3:10 to 3:40 pm

SESSION 10

Room: Town & Country. Thurs. 3:40 to 5:40 pm

Solar Instrumentation

Session Chair: Oskar F. H. von der Luehe II, Albert-Ludwigs-Univ. Freiburg (Germany)

3:40 pm: **Feasibility study of high-resolution integral-field spectrographs for EST with multislit and multiwavelength capabilities**, Ariadna Calcines Rosario, Manuel Collados Vera, Roberto L. López, Instituto de Astrofísica de Canarias (Spain)[7735-67]

4:00 pm: **ZIMPOL-3: a powerful solar polarimeter**, Renzo Ramelli, Istituto Ricerche Solari Locarno (Switzerland); Silvano Balemi, Scuola Univ. Professionale della Svizzera Italiana (Switzerland); Michele Bianda, Istituto Ricerche Solari Locarno (Switzerland); Ivan Defilippis, Luca Gamma, Scuola Univ. Professionale della Svizzera Italiana (Switzerland); Daniel Gisler, Istituto Ricerche Solari Locarno (Switzerland) and ETH Zürich (Switzerland); Stefan Hagenbuch, ETH Zürich (Switzerland); Marco Rogantini, Scuola Univ. Professionale della Svizzera Italiana (Switzerland); Peter Steiner, Istituto Ricerche Solari Locarno (Switzerland); Jan O. Stenflo, Istituto Ricerche Solari Locarno (Switzerland) and ETH Zürich (Switzerland) [7735-238]

4:20 pm: **Auxiliary full-disc telescope for the European Solar Telescope**, Michal Sobotka, Miroslav Kivana, Astronomical Institute of the ASCR, v.v.i (Czech Republic); Zbynek Melich, Zdenek Rail, Institute of Plasma Physics of the ASCR, v.v.i. (Czech Republic); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Bernard F. Gelly, Themis S.L. (France) [7735-69]

4:40 pm: **Spectrograph capabilities of the European Solar Telescope**, Manuel Collados Vera, Ariadna Calcines Rosario, Instituto de Astrofísica de Canarias (Spain); Alex Feller, Bianca Grauf, Max-Planck-Institut für Sonnensystemforschung (Germany); Christine Grivel-Gelly, Instituto de Astrofísica de Canarias (Spain); Johann Hirzberger, Max-Planck-Institut für Sonnensystemforschung (Germany); Arturo López Ariste, Themis S.L. (Spain); Roberto L. López, Instituto de Astrofísica de Canarias (Spain); Pierre Mein, Frédéric N. Sayède, Observatoire de Paris à Meudon (France) . [7735-70]

5:00 pm: **The ATST visible broadband imager: a case study for real-time image reconstruction and optimal data handling**, Friedrich Woeger, Thomas R. Rimmele, Alexandra Tritschler, Han Uitenbroek, David F. Elmore, National Solar Observatory (United States) [7735-71]

5:20 pm: **The diffraction-limited near-IR spectropolarimeter of the Advanced Technology Solar Telescope**, Haosheng Lin, Univ. of Hawai'i (United States); Stephen L. Hegwer, Scott Gregory, National Solar Observatory (United States) [7735-72]

Friday 2 July

SESSION 11

Room: Town & Country. Fri. 8:30 am to 12:00 pm

Instrumentation for ELTs I

Session Chair: David Crampton, National Research Council Canada (Canada)

8:30 am: **The TMT instrumentation program (Invited Paper)**, Luc Simard, David Crampton, National Research Council Canada (Canada); Brent Ellerbroek, Corinne Boyer, Thirty Meter Telescope Project (United States) [7735-73]

9:00 am: **An overview of the European ELT instrumentation programme (Invited Paper)**, Suzanne K. Ramsay, Sandro D'Odorico, Mark M. Casali, Juan Carlos Gonzalez, Markus E. Kasper, Hans-Ulrich Kaeufli, Markus Kissler-Patig, Norbert Hubin, Enrico Marchetti, Jerome Paufigue, Luca Pasquini, Andrea Richichi, Ralf Siebenmorgen, Joel Vernet, Filippo Maria Zerbi, European Southern Observatory (Germany) [7735-74]

9:30 am: **Science instrument development for the Giant Magellan Telescope**, Daniel T. Jaffe, The Univ. of Texas at Austin (United States) [7735-75]

9:50 am: **PixelOne: a proposed novel technology to mosaic ELT focal planes**, Fernando Pedichini, Andrea Di Paola, Vincenzo Testa, Osservatorio Astronomico di Roma (Italy) [7735-76]

Coffee Break 10:10 to 10:40 am

10:40 am: **Progress of the conceptual design for the MOBIE imaging spectrograph for TMT**, Rebecca A. Bernstein, Bruce C. Bigelow, Univ. of California, Santa Cruz (United States) [7735-77]

11:00 am: **DIORAMAS: a wide-field visible and near-infrared imaging multi-slit spectrograph for the EELT**, Olivier C. Le Fèvre, Observatoire Astronomique de Marseille-Provence (France); Dario Maccagni, INAF - IASF Milano (Italy); Laurence Tresse, Observatoire Astronomique de Marseille-Provence (France) [7735-78]

11:20 am: **The infrared imaging spectrograph (IRIS) for TMT: instrument overview**, James E. Larkin, Univ. of California, Los Angeles (United States); Anna M. Moore, California Institute of Technology (United States); Elizabeth J. Barton, Univ. of California, Irvine (United States); Brian J. Bauman, Lawrence Livermore National Lab. (United States); Khanh Bui, California Institute of Technology (United States); John M. Canfield, Univ. of California, Los Angeles (United States); David Crampton, Dominion Astrophysical Observatory (Canada); Alex Delacroix, California Institute of Technology (United States); J. Murray Fletcher, Dominion Astrophysical Observatory (Canada); David D. S. Hale, California Institute of Technology (United States); David Loop, Dominion Astrophysical Observatory (Canada); Cynthia N. Niehaus, Univ. of California, Los Angeles (United States); Andrew C. Phillips, Univ. of California, Santa Cruz (United States); Vladimir A. Reshetov, Luc Simard, Dominion Astrophysical Observatory (Canada); Roger M. Smith, California Institute of Technology (United States); Ryuji Suzuki, Tomonori Usuda, National Astronomical Observatory of Japan/Subaru Telescope (Japan); Shelley A. Wright, Univ. of California, Berkeley (United States) [7735-79]

11:40 am: **MICADO: the adaptive optics imaging camera for the E-ELT**, Richard I. Davies, Max-Planck-Institut für extraterrestrische Physik (Germany) [7735-80]

Lunch Break 12:00 to 1:00 pm

SESSION 12

Room: Town & Country. Fri. 1:00 to 3:00 pm

Instrumentation for ELTs II

Session Chair: David Crampton, National Research Council Canada (Canada)

1:00 pm: **SIMPLE: a high-resolution near-infrared spectrometer for the E-ELT**, Ernesto Oliva, Osservatorio Astrofisico di Arcetri (Italy); Livia Origlia, Osservatorio Astronomico di Bologna (Italy); Roberto Maiolino, Osservatorio Astronomico di Bologna (Italy); Nikolai A. Piskunov, Uppsala Univ. (Sweden); Artie P. Hatzes, Thüringer Landessternwarte Tautenburg (Germany); Leonardo Vanzi, Pontificia Univ. Católica de Chile (Chile); Bengt Gustafsson, Uppsala Univ. (Sweden); Emanuel Rossetti, Univ. degli Studi di Bologna (Italy) [7735-81]

1:20 pm: **The design of a mid-infrared instrument for the Thirty Meter Telescope**, Alan T. Tokunaga, Univ. of Hawai'i (United States); Christopher C. Packham, Univ. of Florida (United States); Yoshiko K. Okamoto, Ibaraki Univ. (Japan); John S. Carr, U.S. Naval Research Lab. (United States); Mark R. Chun, Univ. of Hawai'i (United States); Mitsuhiro Honda, Kanagawa Univ. (Japan); Hirokazu Katata, Japan Aerospace Exploration Agency (Japan); Joan R. Najita, National Optical Astronomy Observatory (United States); Takashi Onaka, The Univ. of Tokyo (Japan); Matthew J. Richter, Univ. of California, Davis (United States); Itsuki Sakon, The Univ. of Tokyo (Japan); Charles M. Telesco, Univ. of Florida (United States) [7735-82]

1:40 pm: **EAGLE: the multi-IFU, AO assisted, near-IR spectrograph for the EELT: a status report**, Jean-Gabriel Cuby, Observatoire Astronomique de Marseille-Provence (France); Simon M. Morris, Durham Univ. (United Kingdom); Christopher J. Evans, UK Astronomy Technology Ctr. (United Kingdom); Thierry Fusco, ONERA (France); Pascal Jagourel, Observatoire de Paris à Meudon (France); David Le Mignant, Observatoire Astronomique de Marseille-Provence (France); Philip M. Parr-Burman, UK Astronomy Technology Ctr. (United Kingdom); Gerard C. Rousset, Observatoire de Paris à Meudon (France); Hermine Schnetler, UK Astronomy Technology Ctr. (United Kingdom) [7735-83]

2:00 pm: **EPICS: direct imaging of exoplanets with the EELT**, Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Jean-Luc Beuzit, Christophe Verinaud, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Pierre Baudoz, Anthony Boccaletti, Observatoire de Paris à Meudon (France); Raffaele G. Gratton, Mariangela Bonavita, Osservatorio Astronomico di Padova (Italy); Christoph U. Keller, Utrecht Univ. (Netherlands); Florian Kerber, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Hans Martin Schmid, ETH Zürich (Switzerland); Niranjana A. Thatte, Mathias Tecza, Univ. of Oxford (United Kingdom); Lars B. Venema, Rieks Jager, ASTRON (Netherlands); Natalia Yaitzkova, Emmanuel Aller-Carpentier, Patrice Martinez, Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-84]

2:20 pm: **CODEX**, Luca Pasquini, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-85]

2:40 pm: **Instrument concept and science case for the mid-infrared E-ELT imager and spectrograph METIS**, Bernhard R. Brandl, Leiden Univ. (Netherlands); Rainer Lenzen, Max-Planck-Institut für Astronomie (Germany); Eric J. Pantin, Commissariat à l'Énergie Atomique (France); Alistair C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); Joris Blommaert, Katholieke Univ. Leuven (Belgium); Lars B. Venema, ASTRON (Netherlands); Frank Molster, Netherlands Research School for Astronomy, NOVA (Netherlands); Ralf Siebenmorgen, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7735-86]

Coffee Break 3:00 to 3:30 pm

SESSION 13

Room: Town & Country Fri. 3:30 to 5:10 pm

Instrumentation for ELTs III

Session Chair: Ian S. McLean, Univ. of California, Los Angeles

3:30 pm: **The infrared imaging spectrograph (IRIS) for TMT: spectrograph design**, Anna M. Moore, Caltech Optical Observatories (United States); Brian J. Bauman, Lawrence Livermore National Lab. (United States); Elizabeth J. Barton, Univ. of California, Irvine (United States); David Crampton, Dominion Astrophysical Observatory (Canada); Alex Delacroix, Caltech Optical Observatories (United States); James E. Larkin, Univ. of California, Los Angeles (United States); Luc Simard, Dominion Astrophysical Observatory (Canada); Shelley A. Wright, Univ. of California, Berkeley (United States) [7735-87]

3:50 pm: **HARMONI: a single-field, wide-band, integral-field spectrograph for the E-ELT**, Niranjan A. Thatte, Mathias Tecza, Fraser Clarke, Timothy M. Goodsall, Univ. of Oxford (United Kingdom); David W. Lunney, UK Astronomy Technology Ctr. (United Kingdom); Roland M. Bacon, Observatoire de Lyon (France); Santiago Arribas, Consejo Superior de Investigaciones Científicas (Spain); Evencio Mediavilla, Instituto de Astrofísica de Canarias (Spain); Consortium Harmoni, Univ. of Oxford (United Kingdom) [7735-88]

4:10 pm: **The EAGLE pick-off system**, Helen M. McGregor, Peter R. Hastings, Martyn Wells, UK Astronomy Technology Ctr. (United Kingdom) [7735-89]

4:30 pm: **GMTNIRS (Giant Magellan Telescope near-infrared spectrograph): design concept**, SungHo Lee, The Univ. of Texas at Austin (United States) and Korea Astronomy and Space Science Institute (Korea, Republic of); Daniel T. Jaffe, The Univ. of Texas at Austin (United States); In-Soo Yuk, Korea Astronomy and Space Science Institute (Korea, Republic of); Hanshin Lee, Weisong Wang, The Univ. of Texas at Austin (United States); Chan Park, Kwi-Jong Park, Moo-Young Chun, Korea Astronomy and Space Science Institute (Korea, Republic of); Soojong Pak, Kyung Hee Univ. (Korea, Republic of); Joseph Strubhar, Casey P. Deen, Michael Gully-Santiago, Jared Rand, The Univ. of Texas at Austin (United States); Haingja Seo, Kyung Hee Univ. (Korea, Republic of); Jung-Mi Kwon, Korea Astronomy and Space Science Institute (Korea, Republic of); Heeyoung Oh, Kyung Hee Univ. (Korea, Republic of) and Korea Astronomy and Space Science Institute (Korea, Republic of); Stuart I. Barnes, Anglo-Australian Observatory (Australia); John H. Lacy, John A. Goertz, The Univ. of Texas at Austin (United States); Won-Kee Park, Seoul National Univ. (Korea, Republic of); Tae-Soo Pyo, National Astronomical Observatory of Japan (Japan) [7735-90]

4:50 pm: **Project overview of OPTIMOS-EVE: the fiber-fed multi-object spectrograph for the E-ELT**, Ramón Navarro, ASTRON (Netherlands); Fanny Chemla, Piercarlo Bonifacio, Hector Flores, Isabelle Guinouard, Jean-Michel Huet, Mathieu Puech, Frédéric Royer, Observatoire de Paris à Meudon (France); Johannes H. Pragt, ASTRON (Netherlands); Gerben Wulterkens, Radboud Univ. Nijmegen (Netherlands); Eric C. Sawyer, Martin E. Caldwell, Ian A. J. Tosh, Martin S. Whalley, Guy F. W. Woodhouse, Rutherford Appleton Lab. (United Kingdom); Paolo Spanò, Osservatorio Astronomico di Brera (United States); Paolo Di Marcantonio, Osservatorio Astronomico di Trieste (Italy); Michael I. Andersen, Univ. of Copenhagen (Denmark); Gavin B. Dalton, Rutherford Appleton Lab. (United Kingdom) and Univ. of Oxford (United Kingdom); Lex Kaper, Univ. van Amsterdam (Netherlands); Jean-François Hammer, Observatoire de Paris à Meudon (France) [7735-91]

Closing Remarks

Room: Town & Country Fri. 5:10 to 5:15 pm

Session Chair: Ian S. McLean, Univ. of California, Los Angeles

Facility Map

See page 143.

Adaptive Optics Systems II

Conference Chairs: **Brent L. Ellerbroek**, TMT Observatory Corp.; **Michael Hart**, The Univ. of Arizona; **Norbert Hubin**, European Organization for Astronomical Research in the Southern Hemisphere (Germany); **Peter L. Wizinowich**, W. M. Keck Observatory

Program Committee: **Geoff P. Andersen**, U.S. Air Force Academy; **Jean-Luc Beuzit**, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); **Laird Miller Close**, The Univ. of Arizona; **Rodolphe Conan**, Univ. of Victoria (Canada); **Emiliano Diolaiti**, Osservatorio Astronomico di Bologna (Italy); **Thierry Fusco**, ONERA (France); **Philip M. Hinz**, The Univ. of Arizona; **Anne-Marie Lagrange**, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); **Pierre-Yves Madec**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Enrico Marchetti**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Claire E. Max**, Univ. of California, Santa Cruz; **Richard M. Myers**, Durham Univ. (United Kingdom); **Céline d'Orgeville**, Gemini Observatory (Chile); **Lisa A. Poyneer**, Lawrence Livermore National Lab.; **Armando Riccardi**, Osservatorio Astrofisico di Arcetri (Italy); **Francois J. Rigaut**, Gemini Observatory (Chile); **Andrei A. Tokovinin**, National Optical Astronomy Observatory; **Jean-Pierre Véran**, National Research Council Canada (Canada)

Sunday 27 June

SESSION 1

Room: Golden WestSun. 9:00 am to 12:20 pm

Project Status I

Session Chair: **Richard M. Myers**, Durham Univ. (United Kingdom)

9:00 am: **The scientific impact of reaching the diffraction limit with ELTs** (*Invited Paper*), Claire E. Max, Univ. of California, Santa Cruz (United States); Elizabeth J. Barton, Univ. of California, Irvine (United States) [7736-01]

9:30 am: **ESO adaptive optics program and status**, Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-02]

9:50 am: **First light adaptive optics systems and components for the Thirty Meter Telescope**, Brent L. Ellerbroek, Thirty Meter Telescope Project (United States); Sean M. Adkins, W.M. Keck Observatory (United States); David Andersen, Jennifer Atwood, National Research Council Canada (Canada); Steve Browne, The Optical Sciences Co. (United States); Corinne Boyer, Thirty Meter Telescope Project (United States); Peter Byrnes, National Research Council Canada (Canada); Rodolphe Conan, Univ. of Victoria (Canada); Raphaël Cousty, CILAS (France); Frederick Gamache, Lyrtech Inc. (Canada); Luc Gilles, Thirty Meter Telescope Project (United States); Glen Herriot, National Research Council Canada (Canada); Paul Hickson, The Univ. of British Columbia (Canada); Olivier Lardiere, Univ. of Victoria (Canada); Pierre Morin, CILAS (France); Thomas Pfrommer, The Univ. of British Columbia (Canada); David Quinn, Lyrtech Inc. (Canada); Jean-Christophe Singuin, CILAS (France); Matthias Schoeck, Thirty Meter Telescope Project (United States); Malcolm Smith, National Research Council Canada (Canada); Glenn Tyler, Jeff Vaughn, The Optical Sciences Co. (United States); Jean-Pierre Veran, National Research Council Canada (Canada); Curt Vogel, Montana State Univ. (United States); Ivan Wevers, National Research Council Canada (Canada); Lianqi Wang, Thirty Meter Telescope Project (United States) [7736-03]

10:10 am: **An update on the Magellan adaptive secondary AO system**, Laird M. Close, Jared R. Males, Derek A. Kopon, Victor Gasho, Katherine Brutlag, The Univ. of Arizona (United States); Tyson Hare, Alan Uomoto, Carnegie Observatories (United States) [7736-04]

Coffee Break 10:30 to 11:00 am

11:00 am: **GeMS: ultimate calibrations and laboratory results**, Benoit Neichel, Francois J. Rigaut, Matthieu Bec, Gemini Observatory (Chile); Damien Gratadour, Observatoire de Paris à Meudon (France); Maxime Boccas, Gelys Tranco, Gemini Observatory (Chile) [7736-05]

11:20 am: **Latest achievements of the MCAO testbed of the Gregor Solar Telescope**, Dirk Schmidt, Thomas Berkefeld, Frank Heidecke, Oskar F. H. von der Luehe II, Dirk Soltan, Kiepenheuer Institut für Sonnenphysik (Germany) [7736-06]

11:40 am: **The adaptive optics and wavefront correction systems for the Advanced Technology Solar Telescope**, Thomas R. Rimmele, Kit Richards, Stephen L. Hegwer, National Solar Observatory (United States); Jose Marino, Univ. of Florida (United States); Robert S. Upton, Scott Gregory, Friedrich Woeger, National Solar Observatory (United States) [7736-07]

12:00 pm: **First light AO (FLAO) system for LBT: final integration and acceptance test results in Europe**, Simone Esposito, Armando Riccardi, Luca Fini, Alfio T. Puglisi, Enrico Pinna, Marco Xompero, Runa Briguglio, Fernando Quirós-Pacheco, Paolo Stefanini, Juan Carlos Guerra, Lorenzo Busoni, Andrea Tozzi, Francesca Pieralli, Guido Agapito, Osservatorio Astrofisico di Arcetri (Italy); Guido Brusa-Zappellini, Richard Demers, Joar G. Brynnel, Large Binocular Telescope Observatory (United States); Piero Salinari, Osservatorio Astrofisico di Arcetri (Italy) [7736-12]

Lunch Break 12:20 to 1:30 pm

SESSION 2

Room: Golden WestSun. 1:30 to 3:40 pm

New AO System Designs I

Session Chair: **Brent Ellerbroek**, TMT Observatory Corp.

1:30 pm: **The scientific potential of ground layer AO on large telescopes** (*Invited Paper*), Patrick J. McCarthy, Carnegie Observatories (United States) [7736-08]

2:00 pm: **NFIRAOS: facility adaptive optics system for the TMT**, Glen Herriot, David Andersen, Jennifer Atwood, National Research Council Canada (Canada); Corinne Boyer, Thirty Meter Telescope Project (United States); Peter Byrnes, National Research Council Canada (Canada); Rodolphe Conan, Univ. of Victoria (Canada); Brent Ellerbroek, Thirty Meter Telescope Project (United States); Joeleff T. Fitzsimmons, National Research Council Canada (Canada); Luc Gilles, Thirty Meter Telescope Project (United States); Paul Hickson, The Univ. of British Columbia (Canada); Alexis Hill, National Research Council Canada (Canada); Kate J. Jackson, Olivier Lardière, Univ. of Victoria (Canada); Thomas Pfrommer, The Univ. of British Columbia (Canada); Jean-Pierre Véran, National Research Council Canada (Canada); Lianqi Wang, Thirty Meter Telescope Project (United States); Ivan Wevers, National Research Council Canada (Canada) [7736-09]

2:20 pm: **The GMT adaptive optics system**, Philip M. Hinz, The Univ. of Arizona (United States); Matt W. Johns, Stephen A. Shectman, Carnegie Observatories (United States); Michael Hart, The Univ. of Arizona (United States); Brian A. McLeod, Harvard-Smithsonian Ctr. for Astrophysics (United States); Peter J. McGregor, The Australian National Univ. (Australia) [7736-10]

2:40 pm: **ATLAS: the LTAO system for the E-ELT: design, performance, and sky coverage**, Thierry Fusco, Serge C. Meimon, ONERA (France); Yann Clenet, Mathieu Cohen, Observatoire de Paris à Meudon (France); Jérôme Pauflique, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Hermine Schnetler, UK Astronomy Technology Ctr. (United Kingdom) [7736-11]

3:00 pm: **ARGOS the laser guide star system for LBT**, Sebastian Rabien, Nancy Ageorges, Max-Planck-Institut für extraterrestrische Physik (Germany); Udo Beckmann, Max-Planck-Institut für Radioastronomie (Germany); Thomas Blümchen, Max-Planck-Institut für Astronomie (Germany); Marco Bonaglia, Osservatorio Astrofisico di Arcetri (Italy); Jose Luis Borelli, Max-Planck-Institut für Astronomie (Germany); Joar G. Brynnel, The Univ. of Arizona (United States); Lorenzo Busoni, Osservatorio Astrofisico di Arcetri (Italy); Richard I. Davies, Matthias Deysenroth, Max-Planck-Institut für extraterrestrische Physik (Germany); Olivier Dumey, The Univ. of Arizona (United States); Simone Esposito, Osservatorio Astrofisico di Arcetri (Italy); Wolfgang Gaessler, Max-Planck-Institut für Astronomie (Germany); Victor Gasho, The Univ. of Arizona (United States); Hans Gempferlein, Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany); Richard F. Green, Michael Hart, The Univ. of Arizona (United States); Shrikrishna Kanneganti, Max-Planck-Institut für extraterrestrische Physik (Germany); Elena Masciadri, Osservatorio Astrofisico di Arcetri (Italy); Jamison Noenickx, The Univ. of Arizona (United States); Peter Diethard, Max-Planck-Institut für Astronomie (Germany); Matt Rademacher, The Univ. of Arizona (United States); Hans-Walter Rix, Max-Planck-Institut für Astronomie (Germany); Christian Schwab, Landessternwarte Heidelberg (Germany); Jesper Storm, Astrophysikalisches Institut Potsdam (Germany); et al. [7736-13]

3:20 pm: **First laboratory results of the SPHERE eXtreme AO system: SAXO**, Jean-François Sauvage, ONERA (France) [7736-14]

Coffee Break 3:40 to 4:10 pm

SESSION 3

Room: Golden West Sun. 4:10 to 5:30 pm

Modeling, Analysis, and Simulation Tools I

Session Chair: Michael Hart, The Univ. of Arizona

4:10 pm: **Impact of laser guide fraticide on TMT MCAO system**, Lianqi Wang, Angel Otárola, Brent L. Ellerbroek, Thirty Meter Telescope Project (United States) [7736-16]4:30 pm: **Monte-Carlo simulation of ELT scale multi-conjugate and multi-object AO systems**, Alastair G. Basden, Richard M. Myers, Timothy Butterley, Sofia Dimoudi, Durham Univ. (United Kingdom) [7736-17]4:50 pm: **Wide-field AO systems on Extremely Large Telescope: analysis of tomographic reconstruction based on rescaled end-to-end simulation tools**, Cyril Petit, Jean-Marc Conan, Thierry Fusco, ONERA (France); Benoit Neichel, Gemini Observatory (Chile) [7736-18]5:10 pm: **Impact of Cn² profile on ELT wide-field AO performance**, Thierry Fusco, Jean-Marc Conan, ONERA (France) [7736-30]11:20 am: **Commissioning status of Subaru laser guide star adaptive optics system**, Yutaka Hayano, Hideki Takami, Shin Oya, Masayuki Hattori, Yoshihiko Saito, National Astronomical Observatory of Japan/Subaru Telescope (United States); Makoto Watanabe, Hokkaido Univ. (Japan); Olivier Guyon, Yosuke Minowa, Sebastian E. Egner, Meguro Ito, Vincent Garrel, Stephen Colley, Taras I. Golota, National Astronomical Observatory of Japan/Subaru Telescope (United States); Masanori Iye, National Astronomical Observatory of Japan (United States) [7736-22]11:40 am: **Status of the 6.5m MMT Telescope laser adaptive optics system**, Eduardo A. Bendek Selman, Michael Hart, Norman M. Milton, Keith B. Powell, Vidhya Vaitheeswaran, Donald W. McCarthy, Jr., Craig A. Kulesa, Stephen M. Ammons, The Univ. of Arizona (United States) [7736-23]12:00 pm: **Laboratory results from the CANARY on-sky MOAO demonstrator**, Eric Gendron, Observatoire de Paris à Meudon (France); Tim J. Morris, Durham Univ. (United Kingdom); Zoltan Hubert, Observatoire de Paris à Meudon (France); Richard M. Myers, Nigel A. Dipper, Durham Univ. (United Kingdom); Matthieu Brangier, Observatoire de Paris à Meudon (France); Stephen J. Goodsell, Durham Univ. (United Kingdom); Gerard C. Rousset, Univ. Paris Diderot-Paris 7 (France); Eddy J. Younger, Nik Looker, Durham Univ. (United Kingdom); Michel Marteau, Observatoire de Paris à Meudon (France) [7736-24]

Lunch Break 12:20 to 1:50 pm

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 4

Room: Golden West Mon. 10:20 am to 12:20 pm

Project Status II

Session Chair: Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

10:20 am: **W. M. Keck Observatory's next-generation adaptive optics facility**, Peter L. Wizinowich, Sean M. Adkins, James M. Bell, Jason C. Y. Chin, Thomas E. Stalcup, Jr., Erik M. Johansson, James M. Johnson, Drew W. Medeiros, Doug Morrison, Christopher R. Neyman, Sergey Pantelev, Edward Wetherell, W. M. Keck Observatory (United States); Donald T. Gavel, Claire E. Max, Renate Kupke, Marc R. Reinig, Elizabeth J. McGrath, Christopher Lockwood, Lick Observatory (United States); Richard G. Dekany, Antonin H. Bouchez, Viswa N. Velur, California Institute of Technology (United States); Franck Marchis, Univ. of California, Berkeley (United States) [7736-19]10:40 am: **Manufacturing of the ESO adaptive optics facility**, Robin Arsenaull, Pierre-Yves Madec, Norbert Hubin, Stefan Stroebele, Jérôme Pauflique, Elise Vernet, Wolfgang K. P. Hackenberg, Jean-Francois Pirard, Lieselotte Jochum, Andreas Glindemann, Andreas Jost, Ralf D. Conzelmann, Mario J. Kiekebusch, Sebastien Tordo, Jean-Louis Lizon, Robert Donaldson, Enrico Fedrigo, Christian Soenke, Michel Duchateau, Andrew Bruton, Bernard Delabre, Mark D. Downing, Javier Reyes Moreno, Johann Kolb, Clémentine Béchet, Miska Le Louarn, Antonio Manescau, Domenico Bonaccini Calia, Marco Quattri, Ivan M. Guidolin, Bernard Buzzoni, Christophe Dupuy, Ronald Guzman, Mauro Comin, Armin Silber, Jutta Quentin, Paul Jolley, Volker Heinz, Javier Argomedo, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Daniele Gallieni, Paolo G. Lazzarini, A.D.S. International S.r.l. (Italy); Roberto Biasi, Mario Andrighettoni, Gerald Angerer, Dietrich Pescoller, Microgate S.r.l. (Italy); Paolo La Penna, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Remko Stuik, Atul Deep, Leiden Univ. (Netherlands) [7736-20]11:00 am: **E-ELT M5 field stabilisation unit scale 1 demonstrator design and performances evaluation**, Joan Manel Casalta Escuer, José Javier Barriga, Joan Ariño, Joan Mercader, Manuel San Andrés, Jordi Serra, NTE-SENER S.A. (Spain); Ivar Kjelberg, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Norbert Hubin, Lieselotte Jochum, Elise Vernet, Martin Dimmler, Michael Müller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-21]

SESSION 5

Room: Golden West Mon. 1:50 to 3:40 pm

New AO System Designs II

Session Chair: Peter L. Wizinowich, W. M. Keck Observatory

1:50 pm: **Progress and prospects for high-contrast adaptive optics (Invited Paper)**, Bruce A. Macintosh, Lawrence Livermore National Lab. (United States) [7736-25]2:20 pm: **Conceptual design of the multi-conjugate adaptive optics module for the European Extremely Large Telescope**, Emiliano Diolaiti, Osservatorio Astronomico di Bologna (Italy); Jean-Marc Conan, ONERA (France); Italo Foppiani, Univ. degli Studi di Bologna (Italy); Enrico Marchetti, European Southern Observatory (Germany); Andrea Baruffolo, Osservatorio Astronomico di Padova (Italy); Michele Bellazzini, Paolo Ciliegi, Matteo Lombini, Osservatorio Astronomico di Bologna (Italy); Cyril Petit, Clelia Robert, ONERA (France); Laura Schreiber, Giuseppe Cosentino, Univ. degli Studi di Bologna (Italy); Valdemaro Billotti, Osservatorio Astrofisico di Arcetri (Italy); Giovanni Bregoli, Osservatorio Astronomico di Bologna (Italy); Thierry Fusco, ONERA (France); Norbert Hubin, European Southern Observatory (Germany); Serge C. Meimon, Jean-François Sauvage, ONERA (France) [7736-26]2:40 pm: **EAGLE MOAO system conceptual design and related technologies**, Gerard C. Rousset, Observatoire de Paris à Meudon (France); Thierry Fusco, ONERA (France); François Assémat, Observatoire de Paris à Meudon (France); Tim J. Morris, Durham Univ. (United Kingdom); Eric Gendron, Observatoire de Paris à Meudon (France); Richard M. Myers, Durham Univ. (United Kingdom); Hermine Schnetter, UK Astronomy Technology Ctr. (United Kingdom); Mathieu Cohen, Observatoire de Paris à Meudon (France); David Le Mignant, Observatoire Astronomique de Marseille-Provence (France) [7736-27]3:00 pm: **Raven: a harbinger of multi-object adaptive optics based instruments at the Subaru Telescope**, Rodolphe Conan, Colin Bradley, Olivier Lardiere, Celia Blain, Univ. of Victoria (Canada); David Andersen, Luc Simard, Jean-Pierre Véran, Glen Herriot, David Loop, National Research Council Canada (Canada); Tomonori Usada, Tetsuo Nishimura, Shin Oya, Yutaka Hayano, Hiroshi Terada, Naruhisa Takato, National Astronomical Observatory of Japan/Subaru Telescope (Japan); Masayuki Akiyama, Tohoku Univ. (Japan); Gary Hovey, National Research Council Canada (Canada); Maxime Dumas, David Quinn, Lyrtech Inc. (Canada); François Châteauneuf, Jean-François Lavigne, INO (Canada) [7736-28]3:20 pm: **Adaptive optics and MCAO for the 4-m European Solar Telescope EST**, Dirk Soltau, Kiepenheuer Institut für Sonnenphysik (Germany); Thomas Berkefeld, Kiepenheuer-Institut für Sonnenphysik (Germany); Jorge Sánchez Capuchino, Manuel Collados Vera, Instituto de Astrofísica de Canarias (Spain); Dario Del Moro, Univ. degli Studi di Roma Tor Vergata (Italy); Mats Löfdahl, Göran Scharmer, Royal Swedish Academy of Sciences (Sweden) [7736-29]

Coffee Break 3:40 to 4:10 pm

SESSION 6

Room: Golden West Mon. 4:10 to 5:30 pm

Modeling, Analysis, and Simulation Tools II

Session Chair: Francois J. Rigaut, Gemini Observatory (Chile)

- 4:10 pm: **Laser guide star return flux simulations based on observed sodium density profiles**, Ronald Holzlohner, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Simon Rochester, Univ. of California, Berkeley (United States); Thomas Pfrommer, The Univ. of British Columbia (Canada); Dmitry Budker, Univ. of California, Berkeley (United States); Domenico Bonaccini Calia, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); James Higbie, Bucknell Univ. (United States) [7736-15]
- 4:30 pm: **Modeling update for the Thirty Meter Telescope laser guide star dual-conjugate adaptive optics system**, Luc Gilles, Lianqi Wang, Brent L. Ellerbroek, Thirty Meter Telescope Project (United States). [7736-31]
- 4:50 pm: **Fractal iterative method for fast atmospheric tomography on Extremely Large Telescopes**, Michel Tallon, Isabelle Tallon-Bosc, Ctr. de Recherche Astronomique de Lyon (France); Clémentine Béchet, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Fabien Momey, Marie Fradin, Eric M. Thiébaud, Ctr. de Recherche Astronomique de Lyon (France) [7736-32]
- 5:10 pm: **Sky coverage assessment strategy for wide-field AO systems: application to ALTA, the LTAO system of the E-ELT**, Serge Meimon, Thierry Fusco, Jean-Marc Conan, ONERA (France); François Assémat, Observatoire de Paris à Meudon (France) [7736-33]

Monday Poster Session

Room: Grand Exhibit Hall Mon. 5:30 to 7:00 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Monday. The interactive poster session with authors in attendance will be Monday evening from 5:30 to 7:00 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

- Maintenance and operation of the adaptive optics module for NICI, the high-contrast coronagraphic imager of GEMINI Observatory**, Markus Hartung, Thomas L. Hayward, Gemini Observatory (Chile); Mark R. Chun, Aglaé Kellerer, Univ. of Hawai'i (United States) [7736-91]
- MOAO activities in Tohoku University**, Masayuki Akiyama, Tohoku Univ. (Japan); Shin Oya, National Astronomical Observatory of Japan/Subaru Telescope (United States); Kazuhiro Hane, Chihiro Tohoku, Tohoku Univ. (Japan) [7736-92]
- A focal plane sensor for low-order sensing on laser tomographic systems**, Serge C. Meimon, Thierry Fusco, Jean-François Sauvage, Sarah Dandy, Laurent Mugnier, Frédéric Cassaing, ONERA (France) [7736-93]
- A compact design of a wfs for a natural guide star-based ELT adaptive optics system**, Jacopo Farinato, Roberto Ragazzoni, Carmelo Arcidiacono, Andrea Baruffolo, Marco Dima, Giorgia Gentile, Demetrio Magrin, Valentina Viotto, Osservatorio Astronomico di Padova (Italy) [7736-94]
- Status and new operation modes of the irreplaceable and versatile VLT/NaCo**, Julien H. Girard, Jared O'Neal, Guillaume Montagnier, Emanuela Pompei, Nicholas Huerter, Gordon Gillet, European Southern Observatory (Chile); Nicholas Kornweibel, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Regaswamy Sridharan, European Southern Observatory (Chile); Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Alain Smette, European Southern Observatory (Chile). [7736-95]
- Fast, autonomous holographic adaptive optics**, Geoff P. Andersen, U.S. Air Force Academy (United States). [7736-96]
- Feasibility study of wavefront sensing with a Mach-Zehnder for extreme adaptive optics with very large telescopes**, Maud P. Langlois, Ctr. de Recherche Astrophysique de Lyon (France); Michel Tallon, Ctr. de Recherche Astronomique de Lyon (France); Gil Moretto, Lab. de Physique Corpusculaire Clermont-Ferrand (France) [7736-97]
- Residual tip-tilt motion of LGS in monostatic scheme**, Vladimir P. Lukin, Viktor V. Nosov, Lidia A. Bolbasova, Institute of Atmospheric Optics (Russian Federation) [7736-98]
- High-precision fast photometry from ground-based observatories**, James Osborn, Richard W. Wilson, Durham Univ. (United Kingdom); Vik Dhillon, The Univ. of Sheffield (United Kingdom); Remy Avila, Univ. Nacional Autónoma de México (Mexico); Gordon D. Love, Durham Univ. (United Kingdom). [7736-99]
- Online wind estimation and prediction for a two-layer frozen flow atmosphere**, Luke C. Johnson, Donald T. Gavel, Donald M. Wiberg, Univ. of California Observatories (United States) [7736-100]

- Implementation and characterization of a phase apodization coronagraph using a focal plane interferometer**, Esen Salcin, College of Optical Sciences, The Univ. of Arizona (United States); Johanan L. Codona, Steward Observatory, The Univ. of Arizona (United States) [7736-101]
- Reducing PSF halo with adaptive pupil masking**, James Osborn, Richard M. Myers, Gordon D. Love, Durham Univ. (United Kingdom) [7736-102]
- Adaptive optics using a linear response 91-actuator magnetic liquid deformable mirror**, Denis Brousseau, Ermanno F. Borra, Maxime Rochette, Daniel Bouffard Landry, Univ. Laval (Canada) [7736-103]
- The Magellan adaptive secondary VisAO Camera: diffraction-limited broadband visible imaging and 20mas fiber array IFU**, Derek A. Kopon, Laird M. Close, Jared R. Males, Victor Gasho, Katherine Brutlag, Steward Observatory, The Univ. of Arizona (United States). [7736-105]
- Diffraction limited operation with ARGOS: an hybrid AO system**, Marco Bonaglia, Lorenzo Busoni, Simone Esposito, Fernando Quirós-Pacheco, Osservatorio Astrofisico di Arcetri (Italy); Michael Hart, The Univ. of Arizona (United States) [7736-106]
- Extremely large telescopes MCAO with a single NGS**, Pierre-Marie Gori, Simone Esposito, Guido Brusa-Zappellini, Osservatorio Astrofisico di Arcetri (Italy) [7736-107]
- New method of fabricating phase screens for simulated atmospheric turbulence**, Rachel Rampy, Daren Dillon, Univ. of California, Santa Cruz (United States); Donald T. Gavel, Sandrine J. Thomas, Univ. of California Observatories (United States). [7736-108]
- System overview of the multiconjugated adaptive optics RelaY for the E-ELT**, Italo Foppiani, Emiliano Diolaiti, Matteo Lombini, Osservatorio Astronomico di Bologna (Italy); Andrea Baruffolo, Osservatorio Astronomico di Padova (Italy); Valdemaro Biliotti, Osservatorio Astrofisico di Arcetri (Italy); Giovanni Bregoli, Osservatorio Astronomico di Bologna (Italy); Giuseppe Cosentino, Univ. degli Studi di Bologna (Italy); Bernard Delabre, Norbert Hubin, Enrico Marchetti, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Laura Schreiber, Univ. degli Studi di Bologna (Italy) [7736-109]
- Calibration strategy and optics for ARGOS at the LBT**, Christian Schwab, Landessternwarte Heidelberg (Germany); Peter Diethard, Wolfgang Gaessler, Max-Planck-Institut für Astronomie (Germany); Andreas Quirrenbach, Landessternwarte Heidelberg (Germany) [7736-110]
- Multi-conjugate adaptive optics at the Dunn Solar Telescope**, Thomas R. Rimmele, Stephen L. Hegwer, National Solar Observatory (United States); Jose Marino, Univ. of Florida (United States); Kit Richards, Friedrich Woeger, National Solar Observatory (United States); Thomas Berkefeld, Dirk Schmidt, Dirk Soltau, Albert-Ludwigs-Univ. Freiburg (Germany). [7736-111]
- The optical tests for the E-ELT adaptive mirror demonstration prototype**, Emilio Molinari, Daniela Tresoldi, Giorgio Toso, Paolo Spanò, Ruben R. Mazzoleni, Osservatorio Astronomico di Brera (Italy); Roberto Biasi, Microgate S.r.l. (Italy); Daniele Gallieni, A.D.S. International S.r.l. (Italy); Gilles Marque, Sagem Défense Sécurité (France); Matteo Tintori, A.D.S. International S.r.l. (Italy); Mario Andrighettoni, Gerald Angherer, Microgate S.r.l. (Italy) [7736-112]
- Adaptive optics systems for HARMONI: a visible and near-infrared integral field spectrograph for the E-ELT**, Thierry Fusco, ONERA (France); Niranjana A. Thatte, Univ. of Oxford (France); Serge C. Meimon, ONERA (France) [7736-113]
- Diffraction-limited upgrade to ARGOS: the LBT's ground-layer adaptive optics system**, Michael Hart, Victor Gasho, Olivier Durney, The Univ. of Arizona (United States); Sebastian Rabien, Max-Planck-Institut für extraterrestrische Physik (Germany); Wolfgang Gässler, Max-Planck-Institut für Astronomie (Germany); Simone Esposito, Lorenzo Busoni, Osservatorio Astrofisico di Arcetri (Italy) [7736-114]
- Is ISO's adaptive optics facility suited for MCAO?**, Enrico Marchetti, Paola Amico, Norbert Hubin, Miska Le Louarn, Pierre-Yves Madec, Andreas Glindemann, European Organisation for Astronomical Research in the Southern Hemisphere [7736-115]
- Implementation and results of an optimal wavefront controller for the MMT NGS adaptive optics system**, Keith B. Powell, Vidhya Vaitheeswaran, The Univ. of Arizona (United States). [7736-116]
- Closed-loop tomographic control on HOMER wide-field AO bench: experimental results and identification issues**, Amélie Parisot, ONERA (France); Anne Costille, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Cyril Petit, Thierry Fusco, ONERA (France) [7736-117]
- Development and performance of the EAGLE active optics LGS WFS refocusing system**, Fabrice Madec, Elodie Chardin, Jean-Gabriel Cuby, Marc Ferrari, Emmanuel Hugot, Jean-Luc Gimenez, David Le Mignant, Silvio Mazzanti, Gabriel Moreaux, Sébastien Vivès, Observatoire Astronomique de Marseille-Provence (France) [7736-119]

- FFREE: a Fresnel-FREE experiment for EPICS, the EELT exoplanets imager**, Jacopo Antichi, Christophe Verinaud, Olivier Preis, Alain Delboulbé, Patrick Rabou, Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus E. Kasper, Patrice Martinez, Emmanuel Aller-Carpentier, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-120]
- Designing and prototyping VRALA: a novel, high-efficiency actuator for large adaptive mirrors**, Ciro Del Vecchio, Osservatorio Astrofisico di Arcetri (Italy); Fabrizio Marignetti, Giovanni Tomassi, Univ. degli Studi di Cassino (Italy); Guido Agapito, Armando Riccardi, Osservatorio Astrofisico di Arcetri (Italy) [7736-121]
- Simulations for diffraction limited near-infrared adaptive optics systems on the AOF**, Miska Le Louarn, Andreas Glindemann, Norbert Hubin, Enrico Marchetti, Pierre-Yves Madec, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-122]
- Optical designs with wide field-of-view adaptive optics for IMAKA of CFHT**, Min Wang, Michel Doucet, Jonny Gauvin, François Châteauneuf, INO (Canada); Derrick A. Salmun, Canada-France-Hawaii Telescope (United States) [7736-123]
- An update of the on-sky performance of the layer-oriented wave-front sensor for MAD**, Carmelo Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy) and Osservatorio Astronomico di Padova (Italy); Matteo Lombini, Osservatorio Astronomico di Bologna (Italy); Alessia Moretti, Roberto Ragazzoni, Jacopo Farinato, Renato Falomo, Marco Gullieuszik, Osservatorio Astronomico di Padova (Italy); Giampaolo Piotto, Univ. degli Studi di Padova (Italy) [7736-124]
- Analysis of adaptive optics control for the Advanced Technology Solar Telescope**, Jose Marino, National Solar Observatory (United States) and Univ. of Florida (United States); Thomas Rimmele, Friedrich Woeger, National Solar Observatory (United States) [7736-125]
- First-generation adaptive optics system of the New Solar Telescope at Big Bear Solar Observatory**, Wenda Cao, Nicolas Gorceix, Big Bear Solar Observatory (United States); Thomas Rimmele, National Solar Observatory (United States) [7736-126]
- The METIS AO system: bringing extreme adaptive optics to the mid IR**, Remko Stuik, Leiden Univ. (Netherlands); Stefan Hippler, Max-Planck-Institut für Astronomie (Germany); Laurent Jollissaint, aquilaOptics (Switzerland); Sarah Kendrew, Leiden Univ. (Netherlands); Lars B. Venema, ASTRON (Netherlands); Bernhard Brandl, Leiden Univ. (Netherlands); Joris Blommaert, Katholieke Univ. Leuven (Belgium); Alistair C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); Rainer Lenzen, Max-Planck-Institut für Astronomie (Germany); Eric J. Pantin, Commissariat à l'Énergie Atomique (France) [7736-127]
- First light AO (FLAO) system for LBT: system characterization and performance optimization**, Fernando Quirós-Pacheco, Guido Agapito, Alfio T. Puglisi, Enrico Pinna, Lorenzo Busoni, Francesca Pieralli, Anna Bruccalassi, Runa Briguglio, Marco Xompero, Armando Riccardi, Simone Esposito, Osservatorio Astrofisico di Arcetri (Italy) [7736-128]
- Demonstration of a robust curved carbon fiber reinforced polymer deformable mirror with low-surface error**, Blake M. Coughenour, College of Optical Sciences, The Univ. of Arizona (United States); Mark Ammons, Michael Hart, S. Hop Bailey, Matt Rademacher, The Univ. of Arizona (United States); Robert N. Martin, Robert C. Romeo, Composite Mirror Applications, Inc. (United States) [7736-129]
- Real-time control for Keck Observatory next-generation adaptive optics**, Marc R. Reinig, Donald T. Gavel, Lick Observatory (United States) [7736-130]
- Adaptive optics system for the IRSOL Solar Observatory**, Renzo Ramelli, Istituto Ricerche Solari Locarno (Switzerland); Roberto Bucher, Scuola Univ. Professionale della Svizzera Italiana (Switzerland); Michele Blanda, Istituto Ricerche Solari Locarno (Switzerland); Silvano Balemi, Scuola Univ. Professionale della Svizzera Italiana (Switzerland); Leopoldo Rossini, Istituto Ricerche Solari Locarno (Switzerland) and Univ. of Applied Sciences of Southern Switzerland (Switzerland) [7736-131]
- SAM sees the light**, Andrei A. Tokovinin, Roberto Tighe, Patricio Schurter, Rolando Cantarutti, Nicole S. van der Blik, Manuel Martinez, Eduardo Mondaca, Wolnays Naudy, National Optical Astronomy Observatory (United States) [7736-132]
- Testing the VLT AO facility with ASSIST**, Remko Stuik, Atul Deep, Emiel Wiegers, Leiden Univ. (Netherlands); Frank Molster, Netherlands Research School for Astronomy, NOVA (Netherlands); Paolo La Penna, Robin Arsenault, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Wilfried Boland, NOVA, Leiden Univ. (Netherlands); Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-133]
- Performance of Subaru adaptive optics system AO188**, Yosuke Minowa, Yutaka Hayano, Shin Oya, Subaru Telescope (United States); Makoto Watanabe, Hokkaido Univ. (Japan); Masayuki Hattori, Olivier Guyon, Sebastian E. Egner, Yoshihiko Saito, Meguro Ito, Subaru Telescope (United States); Masanori Iye, National Astronomical Observatory of Japan (Japan); Hideki Takami, Vincent Garrel, Stephen Colley, Taras I. Golota, Subaru Telescope (United States) [7736-134]
- GMT adaptive secondary design**, Roberto Biasi, Microgate S.r.l. (Italy); Daniele Gallieni, Marco Mantegazza, Matteo Tintori, A.D.S. International S.r.l. (Italy); Mauro Manetti, Politecnico di Milano (Italy); Matt W. Johns, Philip M. Hinz, Johnathan Kern, GMTO Corp. (United States); Armando Riccardi, Osservatorio Astrofisico di Arcetri (Italy) [7736-135]
- A portable solar adaptive optics system: software and laboratory developments**, Deqing Ren, California State Univ., Northridge (United States); Mathew J. Penn, Claude Plymate, National Solar Observatory (United States); Haimin Wang, New Jersey Institute of Technology (United States); Gary Chapman, California State Univ., Northridge (United States) [7736-136]
- SAMI: the SCAO module for the E-ELT adaptive optics imaging camera MICADO**, Yann Clénet, Pernelle Bernardi, Frédéric Chaperon, Eric Gendron, Gerard C. Rousset, Zoltan Hubert, Observatoire de Paris à Meudon (France); Richard Davies, Markus Thiel, Max-Planck-Institut für extraterrestrische Physik (Germany); Niels Tromp, ASTRON (Netherlands); Reinhard Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany) [7736-137]
- Gemini NICI planet-finding campaign: combining angular and spectral difference imaging**, Zahed Wahhaj, Michael C. Liu, Beth A. Biller, Univ. of Hawai'i (United States); Laird M. Close, Eric Nielson, The Univ. of Arizona (United States); Mark R. Chun, Christ Ftaclas, Univ. of Hawai'i (United States); Markus Hartung, Thomas L. Hayward, Gemini Observatory (Chile); Douglas W. Toomey, Mauna Kea Infrared LLC (United States) [7736-138]
- Visible and infrared multi-spectral illumination concept based on GALILEAN collimation systems: IACATS illumination source**, Gonzalo Ramos Zapata, Tomás Belenguer-Dávila, Carmen Pastor, René Restrepo, Concepcion Gonzalez, Hugo Laguna, Antonio Astoff, Instituto Nacional de Técnica Aeroespacial (Spain); Javier Moreno Raso, Heribert Arguelaguet Vilaseca, Javier Serrano, LIDAX (Spain)[7736-139]
- IACATS AIV: AIV process for a versatile turbulence simulator**, Gonzalo Ramos Zapata, Tomás Belenguer-Dávila, Carmen Pastor, Antonio Sánchez, Instituto Nacional de Técnica Aeroespacial (Spain); Javier Moreno Raso, Heribert Arguelaguet Vilaseca, Javier Serrano, LIDAX (Spain) [7736-140]
- Tip/tilt offload of Subaru AO188 by telescope secondary mirror**, Shin Oya, Masayuki Hattori, Yosuke Minowa, Yutaka Hayano, Satoru Negishi, Daigo Tomono, Hiroshi Terada, Tae-Soo Pyo, National Astronomical Observatory of Japan/Subaru Telescope (United States); Makoto Watanabe, Hokkaido Univ. (Japan); Meguro Ito, Yoshihiko Saito, Sebastian E. Egner, Hideki Takami, National Astronomical Observatory of Japan/Subaru Telescope (United States); Masanori Iye, National Astronomical Observatory of Japan (Japan); Olivier Guyon, Vincent Garrel, Stephen Colley, Taras I. Golota, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-141]
- Design and expected performances of the SCAO-WFS module of SIMPLE: the high-resolution near-infrared spectrometer for the E-ELT**, Andrea Tozzi, Ernesto Oliva, Osservatorio Astrofisico di Arcetri (Italy); Livia Origlia, Osservatorio Astronomico di Bologna (Italy); Miska Le Louarn, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-142]
- Experimental validation of a numerical modeling for noncontact, massively actuated, deformable adaptive mirrors**, Mauro Manetti, Marco Morandini, Paolo Mantegazza, Politecnico di Milano (Italy); Roberto Biasi, Microgate S.r.l. (Italy); Daniele Gallieni, A.D.S. International S.r.l. (Italy); Armando Riccardi, Osservatorio Astrofisico di Arcetri (Italy) [7736-144]
- Lucky imaging and adaptive optics on 10-m class telescopes: a real promise for diffraction limited imaging in the visible?**, Bruno Femenía Castellá, Lucas Labadie, Instituto de Astrofísica de Canarias (Spain); Rafael Rebolo Lopez, Instituto de Astrofísica de Canarias (Spain) and CSIC (Spain); Jorge Andrés Pérez Prieto, Instituto de Astrofísica de Canarias (Spain); Antonio Pérez Garrido, Anastasio Díaz Sánchez, Isidro Villo Pérez, Univ. Politécnica de Cartagena (Spain) [7736-145]
- Adaptive optics simulation with mechanically motivated basis functions**, Thomas Ruppel, Wolfgang Osten, Oliver Sawodny, Univ. Stuttgart (Germany) [7736-146]
- Multilayered temporally evolving phase screens based on statistical interpolation**, Roopashree M. B., Indian Institute of Astrophysics (India); Akondi Vyas, Indian Institute of Astrophysics (India) and Indian Institute of Science (India); B. Raghavendra Prasad, Indian Institute of Astrophysics (India) [7736-147]
- Optimizing the modal index of Zernike polynomials for regulated phase screen simulation**, Vyas Akondi, Indian Institute of Astrophysics (India) and Indian Institute of Science (India); Roopashree M. B., B. Raghavendra Prasad, Indian Institute of Astrophysics (India) [7736-148]
- Multi-conjugate adaptive optics with plenoptic cameras and the Fourier transform reconstructor**, Iciar Montilla, Marcos Reyes Garcia-Talavera, Instituto de Astrofísica de Canarias (Spain); Jose Manuel Rodríguez-Ramos, Univ. de La Laguna (Spain); Bruno Femenía, Instituto de Astrofísica de Canarias (Spain) [7736-149]
- Modeling the adaptive optics systems on the Giant Magellan Telescope**, Marcos A. van Dam, Flat Wavefronts, Ltd. (New Zealand) [7736-150]
- Simulations of the extreme adaptive optics system for EPICS**, Visa A. Korkiakoski, Christophe Verinaud, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7736-151]

The CAOS problem-solving environment: recent developments, Marcel Carbillot, Univ. de Nice Sophia Antipolis (France) [7736-152]

Modeling adaptive optics for the segmented aperture of the GMT, Russell P. Knox, Philip M. Hinz, Johanan L. Codona, Steward Observatory, The Univ. of Arizona (United States) [7736-153]

An atmospheric turbulence generator for dynamic tests with LINC-NIRVANA's adaptive optics system, Daniel Meschke, Peter Bizenberger, Wolfgang Gaessler, Xianyu Zhang, Lars Mohr, Harald Baumeister, Max-Planck-Institut für Astronomie (Germany); Emiliano Diolaiti, Osservatorio Astronomico di Bologna (Italy) [7736-154]

Simulation of low-order AO performance on LAMOST, Hua Bai, Xianguan Yuan, Nanjing Institute of Astronomical Optics & Technology (China) [7736-155]

Performance evaluation of a SCAO system for a 42-m telescope using the pyramid wavefront sensor, Aurea Garcia-Rissman, Steward Observatory, The Univ. of Arizona (United States); Miska Le Louarn, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-156]

Modeling the spatial PSF at the VLT focal plane for MUSE data deconvolution purpose, Denis Serre, Leiden Univ. (Netherlands); Emma Villeneuve, Hervé Carfantan, Univ. de Toulouse (France); Vincent Mazet, Univ. de Strasbourg (France); Sébastien Bourguignon, Univ. de Nice Sophia Antipolis (France); Aurélien Jarno, Observatoire de Lyon (France); Laurent Jolissaint, Leiden Univ. (Netherlands) [7736-157]

Dimensioning and localising the Gravity AO WFS, Yann Clénet, Eric Gendron, Observatoire de Paris à Meudon (France); Stefan Hippler, Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Frank Eisenhauer, Stefan Gillessen, Max-Planck-Institut für extraterrestrische Physik (Germany); Guy S. Perrin, Observatoire de Paris à Meudon (Germany); Christian Straubmeier, Univ. zu Köln (Germany) [7736-158]

Atmosphere and telescope simulator for new adaptive optics methods development, Javier Moreno Raso, Javier Serrano, Heribert Arguelaguet Vilaseca, LIDAX (Spain) [7736-159]

Adaptive optics for satellite-to-ground laser communication at the 1m Telescope of the ESA Optical Ground Station, Tenerife, Spain, Thomas Berkefeld, Dirk Soltau, Kiepenheuer Institut für Sonnenphysik (Germany); Reinhard Czichy, Edgar Fischer, Bernhard Wandernoth, Synopta GmbH (Switzerland); Zoran Sodnik, European Space Research and Technology Ctr. (Netherlands) [7736-160]

ARGOS: a laser constellation for adaptive optics at the LBT, Shrikrishna Kanneganti, Sebastian Rabien, Matthias Deysenroth, Julian Ziegleder, Hans Gemperlein, Marcus Haug, Max-Planck-Institut für extraterrestrische Physik (Germany) [7736-161]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 7

Room: Golden West Tues. 2:00 to 3:20 pm

Wavefront Sensors I

Session Chair: Lisa A. Poyneer, Lawrence Livermore National Lab.

2:00 pm: **OCam and CCD220: world's fastest and most sensitive camera system for advanced AO wavefront sensing**, Philippe Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Jean-Luc Gach, Philippe Balard, Christian Guillaume, Observatoire Astronomique de Marseille-Provence (France); Mark D. Downing, Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Eric Stadler, Yves Magnard, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Sandy Denney, Wolfgang Suske, Paul R. Jorden, Patrick Wheeler, Michael Skegg, Peter J. Pool, Ray T. Bell, David J. Burt, Ian Davies, e2v technologies plc (United Kingdom); Javier Reyes Moreno, Manfred W. Meyer, Dietrich Baade, Markus E. Kasper, Robin Arsenault, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Thierry Fusco, ONERA (France); José Javier Diaz-Garcia, Instituto de Astrofísica de Canarias (Spain) [7736-34]

2:20 pm: **Adaptive optics wavefront sensors based on photon-counting detector arrays**, Brian F. Aull, Daniel R. Schuette, Robert K. Reich, Lincoln Lab. (United States); Robert L. Johnson, Air Force Research Lab. (United States) [7736-35]

2:40 pm: **NIR low-order wavefront sensor for TMT IRIS**, David D. S. Hale, Roger M. Smith, Gustavo Rahmer, California Institute of Technology (United States); David Loop, National Research Council Canada (Canada); Brent L. Ellerbroek, Lianqi Wang, Thirty Meter Telescope Project (United States) [7736-36]

3:00 pm: **The Subaru coronagraphic extreme adaptive optic (SCEAO) system: implementation and performances of the coronagraphic low-order wave-front sensor**, Frederic Vogt, Olivier Guyon, Frantz Martinache, Vincent Garrel, Kaito Yokochi, Takashi Yoshikawa, Taro Matsuo, National Astronomical Observatory of Japan/Subaru Telescope (Japan) [7736-37]

Coffee Break 3:20 to 3:50 pm

SESSION 8

Room: Golden West Tues. 3:50 to 5:40 pm

Real-Time Control I

Session Chair: Thierry Fusco, ONERA (France)

3:50 pm: **Introduction to advanced real-time control algorithms** (*Invited Paper*), Rodolphe Conan, Univ. of Victoria (Canada); Jean-Pierre Veran, National Research Council Canada (Canada) [7736-38]

4:20 pm: **Optimal AO control with NGS/LGS wave-front sensors: the multirate case**, Caroline Kulcsar, Henri-François G. Raynaud, Univ. Paris 13 (France); Cyril Petit, Jean-Marc Conan, ONERA (France) [7736-39]

4:40 pm: **An optimized controller for ARGOS: using multiple wavefront sensor signals for homogeneous correction over the field**, Peter Diethard, Max-Planck-Institut für Astronomie (Germany) [7736-40]

5:00 pm: **Wavefront control algorithms for the Keck next-generation adaptive optics system**, Donald T. Gavel, Marc R. Reinig, Univ. of California Observatories (United States) [7736-41]

5:20 pm: **Modeling of turbulence-induced wavefront distortions and the effects on optimal AO control**, Niek J. Doelman, TNO (Netherlands); Rufus Fraanje, Technische Univ. Delft (Netherlands) [7736-162]

Wednesday 30 June

SESSION 9

Room: Golden West Wed. 8:30 to 11:50 am

Modeling, Analysis, and Simulation Tools III

Session Chair: Rodolphe Conan, Univ. of Victoria (Canada)

8:30 am: **Progress and prospects in adaptive optics simulation capabilities** (*Invited Paper*), Miska Le Louarn, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-43]9:00 am: **Identification of system misregistrations during observations corrected by adaptive optics**, Clémentine Béchet, European Southern Observatory (Germany); Johann Kolb, Pierre-Yves Madec, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Michel Tallon, Ctr. de Recherche Astronomique de Lyon (France); Éric M. Thiébaud, Univ. Claude Bernard Lyon 1 (France) [7736-44]9:20 am: **Comparing centroiding methods for Shack-Hartmann wavefront sensing with laser guide stars on an ELT**, Damien Gratadour, Univ. Paris-Diderot (France) and LESIA, Observatoire de Paris (France); Éric Gendron, Observatoire de Paris à Meudon (France); Thierry Fusco, ONERA (France); Gerard C. Rousset, Observatoire de Paris à Meudon (France); Vincent Michaud, Serge Meimon, ONERA (France) [7736-45]9:40 am: **Dynamic behaviour of a large deformable mirror for future E-ELT**, Rami Gasmi, Observatoire de Paris à Meudon (France); Dominique Le Bihan, ONERA (France); Jean-Laurent Dournaux, Observatoire de Paris à Meudon (France); Jean-Christophe Sinquin, CILAS (France); Pascal Jagourel, Observatoire de Paris à Meudon (France) [7736-46]10:00 am: **Deformable mirror models for open-loop adaptive optics using non-parametric estimation techniques**, Dani Guzman, Durham Univ. (United Kingdom); Francisco J. De Cos Juez, Univ. de Oviedo (Spain); Richard M. Myers, Durham Univ. (United Kingdom) [7736-47]

Coffee Break 10:20 to 10:50 am

10:50 am: **'Imaka: a Lagrangian invariant of ELTs**, Olivier Lai, Canada-France-Hawaii Telescope (United States); Mark R. Chun, Univ. of Hawai'i (United States); Jean-Pierre Véran, David Andersen, National Research Council Canada (Canada); Jean-Charles Cuillandre, Derrick A. Salmon, Canada-France-Hawaii Telescope (United States) [7736-48]11:10 am: **Optimal method for exoplanet detection by spectral and angular differential imaging**, Alberto Cornia, Laurent M. Mugnier, ONERA (France); Marcel Carbillet, Univ. de Nice Sophia Antipolis (France); David Mouillet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Gerard C. Rousset, Anthony Boccaletti, Observatoire de Paris à Meudon (France); Thierry Fusco, ONERA (France) [7736-49]11:30 am: **Point-spread function reconstruction for Altair, Gemini North adaptive optics system: first on-sky results**, Laurent Jolissaint, aquilAOptics (Switzerland); Julian C. Christou, Gemini Observatory (United States); Eline Tolstoy, Univ. of Groningen (Netherlands); Dennis R. Crabtree, Gemini Observatory (Chile); Peter L. Wizinowich, W. M. Keck Observatory (United States); Markus Hartung, Gemini Observatory (Chile) [7736-50]

Lunch/Exhibition Break 11:50 am to 1:40 pm

Panel Discussion: and Plans on
AO Development Roadmaps

Room: Golden West Wed. 1:40 to 2:40 pm

Panel Members: **Richard G. Dekany**, California Institute of Technology; **Norbert Hubin**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Michael Hart**, The Univ. of Arizona; **Richard M. Myers**, Durham Univ. (United Kingdom); **Hideki Takami**, National Astronomical Observatory of Japan/Subaru Telescope

SESSION 10

Room: Golden West Wed. 2:40 to 4:40 pm

Quantitative Astronomy

Session Chair: Laird Miller Close, The Univ. of Arizona

2:40 pm: **Dissecting galaxies with adaptive optics**, Richard Davies, Max-Planck-Institut für extraterrestrische Physik (Germany) [7736-51]3:00 pm: **Novel, multi-frame approach to photometry of exoplanets**, Szymon Gladysz, Natalia Yaitskova, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Julian C. Christou, Gemini Observatory (United States) [7736-52]

Coffee Break 3:20 to 3:50 pm

3:50 pm: **Recent results and perspectives for precision astrometry and photometry with adaptive optics** (*Invited Paper*), Jessica R. Lu, California Institute of Technology (United States); Andrea M. Ghez, Sylvana Yelda, Tuan Do, Univ. of California, Los Angeles (United States) [7736-53]4:20 pm: **Accurate photometry and astrometry of exoplanets after ADI processing**, Christian Marois, National Research Council Canada (Canada); Bruce A. Macintosh, Lawrence Livermore National Lab. (United States) [7736-54]

SESSION 11

Room: Golden West Wed. 4:40 to 6:00 pm

Exoplanet Instruments

Session Chair: Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France)

4:40 pm: **The Gemini NICI planet-finding campaign**, Michael C. Liu, Zahed Wahhaj, Beth A. Biller, Mark R. Chun, Univ. of Hawai'i (United States); Laird M. Close, The Univ. of Arizona (United States); Christ Ftaclas, Univ. of Hawai'i (United States); Markus Hartung, Thomas L. Hayward, Gemini Observatory (Chile); Eric L. Nielsen, The Univ. of Arizona (United States); Douglas W. Toomey, Mauna Kea Infrared LLC (United States); Evgenya Shkolnik, Carnegie Institution of Washington (United States); I. Neill Reid, Space Telescope Science Institute (United States); Sylvia Alencar, Univ. Federal de Minas Gerais (Brazil); Pawel Artymowicz, Univ. of Toronto (Canada); Alan Boss, Carnegie Institution of Washington (United States); Adam S. Burrows, Princeton Univ. (United States); Fraser Clarke, Univ. of Oxford (United Kingdom); Elisabete de Gouveia Dal Pino, Jane Gregorio-Hetem, Univ. de São Paulo (Brazil); Shigeru Ida, Tokyo Institute of Technology (Japan); Marc J. Kuchner, NASA Goddard Space Flight Ctr. (United States); Douglas N. C. Lin, Lick Observatory (United States); Mathias Tecza, Niranjana A. Thatte, Univ. of Oxford (United Kingdom) [7736-55]5:00 pm: **XAO coronagraphy with the high-order testbench in the light of the SPHERE instrument**, Patrice Martinez, Emmanuel Aller-Carpentier, Markus E. Kasper, Szymon Gladysz, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-56]5:20 pm: **The Gemini planet imager: status and integration**, Bruce A. Macintosh, David W. Palmer, Lawrence Livermore National Lab. (United States); James R. Graham, Univ. of California, Berkeley (United States); Jennifer Dunn, National Research Council Canada (Canada); Donald T. Gavel, Univ. of California Observatories (United States); James E. Larkin, Univ. of California, Los Angeles (United States); Ben Oppenheimer, American Museum of Natural History (United States); Leslie K. Saddlemyer, National Research Council Canada (Canada); J. Kent Wallace, Jet Propulsion Lab. (United States) [7736-57]5:40 pm: **System study of EPICS: the exoplanets imager for the EELT**, Christophe Vérinaud, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Markus E. Kasper, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Jean-Luc Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7736-58]

Wednesday Poster Session

Room: Grand Exhibit Hall Wed. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Wednesday. The interactive poster session with authors in attendance will be Wednesday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Noise reduction in the centroiding of laser guide star spot pattern using thresholded Zernike reconstructor, Vyas Akondi, Indian Institute of Astrophysics (India) and Indian Institute of Science (India); Roopashree M. B., B. Raghavendra Prasad, Indian Institute of Astrophysics (India) [7736-163]

- Classic adaptive optics: disturbance rejection control**, Andrea Abelli, Observatoire de la Côte d'Azur (France); Jean-Pierre Folcher, Univ. de Nice Sophia-Antipolis (France); André Ferrari, Marcel Carbillet, Univ. de Nice Sophia Antipolis (France) [7736-164]
- An optimal control law for wide-field AO on ELTs**, Manal Chebbo, Brice Le Roux, Observatoire Astronomique de Marseille-Provence (France) [7736-165]
- Multiple field-of-view MCAO for a Large Solar Telescope: LOST simulations**, Marco Stangalini, Francesco Berrilli, Dario Del Moro, Roberto Piazzesi, Univ. degli Studi di Roma Tor Vergata (Italy) [7736-166]
- Implementation of type-II tip-tilt control in NFIRAOS, with woofer-tweeter and vibration cancellation**, Jean-Pierre Véran, National Research Council Canada (Canada); Craig Irvin, Univ. of Victoria (Canada); Glen Herriot, National Research Council Canada (Canada) [7736-167]
- Numerical control matrix rotation for the LINC-NIRVANA multiconjugate adaptive optics system**, Carmelo Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy) and Osservatorio Astronomico di Padova (Italy); Thomas Bertram, Max-Planck-Institut für Astronomie (Germany) [7736-168]
- Experimental validation of type-II tip-tilt control in a woofer-tweeter adaptive optics system**, Rodolphe Conan, Univ. of Victoria (Canada); Jean-Pierre Guyon, National Research Council Canada (Canada); Kate J. Jackson, Univ. of Victoria (Canada) [7736-169]
- Real-time open-loop control of a 1024-actuator MEMS deformable mirror**, Celia Blain, Rodolphe Conan, Colin Bradley, Univ. of Victoria (Canada); Olivier Guyon, National Astronomical Observatory of Japan/Subaru Telescope (United States); Darryl Gamroth, Reston Nash, Dave Roberts, Univ. of Victoria (Canada) [7736-170]
- Recent development in real-time control system of Subaru adaptive optics including laser guide star mode**, Masayuki Hattori, Yosuke Minowa, Stephen Colley, Vincent Garrel, Sebastian E. Egner, Taras I. Golota, Olivier Guyon, Meguro Ito, Shin Oya, Makoto Watanabe, Yutaka Hayano, Hideki Takami, Masanori Iye, Yoshihiko Saito, National Astronomical Observatory of Japan/Subaru Telescope (Japan) [7736-171]
- A COTS high-performance real-time control system for adaptive optics**, Alastair G. Basden, Richard M. Myers, Sofia Dimoudi, Tim J. Morris, Eddy J. Younger, Nik E. Looker, Deli Geng, Nigel A. Dipper, Durham Univ. (United Kingdom) [7736-172]
- SPARTA roadmap and future challenges**, Enrico Fedrigo, Bertrand Bauvir, Robert Donaldson, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-173]
- The real-time control system for the CANARY multi-object adaptive optics on-sky demonstrator**, Nigel A. Dipper, Nik Looker, Deli Geng, Eddy J. Younger, Richard M. Myers, Alastair G. Basden, Durham Univ. (United Kingdom); Gerard C. Rousset, Eric Gendron, Zoltan Hubert, Observatoire de Paris à Meudon (France) . . . [7736-174]
- Control system of a dispersed fringe type sensing system of active optics**, Yajun Zhang, Zhenchao Zhang, Nanjing Institute of Astronomical Optics & Technology (China) [7736-176]
- Point-spread function reconstruction for the ground layer adaptive optics system ARGOS**, Peter Diethard, Max-Planck-Institut für Astronomie (Germany) [7736-177]
- Transients in the sodium layer: assessment and mitigation for TMT**, Glen Herriot, National Research Council Canada (Canada); Rodolphe Conan, Univ. of Victoria (Canada); Paul Hickson, The Univ. of British Columbia (Canada); Kate J. Jackson, Olivier Lardière, Univ. of Victoria (Canada); Thomas Pfrommer, The Univ. of British Columbia (Canada) [7736-178]
- Anisoplanatism across wide fields at high-frame rates**, Timothy D. Staley, Craig D. Mackay, Univ. of Cambridge (United Kingdom) [7736-179]
- Making a robust, reliable, and a highly available DIMM seeing monitor**, Jose M. Delgado Hernandez, Luis Fernando Rodriguez Ramos, Hector Vazquez Ramio, David Jimenez Mejias, Instituto de Astrofisica de Canarias (Spain) [7736-180]
- Atmospheric dispersion correction for the Subaru AO system**, Sebastian E. Egner, National Astronomical Observatory of Japan/Subaru Telescope (United States); Yuji Ikeda, Photocoding (Japan); Makoto Watanabe, Hokkaido Univ. (Japan); Yutaka Hayano, Taras I. Golota, Masayuki Hattori, Meguro Ito, Yosuke Minowa, Shin Oya, Yoshihiko Saito, Hideki Takami, National Astronomical Observatory of Japan/Subaru Telescope (United States); Masanori Iye, National Astronomical Observatory of Japan (Japan) [7736-181]
- The physics of the mesospheric sodium layer**, Edward J. Kibblewhite, The Univ. of Chicago (United States) [7736-182]
- Laser guide star facility at La Silla Paranal Observatory: latest upgrades, operation, and performance**, José Luis Alvarez, European Southern Observatory (Chile) [7736-183]
- Gemini North laser guide star system: operations, maintenance, and science observations review**, Vincent Fesquet, Richard Oram, Gemini Observatory (United States) [7736-185]
- A pulsed guide star laser can be the brightest**, Nikita Simakov, Murray Hamilton, Peter Veitch, Jesper Munch, The Univ. of Adelaide (Australia) [7736-186]
- Characterizing site specific considerations for protecting aircraft during LGS operations at W. M. Keck Observatory**, Paul J. Stomski, Jr., Randall D. Campbell, Steve Shimko, Kevin McCann, W. M. Keck Observatory (United States) . . [7736-187]
- The characteristics of laser-transmission and guide star's brightness for Subaru LGS/AO188 system**, Meguro Ito, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-188]
- Gemini North r' band imaging of the Keck II Laser**, Dolores M. Coulson, Katherine C. Roth, Gemini Observatory (United States) [7736-189]
- The performance of the laser guide star system for the Subaru Telescope**, Yoshihiko Saito, Yutaka Hayano, Meguro Ito, Yosuke Minowa, Sebastian E. Egner, Shin Oya, National Astronomical Observatory of Japan/Subaru Telescope (United States); Makoto Watanabe, Hokkaido Univ. (Japan); Masayuki Hattori, Vincent Garrel, National Astronomical Observatory of Japan/Subaru Telescope (United States); Kazuyuki Akagawa, SINGLE-MODE Co., Ltd. (Japan); Olivier Guyon, Stephen Colley, Taras I. Golota, National Astronomical Observatory of Japan/Subaru Telescope (United States); Norihito Saito, RIKEN (Japan); Akira Takazawa, Mayumi Ito, Megaopto Co., Ltd. (Japan); Hideki Takami, National Astronomical Observatory of Japan/Subaru Telescope (United States); Satoshi Wada, RIKEN (Japan); Masanori Iye, National Astronomical Observatory of Japan (Japan) [7736-190]
- Optical setup and wavefront sensor for solar adaptive optics at the Domeless Solar Telescope, Hida Observatory**, Noriaki Miura, Fumihito Yokoyama, Maoto Nefu, Susumu Kuwamura, Kitami Institute of Technology (Japan); Nashi Baba, Hokkaido Univ. (Japan); Yoichiro Hanaoka, National Astronomical Observatory of Japan (Japan); Satoru Ueno, Yoshikazu Nakatani, Shin-ichi Nagata, Reizaburo Kitai, Kiyoshi Ichimoto, Kyoto Univ. (Japan); Hideki Takami, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-191]
- Installation and observation of correlation tracker for New Solar Telescope**, Seonghwan Choi, Korea Astronomy and Space Science Institute (Korea, Republic of); Kwangsoo Ahn, Big Bear Solar Observatory (United States); Jakyoungh Nah, Yong-Jae Moon, Young-Deuk Park, Korea Astronomy and Space Science Institute (Korea, Republic of) [7736-192]
- Symmetrically weighted center of gravity for Shack-Hartmann wavefront sensing on a laser guide star**, Damien Gratadour, Univ. Paris-Diderot (France) and LESIA, Observatoire de Paris (France); Éric Gendron, Observatoire de Paris à Meudon (France); Gerard C. Rousset, Univ. Paris-Diderot (France) [7736-193]
- Full end-to-end simulation of a pyramid wave front sensor with a laser guide star**, Brice Le Roux, Observatoire Astronomique de Marseille-Provence (France) [7736-194]
- Advanced curvature-sensing techniques**, Aglaé Kellerer, Mark R. Chun, Christ Ftacilas, Univ. of Hawai'i (United States) [7736-195]
- Wavefront sensors and algorithms for adaptive optical systems**, Vladimir P. Lukin, Nina N. Botugina, Oleg N. Emaleev, Peter Konyaev, Institute of Atmospheric Optics (Russian Federation) [7736-196]
- A new optical differentiation wavefront sensor**, Eric Gendron, Observatoire de Paris à Meudon (France) [7736-197]
- Prototype of a laser guide stars wavefront sensor for E-ELT: test results**, Laura Schreiber, Univ. degli Studi di Bologna (Italy); Matteo Lombini, Emiliano Diolaiti, Italo Foppiani, Osservatorio Astronomico di Bologna (Italy); Giuseppe Cosentino, Univ. degli Studi di Bologna (Italy); Giovanni Bregoli, Osservatorio Astronomico di Bologna (Italy); Clelia Robert, Jean-Marc Conan, ONERA (France); Enrico Marchetti, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-198]
- Wide-field AO correction: the large wavefront sensor detector of ARGOS**, Gilles Orban de Xivry, Sebastian Rabien, Lothar Barl, Max-Planck-Institut für extraterrestrische Physik (Germany); Simone Esposito, Osservatorio Astrofisico di Arcetri (Italy); Wolfgang Gässler, Max-Planck-Institut für Astronomie (Germany); Michael Hart, The Univ. of Arizona (United States); Matthias Deysenroth, Hans Gempferlein, Lothar W. Strüder, Julian Ziegleder, Max-Planck-Institut für extraterrestrische Physik (Germany) [7736-199]
- The Gemini planet imager calibration wavefront sensor instrument**, J. Kent Wallace, Rick S. Burruss, Randall D. Bartos, Thang Q. Trinh, Laurent A. Pueyo, Santos F. Fregoso, John R. Angione, J. Chris Shelton, Jet Propulsion Lab. (United States) [7736-200]
- Results from the laboratory demonstration of the nonlinear curvature wavefront sensor**, Mala Mateen, The Univ. of Arizona (United States); Vincent Garrel, National Astronomical Observatory of Japan/Subaru Telescope (United States); Michael Hart, The Univ. of Arizona (United States); Olivier Guyon, The Univ. of Arizona (United States) and National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-201]

Prototype of a laser guide stars wavefront sensor for E-ELT: design and integration, Matteo Lombini, Giovanni Bregoli, Osservatorio Astronomico di Bologna (Italy); Giuseppe Cosentino, Univ. degli Studi di Bologna (Italy); Italo Foppiani, Osservatorio Astronomico di Bologna (Italy); Laura Schreiber, Univ. degli Studi di Bologna (Italy); Emiliano Diolaiti, Osservatorio Astronomico di Bologna (Italy) [7736-202]

Performance of a Shack-Hartmann wavefront sensor using real sodium laser data, Sandrine J. Thomas, Donald T. Gavel, Univ. of California Observatories (United States) [7736-203]

Characterization of the wavefront sensor unit for LBTI, Vanessa Bailey, Vidhya Vaitheeswaran, Phillip M. Hinz, Olivier Durney, The Univ. of Arizona (United States); Simone Esposito, Enrico Pinna, Osservatorio Astrofisico di Arcetri (Italy); Alfio T. Puglisi, Osservatorio Astrofisico di Arcetri (Italy); Johanan L. Codona, The Univ. of Arizona (United States) [7736-204]

Visible low-order wavefront sensor for the Subaru LGS AO system, Makoto Watanabe, Hokkaido Univ. (Japan); Meguro Ito, Shin Oya, Yutaka Hayano, Yosuke Minowa, Masayuki Hattori, Yoshihiko Saito, Sebastian E. Egner, Hideki Takami, National Astronomical Observatory of Japan/Subaru Telescope (United States); Masanori Iye, National Astronomical Observatory of Japan (Japan); Olivier Guyon, Vincent Garrel, Stephen Colley, Taras I. Golota, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-205]

Handling complex adaptive optics concepts including the third and fourth dimension, Marco Dima, Osservatorio Astronomico di Padova (Italy); Carmelo Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); Maria Bergomi, Alessandro Brunelli, Jacopo Farinato, Giorgia Gentile, Demetrio Magrin, Roberto Ragazzoni, Valentina Viotto, Osservatorio Astronomico di Padova (Italy) [7736-206]

Integration and alignment of adaptive optics systems: 10 years experience at the VLT, Sebastian Tordo, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-207]

Final design of the wavefront sensor unit for ARGOS, the LBT's LGS facility, Lorenzo Busoni, Marco Bonaglia, Simone Esposito, Luca Carbonaro, Osservatorio Astrofisico di Arcetri (Italy); Sebastian Rabien, Max-Planck-Institut für extraterrestrische Physik (Germany) [7736-208]

Wavefront corrector for solar telescopes based on variable reluctance actuators, Roger F. M. M. Hamelincx, Niek J. Doelman, TNO (Netherlands) [7736-210]

Laboratory test of application of electric-field conjugation image-sharpening to ground-based adaptive optics, Sandrine J. Thomas, Univ. of California Observatories (United States); Amir Give'on, Jet Propulsion Lab. (United States); Daren Dillon, Univ. of California Observatories (United States); Bruce A. Macintosh, Lawrence Livermore National Lab. (United States); Donald T. Gavel, Univ. of California Observatories (United States); Remi Soummer, Space Telescope Science Institute (United States) [7736-211]

Integrated dual-stage deformable mirrors, Michael S. Griffith, BAE Systems (United Kingdom); Richard M. Myers, Durham Univ. (United Kingdom); Peter Doel, Univ. College London (United Kingdom); Leslie Laycock, Nick Archer, Imdad Sardharwalla, BAE Systems (United Kingdom); Andrew K. Kirby, Durham Univ. (United Kingdom); David Brooks, Univ. College London (United Kingdom) . [7736-212]

Progress of development of a large, low-cost deformable mirror, Rikard Heimsten, Torben E. Andersen, Lund Observatory (Sweden); Douglas G. MacMynowski, California Institute of Technology (United States) [7736-213]

High-power visible-laser effect on a Boston Micromachines' MEMS deformable mirror, Andrew P. Norton, Univ. of California, Santa Cruz (United States); Donald T. Gavel, Univ. of California Observatories (United States); Daren Dillon, Univ. of California, Santa Cruz (United States); Steven Cornelissen, Boston Micromachines Corp. (United States) [7736-214]

Demonstration prototype and breadboards of the piezo stack M4 adaptive unit of the E-ELT, Bruno Crépy, CILAS (France); Stéphane Chaillot, BOOSTEC S.A. (France); Marcel Cola, AMOS Ltd. (Belgium); Raphaël Cousty, CILAS (France); Martin Dimmler, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Eric Gabriel, AMOS Ltd. (Belgium); Rami Gasmi, Observatoire de Paris à Meudon (France); Regis Grasser, CILAS (France); Norbert Hubin, Lieselotte Jochum, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Frédéric Loche, CILAS (France); Pierre-Yves Madec, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Pierre Morin, CILAS (France); Michaël Müller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Daniel Petitgas, Jean-Jacques Roland, Jean-Christophe Sinquin, CILAS (France); Elise Vernet, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-215]

The Subaru coronagraphic extreme AO (SCExAO) system: progress report, Frantz Martinache, Olivier Guyon, Frederic Vogt, Vincent Garrel, Kaito Yokochi, Takashi Yoshikawa, National Astronomical Observatory of Japan/Subaru Telescope (Japan) [7736-216]

Polarization properties of the vector vortex coronagraph with image plane wavefront control, Dwight C. Moody, Laurent A. Pueyo, Dimitri P. Mawet, Jet Propulsion Lab. (United States) [7736-217]

Polarimetry with the Gemini planet imager, Marshall D. Perrin, Univ. of California, Los Angeles (United States); James R. Graham, Univ. of California, Berkeley (United States); James E. Larkin, Univ. of California, Los Angeles (United States); Sloane Wiktorowicz, Univ. of California, Berkeley (United States); Jérôme Maire, Univ. de Montréal (Canada); Simon Thibault, ImmerVision (Canada); René Doyon, Univ. de Montréal (Canada); Bruce A. Macintosh, Lawrence Livermore National Lab. (United States); Donald T. Gavel, Univ. of California Observatories (United States); Ben R. Oppenheimer, American Museum of Natural History (United States); David W. Palmer, Lawrence Livermore National Lab. (United States); Leslie Saddlemyer, National Research Council Canada (Canada); J. Kent Wallace, Jet Propulsion Lab. (United States); Michael P. Fitzgerald, Lawrence Livermore National Lab. (United States) [7736-218]

Focal plane wavefront sensor sensitivity for ELT planet finder, Pierre Baudoz, Marion Mas, Raphaël Galicher, Gerard C. Rousset, Observatoire de Paris à Meudon (France) [7736-219]

PSF reconstruction for NICI: the high-contrast coronagraphic imager of GEMINI Observatory, Markus Hartung, Gemini Observatory (Chile); Damien Gratadour, Observatoire de Paris à Meudon (France); Mark R. Chun, Univ. of Hawai'i (United States); Thomas L. Hayward, Gemini Observatory (Chile); Julian C. Christou, Gemini Observatory (United States) [7736-220]

Application of wavelength diversity for astronomical adaptive optics imaging, Daniel Burke, Nicholas Devaney, National Univ. of Ireland, Galway (Ireland); Julian C. Christou, Markus Hartung, Gemini Observatory (United States) [7736-221]

The Subaru coronagraphic extreme AO (SCExAO) system: visible imaging mode, Vincent Garrel, National Astronomical Observatory of Japan/Subaru Telescope (United States) and LESIA, Observatoire de Paris (France); Olivier Guyon, National Astronomical Observatory of Japan/Subaru Telescope (United States); Pierre Baudoz, LESIA, Observatoire de Paris à Meudon (France); Frantz Martinache, Frederic Vogt, Takashi Yoshikawa, Kaito Yokochi, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-222]

Weighing black holes using open-loop focus corrections for LGS-AO observations of galaxy nuclei at Gemini Observatory, Richard M. McDermid, Gemini Observatory (United States); Davor Krajinovic, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Michele Cappellari, Univ. of Oxford (United Kingdom); Chadwick Trujillo, Gemini Observatory (United States); Roger L. Davies, Univ. of Oxford (United Kingdom) [7736-223]

Demonstration of on sky contrast improvement using the modified Gerchberg-Saxton algorithm at the Palomar Observatory, Rick S. Burruss, Eugene Serabyn, Dimitri P. Mawet, Jet Propulsion Lab. (United States); Jeffrey P. Hickey, Kevin Rykoski, California Institute of Technology (United States); Siddarayappa Bikkannavar, Jet Propulsion Lab. (United States) [7736-224]

FARIES: medium-field Arizona infrared imager and echelle spectrograph, Stephen M. Ammons, Donald W. McCarthy, Jr., Craig Kulesa, Michael Hart, Matt Rademacher, Eduardo A. Bendek Selman, Norman M. Milton, Keith B. Powell, Vidhya Vaitheeswaran, The Univ. of Arizona (United States) [7736-225]

Computed PSF subtraction for high-contrast imaging, Johanan L. Codona, Matthew A. Kenworthy, The Univ. of Arizona (United States) [7736-226]

Frame selection techniques for the Magellan adaptive optics VisAO camera, Jared R. Males, Laird M. Close, Derek A. Kopon, Victor Gasho, Katherine Brutlag, The Univ. of Arizona (United States) [7736-227]

Novel technology for small deformable mirrors, Mel Strachan, UK Astronomy Technology Ctr. (United Kingdom); Kevin Cooke, Joanne Hampshire, Teer Coatings Ltd. (United Kingdom); Jim Hough, Univ. of Glasgow (United Kingdom); David Hutson, Shin-Sung Kim, Katherine Kirk, Univ. of the West of Scotland (United Kingdom); Richard M. Myers, Durham Univ. (United Kingdom); Sheila Rowan, Univ. of Glasgow (United Kingdom); Erman Uzgur, Univ. of the West of Scotland (United Kingdom); Marielle van Veggel, Univ. of Glasgow (United Kingdom) [7736-228]

The LSST camera corner raft conceptual design: a front-end for guiding and wavefront correction, Vincent J. Riot, Lawrence Livermore National Lab. (United States); Kirk Arndt, Enver Alagoz, Alec Biccum, Andy Bohn, Joseph Clampit, Tony Coiro, Wei Cui, Alan Licht, Desiree Skaggs, Matt J. Triano, Bo Xin, Kat Ziegler, Purdue Univ. (United States); John Oliver, Harvard Univ. (United States); Richard Van Berg, Univ. of Pennsylvania (United States); Gunther M. Haller, Leonid Sapozhnikov, SLAC National Accelerator Lab. (United States); Ian Shipsey, Purdue Univ. (United States); Scot S. Olivier, Lawrence Livermore National Lab. (United States) . [7736-229]

New techniques for the live update of gain tables in NGS and LGS WFS operation, Michael D. Oliker, Daniel Roskey, SAIC (United States) [7736-230]

Novel technologies for large deformable mirrors, Mel Strachan, UK Astronomy Technology Ctr. (United Kingdom); Martin Strangwood, The Univ. of Birmingham (United Kingdom); Matthias R. Krödel, ECM GmbH (Germany); Kevin Cooke, Joanne Hampshire, Teer Coatings Ltd. (United Kingdom); Richard M. Myers, Durham Univ. (United Kingdom); David Hutson, Univ. of the West of Scotland (United Kingdom); Marielle van Veggel, Sheila Rowan, Jim Hough, Univ. of Glasgow (United Kingdom); Katherine Kirk, Univ. of the West of Scotland (United Kingdom); Erman Uzgur, Anadolu Univ. (Turkey); Shin-Sung Kim, Univ. of the West of Scotland (United Kingdom) [7736-231]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 12

Room: Golden West Thurs. 10:30 am to 12:10 pm

New AO System Designs III

Session Chair: Philip M. Hinz, The Univ. of Arizona

10:30 am: **Performance of MEMS-based visible-light adaptive optics at Lick Observatory**, Katie Morzinski, Donald T. Gavel, Univ. of California, Santa Cruz (United States); Bryant J. Grigsby, Lick Observatory (United States); Daren Dillon, Marc R. Reinig, Univ. of California, Santa Cruz (United States) [7736-59]

10:50 am: **GRAAL: a seeing enhancer for the NIR wide-field imager Hawk-I**, Jérôme Paufigue, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-60]

11:10 am: **Status of the PALM-3000 adaptive optics system**, Antonin H. Bouchez, Richard G. Dekany, California Institute of Technology (United States); John R. Angione, Jet Propulsion Lab. (United States); Christoph Baranec, Khanh Bui, California Institute of Technology (United States); Rick S. Burruss, Jet Propulsion Lab. (United States); Ernest E. Croner, California Institute of Technology (United States); Stephen R. Guiwits, Jet Propulsion Lab. (United States); David D. S. Hale, California Institute of Technology (United States); John R. Henning, Palomar Observatory (United States); Dean L. Palmer, Jennifer E. Roberts, J. Chris Shelton, Mitchell Troy, Tuan N. Truong, J. Kent Wallace, Jet Propulsion Lab. (United States); Jeffrey Zolkower, Palomar Observatory (United States) [7736-61]

11:30 am: **ALTAIR NGS/LGS performance at Gemini North**, Julian C. Christou, Chadwick Trujillo, Michael Sheehan, Gemini Observatory (United States); Francois J. Rigaut, Benoit Neichel, Gemini Observatory (Chile) [7736-62]

11:50 am: **The MCAO systems within LINC-NIRVANA: functions, procedures, and control strategies**, Thomas Bertram, Max-Planck-Institut für Astronomie (Germany); Carmelo Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); Jürgen Berwein, Florian Briegel, Max-Planck-Institut für Astronomie (Germany); Emiliano Diolaiti, Osservatorio Astronomico di Bologna (Italy); Jacopo Farinato, Osservatorio Astronomico di Padova (Italy); Wolfgang Gässler, Frank Kittmann, Max-Planck-Institut für Astronomie (Germany); Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy) [7736-63]

Lunch/Exhibition Break 12:10 to 2:00 pm

SESSION 13

Room: Golden West Thurs. 2:00 to 4:40 pm

Laser Systems

Session Chair: Céline d'Orgeville, Gemini Observatory (Chile)

2:00 pm: **Laser systems for laser guide star adaptive optics: status and perspectives** (*Invited Paper*), Sean M. Adkins, W. M. Keck Observatory (United States) [7736-64]

2:30 pm: **PM fiber lasers at 589nm: a 30W prototype and a portable laser system for LGS return flux studies**, Domenico Bonaccini Calia, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Axel Friedenaer, TOPTICA Photonics AG (Germany); Vladimir Protopopov, MPB Communications Inc. (Canada); Luke R. Taylor, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Vladimir I. Karpov, MPB Communications Inc. (Canada); Manfred Hager, TOPTICA Photonics AG (Germany); Wallace R. L. Clements, MPB Communications Inc. (Canada); Bernhard Ernstberger, TOPTICA Photonics AG (Germany); Steffan Lewis, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Wilhelm G. Kaenders, TOPTICA Photonics AG (Germany) [7736-65]

2:50 pm: **Keck I laser guide star AO system integration**, Jason C. Y. Chin, Thomas E. Stalcup, Jr., W. M. Keck Observatory (United States) [7736-66]

3:10 pm: **Setting up ELP-OA: the polychromatic laser guide star demonstrator**, Nicolas Meillard, Renaud Foy, Observatoire de Lyon (France); Maud Langlois, Michel Tallon, Éric M. Thiébaud, Ctr. de Recherche Astronomique de Lyon (France); Alain D. Petit, Commissariat à l'Énergie Atomique (France); Pierre-Éric Blanc, Michel Boër, Julien Chombart, Olivier Fouche, Andrée Laloge, Auguste Le Van Suu, Xavier Regal, Jérôme Schmitt, Observatoire de Haute-Provence (France); Alain Blazit, Observatoire de la Côte d'Azur (France) [7736-90]

Coffee Break 3:30 to 4:00 pm

4:00 pm: **A bright, pulsed, guide star laser for very large telescopes**, Jesper Munch, Murray Hamilton, Nikita Simakov, Peter Veitch, The Univ. of Adelaide (Australia) [7736-68]

4:20 pm: **System overview of a 30 W and 60 W 589 nm guidestar laser systems**, Nicholas W. Sawruk, Ian Lee, Munib P. Jalali, Zachary Prezkuta, Kenneth W. Groff, Jared Roush, Nathan Rogers, Bruce Tiemann, Stephen M. Hannon, William J. Alford, Lockheed Martin Coherent Technologies (United States); Céline d'Orgeville, Gemini Observatory (Chile); Vincent Fesquet, Richard Oram, Gemini Observatory (United States); Sean M. Adkins, Kenny Grace, W. M. Keck Observatory (United States) [7736-69]

SESSION 14

Room: Golden West Thurs. 4:40 to 5:30 pm

Atmospheric Characterization

Session Chair: Andrei A. Tokovinin,
National Optical Astronomy Observatory

4:40 pm: **Open questions in site characterization and turbulence parameter measurements** (*Invited Paper*), Matthias Schoeck, Thirty Meter Telescope Project (United States) and National Research Council Canada (Canada); Sebastian G. Els, European Space Astronomy Ctr. (Spain) and Cerro Tololo Inter-American Observatory (Chile); Reed L. Riddle, Caltech Optical Observatories (United States); Warren A. Skidmore, Tony Travouillon, Thirty Meter Telescope Project (United States) [7736-70]

5:10 pm: **High-resolution mesospheric sodium observations for extremely large telescopes**, Thomas Pfrommer, Paul Hickson, The Univ. of British Columbia (Canada) [7736-71]

Friday 2 July

SESSION 15

Room: Golden West Fri. 8:30 to 10:20 am

Innovative AO Concepts

Session Chair: Emiliano Diolaiti,
Osservatorio Astronomico di Bologna (Italy)

8:30 am: **Recent progress and perspectives for GLAO and MOAO** (*Invited Paper*), Richard M. Myers, Durham Univ. (United Kingdom) [7736-72]

9:00 am: **Adaptive optics with solely natural guide stars at an Extremely Large Telescope**, Roberto Ragazzoni, Carmelo Arcidiacono, Marco Dima, Jacopo Farinato, Demetrio Magrin, Valentina Viotto, Osservatorio Astronomico di Padova (Italy) [7736-73]

9:20 am: **The Subaru coronagraphic extreme AO (SCEAO) system: wavefront control and detection of exoplanets with coherent light modulation in the focal plane**, Olivier Guyon, National Astronomical Observatory of Japan/Subaru Telescope (United States) and The Univ. of Arizona (United States); Frantz Martinache, Vincent Garrel, Frederic Vogt, Kaito Yokochi, Takashi Yoshikawa, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7736-74]

9:40 am: **A comparison of tip-tilt star sharpening techniques for precision laser guide star adaptive optics systems**, Richard G. Dekany, California Institute of Technology (United States) [7736-75]

10:00 am: **Experimental demonstration of laser tomographic adaptive optics on a 30-meter telescope at 850 nm**, Stephen M. Ammons, The Univ. of Arizona (United States); Luke C. Johnson, Donald T. Gavel, Renate Kupke, Claire E. Max, Univ. of California, Santa Cruz (United States) [7736-76]

Coffee Break 10:20 to 10:50 am

SESSION 16

Room: Golden West Fri. 10:50 am to 12:10 pm

Wavefront Sensors II

Session Chair: Simone Esposito, Osservatorio Astrofisico di Arcetri (Italy)

- 10:50 am: **Compared performance of different centroiding algorithms for high-pass filtered laser guide star Shack-Hartmann wavefront sensors.** Olivier Lardière, Rodolphe Conan, Univ. of Victoria (Canada); Richard M. Clare, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Colin Bradley, Univ. of Victoria (Canada); Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-77]
- 11:10 am: **Anisoplanatism effects in wave-front sensing with laser guide stars on the ELTs.** Nicolas Muller, Clelia Robert, Vincent Michau, Thierry Fusco, Cyril Petit, Jean-Marc Conan, Nicolas Vedrenne, ONERA (France); Gerard C. Rousset, Observatoire de Paris à Meudon (France) [7736-78]
- 11:30 am: **Optimized phase diversity sensor for wideband analysis on long-exposure AO corrected images: theory, simulations, and experimental validations.** Sarah Dandy, Jean-François Sauvage, Thierry Fusco, Laurent Mugnier, ONERA (France) [7736-79]
- 11:50 am: **Advanced static speckle calibration for exoplanet imaging.** Laurent A. Pueyo, J. Kent Wallace, Rick S. Burruss, Mitchell Troy, Jet Propulsion Lab. (United States); Bruce A. Macintosh, Lawrence Livermore National Lab. (United States) [7736-80]
- Lunch Break 12:10 to 1:30 am

SESSION 17

Room: Golden West Fri. 1:30 to 3:10 pm

Wavefront Correctors

Session Chair: Enrico Marchetti, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

- 1:30 pm: **Contactless thin adaptive mirror technology: past, present and future..** Roberto Biasi, Microgate S.r.l. (Italy); Daniele Gallieni, A.D.S. International S.r.l. (Italy); Piero Salinari, Armando Riccardi, Osservatorio Astrofisico di Arcetri (Italy); Paolo Mantegazza, Politecnico di Milano (Italy); Guido Brusa-Zappellini, Large Binocular Telescope Observatory (United States) [7736-81]
- 1:50 pm: **The adaptive secondary mirror for the Large Binocular Telescope: result of the optical acceptance test.** Armando Riccardi, Marco Xompero, Runa Briguglio, Fernando Quirós-Pacheco, Osservatorio Astrofisico di Arcetri (Italy); Richard Demers, Large Binocular Telescope Corp. (United States) [7736-82]
- 2:10 pm: **MEMS deformable mirrors for astronomical adaptive optics.** Steven Cornelissen, Allyson Hartzell, Jason Stewart, Boston Micromachines Corp. (United States); Thomas Bifano, Boston Univ. (United States); Paul Bierden, Boston Micromachines Corp. (United States) [7736-83]
- 2:30 pm: **Characterization of the PALM-3000 3388-actuator deformable mirror.** Jennifer E. Roberts, Jet Propulsion Lab. (United States); Antonin H. Bouchez, Caltech Optical Observatories (United States); Rick S. Burruss, Jet Propulsion Lab. (United States); Richard G. Dekany, Caltech Optical Observatories (United States); Stephen R. Guiwits, Mitchell Troy, Jet Propulsion Lab. (United States) [7736-84]
- 2:50 pm: **Last progress concerning the design of the piezo stack M4 adaptive unit of the E-ELT.** Bruno Crépy, CILAS (France); Stéphane Chaillot, BOOSTEC S.A. (France); Jean-Marc Conan, ONERA (France); Raphaël Cousty, CILAS (France); Christophe Delrez, AMOS Ltd. (Belgium); Martin Dimmler, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Jean-Laurent Dournaux, Observatoire de Paris à Meudon (France); Sophie De Zotti, EADS Astrium (France); Eric Gabriel, AMOS Ltd. (Belgium); Rami Gasmí, Observatoire de Paris à Meudon (France); Regis Grasser, CILAS (France); Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Pascal Jagourel, Observatoire de Paris à Meudon (France); Lieselotte Jochum, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Frédéric Locre, CILAS (France); Pierre-Yves Madec, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Pierre Morin, CILAS (France); Michaël Müller, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Cyril Petit, ONERA (France); Daniel Petitgas, Jean-Jacques Roland, CILAS (France); Elise Vernet, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-85]
- Coffee Break 3:10 to 3:30 pm

SESSION 18

Room: Golden West Fri. 3:30 to 4:50 pm

Real-Time Control II

Session Chair: Jean-Pierre Véran, National Research Council Canada (Canada)

- 3:30 pm: **Laboratory performance of the Gemini planet imager's adaptive optics wavefront reconstruction and control system.** Lisa A. Poyneer, Steven M. Jones, Lawrence Livermore National Lab. (United States) [7736-86]
- 3:50 pm: **MYST: a comprehensive high-level control tool for GeMS.** Francois J. Rigaut, Benoit Neichel, Matthieu Bec, Aurea Garcia-Rissman, Gemini Observatory (Chile) [7736-87]
- 4:10 pm: **SPARTA for the VLT: status and plans.** Enrico Fedrigo, Robert Donaldson, Marcos Suarez Valles, Christian Soenke, Stefano Zampieri, Reynald Bourtembourg, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7736-88]
- 4:30 pm: **Wavefront sensing and wavefront reconstruction for the 4m European Solar Telescope EST.** Thomas Berkefeld, Dirk Soltau, Albert-Ludwigs-Univ. Freiburg (Germany); Dario Del Moro, Univ. degli Studi di Roma Tor Vergata (Italy); Mats Löfdahl, Institute for Solar Physics (Sweden) [7736-89]

Facility Map

See page 143.



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See full course descriptions, pp. 106-108.

Observatory Operations: Strategies, Processes, and Systems III

Conference Chairs: David R. Silva, National Optical Astronomy Observatory; Alison B. Peck, Atacama Large Millimeter/Submillimeter Array (Chile); B. Thomas Soifer, California Institute of Technology

Program Committee: David S. Adler, Space Telescope Science Institute; Roger J. Brissenden, Chandra Science Ctr./Harvard-Smithsonian Ctr. for Astrophysics; Dennis R. Crabtree, Gemini Observatory (Chile); Suzanne R. Dodd, Spitzer Science Ctr./California Institute of Technology; Richard F. Green, Large Binocular Telescope/The Univ. of Arizona; Andreas Kaufer, European Southern Observatory (Chile); Nicole M. Radziwill, National Radio Astronomy Observatory; Robert L. Seaman, National Optical Astronomy Observatory; R. Christopher Smith, National Optical Astronomy Observatory

Wednesday 30 June

SESSION 1

Room: Pacific Salon III Wed. 8:30 am to 12:00 pm

Site and Facility Operations I

Session Chair: Andreas Kaufer,
European Southern Observatory (Chile)

8:30 am: **10 years of VLT end-to-end operations**, Andreas Kaufer, European Southern Observatory (Chile); Fernando Comerón, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-01]

8:50 am: **The MMT Observatory: operations 10 years after conversion**, Faith Vilas, G. Grant Williams, Joseph T. Williams, Shawn P. Callahan, Morag A. Hastie, MMT Observatory (United States) [7737-02]

9:10 am: **The IRAM Plateau de Bure interferometer: current status, upgrades, and future**, Pierre H. Cox, Roberto Neri, Instituto de RadioAstronomía Milimétrica (France) [7737-03]

9:30 am: **Constructing the EVLA while operating the VLA**, Robert L. Dickman, National Radio Astronomy Observatory (United States) [7737-04]

9:50 am: **Mixing completion, commissioning, and operations at the LBT**, Richard F. Green, John M. Hill, The Univ. of Arizona (United States) and Large Binocular Telescope Observatory (United States); Joar G. Brynneel, The Univ. of Arizona (United States); James H. Slagle, David S. Ashby, Norman J. Cushing, John Little, R. Mark Wagner, Marco Pedani, The Univ. of Arizona (United States) and Large Binocular Telescope Observatory (United States) [7737-05]

Coffee Break 10:10 to 10:40 am

10:40 am: **A new La Silla site operations paradigm**, Gerardo J. F. Ihle, Andreas Kaufer, Ivo Saviane, Michael F. Sterzik, Bernardo Ahumada, Javier Duk, Juan Carlos Fluxa, Andres Gonzalez, Ismo Kastinen, Eduardo Matamoros, Marcus Pavez, Juan Carlos Pineda, Aldo Pizarro, Peter Sinclair, European Southern Observatory (Chile) [7737-06]

11:00 am: **APEX: first five years of operations**, Andreas Lundgren, David Rabanus, Gundolf Wieching, European Southern Observatory (Chile) [7737-08]

11:20 am: **Laser guide star operations at the Gemini North Observatory**, Tony C. Matulis, Gemini Observatory (United States) [7737-09]

11:40 am: **Laser operations the 8-10m class telescopes Gemini, Keck, and the VLT: lessons learned, old and new challenges**, Paola Amico, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Randall D. Campbell, W. M. Keck Observatory (United States); Julian C. Christou, Gemini Observatory (United States) [7737-10]

Lunch/Exhibition Break 12:00 to 1:50 pm

SESSION 2

Room: Pacific Salon III Wed. 1:50 to 3:10 pm

Site and Facility Operations II

Session Chair: Richard F. Green, The Univ. of Arizona

1:50 pm: **The ALMA maintenance plan**, Dean Chalmers, Richard M. Prestage, Clinton C. Janes, Cristian Lastra, Joaquin Penroz, Atacama Large Millimeter Array (Chile) [7737-11]

2:10 pm: **Operational model for the Magdalena Ridge Observatory interferometer**, Eric J. Bakker, Van D. Romero, Dave J. Westpfahl, Ifan Payne, Michelle J. Creech-Eakman, Fernando G. Santoro, Allen R. Farris, New Mexico Institute of Mining and Technology (United States) [7737-12]

2:30 pm: **Testing and validation of orbital operations plans for the MESSENGER Mission**, Alice F. Berman, The Johns Hopkins Univ. (United States); Deborah L. Domingue, Planetary Science Institute (United States); Mark H. Holdridge, Teck H. Choo, Robert J. Steele, Richard G. Shelton, The Johns Hopkins Univ. (United States) [7737-13]

2:50 pm: **Using the Baldrige criteria for observatory strategic and operations planning**, Nicole M. Radziwill, James Madison Univ. (United States); Lory Mitchell, National Radio Astronomy Observatory (United States) [7737-14]

Coffee Break 3:10 to 3:40 pm

SESSION 3

Room: Pacific Salon III Wed. 3:40 to 6:00 pm

Science Operations Processes

Session Chair: Richard F. Green, The Univ. of Arizona

3:40 pm: **Scientific productivity and impact of large telescopes**, Dennis R. Crabtree, National Research Council Canada (Canada) [7737-15]

4:00 pm: **ALMA science operations**, Lars-Ake Nyman, European Southern Observatory (Chile) [7737-16]

4:20 pm: **Kepler science operations processes, procedures, and tools**, Jennifer R. Hall, Khadeejah Ibrahim, Todd C. Klaus, Orbital Sciences Corp. (United States); Miles T. Cote, NASA Ames Research Ctr. (United States); Christopher Middour, Orbital Sciences Corp. (United States); Michael R. Haas, Jessie L. Dotson, Brett A. Strozias, Michael Wu, NASA Ames Research Ctr. (United States); Jeneen Sommers, Orbital Sciences Corp. (United States); Paresh Bhavsar, NASA Ames Research Ctr. (United States) [7737-17]

4:40 pm: **The care and feeding of the JWST on-board event-driven system**, Vicki A. Balzano, Dean Zak, William Whitman, Space Telescope Science Institute (United States) [7737-18]

5:00 pm: **Gemini Observatory: five years of multi-instrument queue operations**, Inger Jorgensen, Gemini Observatory (United States); Bernadette Rodgers, Dennis R. Crabtree, Gemini Observatory (Chile) [7737-19]

5:20 pm: **GALEX extended mission operations**, Karl Forster, California Institute of Technology (United States); Kerry D. Erickson, Jet Propulsion Lab. (United States); Justin F. McNeill, Eyal Amir, Ryan Pfeiffer, The Aerospace Corp. (United States); Paul Herrera, California Institute of Technology (United States) [7737-20]

5:40 pm: **Downsizing a great observatory: the story of warm Spitzer**, Lisa J. Storrie-Lombardi, Suzanne R. Dodd, California Institute of Technology (United States) [7737-21]

Wednesday Poster Session

Room: Grand Exhibit Hall Wed. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Wednesday. The interactive poster session with authors in attendance will be Wednesday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Interfaces between science and engineering operations for the WISE Telescope, Beth E. Fabinsky, Jet Propulsion Lab. (United States); Timothy Conrow, California Institute of Technology (United States) [7737-59]

Preventive maintenance optimization at Paranal Observatory, Erich F. Bugueno, European Southern Observatory (Chile) [7737-60]

Reliability as culture at the La Silla Paranal Observatory, Sergio E. Gonzalez, European Organisation for Astronomical Research in the Southern Hemisphere (Chile) [7737-61]

- Data management subsystem software architecture for JWST**, Daryl A. Swade, Space Telescope Science Institute (United States) [7737-62]
- Queue observing as a student training tool**, Etienne Artigau, René Doyon, Robert A. Lamontagne, Univ. de Montréal (Canada) [7737-63]
- Fermi Large Area Telescope operations: from pre-launch challenges to mission success**, Robert A. Cameron, SLAC National Accelerator Lab. (United States) [7737-64]
- Shootout: the performance of dual-image cosmic-ray detection algorithms**, Russ R. Laher, Nouhad Hamam, Frank J. Masci, Serge Monkewitz, Carl J. Grillmair, Suzanne R. Dodd, Sean Mattingly, California Institute of Technology (United States); Simon Krughoff, Andrew Connolly, Univ. of Washington (United States); David R. Kirkby, Univ. of California, Irvine (United States); Paul Kendall, Northrop Grumman Corp. (United States); Shanie Asato, Defense Group Inc. (United States) ... [7737-65]
- Recent developments on the SINFONI pipeline**, Konstantin Mirny, Radius ZUG (Germany); Andrea Modigliani, Mark Neeser, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Dieter Nuernerberger, European Southern Observatory (Chile) [7737-66]
- The GPS water vapor monitor and thermal astronomy at Gemini South**, James T. Radomski, Gelys Tranco, Lucas Fuhrman, Pedro Gigoux, Vanessa Montes, Felipe Daruich, Gemini Observatory (Chile); Mark Falvey, Univ. de Chile (Chile); Manuel Lazo, Gemini Observatory (Chile) [7737-67]
- DTS: the NAOO data transport system**, Michael J. Fitzpatrick, National Optical Astronomy Observatory (United States) [7737-68]
- The Gemini recipe system: a dynamic workflow for automated data reduction**, Kathleen Labrie, Craig Allen, Paul Hirst, Gemini Observatory (United States); Jennifer Holt, Univ. of California, Santa Cruz (United States); River Allen, Denny K. Dement, Gemini Observatory (United States) [7737-69]
- The Spitzer bibliography database: bibliographic statistics**, Elena Scire, Ben H. Chan, Nancy Silbermann, California Institute of Technology (United States); Aomawa Shields, Univ. of Washington (United States) [7737-70]
- Spitzer warm mission transition and operations**, William A. Mahoney, Lisa J. Garcia, California Institute of Technology (United States); Joseph C. Hunt, Jr., Jet Propulsion Lab. (United States); Douglas B. McElroy, Vince G. Mannings, California Institute of Technology (United States); David S. Mittman, Jet Propulsion Lab. (United States); JoAnn C. O'Linger, California Institute of Technology (United States); Marc A. Sarrel, Jet Propulsion Lab. (United States); Elena Scire, California Institute of Technology (United States) [7737-71]
- Post-cryogenic reanalysis of the absolute calibration of the infrared array camera on the Spitzer Space Telescope**, David M. Cole, Spitzer Science Ctr. (United States); Sean J. Carey, Jason A. Surace, William J. Glaccum, James Ingalls, Jessica Krick, California Institute of Technology (United States); Mark D. Lacy, National Radio Astronomy Observatory (United States); Patrick J. Lowrance, Seppo J. Laine, JoAnn C. O'Linger, California Institute of Technology (United States); Joseph L. Hora, Harvard-Smithsonian Ctr. for Astrophysics (United States); William F. Hoffmann, The Univ. of Arizona (United States); Giovanni G. Fazio, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7737-72]
- Toward a 'green' observatory**, Ueli Weilenmann, Christian Ramirez, Pierre Vanderheyden, European Southern Observatory (Chile) [7737-73]
- First year of ALMA site software deployment: where everything comes together**, Victor Gonzalez, Matias Mora, Rodrigo Araya, Diego Arredondo, Marcelo Bartsch, Pablo Burgos, Atacama Large Millimeter Array (Chile); Jorge Ibsen, European Southern Observatory (Chile); Johnny Reveco, Norman Saez, Anton Schemrl, Jorge Sepulveda, Tzu-Chiang Shen, Ruben Soto, Nicolas Troncoso, Mauricio Zambrano, Atacama Large Millimeter Array (Chile); Brian Glendinning, National Radio Astronomy Observatory (United States); Gianni Raffi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Jeff S. Kern, National Radio Astronomy Observatory (United States) [7737-74]
- Software operations support at Gemini Observatory**, Angelic W. Ebberts, Gemini Observatory (United States); Cristian Urrutia, Gemini Observatory (Chile); Tom Cumming, Gemini Observatory (United States); Pedro Gigoux, Gemini Observatory (Chile) [7737-75]
- Process-oriented modeling method for sensors resources management under sensor web**, Jiaying Chen, Nengcheng Chen, Wuhan Univ. (China) [7737-77]
- The ESO Extremely Large Telescope dome: system engineering strategies for electrical power management**, Gianpietro Marchiori, Luigino Giacomel, European Industrial Engineering s.r.l. (Italy) [7737-78]
- A portable observatory for persistent monitoring of the night sky**, James A. Wren, W. Thomas Vestrand, Przemek Wozniak, Heath R. Davis, Los Alamos National Lab. (United States) [7737-79]
- From Chile to Europe in minutes: handling the data stream from ESO's Paranal Observatory**, Martino Romaniello, Stefano Zampieri, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Cecilia Ceron, Andrew Wright, European Southern Observatory (Chile); Reinhard W. Hanuschik, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Cédric Ledoux, European Southern Observatory (Chile); Fernando Comerón, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-81]
- PySALT: the SALT science pipeline**, Steven M. Crawford, South African Astronomical Observatory (South Africa) and Southern African Large Telescope (South Africa); Martin D. Still, NASA Ames Research Ctr. (United States); Pim Schellart, South African Astronomical Observatory (South Africa) and Radboud Univ. (Netherlands); Luis Balona, South African Astronomical Observatory (South Africa); David A. H. Buckley, Amanda A. S. Gulbis, Alexei Kniazev, Southern African Large Telescope (South Africa); Marissa Kotze, South African Astronomical Observatory (South Africa) and Univ. of Cape Town (South Africa); Nicola Loaring, Southern African Large Telescope (South Africa); Kenneth H. Nordsieck, Univ. of Wisconsin-Madison (United States); Timothy E. Pickering, Encarni Romero Colmenero, Petri Vaisanen, Southern African Large Telescope (South Africa); Ewald Zietsman, South African Astronomical Observatory (South Africa) and Univ. of South Africa (South Africa) [7737-82]
- Autonomous observations in extreme environments: the AMICA case**, Gianluca Di Rico, Maurizio Ragni, Mauro M. Dolci, Oscar Straniero, Gaetano Valentini, Osservatorio Astronomico di Teramo (Italy); Carlotta Bonoli, Favio Bortoletto, Maurizio D'Alessandro, Demetrio Magrin, Osservatorio Astronomico di Padova (Italy); Leonardo Corcione, Osservatorio Astronomico di Torino (Italy); Carlos A. Abia, Univ. de Granada (Spain) [7737-83]
- PACS scan mapping mode optimization with the Herschel Space Observatory**, Bruno G. M. Altieri, European Space Astronomy Ctr. (Spain); Marc Sauvage, Commissariat à l'Énergie Atomique (France); Albrecht Poglitsch, Thomas Müller, Max-Planck-Institut für extraterrestrische Physik (Germany); Miguel A. Sánchez-Portal, Leo Metcalfe, Jon Brumfit, European Space Astronomy Ctr. (Spain); Ulrich Klaas, Markus Nielbock, Max-Planck-Institut für Astronomie (Germany); Dieter Lutzke, Eckhard Wiewrecht, Michael Wetzstein, Vanessa Doublier-Pritchard, Max-Planck-Institut für extraterrestrische Physik (Germany); Roland Vavrek, Antony Marston, European Space Astronomy Ctr. (Spain) [7737-84]
- The X-Shooter pipeline**, Andrea Modigliani, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Paolo Goldoni, AstroParticule et Cosmologie (France); Patrick François, Observatoire de Paris à Meudon (France); Laurent Guglielmi, AstroParticule et Cosmologie (France); Régis Haigron, Frédéric Royer, Observatoire de Paris à Meudon (France); Matthew Horrobin, Univ. zu Köln (Germany); Paul Bristow, Pascal Ballester, Florian Kerber, Sabine Moehler, Jöl Vernet, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-85]
- The new FORS pipeline**, Carlo Izzo, Lander de Bilbao, Jonas M. Larsen, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Stefano Bagnulo, Armagh Observatory (United Kingdom); Pascal Ballester, Wolfram Freudling, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-86]
- Spectroradiometric calibration of telescopes using laser illumination of flat field screens**, John T. Woodward, Steven W. Brown, Keith R. Lykke, Allan W. Smith, National Institute of Standards and Technology (United States); Claire E. Cramer, Peter E. Doherty, Harvard Univ. (United States); Emilio E. Falco, Harvard-Smithsonian Ctr. for Astrophysics (United States); Christopher W. Stubbs, Harvard Univ. (United States) [7737-87]
- Changes and improvements to the Gemini North aircraft avoidance program at the Gemini North laser guide star facility on Mauna Kea**, Jon P. Archambeau, Richard Oram, Michael Sheehan, Gemini Observatory (United States) [7737-88]
- Washing very large mirrors, in-situ: extending the life of astronomical coatings**, Joseph T. Williams, Ricardo Ortiz, MMT Observatory (United States) [7737-89]
- High-precision near-infrared differential photometry using WirCam on the Canada-France-Hawaii Telescope**, Daniel Devost, Douglas Teeple, Loïc Albert, Tom A. Vermeulen, Canada-France-Hawaii Telescope (United States) [7737-90]
- Effect seasonal of optical seeing above Oukaimeden Observatory in the Morocco High Atlas mountains: dependence of results on the exposure time**, Youssef Hach, Mohammed Sabil II, Abdelouhed Abahamid, Zouhair Z. Benkhaldoun, Abdelhadi Jabiri, Youssef Elazhari, Univ. Cadi Ayyad (Morocco) [7737-91]
- Characterization of the mid-IR image quality at Gemini South**, Dan Li, Charles M. Telesco, Frank Varosi, Univ. of Florida (United States) [7737-92]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 4

Room: Pacific Salon III Thurs. 10:30 am to 12:30 pm

Time Domain and Target of Opportunity

Session Chair: Nicole M. Radziwill, James Madison Univ.

10:30 am: **The VLT rapid-response mode: implementation and scientific results at Gemini Observatory**, Katherine C. Roth, Gemini Observatory (United States); Paul M. Vreesswijk, Univ. of Copenhagen (Denmark); Andreas Kaufer, European Southern Observatory (Chile); Jason Spyromilio, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Ricardo Schmutzer, Cédric Ledoux, Alain Smette, European Southern Observatory (Chile) [7737-22]

10:50 am: **Managing target of opportunity (ToO) observations in queue mode at Gemini Observatory**, Katherine C. Roth, Gemini Observatory (United States); Rodrigo Carrasco, Bryan Miller, Gemini Observatory (Chile); Andrew Stephens, Inger Jorgensen, Gemini Observatory (United States); Bernadette Rodgers, Gemini Observatory (Chile) [7737-23]

11:10 am: **LCOGT sites and site operations plan**, John Martinez, Timothy M. Brown, Patrick Conway, Mark Elphick, Michael Falarski, Eric Hawkins, Wayne Rosing, John Shobbrook, Las Cumbres Observatory Global Telescope Network (United States) [7737-24]

11:30 am: **Scheduling observations on the LCOGT network**, Eric Hawkins, Nairn Baliber, Mark Bowman, Timothy M. Brown, Benjamin Burleson, Steven Foale, Martyn Ford, Timothy Lister, Martin Norbury, Eric Saunders, Zachary A. Walker, Las Cumbres Observatory Global Telescope Network (United States) [7737-25]

11:50 am: **The Gamma-ray Coordinates Network (GCN): real-time events to the world**, Scott D. Barthelmy, NASA Goddard Space Flight Ctr. (United States) [7737-26]

12:10 pm: **VOEvent as a framework for autonomous observatory operations**, Roy D. Williams, California Institute of Technology (United States); Robert L. Seaman, National Optical Astronomy Observatory (United States) [7737-27]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 5

Room: Pacific Salon III Thurs. 2:00 to 3:00 pm

Transient Events and Observatory Operations

Session Chair: Robert L. Seaman,
National Optical Astronomy Observatory

2:00 pm: **The Catalina real-time transient survey**, Andrew J. Drake, George Djorgovski, Ashish A. Mahabal, Roy D. Williams, Matthew J. Graham, Ciro Donalek, California Institute of Technology (United States); Edward Beshore, The Univ. of Arizona (United States) [7737-28]

2:20 pm: **Transient events on mobile devices: astronomers as consumers**, Alasdair Allan, The Univ. of Exeter (United Kingdom) [7737-31]

2:40 pm: **Transient alert operations for the Large Synoptic Survey Telescope**, R. Christopher Smith, Robert L. Seaman, National Optical Astronomy Observatory (United States); Timothy Axelrod, Jeff Kantor, LSST Corp. (United States) [7737-32]

Coffee Break 3:00 to 3:40 pm

SESSION 6

Room: Pacific Salon III Thurs. 3:40 to 5:20 pm

Dynamic Observatory Scheduling

Session Chair: Robert L. Seaman,
National Optical Astronomy Observatory

3:40 pm: **New observing concepts for ESO Survey Telescopes**, Thomas Bierwirth, Keith Baugh, Dario Dorigo, Maurice S. Klein Gebbinck, Alisdair Manning, Dmitriy Muravov, Paulo Nunes, Marina Rejkuba, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Thomas Szeifert, European Southern Observatory (Chile); Ignacio Vera Sequeiros, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-33]

4:00 pm: **Dynamic scheduling at the submillimeter array**, Glen Pettipas, Qizhou Zhang, Charles Katz, Nimesh Patel, Raymond Blundell, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7737-34]

4:20 pm: **JWST planning and scheduling operations and concepts**, Wayne M. Kinzel, Space Telescope Science Institute (United States) [7737-35]

4:40 pm: **Simulation of autonomous observing with a ground-based telescope: the LSST Experience**, Stephen T. Ridgway, National Optical Astronomy Observatory (United States); Kem H. Cook, Lawrence Livermore National Lab. (United States); Robyn Allsman, LSST Corp. (United States); Timothy Axelrod, The Univ. of Arizona (United States); Srinivasan Chandrasekharan, Charles F. Claver, Francisco Delgado, National Optical Astronomy Observatory (United States); Zeljko Ivezic, R. Lynne Jones, Simon Krughoff, Univ. of Washington (United States); Michelle Miller, National Optical Astronomy Observatory (United States); Catherine Petry, The Univ. of Arizona (United States); Francesco Pierfederici, Harvard-Smithsonian Ctr. for Astrophysics (United States); Phillip Pinto, The Univ. of Arizona (United States); Abhijit Saha, National Optical Astronomy Observatory (United States) [7737-36]

5:00 pm: **Implementation of the LSST operations simulator for testing observatory design, operations, observing cadences, and delivery of LSST science**, Kem H. Cook, Lawrence Livermore National Lab. (United States); Robyn Allsman, LSST Corp. (United States); Srinivasan Chandrasekharan, National Optical Astronomy Observatory (United States); Francisco Delgado, Cerro Tololo Inter-American Observatory (Chile); R. Lynne Jones, Simon Krughoff, Univ. of Washington (United States); Michelle Miller, National Optical Astronomy Observatory (United States); Catherine Petry, The Univ. of Arizona (United States); Francesco Pierfederici, Harvard-Smithsonian Ctr. for Astrophysics (United States); Phillip Pinto, The Univ. of Arizona (United States); Stephen T. Ridgway, Abhijit Saha, National Optical Astronomy Observatory (United States) [7737-37]

Friday 2 July

SESSION 7

Room: Pacific Salon III Fri. 8:20 to 10:00 am

Remote Robotic and Service

Session Chair: David R. Silva, National Optical Astronomy Observatory

8:20 am: **Switching the Liverpool Telescope from a 'full service' operating model to 'self service'**, Robert J. Smith, Neil R. Clay, Stephen N. Fraser, Chris M. Moss, Iain A. Steele, Jonathan Marchant, Liverpool John Moores Univ. (United Kingdom) [7737-38]

8:40 am: **A shared approach to supporting remote observing for multiple observatories**, Robert I. Kibrick, Lick Observatory (United States); Gregory D. Wirth, W. M. Keck Observatory (United States); Elinor L. Gates, Bryant J. Grigsby, William T. S. Deich, Kyle Lanclos, Steven L. Allen, Lick Observatory (United States) [7737-39]

9:00 am: **VISTA: survey area definition tool**, James P. Emerson, Queen Mary, Univ. of London (United Kingdom) [7737-40]

9:20 am: **Data compression for optimizing observatory workflows**, Robert L. Seaman, National Optical Astronomy Observatory (United States) [7737-42]

9:40 am: **Mopra remote observing: a story of innovation and success**, Balthasar T. Indermuehle, Philip G. Edwards, Commonwealth Scientific and Industrial Research Organisation (Australia) [7737-93]

Coffee Break 10:00 to 10:30 am

SESSION 8

Room: Pacific Salon III Fri. 10:30 to 11:30 am

Archive Operations and Legacy

Session Chair: Suzanne R. Dodd, California Institute of Technology

10:30 am: **Spitzer heritage archive**, Xiuqin Wu, Trey Roby, Luisa M. Rebull, Harry I. Teplitz, Loi Ly, California Institute of Technology (United States). [7737-43]

10:50 am: **STARS 2: implementation issues for 2nd-generation archiving and query software**, Tom Winegar, National Astronomical Observatory of Japan/Subaru Telescope (United States). [7737-44]

11:10 am: **ESO's strategy, plans, and lessons learned on science data production**, Martino Romaniello, Wolfram Freudling, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Alain Smette, Christophe Dumas, European Southern Observatory (Chile); Pascal Ballester, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-45]

Lunch Break 11:30 am to 1:10 pm

SESSION 9

Room: Pacific Salon III Fri. 1:10 to 2:30 pm

User Support

Session Chair: David S. Adler, Space Telescope Science Institute

1:10 pm: **User support: new ways forward after 10 years of successful VLT operations**, Francesca Primas, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-48]

1:30 pm: **ALMA science operations and user support (software)**, Mark G. Rawlings, Atacama Large Millimeter Array (Chile). [7737-49]

1:50 pm: **Handling observation proposals for SALT**, Christian Hettlage, David A. H. Buckley, Anne C. Charles, South African Astronomical Observatory (South Africa); Martin Cordiner, NASA Goddard Space Flight Ctr. (United States); Daniel R. Harbeck, National Optical Astronomy Observatory (United States); Kenneth H. Nordsieck, Jeffrey W. Percival, Univ. of Wisconsin-Madison (United States); Encarni Romero Colmenero, South African Astronomical Observatory (South Africa); Martin D. Still, NASA Ames Research Ctr. (United States). [7737-50]

2:10 pm: **SMARTS revealed**, John P. Subasavage, Jr., Cerro Tololo Inter-American Observatory (Chile); Charles D. Bailyn, Yale Univ. (United States); R. Christopher Smith, Cerro Tololo Inter-American Observatory (Chile); Todd J. Henry, Georgia State Univ. (United States); Frederick M. Walter, Stony Brook Univ. (United States); Michelle M. Buxton, Yale Univ. (United States). [7737-80]

SESSION 10

Room: Pacific Salon III Fri. 2:30 to 5:20 pm

Operations and Data Quality Control

Session Chair: David S. Adler, Space Telescope Science Institute

2:30 pm: **Calibration of the LSST instrumental and atmospheric photometric passbands**, David L. Burke, SLAC National Accelerator Lab. (United States); Timothy Axelrod, National Optical Astronomy Observatory (United States); Stephane Blondin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) and Ctr. de Physique des Particules de Marseille (France); Charles F. Claver, Victor L. Krabbendam, Ming Liang, Abhijit Saha, National Optical Astronomy Observatory (United States); R. Christopher Smith, CTIO, National Optical Astronomy Observatory (United States); Christopher W. Stubbs, Harvard-Smithsonian Ctr. for Astrophysics (United States). [7737-52]

2:50 pm: **Absolute spectroradiometry of standard stars**, John T. Woodward, Steven W. Brown, Keith R. Lykke, Allan W. Smith, National Institute of Standards and Technology (United States); John T. McGraw, Peter C. Zimmer, The Univ. of New Mexico (United States); Claire E. Cramer, Harvard Univ. (United States); Emilio E. Falco, Harvard-Smithsonian Ctr. for Astrophysics (United States); Christopher W. Stubbs, Harvard Univ. (United States) [7737-53]

Coffee Break 3:10 to 3:40 pm

3:40 pm: **Solving the global photometric self-calibration problem**, R. Lynne Jones, Univ. of Washington (United States); Nikhil Padmanabhan, Yale Univ. (United States); Zeljko Ivezic, Univ. of Washington (United States); Timothy Axelrod, The Univ. of Arizona (United States); David L. Burke, SLAC National Accelerator Lab. (United States); Abhijit Saha, National Optical Astronomy Observatory (United States) [7737-54]

4:00 pm: **Quality control and data flow operations of the survey instrument VIRCAM**, Wolfgang Hummel, Reinhard W. Hanuschik, Lander de Bilbao, Sandra Castro, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Thomas Szeifert, European Southern Observatory (Germany); Valentin Ivanov, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Steffen Mieske, European Southern Observatory (Germany) [7737-55]

4:20 pm: **The physical model in action: quality control for XSHOOTER**, Sabine Moehler, Paul Bristow, Florian Kerber, Andrea Modigliani, Joel Vernet, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7737-56]

4:40 pm: **Handling heterogeneous arrays: calibrations and data reduction**, Stuartt A. Corder, National Radio Astronomy Observatory (Chile); Melvyn C. H. Wright, Univ. of California, Berkeley (United States). [7737-57]

5:00 pm: **The APEX calibration plan: goals, implementation, and achievements**, Michael Dumke, Felipe Mac-Auliffe, European Southern Observatory (Chile) [7737-58]

Summary and/or Discussion

Room: Pacific Salon III Fri. 5:20 to 5:50 pm

Modeling, Systems Engineering, and Project Management for Astronomy IV

Conference Chairs: **George Z. Angeli**, Thirty Meter Telescope Project; **Philippe Dierickx**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

Program Committee: **Torben E. Andersen**, Lund Observatory (Sweden); **Roberto Biasi**, Microgate S.r.l. (Italy); **Simon C. Craig**, Joint Astronomy Ctr.; **Eric R. Hansen**, National Solar Observatory; **Christoph Haupt**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Michael T. Menzel**, NASA Goddard Space Flight Ctr.; **Danniella M. Muheim**, NASA Goddard Space Flight Ctr.; **Jan R. Nijenhuis**, TNO (Netherlands); **Rick O'Connell**, Ball Aerospace & Technologies Corp.; **David C. Redding**, Jet Propulsion Lab.; **Hermine Schnetler**, UK Astronomy Technology Ctr. (United Kingdom); **Donald W. Sweeney**, LSST Corp.; **Alberto Vizcargüenaga**, Ingeniería, Arquitectura y Consultoría S.A. (Spain); **François P. Wildi**, Univ. de Geneva (Switzerland)

Sunday 27 June

SESSION 1

Room: Pacific Salon III Sun. 9:00 to 10:20 am

Systems Engineering for Ground-Based Telescopes I

Session Chairs: **George Z. Angeli**, Thirty Meter Telescope Project; **Philippe Dierickx**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

9:00 am: **System safety and hazard analysis for the Advanced Technology Solar Telescope**, Robert P. Hubbard, National Solar Observatory (United States) [7738-01]

9:20 am: **Optical and system engineering in the development of a high-quality student telescope kit**, Stephen M. Pompea, National Optical Astronomy Observatory (United States); Richard N. Pfisterer, K. Scott Ellis, Photon Engineering LLC (United States); Douglas N. Arion, Carthage College (United States); Richard T. Fienberg, American Astronomical Society (United States) [7738-02]

9:40 am: **MUSE instrument global performance analysis**, Magali Loupias, Observatoire de Lyon (France) [7738-03]

10:00 am: **Delivered image quality budget for the Discovery Channel Telescope**, Byron W. Smith, Lowell Observatory (United States); Stacie M. Manuel, College of Optical Sciences, The Univ. of Arizona (United States) [7738-04]

Coffee Break 10:20 to 10:50 am

SESSION 2

Room: Pacific Salon III Sun. 10:50 to 11:50 am

Modeling of Space Telescopes I

Session Chairs: **Roberto Biasi**, Microgate S.r.l. (Italy); **David C. Redding**, Jet Propulsion Lab.

10:50 am: **A method for studying the effects of thermal deformations on optical system for space application**, Elisa Segato, Univ. degli Studi di Padova (Italy); Vania Da Deppo, Consiglio Nazionale delle Ricerche (Italy); Stefano Debei, Univ. degli Studi di Padova (Italy); Gabriele Cremonese, Osservatorio Astronomico di Padova (Italy) [7738-05]

11:10 am: **Investigation of disturbance effects on space-based weak lensing measurements with an integrated model**, Michael D. Lieber, Michael L. Kaplan, Ball Aerospace & Technologies Corp. (United States); Michael J. Sholl, Univ. of California, Berkeley (United States); Gary M. Bernstein, Univ. of Pennsylvania (United States) [7738-06]

11:30 am: **The Kepler end-to-end model: creating high-fidelity simulations to test Kepler ground processing**, Stephen T. Bryson, Jenkins Jon, NASA Ames Research Ctr. (United States); Dan J. Peters, Ball Aerospace & Technologies Corp. (United States); Peter Tenenbaum, NASA Ames Research Ctr. (United States) and SETI Institute (United States); Todd C. Klaus, NASA Ames Research Ctr. (United States) and Orbital Sciences Corp. (United States); Jay P. Gunter, Orbital Sciences Corp. (United States); Miles T. Cote, NASA Ames Research Ctr. (United States) . . [7738-08]

Lunch Break 11:50 am to 1:30 pm

SESSION 3

Room: Pacific Salon III Sun. 1:30 to 3:30 pm

Modeling of Ground-Based Telescopes I

Session Chairs: **Jan R. Nijenhuis**, TNO (Netherlands); **Alberto Vizcargüenaga**, IDOM (Spain)

1:30 pm: **Comparing numerical simulation of the VLT/MUSE instrument with the first real data**, Aurélien Jarno, Roland M. Bacon, Arlette Pécontal-Rousset, Pierre Ferruit, Observatoire de Lyon (France) and Univ. de Lyon (France) [7738-09]

1:50 pm: **Introducing atmosphere effects in the numerical simulation of the VLT/MUSE instrument**, Aurélien Jarno, Roland M. Bacon, Arlette Pécontal-Rousset, Pierre Ferruit, Observatoire de Lyon (France) and Ctr. de Recherche Astrophysique de Lyon (France) [7738-10]

2:10 pm: **Thermal modeling environment for TMT**, Konstantinos Vogiatzis, Thirty Meter Telescope (United States) [7738-11]

2:30 pm: **Thermal analysis of the TMT telescope structure**, Myung K. Cho, National Optical Astronomy Observatory (United States); Andrew Corredor, The Univ. of Arizona (United States); Konstantinos Vogiatzis, George Z. Angeli, California Institute of Technology (United States) [7738-12]

2:50 pm: **LSST camera heat requirements using CFD and thermal seeing modeling**, Jacques Sebag, National Optical Astronomy Observatory (United States); Konstantinos Vogiatzis, Thirty Meter Telescope (United States) [7738-13]

3:10 pm: **Primary mirror dynamic disturbance models for TMT: vibration and wind**, Douglas G. MacMynowski, California Institute of Technology (United States); M. Mark Colavita, Jet Propulsion Lab. (United States); Warren A. Skidmore, Konstantinos Vogiatzis, Thirty Meter Telescope (United States) [7738-14]

Coffee Break 3:30 to 4:00 pm

SESSION 4

Room: Pacific Salon III Sun. 4:00 to 6:00 pm

Modeling of Ground-Based Telescopes II

Session Chairs: **François P. Wildi**, Observatoire de Genève (Switzerland); **Rick O'Connell**, Ball Aerospace & Technologies Corp.

4:00 pm: **Modeling of the European Extremely Large Telescope for high-contrast imaging tasks**, Szymon Gladysz, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Laurent Jollissaint, aquilAOptics (Switzerland) [7738-15]

4:20 pm: **Normalized point source sensitivity for off-axis optical performance evaluation of the Thirty Meter Telescope**, Byoung-Joon Seo, Carl R. Nissly, Mitchell Troy, Jet Propulsion Lab. (United States); George Z. Angeli, California Institute of Technology (United States) [7738-16]

4:40 pm: **Investigation of Thirty Meter Telescope wavefront maintenance using low-order Shack-Hartmann wavefront sensors to correct for thermally induced misalignment**, Carl R. Nissly, Byoung-Joon Seo, Mitchell Troy, Jet Propulsion Lab. (United States); George Z. Angeli, Myung K. Cho, Thirty Meter Telescope (United States); Lewis C. Roberts, Jr., J. Chris Shelton, Norbert Sigrist, Jet Propulsion Lab. (United States); Mark J. Sirota, Larry M. Stepp, Thirty Meter Telescope (United States) [7738-17]

5:00 pm: **Analysis of active alignment control of the Hobby-Eberly Telescope wide-field corrector using Shack-Hartmann wavefront sensors**, Hanshin Lee, The Univ. of Texas at Austin (United States); Michael Hart, Hart Scientific Consulting International L.L.C. (United States); Gary J. Hill, Marc D. Rafal, The Univ. of Texas at Austin (United States) [7738-18]

5:20 pm: **Integrated finite element analysis and raytracing, oriented to structural optimization, for astronomical instrument design**, Marco Riva, Vincenzo De Caprio, Spanò Paolo, Osservatorio Astronomico di Brera (Italy) [7738-19]

5:40 pm: **SOFIA Telescope modal survey test and test-model correlation**, Paul J. Keas, CSA Engineering, Inc. (United States); Rick Brewster, Orbital Sciences Corp. (United States); Hans J. Kärcher, MT Aerospace AG (Germany); Ulrich Lampater, Stefan Teufel, Jörg Wagner, Univ. Stuttgart (Germany) [7738-20]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: **Douglas A. Simons**, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 5

Room: Pacific Salon III Mon. 10:10 am to 12:10 pm

Project Management I

Session Chairs: **Danniella M. Muheim**, NASA Goddard Space Flight Ctr.; **Michael T. Menzel**, NASA Goddard Space Flight Ctr.

10:10 am: **Evolution of system modeling as a management tool for the Hubble Space Telescope Astrophysics Observatory** (*Invited Paper*), Thomas J. Griffin, NASA Goddard Space Flight Ctr. (United States) [7738-22]

10:40 am: **Managing complex space missions like the James Webb Space Telescope** (*Invited Paper*), Phillip A. Sabelhaus, NASA Goddard Space Flight Ctr. (United States) [7738-23]

11:10 am: **Management and systems engineering of the Kepler mission** (*Invited Paper*), James L. Fanson, Leslie L. Livesay, Margaret A. Frerking, Brian C. Cooke, Riley M. Duren, Jet Propulsion Lab. (United States) [7738-24]

11:40 am: **Managing the development of the Wide-field Infrared Survey Explorer Mission** (*Invited Paper*), William R. Irace, Jet Propulsion Lab. (United States); Roc Cutri, California Institute of Technology (United States); Valerie G. Duval, Peter R. Eisenhardt, Jet Propulsion Lab. (United States); John D. Elwell, Space Dynamics Lab. (United States); George Greanias, Ingolf H. Heinrichsen, Jet Propulsion Lab. (United States); Joan F. Howard, Ball Aerospace & Technologies Corp. (United States); Feng-Chuan Liu, Donald Royer, Jet Propulsion Lab. (United States); Edward L. Wright, Univ. of California, Los Angeles (United States) [7738-25]

Lunch Break 12:10 to 1:40 pm

SESSION 6

Room: Pacific Salon III Mon. 1:40 to 3:20 pm

Project Management II

Session Chairs: **Hermine Schnetler**, UK Astronomy Technology Ctr. (United Kingdom); **Torben E. Andersen**, Lund Observatory (Sweden)

1:40 pm: **Management evolution of the LSST project** (*Invited Paper*), Donald W. Sweeney, LSST Corp. (United States); Charles F. Claver, LSST Corp. (United States) and National Optical Astronomy Observatory (United States); Suzanne Jacoby, Jeffrey Kantor, LSST Corp. (United States); Victor Krabbendam, National Optical Astronomy Observatory (United States); Nadine Kurita, SLAC National Accelerator Lab. (United States) [7738-26]

2:10 pm: **Advanced Technology Solar Telescope project management** (*Invited Paper*), Jeremy J. Wagner, National Optical Astronomy Observatory (United States) [7738-27]

2:40 pm: **The poacher turned gamekeeper: or getting the most out of the design review process**, Simon C. Craig, Joint Astronomy Ctr. (United States) [7738-28]

3:00 pm: **The MUSE project from the dream toward reality**, Patrick Callier, Ctr. de Recherche Astrophysique de Lyon (France) and Ctr. National de la Recherche Scientifique (France) and Univ. Claude Bernard - Lyon 1 (France) [7738-29]

Coffee Break 3:20 to 3:50 pm

SESSION 7

Room: Pacific Salon III Mon. 3:50 to 5:40 pm

Project Management III

Session Chairs: **Eric R. Hansen**, National Solar Observatory; **George Z. Angeli**, Thirty Meter Telescope Project

3:50 pm: **Management of the Herschel/Planck Programme** (*Invited Paper*), Thomas Passvogel, European Space Agency (Netherlands) [7738-30]

4:20 pm: **EAGLE: A successful instrument phase A study for the E-ELT** (*Invited Paper*), Jean-Gabriel Cuby, Observatoire Astronomique de Marseille-Provence (France) [7738-31]

4:50 pm: **The Javalambre Astrophysical Observatory project** (*Invited Paper*), Javier Cenarro, M. Moles, Sebastian F. Sanchez, D. Cristobal, Centro de Estudios de Fisica del Cosmos de Aragon (Spain) [7738-32]

5:20 pm: **Using value-based total cost of ownership (TCO) measures to inform subsystem trade offs**, Nicole M. Radziwill, James Madison Univ. (United States); Ronald F. DuPlain, National Radio Astronomy Observatory (United States) . [7738-33]

Monday Poster Session

Room: Grand Exhibit Hall Mon. 5:30 to 7:00 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Monday. The interactive poster session with authors in attendance will be Monday evening from 5:30 to 7:00 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Modeling

Modeling of control system for LAMOST based on Petri net workflow, Lingzhe Xu, Xinqi Xu, Nanjing Institute of Astronomical Optics & Technology (China) [7738-56]

LAMOST control system: past and future, Xinqi Xu, Lingzhe Xu, Nanjing Institute of Astronomical Optics & Technology (China) [7738-57]

Surface figure measurement of the Hobby-Eberly Telescope primary mirror segments via phase retrieval and its implication for the wavefront sensing in the new wide-field upgrade, Hanshin Lee, The Univ. of Texas at Austin (United States); Michael Hart, Hart Scientific Consulting International L.L.C. (United States); Gary J. Hill, Marc D. Rafal, The Univ. of Texas at Austin (United States) [7738-58]

Orthonormal aberration polynomials over arbitrarily obscured pupil geometries for wavefront sensing in the Hobby-Eberly Telescope, Hanshin Lee, The Univ. of Texas at Austin (United States); Michael Hart, Hart Scientific Consulting International L.L.C. (United States); Gary J. Hill, Marc D. Rafal, The Univ. of Texas at Austin (United States) [7738-59]

Computational fluid dynamic modeling of the summit of Mt. Hopkins for the MMT Observatory, Shawn P. Callahan, MMT Observatory (United States) . [7738-60]

Unsteady aerodynamic simulations for TMT primary mirror segment wind loading, Konstantinos Vogiatzis, Thirty Meter Telescope (United States); Douglas G. Macmynowski, California Institute of Technology (United States) [7738-61]

Simulating the LSST system, Andrew Connolly, Univ. of Washington (United States); John Peterson, Purdue Univ. (United States); J. Garrett Jernigan, Univ. of California, Berkeley (United States); Robert Abel, Olympic College (United States); Justin Bankert, Purdue Univ. (United States); Chihway Chang, Stanford Linear Accelerator Ctr. (United States); Charles F. Claver, National Optical Astronomy Observatory (United States); Robert Gibson, Univ. of Washington (United States); David K. Gilmore, Stanford Linear Accelerator Ctr. (United States); Emily Grace, Purdue Univ. (United States); R. Lynne Jones, Zeljko Ivezic, Univ. of Washington (United States); James Jee, Univ. of California, Davis (United States); Mario Juric, Harvard-Smithsonian Ctr. for Astrophysics (United States); Steven M. Kahn, Stanford Univ. (United States); Victor L. Krabbendam, National Optical Astronomy Observatory (United States); Simon Krughoff, Univ. of Washington (United States); Suzanne Lorenz, Purdue Univ. (United States); James Pizagno, Univ. of Washington (United States); Andrew P. Rasmussen, Stanford Linear Accelerator Ctr. (United States); Nathan Todd, Purdue Univ. (United States); J. Anthony Tyson, Univ. of California, Davis (United States); Mallory Young, Purdue Univ. (United States) [7738-62]

High-speed data acquisition system to measure telescope response to earthquake-induced ground motion, Michael Sheehan, Gemini Observatory (United States) [7738-63]

Kinematic analysis of a hexapod telescope mount, Yau-De Huang, Institute of Astronomy and Astrophysics (Taiwan) [7738-64]

Stray light analysis of the Thirty Meter Telescope, John S. Pazder, National Research Council Canada (Canada) [7738-65]

Optical mount optimization through the integration of ANSYS and GNU octave, Joeleff T. Fitzsimmons, National Research Council Canada (Canada) [7738-66]

Active dynamic isolation and pointing control system design and analysis for the ACCESS TPF mission concept, Phillip Vallone, Robert M. Egerman, Jason Elias, ITT Corp. (United States) [7738-67]

LST Telescope guider loop requirements analysis and predicted performance, Michael Warner, Cerro Tololo Inter-American Observatory (Chile); Vincent J. Riot, Lawrence Livermore National Lab. (United States); Jacques Sebag, National Optical Astronomy Observatory (United States) [7738-69]

Systems Engineering

A formal risk management process for instrumentation projects at the Anglo-Australian Observatory, David R. Orr, Anthony Heng, Anglo-Australian Observatory (Australia) [7738-71]

PORIS: practical-oriented representation for instrument systems, Jacinto Javier Vaz-Cedillo, José Carlos Lopez-Ruiz, José Marco de la Rosa, Instituto de Astrofísica de Canarias (Spain) [7738-72]

Role and uses of uncertainty in integrated modeling of telescope and instrumentation systems, Lorenzo Zago, HEIG-VD (Switzerland) [7738-73]

VISTA, a success story: from conceptual design to operation, Andrew J. Born, UK Astronomy Technology Ctr. (United Kingdom) [7738-74]

Integrating AO in a performance budget: toward a global system engineering vision, Philippe Laporte, Observatoire de Paris à Meudon (France); Hermine Schnetler, UK Astronomy Technology Ctr. (United Kingdom) [7738-75]

Image quality verification analysis of the JWST, Scott Knight, Ball Aerospace & Technologies Corp. (United States) [7738-78]

Project Management

The VST telescope primary mirror safety system: simulation model and mechanical implementation, Francesco Perrotta, Pietro Schipani, Davide Fierro, Osservatorio Astronomico di Capodimonte (Italy) [7738-80]

The Baldrige criteria for performance excellence for quality management in observatories, Nicole M. Radziwill, James Madison Univ. (United States) . . [7738-81]

Virtual reality and project management for astronomy, Luis A. Martinez, Fernando Angeles, Rubén A. Flores, José L. Villarreal, Ernesto Bribiesca, Univ. Nacional Autónoma de México (Mexico) [7738-82]

Collaborative engineering and design management for the Hobby-Eberly Telescope tracker upgrade, Nicholas T. Mollison, Richard J. Hayes, John R. Jackson, Richard D. Savage, Marc D. Rafal, Joseph H. Beno, The Univ. of Texas at Austin (United States) [7738-84]

A paradigm shift to enable more cost effective space science telescope missions in the upcoming decades, Gary Matthews, Robert M. Egerman, Keith A. Havey, Jr., ITT Corp. (United States) [7738-86]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 8

Room: Pacific Salon III Tues. 2:00 to 3:40 pm

Systems Engineering for Space Telescopes

Session Chairs: Simon C. Craig, Joint Astronomy Ctr.; *Christoph Haupt*, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

2:00 pm: **Systems engineering on the James Webb Space Telescope**, Michael T. Menzel, NASA Goddard Space Flight Ctr. (United States); Marie C. Bussman, Stinger Ghaffarian Technologies, Inc. (United States); Michael S. Davis, Ball Corp. (United States); Sandra M. Irish, NASA Goddard Space Flight Ctr. (United States); Gary Golnik, Schaefer Corp. (United States); Jon F. Lawrence, Richard Lynch, Peiman G. Maghami, F. Landis Markley, Kimberly I. Mehalick, Gary E. Mosier, Danniella M. Muheim, Keith A. Parris, NASA Goddard Space Flight Ctr. (United States); Joseph T. Pitman, Exploration Sciences (United States); Shaun R. Thomson, NASA Goddard Space Flight Ctr. (United States) [7738-34]

2:20 pm: **10 years of Chandra: reflecting back on engineering lessons learned during the design, fabrication, integration, test, and verification of NASA's Great X-ray Observatory**, Gary Matthews, Keith A. Havey, Jr., Robert M. Egerman, ITT Corp. (United States) [7738-35]

2:40 pm: **NuSTAR: system engineering and modeling challenges in pointing reconstruction for a deployable X-ray telescope**, D. Isaiah Harp, Jet Propulsion Lab. (United States); William W. Craig, Univ. of California, Berkeley (United States); Fiona A. Harrison, California Institute of Technology (United States); Carl C. Liebe, Jet Propulsion Lab. (United States); Kristin K. Madsen, California Institute of Technology (United States); Andreas Zoglauer, Univ. of California, Berkeley (United States) [7738-36]

3:00 pm: **The project office of the Gaia data processing and analysis consortium**, Emmanuel Mercier, Sebastian G. Els, Gonzalo Gracia, William O'Mullane, Tim Lock, Gabriele Comoretto, European Space Astronomy Ctr. (Spain) [7738-37]

3:20 pm: **The role of stray light modeling and analysis in telescope system engineering, performance assessment, and risk abatement**, Richard N. Pfisterer, K. Scott Ellis, Photon Engineering LLC (United States); Stephen M. Pompea, National Optical Astronomy Observatory (United States) [7738-38]

Coffee Break 3:40 to 4:10 pm

Facility Map

See page 143.

SESSION 9

Room: Pacific Salon III Tues. 4:10 to 5:30 pm

Modeling of Space Telescopes II

Session Chairs: **Torben E. Andersen**, Lund Observatory (Sweden);
Philippe Dierickx, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

4:10 pm: **The JWST/NIRSpec instrument performance simulator software**, Laure Piqueras, Emeline Legros, Aurélien Pons, Pierre-Jacques Legay, Pierre Ferruit, Bernhard Dorner, Arlette Pécontal-Rousset, Observatoire de Lyon (France); Xavier Gnata, Peter Mosner, EADS Astrium GmbH (Germany) [7738-41]

4:30 pm: **Confronting the NIRSpec instrument performance simulator outputs with results of the NIRSpec demonstration model calibration campaign**, Bernhard Dorner, Pierre Ferruit, Observatoire de Lyon (France); Xavier Gnata, EADS Astrium GmbH (Germany); Stephan M. Birkmann, Torsten Böker, Guido de Marchi, European Space Research and Technology Ctr. (Netherlands); Marco Sirianni, European Space Agency (Netherlands); Werner J. Hupfer, Jess Köhler, Manfred-Georg Kolm, Ralf Ehrenwinkler, EADS Astrium GmbH (Germany); Laure Piqueras, Emeline Legros, Pierre-Jacques Legay, Arlette Pécontal-Rousset, Aurélien Jarno, Aurélien Pons, Observatoire de Lyon (France) [7738-40]

4:50 pm: **An update on the role of system modeling in the design and verification of the James Webb Space Telescope**, Danniella M. Muheim, Michael T. Menzel, Gary E. Mosier, Joseph M. Howard, Sandra M. Irish, Peiman G. Maghami, Kimberly I. Mehalick, Keith A. Parrish, NASA Goddard Space Flight Ctr. (United States); Joseph T. Pitman, Exploration Sciences (United States); Shaun R. Thomson, NASA Goddard Space Flight Ctr. (United States); Charity Asuquo, Stinger Ghaffarian Technologies, Inc. (United States); Carl A. Blaurock, Nightsky Systems, Inc. (United States); Cherie Congedo, Stinger Ghaffarian Technologies, Inc. (United States); Kong Q. Ha, KDA Engineering (United States); Norman C. Holmes, Vantage Systems, Inc. (United States); Frank X. Liu, Mark A. McGinnis, Stinger Ghaffarian Technologies, Inc. (United States); Stephen Mariconti, Vantage Systems, Inc. (United States); Christopher P. May, Maze Engineering (United States); Blair Russell, Stinger Ghaffarian Technologies, Inc. (United States); James A. Sanders, Vantage Systems, Inc. (United States); Shahram Shiri, Jeffrey S. Smith, NASA Goddard Space Flight Ctr. (United States); Dennis L. Skelton, Sigma Space Corp. (United States) [7738-42]

5:10 pm: **Verification of the observatory integrated model for the JWST**, Scott Knight, Ball Aerospace & Technologies Corp. (United States) [7738-43]

Wednesday 30 June - Conference Break

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: **Kathryn A. Flanagan**, Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

NOTE Room CHANGE

SESSION 10

Room: Pacific Salon II. Thurs. 10:30 am to 12:30 pm

Systems Engineering for Ground-Based Telescopes II

Session Chairs: **Donald W. Sweeney**, LSST Corp.;
Eric R. Hansen, National Solar Observatory

10:30 am: **Application of systems engineering concepts in the Canada-France-Hawaii Telescope Observatory automation project**, Sarah Gajadhar, William L. Cruise, Todd W. Burdullis, Tom A. Vermeulen, Canada-France-Hawaii Telescope (United States) [7738-44]

10:50 am: **Systems engineering for the Thirty Meter Telescope**, George Z. Angeli, Thirty Meter Telescope (United States); Scott Roberts, National Research Council Canada (Canada); Konstantinos Vogiatzis, Thirty Meter Telescope (United States) [7738-45]

11:10 am: **Systems engineering of the Thirty Meter Telescope through integrated opto-mechanical analysis**, Scott Roberts, National Research Council Canada (Canada) [7738-46]

11:30 am: **Use of requirements engineering to maintain traceability and consistency between high-level science requirements and the detailed requirements applicable to individual subsystems of the Thirty Meter Telescope**, John Rogers, TMT Observatory Corp. (Canada) [7738-47]

11:50 am: **Building confidence early and often: a systematic approach to requirement verification for a large telescope project**, Hugh A. Thompson, TMT Observatory Corp. (Canada) [7738-48]

12:10 pm: **The large observatories maintenance management: tools and strategies for maintenance manuals preparation**, Gianpietro Marchiori, Luigino Giacomel, Matteo Pozzobon, Federico Formentin, European Industrial Engineering s.r.l. (Italy) [7738-79]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 11

Room: Pacific Salon II. Thurs. 2:00 to 3:40 pm

Systems Engineering for Ground-Based Telescopes III

Session Chairs: **Philippe Dierickx**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **George Z. Angeli**, Thirty Meter Telescope Project

2:00 pm: **Using SysML for MBSE analysis of the LSST system**, Charles F. Claver, National Optical Astronomy Observatory (United States); Gregory Duboise-Felsmann, SLAC National Accelerator Lab. (United States); Francisco Delgado, Cerro Tololo Inter-American Observatory (Chile); Pat Hascall, Dick Horn, Stuart Marshall, Martin Nordby, Terry Schalk, SLAC National Accelerator Lab. (United States); German Schumacher, Cerro Tololo Inter-American Observatory (Chile); Jacques Sebag, National Optical Astronomy Observatory (United States) [7738-50]

2:20 pm: **The Large Synoptic Survey Telescope OCS and TCS models**, German Schumacher, Francisco Delgado, Cerro Tololo Inter-American Observatory (Chile) [7738-51]

2:40 pm: **Conquering complexity with systems engineering, as illustrated by EAGLE (a multi-object adaptive optics IFU spectrograph)**, Hermine Schnetler, UK Astronomy Technology Ctr. (United Kingdom); Philippe Laporte, Observatoire de Paris à Meudon (France) [7738-52]

3:00 pm: **E-ELT phase-A instrument studies: a system engineering view**, Juan-Carlos Gonzalez, Sandro D'Odorico, Suzanne K. Ramsay, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7738-53]

3:20 pm: **Error budgets definition for the European Solar Telescope (EST)**, Lluís Cavaller-Marquéz, Germán Prieto Labra, GRANTECAN S.A. (Spain); Christine Grivel-Gelly, Instituto de Astrofísica de Canarias (Spain) [7738-54]

Modern Technologies in Space- and Ground-based Telescopes and Instrumentation

Conference Chairs: **Eli Atad-Etzedgui**, UK Astronomy Technology Ctr./The Royal Observatory Edinburgh (United Kingdom); **Dietrich Lemke**, Max-Planck-Institut für Astronomie (Germany)

Program Committee: **Joseph Antebi**, Simpson Gumpertz & Heger Inc.; **Daniel R. Blanco**, National Optical Astronomy Observatory; **Colin R. Cunningham**, UK Astronomy Technology Ctr. (United Kingdom); **V. Alfonso Fera**, Jet Propulsion Lab.; **Roland Geyl**, Sagem SA (France); **Peter Hartmann**, SCHOTT AG (Germany); **David Montgomery**, UK Astronomy Technology Ctr. (United Kingdom); **Eric Prieto**, Observatoire Astronomique de Marseille-Provence (France)

Sunday 27 June

SESSION 1

Room: Royal Palm I-IIISun. 8:40 am to 12:00 pm

Optics Fabrication I

Session Chair: **Eli Atad-Etzedgui**, UK Astronomy Technology Ctr./The Royal Observatory Edinburgh (United Kingdom)

8:40 am: **Measurement of aspheric mirror segments using Fizeau interferometry with CGH correction** (*Invited Paper*), James H. Burge, Matthew B. Dubin, Chunyu Zhao, College of Optical Sciences, The Univ. of Arizona (United States) . . . [7739-32]

9:10 am: **Fabrication technologies for large optical components at Carl Zeiss Jena GmbH**, Gerhard Derst, Tilman Schmachtel, Gerhard Reiling, Volkmar Giggel, Dirk Liedtke, Gerd Ullrich, Carl Zeiss Jena GmbH (Germany) [7739-02]

9:30 am: **How fast is too fast: manufacturing limitations of aspheric optics at Tinsley**, Michael J. Riso, Jay Daniel, L-3 Communications Tinsley Labs. Inc. (United States) [7739-03]

9:50 am: **Precision grinding for rapid fabrication of segments for extreme large telescopes using the Cranfield BoX®**, Xavier P. Tonnellier, Paul M. Morantz, Paul R. Shore, Andrew Baldwin, Cranfield Univ. (United Kingdom) [7739-04]

Coffee Break 10:10 to 10:40 am

10:40 am: **M2: the most difficult mirror in many telescope systems**, Andrew R. Clarkson, L-3 Brashear (United States); Jay Daniel, Tony B. Hull, L-3 Communications Tinsley Labs. Inc. (United States) [7739-05]

11:00 am: **M1 and M2 mirror manufacturing for ARIES project: current status**, Alexandr P. Semenov, Magomed A. Abdulkadyrov, Alexey P. Patrikeev, Vladimir E. Patrikeev, Vitaliy V. Pridnya, Joint Stock Co. Lytkarino Optical Glass Factory (Russian Federation) [7739-06]

11:20 am: **Ultra-precisely manufactured mirror assemblies with well-defined reference structures**, Sebastian Scheiding, Christoph Damm, Thomas Peschel, Andreas Gebhardt, Stefan Risse, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [7739-07]

11:40 am: **Emerging results for producing low-scatter EN clad and bare Al mirrors: enabling technology for new astronomical instruments**, Keith G. Carrigan, Jay Daniel, John M. Barentine, L-3 Communications Tinsley Labs. Inc. (United States) [7739-08]

Lunch Break 12:00 to 1:30 pm

SESSION 2

Room: Royal Palm I-IIISun. 1:30 to 3:40 pm

Optics Fabrication II

Session Chair: **Eli Atad-Etzedgui**, UK Astronomy Technology Ctr./The Royal Observatory Edinburgh (United Kingdom)

1:30 pm: **Fabrication and testing of the first 8.4 m off-axis segment for the Giant Magellan Telescope** (*Invited Paper*), Hubert M. Martin, Richard G. Allen, The Univ. of Arizona (United States); James H. Burge, Dae Wook Kim, College of Optical Sciences, The Univ. of Arizona (United States); Jeffrey S. Kingsley, Michael T. Tuell, Stephen H. Warner, Steven C. West, The Univ. of Arizona (United States); Chunyu Zhao, College of Optical Sciences, The Univ. of Arizona (United States); Tom L. Zobrist, The Univ. of Arizona (United States) [7739-09]

2:00 pm: **Narrow ion-beam figuring: a new tool to address extreme slopes on small surfaces located near telescope pupils**, Ulrich Mueller, Bridget G. Peters, Jay Daniel, Tony B. Hull, John M. Barentine, L-3 Communications Tinsley Labs. Inc. (United States); Thomas P. Greene, Ruslan Belikov, NASA Ames Research Ctr. (United States); Mark Schwalm, L-3 Communications Tinsley Labs. Inc. (United States); Olivier Guyon, The Univ. of Arizona (United States) [7739-10]

2:20 pm: **Lightweight high-performance 1-4 meter class spaceborne mirrors: emerging technology for demanding spaceborne requirements**, Tony B. Hull, L-3 Communications Tinsley Labs. Inc. (United States); Peter Hartmann, SCHOTT AG (Germany); Andrew R. Clarkson, L-3 Brashear (United States); John M. Barentine, L-3 Communications Tinsley Labs. Inc. (United States); Ralf Jedamzik, Thomas Westerhoff, SCHOTT AG (Germany) [7739-118]

2:40 pm: **Fast and agile 3D error correction and figuring of large optical surface using RAP**, Renaud P. Jourdain, Marco Castelli, Paul R. Shore, Cranfield Univ. (United Kingdom) [7739-12]

3:00 pm: **On the super polishing under stress of aspherical surfaces for exoplanet detection and solar instruments**, Emmanuel Hugot, Marc Ferrari, Kacem El-Hadi, Kjetil Dohlen, Sébastien Vivès, Observatoire Astronomique de Marseille-Provence (France) [7739-13]

3:20 pm: **Low-cost, low-cycle time, replicated glass mirrors**, Robert M. Egerman, Steven De Smitt, David N. Strafford, ITT Corp. (United States) [7739-14]

Coffee Break 3:40 to 4:00 pm

SESSION 3

Room: Royal Palm I-IIISun. 4:00 to 6:00 pm

Materials/Metrology

Session Chair: **Peter Hartmann**, SCHOTT AG (Germany)

4:00 pm: **Composite panels for optical mirrors for Cherenkov Telescopes: development of the cold glass slumping technology**, Rodolfo Canestrari, Gianpaolo Motta, Giovanni Pareschi, Stefano Basso, Osservatorio Astronomico di Brera (Italy); Michele Doro, Istituto Nazionale di Fisica Nucleare (Italy); Enrico Giro, Luigi Lessio, Osservatorio Astronomico di Padova (Italy) [7739-15]

4:20 pm: **Modelling of the thermal expansion behaviour of ZERODUR® at arbitrary temperature profiles**, Ralf Jedamzik, Thoralf Johansson, Thomas Westerhoff, SCHOTT AG (Germany) [7739-16]

4:40 pm: **Optimized, ultra-light-weighted mirror structures made of Cesium® for space applications**, Peter Hofbauer, Matthias R. Krödel, ECM GmbH (Germany) [7739-17]

5:00 pm: **Material characteristics of CLEARCERAM-Z HS from OHARA**, Takayuki Kishi, Naoyuki Goto, Ohara Inc. (Japan); Brion Hoffman, Ohara Corp. (United States); Yasuyuki Kawashima, Kenji Suzuki, Kazuharu Yoshizawa, Kaito Suzuki, Ohara Inc. (Japan) [7739-111]

5:20 pm: **The center of curvature optical assembly (and null lens) for the JWST primary mirror cryogenic optical test**, Conrad Wells, ITT Space Systems Div. (United States) [7739-19]

5:40 pm: **Manufacturing of the ZERODUR 1.5m primary mirror blank for the solar telescope GREGOR as preparation of for light weighting of blanks up to 4m diameter**, Thomas Westerhoff, Martin Schaefer, Armin Thomas, Marco Weissenburger, Thomas Werner, Alexander Werz, SCHOTT AG (Germany) . [7739-20]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 4

Room: Royal Palm I-III Mon. 10:10 am to 12:20 pm

Test and Metrology I

Session Chair: Peter Hartmann, SCHOTT AG (Germany)

10:10 am: **Alignment and use of the optical test for the 8.4m off-axis primary mirrors of the Giant Magellan Telescope** (*Invited Paper*), Steven C. West, The Univ. of Arizona (United States); James H. Burge, College of Optical Sciences, The Univ. of Arizona (United States); Brian Cuerden, Warren B. Davison, Jeff Hagen, Hubert M. Martin, Michael T. Tuell, The Univ. of Arizona (United States); Chunyu Zhao, College of Optical Sciences, The Univ. of Arizona (United States) [7739-21]

10:40 am: **Automated metrology simulator for multi-objects instruments**, Eli Atad-Ettedgui, Colin J. Dickson, Steven M. Beard, Xiaofeng Gao, Brian Stobie, Peter R. Hastings, UK Astronomy Technology Ctr. (United Kingdom) [7739-22]

11:00 am: **Interference testing methods of large astronomical mirrors base on lenses and CGH wavefront correctors**, Magomed A. Abdulkadyrov, Sergey P. Belousov, Vladimir E. Patrikeev, Alexandr P. Semenov, Joint Stock Co. Lytkarino Optical Glass Factory (Russian Federation) [7739-23]

11:20 am: **Saving SALT: repairs to the spherical aberration corrector of the Southern African Large Telescope**, Darragh E. O'Donoghue, James E. O'Connor, Lisa A. Crause, Francois Strumpher, Ockert J. Strydom, Janus D. Brink, Craig Sass, Eben Wiid, South African Astronomical Observatory (South Africa); Eli Atad-Ettedgui, UK Astronomy Technology Ctr. (United Kingdom) [7739-24]

11:40 am: **Metrology of complex astigmatic surfaces for astronomical optics**, Stephen Rolt, Andrew K. Kirby, David J. Robertson, Durham Univ. (United Kingdom) [7739-25]

12:00 pm: **Accuracy of laser tracker measurements of the GMT 8.4 m off-axis mirror segments**, Tom L. Zobrist, The Univ. of Arizona (United States) and College of Optical Sciences, The Univ. of Arizona (United States); James H. Burge, College of Optical Sciences, The Univ. of Arizona (United States) and The Univ. of Arizona (United States); Hubert M. Martin, The Univ. of Arizona (United States) [7739-26]

Lunch Break 12:20 to 1:50 pm

SESSION 5

Room: Royal Palm I-III Mon. 1:50 to 3:30 pm

Test and Metrology II

Session Chair: Eric Prieto, Observatoire Astronomique de Marseille-Provence (France)

1:50 pm: **Imaging issues for interferometry with CGH null correctors**, James H. Burge, Chunyu Zhao, College of Optical Sciences, The Univ. of Arizona (United States) [7739-27]

2:10 pm: **Metrology systems for active alignment control of the Hobby-Eberly Telescope wide-field upgrade**, Hanshin Lee, Gary J. Hill, The Univ. of Texas at Austin (United States); Michael Hart, Hart Scientific Consulting International L.L.C. (United States); Mark E. Cornell, Richard D. Savage, Marc D. Rafal, The Univ. of Texas at Austin (United States) [7739-28]

2:30 pm: **Optical testing of aspheres based on photochromic computer-generated holograms**, Giorgio Pariani, Politecnico di Milano (Italy); Andrea G. Bianco, Osservatorio Astronomico di Brera (Italy); Chiara Bertarelli, Politecnico di Milano (Italy); Paolo Spanò, Emilio Molinari, Osservatorio Astronomico di Brera (Italy) [7739-29]

2:50 pm: **Image improvement using phase diversity for sparse apertures**, David Wolinski, David M. Weitz, Gregory D. Berthiaume, Deborah F. Woods, Jenna Samra, Lincoln Lab. (United States) [7739-30]

3:10 pm: **Interferometric test method for testing convex aspheric mirror surfaces**, T. Stewart McKechnie, McKechnie Optics Research (United States) [7739-31]

Coffee Break 3:30 to 3:50 pm

SESSION 6

Room: Royal Palm I-III Mon. 3:50 to 6:00 pm

Test and Metrology III

Session Chair: Eli Atad-Ettedgui, UK Astronomy Technology Ctr./The Royal Observatory Edinburgh (United Kingdom)

3:50 pm: **ELT primary mirror prototype segment manufacturing and testing** (*Invited Paper*), Eric Ruch, Sagem Défense Sécurité (France) [7739-01]

4:20 pm: **Liquid deformable mirror for advanced sub-optical system testing**, Simon Thibault, Denis Brousseau, Ermanno F. Borra, Univ. Laval (Canada) [7739-33]

4:40 pm: **Scanning pentaprism test for the GMT 8.4 m off-axis segments**, Richard G. Allen, The Univ. of Arizona (United States); James H. Burge, Peng Su, College of Optical Sciences, The Univ. of Arizona (United States); Hubert M. Martin, The Univ. of Arizona (United States) [7739-34]

5:00 pm: **A novel optical sensor for mirror edge sensing**, David A. H. Buckley, Sebastien Buous, Hitesh Gajjar, John W. Menzies, South African Astronomical Observatory (South Africa); Florian Schindler, Karsten Sändig, DR. JOHANNES HEIDENHAIN GmbH (Germany); Samuel A. Lévêque, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-128]

5:20 pm: **Development of a large mosaic volume phase holographic (VPH) grating for APOGEE**, James A. Arns, Kaiser Optical Systems, Inc. (United States); John C. Wilson, Univ. of Virginia (United States); Daniel J. Eisenstein, The Univ. of Arizona (United States); James E. Gunn, Princeton Univ. (United States); Stephen A. Smee, Robert H. Barkhouser, The Johns Hopkins Univ. (United States); Fred R. Hearty, Michael F. Skrutskie, Univ. of Virginia (United States); Jon Holtzman, New Mexico State Univ. (United States); Ricardo Schiavon, Gemini Observatory (United States); Bruce Gillespie, Apache Point Observatory (United States); Steven Majewski, Univ. of Virginia (United States) [7739-36]

5:40 pm: **The vector vortex coronagraph: analysis of sensitivity to low-order aberrations, central obscuration and chromatism**, Dimitri P. Mawet, Eugene Serabyn, Jet Propulsion Lab. (United States) [7739-37]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 7

Room: Royal Palm I-III Tues. 2:00 to 4:50 pm

Cryogenic Space Instruments

Session Chair: Dietrich Lemke,
Max-Planck-Institut für Astronomie (Germany)

2:00 pm: **The innovative MAIT plan for the MATISSE cold optics, comprising an unprecedented 300 cryogenic optical components**, Eddy Elswijk, Niels Tromp, Ramón Navarro, Hiddo H. Hanenburg, Albert van Duin, ASTRON (Netherlands); Sylvie Robbe-Dubois, Univ. de Nice Sophia Antipolis (France). [7739-167]

2:20 pm: **The thermal architecture of the Clover cryostats**, William F. Grainger, Peter A. R. Ade, Cardiff Univ. (United Kingdom); Simon T. Chase, Chase Research Cryogenics Ltd. (United Kingdom); Peter C. Hargrave, Christopher E. North, Cardiff Univ. (United Kingdom). [7739-165]

2:40 pm: **Flight model performance of the integral field unit for the James Webb Space Telescope's near-infrared spectrograph**, David J. Purll, Daniel R. Lobb, Andrew R. Barnes, Surrey Satellite Technology Ltd. (United Kingdom); Robert G. Talbot, Stephen Rolt, Durham Univ. (United Kingdom); Martin F. Closs, EADS Deutschland GmbH (Germany); David J. Robertson, Durham Univ. (United Kingdom). [7739-40]

3:00 pm: **High-precision cryogenic wheel mechanisms of the JWST/MIRI instrument: performance of the flight models**, Oliver Krause, Friedrich Müller, Max-Planck-Institut für Astronomie (Germany); Stephan M. Birkmann, European Space Research and Technology Ctr. (Netherlands); Armin Boehm, Monica Ebert, Ulrich Grözinger, Thomas F. E. Henning, Ralph Hofferbert, Armin Huber, Dietrich Lemke, Ralf-Rainer Rohloff, Silvia Scheithauer, Max-Planck-Institut für Astronomie (Germany); Torsten Gross, Thomas Fischer, Georg Luichtel, Hugo Merkle, Hans-Ulrich Wieland, Manfred Übele, Carl Zeiss Optronics GmbH (Germany); Jérôme Amiaux, Commissariat à l'Énergie Atomique (France); Rieks Jager, ASTRON (Netherlands); Philip M. Parr-Burman, Adrian M. Glauser, UK Astronomy Technology Ctr. (United Kingdom); Jonathan Sykes, Univ. of Leicester (United Kingdom). [7739-41]

Coffee Break 3:20 to 3:50 pm

3:50 pm: **Accurate blackbodies**, Harri M. Latvakoski, Michael Watson, Shane Topham, Deron K. Scott, Michael D. Wojcik, Gail E. Bingham, Utah State Univ. (United States). [7739-42]

4:10 pm: **The filter wheel mechanism for the Euclid near-infrared imaging photometer**, Rory Holmes, Ulrich Grözinger, Oliver Krause, Max-Planck-Institut für Astronomie (Germany); Mario Schweitzer, Max-Planck-Institut für extraterrestrische Physik (Germany). [7739-43]

4:30 pm: **Cryogenic magnetic bearing scanning mechanism design for the SPICA/SAFARI Fourier transform spectrometer**, Teun C. van den Dool, Roger F. M. M. Hamelincx, Bob Kruizinga, Ben C. Braam, TNO (Netherlands); Nicolas Loix, Stanislas Luycks, Micromega Dynamics SA (Belgium); Peter P. Kooijman, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands). [7739-44]

Wednesday 30 June

SESSION 8

Room: Royal Palm I-III Wed. 8:30 am to 12:20 pm

Telescope Structure I

Session Chair: Joseph Antebi, Simpson Gumpertz & Heger Inc.

8:30 am: **A control loop closure system for the Sardinia Radio Telescope active surface**, Claudio Pernechele, Carlo Barbieri, Pietro Bolli, Franco Buffa, Tonino Pisanu, Sergio Poppi, Giampaolo Serra, Osservatorio Astronomico di Cagliari (Italy); Marco Morsiani, Juri Roda, Giampaolo Zaccarelli, Carlo Nocita, Mario Paternò, Istituto di Radioastronomia (Italy). [7739-46]

8:50 am: **A prototype micro-autonomous positioning system for mirror deployment within multi-object instruments**, William D. Taylor, David C. Atkinson, David Montgomery, Hermine Schnetler, UK Astronomy Technology Ctr. (United Kingdom). [7739-48]

9:10 am: **Starbugs: focal plane fiber positioning technology**, Michael Goodwin, Jeroen Heijmans, Ian Saunders, Jurek K. Brzeski, William Saunders, Roger Haynes, Rolf Müller, Anglo-Australian Observatory (Australia). [7739-49]

9:30 am: **Vibration damping system for ALMA antenna transporters**, Martin Dimmler, Maximilian Kraus, Lothar Kern, Nicola Di Lieto, European Organisation for Astronomical Research in the Southern Hemisphere (Germany). [7739-50]

9:50 am: **Study on a novel panel support mechanism of a radio telescope**, Dehua Yang, Zengxiang Ma, Hui Li, Kunxin Chen, Nanjing Institute of Astronomical Optics & Technology (China). [7739-52]

Coffee Break 10:10 to 10:40 am

10:40 am: **EST main telescope structure: concepts and trade-offs of the main structure for the European Solar Telescope**, Martin Süß, MT Mechatronics GmbH (Germany); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Reiner Volkmer, Albert-Ludwigs-Univ. Freiburg (Germany); Hans J. Kärcher, Peter Eisenträger, David Fischer, MT Mechatronics GmbH (Germany). [7739-53]

11:00 am: **GREGOR M1 mirror and cell design: effects of different mirror substrates on the telescope design**, Martin Süß, MT Mechatronics GmbH (Germany); Reiner Volkmer, Albert-Ludwigs-Univ. Freiburg (Germany); Peter Eisenträger, MT Mechatronics GmbH (Germany). [7739-54]

11:20 am: **LSST telescope primary/tertiary mirror hardpoints**, Joseph R. De Vries, Douglas R. Neill, National Optical Astronomy Observatory (United States). [7739-142]

11:40 am: **Friction drive characterization breadboard: test results**, Babak Sedghi, Christian Lucuix, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Jean Marc Tortolani, AMOS Ltd. (Belgium); Enzo Brunetto, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Christophe Delrez, Eric Gabriel, AMOS Ltd. (Belgium). [7739-51]

12:00 pm: **Innovative enclosure design for the MROI array telescopes**, Ifan Payne, New Mexico Institute of Mining and Technology (United States); Gianpietro Marchiori, Andrea Busatta, European Industrial Engineering s.r.l. (Italy). [7739-144]

Lunch/Exhibition Break 12:20 to 1:50 pm

SESSION 9

Room: Royal Palm I-III Wed. 1:50 to 6:00 pm

Telescope Structure II

Session Chair: V. Alfonso Fera, Jet Propulsion Lab.

1:50 pm: **Smart structures for deformable mirrors actuated by shape memory alloy**, Marco Riva, Osservatorio Astronomico di Brera (Italy); Paolo Bettini, Giuseppe Sala, Politecnico di Milano (Italy); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy). [7739-56]

2:10 pm: **Smart structures for deformable mirrors actuated by piezocomposites (Invited Paper)**, Marco Riva, Osservatorio Astronomico di Brera (Italy); Alessandro Airolidi, Politecnico di Milano (Italy); Daniele Di Sanzo, Osservatorio Astronomico di Brera (Italy); Giuseppe Sala, Politecnico di Milano (Italy); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy). [7739-57]

2:40 pm: **EST Telescope: primary mirror, support, and cooling system**, Reiner Volkmer, Albert-Ludwigs-Univ. Freiburg (Germany); Fabio Manni, S.R.S. Engineering Design s.r.l. (Italy); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Lluís Cavaller-Marquéz, Instituto de Astrofísica de Canarias (Spain); Michele Giannuzzi, S.R.S. Engineering Design S.r.l. (Italy); Thomas Scheiffelen, Albert-Ludwigs-Univ. Freiburg (Germany); Andrea Scotto, S.R.S. Engineering Design S.r.l. (Italy). [7739-58]

3:00 pm: **Calibration dome screen for the Large Synoptic Survey Telescope**, William J. Gressler, Victor L. Krabbendam, Ming Liang, Abhijit Saha, National Optical Astronomy Observatory (United States); Christopher W. Stubbs, Harvard Univ. (United States). [7739-59]

3:20 pm: **New paradigms for producing high-performing meter class ground-based telescopes**, Richard L. Hedrick, Allan Keller, Joseph Haberman, PlaneWave Instruments (United States); Tony B. Hull, L-3 Communications Tinsley Labs. Inc. (United States); Andrew R. Clarkson, L-3 Brashear (United States). [7739-60]

Coffee Break 3:40 to 4:10 pm

4:10 pm: **High-precision robotic equatorial C-ring telescope mounts: design, fabrication, and performance**, Matthew A. Dubberley, Las Cumbres Observatory Global Telescope Network (United States). [7739-61]

4:30 pm: **Design and performance characterization of the LCOGTN One-Meter Telescope optical tube assembly (Invited Paper)**, Benjamin J. Haldeman, Rachel M. Haynes, Vincent Posner, Joseph R. Tufts, Andrew J. Pickles, Matthew A. Dubberley, Las Cumbres Observatory Global Telescope Network (United States). [7739-62]

5:00 pm: **The active optics system for the Discovery Channel Telescope**, Byron W. Smith, Tomas Chylek, Lowell Observatory (United States); Brian Cuerden, The Univ. of Arizona (United States); Bill DeGroff, Paul J. Lotz, Alexander Venetiou, Lowell Observatory (United States). [7739-63]

5:20 pm: **Challenges of extreme load hexapod design and modularization for large ground-based telescopes**, Rainer Gloess, Physik Instrumente (PI) GmbH & Co. KG (Germany); Brian Lula, PI (Physik Instrumente) L.P. (United States). [7739-64]

5:40 pm: **Innovative enclosure dome/observing aperture system design for the MROI Array Telescopes**, Gianpietro Marchiori, Andrea Busatta, European Industrial Engineering s.r.l. (Italy); Ifan Payne, New Mexico Institute of Mining and Technology (United States). [7739-65]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States) [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 10

Room: Royal Palm I-III Thurs. 10:30 am to 12:30 pm

Coatings

Session Chair: Daniel R. Blanco,
National Optical Astronomy Observatory10:30 am: **Are ophthalmic hydrophobic coatings useful for astronomical optics?**, Christian Schwab, Landessternwarte Heidelberg (Germany); Andrew C. Phillips, Univ. of California Observatories (United States) [7739-66]10:50 am: **Design and manufacturing of high-performance notch filters**, Uwe B. Schallenberg, Beatrix Ploss, Marc Lappschies, Stefan Jakobs, mso jena Mikroschichtoptik GmbH (Germany) [7739-67]11:10 am: **Dual-achromatic mask for nulling: experimental demonstrator**, Damien Pickel, Fanny Chemla, Mathieu Cohen, Olivier Dupuis, Didier Pelat, Jean-Michel Réess, Daniel Rouan, Observatoire de Paris à Meudon (France) [7739-68]11:30 am: **Experimental advances in phase mask coronagraphy**, Mamadou N'Diaye, Univ. Nacional Autónoma de México (Mexico); Kjetil Dohlen, Observatoire Astronomique de Marseille-Provence (France); Salvador Cuevas, Univ. Nacional Autónoma de México (Mexico) [7739-69]11:50 am: **Verification of the controllability of refractive index by subwavelength structure fabricated by photolithography: toward single-material mid- and far-infrared multilayer filters**, Hironobu Makitsubo, Japan Aerospace Exploration Agency (Japan) and The Univ. of Tokyo (Japan); Takehiko Wada, Makoto Mita, Japan Aerospace Exploration Agency (Japan) [7739-70]12:10 pm: **Assessment of black and spectrally selective surfaces for stray light reduction in telescope systems**, Stephen M. Pompea, National Optical Astronomy Observatory (United States) [7739-71]

Lunch/Exhibition Break 12:30 to 2:00 pm

SESSION 11

Room: Royal Palm I-III Thurs. 2:00 to 5:50 pm

Photonics

Session Chair: Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)2:00 pm: **The OPTICON technology roadmap for optical and infrared astronomy** (*Invited Paper*), Colin R. Cunningham, David Melotte, UK Astronomy Technology Ctr. (United Kingdom); Frank Molster, Netherlands Research School for Astronomy, NOVA (Netherlands) [7739-72]2:30 pm: **Direct laser written multimode waveguides for astronomical applications**, Nemanja Jovanovic, Simon Gross, Christopher Miese, Alexander Fuerbach, Jon S. Lawrence, Michael J. Withford, Macquarie Univ. (Australia) [7739-73]2:50 pm: **Characterising modal noise in fibre-coupled spectrographs for astronomy**, Ulrike Lemke, Durham Univ. (United Kingdom); Jason C. W. Corbett, Jeremy R. Allington-Smith, Durham Univ. (United States) [7739-194]3:10 pm: **Defining requirements and identifying relevant technologies in astrophotonics**, Jeremy R. Allington-Smith, Durham Univ. (United Kingdom); Timothy A. Birks, Univ. of Bath (United Kingdom); Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Colin R. Cunningham, UK Astronomy Technology Ctr. (United Kingdom); Sonali Dagupta, Univ. of Southampton (United Kingdom); Roger Haynes, Anglo-Australian Observatory (Australia); Paulo J. V. Garcia, Univ. do Porto (Portugal); Ajay K. Kar, Heriot-Watt Univ. (United Kingdom); Andreas Kelz, Astrophysikalisches Institut Potsdam (Germany); Pierre Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Lucas Labadie, Instituto de Astrofísica de Canarias (Spain); Jon S. Lawrence, Macquarie Univ. (Australia); Etienne P. Le Coarer, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Martin M. Roth, Astrophysikalisches Institut Potsdam (Germany); Ray M. Sharples, Durham Univ. (United Kingdom); Robert R. Thomson, Heriot-Watt Univ. (United Kingdom) [7739-75]

Coffee Break 3:30 to 3:50 pm

3:50 pm: **Supercontinuum light sources for use in astronomical instrumentation: a test with PMAS, the Potsdam multi-aperture spectrophotometer**, Martin M. Roth, Astrophysikalisches Institut Potsdam (Germany); Hans-Gerd Löhmannsroben, Oliver Reich, Carsten Dosche, Univ. Potsdam (Germany); Roger Haynes, Astrophysikalisches Institut Potsdam (Germany); Lasse Leick, NKT Photonics A/S (Denmark) [7739-76]4:10 pm: **Optical design of optical switches for diverse field spectroscopy**, Robert Content, Graham J. Murray, Jeremy R. Allington-Smith, Durham Univ. (United Kingdom) [7739-177]4:30 pm: **Dither-based sensor for improved consistency of adaptive optics system**, Akondi Vyas, Indian Institute of Astrophysics (India) and Indian Institute of Science (India); Roopashree M. B., B. Raghavendra Prasad, Indian Institute of Astrophysics (India) [7739-78]4:50 pm: **Ground-based observatory operations optimized and enhanced by direct atmospheric measurements**, John T. McGraw, Peter C. Zimmer, Mark R. Ackermann, The Univ. of New Mexico (United States); Steven W. Brown, Gerald T. Fraser, National Institute of Standards and Technology (United States); Dean C. Hines, The Univ. of New Mexico (United States); Anthony B. Hull, L-3 Communications Tinsley Labs. Inc. (United States); Keith R. Lykke, Allan W. Smith, National Institute of Standards and Technology (United States); Christopher W. Stubbs, Harvard Univ. (United States); Jonathan H. Turner, The Univ. of New Mexico (United States); John T. Woodward, National Institute of Standards and Technology (United States); Daniel C. Zirzow, The Univ. of New Mexico (United States) . [7739-79]5:10 pm: **Flexure mount for a MEMS deformable mirror for the GPI planet imager**, Alexis Hill, National Research Council Canada (Canada) [7739-80]5:30 pm: **Fibre Bragg gratings for temporal spectral astronomy**, Geraldine Marien, Nick Cvetojevic, Judith M. Dawes, Macquarie Univ. (Australia); Roger Haynes, Anglo-Australian Observatory (Australia); Nemanja Jovanovic, Jon S. Lawrence, Quentin A. Parker, Michael J. Withford, Macquarie Univ. (Australia) [7739-81]

Thursday Poster Session

Room: Grand Exhibit Hall Thurs. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Thursday. The interactive poster session with authors in attendance will be Thursday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Optics Fabrication/Materials

Fabrication of 4-meter class astronomical optics, Martin J. Valente, Dae Wook Kim, Matthew J. Novak, Chang Jin Oh, James H. Burge, College of Optical Sciences, The Univ. of Arizona (United States) [7739-104]**Studies on evaluating and removing subsurface damage on the ground surface of CLEARCERAM-Z HS**, Hiroshi Akitaya, Takuya Yamashita, Norio Ohshima, Masanori Iye, National Astronomical Observatory of Japan (Japan); Toshinori Maihara, Hitoshi Tokoro, Keisuke Takahashi, Nano-Optonics Research Institute (Japan) [7739-105]**Diamond machining of multifaceted and freeform components for astronomical optics**, David J. Robertson, David A. Ryder, Kenneth Parkin, Durham Univ. (United Kingdom) [7739-106]**Investigation of sub-aperture polish techniques for manufacturing astronomical mirror**, Yi Zheng, Xinnan Li, Nanjing Institute of Astronomical Optics & Technology (China) [7739-107]**Carbon fiber-reinforced composites: their structural and thermal properties**, Jingquan Cheng, National Radio Astronomy Observatory (United States) . . [7739-108]**Structural analysis of a new type lightweight optical mirror blank**, Yeping Li, Xiangqun Cui, Nanjing Institute of Astronomical Optics & Technology (China); Ningsheng Hu, Nanjing Modern Product Development Institute (China) . . . [7739-109]

Herschel Space Telescope: impact of new material strain data on optical test and model correlation, Brian Catanzaro, CFE Services (United States); Dominic B. Doyle, European Space Research and Technology Ctr. (Netherlands); Eri J. Cohen, Jet Propulsion Lab. (United States) [7739-112]

Optical characterization of COSTAR and WF/PC 2 pickoff mirror coatings following their 16 years on-orbit exposure, Manuel A. Quijada, Ross M. Henry, Benjamin B. Reed, David W. Hughes, John G. Hagopina, NASA Goddard Space Flight Ctr. (United States) [7739-113]

Super-light-weighted HB-Cesic mirror demonstrator, Matthias R. Krödel, Peter Hofbauer, ECM GmbH (Germany) [7739-114]

Recent achievements with a cryogenic super-light-weighted HB-Cesic mirror, Matthias R. Krödel, Peter Hofbauer, ECM GmbH (Germany); Christophe Devilliers, Thales Alenia Space (France); Zoran Sodnik, European Space Research and Technology Ctr. (Netherlands); Christian Du Jeu, Société Européenne de Systèmes Optiques (France) [7739-115]

Development of CFRP mirrors for space telescopes and investigation on the micro-dimensional stability, Shin Utsunomiya, Ryuzo Shimizu, Tomohiro Kamiya, Jun Koyanagi, Japan Aerospace Exploration Agency (Japan); Yoshihiko Arao, Hiroyuki Kawada, Waseda Univ. (Japan) [7739-116]

Time-dependent deformation of surface geometry on light weight and thermally stable CFRP mirror in humid environment, Yoshihiko Arao, Waseda Univ. (Japan); Jun Koyanagi, Shin Utsunomiya, Shin-ichi Takeda, Japan Aerospace Exploration Agency (Japan); Hiroyuki Kawada, Waseda Univ. (Japan) [7739-117]

Secondary mirror system for the European Solar Telescope (EST), Lluís Cavaller-Marquóz, Benjamin Siegel, Germán Prieto Labra, GRANTECAN S.A. (Spain); Elvijo Hernandez Suarez, Instituto de Astrofísica de Canarias (Spain); Joan Manel Casalta Escuer, Juan Mercader, José Javier Barriga, NTE-SENER S.A. (Spain) [7739-119]

Test and Metrology

An improved method of the spatial point's position detection, Weimin Li, Univ. of Science and Technology of China (China); Lichun Zhu, National Astronomical Observatories (China) [7739-120]

A method of attitude measurement of the spatial target, Weimin Li, Univ. of Science and Technology of China (China); Lichun Zhu, National Astronomical Observatories (China) [7739-121]

A method of 3D reconstruction based on single camera, Weimin Li, Xiaofeng Li, Univ. of Science and Technology of China (China) [7739-122]

Use of a Faro Arm for optical alignment, James E. O'Connor, Lisa A. Crause, Darragh E. O'Donoghue, Francois Strumpfer, South African Astronomical Observatory (South Africa) [7739-123]

Surface measurements of radio antenna panels with white-light interferometry, Simonetta Chinellato, Univ. degli Studi di Padova (Italy); Claudio Pernechele, Osservatorio Astronomico di Cagliari (Italy); Simone Carmignato, Alessandro Voltan, Univ. degli Studi di Padova (Italy); Federico Manzan, Osservatorio Astronomico di Cagliari (Italy) [7739-124]

Lens curvature measurements with contact-less LCI technique, Simonetta Chinellato, Univ. degli Studi di Padova (Italy); Claudio Pernechele, Osservatorio Astronomico di Cagliari (Italy); Favio Bortoletto, Osservatorio Astronomico di Padova (Italy); Federico Manzan, Osservatorio Astronomico di Cagliari (Italy) [7739-125]

Optical testing of the LSST combined primary/tertiary mirror, Michael T. Tuell, Hubert M. Martin, The Univ. of Arizona (United States); James H. Burge, College of Optical Sciences, The Univ. of Arizona (United States); William J. Gressler, National Optical Astronomy Observatory (United States) [7739-126]

Advanced wavefront sensing and control testbed (A-WCT), Fang Shi, Scott A. Basinger, Robert O. Gappinger, Randall C. Hein, Mike Rud, Hong Tang, Mitchell Troy, Jet Propulsion Lab. (United States) [7739-130]

Wavefront sensing using phase retrieval methods, Siddarayappa Bikkannavar, Scott A. Basinger, David Cohen, Joseph J. Green, John Z. Lou, Catherine M. Ohara, David C. Redding, Jet Propulsion Lab. (United States) [7739-131]

SALT segmented primary mirror: laboratory test results for Fogale inductive edge sensors, John W. Menzies, Hitesh Gajjar, David A. H. Buckley, Sebastien Buous, South African Astronomical Observatory (South Africa) [7739-132]

First cophasing of a segmented mirror with a tunable filter and the pyramid wavefront sensor, Marco Bonaglia, Enrico Pinna, Alfio T. Puglisi, Juan Carlos Guerra, Osservatorio Astrofisico di Arcetri (Italy); Nigel A. Dipper, Richard M. Myers, Durham Univ. (United Kingdom); Simone Esposito, Osservatorio Astrofisico di Arcetri (Italy) [7739-135]

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Deformable active optics test of the submirrors of the LAMOST reflecting Schmidt plate, Dehua Yang, Zibo Jiang, Yeping Li, Xinnan Li, Nanjing Institute of Astronomical Optics & Technology (China) [7739-55]

An innovative low-cost antenna dish built with commercial off-the-shelf (COTS) components, Jingquan Cheng, National Radio Astronomy Observatory (United States) [7739-136]

The VST active primary mirror support system, Pietro Schipani, Sergio D'Orsi, Luigi Ferragina, Davide Fierro, Laurent Marty, Cesare Molfese, Francesco Perrotta, Massimo Capaccioli, Osservatorio Astronomico di Capodimonte (Italy); Giacinto De Paris, Istituto Nazionale di Astrofisica (Italy) [7739-137]

Performance of the VST secondary mirror support system, Pietro Schipani, Sergio D'Orsi, Luigi Ferragina, Davide Fierro, Laurent Marty, Osservatorio Astronomico di Capodimonte (Italy) [7739-138]

The axial actuators for the VST primary mirror, Davide Fierro, Sergio D'Orsi, Luigi Ferragina, Laurent Marty, Cesare Molfese, Francesco Perrotta, Pietro Schipani, Massimo Capaccioli, Osservatorio Astronomico di Capodimonte (Italy); Giacinto De Paris, Istituto Nazionale di Astrofisica (Italy); Raffaele Tomelleri, Pierfrancesco Rossetini, Tomelleri s.r.l. (Italy) [7739-139]

Research on signal cable entering cabin, Gaofeng Pan, National Astronomical Observatories (China) [7739-140]

Thermal behavior of the Medicina 32 Meter Radio Telescope, Tonino Pisanu, Franco Buffa, Osservatorio Astronomico di Cagliari (Italy); Marco Morsiani, Istituto di Radioastronomia (Italy); Claudio Pernechele, Sergio Poppi, Osservatorio Astronomico di Cagliari (Italy) [7739-141]

Fast force actuators for LSST primary/tertiary mirror, Edward A. Hileman, National Optical Astronomy Observatory (United States); Michael Warner, Cerro Tololo Inter-American Observatory (Chile); Oliver Wiecha, National Optical Astronomy Observatory (United States) [7739-143]

Innovative relocation system for enclosures for MROI array telescopes, Gianpietro Marchiori, Matteo Pozzobon, European Industrial Engineering s.r.l. (Italy); Ifan Payne, New Mexico Institute of Mining and Technology (United States) [7739-145]

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Design and simulation of the direct-drive system, Changzhi Ren, Tsinghua Univ. (China) [7739-147]

Toward high-dynamic active mirrors for LGS refocusing systems, Emmanuel Hugot, Fabrice Madec, Marc Ferrari, David Le Mignant, Jean-Gabriel Cuby, Observatoire Astronomique de Marseille-Provence (France) [7739-148]

In-flight aberrations corrections for large space telescopes using active optics, Marie Laslandes, Marc Ferrari, Emmanuel Hugot, Observatoire Astronomique de Marseille-Provence (France) [7739-149]

The calibration and evaluation for laser tracker apply in LAMOST field environment, Zeng Xiang Zhou, Chao Zhai, Hongzhan Hu, Jin Yi, Xiaozheng Xing, Univ. of Science and Technology of China (China) [7739-151]

Design of performance verification testing for HET wide-field upgrade tracker in the laboratory, John M. Good, Richard J. Hayes, Jason R. Mock, Ian M. Soukup, Joseph H. Beno, Richard D. Savage, John A. Booth, Gary J. Hill, Hanshin Lee, Mark E. Cornell, Marc D. Rafal, The Univ. of Texas at Austin (United States) [7739-152]

Upgrading the controller of the fast tip-tilt tertiary mirror for the SOAR telescope, Michael Warner, Stephen R. Heathcote, German Schumacher, Rolando Cantarutti, Esteban Parkes, Cerro Tololo Inter-American Observatory (Chile) [7739-153]

Cryogenics, Mechanisms, Instruments

LN2 continuous-flow cryostats, compact vibration free cooling system for single to multiple detector systems, Jean-Louis Lizon, Matteo Accardo, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-154]

Liquid nitrogen pre-cooling of large infrared instrument at ESO, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-155]

A very accurate filter wheel for a large-field IR imager, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-156]

A hybrid liquid nitrogen system for the cooling of ESO OmegaCAM detector, Jean-Louis Lizon, Armin Silber, Gerd H. Jakob, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-157]

Advanced high-cooling power 2-stage Gifford-McMahon refrigerator systems, Gerd H. Jakob, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-158]

First concept for the E-ELT cryogenic infrastructure, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Ian R. Bryson, David Montgomery, UK Astronomy Technology Ctr. (United Kingdom); Charles Monroe, Monroe Brothers Ltd. (United Kingdom) [7739-159]

An optical shutter for the Euclid imager, Adrian M. Glauser, ETH Zürich (Switzerland) and UK Astronomy Technology Ctr. (United Kingdom); Jérôme Amiaux, Jean-Louis Auguères, Commissariat à l'Énergie Atomique (France); Simon J. Lilly, ETH Zürich (Switzerland); Alexandre Refregier, Commissariat à l'Énergie Atomique (France) [7739-161]

Large format filter changer mechanism and shutter for the dark energy survey, Gregory Tarlé, Michael S. Schubnell, Univ. of Michigan (United States); Bruce C. Bigelow, Univ. of California, Santa Cruz (United States); Eric M. Dede, Univ. of Michigan (United States) [7739-162]

Assembly of the dark energy survey CCD imager, Gregory E. Derylo, Herman P. Cease, H. Thomas Diehl, Juan Estrada, Brenna L. Flaughner, Fermi National Accelerator Lab. (United States) [7739-163]

Cooling the dark energy camera CCD array using a closed-loop two-phase liquid nitrogen system, Herman P. Cease, Fermi National Accelerator Lab. (United States) [7739-164]

A precision lens cell for large temperature excursions, Stephen A. Smee, The Johns Hopkins Univ. (United States) [7739-166]

Spectroscopy and Image Slicer

GRAVITY spectrometer: mechanical design, Sebastian Fischer, Michael Wiest, Christian Straubmeier, Constanza Araujo-Hauck, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Guy S. Perrin, Observatoire de Paris à Meudon (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Andreas Eckart, Univ. zu Köln (Germany) [7739-169]

GRAVITY spectrometer: cryo-mechanism commissioning testbed, Michael Wiest, Christian Straubmeier, Sebastian Fischer, Constanza Araujo-Hauck, Univ. zu Köln (Germany); Frank Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); Guy S. Perrin, Observatoire de Paris à Meudon (France); Wolfgang Brandner, Max-Planck-Institut für Astronomie (Germany); Andreas Eckart, Univ. zu Köln (Germany) [7739-170]

HARPS secondary guiding, Gerardo J. F. Ihle, European Southern Observatory (Chile); Gerardo Avila, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Ismo Kastinen, European Southern Observatory (Chile); Gaspare Lo Curto, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Alex Segovia, Peter Sinclair, European Southern Observatory (Chile); Raffaele Tomelleri, Tomelleri s.r.l. (Italy) [7739-171]

Manufacturing of silicon immersion grating for infrared spectrometer, Weisong Wang, Daniel T. Jaffe, Casey P. Deen, Michael Gully-Santiago, The Univ. of Texas at Austin (United States); Douglas J. Mar, Liquidia Technologies, Inc. (United States) [7739-172]

High-performance silicon grisms for 1.2-8.0 μm : detailed results from the JWST-NIRCam devices, Michael Gully-Santiago, Daniel T. Jaffe, Weisong Wang, Casey P. Deen, The Univ. of Texas at Austin (United States); Douglas M. Kelly, The Univ. of Arizona (United States); Thomas P. Greene, NASA Ames Research Ctr. (United States); James W. Bacon, II-VI Infrared (United States) [7739-173]

Optomechanical system of AIT tools to perform tests and integrations of 24 IFU, Edgard Renault, Florence Laurent, Observatoire de Lyon (France) [7739-174]

Improvements in diamond machining applied to the fabrication of a large ZnSe immersion grating, Paul J. Kuzmenko, Steve L. Little, Lawrence Livermore National Lab. (United States); Yuji Ikeda, Photocoding (Japan); Naoto Kobayashi, The Univ. of Tokyo (Japan) [7739-175]

HERMES: VPH grating design issues with polarization, Samuel C. Barden, Stuart I. Barnes, Anglo-Australian Observatory (Australia) [7739-176]

ESPRESSO: design and analysis of Coudé-Train concepts for stable and efficient optical feeding, Alexandre P. Cabral, André Moitinho, João M. P. Coelho, Jorge Lima, Pedro Carvas, Antonio Amorim, José M. Rebordão, Univ. de Lisboa (Portugal); Gerardo Avila, European Southern Observatory (Germany); Denis Mégevand, Observatoire de Genève (Switzerland); José-Miguel Herreros, Instituto de Astrofísica de Canarias (Spain); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy); Paolo Di Marcantonio, Osservatorio Astronomico di Trieste (Italy); Christophe Lovis, Observatoire de Genève (Switzerland); Nuno C. Santos, Univ. do Porto (Portugal); Francesco A. Pepe, Observatoire de Genève (Switzerland); Stefano Cristiani, Osservatorio Astronomico di Trieste (Italy); Rafael Reboló Lopez, Instituto de Astrofísica de Canarias (Spain) [7739-178]

Scattered light analysis of a DMD slit mask, Zoran Ninkov, Kenneth Fourspring, Rochester Institute of Technology [7739-195]

Coatings/Filters/Cleaning/Masks

Progress toward high-performance astronomical coatings, Andrew C. Phillips, William E. Brown, Brian DuPraw, David F. Hilyard, David J. Cowley, Univ. of California Observatories (United States) [7739-180]

Cleaning the Southern African Large Telescope's M5 mirror, Lisa A. Crause, Hitesh Gajjar, Jonathan Love, Francois Strumpfer, James E. O'Connor, Darragh E. O'Donoghue, Ockert J. Strydom, Peter Gillingham, South African Astronomical Observatory (South Africa) [7739-182]

Blocking filters with enhanced throughput for x-ray microcalorimetry, David A. Grove, Bruce Lairson, Ryan Smith, Travis Ayers, Luxel Corp. (United States) [7739-184]

Stray light calculation of complex telescope systems: efficiency and accuracy, Fei Zhao, Xiaojun Jiang, National Astronomical Observatories (China) [7739-185]

Pass-band filter performance for space-flight dark energy missions, Jerry Edelstein, Univ. of California, Berkeley (United States); Stuart L. Mufson, Indiana Univ. (United States); Nick J. Mostek, Lawrence Berkeley National Lab. (United States); Brian J. Baptista, Indiana Univ. (United States); Bruce E. Woodgate, NASA Goddard Space Flight Ctr. (United States); Alex G. Kim, Lawrence Berkeley National Lab. (United States); Charles R. Bower, Indiana Univ. (United States); Ray Boucarut, NASA Goddard Space Flight Ctr. (United States) [7739-186]

Large Synoptic Survey Telescope filter design and fabrication, David K. Gilmore, SLAC National Accelerator Lab. (United States) [7739-187]

Photonics/ADC/Adaptive Optics

Development of five multifiber links for the OPTIMOS-EVE study for the E-ELT, Isabelle Guinard, Fanny Chemla, Jean-Michel Huet, Jean-François Hammer, Hector Flores, Observatoire de Paris à Meudon (France) [7739-188]

Optical fiber tapers for applications in astronomy, Dionne M. Haynes, Roger Haynes, Martin M. Roth, Astrophysikalisches Institut Potsdam (Germany); Sergio G. Leon-Saval, The Univ. of Sydney (Australia); William Rambold, Astrophysikalisches Institut Potsdam (Germany) [7739-189]

Multi-way optical fiber connectors for astronomy, Dionne M. Haynes, Roger Haynes, Anglo-Australian Observatory (Australia) and Astrophysikalisches Institut Potsdam (Germany); Michael Goodwin, Ed Penny, Anglo-Australian Observatory (Australia) [7739-190]

Study of optical fibers scrambling to improve radial velocity measurements, Bruno Chazelas, Francesco A. Pepe, François P. Wildi, Observatoire de Genève (Switzerland); Francois Bouchy, Institut d'Astrophysique de Paris (France) [7739-191]

Fiber positioning revisited: the use of an off-the-shelf assembly robot for OPTIMOS-EVE, Gavin B. Dalton, Martin S. Whalley, Eric C. Sawyer, Ian A. J. Tosh, David L. Terrett, Rutherford Appleton Lab. (United Kingdom) [7739-192]

The ADC for the VST Telescope: theory and preliminary test of the electromechanical system, Pietro Schipani, Osservatorio Astronomico di Capodimonte (Italy); Jacopo Farinato, Carmelo Arcidiacono, Osservatorio Astronomico di Padova (Italy); Sergio D'Orsi, Luigi Ferragina, Davide Fierro, Osservatorio Astronomico di Capodimonte (Italy); Demetrio Magrin, Osservatorio Astronomico di Padova (Italy); Laurent Marty, Osservatorio Astronomico di Capodimonte (Italy); Roberto Ragazzoni, Osservatorio Astronomico di Padova (Italy); Gabriele Umbrico, Univ. degli Studi di Padova (Italy) [7739-193]

Friday 2 July

SESSION 12

Room: Royal Palm I-III Fri. 8:00 to 10:10 am

Cryogenic Instruments

Session Chair: Dietrich Lemke,
Max-Planck-Institut für Astronomie (Germany)

8:00 am: **Cryogenic submicron linear actuator (CSA)** (*Invited Paper*), Javier Serrano, Javier Moreno Raso, David González de María, Alberto Martín, Mikel Lamensans, Heribert Arguelaguet Vilaseca, David López Justo, Gemma Rodríguez, Rubén Cerezo Sierra, LIDAX (Spain) [7739-82]

8:30 am: **Design and qualification of an innovative cryogenic tip-tilt mirror**, Huub Janssen, Maurice Teuwen, Janssen Precision Engineering B.V. (Netherlands); Ramón Navarro, Hiddo H. Hanenburg, Eddy Elswijk, Niels Tromp III, ASTRON (Netherlands) [7739-83]

8:50 am: **Different ways of reducing vibrations induced by cryogenic instruments**, Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Bruno De Marneffe, Univ. Libre de Bruxelles (Belgium) [7739-84]

9:10 am: **Ultra-stable operation of detectors for high-resolution spectrographs**, Antonio Manescau, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Marco Gullieuszik, Osservatorio Astronomico di Padova (Italy); Olaf Iwert, Hans Dekker, Jean-Louis Lizon, Gaspare Lo Curto, Gerd H. Jakob, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Dario Sosa, Instituto de Astrofísica de Canarias (Spain); Paola Amico, European Organisation for Astronomical Research in the Southern Hemisphere (Chile); Luca Pasquini, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-85]

9:30 am: **Cryogenic Fourier transform infrared spectrometer from 4 to 20 micrometers**, Simon G. Kaplan, Solomon I. Woods, Timothy M. Jung, Adrian C. Carter, Raju U. Datla, National Institute of Standards and Technology (United States) [7739-86]

9:50 am: **A novel athermal approach for high-performance cryogenic metal optics**, Ralf-Rainer Rohloff, Max-Planck-Institut für Astronomie (Germany); Andreas Gebhardt, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Veit Schönherr, Max-Planck-Institut für Astronomie (Germany); Stefan Risse, Thomas Peschel, Jan Kinast, Sebastian Scheiding, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) [7739-87]

Coffee Break 10:10 to 10:40 am

SESSION 13

Room: Royal Palm I-III Fri. 10:40 am to 12:00 pm

Spectroscopy/Slicers I

Session Chair: David Montgomery,
UK Astronomy Technology Ctr. (United Kingdom)

10:40 am: **MATIOMA: a project for an enhanced optical contact technology offering repositioning possibility and a precise structural model**, Eric Prieto, Observatoire Astronomique de Marseille-Provence (France); Sonia Ait Zaid, Ctr. National d'Études Spatiales (France); Adhane Boukamel, Lab. de Mécanique et d'Acoustique (France); Helene Combes, Vincent Costes, Ctr. National d'Études Spatiales (France); Franck Ducret, Observatoire Astronomique de Marseille-Provence (France); Frédéric Lebon, Lab. de Mécanique et d'Acoustique (France); Tony Pamplona, Christelle Rossin, Observatoire Astronomique de Marseille-Provence (France); Yves Salaun, Winlight System S.A. (France); Isabelle Savin De Larclause, Ctr. National d'Études Spatiales (France) [7739-88]

11:00 am: **Optical performance of a large diamond-machined ZnSe immersion grating**, Yuji Ikeda, Photocoding (Japan); Naoto Kobayashi, The Univ. of Tokyo (Japan); Paul J. Kuzmenko, Steve L. Little, Lawrence Livermore National Lab. (United States); Chikako Yasui, Sohei Kondo, Hiroyuki Mito, Yuki Sarugaku, The Univ. of Tokyo (Japan) [7739-90]

11:20 am: **Miniature spectrograph: characterization of arrayed waveguide gratings for astronomy**, Nick Cvetojevic, Macquarie Univ. (Australia); Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Roger Haynes, Anglo-Australian Observatory (Australia); Nemanja Jovanovic, Jon S. Lawrence, Macquarie Univ. (Australia) [7739-91]

11:40 am: **Miniature astronomical spectrograph using array waveguide gratings: capabilities and limitations**, Jon S. Lawrence, Macquarie Univ. (Australia); Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Roger Haynes, Anglo-Australian Observatory (Australia) [7739-92]

Lunch Break 12:00 to 1:20 pm

SESSION 14

Room: Royal Palm I-III Fri. 1:20 to 5:40 pm

Spectroscopy/Slicers II

Session Chair: Eli Atad-Etzedgui, UK Astronomy Technology Ctr./The Royal Observatory Edinburgh (United Kingdom)

1:20 pm: **Optical fiber spectroscopy and sensing innovation at innoFSPEC**, Roger Haynes, Martin M. Roth, William Rambold, Astrophysikalisches Institut Potsdam (Germany) [7739-93]

1:40 pm: **Design, modeling, and tests for space environment qualification of an image slicer using optical contact technology**, Tony Pamplona, Christelle Rossin, Eric Prieto, Laurent Martin, Philippe Laurent, José Garcia, Gabriel Moreaux, Observatoire Astronomique de Marseille-Provence (France) [7739-94]

2:00 pm: **MUSE integral field unit: test results on the first out of 24**, Florence Laurent, Louisa Adjali, Roland M. Bacon, Didier Boudon, Patrick Callier, Eric Daguise, Jean-Pierre Dubois, Johan Kosmalski, Observatoire de Lyon (France); Jean-Louis Lizon, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Magali Loupias, Arlette Pécontal-Rousset, Observatoire de Lyon (France); Roland Reiss, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Alban Remillieux, Edgard Renault, Observatoire de Lyon (France); Gero Rupprecht, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7739-95]

2:20 pm: **ERASMUS-F: pathfinder for an E-ELT 3D instrumentation (Invited Paper)**, Andreas Kelz, Martin M. Roth, Astrophysikalisches Institut Potsdam (Germany); Harald E. Nicklas, Georg-August-Univ. Göttingen (Germany); Roland M. Bacon, Observatoire de Lyon (France); Joss Bland-Hawthorn, The Univ. of Sydney (Australia); Jean-Christophe Olaya, Astrophysikalisches Institut Potsdam (Germany); Patrick Lanzoni, Georg-August-Univ. Göttingen (Germany); Johan Kosmalski, Observatoire de Lyon (France) [7739-96]

2:50 pm: **Volume phase holographic echelle grating: a theoretical study**, Andrea G. Bianco, Giorgio Pariani, Osservatorio Astronomico di Brera (Italy) and Politecnico di Milano (Italy) [7739-97]

3:10 pm: **Photochromic polymers for making volume phase holographic gratings: between theory and practical**, Andrea G. Bianco, Osservatorio Astronomico di Brera (Italy); Giorgio Pariani, Chiara Bertarelli, Politecnico di Milano (Italy); Filippo Maria Zerbi, Osservatorio Astronomico di Brera (Italy) [7739-98]

Coffee Break 3:30 to 4:00 pm

4:00 pm: **Development of MEMS-based programmable slit mask for multi-object spectroscopy**, Michael D. Canonica, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Severin Waldis, Univ. of Neuchâtel (Switzerland); Frederic Zamkotsian, Patrick Lanzoni, Observatoire Astronomique de Marseille-Provence (France); Wilfried Noell, Nico De Rooij, Ecole Polytechnique Fédérale de Lausanne (Switzerland) [7739-99]

4:20 pm: **Efficiency measurements performed on the MUSE VPHG**, Edgard Renault, Magali Loupias, Observatoire de Lyon (France) [7739-100]

4:40 pm: **The SOAR integral field unit spectrograph optical design and IFU implementation**, Antonio C. de Oliveira, Ligia S. de Oliveira, Clemens D. Gneiding, Lab. Nacional de Astrofísica (Brazil); Beatriz Barbuy, Univ. de São Paulo (Brazil); Damien J. Jones, Prime Optics (Australia); Jacques Lepine, Univ. de São Paulo (Brazil); Vanessa B. P. Macanhan, João Batista Carvalho de Oliveira, Lab. Nacional de Astrofísica (Brazil); Fernando G. Santoro, New Mexico Institute of Mining and Technology (United States); Keith Taylor, Univ. de São Paulo (Brazil) [7739-101]

5:00 pm: **Combining laser frequency combs and iodine cell calibration techniques for Doppler detection of exoplanets**, Kerri L. Cahoy, NASA Ames Research Ctr. (United States); Debra A. Fischer, Julien F. P. Spronck, David P. DeMille, Yale Univ. (United States) [7739-102]

5:20 pm: **The Brazilian tunable filter imager for SOAR**, Keith Taylor, Claudia Mendes de Oliveira, Univ. de São Paulo (Brazil); Rene Laporte, Instituto Nacional de Pesquisas Espaciais (Brazil); Christian D. Guzman, AstroInventions (Chile); Javier Ramirez Fernandez, Sergio Scarano, Jr., Giseli de Araujo Ramos, Univ. de São Paulo (Brazil); Henri Plana, Univ. Estadual de Santa Cruz (Brazil); Fernando E. Lourenco, Univ. Estadual Paulista (Brazil); Jean-Luc Gach, Observatoire Astronomique de Marseille-Provence (France); Fernando L. Fontes, XNOVA Tecnologia (Brazil); Fabricio Ferrari, Univ. Federal do Pampa (Brazil); Luiz Cavalcanti, Edna C. Gutierrez Castañeda, Alvaro de Calasans, Univ. de São Paulo (Brazil); Philippe Balard, Observatoire Astronomique de Marseille-Provence (France); Denis Andrade, Univ. de São Paulo (Brazil); Philippe Amram, Observatoire Astronomique de Marseille-Provence (France) [7739-103]

Software and Cyberinfrastructure for Astronomy

Conference Chairs: **Nicole M. Radziwill**, James Madison Univ. and National Radio Astronomy Observatory; **Alan Bridger**, UK Astronomy Technology Ctr. (United Kingdom)

Program Committee: **Gianluca Chiozzi**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Kim K. Gillies**, Space Telescope Science Institute; **Bret D. Goodrich**, National Solar Observatory; **Robert I. Kibrick**, Lick Observatory; **Hilton A. Lewis**, Keck Observatory and California Association for Research in Astronomy; **Gianni Raffi**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **David L. Terrett**, Science and Technology Facilities Council (United Kingdom)

Sunday 27 June

SESSION 1

Room: Pacific Salon II. Sun. 9:00 to 10:20 am

Control Systems I

Session Chair: **Alan Bridger**,
UK Astronomy Technology Ctr. (United Kingdom)

9:00 am: **Control software and electronics architecture design in the framework of the E-ELT instrumentation**, Paolo Di Marcontonio, Igor Coretti, Roberto Cirami, Maurizio Comari, Paolo Santin, Mauro Pucillo, Osservatorio Astronomico di Trieste (Italy) [7740-01]

9:20 am: **Flight control software for the wave-front sensor of Sunrise 1m Balloon Telescope**, Alexander Bell, Kiepenheuer Institut für Sonnenphysik (Germany); Peter Barthol, Max-Planck-Institut für Sonnensystemforschung (Germany); Thomas Berkefeld, Bernhard Feger, Kiepenheuer Institut für Sonnenphysik (Germany); Achim M. Gandorfer, Max-Planck-Institut für Sonnensystemforschung (Germany); Frank Heidecke, Kiepenheuer Institut für Sonnenphysik (Germany); Michael Knoelker, National Ctr. for Atmospheric Research (United States); Valentin M. Pillet, Instituto de Astrofísica de Canarias (Spain); Wolfgang Schmidt, Michael Sigwarth, Kiepenheuer Institut für Sonnenphysik (Germany); Sami K. Solanki, Max-Planck-Institut für Sonnensystemforschung (Germany); Dirk Soltau, Kiepenheuer Institut für Sonnenphysik (Germany); Alan M. Title, Lockheed Martin Space Systems Co. (United States) [7740-02]

9:40 am: **The LUCIFER control software**, Marcus Jütte, Volker Knierim, Kai Polsterer, Ruhr-Univ. Bochum (Germany); Michael Lehmitz, Clemens Storz, Max-Planck-Institut für Astronomie (Germany); Walter Seifert, Landessternwarte Heidelberg (Germany); Nancy Ageorges, Max-Planck-Institut für extraterrestrische Physik (Germany) [7740-03]

10:00 am: **The LBT real-time based control software to mitigate and compensate vibrations**, Jose Luis Borelli, Martin Kuerster, Wolfgang Gaessler, Thomas Bertram, Mario Brix, Florian Briegel, Max-Planck-Institut für Astronomie (Germany) . . [7740-73]

Coffee Break 10:20 to 10:50 am

SESSION 2

Room: Pacific Salon II. Sun. 10:50 am to 12:10 pm

Control Systems II

Session Chair: **Gianluca Chiozzi**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

10:50 am: **Control software architecture for the SALT Robert Stobie Spectrograph**, Anthony R. Koeslag, Janus D. Brink, Peter Menzies, South African Astronomical Observatory (South Africa); Kenneth H. Nordsieck, Jeffrey W. Percival, Univ. of Wisconsin-Madison (United States); Ted B. Williams, Rutgers, The State Univ. of New Jersey (United States); Mike Smith, Univ. of Wisconsin-Madison (United States) [7740-05]

11:10 am: **Software systems for operation, control, and monitoring of the EBEX instrument**, Michael Milligan, Univ. of Minnesota (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); François Aubin, McGill Univ. (Canada); Carlo Baccigalupi, Scuola Internazionale Superiore di Studi Avanzati (Italy); Chaoyun Bao, Univ. of Minnesota (United States); Julian Borrill, Christopher Cantalupo, Lawrence Berkeley National Lab. (United States); Daniel Chapman, Joy Didier, Columbia Univ. (United States); Matthew Dobbs, McGill Univ. (Canada); Will F. Grainger, Cardiff Univ. (United Kingdom); Shaul Hanany, Univ. of Minnesota (United States); Seth N. Hillbrand, Columbia Univ. (United States); Johannes Hubmayr, National Institute of Standards and Technology (United States); Andrew Jaffe, Imperial College London (United Kingdom); Bradley Johnson, Univ. of California, Berkeley (United States); Theodore S. Kisner, National Institute of Standards and Technology (United States); Jeffrey Klein, Univ. of Minnesota (United States); Andrei L. Korotkov, Brown Univ. (United States); Samuel Leach, Scuola Internazionale Superiore di Studi Avanzati (Italy); Adrian T. Lee, Univ. of California, Berkeley (United States); Lorne Levinson, Weizmann Institute of Science (Israel); Michele Limon, Columbia Univ. (United States); Kevin MacDermid, McGill Univ. (Canada); Tomotake Matsumura, California Institute of Technology (United States); Amber Miller, Columbia Univ. (United States); Enzo Pascale, Cardiff Univ. (United Kingdom); Daniel Polsgrrove, Univ. of Minnesota (United States); et al. [7740-06]

11:30 am: **Faking it for pleasure and profit: the use of hardware simulation at AAO**, Keith Shortridge, Minh Vuong, Anglo-Australian Observatory (Australia) [7740-07]

11:50 am: **OAdM Robotic Observatory: openROCS and dome control**, Josep Colome, Institut d'Estudis Espacials de Catalunya (Spain) and Institute of Space Sciences - CSIC (Spain); Xavier Francisco, Institut d'Estudis Espacials de Catalunya (Spain); Ignasi Ribas, Institut d'Estudis Espacials de Catalunya (Spain) and Institute of Space Sciences - CSIC (Spain) [7740-08]

Lunch Break 12:10 to 1:40 pm

SESSION 3

Room: Pacific Salon II. Sun. 1:40 to 3:30 pm

Real-Time/Events

Session Chair: **David L. Terrett**,
Rutherford Appleton Lab. (United Kingdom)

1:40 pm: **Heterogeneous real-time computing in radio astronomy (Invited Paper)**, John M. Ford, Scott Ransom, Paul Demorest, National Radio Astronomy Observatory (United States) [7740-09]

2:10 pm: **Astronomers as mechanical turks: distributing decision making in real time**, Alasdair Allan, The Univ. of Exeter (United Kingdom) [7740-10]

2:30 pm: **Skyaler: a platform for event understanding and dissemination**, Roy D. Williams, California Institute of Technology (United States) [7740-11]

2:50 pm: **Transiting planet search in the Kepler pipeline**, Jon M. Jenkins, Hema Chandrasekaran, Sean D. McCauliff, Douglas A. Caldwell, Peter Tenenbaum, Jie Li, Todd C. Klaus, Miles T. Cote, Christopher Middour, NASA Ames Research Ctr. (United States) [7740-12]

3:10 pm: **Adapting a publish-subscribe (DDS) middleware to a RPC style command response pattern**, Doug Morrison, James M. Johnson, W. M. Keck Observatory (United States) [7740-13]

Coffee Break 3:30 to 4:00 pm



SESSION 4

Room: Pacific Salon II Sun. 4:00 to 5:40 pm

Data Processing Operations

Session Chair: Robert I. Kibrick, Lick Observatory

4:00 pm: **Lessons learned deploying a second-generation observation control system for Subaru Telescope**, Eric Jeschke, Takeshi Inagaki, National Astronomical Observatory of Japan/Subaru Telescope (United States) [7740-16]

4:20 pm: **Control and data handling for the EST European Solar Telescope**, Ilaria Ermolli, Osservatorio Astronomico di Roma (Italy); Felix C. M. Bettonvil, Utrecht Univ. (Netherlands); Gianna Cauzzi, Osservatorio Astrofisico di Arcetri (Italy); Manuel Collados Vera, Instituto de Astrofísica de Canarias (Spain); Paolo Di Marcantonio, Osservatorio Astronomico di Trieste (Italy); Frederic Paletou, Univ. de Toulouse (France); Paolo Romano, Osservatorio Astrofisico di Catania (Italy); Jean Abouardham, Observatoire de Paris à Meudon (France); Roberto Cirami, Osservatorio Astronomico di Trieste (Italy); Rosario Cosentino, Osservatorio Astrofisico di Catania (Italy); Martine Lafon, Univ. de Toulouse (France); Didier Laforge, Instituto de Astrofísica de Canarias (Spain); Mauro Pucillo, Osservatorio Astronomico di Trieste (Italy); Kevin Reardon, Osservatorio Astrofisico di Arcetri (Italy); Guus Sliepen, Utrecht Univ. (Netherlands) [7740-17]

4:40 pm: **Science data quality assessment for the Large Synoptic Survey Telescope**, Richard A. Shaw, Kitt Peak National Observatory (United States); Deborah Levine, California Institute of Technology (United States); Timothy Axelrod, LSST Corp. (United States); Russ R. Laher, Vince G. Mannings, Jeonghee Rho, California Institute of Technology (United States) [7740-18]

5:00 pm: **LBT data mining leads to increased open shutter time**, Norman J. Cushing, Christopher Biddick, David J. Thompson, John M. Hill, Michele D. De La Pena, Torsten Leibold, The Univ. of Arizona (United States) [7740-19]

5:20 pm: **An algorithm for fitting of planet models to Kepler light curves**, Peter Tenenbaum, Jon M. Jenkins, Hema Chandrasekaran, Jie Li, Elisa V. Quintana, Joseph D. Twicken, NASA Ames Research Ctr. (United States) [7740-20]

Sunday Poster Session

Room: Grand Exhibit Hall Sun. 6:00 to 7:30 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Sunday. The interactive poster session with authors in attendance will be Sunday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

Development of an analysis framework for HSC and Belle II, Sogo Mineo, Hiroaki Aihara, The Univ. of Tokyo (Japan); Nobuhiko Katayama, Ryosuke Itoh, High Energy Accelerator Research Organization (Japan); Hisanori Furusawa, Yuki Okura, National Astronomical Observatory of Japan (Japan); Naoki Yasuda, The Univ. of Tokyo (Japan); Satoshi Miyazaki, National Astronomical Observatory of Japan (Japan) [7740-62]

The MOSFIRE desktop: a highly customizable, GUI-building user interface for the MOSFIRE instrument, Jason L. Weiss, Univ. of California, Los Angeles (United States) [7740-63]

Experience with a new approach for instrument software at Gemini, Arturo J. Nunez, Shane Walker, Gemini Observatory (Chile); Jennifer Dunn, National Research Council Canada (Canada); Kim K. Gillies, Space Telescope Science Institute (United States) [7740-64]

New architectures support for ALMA common software: lessons learned and taught, Camilo Menay, Gabriel Zamora, Rodrigo J. Tobar, Univ. Tecnica Federico Santa Maria (Chile); Jorge Avarias, National Radio Astronomy Observatory (United States); Kevin Dahl-skog, Horst H. von Brand, Univ. Tecnica Federico Santa Maria (Chile) [7740-65]

Photometer performance assessment in Kepler science data processing, Jie Li, Christopher Allen, Stephen T. Bryson, Douglas A. Caldwell, Hema Chandrasekaran, Bruce D. Clarke, Jay P. Gunter, Jon M. Jenkins, Todd C. Klaus, Elisa V. Quintana, Peter Tenenbaum, Joseph D. Twicken, Bill Wohler, Hayley Wu, NASA Ames Research Ctr. (United States) [7740-66]

Presearch data conditioning in the Kepler Science Operations Center pipeline, Joseph D. Twicken, Hema Chandrasekaran, Jon M. Jenkins, Jay P. Gunter, Forrest R. Girouard, Todd C. Klaus, NASA Ames Research Ctr. (United States) [7740-67]

Design of modular C++ observatory control system: from observatories to laboratories and back, Petr Kubanek, Instituto de Astrofísica de Andalucía (Spain) and IPL UV Valencia (Spain) and Fyzikální ústav AVČR, v.v.i. (Czech Republic); Martin Jelínek, Instituto de Astrofísica de Andalucía (Spain); Michael Prouza, Institute of Physics of the ASCR, v.v.i. (Czech Republic); Antonio de Ugarte Postigo, Osservatorio Astronomico di Brera (Italy); Jan Štrobil, Astronomical Institute of the ASCR, v.v.i. (Czech Republic); Ivan Kotov, Paul O'Connor, Brookhaven National Lab. (United States) [7740-68]

Collaborative use of the common services framework at ATST and Keck Observatories, Bret D. Goodrich, National Solar Observatory (United States); James M. Johnson, W. M. Keck Observatory (United States); Steve Wampler, John R. Hubbard, Erik Johannson, National Solar Observatory (United States); Doug Morrison, W. M. Keck Observatory (United States) [7740-69]

Pixel-level calibration in the Kepler Science Operations Center pipeline, Elisa V. Quintana, Jon M. Jenkins, Bruce D. Clarke, Joseph D. Twicken, Sean D. McCauliff, Miles T. Cote, Todd C. Klaus, Hema Chandrasekaran, Christopher Allen, Douglas A. Caldwell, Stephen T. Bryson, NASA Ames Research Ctr. (United States) [7740-70]

New direction in the development of the observation software framework (BOSS), Eszter Pozna, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-71]

JCMT telescope control system upgrades for SCUBA-2, Russell D. Kackley, Joint Astronomy Ctr. (United States); Edward Chapin, Douglas Scott, The Univ. of British Columbia (Canada) [7740-72]

A framework for propagation of uncertainties in the Kepler data analysis pipeline, Bruce D. Clarke, Christopher Allen, Stephen T. Bryson, Douglas A. Caldwell, Hema Chandrasekaran, Miles T. Cote, Forrest R. Girouard, Jon M. Jenkins, Todd C. Klaus, Jie Li, Sean D. McCauliff, Elisa V. Quintana, Peter Tenenbaum, Joseph D. Twicken, Bill Wohler, Hayley Wu, NASA Ames Research Ctr. (United States) [7740-74]

Using ICE to provide a multi-platform interface to the Teledyne SIDECAR ASIC, Jason L. Weiss, Univ. of California, Los Angeles (United States); James M. Johnson, W. M. Keck Observatory (United States); Chris A. Johnson, Univ. of California, Los Angeles (United States) [7740-75]

SPHERE data reduction software: first insights into data reduction software development for next-generation instruments, Ole Moeller-Nilsson, Markus Feldt, Aleksej I. Pavlov, Max-Planck-Institut für Astronomie (Germany) [7740-76]

Photometric analysis in the Kepler Science Operations Center pipeline, Joseph D. Twicken, Bruce D. Clarke, Stephen T. Bryson, Peter Tenenbaum, Hayley Wu, Jon M. Jenkins, Forrest R. Girouard, Todd C. Klaus, NASA Ames Research Ctr. (United States) [7740-77]

High-performance graphical data trending in a distributed system, Cristián D. Maureira, Univ. Tecnica Federico Santa Maria (Chile); Arturo A. Hoffstadt, Univ. Tecnica Federico Santa Maria (Chile) and ALMA Observatory (Chile); Joao S. López, Univ. Tecnica Federico Santa Maria (Chile); Nicolas Troncoso, Atacama Large Millimeter Array (Chile) and Univ. Técnica Federico Santa Maria (UTFSM) (Chile); Rodrigo J. Tobar, European Southern Observatory (Germany); Horst H. von Brand, Univ. Tecnica Federico Santa Maria (Chile) [7740-78]

A simple way to build from scratch an ANSI-C like compiler and embed it on the instruments software, Alicia Rodríguez, Rafael Morales, Miguel Abril, Luis Pedro Costillo, María Concepción Cárdenas Vázquez, Ovidio Rabaza, Alejandro Ramón, Miguel A. Sánchez Carrasco, Santiago Becerril, Pedro José Amado, Instituto de Astrofísica de Andalucía (Spain) [7740-79]

Science Analysis Portal for the Dark Energy Survey Collaboration, Leandro Martelli, Luiz A. N. da Costa, Bruno M. Rossetto, Ricardo L. C. Ogando, Observatório Nacional (Brazil); Carlos Brandt, Ctr. Brasileiro de Pesquisas Físicas (Brazil); Angelo Fausti Neto, Univ. Federal do Rio Grande do Sul (Brazil); Martin Makler, Ctr. Brasileiro de Pesquisas Físicas (Brazil); Beatriz Ramos, Fernando S. de Simoni, Observatorio Nacional (Brazil) [7740-80]

A methodological proposal for the development of an HPC-based antenna array scheduler, Roberto Bonvallet, Arturo A. Hoffstadt, Diego Herrera, Daniela Lopez, Rodrigo Gregorio, Manuel Almuna, Univ. Tecnica Federico Santa Maria (Chile); Rafael Hiriart, National Radio Astronomy Observatory (United States); Mauricio Solar, Univ. Tecnica Federico Santa Maria (Chile) [7740-81]

Choosing a control system for CCAT, David L. Terrett, Patrick T. Wallace, Rutherford Appleton Lab. (United Kingdom); Alan Bridger, Dennis Kelly, UK Astronomy Technology Ctr. (United Kingdom) [7740-82]

Progress in cancellable, multi-threaded, control software, Keith Shortridge, Tony J. Farrell, Anglo-Australian Observatory (Australia) [7740-84]

A solution for remote-upgrading field controllers based on FPGA Cyclone 2C35, Dan Zhu, Yuhua Zhu, Nanjing Univ. of Posts and Telecommunications (China); Jianing Wang, Nanjing Institute of Astronomical Optics & Technology (China) [7740-85]

A virtual reality environment for telescope operation, Luis A. Martínez, Fernando Angeles, Abel Bernal, José L. Villarreal, Univ. Nacional Autónoma de México (Mexico) [7740-86]

Middleware design and implementation for LSST, David Mills, German Schumacher, National Optical Astronomy Observatory (United States) [7740-87]

The research on direct-drives control system in the large-aperture telescope, Xiaoyan Li, Nanjing Institute of Astronomical Optics & Technology (China) and Graduate Univ. of Chinese Academy of Sciences (China); Zhenchao Zhang, Daxing Wang, Nanjing Institute of Astronomical Optics & Technology (China) [7740-88]

The PANIC software system, Jose-Miguel Ibáñez Mengual, Matilde Fernández, Julio F. Rodríguez Gómez, Antonio J. García, Instituto de Astrofísica de Andalucía (Spain); Clemens Storz, Max-Planck-Institut für Astronomie (Germany) [7740-89]

- Practical considerations for pointing a binocular telescope**, Michele D. De La Pena, Large Binocular Telescope Observatory (United States); David L. Terrett, Rutherford Appleton Lab. (United Kingdom); David J. Thompson, Large Binocular Telescope Observatory (United States) [7740-90]
- A high-efficient and fast KNN algorithm based on CUDA**, Tong Pei, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China) [7740-91]
- The Blanco Telescope TCS upgrade**, German Schumacher, Eduardo Mondaca, Michael Warner, Omar Estay, Manuel Martinez, Timothy M. C. Abbott, Cerro Tololo Inter-American Observatory (Chile) [7740-92]
- A prototype of Hyper Suprime-Cam data analysis system**, Hisanori Furusawa, National Astronomical Observatory of Japan (Japan); Naoki Yasuda, The Univ. of Tokyo (Japan); Yuki Okura, National Astronomical Observatory of Japan (Japan); Fumiaki Nakata, National Astronomical Observatory of Japan (United States); Sogo Mineo, The Univ. of Tokyo (Japan); Tadafumi Takata, National Astronomical Observatory of Japan (Japan); Manobu Tanaka, Ryoosuke Itoh, Nobuhiko Katayama, High Energy Accelerator Research Organization (Japan); Yutaka Komiyama, Satoshi Miyazaki, Yousuke Utsumi, National Astronomical Observatory of Japan (Japan); Hiroaki Aihara, The Univ. of Tokyo (Japan); Uchida Tomohisa, High Energy Accelerator Research Organization (Japan); Robert H. Lupton, Princeton Univ. (United States) [7740-93]
- Dedicated versus realtime Linux-based adaptive optics systems for LINC-NIRVANA**, Florian R. Briegel, Jürgen Berwein, Thomas Bertram, Wolfgang Gaessler, Max-Planck-Institut für Astronomie (Germany); Alfio T. Puglisi, Lorenzo Busoni, Osservatorio Astrofisico di Arcetri (Italy); Frank Kittmann, Univ. zu Köln (Germany) [7740-94]
- Instrument-specific features within the observation preparation software for LINC-NIRVANA**, Aleksej I. Pavlov, Jan Trowitzsch, Max-Planck-Institut für Astronomie (Germany) [7740-95]
- Research of remote control for Chinese Antarctica Telescope based on iridium satellite communication**, Lingzhe Xu, XinQi Xu, Shihai Yang, Nanjing Institute of Astronomical Optics & Technology (China) [7740-97]
- Comparison of several algorithms for celestial object classification**, Nanbo Peng, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China) [7740-98]
- Design and realization of the IP control core in field controllers for LAMOST spectroscopes**, Jianing Wang, Zhongyi Han, Yizhong Zeng, Songxin Dai, Yongtian Zhu, Zhongwen Hu, Lei Wang, Yong-Hui Hou, Nanjing Institute of Astronomical Optics & Technology (China) [7740-99]
- Approaches for photometric redshift estimation of quasars from SDSS and UKIDSS**, Dan Wang, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China) [7740-100]
- Clock synchronization of motor control systems and PC system time**, Frank Kittmann, Max-Planck-Institut für Astronomie (Germany) and Univ. zu Köln (Germany); Thomas Bertram, Florian Briegel, Jürgen Berwein, Max-Planck-Institut für Astronomie (Germany) [7740-101]
- Producing an LSST data release**, Timothy Axelrod, The Univ. of Arizona (United States); Jeff Kantor, LSST Corp. (United States) [7740-102]
- The ATST base: command-action-response in action**, John R. Hubbard, Bret D. Goodrich, Steve Wampler, National Solar Observatory (United States) [7740-103]
- Automated classification of pointed sources**, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China); Hongwen Zheng, North China Electric Power Univ. (China) [7740-104]
- Support vector machines for quasar selection**, Nanbo Peng, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China) [7740-105]
- The design of LBT's telemetry source registration**, Tony Edgin, Norman J. Cushing, The Univ. of Arizona (United States) [7740-106]
- Design considerations for LBTI observer interface**, Vidhya Vaitheeswaran, Phillip M. Hinz, Christopher O'Connell, Joseph Kraus, Steward Observatory, The Univ. of Arizona (United States) [7740-107]
- A multistrategy control system for field controllers of astronomical instruments**, Dan Zhu, Yuhua Zhu, Nanjing Univ. of Posts and Telecommunications (China) [7740-108]
- A simple and effective algorithm for quasar candidate selection**, Tong Pei, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China) [7740-109]
- An automated algorithm for determining photometric redshifts of quasars**, Dan Wang, Yanxia Zhang, Yongheng Zhao, National Astronomical Observatories (China) [7740-110]
- Separating quasars from stars by support vector machines**, Yanxia Zhang, National Astronomical Observatories (China); Hongwen Zheng, North China Electric Power Univ. (China); Yongheng Zhao, National Astronomical Observatories (China) [7740-111]
- Development of an automatic program to count the number of sunspots using Visual C++**, Jong-Yeob Park, Yong-Jae Moon, Kyung Hee Univ. (Korea, Republic of); Sung-Hwan Choi, Kyung Hee Univ. (Korea, Republic of) and Korea Astronomy and Space Science Institute, Daejeon 305-348 (Korea, Republic of) [7740-112]
- Calibration of LAMOST spectral analysis**, Fengfei Wang, A-Li Luo, National Astronomical Observatories (China) [7740-113]
- Control, acquisition, and reduction software for infrared spectrometers**, Emanuel Rossetti, Livia Origlia, Osservatorio Astronomico di Bologna (Italy); Ernesto Oliva, Carlo Baffa, Elisabetta Giani, Osservatorio Astrofisico di Arcetri (Italy); Paolo Montegriffo, Osservatorio Astronomico di Bologna (Italy) [7740-114]
- Robustness of LAMOST networked control system**, A-Li Luo, Kefei Wu, National Astronomical Observatories (China) [7740-115]
- Research of large telescope control system**, Shuai Xiao Ying, Chizhou College (China); Zhenchao Zhang, Nanjing Institute of Astronomical Optics & Technology (China) [7740-116]
- Position measurement of the direct-drive motor of large-aperture telescope**, Ying Li, Daxing Wang, Zhenchao Zhang, Nanjing Institute of Astronomical Optics & Technology (China) [7740-117]
- Design and implementation of LAMOST CCD cameras' master control**, Xiaochao Deng, Jin Ge, Jian Wang, Univ. of Science and Technology of China (China) [7740-118]
- The primary mirror system control software for the VST**, Pietro Schipani, Laurent Marty, Osservatorio Astronomico di Capodimonte (Italy) [7740-119]
- Telescope information service system of LAMOST**, Shiwei Sun, National Astronomical Observatories (China) [7740-120]
- A code generation framework for ALMA common software**, Nicolas Troncoso, Atacama Large Millimeter Array (Chile) and Universidad Técnica Federico Santa María (Chile); Horst H. von Brand, Univ. Tecnica Federico Santa María (Chile); Jorge Ibsen, European Southern Observatory (Chile); Matias Mora, Atacama Large Millimeter Array (Chile) and Universidad Técnica Federico Santa María (Chile); Victor Gonzalez, Atacama Large Millimeter Array (Chile); Gianluca Chiozzi, Bogdan Jeram, Heiko Sommer, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-121]
- The interaction between pointing and active optics on the VISTA Telescope**, David L. Terrett, Rutherford Appleton Lab. (United Kingdom); William J. Sutherland, Queen Mary, Univ. of London (United Kingdom) [7740-122]
- MOCS: a new control system for the Mercator Telescope**, Wim Pessemier, Gert Raskin, Saskia Prins, Florian Merges, Jesus P. Padilla, Hans Van Winckel, Christoffel Waelkens, Katholieke Univ. Leuven (Belgium) [7740-123]
- A high-availability, distributed hardware control system using Java**, Al Niessner, Jet Propulsion Lab. (United States) [7740-124]
- Zigbee networking technology and its application in Lamost optical fiber positioning and control system**, Jin Yi, Zhai Chao, Yonggang Gu, Xiaofeng Gai, Univ. of Science and Technology of China (China) [7740-125]
- Realizing software longevity over a system's lifetime**, Kyle Lanclos, William T. S. Deich, Robert I. Kibrick, Steven L. Allen, John Gates, Lick Observatory (United States) [7740-126]
- Instrument control software requirement specification for extreme large telescopes**, Mario J. Kiekebusch, Gianluca Chiozzi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Peter Young, The Australian National Univ. (Australia) [7740-127]
- Introducing high-performance distributed logging service for ACS**, Jorge Avarias, National Radio Astronomy Observatory (United States); Joao S. López, Cristián D. Maureira, Univ. Tecnica Federico Santa María (Chile); Heiko Sommer, Gianluca Chiozzi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-128]
- A new control system hardware architecture for the Hobby-Eberly Telescope prime focus instrument package**, Chuck Ramiller, Trey Taylor, Tom H. Rafferty, Mark E. Cornell, Marc D. Rafal, Richard D. Savage, The Univ. of Texas at Austin (United States) [7740-129]
- Integrating a university team in the ALMA software development process: a successful model for distributed collaborations**, Matias Mora, Atacama Large Millimeter Array (Chile) and Universidad Técnica Federico Santa María (Chile); Jorge Ibsen, European Southern Observatory (Chile); Gianluca Chiozzi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Nicolas Troncoso, Atacama Large Millimeter Array (Chile) and Universidad Técnica Federico Santa María (Chile); Mauricio Araya, Institut National de Recherche en Informatique (France); Rodrigo J. Tobar, European Southern Observatory (Germany); Jorge Avarias, National Radio Astronomy Observatory (United States); Arturo A. Hoffstadt, Univ. Tecnica Federico Santa María (Chile) [7740-130]

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SPHERE instrumentation software in the construction and integration phases, Andrea Baruffolo, Osservatorio Astronomico di Padova (Italy); Pietro Bruno, Osservatorio Astrofisico di Catania (Italy); Daniela Fantinel, Osservatorio Astronomico di Padova (Italy); Enrico Fedrigo, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Laurence Gluck, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Mario J. Kiekebusch, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Mickael Micallef, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Bernardo Salasnich, Osservatorio Astronomico di Padova (Italy); Peter Steiner, ETH Zürich (Switzerland); Gérard Zins, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7740-131]

The OAdM Robotic Observatory: the scheduler, Josep Colome, Institut d'Estudis Espacials de Catalunya (Spain) and Institute of Space Sciences - CSIC (Spain); Xavier Francisco, Institut d'Estudis Espacials de Catalunya (Spain); Ignasi Ribas, Institut d'Estudis Espacials de Catalunya (Spain) and Institute of Space Sciences - CSIC (Spain) [7740-132]

UCam: universal camera controller and data acquisition system, Stewart A. McLay, UK Astronomy Technology Ctr. (United Kingdom); Derek J. Ives, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-133]

An object-oriented software framework for telemetry and data logging at the MMT Observatory, Tucson, Arizona, USA, J. Duane Gibson, Tom Trebisky, Dallon Porter, Skip Schaller, MMT Observatory (United States) [7740-134]

Software for automated CCD testing and characterization for Large Synoptic Survey Telescope, Michael Prouza, Institute of Physics of the ASCR, v.v.i. (Czech Republic); Petr Kubanek, Instituto de Astrofísica de Andalucía (Spain) and IPL UV Valencia (Spain) and Fyzikální ústav AV ČR, v.v.i. (Czech Republic); Paul O'Connor, Ivan Kotov, James Frank, Brookhaven National Lab. (United States) [7740-135]

Software for automated run-time determination of calibration values and hardware capabilities in torrent detector control systems, Nick C. Buchholz, Philip N. Daly, National Optical Astronomy Observatory (United States) [7740-136]

World coordinate system keywords for FITS files from Lick Observatory, Steven L. Allen, John Gates, Robert I. Kibrick, Lick Observatory (United States) [7740-137]

Re-using the NOCS as a common instrument interface, Philip N. Daly, National Optical Astronomy Observatory (United States) [7740-138]

Upgrading the Gemini secondary mirror micro-controller, Mathew J. Rippha, Gemini Observatory (United States) [7740-139]

Effect of noise in image restoration of Multi-aperture Telescope, Zhiwei Zhou, Dayong Wang, Yunxin Wang, Yuhong Wan, Beijing Univ. of Technology (China) [7740-140]

Programmable workflow control with rule check on LAMOST, Guangcao Liu, Jian Wang, Xiaochao Deng, Jin Ge, Univ. of Science and Technology of China (China) [7740-141]

10:40 am: **Complex/large data sets: information representation and processing on manifolds and graphs**, Meyer Z. Pesenson, California Institute of Technology (United States); Isaac Z. Pesenson, Temple Univ. (United States); Bruce McCollum, California Institute of Technology (United States) [7740-22]

11:00 am: **The Kepler DB: a database management system for arrays, sparse arrays, and binary objects**, Sean D. McCauliff, Todd C. Klaus, Forrest R. Girouard, Bill Wohler, Christopher Middour, Miles T. Cote, NASA Ames Research Ctr. (United States) [7740-23]

11:20 am: **An open source, service-oriented architecture for the WIYN one degree imager software system**, Andrey Yeatts, John W. Ivens, Daniel R. Harbeck, WIYN Observatory (United States); John Cavin, Univ. of Wisconsin-Madison (United States) [7740-24]

11:40 am: **Discovery Channel Telescope software key technologies**, Paul J. Lotz, Lowell Observatory (United States) [7740-25]

12:00 pm: **Future management needs of a 'software-driven' science community**, Ole Moeller-Nilsson, Max-Planck-Institut für Astronomie (Germany); Kim Nilsson, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-26]

Lunch Break 12:20 to 1:40 pm

SESSION 6

Room: Pacific Salon II. Mon. 1:40 to 3:20 pm

Cyberinfrastructure I

Session Chair: Gianluca Chiozzi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

1:40 pm: **An observation execution system for next-generation large telescopes**, Kim K. Gillies, Space Telescope Science Institute (United States); Shane Walker, Gemini Observatory (Chile) [7740-27]

2:00 pm: **Software architecture of the Magdalena Ridge Observatory interferometer**, Allen R. Farris, Daniel A. Klingsmith III, John Seamons, Nicolas Torres, New Mexico Institute of Mining and Technology (United States); David F. Buscher, John Young, Univ. of Cambridge (United Kingdom) [7740-28]

2:20 pm: **Designing a high-availability cluster for the Subaru Telescope second-generation observation control system**, Eric Jeschke, Takeshi Inagaki, National Astronomical Observatory of Japan/Subaru Telescope (Japan) [7740-29]

2:40 pm: **Evolution of the VLT instrument control system toward industry standards**, Mario J. Kiekebusch, Gianluca Chiozzi, Jens Knudstrup, Dan Popovic, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Gérard Zins, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7740-30]

3:00 pm: **Operating global network of autonomous observatories**, Petr Kubanek, Instituto de Astrofísica de Andalucía (Spain) and IPL UV Valencia (Spain); Martin Jelínek, Instituto de Astrofísica de Andalucía (Spain); Michael Prouza, Institute of Physics of the ASCR, v.v.i. (Czech Republic); Alberto J. Castro-Tirado, Instituto de Astrofísica de Andalucía (Spain); Antonio de Ugarte Postigo, Osservatorio Astronomico di Brera (Italy); Jan Strobl, René Hudec, Astronomical Institute of the ASCR, v.v.i. (Czech Republic); Philip Yock, Univ. of Auckland (New Zealand); William H. Allen, Vintage Lane Observatory (New Zealand); Javier U. Gorosabel, Instituto de Astrofísica de Andalucía (Spain) [7740-31]

Coffee Break 3:20 to 3:50 pm

SESSION 7

Room: Pacific Salon II. Mon. 3:50 to 5:30 pm

Common Services/Reuse

Session Chair: Hilton A. Lewis, California Association for Research in Astronomy

3:50 pm: **Achieving reusability in KMOS instrument software through design patterns**, Michael Wegner, Bernard Muschielok, Univ.-Sternwarte München (Germany) [7740-32]

4:10 pm: **Re-using the VLT control system on the VISTA Telescope**, David L. Terrett, Rutherford Appleton Lab. (United Kingdom); Malcolm Stewart, Sulaire Systems (United Kingdom) [7740-33]

4:30 pm: **Evaluating and evolving common services framework for use at W.M.K.O.**, James M. Johnson, W. M. Keck Observatory (United States); Steve Wampler, National Solar Observatory (United States); Kevin McCann, W.M. Keck Observatory (United States) [7740-34]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 5

Room: Pacific Salon II. Mon. 10:10 am to 12:20 pm

VO/Archive

Session Chair: Kim K. Gillies, Space Telescope Science Institute

10:10 am: **Building archives in the virtual observatory era (Invited Paper)**, Raymond L. Plante, Univ. of Illinois at Urbana-Champaign (United States); Gretchen Greene, Robert J. Hanisch, Space Telescope Science Institute (United States); Thomas A. McGlynn, NASA Goddard Space Flight Ctr. (United States); Christopher J. Miller, National Optical Astronomy Observatory (United States); Doug Tody, National Radio Astronomy Observatory (United States); Richard L. White, Space Telescope Science Institute (United States) [7740-21]

4:50 pm: **Integration of SCUBA-2 within the JCMT Observatory control system**, Craig A. Walther, Joint Astronomy Ctr. (United States); Xiaofeng Gao, Dennis Kelly, UK Astronomy Technology Ctr. (United Kingdom); Russell D. Kackley, Tim Jenness, Joint Astronomy Ctr. (United States). [7740-35]

5:10 pm: **Commensal observing with the Allen Telescope array: software command and control**, Colby Gutierrez-Kraybill, Garrett Keating, Univ. of California, Berkeley (United States); Jon Richards, Gerald Harp, Robert Ackermann, William C. Barott, NASA Ames Research Ctr. (United States); David MacMahon, Univ. of California, Berkeley (United States). [7740-36]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany). [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany). [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands). [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands). [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States). [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States). [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 8

Room: Pacific Salon II. Tues. 2:00 to 3:40 pm

Web 2.0/User Interfaces

Session Chair: Bret D. Goodrich, National Solar Observatory

2:00 pm: **Writing Web 2.0 applications for science archives**, William W. Roby, California Institute of Technology (United States). [7740-37]

2:20 pm: **Build great web-based search applications quickly with Solr and Blacklight**, Ronald F. DuPlain, Dana S. Balsler, National Radio Astronomy Observatory (United States); Nicole M. Radziwill, James Madison Univ. (United States). [7740-38]

2:40 pm: **HTML 5, Websockets, and Sproutcore: a web-based user interface for the dark energy camera (DECAM)**, Jacob Eiting, Ann Elliott, Klaus Honscheid, The Ohio State Univ. (United States); Jim Annis, Elizabeth J. Buckley-Geer, William Wester, Fermi National Accelerator Lab. (United States); Michael Haney, William Hanlon, Inga Karliner, Jon Thaler, Univ. of Illinois (United States); Marco Bonati, German Schumacher, Cerro Tololo Inter-American Observatory (Chile); Kyler W. Kuehn, Stephen E. Kuhlmann, Argonne National Lab. (United States); Terry Schalk, Univ. of California, Santa Cruz (United States); Stuart Marshall, Aaron J. Roodman, SLAC National Accelerator Lab. (United States). [7740-39]

3:00 pm: **User interface software development for the WIYN one degree imager (ODI)**, John W. Ivens, Andrey Yeatts, Daniel R. Harbeck, John Cavin, Pierre Martin, WIYN Observatory (United States). [7740-40]

3:20 pm: **The use of Flex as a viable toolkit for astronomy software applications**, Alberto Conti, Anthony Rogers, Kim K. Gillies, Space Telescope Science Institute (United States). [7740-41]

Coffee Break 3:40 to 4:10 pm

SESSION 9

Room: Pacific Salon II. Tues. 4:10 to 5:50 pm

Lightning Talks

Session Chair: Nicole M. Radziwill, James Madison Univ.

Lightning talks are short (less than 5 minute) interest-driven talks where you can ask questions to the audience, present a new idea or insight, share an untested hypothesis, or just communicate lessons learned or other things you've found useful in your work. Simply show up and present your proposal and be prepared to give your brief presentation if selected.

You are encouraged to visit <http://perl.plover.com/lt/osc2003/lightning-talks.html> for examples of past sessions.

Wednesday 30 June

SESSION 10

Room: Pacific Salon II. Wed. 8:30 to 10:10 am

Pipelines/Kepler

Session Chair: Robert I. Kibrick, Lick Observatory

8:30 am: **An open source application framework for astronomical imaging pipelines**, Timothy Axelrod, The Univ. of Arizona (United States); Jeff Kantor, LSSST Corp. (United States). [7740-42]

8:50 am: **Automated calibration and imaging on the Allen Telescope array**, Garrett Keating, Melvyn C. H. Wright, Univ. of California, Berkeley (United States); William C. Barott, SETI Institute (United States). [7740-43]

9:10 am: **The Kepler Science Operations Center pipeline framework**, Todd C. Klaus, Sean D. McCauliff, Miles T. Cote, Forrest R. Girouard, Bill Wohler, Christopher Allen, Christopher Middour, Douglas A. Caldwell, Jon M. Jenkins, NASA Ames Research Ctr. (United States). [7740-44]

9:30 am: **The Kepler Science Operations Center pipeline framework extensions**, Todd C. Klaus, NASA Ames Research Ctr. (United States) and NASA Ames Research Center (United States); Miles T. Cote, NASA Ames Research Ctr. (United States); Sean D. McCauliff, Forrest R. Girouard, Bill Wohler, Hema Chandrasekaran, NASA Ames Research Ctr. (United States) and NASA Ames Research Center (United States); Stephen T. Bryson, NASA Ames Research Ctr. (United States); Christopher Allen, Christopher Middour, Douglas A. Caldwell, Jon M. Jenkins, NASA Ames Research Ctr. (United States) and NASA Ames Research Center (United States). [7740-45]

9:50 am: **Data validation in the Kepler Science Operations Center pipeline**, Hayley Wu, Joseph D. Twicken, Peter Tenenbaum, Bruce D. Clarke, Jie Li, Elisa V. Quintana, Christopher Allen, Hema Chandrasekaran, Jon M. Jenkins, Douglas A. Caldwell, Bill Wohler, Forrest R. Girouard, Sean D. McCauliff, Miles T. Cote, Todd C. Klaus, NASA Ames Research Ctr. (United States). [7740-46]

Coffee Break 10:10 to 10:40 am

SESSION 11

Room: Pacific Salon II. Wed. 10:40 am to 12:30 pm

Kepler Session

Session Chair: David L. Terrett, Rutherford Appleton Lab. (United Kingdom)

10:40 am: **Kepler Science Operations Center architecture** (*Invited Paper*), Christopher Middour, Todd C. Klaus, Jon M. Jenkins, Miles T. Cote, David Pletcher, Hema Chandrasekaran, Bill Wohler, Forrest R. Girouard, Christopher Allen, Jay P. Gunter, Kamal Uddin, Jennifer R. Hall, Khadeejah Ibrahim, Bruce D. Clarke, Jie Li, Sean D. McCauliff, Elisa V. Quintana, Peter Tenenbaum, Joseph D. Twicken, Hayley Wu, Douglas A. Caldwell, Stephen T. Bryson, Paresch Bhavsar, Michael Wu, NASA Ames Research Ctr. (United States); Jeneen Sommers, Stanford Univ. (United States); Brett A. Strozozas, Strozozas Operations & Management (United States); Brian Stamper, Christopher Page, Elaine Santiago, Terry Trombly, NASA Ames Research Ctr. (United States). [7740-47]

Conference 7740

11:10 am: **Semi-weekly monitoring of the performance and attitude of Kepler using a sparse set of targets**, Hema Chandrasekaran, Jon M. Jenkins, Forrest R. Girouard, Joseph D. Twicken, Douglas A. Caldwell, Christopher Allen, Stephen T. Bryson, Todd C. Klaus, Miles T. Cote, NASA Ames Research Ctr. (United States); Brett A. Strozozas, Strozozas Operations & Management (United States); Jennifer R. Hall, Khadeejah Ibrahim, NASA Ames Research Ctr. (United States). [7740-48]

11:30 am: **Focal plane geometry characterization of the Kepler Mission**, Peter Tenenbaum, Jon M. Jenkins, NASA Ames Research Ctr. (United States) . . . [7740-49]

11:50 am: **Selecting pixels for Kepler downlink**, Stephen T. Bryson, Jon M. Jenkins, Todd C. Klaus, Miles T. Cote, Elisa V. Quintana, Jennifer R. Hall, Khadeejah Ibrahim, Douglas A. Caldwell, Jeffrey E. Van Cleve, Michael R. Haas, NASA Ames Research Ctr. (United States) [7740-50]

12:10 pm: **Kepler Mission's focal plane characterization models implementation**, Christopher Allen, Todd C. Klaus, NASA Ames Research Ctr. (United States); Jon M. Jenkins, SETI Institute (United States) [7740-51]

Lunch/Exhibition Break 12:30 to 1:40 pm

4:20 pm: **ALMA software management and deployment**, Brian Glendenning, National Radio Astronomy Observatory (United States); Jorge Ibsen, European Southern Observatory (Chile); George Kosugi, National Astronomical Observatory of Japan (Japan); Gianni Raffi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-58]

4:40 pm: **Discovery Channel Telescope software development overview**, Paul J. Lotz, Lowell Observatory (United States) [7740-59]

5:00 pm: **An overview of the LSST data management system**, Jeffrey P. Kantor, Timothy Axelrod, LSST Corp. (United States) [7740-60]

5:20 pm: **LSST data challenges**, Jeffrey P. Kantor, Timothy Axelrod, LSST Corp. (United States) [7740-61]

SESSION 12

Room: Pacific Salon II Wed. 1:40 to 3:10 pm

Cyberinfrastructure II

Session Chair: Hilton A. Lewis,
California Association for Research in Astronomy

1:40 pm: **The application of cloud computing to the creation of image mosaics and management of their provenance** (*Invited Paper*), Graham B. Berriman, California Institute of Technology (United States); Ewa Deelman, Paul Groth, Gideon Juve, The Univ. of Southern California (United States) [7740-52]

2:10 pm: **EVASSO: a high-bandwidth communication infrastructure to efficiently connect the ESO Paranal and the Cerro Armazones Observatories to Europe**, Giorgio Filippi, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Fernando Liello, GARR (Italy); Sandra Jaque, REUNA (Chile); Rolf Chini, Ruhr-Univ. Bochum (Germany); Florencio Utreras, Cooperación Latinoamericana de Redes Avanzadas (Uruguay); Andrew Wright, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Roland Lemke, Ruhr-Univ. Bochum (Germany); Florian Heissenhuber, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7740-53]

2:30 pm: **File-storage cyberinfrastructure for large projects years before first-light**, Arun Jagatheesan, National Optical Astronomy Observatory (United States) and Dice Research.org (United States) and LSST (United States); Jeffrey Kantor, National Optical Astronomy Observatory (United States); Raymond L. Plante, Univ. of Illinois at Urbana-Champaign (United States); Jacek Becla, SLAC National Accelerator Lab. (United States) [7740-54]

2:50 pm: **CANFAR: the Canadian advanced network for astronomical research**, Séverin Gaudet, Patrick Dowler, Sharon Goliath, Norman Hill, National Research Council Canada (Canada); Chris Pritchett, Univ. of Victoria (Canada); David Schade, National Research Council Canada (Canada) [7740-55]

Coffee Break 3:10 to 3:40 pm

SESSION 13

Room: Pacific Salon II Wed. 3:40 to 5:40 pm

Current Project Overviews

Session Chair: Bret D. Goodrich, National Solar Observatory

3:40 pm: **The Australian SKA Pathfinder (ASKAP) software architecture**, Juan C. Guzman, Ben Humphreys, Commonwealth Scientific and Industrial Research Organisation (Australia) [7740-56]

4:00 pm: **The DECAM data acquisition and control system**, Klaus Honscheid, Jacob Eiting, Ann Elliott, The Ohio State Univ. (United States); Jim Annis, Elizabeth J. Buckley-Geer, William Wester, Fermi National Accelerator Lab. (United States); Michael Haney, William Hanlon, Inga Karliner, Jon Thaler, Univ. of Illinois (United States); Marco Bonati, German Schumacher, Cerro Tololo Inter-American Observatory (Chile); Kyle W. Kuehn, Stephen E. Kuhlmann, Argonne National Lab. (United States); Terry Schalk, Univ. of California, Santa Cruz (United States); Stuart Marshall, Aaron J. Roodman, SLAC National Accelerator Lab. (United States) [7740-57]

Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy V

Conference Chairs: **Wayne S. Holland**, The Royal Observatory, Edinburgh (United Kingdom); **Jonas Zmuidzinas**, California Institute of Technology

Program Committee: **Sarah E. Church**, Stanford Univ.; **Kent D. Irwin**, National Institute of Standards and Technology; **J. Anthony Murphy**, National Univ. of Ireland, Maynooth (Ireland); **Albrecht Poglitsch**, Max-Planck-Institut für extraterrestrische Physik (Germany); **Karl-Friedrich Schuster**, IRAM-Domaine Univ. (France); **Gordon J. Stacey**, Cornell Univ.; **Christopher K. Walker**, Steward Observatory, The Univ. of Arizona

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: **Mark M. Casali**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany). [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany). [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: **Mark M. Casali**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands). [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States). [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:30 pm

SESSION 1

Room: Pacific Salon I Tues. 1:30 to 3:30 pm

Cameras I: Current Direct Detection I

Session Chair: **Jonas Zmuidzinas**, California Institute of Technology

1:30 pm: **CEA bolometer arrays: the first year in space**, Nicolas P. Billot, Infrared Processing and Analysis Ctr. (United States); Louis R. Rodriguez, Marc Sauvage, Koryo Okumura, Olivier Boulade, Patrick Agnese, Commissariat à l'Énergie Atomique (France) [7741-01]

1:50 pm: **Performance of the Herschel/SPIRE bolometer arrays**, Adam L. Woodcraft, The Royal Observatory, Edinburgh (United Kingdom) and UK Astronomy Technology Ctr. (United Kingdom); Hien T. Nguyen, James J. Bock, Jet Propulsion Lab. (United States); Matthew J. Griffin, Cardiff Univ. (United Kingdom); Bernhard Schulz, California Institute of Technology (United States); Bruce Sibthorpe, UK Astronomy Technology Ctr. (United Kingdom); Bruce M. Swinyard, Rutherford Appleton Lab. (United Kingdom) [7741-02]

2:10 pm: **Latest results from GISMO: a 2-mm bolometer camera for the IRAM 30-m Telescope**, Johannes G. Staguhn, The Johns Hopkins Univ. (United States) and NASA Goddard Space Flight Ctr. (United States); Christine A. Jhabvala, Richard G. Arendt, Dominic Benford, David T. Chuss, Dale J. Fixsen, NASA Goddard Space Flight Ctr. (United States); Attila Kovacs, Univ. of Minnesota (United States); Samuel Leclercq, IRAM-Domaine Univ. de Grenoble (France); Stephen F. Maher, Timothy M. Miller, S. Harvey Moseley, Elmer H. Sharp, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7741-03]

2:30 pm: **SCUBA-2: first results and on-sky performance**, Wayne S. Holland, UK Astronomy Technology Ctr. (United Kingdom); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Eli Atad-Ettinger, UK Astronomy Technology Ctr. (United Kingdom); Dan Bintley, Joint Astronomy Ctr. (United States); Edward Chapin, The Univ. of British Columbia (Canada); Simon C. Craig, Gary Davis, Joint Astronomy Ctr. (United States); Michel Fich, Univ. of Waterloo (Canada); Xiaofeng Gao, UK Astronomy Technology Ctr. (United Kingdom); Andy Gibb, Mark Halpern, The Univ. of British Columbia (Canada); Gene C. Hilton, National Institute of Standards and Technology (United States); Tim Jenness, Joint Astronomy Ctr. (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); Dennis Kelly, David W. Lunney, Michael J. MacIntosh, UK Astronomy Technology Ctr. (United Kingdom); William Parkes, Scottish Microelectronics Ctr. (United Kingdom); Ian Robson, UK Astronomy Technology Ctr. (United Kingdom); Douglas Scott, The Univ. of British Columbia (Canada); Remo P. J. Tilanus, Joint Astronomy Ctr. (United States); Anthony J. Walton, Scottish Microelectronics Ctr. (United Kingdom) [7741-04]

2:50 pm: **Characterising the SCUBA-2 superconducting bolometer arrays**, Dan Bintley, Joint Astronomy Ctr. (United Kingdom); Michael J. MacIntosh, Wayne S. Holland, UK Astronomy Technology Ctr. (United Kingdom); Per Friberg, Craig A. Walthers, Joint Astronomy Ctr. (United Kingdom); David C. Atkinson, Dennis Kelly, Xiaofeng Gao, UK Astronomy Technology Ctr. (United Kingdom); Peter A. R. Ade, William F. Grainger, Julian House, Lorenzo Moncelsi, Cardiff Univ. (United Kingdom); Matthew I. Hollister, Univ. of Edinburgh (United Kingdom); Adam L. Woodcraft, The Royal Observatory, Edinburgh (United Kingdom); Camelia Dunare, William Parkes, Anthony J. Walton, Scottish Microelectronics Ctr. (United Kingdom); Kent D. Irwin, Gene C. Hilton, Michael D. Niemack, Carl D. Reintsema, National Institute of Standards and Technology (United States); Mandana Amiri, Bryce Burger, Mark Halpern, Matthew Hasselfield, The Univ. of British Columbia (Canada); Jan B. Kycia, Chas G. A. Mugford, Lauren Persaud, Univ. of Waterloo (Canada) [7741-05]

3:10 pm: **Multiband millimeter-wave polarimetry with BICEP**, Evan M. Bierman, Univ. of California, San Diego (United States); C. Darren Dowell, Tomotake Matsumura, California Institute of Technology (United States); Peter A. R. Ade, Univ. of Wales (United Kingdom); Denis Barkats, California Institute of Technology (United States); Darcy Barron, Univ. of California, San Diego (United States); John O. Battle, James J. Bock, H. Cynthia Chiang, California Institute of Technology (United States); Lionel Duband, Commissariat à l'Énergie Atomique (France); Eric F. Hivon, Institut d'Astrophysique de Paris (France); William L. Holzapfel, Univ. of California, Berkeley (United States); Viktor V. Hristov, William C. Jones, California Institute of Technology (United States); J. P. Kaufman, Brian G. Keating, Univ. of California, San Diego (United States); John M. Kovac, Chao-lin Kuo, Andrew E. Lange, Erik M. Leitch, Peter V. Mason, Hien T. Nguyen, California Institute of Technology (United States); Nicolas Ponthieu, Institut d'Astrophysique Spatiale (France); Clement Pryke, The Univ. of Chicago (United States); Steffen Richter, Graca M. Rocha, California Institute of Technology (United States); Christopher D. Sheehy, The Univ. of Chicago (United States); Yuki D. Takahashi, Univ. of California, Berkeley (United States); Ki Won Yoon, California Institute of Technology (United States). [7741-06]

Coffee Break 3:30 to 4:00 pm

SESSION 2

Room: Pacific Salon I Tues. 4:00 to 4:40 pm

Cameras I: Current Direct Detection II

Session Chair: **Wayne S. Holland**, UK Astronomy Technology Ctr. (United Kingdom)

4:00 pm: **Beginning of operation on APEX of the polarimeter for the Large APEX Bolometer Camera (LABOCA)**, Giorgio Siringo, European Southern Observatory (Chile). [7741-07]

4:20 pm: **MKID multicolor array status and results from DemoCam**, James A. Schlaerth, Univ. of Colorado at Boulder (United States); Nicole G. Czakon, California Institute of Technology (United States); Peter K. Day, Jet Propulsion Lab. (United States); Thomas P. Downes, Ran P. Duan, California Institute of Technology (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Sunil R. Golwala, Matthew I. Hollister, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Benjamin A. Mazin, Univ. of California, Santa Barbara (United States); Philip R. Maloney, Univ. of Colorado at Boulder (United States); Omid Noroozian, California Institute of Technology (United States); Hien T. Nguyen, Jack Sayers, Jet Propulsion Lab. (United States); Seth Siegel, California Institute of Technology (United States); John E. Vaillancourt, SOFIA / USRA (United States); Anastasios K. Vayonakis, California Institute of Technology (United States); Philip R. Wilson, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-08]

SESSION 3

Room: Pacific Salon I Tues. 4:40 to 5:40 pm

Detectors I: Photoconductor Arrays

Session Chair: Wayne S. Holland,
UK Astronomy Technology Ctr. (United Kingdom)

4:40 pm: **Latest progress in developing large-format Ge arrays for far-IR astronomy**, Jam Farhoomand, David L. Sisson, TechnoScience Corp. (United States); Jeffrey W. Beeman, Lawrence Berkeley National Lab. (United States) [7741-09]

5:00 pm: **Development of a far-infrared Ge:Ga monolithic array for a possible application to SPICA**, Mai Shirahata, Japan Aerospace Exploration Agency (Japan); Shuhei Kamiya, The Univ. of Tokyo (Japan); Shuji Matsuura, Japan Aerospace Exploration Agency (Japan); Yasuo Doi, The Univ. of Tokyo (Japan); Mitsunobu Kawada, Hidehiro Kaneda, Nagoya Univ. (Japan); Yoshihiro Sawayama, Toshiaki Arai, Kentaroh Watanabe, The Univ. of Tokyo (Japan); Takao Nakagawa, Takehiko Wada, Japan Aerospace Exploration Agency (Japan); Ybe Creten, Burak Okcan, IMEC (Belgium); Walfried Raab, Albrecht Poglitsch, Max-Planck-Institut für extraterrestrische Physik (Germany) [7741-10]

5:20 pm: **Development of a large-scale stressed Ge:Ga detector array for SAFARI**, Walfried Raab, Albrecht Poglitsch, Rainer Hoehnl, Lothar Barl, Max-Planck-Institut für extraterrestrische Physik (Germany) [7741-11]

Wednesday 30 June

SESSION 4

Room: Pacific Salon I Wed. 8:50 to 10:10 am

Cameras II: Future Direct Detection

Session Chair: Gordon J. Stacey, Cornell Univ.

8:50 am: **Status of the ArTeMiS camera to be installed on APEX**, Michel Talvard, Philippe André, Yannick-Jean Le-Pennec, Eric Doumayrou, Didier Dubreuil, Michel Lortholary, Jérôme Martignac, Commissariat à l'Énergie Atomique (France); Carlos De Breuck, European Southern Observatory (Germany); David Rabanus, European Southern Observatory (Chile); Patrick Agnès, Olivier Boulade, Eric Ercolani, Pascal Gallais, Benoit Horeau, Pierre-Olivier Lagage, Commissariat à l'Énergie Atomique (France); Bernadette Leriche, Institut d'Astrophysique Spatiale (France); Johan Relland, Vincent Revéret, Louis R. Rodriguez, Commissariat à l'Énergie Atomique (France) [7741-12]

9:10 am: **The balloon-borne large-aperture submillimeter telescope and polarimeter: BLAST-pol**, Laura M. Fissel, Univ. of Toronto (Canada); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Francesco E. Angilè, Univ. of Pennsylvania (United States); Steven J. Benton, Univ. of Toronto (Canada); Edward Chapin, The Univ. of British Columbia (Canada); Mark J. Devlin, Univ. of Pennsylvania (United States); Natalie N. Gandilo, Univ. of Toronto (Canada); Joshua O. Gundersen, Univ. of Miami (United States); Peter C. Hargrave, Cardiff Univ. (United Kingdom); David H. Hughes, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Jeffrey Klein, Univ. of Pennsylvania (United States); Andrei L. Korotkov, Brown Univ. (United States); Tristan G. Matthews, Northwestern Univ. (United States); Lorenzo Moncelsi, Cardiff Univ. (United Kingdom); Tony K. Mroczkowski, Univ. of Pennsylvania (United States); C. Barth Netterfield, Univ. of Toronto (Canada); Giles Novak, Northwestern Univ. (United States); Luca Olmi, Univ. of Puerto Rico (United States) and Osservatorio Astrofisico di Arcetri-INAF (Italy); Enzo Pascale, Cardiff Univ. (United Kingdom); Giorgio Savini, Univ. College London (United Kingdom); Douglas Scott, The Univ. of British Columbia (Canada); Jamil Shariff, Juan Diego Soler, Univ. of Toronto (Canada); Nicholas E. Thomas, Univ. of Miami (United States); Matthew D. P. Truch, Univ. of Pennsylvania (United States); Carole E. Tucker, Cardiff Univ. (United Kingdom); Gregory S. Tucker, Brown Univ. (United States); Derek Ward-Thompson, Cardiff Univ. (United Kingdom); et al. [7741-13]

9:30 am: **MUSIC for sub/millimeter astrophysics**, Philip R. Maloney, Univ. of Colorado at Boulder (United States); Nicole G. Czakon, California Institute of Technology (United States); Peter K. Day, Jet Propulsion Lab. (United States); Thomas P. Downes, Ran P. Duan, California Institute of Technology (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Sunil R. Golwala, Matt I. Hollister, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Benjamin A. Mazin, Univ. of California, Santa Barbara (United States); Omid Noroozian, California Institute of Technology (United States); Hien T. Nguyen, Jack Sayers, Jet Propulsion Lab. (United States); James A. Schlaerth, Univ. of Colorado at Boulder (United States); Seth Siegel, California Institute of Technology (United States); John E. Vaillancourt, SOFIA / USRA (United States); Anastasios Vayonakis, California Institute of Technology (United States); Philip R. Wilson, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-15]

9:50 am: **BASIC: a high-sensitivity all silicon bolometer focal plane for the SAFARI instrument aboard the SPICA Observatory**, Louis R. Rodriguez, Patrick Agnès, Christophe Cara, Olivier Boulade, Jérôme Martignac, Yannick-Jean Le-Pennec, Vincent Revéret, Commissariat à l'Énergie Atomique (France) [7741-16]

Coffee Break 10:10 to 10:40 am

SESSION 5

Room: Pacific Salon I Wed. 10:40 am to 12:20 pm

Detectors II: Transition Edge Sensors

Session Chair: Kent D. Irwin,
National Institute of Standards and Technology

10:40 am: **Antenna-coupled TES bolometer arrays for BICEP2/Keck and SPIDER**, Angiola Orlando, BICEP2/Keck Collaboration, SPIDER Collaboration, California Institute of Technology (United States) [7741-17]

11:00 am: **Feedhorn-coupled TES polarimeters for next-generation CMB instruments**, Ki Won Yoon, National Institute of Standards and Technology (United States); John Appel, Princeton Univ. (United States); Jason Austermann, Univ. of Colorado at Boulder (United States); James A. Beall, Dan Becker, National Institute of Standards and Technology (United States); Bradford Benson, Lindsey Bleem, Kavli Institute for Cosmological Physics (United States); Joe W. Britton, National Institute of Standards and Technology (United States); John E. Carlstrom, Clarence Chang, Kavli Institute for Cosmological Physics (United States); Hsiao-Mei Cho, National Institute of Standards and Technology (United States); Abigail Crites, Kavli Institute for Cosmological Physics (United States); Thomas Essinger-Hileman, Princeton Univ. (United States); Wendeline Everett, The Univ. of Chicago (United States); Nils W. Halverson, Jason W. Henning, Univ. of Colorado at Boulder (United States); Gene C. Hilton, Kent D. Irwin, National Institute of Standards and Technology (United States); Jeffrey J. McMahon, Univ. of Michigan (United States); Jared Mehl, Stephan S. Meyer, Kavli Institute for Cosmological Physics (United States); S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States); Michael D. Niemack, National Institute of Standards and Technology (United States); Lucas P. Parker, Princeton Univ. (United States); Sara Simon, Univ. of Colorado at Boulder (United States); Suzanne T. Staggs, Princeton Univ. (United States); et al. [7741-18]

11:20 am: **Dual-polarized-multifrequency-channel-antenna-coupled TES bolometers for the Polarbear CMB experiment**, Roger C. O'Brien, Aritoki Suzuki, Erin Quealy, Univ. of California, Berkeley (United States) [7741-19]

11:40 am: **Background-limited transition-edge sensors for far-IR/sub-mm spaceborne spectroscopy**, Matthew E. Kenyon, Jet Propulsion Lab. (United States); Andrew D. Beyer, California Institute of Technology (United States); Charles M. Bradford, Peter K. Day, James J. Bock, Henry G. Leduc, Jet Propulsion Lab. (United States) [7741-20]

12:00 pm: **Low-noise transition edge sensor (TES) for SAFARI instrument on SPICA**, Pourya Khosropanah, Marcel Ridder, Bob Dirks, Jan van der Kuur, Marcel P. Bruijn, Piet A. J. de Korte, Jian-Rong Gao, Henk F. C. Hoevers, SRON Netherlands Institute for Space Research (Netherlands); Maria Parra, Univ. de Zaragoza (Spain); Dmitry Morozov, Philip D. Mauskopf, Cardiff Univ. (United Kingdom); M. Damian Audley, David J. Goldie, Stafford Withington, Univ. of Cambridge (United Kingdom) [7741-21]

Lunch/Exhibition Break 12:20 to 1:50 pm

SESSION 6

Room: Pacific Salon I Wed. 1:50 to 3:30 pm

Detectors III: Kinetic Inductance Detectors*Session Chair: Wayne S. Holland,*
UK Astronomy Technology Ctr. (United Kingdom)1:50 pm: **A review of the lumped element kinetic inductance detector**, Simon M. Doyle, Philip D. Mausekopf, Cardiff Univ. (United Kingdom); Alessandro Monfardini, Loren J. Swenson, Institut NÉEL (France); Markus Roesch, IRAM-Domaine Univ. de Grenoble (France) [7741-22]2:10 pm: **Characterization of lumped element kinetic inductance detectors for mm-wave detection**, Markus Roesch, IRAM-Domaine Univ. de Grenoble (France); Loren J. Swenson, Institut NÉEL (France); Simon M. Doyle, Cardiff Univ. (United Kingdom); Alessandro Monfardini, Institut NÉEL (France) [7741-23]2:30 pm: **Advanced resonator designs for far-infrared astrophysics with MKIDs**, Omid Noroozian, California Institute of Technology (United States); Peter K. Day, Jet Propulsion Lab. (United States); Byeong-Ho Eom, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Juan M. Bueno, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States). [7741-24]2:50 pm: **Fabrication of an absorber-coupled MKID detector and readout for sub-millimeter and far-infrared astronomy**, Ari-David Brown, Wen-Ting Hsieh, S. Harvey Moseley, Thomas R. Stevenson, Kongpop U-yen, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7741-25]3:10 pm: **Optimization of MKID noise performance via readout technique for astronomical applications**, Nicole G. Czakon, California Institute of Technology (United States); James A. Schlaerth, Univ. of Colorado at Boulder (United States); Peter K. Day, Jet Propulsion Lab. (United States); Thomas P. Downes, Ran P. Duan, California Institute of Technology (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Sunil R. Golwala, Matthew I. Hollister, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Benjamin A. Mazin, Univ. of California, Santa Barbara (United States); Philip R. Maloney, Univ. of Colorado at Boulder (United States); Omid Noroozian, California Institute of Technology (United States); Hien T. Nguyen, Jack Sayers, Jet Propulsion Lab. (United States); Seth Siegel, California Institute of Technology (United States); John E. Vaillancourt, SOFIA / USRA (United States); Anastasios Vayonakis, California Institute of Technology (United States); Philip R. Wilson, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-26]

Coffee Break 3:30 to 4:00 pm

SESSION 7

Room: Pacific Salon I Wed. 4:00 to 6:00 pm

Optical Design and Components*Session Chair: J. Anthony Murphy,*
National Univ. of Ireland, Maynooth (Ireland)4:00 pm: **Efficient optical modeling for far-infrared astronomical instrumentation**, Cr  idhe M. M. O'Sullivan, J. Anthony Murphy, Neil A. Trappe, Marcin L. Gradziel, Tully Peacocke, National Univ. of Ireland, Maynooth (Ireland); Stafford Withington, Univ. of Cambridge (United Kingdom) [7741-27]4:20 pm: **Anti-reflection coating of large-format lenses for sub-mm applications**, Peter C. Hargrave, Cardiff Univ. (United Kingdom); Giorgio Savini, Univ. College London (United Kingdom) [7741-28]4:40 pm: **Corrugated feed horn arrays in silicon**, Joe W. Britton, National Institute of Standards and Technology (United States) and Univ. of Colorado at Boulder (United States); Ki Won Yoon, James A. Beall, Dan Becker, Hsiao-Mei Cho, Gene C. Hilton, Michael D. Niemack, Kent D. Irwin, National Institute of Standards and Technology (United States) [7741-29]5:00 pm: **Submillimeter pupil plane wavefront sensing**, Eugene Serabyn, J. Kent Wallace, Jet Propulsion Lab. (United States) [7741-30]5:20 pm: **Optical performance of the BICEP2 Telescope at the South Pole**, Randol W. Aikin, for the BICEP2 collaboration, California Institute of Technology (United States) [7741-31]5:40 pm: **Optics for MUSIC: a new (sub)millimeter camera for the Caltech Submillimeter Observatory**, Jack Sayers, Jet Propulsion Lab. (United States); Nicole G. Czakon, California Institute of Technology (United States); Peter K. Day, Jet Propulsion Lab. (United States); Thomas P. Downes, Ran P. Duan, California Institute of Technology (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Sunil R. Golwala, Matt I. Hollister, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Benjamin A. Mazin, Univ. of California, Santa Barbara (United States); Philip R. Maloney, Univ. of Colorado at Boulder (United States); Omid Noroozian, California Institute of Technology (United States); Hien T. Nguyen, Jet Propulsion Lab. (United States); James A. Schlaerth, Univ. of Colorado at Boulder (United States); Seth Siegel, California Institute of Technology (United States); John E. Vaillancourt, SOFIA / USRA (United States); Anastasios Vayonakis, California Institute of Technology (United States); Philip R. Wilson, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-32]**Wednesday Poster Session**

Room: Grand Exhibit Hall Wed. 6:00 to 7:30 pm

*Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Wednesday. The interactive poster session with authors in attendance will be Wednesday evening from 6:00 to 7:30 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.***Cameras I: Current Direct Detection****A new generation of receivers on the Atacama Pathfinder Experiment (APEX)**, Giorgio Siringo, European Southern Observatory (Chile) [7741-68]**Extinction correction and on-sky calibration of SCUBA-2**, Jessica T. Dempsey, Per Friberg, Tim Jenness, Dan Bintley, Joint Astronomy Ctr. (United States); Wayne S. Holland, UK Astronomy Technology Ctr. (United Kingdom) [7741-69]**Detectors I: Photoconductor Arrays****Development of compact far-infrared array sensor with high efficiency**, Hiroshi Shibai, Osaka Univ. (Japan); Mitsunobu Kawada, Toyoki Watabe, Nagoya Univ. (Japan); Yasuo Doi, The Univ. of Tokyo (Japan); Mikio Fujiwara, National Institute of Information and Communications Technology (Japan) [7741-70]**Far-infrared extended blocked impurity band (FIREBIB) detectors**, Henry H. Hogue, DRS Sensors & Targeting Systems, Inc. (United States); Martin Mlynarczyk, NASA Langley Research Ctr. (United States); Mark Muzilla, DRS Sensors & Targeting Systems, Inc. (United States); Nurul Abedin, NASA Langley Research Ctr. (United States) [7741-71]**Detectors II: Transition Edge Sensors****Development of superconducting transition edge sensors based on electron-phonon decoupling**, Nikhil S. Jethava, James A. Chervenak, Dominic Benford, Ari-David Brown, Gunther Kletetschka, Vilem Mikula, Kongpop U-yen, NASA Goddard Space Flight Ctr. (United States) [7741-72]**Characterizing Si_xN_y absorbers and support beams for far-IR/sub-mm transition-edge sensor bolometers**, Andrew D. Beyer, Matthew E. Kenyon, Pierre M. Echtermach, Jet Propulsion Lab. (United States); Byeong-Ho Eom, California Institute of Technology (United States); Juan M. Bueno, Peter K. Day, James J. Bock, Charles M. Bradford, Jet Propulsion Lab. (United States) [7741-73]**Optical and polarization efficiencies of feedhorn-coupled TES polarimeters for next-generation CMB instruments**, Jason W. Henning, Jason Austermann, Univ. of Colorado at Boulder (United States); John Appel, Princeton Univ. (United States); James A. Beall, Dan Becker, National Institute of Standards and Technology (United States); Bradford Benson, Lindsey Bleem, Kavli Institute for Cosmological Physics (United States); Joe W. Britton, National Institute of Standards and Technology (United States); John E. Carlstrom, Clarence Chang, Kavli Institute for Cosmological Physics (United States); Hsiao-Mei Cho, National Institute of Standards and Technology (United States); Abigail Crites, Kavli Institute for Cosmological Physics (United States); Thomas Essinger-Hileman, Princeton Univ. (United States); Wendeline Everett, Kavli Institute for Cosmological Physics (United States); Nils W. Halverson, Univ. of Colorado at Boulder (United States); Gene C. Hilton, Kent D. Irwin, National Institute of Standards and Technology (United States); Jeffrey J. McMahon, Jared Mehl, Stephan S. Meyer, Kavli Institute for Cosmological Physics (United States); S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States); Michael D. Niemack, National Institute of Standards and Technology (United States); Lucas P. Parker, Princeton Univ. (United States); Sara Simon, Univ. of Colorado at Boulder (United States); Suzanne T. Staggs, Princeton Univ. (United States); Kongpop U-Yen, NASA Goddard Space Flight Ctr. (United States); Katerina Visnjic, Princeton Univ. (United States); Edward J. Wollack, NASA Goddard Space [7741-74]

Optical Design and Components

Component development for ALMA Band 1 (31-45 GHz), Doug W. Henke, Stéphane Claude, Frank Jiang, David Dousset, Filippo Rossi, NRC Herzberg Institute of Astrophysics (Canada) [7741-75]

A compact L-band ortho mode transducer, Tonino Pisanu, Alessandro Navarrini, Osservatorio Astronomico di Cagliari (Italy) [7741-76]

Selective spectral detection of continuum terahertz radiation, Pierre Kaufmann, Giuseppe Valente, Tonino Pisanu, Pietro Bolli, Osservatorio Astronomico di Cagliari (Brazil); Rogério Marcon, Univ. Estadual de Campinas (Brazil); Adolfo Marun, Complejo Astronómico El Leoncito (Argentina); Amauri S. Kudaka, Univ. Presbiteriana Mackenzie (Brazil); Emilio C. Bortolucci, Maria B. Zakia, Jose A. Diniz, Univ. Estadual de Campinas (Brazil); Marta M. Cassiano, Univ. Presbiteriana Mackenzie (Brazil); Pablo Pereyra, Rodolfo Godoy, Complejo Astronómico El Leoncito (Argentina); Alexander V. Timofeevsky, Valery A. Nikolaev, Tydex JS Co. (Russian Federation); Alexandre M. Pereira Alves da Silva, Univ. Estadual de Campinas (Brazil); Luis O. Fernandes, Univ. Presbiteriana Mackenzie (Brazil) [7741-77]

The dual-band L-P feed system for the Sardinia Radio Telescope prime focus, Giuseppe Valente, Tonino Pisanu, Pietro Bolli, Osservatorio Astronomico di Cagliari (Italy); Sergio Mariotti, Istituto di Radioastronomia (Italy); Pasqualino Marongiu, Alessandro Navarrini, Osservatorio Astronomico di Cagliari (Italy); Renzo Nesti, Osservatorio Astrofisica di Arcetri (Italy); Alessandro Orfei, Istituto di Radioastronomia (Italy) [7741-79]

A slot array antenna for a millimeter/submillimeter-wave focal plane, Peter K. Day, Jet Propulsion Lab. (United States); Nicole G. Czakon, Ran P. Duan, California Institute of Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Sunil R. Golwala, Matthew I. Hollister, California Institute of Technology (United States); Henry G. Leduc, Jet Propulsion Lab. (United States); Philip R. Maloney, Univ. of Colorado at Boulder (United States); Omid Noroozian, Jack Sayers, California Institute of Technology (United States); James A. Schlaerth, Univ. of Colorado at Boulder (United States); Anastasios K. Vayonakis, Jonas Zmuidzinas, California Institute of Technology (United States) [7741-80]

Optical properties of astronomical silicates with infrared techniques, Raymond E. Kinzer, Jr., NASA Goddard Space Flight Ctr. (United States) and Oak Ridge Associated Universities (United States); Stephen A. Rinehart, Dominic Benford, Elishah Dwek, Ross M. Henry, Joe Nuth, Caleb H. Wheeler, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7741-81]

A wideband smooth-walled feed horn with low cross-polarization for millimeter astronomy, Lingzhen Zeng, Charles L. Bennett, The Johns Hopkins Univ. (United States); David T. Chuss, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7741-82]

High-efficiency anti-reflection-coated cryogenic silicon lenses for millimeter wavelengths, Joe W. Britton, National Institute of Standards and Technology (United States) and Univ. of Colorado at Boulder (United States); Michael D. Niemack, James A. Beall, Dan Becker, Hsiao-Mei Cho, Gene C. Hilton, Ki Won Yoon, Kent D. Irwin, National Institute of Standards and Technology (United States) [7741-83]

Modeling and characterization of the SPIDER half-wave plate, Sean A. Bryan, Case Western Reserve Univ. (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Mandana Amir, The Univ. of British Columbia (Canada); Steven J. Benton, Univ. of Toronto (United States); Richard Bihary, Case Western Reserve Univ. (United States); James J. Bock, Jet Propulsion Lab. (United States); J. Richard Bond, Canadian Institute for Theoretical Astrophysics, Inc. (United States); Joseph A. Bonetti, Jet Propulsion Lab. (United States); H. Cynthia Chiang, Princeton Univ. (United States); Carlo R. Contaldi, Imperial College London (United Kingdom); Brendan P. Crill, Jet Propulsion Lab. (United States); Daniel T. O’Dea, Imperial College London (United Kingdom); Marzieh Farhang, Canadian Institute for Theoretical Astrophysics, Inc. (United States); Jeffrey P. Filippini, California Institute of Technology (United States); Laura M. Fissel, Natalie N. Gandilo, Univ. of Toronto (United States); Sunil R. Golwala, California Institute of Technology (United States); Jon E. Gudmundsson, Princeton Univ. (United States); Matthew Hasselfield, Mark Halpern, The Univ. of British Columbia (Canada); Gene C. Hilton, National Institute of Standards and Technology (United States); Warren R. Holmes, Jet Propulsion Lab. (United States); Viktor V. Hristov, California Institute of Technology (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); William C. Jones, Princeton Univ. (United States); Chao-lin Kuo, Stanford Univ. (United States) [7741-84]

Compact radiative control structures for millimeter astronomy, Ari-David Brown, James A. Chervenak, David T. Chuss, Ross M. Henry, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7741-85]

A waveguide orthomode transducer for 385-500 GHz, Christopher E. Groppi, Arizona State Univ. (United States); Alessandro Navarrini, Osservatorio Astronomico di Cagliari (Italy); Goutam Chattopadhyay, Jet Propulsion Lab. (United States) [7741-86]

Cameras III: Current and Future Spectroscopic

Testing results and current status of FTS-2: an imaging Fourier transform spectrometer for SCUBA-2, Brad G. Gom, David A. Naylor, Univ. of Lethbridge (Canada) [7741-89]

Detectors IV: SIS Mixers, Local Oscillators

A novel 180° hybrid power combiner, Giuseppe Valente, Alessandro Navarrini, Tonino Pisanu, Osservatorio Astronomico di Cagliari (Italy) [7741-90]

Analysis of the amplification system of ALMA band 1, F. Patricio Mena, Nicolás Reyes, Pablo Zorzi, Univ. de Chile (Chile); Christophe Granet, BAE Systems Australia (Australia); Ernest A. Michael, José Pizarro, Pablo Altamirano, Leonardo Bronfman, Jorge May, Univ. de Chile (Chile) [7741-91]

Coherent polarimeter modules for the QUIET experiment, Kieran A. Cleary, (California Institute of Technology) for the QUIET Collaboration (United States) [7741-92]

Development of MMIC receivers for cosmic microwave background interferometry, Matthew Sieth, Judy M. Lau, Patricia Voll, Sarah E. Church, Stanford Univ. (United States); Pekka P. Kangaslahti, Lorene A. Samoska, Todd C. Gaier, Jet Propulsion Lab. (United States); Dan Van Winkle, Sami Tantawi, SLAC National Accelerator Lab. (United States) [7741-93]

Development of a 150 GHz MMIC module prototype for large-scale CMB radiation experiments, Patricia Voll, Judy M. Lau, Matthew Sieth, Sarah E. Church, Stanford Univ. (United States); Lorene A. Samoska, Pekka P. Kangaslahti, Todd C. Gaier, Jet Propulsion Lab. (United States); Dan Van Winkle, Sami Tantawi, SLAC National Accelerator Lab. (United States) [7741-94]

ALMA front-end verification using a dry cold load, Yoonjae Lee, Brian N. Ellison, Peter G. Huggard, Mark R. Harman, Abdelhakim Bourighet, Wojciech Bartynowski, Matthew Oldfield, Nigel Morris, Gie Han Tan, Rutherford Appleton Lab. (United Kingdom) [7741-96]

Vertically illuminated TW UTC photodiodes for terahertz generation, Claudio M. Barrientos, Victor Calle, Marcos Diaz, F. Patricio Mena, Univ. de Chile (Chile); Josp Vukusic, Jan Stake, Chalmers Univ. of Technology (Sweden); Ernest A. Michael, Univ. de Chile (Chile) [7741-97]

CMB Instruments I: Current and Near Term

Beam characterization for the QUIET antenna arrays using polarized and unpolarized astronomical sources, Raul Monsalve, Univ. of Miami (United States) [7741-98]

Calibration of the QUIET telescope, Robert N. Dumoulin, Columbia Univ. (United States) [7741-99]

BICEP: measurement of galactic plane polarization as a calibration source, Tomotake Matsumura, California Institute of Technology (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Denis Barkats, National Radio Astronomy Observatory (Chile); Darcy Barron, Univ. of California, San Diego (United States); John O. Battle, Jet Propulsion Lab. (United States); Evan M. Bierman, Univ. of California, San Diego (United States); James J. Bock, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); C. Darren Dowell, Jet Propulsion Lab. (United States); Lionel Duband, Commissariat à l’Energie Atomique (France); Eric F. Hivon, Institut d’Astrophysique de Paris (France); William L. Holzapfel, Univ. of California, Berkeley (United States); Viktor V. Hristov, California Institute of Technology (United States); William C. Jones, Princeton Univ. (United States); Brian G. Keating, Univ. of California, San Diego (United States); John M. Kovac, Harvard Univ. (United States); Chao-lin Kuo, Stanford Univ. (United States) and Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) (United States); Andrew E. Lange, California Institute of Technology (United States) and Jet Propulsion Lab. (United States); Erik M. Leitch, Jet Propulsion Lab. (United States); Peter V. Mason, California Institute of Technology (United States); Hien T. Nguyen, Jet Propulsion Lab. (United States); Nicolas Ponthieu, Institut d’Astrophysique Spatiale (France); Clement Pryke, The Univ. of Chicago (United States); et al. [7741-100]

A fast superconducting nanoswitch for cosmology instruments, Ernst Otto, Ghassan Yassin, Christopher E. North, Bradley Johnson, Paul K. Grimes, Univ. of Oxford (United Kingdom); Michael A. Tarasov, Institute of Radio Engineering and Electronics (Russian Federation); Leonid S. Kuzmin, Chalmers Univ. of Technology (Sweden) [7741-101]

Calibration sources for the Polarbear Telescope, David Boettger, Brian G. Keating, Hans Paar, Univ. of California, San Diego (United States) [7741-102]

Cryo-Mechanical Design

Thermal and mechanical architecture for the SAFARI focal plane assembly, Jérôme Martignac, Commissariat à l’Énergie Atomique (France) [7741-103]

On-orbit performance of a cryogen-free 4K system for JEM/SMILES, Akinobu Okabayashi, Shoji Tsunematsu, Kiyomi Otsuka, Katsuhiro Narasaki, Sumitomo Heavy Industries, Ltd. (Japan); Ryota Sato, Ken-ichi Kikuchi, Japan Aerospace Exploration Agency (Japan) [7741-104]

SCUBA-2: engineering and commissioning challenges of the world largest sub-mm instrument at the JCMT, Simon C. Craig, Joint Astronomy Ctr. (United States); Helen M. McGregor, Eli Atad-Etiedgui, David Montgomery, UK Astronomy Technology Ctr. (United Kingdom); Dan Bintley, Tim C. Chuter, Joint Astronomy Ctr. (United States); Wayne S. Holland, David W. Lunney, Michael J. MacIntosh, UK Astronomy Technology Ctr. (United Kingdom); Erik Starman, Joint Astronomy Ctr. (United States). [7741-105]

Readouts and Electronics

Real-time Tbps digital correlator in NTU-array, Shing Kwong Wong, National Taiwan Univ. (Taiwan) [7741-106]

Detection and repair of readout FPGA corruption in a space-based TES bolometer array, Graeme Smecher, François Aubin, McGill Univ. (Canada); Don Chen, COM DEV International Ltd. (Canada); Oleg Djazovski, Canadian Space Agency (Canada); Matthew Dobbs, McGill Univ. (Canada); Gordon Faulkner, Fabio Gulino, COM DEV International Ltd. (Canada); Peter O. Hyland, Kevin Macdermid, McGill Univ. (Canada); Neil Rowlands, COM DEV International Ltd. (Canada) [7741-107]

SISCAM 32-ch readout module with GaAs-JFET ASICs, Hiroshi Matsuo, Yasunori Hibi, National Astronomical Observatory of Japan (Japan); Hirohisa Nagata, Hirokazu Ikeda, Japan Aerospace Exploration Agency (Japan); Mikio Fujiwara, National Institute of Information and Communications Technology (Japan). [7741-108]

Thursday 1 July

Plenary Session

Room: Golden Ballroom Thurs. 8:30 to 10:00 am

Session Chair: Kathryn A. Flanagan,
Space Telescope Science Institute

8:30 am: **Hinode: a new solar observatory in space** (*Presentation Only*), Saku Tsuneta, National Astronomical Observatory of Japan (Japan) [AS10PL3-509]

9:00 am: **Gamma ray satellite GLAST** (*Presentation Only*), Steven Ritz, Univ. of California, Santa Cruz (United States) [AS10PL3-510]

9:30 am: **X-ray astronomy in the era of Chandra and XMM-Newton, and a look to the future** (*Presentation Only*), Stephen S. Murray, Johns Hopkins Univ. (United States) and Harvard-Smithsonian Ctr. for Astrophysics (United States). [AS10PL3-511]

Coffee Break 10:00 to 10:30 am

SESSION 8

Room: Pacific Salon I Thurs. 10:30 to 11:30 am

Cameras III: Current and Future Spectroscopic

Session Chair: Jonas Zmuidzinas, California Institute of Technology

10:30 am: **First results from Supercam: a 64-pixel array receiver for the 350 GHz atmospheric window**, Christopher E. Groppi, Arizona State Univ. (United States); Christopher K. Walker, Craig Kulesa, Dathon R. Golish, Jenna L. Kloosterman, The Univ. of Arizona (United States); Sander Weinreb, Glenn E. Jones, Joseph Bardin, Hamdi Mani, California Institute of Technology (United States); Thomas B. H. Kuiper, Jet Propulsion Lab. (United States); Jacob W. Kooi, California Institute of Technology (United States); Arthur W. Lichtenberger, Thomas Cecil, Univ. of Virginia (United States); Patrick Puetz, Univ. zu Köln (Germany); Gopal Narayanan, Univ. of Massachusetts Amherst (United States); Abigail Hedden, Harvard-Smithsonian Ctr. for Astrophysics (United States) [7741-33]

10:50 am: **ZEUS-2: a second generation submillimeter grating spectrometer for exploring distant galaxies**, Carl Ferkinhoff, Thomas Nikola, Stephen C. Parshley, Gordon J. Stacey, Cornell Univ. (United States); Kent D. Irwin, Hsiao-Mei Cho, National Institute of Standards and Technology (United States); Mark Halpern, The Univ. of British Columbia (Canada) [7741-34]

11:10 am: **Large-format heterodyne arrays for observing far-infrared lines with SOFIA**, Christopher K. Walker, Craig Kulesa, The Univ. of Arizona (United States); Jonathan H. Kawamura, Jet Propulsion Lab. (United States); Christopher E. Groppi, Arizona State Univ. (United States); Imran Mehdi, Paul F. Goldsmith, William D. Langer, Jet Propulsion Lab. (United States); Juergen Stutzki, Univ. zu Köln (Germany); Christopher Martin, Oberlin College (United States). [7741-35]

SESSION 9

Room: Pacific Salon I Thurs. 11:30 am to 12:10 pm

Detectors IV: SIS Mixers, Local Oscillators

Session Chair: Wayne S. Holland,
UK Astronomy Technology Ctr. (United Kingdom)

11:30 am: **A THz unilateral finline SIS mixers on 15-um silicon substrate**, Boon-Kok Tan, Ghassan Yassin, Paul K. Grimes, Univ. of Oxford (United Kingdom); Karl Jacobs, Univ. zu Köln (Germany) [7741-36]

11:50 am: **Towards a compact THz local oscillator based on a quantum-cascade laser**, Heiko Richter, Michael Greiner-Baer, Sergeij G. Pavlov, Alexei D. Semenov, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Martin Wienold, Lutz Schrottke, Manfred Giehler, Rudolf Hey, Holger T. Grahn, Paul-Drude-Institut für Festkörperelektronik (Germany); Heinz-Wilhelm Hübers, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7741-37]

Lunch/Exhibition Break 12:10 to 1:40 pm

SESSION 10

Room: Pacific Salon I Thurs. 1:40 to 3:40 pm

Detectors V: SIS Mixers, Local Oscillators

Session Chair: Christopher K. Walker,
Steward Observatory, The Univ. of Arizona

1:40 pm: **High-power local oscillator sources for 1-2 THz**, Imran Mehdi, Bertrand C. Thomas, Jet Propulsion Lab. (United States); Alain E. Maestrini, Univ. Pierre et Marie Curie (France); John S. Ward, Raytheon Co. (United States) [7741-38]

2:00 pm: **An SIS finline mixer with an ultra-wide IF bandwidth**, Yangjun Zhou, Ghassan Yassin, Paul K. Grimes, Jamie Leech, Univ. of Oxford (United Kingdom) [7741-39]

2:20 pm: **Development of a 1.4THz SIS mixer for radio astronomy**, Alexandre Karpov, California Institute of Technology (United States); Jeffrey A. Stern, Jet Propulsion Lab. (United States); David A. Miller, Frank R. Rice III, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-40]

2:40 pm: **Terahertz traveling wave tube amplifiers as high-power local oscillators for large heterodyne receiver arrays**, Christian Y. Drouet d'Aubigny, TeraVision Inc. (United States); Christopher K. Walker, The Univ. of Arizona (United States); Abram G. Young, TeraVision Inc. (United States); Paul Gensheimer, Air Force Research Lab. (United States); Dathon R. Golish, TeraVision Inc. (United States); Nathaniel Lockwood, Air Force Research Lab. (United States); Christopher E. Groppi, Arizona State Univ. (United States); Steven B. Fairchild, John L. Boeckl, Air Force Research Lab. (United States). [7741-41]

3:00 pm: **Ultra-broadband IF/LO system of NTU W-band interferometer array**, Hsiao-Feng Teng, National Taiwan Univ. (Taiwan) [7741-42]

3:20 pm: **Smithsonian Astrophysical Observatory SMA SIS device tuning and optimizing techniques**, Robert D. Christensen, Smithsonian Astrophysical Observatory Submillimeter Array (United States); Edward Tong, Harvard-Smithsonian Ctr. for Astrophysics (United States). [7741-43]

Coffee Break 3:40 to 4:10 pm

SESSION 11

Room: Pacific Salon I Thurs. 4:10 to 5:30 pm

Detectors VI: Hot and Cold Electron Bolometers

Session Chair: Albrecht Poglitsch,
Max-Planck-Institut für extraterrestrische Physik (Germany)

4:10 pm: **Heterodyne gas cell measurements at 2.9 THz using a quantum cascade laser as local oscillator**, Jian-Rong Gao, Yuan Ren, J. Niels Hovenier, Technische Univ. Delft (Netherlands); W. Zhang, Purple Mountain Observatory (China); Pourya Khosropanah, SRON Netherlands Institute for Space Research (Netherlands); A. Bell, B. Klein, Max-Planck-Institut für Radioastronomie (Germany); Teun M. Klapwijk, Technische Univ. Delft (Netherlands); Sheng-Cai Shi, Purple Mountain Observatory (China); W. Kao, S. Kumar, Q. Hu, Massachusetts Institute of Technology (United States); John L. Reno, Sandia National Labs. (United States) [7741-44]

4:30 pm: **Development of the nano-HEB array for low-background FIR applications**, Boris S. Karasik, Sergey Pereverzev, Jonathan H. Kawamura, Peter K. Day, Bruce A. Bumble, Jet Propulsion Lab. (United States); David Olaya, National Institute of Standards and Technology (United States); Michael Gershenson, Rutgers, The State Univ. of New Jersey (United States); Daniel F. Santavicca, Yale Univ. (United States); Bertrand Reulet, Univ. Paris-Sud 11 (France) and Yale Univ. (United States); Daniel E. Prober, Yale Univ. (United States) [7741-45]

4:50 pm: **Filene integrated cold electron bolometer**, Ernst Otto, Univ. of Oxford (United Kingdom); Michael A. Tarasov, Institute of Radio Engineering and Electronics (Russian Federation); Paul K. Grimes, Univ. of Oxford (United Kingdom); Leonid S. Kuzmin, Chalmers Univ. of Technology (Sweden); Ghassan Yassin, Univ. of Oxford (United Kingdom). [7741-46]

5:10 pm: **Noise temperatures and beam patterns of a NbN hot electron bolometer mixer at 5.25 THz**, Jian-Rong Gao, SRON Netherlands Institute for Space Research (Netherlands); W. Zhang, Purple Mountain Observatory (China); Pourya Khosropanah, SRON Netherlands Institute for Space Research (Netherlands); T. Bansal, Teun M. Klapwijk, Technische Univ. Delft (Netherlands); W. Miao, Sheng-Cai Shi, Purple Mountain Observatory (China) [7741-47]

Friday 2 July

SESSION 12

Room: Pacific Salon I Fri. 8:30 to 10:10 am

CMB Instruments I: Current and Near Term I

Session Chair: Sarah E. Church, Stanford Univ.

8:30 am: **EBEX: a balloon-borne CMB polarization experiment**, Britt Reichborn-Kjennerud, Columbia Univ. (United States); Asad M. Aboobaker, Univ. of Minnesota (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); François Aubin, McGill Univ. (Canada); Carlo Baccigalupi, Scuola Internazionale Superiore di Studi Avanzati (Italy); Chaoyun Bao, Univ. of Minnesota (United States); Julian Borrill, Christopher Cantalupo, Lawrence Berkeley National Lab. (United States); Daniel Chapman, Joy Didier, Columbia Univ. (United States); Matthew Dobbs, McGill Univ. (Canada); Julien Grain, Institut d'Astrophysique Spatiale (France); William F. Grainger, Cardiff Univ. (United Kingdom); Shaul Hanany, Univ. of Minnesota (United States); Seth N. Hillbrand, Columbia Univ. (United States); Johannes Hubmayr, Univ. of Minnesota (United States); Andrew Jaffe, Imperial College London (United Kingdom); Bradley Johnson, Univ. of California, Berkeley (United States); Terry J. Jones, Univ. of Minnesota (United States); Theodore S. Kisner, Lawrence Berkeley National Lab. (United States); Jeffrey Klein, Univ. of Minnesota (United States); Andrei L. Korotkov, Brown Univ. (United States); Samuel Leach, Scuola Internazionale Superiore di Studi Avanzati (Italy); Adrian T. Lee, Univ. of California, Berkeley (United States); Lorne Levinson, Weizmann Institute of Science (Israel); Michele Limon, Columbia Univ. (United States); Kevin MacDermaid, McGill Univ. (Canada); Tomotake Matsumura, California Institute of Technology (United States); et al. [7741-48]

8:50 am: **QUIET: a ground-based probe of cosmic microwave background polarization**, Immanuel Buder, for the QUIET Collaboration (United States). [7741-49]

9:10 am: **PolarBear-II experiment**, Takayuki Tomaru, Masashi Hazumi, High Energy Accelerator Research Organization (Japan); Adrian T. Lee, Univ. of California, Berkeley (United States) [7741-50]

9:30 am: **The Atacama B-mode search: a microwave background polarimeter**, Joseph W. Fowler, Princeton Univ. (United States) [7741-51]

9:50 am: **The BICEP2 microwave polarimeter**, R. Walter Ogburn IV, for the BICEP2 collaboration, California Institute of Technology (United States) [7741-52]

Coffee Break 10:10 to 10:40 am

SESSION 13

Room: Pacific Salon I Fri. 10:40 to 11:20 am

CMB Instruments I: Current and Near Term II

Session Chair: J. Anthony Murphy, National Univ. of Ireland, Maynooth (Ireland)

10:40 am: **Initial performance of the BICEP2 antenna-coupled superconducting bolometers at the South Pole**, Justus A. Brevik, BICEP2 A. collaboration, California Institute of Technology (United States) [7741-53]

11:00 am: **The C-band all-sky survey: instrument design, status, and first-look data**, Oliver G. King, Keck Institute for Space Studies (United States); Charles Copley, Univ. of Oxford (United Kingdom); Rod Davies, Richard Davis, Clive Dickinson, Jodrell Bank Ctr. for Astrophysics (United Kingdom); Yaser A. Hafez, King Abdul Aziz City for Science and Technology (Saudi Arabia); Christian Holler, Hochschule Esslingen (Germany); Justin L. Jonas, Rhodes Univ. (South Africa); Michael E. Jones, Univ. of Oxford (United Kingdom); J. Patrick Leahy, Jodrell Bank Ctr. for Astrophysics (United Kingdom); Stephen Muchovej, Timothy J. Pearson, Matthew A. Stevenson, California Institute of Technology (United States); Angela C. Taylor, Univ. of Oxford (United Kingdom) [7741-54]

SESSION 14

Room: Pacific Salon I Fri. 11:20 am to 12:20 pm

Cryo-Mechanical Design

Session Chair: J. Anthony Murphy, National Univ. of Ireland, Maynooth (Ireland)

11:20 am: **SCUBA-2: mechanical overview and lessons learned**, Helen M. McGregor, UK Astronomy Technology Ctr. (United Kingdom); Simon C. Craig, Joint Astronomy Ctr. (United States); Wayne S. Holland, UK Astronomy Technology Ctr. (United Kingdom). [7741-55]

11:40 am: **The cryomechanical design of MUSIC: a novel imaging instrument for millimeter-wave astrophysics at the Caltech Submillimeter Observatory**, Matthew I. Hollister, Nicole G. Czakov, California Institute of Technology (United States); Peter K. Day, Jet Propulsion Lab. (United States); Ran P. Duan, California Institute of Technology (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Sunil R. Golwala, California Institute of Technology (United States); Henry G. LeDuc, Jet Propulsion Lab. (United States); Philip R. Maloney, Univ. of Colorado at Boulder (United States); Benjamin A. Mazin, Univ. of California, Santa Barbara (United States); Hien T. Nguyen, Jet Propulsion Lab. (United States); Omid Noroozian, California Institute of Technology (United States); Jack Sayers, Jet Propulsion Lab. (United States); James A. Schlaerth, Univ. of Colorado at Boulder (United States); Seth Siegel, California Institute of Technology (United States); John E. Vaillancourt, NASA Ames Research Ctr. (United States); Anastasios Vayonakis, California Institute of Technology (United States); Philip R. Wilson, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-56]

12:00 pm: **Thermal architecture for SPIDER long-duration cryostat**, Jon E. Gudmundsson, Princeton Univ. (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Mandana Amiri, The Univ. of British Columbia (Canada); Steven J. Benton, Univ. of Toronto (Canada); James J. Bock, Jet Propulsion Lab. (United States); J. Richard Bond, Canadian Institute for Theoretical Astrophysics, Inc. (Canada); Joseph A. Bonetti, Jet Propulsion Lab. (United States); Hsin C. Chiang, Princeton Univ. (United States); Carlo R. Contaldi, Imperial College London (United Kingdom); Brendan P. Crill, Jet Propulsion Lab. (United States); Daniel T. O'Dea, Imperial College London (United Kingdom); Marzieh Farhang, Univ. of Toronto (Canada); Jeffrey P. Filippini, California Institute of Technology (United States); Laura M. Fissel, Natalie N. Gandilo, Univ. of Toronto (Canada); Sunil R. Golwala, California Institute of Technology (United States); Matthew Hasselfield, Mark Halpern, The Univ. of British Columbia (Canada); Gene C. Hilton, National Institute of Standards and Technology (United States); Warren A. Holmes, Jet Propulsion Lab. (United States); Viktor V. Hristov, California Institute of Technology (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); William C. Jones, Princeton Univ. (United States); Chao-lin Kuo, Stanford Univ. (United States); Andrew E. Lange, California Institute of Technology (United States); Carrie J. MacTavish, Imperial College London (United Kingdom); et al. [7741-57]

Lunch Break 12:20 to 1:30 pm

SESSION 15

Room: Pacific Salon I Fri. 1:30 to 3:30 pm

CMB Instruments II: Longer Term

Session Chair: Jonas Zmuidzinas, California Institute of Technology

1:30 pm: **SPIDER: a balloon-borne CMB polarimeter for large angular scales**, Jeffrey P. Filippini, California Institute of Technology (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Mandana Amiri, The Univ. of British Columbia (Canada); Steven J. Benton, Univ. of Toronto (Canada); Richard Bihary, Case Western Reserve Univ. (United States); James J. Bock, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); J. Richard Bond, Canadian Institute for Theoretical Astrophysics, Inc. (Canada); Joseph A. Bonetti, Jet Propulsion Lab. (United States); Sean A. Bryan, Case Western Reserve Univ. (United States); Bryce Burger, The Univ. of British Columbia (Canada); Hsin C. Chiang, Princeton Univ. (United States); Carlo R. Contaldi, Imperial College London (United Kingdom); Brendan P. Crill, Olivier P. Doré, Jet Propulsion Lab. (United States); Marzieh Farhang, Laura M. Fissel, Natalie N. Gandilo, Univ. of Toronto (Canada); Sunil R. Golwala, California Institute of Technology (United States); Jon E. Gudmundsson, Princeton Univ. (United States); Mark Halpern, Matthew Hasselfield, The Univ. of British Columbia (Canada); Gene C. Hilton, National Institute of Standards and Technology (United States); Warren A. Holmes, Jet Propulsion Lab. (United States); Viktor V. Hristov, California Institute of Technology (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); William C. Jones, Princeton Univ. (United States); Chao-lin Kuo, Stanford Univ. (United States); et al. [7741-58]

1:50 pm: **Design and performance of the SPIDER instrument**, Marcus C. Runyan, California Institute of Technology (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Mandana Amiri, The Univ. of British Columbia (Canada); Steven J. Benton, Univ. of Toronto (Canada); Richard Bihary, Case Western Reserve Univ. (United States); James J. Bock, Jet Propulsion Lab. (United States); J. Richard Bond, Univ. of Toronto (Canada); Joseph A. Bonetti, Jet Propulsion Lab. (United States); Sean A. Bryan, Case Western Reserve Univ. (United States); Bryce Burger, The Univ. of British Columbia (Canada); Hsin C. Chiang, Princeton Univ. (United States); Carlo R. Contaldi, Imperial College London (United Kingdom); Brendan P. Crill, Olivier P. Doré, Jet Propulsion Lab. (United States); Marzieh Farhang, Univ. of Toronto (Canada); Jeffrey P. Filippini, California Institute of Technology (United States); Laura M. Fissel, Natalie N. Gandilo, Univ. of Toronto (Canada); Sunil R. Golwala, California Institute of Technology (United States); Jon E. Gudmundsson, Princeton Univ. (United States); Mark Halpern, Matthew Hasselfield, The Univ. of British Columbia (Canada); Gene C. Hilton, National Institute of Standards and Technology (United States); Warren A. Holmes, Jet Propulsion Lab. (United States); Viktor V. Hristov, California Institute of Technology (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); William C. Jones, Princeton Univ. (United States); Chao-lin Kuo, Stanford Univ. (United States); et al. [7741-59]

2:10 pm: **The Primordial Inflation Polarization Explorer (PIPER)**, David T. Chuss, NASA Goddard Space Flight Ctr. (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Charles L. Bennett, The Johns Hopkins Univ. (United States); Dominic J. Benford, NASA Goddard Space Flight Ctr. (United States); Jessie L. Dotson, NASA Ames Research Ctr. (United States); Joseph R. Eimer, The Johns Hopkins Univ. (United States); Dale J. Fixsen, NASA Goddard Space Flight Ctr. (United States); Mark Halpern, The Univ. of British Columbia (Canada); James Hinderks, Gary F. Hinshaw, NASA Goddard Space Flight Ctr. (United States); Kent D. Irwin, National Institute of Standards and Technology (United States); Christine A. Jhabvala, Alan J. Kogut, NASA Goddard Space Flight Ctr. (United States); Nuala McCullaugh, The Johns Hopkins Univ. (United States); Timothy M. Miller, Paul Mirel, S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States); Carole E. Tucker, Cardiff Univ. (United Kingdom); George M. Voellmer, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States); Lingzhen Zeng, The Johns Hopkins Univ. (United States) [7741-60]

2:30 pm: **5,120 superconducting bolometers for the PIPER balloon-borne CMB polarization experiment**, Dominic J. Benford, David T. Chuss, NASA Goddard Space Flight Ctr. (United States); Gene C. Hilton, Kent D. Irwin, National Institute of Standards and Technology (United States); Nikhil S. Jethava, Christine A. Jhabvala, Alan J. Kogut, Timothy M. Miller, S. Harvey Moseley, Karwan Rostem, Elmer H. Sharp, Johannes G. Staguhn, George M. Voellmer, Edward J. Wollack, NASA Goddard Space Flight Ctr. (United States) [7741-61]

2:50 pm: **The Keck array: a pulse-tube-cooled CMB polarimeter**, Christopher D. Sheehy, for the Keck Collaboration, The Univ. of Chicago (United States) . . [7741-62]

3:10 pm: **ACTPol: a polarization-sensitive receiver for the Atacama Cosmology Telescope**, Michael D. Niemack, National Institute of Standards and Technology (United States) [7741-63]

Coffee Break 3:30 to 4:00 pm

SESSION 16

Room: Pacific Salon I Fri. 4:00 to 5:00 pm

Readouts and Electronics

Session Chair: Wayne S. Holland,
UK Astronomy Technology Ctr. (United Kingdom)

4:00 pm: **SQUID-based multiplexed readout electronics and TES bolometer array during an engineering flight of the EBEX stratospheric balloon**, François Aubin, McGill Univ. (Canada); Asad M. Aboobaker, Univ. of Minnesota (United States); Peter A. R. Ade, Cardiff Univ. (United Kingdom); Carlo Baccigalupi, Scuola Internazionale Superiore di Studi Avanzati (Italy); Chaoyun Bao, Univ. of Minnesota (United States); Julian Borrill, Christopher Cantalupo, Lawrence Berkeley National Lab. (United States); Daniel Chapman, Joy Didier, Columbia Univ. (United States); Matthew Dobbs, McGill Univ. (Canada); Will F. Grainger, Cardiff Univ. (United Kingdom); Shaul Hanany, Univ. of Minnesota (United States); Johannes Hubmayr, National Institute of Standards and Technology (United States); Peter O. Hyland, McGill Univ. (Canada); Seth N. Hillbrand, Columbia Univ. (United States); Andrew Jaffe, Imperial College London (United Kingdom); Bradley Johnson, Univ. of California, Berkeley (United States); Terry J. Jones, Univ. of Minnesota (United States); Theodore S. Kisner, Lawrence Berkeley National Lab. (United States); Jeffrey Klein, Univ. of Minnesota (United States); Andrei L. Korotkov, Brown Univ. (United States); Samuel Leach, Scuola Internazionale Superiore di Studi Avanzati (Italy); Adrian T. Lee, Univ. of California, Berkeley (United States); Michele Limon, Columbia Univ. (United States); Kevin MacDermid, McGill Univ. (Canada); Tomotake Matsumura, California Institute of Technology (United States); Xiaofan Meng, Univ. of California, Berkeley (United States); Amber Miller, Columbia Univ. (United States); et al. [7741-64]

4:20 pm: **Baseband feedback for SAFARI-SPICA TES using frequency-domain multiplexing**, Ayoub Bounab, Ctr. d'Etude Spatiale des Rayonnements (France); Piet A. J. de Korte, SRON Netherlands Institute for Space Research (Netherlands); Alain Cros, Martin Giard, Ctr. d'Etude Spatiale des Rayonnements (France); Jan van der Kuur, Bert van Leeuwen, SRON Netherlands Institute for Space Research (Netherlands); Bert Monna, Systematic Design B.V. (Netherlands); Robert Mossel, Ad Niewenhuizen, SRON Netherlands Institute for Space Research (Netherlands); Laurent Ravera, Ctr. d'Etude Spatiale des Rayonnements (France) [7741-66]

4:40 pm: **An open-source software-defined radio readout for MKIDS**, Ran P. Duan, California Institute of Technology (United States); Sean McHugh, Univ. of California, Santa Barbara (United States); Bruno Serfass, Univ. of California, Berkeley (United States); Benjamin A. Mazin, Andrew Merrill, Univ. of California, Santa Barbara (United States); Sunil R. Golwala, Thomas P. Downes, Nicole G. Czakon, California Institute of Technology (United States); Peter K. Day, Jet Propulsion Lab. (United States); Jiansong Gao, National Institute of Standards and Technology (United States); Jason Glenn, Univ. of Colorado at Boulder (United States); Matthew I. Hollister, California Institute of Technology (United States); Henry G. Leduc, Jet Propulsion Lab. (United States); Philip R. Maloney, Univ. of Colorado at Boulder (United States); Omid Noroozian, California Institute of Technology (United States); Hien T. Nguyen, Jack Sayers, Jet Propulsion Lab. (United States); James A. Schlaerth, Univ. of Colorado at Boulder (United States); Seth Siegel, California Institute of Technology (United States); John E. Vaillancourt, SOFIA / USRA (United States); Tasos A. Vayonakis, California Institute of Technology (United States); Philip R. Wilson, Jet Propulsion Lab. (United States); Jonas Zmuidzinas, California Institute of Technology (United States) [7741-67]

Closing Remarks

Room: Pacific Salon I Fri. 5:00 to 5:10 pm

Facility Map
See page 143.

High Energy, Optical, and Infrared Detectors for Astronomy IV

Conference Chairs: **Andrew D. Holland**, The Open Univ. (United Kingdom); **David A. Dorn**, Pelco

Program Committee: **James W. Beletic**, Teledyne Imaging Sensors; **Morley M. Blouke**, Ball Aerospace & Technologies Corp.; **Gert Finger**, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); **Fiona A. Harrison**, California Institute of Technology; **Paul R. Jorden**, e2v technologies plc (United Kingdom); **Satoshi Miyazaki**, National Astronomical Observatory of Japan (Japan); **Robert H. Philbrick**, Ball Aerospace & Technologies Corp.; **Peter J. Pool**, e2v technologies plc (United Kingdom); **Lothar W. Strüder**, Max-Planck-Institut für extraterrestrische Physik (Germany); **Tadayuki Takahashi**, Japan Aerospace Exploration Agency (Japan); **Hiroshi Tsunemi**, Osaka Univ. (Japan)

Sunday 27 June

SESSION 1

Room: Royal Palm IV-VI Sun. 8:40 to 10:00 am

EM CCDs

Session Chair: **Andrew D. Holland**, The Open Univ. (United Kingdom)

8:40 am: **High-speed photon-counting CCD cameras for astronomy**, Craig D. Mackay, Univ. of Cambridge (United Kingdom) [7742-01]

9:00 am: **EMCCD cryogenic cameras for the Brazilian tunable filter imager**, Denis Andrade, Univ. de São Paulo (Brazil); Dani Guzman, AstroInventions (United Kingdom); Olivier Daigle, Univ. de Montréal (Canada); Keith Taylor, Claudia Oliveira, Javier Ramirez Fernandez, Univ. de São Paulo (Brazil) [7742-02]

9:20 am: **The darkest EMCCD ever**, Olivier Daigle, Univ. de Montréal (Canada); Sébastien Blais-Ouellette, Photon etc. Inc. (Canada); Claude Carignan, Univ. de Montréal (Canada) [7742-03]

9:40 am: **Adaptive optics wavefront sensing detector developments at ESO**, Mark D. Downing, Johann Kolb, Dietrich Baade, Olaf Iwert, Norbert Hubin, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Philippe Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Jean-Luc Gach, Philippe Balard, Observatoire Astronomique de Marseille-Provence (France); Christian Guillaume, Observatoire de Haute-Provence (France); Eric Stadler, Yves Magnard, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [7742-04]

Coffee Break 10:00 to 10:30 am

SESSION 2

Room: Royal Palm IV-VI Sun. 10:30 to 11:50 am

CCDs I

Session Chair: **Paul R. Jorden**, e2v technologies plc (United Kingdom)

10:30 am: **The use of EM-CCDs on the proposed International X-ray Observatory**, James H. Tutt, Neil J. Murray, Andrew D. Holland, The Open Univ. (United Kingdom); Mark Robbins, e2v technologies plc (United Kingdom) [7742-33]

10:50 am: **Study of pixel area variations in prototype LSST CCDs**, Ivan V. Kotov, Alexandra I. Kotov, James Frank, Paul O'Connor, Veljko Radeka, Peter Z. Takacs, Brookhaven National Lab. (United States) [7742-06]

11:10 am: **PSF and MTF measurement methods for thick CCD sensor characterization**, Peter Z. Takacs, Ivan V. Kotov, James Frank, Paul O'Connor, Veljko Radeka, David M. Lawrence, Brookhaven National Lab. (United States) [7742-07]

11:30 am: **Ultra-high sensitivity APD-based 3D ladar sensors**, Michael D. Jack, Raytheon Co. (United States) [7742-08]

Lunch Break 11:50 am to 1:20 pm

SESSION 3

Room: Royal Palm IV-VI Sun. 1:20 to 2:00 pm

CCDs II

Session Chair: **Paul R. Jorden**, e2v technologies plc (United Kingdom)

1:20 pm: **Mas-PMAS: commissioning of a 4k-CCD detector for the Potsdam multi-aperture spectrophotometer**, Andreas Kelz, Martin M. Roth, Thomas Fechner, Emil Popow, Svend M. Bauer, Astrophysikalisches Institut Potsdam (Germany) [7742-09]

1:40 pm: **Characterization of a σ - Δ -based CMOS monolithic detector**, Brandon J. Hanold, Donald F. Figer, Brian Ashe, Thomas Montagiano, Don Stauffer, Rochester Institute of Technology (United States); Zeljko Ignjatovic, Danijel Maricic, Univ. of Rochester (United States); Shouleh Nikzad, Jet Propulsion Lab. (United States) [7742-10]

SESSION 4

Room: Royal Palm IV-VI Sun. 2:00 to 3:40 pm

CMOS

Session Chair: **Andrew D. Holland**, The Open Univ. (United Kingdom)

2:00 pm: **Fundamental performance differences between CMOS and CCD imagers: part IV**, James R. Janesick, Jeff H. Pinter, Robert Potter, Sarnoff Corp. (United States); Tom Elliott, Jet Propulsion Lab. (United States); James T. Andrews, John R. Tower, Mark Grygon, Sarnoff Corp. (United States) [7742-11]

2:20 pm: **Hybridization of a sigma-delta-based CMOS hybrid detector**, Kimberly E. Kolb, Christopher W. Maloney, Rochester Institute of Technology (United States); Nancy C. Stoffel, Infotonics Technology Ctr. (United States); Alan D. Raisanen, Brian Ashe, Donald F. Figer, Rochester Institute of Technology (United States) [7742-12]

2:40 pm: **CCD test bench for the Euclid visible channel: performances and preliminary results**, Nathalie Boudin, Ludovic Duvet, Udo Telljohann, Didier D. E. Martin, European Space Research and Technology Ctr. (Netherlands) [7742-13]

3:00 pm: **High-performance hybrid CMOS sensors for ground-based astronomy applications**, Richard Blank, James W. Beletic, Yibin Bai, Mark Farris, Eric Piquette, Raphael Ricardo, Brian Starr, Min Xu, Teledyne Imaging Sensors (United States) [7742-14]

3:20 pm: **Recent advancements in high-performance CMOS image arrays for astronomical instrumentation**, James W. Beletic, Selmer Anglin, Yibin Bai, Richard Blank, Stephanie Buck, Craig Cabelli, Mark Farris, David Gulbransen, Atul Joshi, Donald Lee, Eric Piquette, Raphael Ricardo, Brian Starr, William E. Tennant, Min Xu, Majid Zandian, Teledyne Imaging Sensors (United States) [7742-15]

Coffee Break 3:40 to 4:00 am

SESSION 5

Room: Royal Palm IV-VI Sun. 4:00 to 5:40 pm

CCDs III

Session Chair: **Satoshi Miyazaki**,

National Astronomical Observatory of Japan (Japan)

4:00 pm: **Packaging LBNL 4-side abutable p-channel CCDs**, Robert W. Besuner, Lawrence Berkeley National Lab. (United States); Stewart E. Harris, Patrick N. Jelinsky, Univ. of California, Berkeley (United States); Natalie A. Roe, Lawrence Berkeley National Lab. (United States) [7742-17]

4:20 pm: **Characterization and absolute QE measurements of delta-doped N-channel and P-channel silicon-based imaging arrays**, Blake C. Jacquot, Steve P. Monacos, Todd J. Jones, Jordana Blacksborg, Michael E. Hoenk, Shouleh Nikzad, Jet Propulsion Lab. (United States) [7742-18]

4:40 pm: **Improving red wavelength sensitivity of CCDs**, Paul R. Jorden, e2v technologies plc (United Kingdom); Mark D. Downing, European Organisation for Astronomical Research in the Southern Hemisphere (Germany); Andrew Harris, Andrew Kelt, Pritesh Mistry, Pash Patel, Peter J. Pool, e2v technologies plc (United Kingdom) [7742-19]

5:00 pm: **Update of the STA1600 10560 x 10560 pixel high-resolution CCD**, Richard A. Bredthauer, Gregory R. Bredthauer, Kasey L. Boggs, Semiconductor Technology Associates Inc. (United States) [7742-20]

5:20 pm: **Characterization of deep-depletion Hamamatsu CCDs for the Gemini multi-object spectrograph**, Tim Hardy, Richard G. Murowinski, J. Murray Fletcher, Darren A. Erickson, Andre Anthony, Kei Szeto, Jennifer Dunn, National Research Council Canada (Canada) [7742-81]

Monday 28 June

Plenary Session

Room: Golden Ballroom Mon. 8:30 to 9:40 am

8:30 am: **Welcome and Introduction**

Session Chair: Douglas A. Simons, Gemini Observatory (United States)

8:40 am: **Unknowns and unknown unknowns: from dark sky to dark matter and dark energy**, Yasushi Suto, The Univ. of Tokyo (Japan) [7733-501]

9:10 am: **Optical synoptic telescopes: new science frontiers**, J. Anthony Tyson, Univ. of California, Davis (United States) [7733-502]

Coffee Break 9:40 to 10:10 am

SESSION 6

Room: Royal Palm IV-VI Mon. 10:10 to 11:30 am

Cryogenic Detectors

Session Chair: Fiona A. Harrison, California Institute of Technology

10:10 am: **Lumped element microwave kinetic inductance detectors for optical to near-IR spectrophotometry**, Andrew Merrill, Benjamin A. Mazin, Sean McHugh, Kieran O'Brien, Univ. of California, Santa Barbara (United States); Bruce A. Bumble, Jet Propulsion Lab. (United States) [7742-22]

10:30 am: **Cryogenic trap detector with high-quantum efficiency from 4-28 micrometers**, Solomon I. Woods, National Institute of Standards and Technology (United States); Adriaan C. Carter, Booz Allen Hamilton, Inc. (United States); Timothy M. Jung, Jung Research and Development Corp. (United States); Simon G. Kaplan, Raju U. Datla, National Institute of Standards and Technology (United States) [7742-23]

10:50 am: **Imaging soft x-ray spectrometers based on superconducting tunnel junction detectors**, Peter Verhoeve, Didier D. E. Martin, Richard Hijmering, European Space Research and Technology Ctr. (Netherlands); Robert Venn, Cambridge Microfab Ltd. (United Kingdom); Alexander G. Kozorezov, Lancaster Univ. (United Kingdom) [7742-24]

11:10 am: **Code-division SQUID multiplexers for transition-edge sensor arrays**, Carl D. Reintsema, National Institute of Standards and Technology (United States); Joern Beyer, Physikalisch-Technische Bundesanstalt (Germany); Hsaio Mei Cho, W. Bertrand Doriese, Gene C. Hilton, Kent D. Irwin, Michael D. Niemack, Daniel R. Schmidt, Joel N. Ullom, Leila R. Vale, National Institute of Standards and Technology (United States) [7742-25]

SESSION 7

Room: Royal Palm IV-VI Mon. 11:30 am to 12:10 pm

X-Ray Detectors I

Session Chair: Fiona A. Harrison, California Institute of Technology

11:30 am: **In-orbit performance of avalanche photodiode as radiation detector onboard a pico-satellite Cute-1.7+APD II**, Takahiro Toizumi, Tokyo Institute of Technology (Japan); Jun Kataoka, Waseda Univ. (Japan) [7742-26]

11:50 am: **Measurements of Si hybrid CMOS x-ray detector characteristics**, Stephen D. Bongiorno, Abraham D. Falcone, David N. Burrows, Robert Cook, The Pennsylvania State Univ. (United States) [7742-27]

Lunch Break 12:10 to 1:40 pm

SESSION 8

Room: Royal Palm IV-VI Mon. 1:40 to 5:30 pm

X-Ray Detectors II

Session Chair: Hiroshi Tsunemi, Osaka Univ. (Japan)

1:40 pm: **The DEPFET-based focal plane detectors for MIXS on BepiColombo**, Johannes Treis, Max-Planck-Institut für extraterrestrische Physik (Germany); Laci Andricek, Max-Planck-Institut für Physik (Germany); Klaus Heinzinger, PNSensor GmbH (Germany); Sven Herrmann, Thomas Lauf, Max-Planck-Institut für extraterrestrische Physik (Germany); Peter H. Lechner, Gerhard Lutz, Petra Majewski, PNSensor GmbH (Germany); Matteo Porro, Jonas Reiffers, Max-Planck-Institut für extraterrestrische Physik (Germany); Rainer H. Richter, Max-Planck-Institut für Physik (Germany); Gerhard Schaller, Max-Planck-Institut für extraterrestrische Physik (Germany); Martina Schnecke, Max-Planck-Institut für Physik (Germany); Florian Schopper, Max-Planck-Institut für extraterrestrische Physik (Germany); Heike Soltau, PNSensor GmbH (Germany); Alexander Stefanescu, Lothar W. Strüder, Giulio de Vita, Max-Planck-Institut für extraterrestrische Physik (Germany) [7742-28]

2:00 pm: **The IXO wide-field imager**, Peter H. Lechner, PNSensor GmbH (Germany); Alexander Stefanescu, Johannes Gutenberg Univ. Mainz (Germany); Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany); Johannes Treis, Max-Planck-Institut für Sonnensystemforschung (Germany) [7742-29]

2:20 pm: **Quantum efficiency measurements of eROSITA pnCCDs**, Stefanie Ebermayer, Norbert Meidinger, Lothar W. Strüder, Max-Planck-Institut Halbleiterlabor (Germany); Alexander Gottwald, Michael K. Krümey, Frank Scholze, Physikalisch-Technische Bundesanstalt (Germany) [7742-30]

2:40 pm: **Development of a 3D CZT detector prototype for Laue Lens telescope**, Ezio Caroli, Natalia Auricchio, INAF - IASF Bologna (Italy); Carl Budtz-Jorgensen, DTU Space (Denmark); Rui M. Curado da Silva, Univ. de Coimbra (Portugal); Stefano Del Sordo, INAF - IASF Palermo (Italy); Irfan Kuvvetli, DTU Space (Denmark); Lorenzo Natalucci, INAF - IASF Roma (Italy); Egidio M. Quadri, INAF - IASF Milano (Italy); John B. Stephen, INAF - IASF Bologna (Italy); Pietro Ubertini III, INAF - IASF Roma (Italy); Massimiliano Zanichelli, Univ. degli Studi di Parma (Italy); Andrea Zappettini, Consiglio Nazionale delle Ricerche (Italy) [7742-31]

3:00 pm: **The silicon drift detector for the IXO high-time resolution spectrometer**, Peter H. Lechner, PNSensor GmbH (Germany); Didier Barret, Ctr. d'Etude Spatiale des Rayonnements (France); Pierre Bodin, Ctr. National d'Etudes Spatiales (France); Rouven Eckhardt, PNSensor GmbH (Germany); Carlo E. Fiorini, Politecnico di Milano (Italy); Karine Lacombe, Ctr. d'Etude Spatiale des Rayonnements (France); Adrian Niculae, PNDetector GmbH (Germany); Roger Pons, Laurent Ravera, Ctr. d'Etude Spatiale des Rayonnements (France); Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany) [7742-32]

Coffee Break 3:20 to 3:50 pm

3:50 pm: **Off-plane x-ray grating spectrometer camera for IXO**, Neil J. Murray, Andrew D. Holland, James H. Tutt, Anthony M. Evagora, Simeon J. Barber, The Open Univ. (United Kingdom); Peter J. Pool, James Endicott, David J. Burt, e2V technologies plc (United Kingdom); David M. Walton, Mathew Page, Univ. College London (United Kingdom); Randall L. McEntaffer, The Univ. of Iowa (United States); Webster C. Cash, Jr., Univ. of Colorado at Boulder (United States); Charles F. Lillie, Suzanne Casement, Northrop Grumman Aerospace Systems (United States) [7742-95]

4:10 pm: **Estimating the eROSITA detector background using Monte-Carlo simulations with Geant4**, Christoph Tenzer, Gabriele Warth, Eckhard Kendziorra, Andrea E. Santangelo, Eberhard Karls Univ. Tübingen (Germany) [7742-34]

4:30 pm: **First performance measurements with the SIMBOL-X science verification model**, Daniel Maier, Christoph Tenzer, Eckhard Kendziorra, Andrea E. Santangelo, Eberhard Karls Univ. Tübingen (Germany) [7742-35]

4:50 pm: **First x-ray imaging measurements with the new SLAC free-electron laser (LCLS)**, Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany); Robert Hartmann, PNSensor GmbH (Germany) [7742-36]

5:10 pm: **Test results of the new large area PNCCD for the eROSITA X-ray Telescope**, Johannes Elbs, Lothar W. Strüder, Norbert Meidinger, Robert Andritschke, Max-Planck-Institut Halbleiterlabor (Germany) [7742-37]

Monday Poster Session

Room: Grand Exhibit Hall Mon. 5:30 to 7:00 pm

Authors should be prepared to display their poster at morning coffee break. Posters for this conference will be on display in the Grand Exhibit Hall on Monday. The interactive poster session with authors in attendance will be Monday evening from 5:30 to 7:00 pm. Posters can remain displayed for extended viewing until 9:00 pm. Authors should return to remove their posters after 8:30 pm. Posters left displayed will be considered unwanted and will be discarded.

New developments for detector controllers at NOAO, Mark R. Hunten, Peter C. Moore, David G. Sawyer, National Optical Astronomy Observatory (United States) [7742-69]

Method to implement the CCD timing generator based on FPGA, Binhua Li, Kunming Univ. of Science and Technology (China); Qian Song, National Astronomical Observatories (China); Chun He, Jianhui Jin, Kunming Univ. of Science and Technology (China) [7742-70]

SIDECAR ASIC focal plane electronics for astronomical instrumentation, Raphael Ricardo, Selmer Anglin, Lalit Bhambhani, James W. Beletic, Richard Blank, Jing Chen, Edwin Dons, Michael Eads, Michael Gorder, Gregory Jacques, Thomas Joyner, Moshe Lanir, Markus Loose, Norair Muradian, Jianmei Pan, Neil Songco, Teledyne Imaging Sensors (United States) [7742-71]

Characterization and performance of the 4k x 4k Hawaii-2RG Mosaic for PANIC, Vianak Naranjo, Josef W. Fried, Ulrich Mall, José Ricardo Ramos, Karl Wagner, Max-Planck-Institut für Astronomie (Germany) [7742-72]

Repackaging and characterization of a HgCdTe CMOS infrared camera for the New Solar Telescope, Wenda Cao, Big Bear Solar Observatory (United States); Kenneth Salvestrini, Infrared Labs., Inc. (United States); Roy Coulter, Philip R. Goode, Big Bear Solar Observatory (United States) [7742-73]

Comparisons of the performances of a HAWAII2RG operated with an in-house acquisition system and a cold SIDECAR ASIC, Gérard Smadja, Institut de Physique Nucléaire de Lyon (France); Cedric Cerna, Ctr. de Physique des Particules de Marseille (France); Alain Castera, Institut de Physique Nucléaire de Lyon (France); Anne Ealet, Ctr. de Physique des Particules de Marseille (France) [7742-74]

Reciprocity failure in 1.7 µm cut-off HgCdTe detectors, Robert J. Hill, Eliot M. Malumuth, Roger D. Foltz, Randy A. Kimble, NASA Goddard Space Flight Ctr. (United States); Augustyn Waczynski, Nick Boehm, Global Science & Technology, Inc. (United States); Yiting Wen, Emily Kan, Nicholas R. Collins, NASA Goddard Space Flight Ctr. (United States) [7742-75]

Characterization of multicolor Type-II InAs/GaSb strained-layer superlattice photodetectors for use in astronomical observation, Andre Wong, Matthew J. Nelson, Univ. of Virginia (United States); Elena A. Plis, The Univ. of New Mexico (United States); Tom Vandervelde, Tufts Univ. (United States); Michael F. Skrutskie, Univ. of Virginia (United States); Sanjay Krishna, Hasul Kim, Arezou Khoshakhlagh, Stephen A. Myers, The Univ. of New Mexico (United States) [7742-76]

Testing of an extended-wavelength InGaAs array in an astronomical spectrograph, Matthew J. Nelson, Andre Wong, Michael F. Skrutskie, John C. Wilson, Univ. of Virginia (United States); Shrikrishna Kanneganti, Max-Planck-Institut für extraterrestrische Physik (Germany) and Univ. of Virginia (United States) [7742-77]

Radiation hardness studies of InGaAs and Si photodiodes at irradiation energies of 30, 52, 98 MeV and fluences to 10¹⁰ protons/cm², Brian J. Baptista, Stuart L. Mufson, Indiana Univ. (United States) [7742-78]

Experiment on the radiation damage evaluation for CCD7899, Qian Song, National Astronomical Observatories (China) [7742-79]

The challenge of highly curved monolithic imaging detectors, Olaf Iwert, Bernard Delabre, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7742-80]

Centroid precision as a function of total counts in a windowed CMOS image of a point source, Ronald E. Wurtz, Vincent J. Riot, Lawrence Livermore National Lab. (United States) [7742-82]

Characterization and performance of hyper supprime-cam CCD, Yukiko Kamata, Satoshi Miyazaki, Hidehiko Nakaya, National Astronomical Observatory of Japan (Japan); Hisanori Suzuki, Masaharu Muramatsu, Hamamatsu Photonics K.K. (Japan) [7742-83]

CCD imaging technique for moving objects in the field of view, Binhua Li, Kunming Univ. of Science and Technology (China); Qian Song, National Astronomical Observatories (China); Kaifan Ji, Chunrong Wang, Jing Liu, Kunming Univ. of Science and Technology (China) [7742-84]

Interpixel crosstalk in a 3D-integrated active pixel sensor for x-ray detection, Beverly J. LaMarr, Gregory Y. Prigozhin, Steve E. Kissel, Marshall W. Bautz, Richard F. Foster, Massachusetts Institute of Technology (United States); Vyshnavi Suntharalingam, Lincoln Lab. (United States) [7742-85]

Mosaic packaging advancements for large-format devices: current and future capabilities at Raytheon Vision Systems, Shawn Erving, Raytheon Co. (United States); Alan Hoffman, Roger Holcombe, Acumen Scientific (United States); Neil Therrien, Raytheon Co. (United States) [7742-87]

Electroplated indium bumps as thermal and electrical connection of NTD Ge sensors for the fabrication of microcalorimeter arrays, Ugo Lo Cicero, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy) and Univ. degli Studi di Palermo (Italy); Claudio Arnone, Univ. degli Studi di Palermo (Italy); Marco Barbera, Univ. degli Studi di Palermo (Italy) and INAF/Osservatorio Astronomico di Palermo (Italy); Alfonso Collura, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy); Giuseppe Lullo, Univ. degli Studi di Palermo (Italy) [7742-88]

Packaging CCD's for space applications, Charles Baltay, William Emmet, David Rabinowitz, Andrew Szymkowiak, Yale Univ. (United States); Christopher J. Bebek, John H. Emes, Armin Karcher, William F. Kolbe, Natalie A. Roe, Lawrence Berkeley National Lab. (United States); Paul Derwent, H. Thomas Diehl, Juan Estrada, Joseph W. Howell, Fermi National Accelerator Lab. (United States) [7742-89]

Utilizing a commercial cRIO FPGA platform to operate a microshutter array on a UV sounding rocket mission, David A. Rapchun, Global Science & Technology, Inc. (United States) and NASA Goddard Space Flight Ctr. (United States); Brian Fleming, The Johns Hopkins Univ. (United States); Alexander S. Kutuyev, Univ. of Maryland (United States) and NASA Goddard Space Flight Ctr. (United States); Eric I. Lyness, Mink Hollow Systems, Inc. (United States); Stephan R. McCandliss, The Johns Hopkins Univ. (United States); S. Harvey Moseley, NASA Goddard Space Flight Ctr. (United States) [7742-90]

Radiation testing of CCD's for space applications, Charles Baltay, Anne Bauer, William Emmet, Jonathan Jerke, David Rabinowitz, Daniel Silverman, Andrew Szymkowiak, Giovanni Zevi Della Porta, Yale Univ. (United States) [7742-91]

New optical modalities utilizing curved focal plane imaging detector devices and large arrays for terrestrial and spaceborne telescopes, David S. Mark, Mark Resources LLC (United States) [7742-92]

Controller and data acquisition system for SIDECAR ASIC driven HAWAII detectors, Anamparambu N. Ramaprakash, Mahesh P. Burse, Pravin Chordia, Kalpesh Chillal, Sujit Punnadi, Abhay Kohok, Vilas Mestry, Inter-Univ. Ctr. for Astronomy and Astrophysics (India) [7742-93]

Gamma radiation damage study of 0.18 µm process CMOS image sensors, Ben Dyer, Andrew D. Holland, The Open Univ. (United Kingdom); Paul Jerram, Mark Robbins, David J. Burt, e2v technologies plc (United Kingdom) [7742-94]

Tuesday 29 June

Plenary Session I

Room: Golden Ballroom Tues. 8:30 to 10:00 am

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

8:30 am: **ELTs science vision**, Roberto Gilmozzi, European Southern Observatory (Germany) [7733-503]

9:00 am: **Science with ALMA: a supersharp view of the nurseries of galaxies, stars and planets** (*Presentation Only*), Ewine F. van Dishoeck, Leiden Observatory (Netherlands) and Max Planck Institute für Extraterrestrische Physik (Germany) [AS10PL2-504]

9:30 am: **The ESA space science and robotic exploration programme** (*Presentation Only*), Mark J. McCaughrean, European Space Research and Technology Ctr. (Netherlands) [AS10PL2-505]

Coffee Break 10:00 to 11:00 am

Plenary Session II

Room: Golden Ballroom Tues. 11:00 am to 12:30 pm

Session Chair: Mark M. Casali, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

11:00 am: **The ESA Herschel Space Observatory: first year achievements and early science results** (*Presentation Only*), Göran L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) [7731-506]

11:30 am: **High-resolution imaging of extraterrestrial planetary surfaces** (*Presentation Only*), Alfred S. McEwen, The Univ. of Arizona (United States) [AS10PL2-507]

12:00 pm: **Transiting exoplanets: from ground-based origins to Kepler discoveries and beyond** (*Presentation Only*), Sara Seager, Massachusetts Institute of Technology (United States) [AS10PL2-508]

Lunch/Exhibition Break 12:30 to 1:50 pm

SESSION 9

Room: Royal Palm IV-VI Tues. 2:00 to 3:40 pm

Radiation Damage

Session Chair: Peter J. Pool, e2v technologies plc (United Kingdom)

2:00 pm: **A fast model of radiation-induced electron trapping in CCDs for implementation in the Gaia data processing**, Alexander D. T. Short, European Space Research and Technology Ctr. (Netherlands); Thibaut Prod'homme, Leiden Univ. (Netherlands); Michael Weiler, Observatoire de Paris à Meudon (France); Scott W. Brown, Univ. of Cambridge (United Kingdom); Anthony G. A. Brown, Leiden Univ. (Netherlands) [7742-38]

2:20 pm: **Comparison of a fast analytical model of radiation damage effects in CCDs with experimental tests and detailed Monte-Carlo simulations**, Thibaut Prod'homme, Leiden Univ. (Netherlands); Michael Weiler, Observatoire de Paris à Meudon (France); Scott W. Brown, Univ. of Cambridge (United Kingdom); Alexander D. T. Short, European Space Research and Technology Ctr. (Netherlands); Anthony G. A. Brown, Leiden Univ. (Netherlands) [7742-39]

2:40 pm: **Silvaco ATLAS model of ESA's Gaia satellite e2v CCD91-72 pixels**, George M. Seabroke, Andrew D. Holland, The Open Univ. (United Kingdom); David J. Burt, Mark Robbins, e2v technologies plc (United Kingdom) [7742-40]

3:00 pm: **The effects of radiation damage on the spectral resolution of the Chandrayaan-1 x-ray spectrometer**, Thomas E. Walker, David R. Smith, Brunel Univ. (United Kingdom); Chris Howe, Barry J. Kellett, Rutherford Appleton Lab. (United Kingdom); P. Sree Kumar, ISRO Satellite Ctr. (India); Manuel Grande, Univ. of Wales (United Kingdom) [7742-41]

3:20 pm: **Charge trap identification for proton-irradiated p+ channel CCDs**, Nick J. Mostek, Christopher J. Bebek, Armin Karcher, William F. Kolbe, Natalie A. Roe, Jonathan Thacker, Lawrence Berkeley National Lab. (United States) [7742-42]

Coffee Break 3:40 to 4:10 pm

SESSION 10

Room: Royal Palm IV-VI Tues. 4:10 to 5:50 pm

Electronics for Imagers

Session Chair: Gert Finger, European Organisation for Astronomical Research in the Southern Hemisphere (Germany)

4:10 pm: **Fully digital image sensor employing sigma-delta indirect feedback ADC with high-sensitivity to low-light illuminations for astronomical imaging applications**, Zeljko Ignjatovic, Danijel Maricic, Univ. of Rochester (United States); Donald F. Figer, Brian Ashe, Brandon J. Hanold, Thomas Montagliano, Don Stauffer, Rochester Institute of Technology (United States) [7742-43]

4:30 pm: **ASIC chip set for control and readout of astronomical CCDs**, Christopher J. Bebek, Jean-Pierre Walder, Henrik von der Lippe, Dario Gnani, Armin Karcher, Lawrence Berkeley National Lab. (United States); Robert P. Abiad, Stewart E. Harris, Univ. of California, Berkeley (United States); Bob Y. Zheng, Lawrence Berkeley National Lab. (United States) [7742-44]

4:50 pm: **SIDECAR ASIC at ESO**, Reinhold J. Dorn, Gert Finger, Derek J. Ives, Leander H. Mehrgan, Manfred W. Meyer, Joerg Stegmeier, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7742-45]

5:10 pm: **Description of the UCAM detector control system with particular emphasis to a development of 4K x 4K CCD camera systems**, Nagaraja N. Bezawada, Stewart A. McLay, UK Astronomy Technology Ctr. (United Kingdom); Derek J. Ives, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7742-46]

5:30 pm: **Optimization of noise performance of low-background detector arrays**, S. Harvey Moseley, Richard G. Arendt, Dale J. Fixsen, Don J. Lindler, NASA Goddard Space Flight Ctr. (United States); Marcel Loose, ASTRON (Netherlands); Bernard J. Rauscher, NASA Goddard Space Flight Ctr. (United States) [7742-96]

Wednesday 30 June

SESSION 11

Room: Royal Palm IV-VI Wed. 8:30 to 10:10 am

Visible Imagers

Session Chair: Paul R. Jorden, e2v technologies plc (United Kingdom)

8:30 am: **High-throughput processes for high-performance silicon imagers**, Shouleh Nikzad, Alex Carver, Michael E. Hoenk, Frank Greer, Jet Propulsion Lab. (United States) [7742-48]

8:50 am: **The photometric stability of delta-doped detectors**, Michael E. Hoenk, Blake C. Jacquot, Steve P. Monacos, Shouleh Nikzad, Jet Propulsion Lab. (United States) [7742-49]

9:10 am: **A high-performance projector for laboratory emulation of gravitational weak lensing observations from space**, Roger M. Smith, Khanh Bui, California Institute of Technology (United States); Eric Jullo, Jason D. Rhodes, Suresh Seshadri, Jet Propulsion Lab. (United States); Wiswa N. Velur, California Institute of Technology (United States) [7742-50]

9:30 am: **Photon collider: a four-channel autoguider solution**, John Hygelund, Benjamin J. Haldeman, Rachel M. Haynes, Benjamin Burleson, David Jahng, Las Cumbres Observatory (United States) [7742-51]

9:50 am: **Flagging and correction of pattern noise in the Kepler focal plane array**, Jeffery J. Kolodziejczak, NASA Marshall Space Flight Ctr. (United States); Douglas A. Caldwell, Jeffery Van Cleve, SETI Institute (United States); Bruce D. Clarke, Jon M. Jenkins, Miles T. Cote, Todd C. Klaus, NASA Ames Research Ctr. (United States); Vic S. Argabright, Ball Aerospace & Technologies Corp. (United States) [7742-52]

Coffee Break 10:10 to 10:40 am

SESSION 12

Room: Royal Palm IV-VI Wed. 10:40 to 11:20 am

X-Ray Detectors III

Session Chair: Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany)

10:40 am: **First results from electrical qualification measurements on DEFPET pixel detector**, Petra Majewski, PNSSensor GmbH (Germany); Ladislav Andricek, Max-Planck-Institut für Physik (Germany); Thomas Lauf, Max-Planck-Institut für extraterrestrische Physik (Germany); Peter H. Lechner, Gerhard Lutz, PNSSensor GmbH (Germany); Jonas Reiffers, Max-Planck-Institut für extraterrestrische Physik (Germany); Rainer H. Richter, Max-Planck-Institut für Physik (Germany); Gerhard Schaller, Max-Planck-Institut für extraterrestrische Physik (Germany); Martina Schneck, Max-Planck-Institut für Physik (Germany); Florian Schopper, Max-Planck-Institut für extraterrestrische Physik (Germany); Heike Soltau, PNSSensor GmbH (Germany); Alexander Stefanescu, Johannes Gutenberg Univ. Mainz (Germany); Lothar W. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany); Johannes Treis, Max-Planck-Institut für Sonnensystemforschung (Germany) [7742-53]

11:00 am: **Measurement results for an x-ray 3D-integrated active pixel sensor**, Gregory Y. Prigozhin, Richard F. Foster, Massachusetts Institute of Technology (United States); Vyshnavi Suntharalingam, Lincoln Lab. (United States); Steve E. Kissel, Beverly J. LaMarr, Marshall W. Bautz, Massachusetts Institute of Technology (United States) [7742-55]

SESSION 13

Room: Royal Palm IV-VI Wed. 11:20 am to 12:20 pm

IR Detectors I

Session Chairs: James W. Beletic, Teledyne Imaging Sensors; David A. Dorn, Pelco

11:20 am: **Extraction of the frequency spectrum of the noise of a HAWAII2RG NIR detector and impact on low-flux measurements**, Gérard Smadja, Institut de Physique Nucléaire de Lyon (France); Cedric Cerna, Ctr. de Physique des Particules de Marseille (France); Alain Castera, Institut de Physique Nucléaire de Lyon (France); Anne Ealet, Ctr. de Physique des Particules de Marseille (France) [7742-56]

11:40 am: **Development of high-speed, low-noise NIR HgCdTe avalanche photodiode arrays for adaptive optics and interferometry**, Gert Finger, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7742-57]

12:00 pm: **High-performance infrared and visible detector arrays for astronomy applications: current state of the art and future developments at Raytheon Vision Systems**, Richard Peralta, Eric Beuville, David Acton, Elizabeth Corrales, Charles Rabkin, Raytheon Co. (United States) [7742-16]

Lunch/Exhibition Break 12:20 to 1:50 pm

SESSION 14

Room: Royal Palm IV-VI Wed. 1:50 to 5:20 pm

IR Detectors II

Session Chairs: **James W. Beletic**, Teledyne Imaging Sensors;
David A. Dorn, Pelco

1:50 pm: **A method for the characterization of subpixel response of near-infrared detectors**, Tomasz P. Biesiadzinski, Gregory Tarlé, Michael J. Howe, Wolfgang Lorenzon, Michael S. Schubnell, Curtis Weaverdyck, Univ. of Michigan (United States) [7742-58]

2:10 pm: **Investigating reciprocity failure in 1.7-micron cut-off HgCdTe detectors**, Michael S. Schubnell, Tomasz P. Biesiadzinski, Wolfgang Lorenzon, Gregory Tarlé, Univ. of Michigan (United States) [7742-59]

2:30 pm: **Advancement of large-format silicon blocked impurity band focal plane arrays**, Henry H. Hogue, David B. Reynolds, Reed B. Mattson, Stacy A. Masterjohn, Daniel Okerlund, Mark Muzilla, DRS Sensors & Targeting Systems, Inc. (United States) [7742-60]

2:50 pm: **Calibration of ultra-low infrared power at NIST**, Solomon I. Woods, National Institute of Standards and Technology (United States); Stephen M. Carr, Jung Research and Development Corp. (United States); Adriaan C. Carter, Booz Allen Hamilton, Inc. (United States); Timothy M. Jung, Jung Research and Development Corp. (United States); Simon G. Kaplan, Raju U. Datla, National Institute of Standards and Technology (United States) [7742-62]

3:10 pm: **Noise performance in long exposures for a recent low-noise 2.5 μm Teledyne H2RG**, Roger M. Smith, California Institute of Technology (United States); F. Elliott Koch, Univ. of California, Los Angeles (United States); Gustavo Rahmer, David D. S. Hale, California Institute of Technology (United States) [7742-63]

Coffee Break 3:30 to 4:00 pm

4:00 pm: **Performance evaluation of 5 μm cut-off Hawaii-2RG detectors using the fast readout amplifiers**, Derek J. Ives, European Organisation for Astronomical Research in the Southern Hemisphere (Germany) [7742-64]

4:20 pm: **Detector characterization for the JWST fine guidance sensor**, Neil Rowlands, Earl Hartwig, Charles Berndt, Gerry Warner, COM DEV Canada (Canada) [7742-65]

4:40 pm: **Dark current characterization of Teledyne LWIR HgCdTe detector array for low background applications**, Candice M. Bacon, Univ. of Rochester (United States) and Roberts Wesleyan College (United States); Craig W. McMurtry, Judith L. Pipher, Univ. of Rochester (United States); Amy Mainzer, Jet Propulsion Lab. (United States); William J. Forrest, Univ. of Rochester (United States) [7742-66]

5:00 pm: **Curved infrared detectors: applications to spectrometry and astronomy**, Delphine Dumas, Manuel Fendler, Frédéric Berger, Francois Marion, Agnès Arnaud, Claire Vialle, Valérie Goudon, Commissariat à l'Énergie Atomique (France); Jérôme Primot, ONERA (France); Etienne P. le Coarer, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Hervé Ribot, Commissariat à l'Énergie Atomique (France) [7742-67]

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Course Daily Schedule

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
WS1002 The Galileoscope: Bringing Telescope Optics Down To Earth (<i>Pompea, Sparks</i>) 1:30 to 3:30 pm, \$15 / \$15, p. 107	SC135 Adaptive Optics (<i>Tyson</i>) 8:30 am to 5:30 pm, \$560 / \$675, p. 107	SC906 Introduction to Visible and NIR Spectrograph Design and Development for Astronomy (<i>Sheinis</i>) 8:30 am to 12:30 pm, \$420 / \$475, p. 106	SC1001 Systems Engineering for Astronomy Projects (<i>Schnetler</i>) 8:30 am to 5:30 pm, \$525 / \$640, p. 105	SC644 An Introduction To Scalable Frameworks For Observatory Software Infrastructure (<i>Chiozzi</i>) 8:30 am to 5:30 pm, \$525 / \$640, p. 106
		SC944 The Radiometry Case Files (<i>Grant</i>) 1:30 to 5:30 pm, \$375 / \$430, p. 106		

Systems Engineering for Astronomy Projects

SC1001

NEW

Course level: Introductory

CEU .65 \$525 / \$640 USD

Wednesday 8:30 am to 5:30 pm

This course provides an introduction to lean systems engineering for the development of telescopes, facilities and instruments for astronomy. A primary goal of this course is to illustrate how the rigor of the systems engineering process can help us to build better astronomy products more quickly and cheaply.

The course will be exercise-driven, using an example of an actual instrument. As part of the course we will also illustrate the synergy between systems engineering, creativity and innovation by using the “Theory of Inventive Problem Solving”.

During the course we will explore the various analysis methods that can be used to ensure performance budgets are partitioned and allocated correctly. This will be followed by working through an example to show the interaction between allocations and performance estimations. Finally the course will also define and show useful tools that can be used to perform the systems engineering tasks.

LEARNING OUTCOMES

This course will enable you to:

- describe the various roles of a project Systems Engineer and list the activities for each of the following participants in a project: Project manager, Project Scientist/Instrument Scientist, Systems Engineer and Discipline Lead Engineers
- describe the typical life-cycle of an astronomy product
- capture and write user and product requirements
- distinguish between requirements, design constraints and design guidelines
- perform a functional and performance analysis
- allocate functions to physical items and then to partition these into systems, sub-systems, modules and assemblies
- identify physical and logical contradictions in your overall system design
- optimise your overall system design
- evaluate the overall system performance

INTENDED AUDIENCE

Project managers and systems engineers new to astronomy who wish to learn more about the application area. Engineers and Project/Instrument scientists who wish to learn more about systems engineering. Undergraduate training in engineering or science is assumed.

INSTRUCTOR

Hermine Schnetler has been a Systems Engineer for 25 years, initially working in the Defence industry on products such as inertial navigation systems for aircraft, helmet sighting systems and helicopter mounted sighting systems. She has joined the United Kingdom Astronomy Technology Centre (UK ATC) five years ago and is the Head of Group: Systems Engineering. She tailored and successfully introduced systems engineering for astronomy and was also involved in a number of instrument studies. She has a first degree in Electronics Engineering and an MSc in Systems Engineering. Both of these were obtained from the University of Pretoria in South Africa. She followed this with a PhD in Software Engineering from Cranfield University, UK. Dr Schnetler is the chair for the International Council on Systems Engineering (INCOSE) Scottish Local Group, a member of the Institute for Engineering Technology and SPIE.

Facility Map

See page 143.

The Radiometry Case Files

SC944

NEW

Course level: Introductory
CEU .35 \$375 / \$430 USD
Tuesday 1:30 to 5:30 pm

This course takes basic radiometric principles and applies them to calculate the amount of radiation reaching a system's entrance aperture or focal plane for a variety of source-system combinations. It provides a wide array of examples from which solutions to related problems may be drawn. It encompasses the UV, visible, and infrared regions of the electromagnetic spectrum, and includes several examples from *The Art of Radiometry*, published by SPIE Press in 2009.

Typical applications to be addressed include solar and overcast sky irradiance, distinguishing between adjacent astronomical targets, sensor signals from specular and diffuse reflectors, image correction for radiometric effects, star sensing, and integrating spheres.

LEARNING OUTCOMES

This course will enable you to:

- identify approaches to problem-solving based on source and geometry considerations
- calculate the amount of radiation received from single and multiple sources
- determine the effects of source and target properties on system requirements
- describe the principles behind radiometric calibration and atmospheric correction algorithms
- qualify the limitations of your solution

INTENDED AUDIENCE

This class is designed for the practicing engineer or technologist who is expected to solve radiometric problems but is unsure what factors to identify in formulating a solution, or where to locate examples of similar problems. Though taught at an introductory level, the course assumes a basic familiarity with radiometric terminology.

INSTRUCTOR

Barbara Grant is the co-author, with Jim Palmer, of *The Art of Radiometry*. For more than twenty years she has applied her engineering skills to solve problems in industries as diverse as aerospace and indoor tanning. A consultant in electro-optics, she received the M. S. degree in Optical Sciences from the University of Arizona and two NASA awards for her work on the GOES weather satellite imager and sounder. Her previous work for SPIE includes developing and chairing a special session on FLIR image analysis.

COURSE PRICE INCLUDES the text *The Art of Radiometry* (SPIE Press, 2009) by James M. Palmer and Barbara G. Grant.

An Introduction To Scalable Frameworks For Observatory Software Infrastructure

SC644

Course level: Intermediate
CEU .65 \$525 / \$640 USD
Thursday 8:30 am to 5:30 pm

This course provides an analysis of the advantages and requirements for an integrated software infrastructure for observatories and similar scientific facilities. It provides a common framework for application software that can range from control to data analysis applications. Currently available and emerging technologies are evaluated and compared. The course concentrates on the architecture of an application framework necessary for such an infrastructure and on the impact on scalability, maintainability and reuse. Many practical examples will be given based on the ALMA Common Software, a CORBA-based, open source solution used by ALMA and other projects.

LEARNING OUTCOMES

This course will enable you to:

- identify the advantages and requirements of an observatory-level software infrastructure
- compare existing and emerging technologies
- estimate the impact of introducing a common software framework in a new or pre-existing project
- demonstrate applications implemented using the concepts described in the course

INTENDED AUDIENCE

This material is intended for anyone who is involved in the design and refurbishment of the software architecture of a scientific facility and in the selection of the middle-ware architecture to use. Those who develop applications integrated in the data flow and control infrastructure of an observatory will find this course valuable.

INSTRUCTOR

Gianluca Chiozzi currently works at the European Organisation for Astronomical Research in the Southern Hemisphere in Munich. For the last 15 years he has been heavily involved in the design and implementation of the Common Software and Telescope Control Software for the VLT and ALMA projects. He is now head of the Control and Instrumentation Software Department. Before ESO he worked at the IBM Technical and Scientific Research Center in Milan.

Introduction to Visible and NIR Spectrograph Design and Development for Astronomy

SC906

Course level: Introductory
CEU .35 \$420 / \$475 USD
Tuesday 8:30 am to 12:30 pm

This course provides attendees with an introduction to aerial spectrograph design and development for astronomy. The course concentrates on system configurations and performance optimization and analysis. Specific concepts to be addressed include: image quality, throughput, flexure, performance modeling and system testing.

LEARNING OUTCOMES

This course will enable you to:

- identify the fundamental optical and mechanical principles that affect spectrograph performance
- construct different first-order design configurations that achieve a desired resolution and field-of-view
- compare the relative merits of different component designs
- specify optical components for vendor quote and fabrication
- judge whether various vendor acceptance tests are sufficient
- design efficient end-to-end testing for your spectrograph

INTENDED AUDIENCE

The material presented in this course is intended for anyone who is developing an astronomical spectrograph or who wants to understand the various constraints, trade-offs and system-level decisions that go into the design of a visible/NIR spectrograph in order to optimize for performance. This course is ideal for a first-time instrument PI as well as graduate students and engineers who will be part of an astronomical-spectrograph development team.

INSTRUCTOR

Andrew Sheinis is a Professor of Astronomy and Astronomical Instrumentation at the University of Wisconsin at Madison. He has been involved in optical system design and engineering for over 25 years. He is currently the PI for the RSS/NIR Spectrograph and Imager for the 11-meter SALT telescope and has developed instruments for Lick Observatory, Keck Observatory and the University of Hawaii as well as medical and defense applications in industry.

COURSE PRICE INCLUDES the text *Astronomical Optics, Second Edition* (Academic Press, 1999) by Daniel J. Schroeder.

Adaptive Optics

SC135

Course level: Introductory
CEU .65 \$560 / \$675 USD
Monday 8:30 am to 5:30 pm

Adaptive optics are used to improve imagery and the transmission of optical signals by sensing a wavefront disturbance and using the information for real-time control of an active optical element such as a deformable mirror. This course covers the basic principles of adaptive optics with emphasis on improving image resolution by atmospheric turbulence compensation.

LEARNING OUTCOMES

This course will enable you to:

- identify the applications and types of adaptive optics systems
- understand the operation of wavefront sensors, deformable mirrors, and laser guide stars
- predict the performance of an adaptive optics system
- estimate the effects of noise, constraints imposed by the control algorithm or bandwidth, and wavefront reconstructor limitations
- compare the advantages and disadvantages of systems to execute informed “make-buy” decisions on components

INTENDED AUDIENCE

This course is intended for engineers, scientists, technicians, and students to understand the basic principles and applications of adaptive optics and to make basic performance predictions.

INSTRUCTOR

Robert Tyson is an Associate Professor of Physics and Optical Science at the University of North Carolina at Charlotte. He has been working in the field of adaptive optics for over 25 years. He is author of *Principles of Adaptive Optics*, *Introduction to Adaptive Optics*, and co-author of *Field Guide to Adaptive Optics*.

COURSE PRICE INCLUDES the text *Introduction to Adaptive Optics* (SPIE Press, 2000) by Robert Tyson.

The Galileoscope: Bringing Telescope Optics Down To Earth

WS1002

NEW

Course level: Introductory
CEU .20 \$15 / \$15 USD
Sunday 1:30 to 3:30 pm

This course is designed for scientists and engineers who want to share astronomy and optics in a fun and engaging manner in schools or in after school settings. You will learn how to teach optics using the Galileoscope, a high quality low-cost telescope designed for educational outreach. The Galileoscope was developed by a team of astronomers, optical engineers, and science educators during the International Year of Astronomy 2009 and was named as a “Gear of the Year” by amateur astronomers and has been nominated for an international education prize. The Galileoscope can be used as an optical bench to explore the optics of lenses as well as showing the wonders of the universe including craters on the Moon, the phases of Venus, the Galilean Moons of Jupiter and the rings of Saturn. Each participant will receive a Galileoscope and standards-based teaching materials. But the main outcome is to have fun building and using a Galileoscope.

LEARNING OUTCOMES

This course will enable you to:

- assemble and use the Galileoscope
- lead students and youth groups in a variety of classroom tested, pedagogically sound activities illustrating the principles of optics used in telescopes
- plan effective observing sessions using the Galileoscope.
- use the Galileoscope in extended learning projects.

INTENDED AUDIENCE

Scientists, engineers, technicians, astronomers, and teachers who want to work with schools and youth groups to promote optics and astronomy.

INSTRUCTORS

Stephen Pompea is Manager of Science Education at the National Optical Astronomy Observatory (NOAO) in Tucson, Arizona. He received his Ph.D. from the University of Arizona and is chair of the U.S. Telescope Kits & Optics Challenges working group that developed the Galileoscope. He was Project Director for the NSF International Year of Astronomy 2009 and the Hands-On Optics projects. He leads a dynamic team at NOAO that conducts programs in teacher and museum educator professional development, optics education, and fosters astronomer-teacher research partnerships. He has worked on many science education and optical engineering projects worldwide and is an adjunct professor at the Universities of Arkansas and the University of Arizona.

Robert Sparks is a Science Education Specialist at NOAO. He received his master's degree in Physics from Michigan State University and leads the Galileoscope teacher professional development program at NOAO. In the last 2 years, he has given dozens of optics education workshops.

COURSE PRICE INCLUDES a Galileoscope as well as a CD of Galileoscope education materials.

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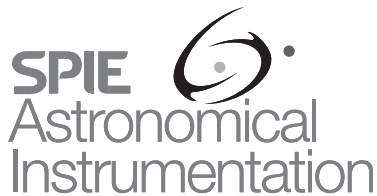
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General Information



San Diego Town & Country Resort and Convention Center
500 Hotel Circle North
San Diego, California 92108 USA

Registration

Registration Hours

Golden Foyer

Saturday	4:00 pm - 7:00 pm
Sunday	7:00 am - 4:00 pm
Monday	7:30 am - 5:00 pm
Tuesday	7:30 am - 5:00 pm
Wednesday	7:30 am - 5:00 pm
Thursday	7:30 am - 4:00 pm
Friday	7:45 am - 11:00 am

Exhibition Hours

Grand Exhibit Hall

Tuesday	10:00 am - 4:00 pm
Wednesday	10:00 am - 4:00 pm
Thursday	10:00 am - 4:00 pm

Course Materials Desk

Golden Foyer

If you have registered to attend a course, stop by the Course Materials Desk after you pick up your badge to obtain your course notes and the course location. Pick up a copy of the latest Education Services catalog to see SPIE Courses at symposia, on video and CD-ROM, and to discover the opportunities of customized In-Company courses.

Food and Beverages

Breakfast Options

The Terrace Cafe opens at 6:00 am serving a full menu breakfast as well as a breakfast buffet. Trellises Garden Grille opens at 7:00 am with full menu and patio dining. Terrace Deli opens at 7:00 am for a quick grab-and-go breakfast.

Coffee and pastries are available for purchase between 7:00 and 9:00 am at the Royal Palm Terrace.

Coffee Breaks

Complimentary coffee will be served at the following times and locations. Please check the individual technical conference listings for exact times and locations.

Sunday 10:00 am to 11:00 am; 3:00 to 4:00 pm
Lion Fountain Court

Monday 9:30 am to 10:30 am; 3:00 to 4:00 pm
Lion Fountain Court

Tuesday 10:00 am to 11:00 am; 3:00 to 4:00 pm
Grand Exhibit Hall

Wednesday 10:00 am to 11:00 am; 3:00 to 4:00 pm
Grand Exhibit Hall

Thursday 10:00 am to 11:00 am; 3:00 to 4:00 pm
Grand Exhibit Hall

Friday 10:00 am to 11:00 am; 3:00 to 4:00 pm
Lion Fountain Court

Lunches

Lunch is available at the hotel restaurants: The Terrace Cafe & Deli, Charlie's Sports Bar and Grille and Trellises Garden Grille.

Hot and cold lunches will also be available for purchase at the Royal Palm Terrace from 11:30 am to 2:00 pm each day. On Tuesday, Wednesday, and Thursday a concession stand will be open in the Grand Exhibit Hall.

Desserts

Grand Exhibit Hall

Tuesday through Thursday

Dessert snacks will be served in the exhibition hall from 3:00 to 3:30 pm. Complimentary tickets for the dessert snacks will be included in attendee registration packets.

Facility Map

See page 143.

Attendee Services

Internet Availability

Internet Pavilion

Grand Foyer - Boardroom

Sunday through Thursday . . . 7:00 am to 9:00 pm

Friday 7:00 am to 11:00 am

SPIE will have a complimentary Internet Pavilion where attendees can use provided workstations or hook up their laptop to an Ethernet connection to access the Internet. There will be a 10-minute time limit per each person's internet session.

Complimentary Internet Wireless Access

Atlas Foyer & Lion Fountain Court

Sunday through Friday 7:00 am to 9:00 pm

SPIE is pleased to provide complimentary wireless access to the Internet for all conference attendees bringing 802.11b wireless-enabled laptops or PDAs.

Note: WiFi service is not available in meeting rooms.

Properly secure your computer before accessing the public wireless network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and/or presentation.

Business Services

Convention Center, Grand Exhibit Hall Corridor

Monday through Friday

The business center can make copies, print documents or transparencies from your laptop, and provides fax services and office supplies. Prices are posted onsite.

SPIE Registration Desk can help with:

Golden Foyer

SPIE Registration Desk can assist with registration payments, receipts, and badge corrections.

- Registration Payments - If you are paying by cash or check as part of your onsite registration, wish to add a course, workshop, or special event requiring payment, or have questions regarding your registration, please see the Registration Desk.
- Receipts - Preregistered attendees who did not receive a receipt prior to the meeting may obtain a new copy of their registration receipt onsite at the Registration Desk.
- Badge Corrections - Attendees who need a correction to their badge information onsite may do so at the Registration Desk. Please have your badge removed from the badge holder, marked with your changes, and ready to hand to the attendant upon approaching the counter.

Messages

SPIE has an urgent message line available during registration hours Sunday through Friday (619.752.7743).

Speaker Check-In Desk

Terrace Salon 1

Sunday-Friday

7:30 am to 5:00 pm

All Presenters are requested to come to Speaker Check-In Desk after they register.

- All Conference rooms will have a computer workstation, LCD projector, screen, lapel microphone, and laser pointer.
- All presenters are requested to come to the Speaker Check-In Desk to confirm display settings of their presentations from their memory devices or laptops with the audiovisual equipment being used at this symposium.

Course Materials Desk

If you have registered to attend a course, please stop by Registration to pick up your badge and course materials.

Marketplace + Souvenirs

Atlas Foyer

Want to find publications related to the event? Check out the SPIE Marketplace area for a variety of books, educational, and professional development materials. You can become a member of SPIE, explore the Digital Library, and take home a souvenir.

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General Information

Policies

Refund Policy

There is a \$40 service charge for processing refunds. Requests for registration or conference dinner refunds must be received no later than 17 June 2010 to be honored. All registration fees will be forfeited after this date. Membership dues are not refundable. SPIE Digital Library subscriptions are not refundable.

Audio, Video, Digital Recording Policy

In the Meeting Rooms and Poster Sessions: For copyright reasons, recordings of any kind are strictly prohibited without prior written consent of the presenter in any conference session, course or of posters presented. Each presenter being taped must file a signed written consent form. Individuals not complying with this policy will be asked to leave a given session and asked to surrender their film or recording media. Consent forms are available at the SPIE Registration Desk.

Laser Pointer Safety Information

SPIE supplies tested and safety approved laser pointers for all conference meeting rooms, and for course rooms if instructors request one. For safety reasons, SPIE requests that presenters use our provided laser pointers available in each meeting room.

If using your personal laser pointer:

- Please have it tested at your facility to make sure it has <5 mW power output. Laser pointers in Class II and IIIa (<5 mW) are eye safe if power output is correct - but don't automatically trust the labeling. Commercially available laser pointers, red or green (or any color), could be incorrectly labeled as to their wavelength and power output.
- We require that you to come to the Audiovisual Desk onsite and test your pointer on our power meter. If the pointer fails the safe power level you may not use the pointer at the conference. You will be required to sign a waiver releasing SPIE of any liability for use of potentially non-safe laser pointers.
- Use of a personal laser pointer at an SPIE event represents user's acceptance of liability for use of a non-SPIE supplied laser pointer device. Misuse of any laser pointer could lead to eye damage. In California, it is a criminal misdemeanor to shine a laser pointer at individuals "who perceive they are at risk."

Underage Persons on Exhibition Floor

For safety and insurance reasons, no persons under the age of 16 will be allowed in the exhibition area during move-in and move-out. During open exhibition hours, only children over the age of 12 accompanied by an adult will be allowed in the exhibition area.

Unauthorized Solicitation

Any manufacturer or supplier who is not an attendee or sponsor and is observed to be soliciting business in the building will be asked to leave immediately. Unauthorized solicitation at SPIE Astronomical Telescopes and Instrumentation is prohibited.

Unsecured Items

Personal belongings such as briefcases, backpacks, coats, book bags, etc. should not be left unattended in meeting rooms or public areas. These items will be subject to removal by security upon discovery.

Parking

Parking at the Town and Country Resort & Convention Center for Overnight Hotel Guests is \$7. Local guests pay \$3.00 for the first hour, then \$2.00 per hour thereafter to a maximum of \$16.00 per day.

Hertz Car Rental is the official car rental agency. To reserve a car, identify yourself as an Astronomical Telescopes & Instrumentation Conference attendee using the Hertz Meeting Code CV# 029B0014.

- In the United States call 1.800.654.2240
- Book Online at www.Hertz.com

Public Transportation on San Diego Trolley/Bus

The San Diego Trolley, i.e. the light rail, is referred to as the "moving landmark" and is a fun way to get around. FARES are based on the trip distance. Fares range from \$1.25 to \$2.50 depending on how many stations are traveled (fares are subject to change). The closest trolley stop, the Fashion Valley Transit Center stop is located between the Town & Country Resort and the Fashion Valley Mall, handy to Old Town, Downtown and even Tijuana. For additional information call Transit System Customer Service at 619.233.3004

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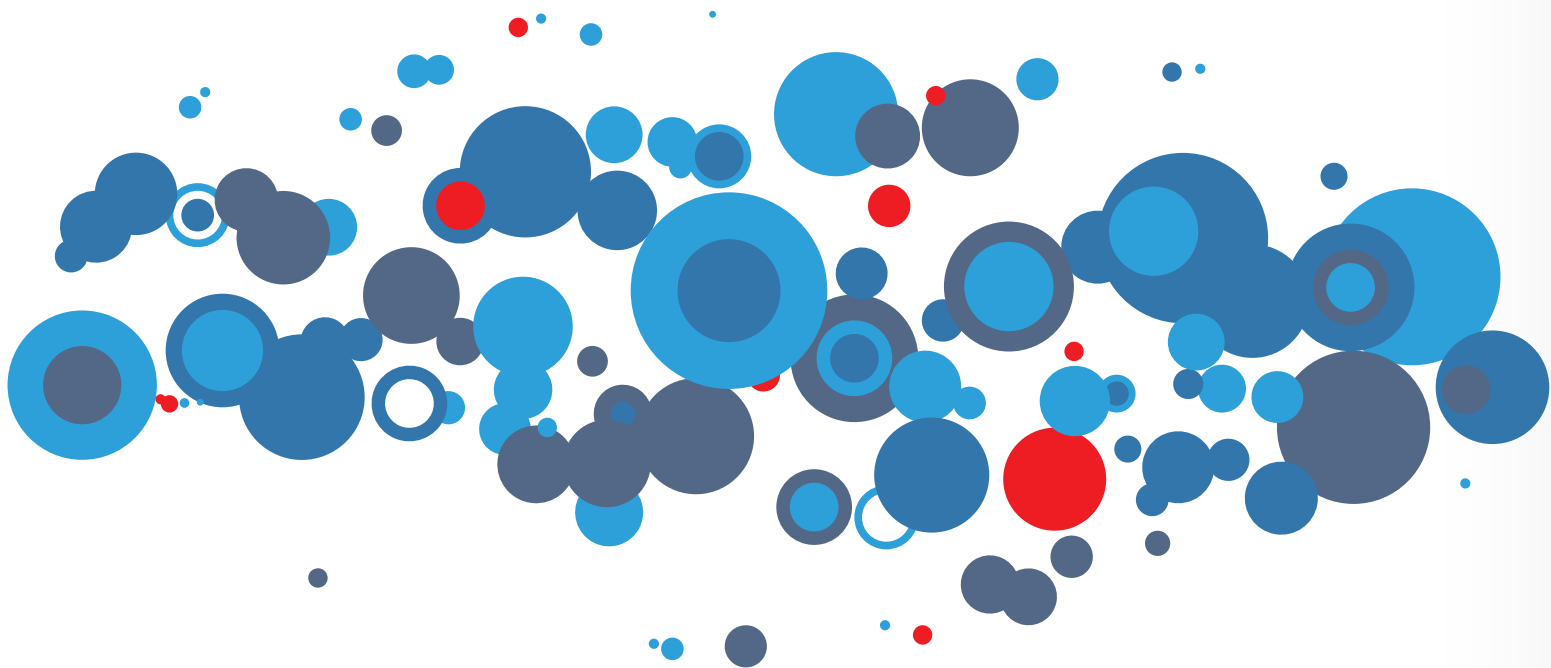
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