Technical Program

SPIE Astronomical Telescopes and Instrumentation

24–31 May 2006

Orlando World Center Marriott Resort & Convention Center

Orlando, Florida USA

The International Society for Optical Engineering

Welcome!

Welcome to the 2006 SPIE symposium on Astronomical Telescopes and Instrumentation. We have chosen the theme of this symposium to emphasize the unique opportunity we have here in Orlando for interaction between astronomers and engineers involved in a wide range of technologies aimed at ground-based, airborne and space telescopes at wavelengths from gamma ray to millimeter. Thanks to the efforts of our conference chairs and committees, and of course the authors, we have a stimulating and varied program, which promises to demonstrate the advances made in the last few years, as well as indicate the exciting prospects for the next generation of facilities, from giant ground-based telescopes to ambitious space facilities.

This symposium is more than a conference. It is a great meeting point for the Astronomy Technology community, leading to gestation of new collaborations and partnerships – especially with industry – which are essential for the bigger and more complex projects of the future. For this reason we are expanding the systems engineering conference introduced at the last Astronomical Telescopes and Instrumentation symposium to include the challenges of large project management. The importance of efficient and novel operational models for the next generation of facilities is recognized with a new conference on this topic. As well as the major conferences on telescopes and their systems and instruments, there is a technology track covering advancements in Adaptive Optics, Opto-mechanics, Software and Controls, and Detectors. We recognize that a major function of this symposium is networking, so we continue to restrict oral presentations in favor of time for posters and interaction among delegates.

We look forward to two new special events this year: a plenary conference session on challenges of the Search for Extra-Solar Planets to complement the plenary talks; and an event where the best young researchers and engineers from individual conferences will be invited to a special session where we can see some of the challenging projects and novel technologies they are pursuing.

The cover image of the Orion Nebula was obtained with WFI at the ESO/MPG 2.2m telescope at La Silla, Chile.

Courtesy: ***European Southern Observatory.***

2006 Symposium Chairs

Colin Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Jacobus Oschmann,
Ball Aerospace & Technologies Corp. (USA)

2006 Symposium Co-Chairs

Mark Clampin,
NASA Goddard Space Flight Ctr. (USA)

Alan F. M. Moorwood,
European Southern Observatory (Germany)

Cooperating Organizations

American Astronomical Society

Association of Universities for Research in Astronomy

Ball Aerospace & Technologies Corp.

European Southern Observatory

OPTICON – Optical Infrared Coordination Network

PPARC – The Particle Physics and Astronomy Research Council

UK Astronomy Technology Centre

University of Florida

College of Optics and Photonics/University of Central Florida

Sponsored by:

The International Society for Optical Engineering

spie.org

Technical Program

SPIE Astronomical Telescopes and Instrumentation

24–31 May 2006

Orlando World Center Marriott Resort & Convention Center

Orlando, Florida USA

Probing the Universe from Ground and Space

Contents

SPIE would like to express its deepest appreciation to the program chairs, conference chairs, cochairs, program committees, and session chairs who have so generously given of 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.

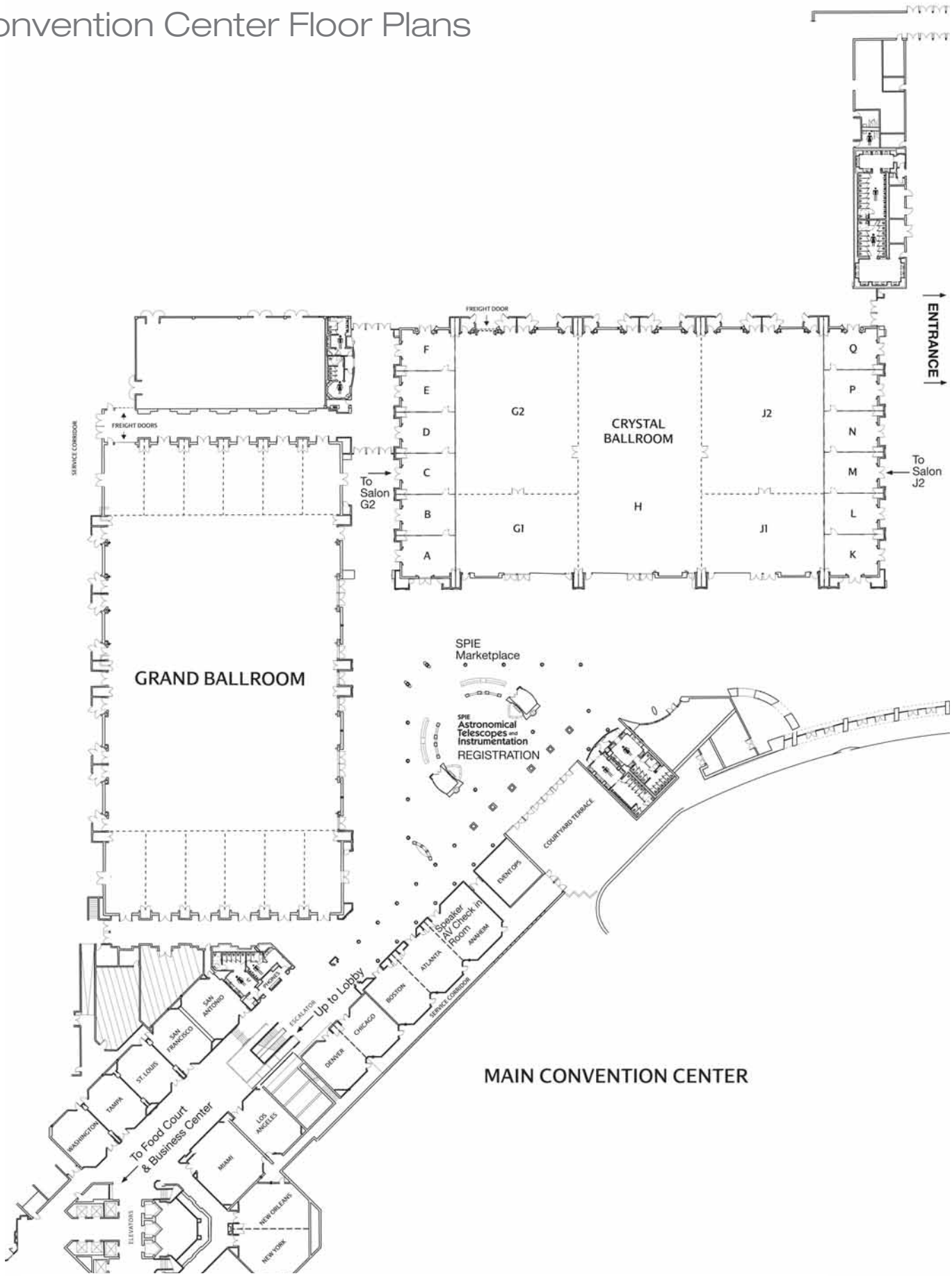
Program Track on:

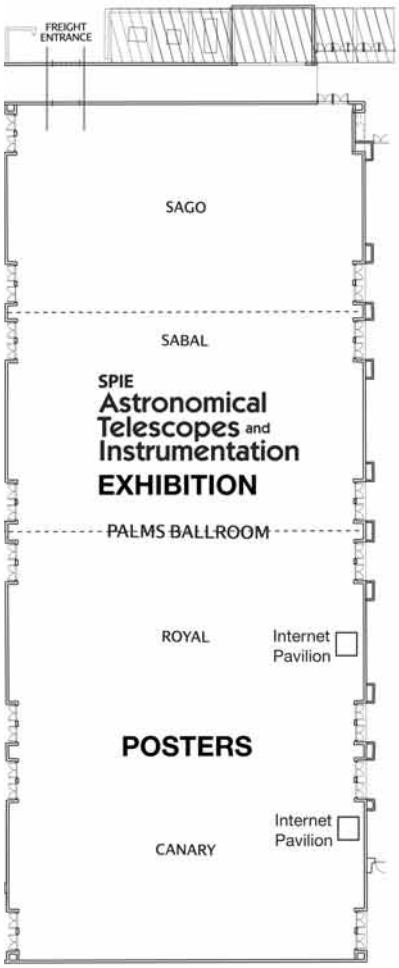
Telescopes and Systems

Program Track on:

Technology Advancements

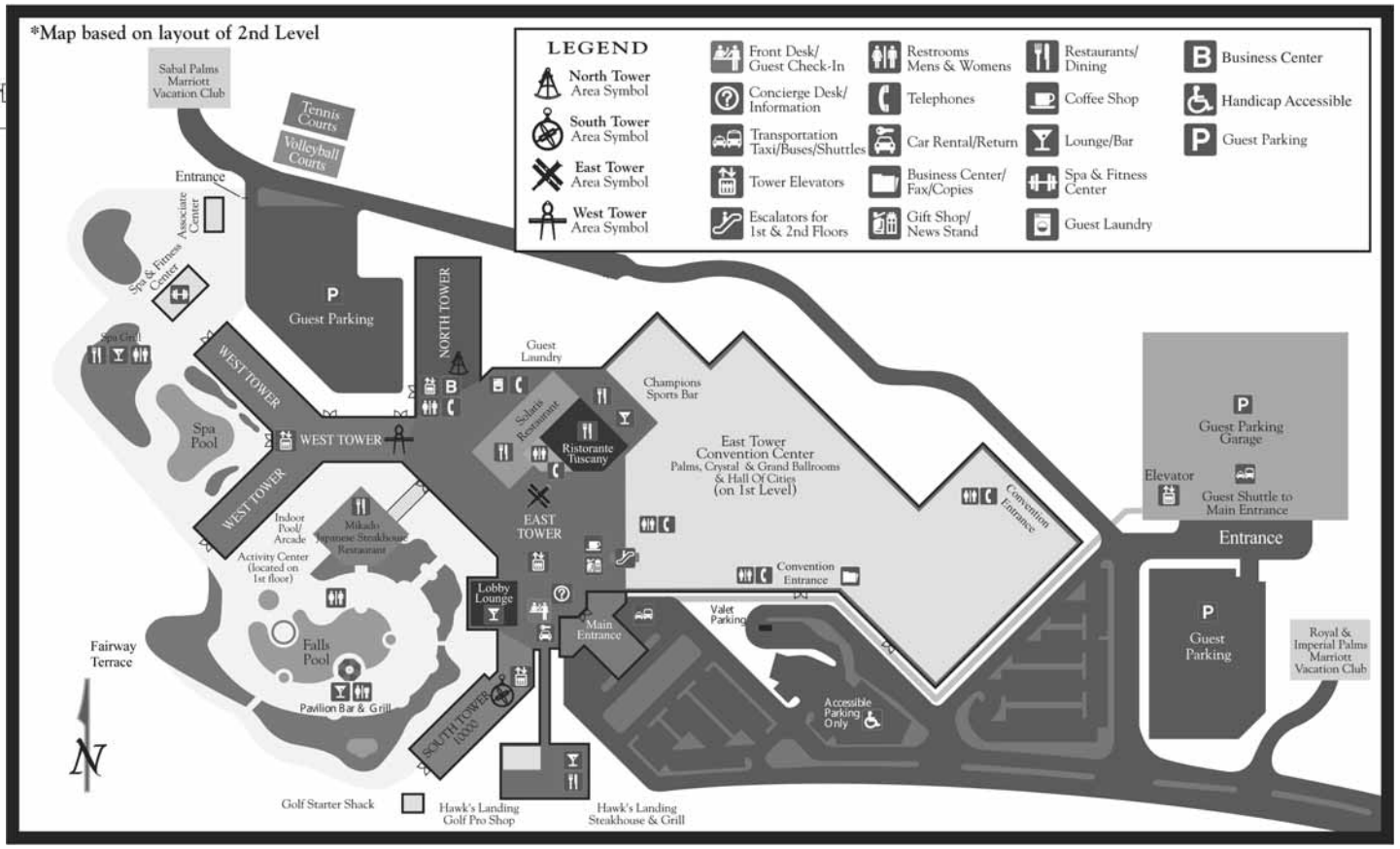
Orlando World Center Marriott Resort & Convention Center Floor Plans





SPIE
Astronomical Telescopes and Instrumentation

Visit the SPIE Marketplace for special meeting prices on SPIE publications and educational courses on video and CD-ROM.



Daily Schedule

Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
24 May	**25 May**	**26 May**	**27 May**	**28 May**	**29 May**	**30 May**	**31 May**

Conference presentations break all day

Technical Conferences

Program Track on:

Telescopes and Systems

6265 **Space Telescopes and Instrumentation I: Optical, Infrared, and Millimeter** *(Mather, MacEwen, de Graauw)* p. 16

6266 **Space Telescopes and Instrumentation II: Ultraviolet to Gamma Ray** *(Turner, Hasinger)* p. 25

6267 **Ground-based and Airborne Telescopes** *(Stepp)* p. 33

6268 **Advances in Stellar Interferometry** *(Monnier, Schöller, Danchi)* p. 42

6269 **Ground-based and Airborne Instrumentation for Astronomy** *(McLean, Iye)* p. 52

6270 **Observatory Operations: Strategies, Processes, and Systems** *(Silva, Doxsey)* p. 65

6271 **Modeling, Systems Engineering, and Project Management for Astronomy II***(Cullum, Angeli)* p. 70

Program Track on:

Technology Advancements

6272 **Advances in Adaptive Optics** *(Ellerbroek, Bonaccini Calia)* p. 73

6273 **Opto-Mechanical Technologies for Astronomy** *(Atad-Ettedgui, Antebi, Lemke)* p. 82

6274 **Advanced Software and Control for Astronomy** *(Lewis, Bridger)* p. 90

6275 **Millimeter and Submillimeter Detectors and Instrumentation for Astronomy III** *(Zmuidzinas, Holland, Withington, Duncan)* p. 95

6276 **High Energy, Optical, and Infrared Detectors for Astronomy II** *(Dorn, Holland)* p. 98

Courses

Optics & Optomechanics

SC141 **Optical Interferometry in Astronomy** *(Haniff)* 8:30 am to 5:30 pm, $460 / $545

SC135 **Adaptive Optics** *(Tyson)* 8:30 am to 5:30 pm, $495 / $580

SC561 **Optomechanics for Space Applications** *(Shipley)* 8:30 am to 5:30 pm, $460 / $545

SC136 **Astronomical Optics for Astronomers** *(Harvey)* 8:30 am to 5:30 pm, $460 / $545

SC017 **Principles of Fourier Optics and Diffraction** *(Gaskill)* 8:30 am to 5:30 pm, $580 / $665

Students Save 50% on Courses

SC139 **Telescope Systems: Materials Choices for Performance & Stability** *(Paquin)* 8:30 am to 5:00 pm, $460 / $545

Sensors & Detectors

SC503 **Use of Visible and Infrared Sensors in Astronomy Applications** *(Lomheim)* 8:30 am to 5:30 pm, $460 / $545

SC504 **Introduction to CCD and CMOS Imaging Sensors and Applica-tions** *(Janesick)* 8:30 am to 5:30 pm, $530 / $615

Software

SC644 **An Introduction to Scalable Frameworks for Observa-tory Software Infrastructure** *(Chiozzi)* 8:30 am to 5:30 pm, $460 / $545

Special Events

Wednesday 24 May	Thursday 25 May	Friday 26 May	Saturday 27 May	Sunday 28 May	Monday 29 May	Tuesday 30 May	Wednesday 31 May
1:00 to 2:00 pm, p. 12 *Welcome and Opening Remarks* *Plenary Presentation*: **Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment, Garth Illingworth,** Univ. of California/ Santa Cruz/Lick Observatory	8:30 to 9:20 am, p. 12 *Plenary Presentation:* **The Central Black Hole and Nuclear Star Cluster of the Galaxy, Reinhard Genzel,** Max-Planck-Institut für extraterrestrische Physik (Germany)	11:30 am to 12:30 pm, p. 10 **Student Lunch with the Experts**	8:30 am to 12:10 pm, p. 10 *Invited Session:* **Young Scientists**	**NO TECHNICAL EVENTS**	11:00 to 12:00 pm, p. 11 **Early Career Roundtable**	8:30 to 9:20 am, p. 13 *Plenary Presentation:* **Novel Technology for Optical and Infrared Astronomy,** Colin R. Cunningham	1:30 to 4:30 pm, p. 11 **The College of Optics & Photonics: CREOL & FPCE, University of Central Florida Tour**
6:30 to 8:00 pm, p. 11 **Networking Reception**	6:00 to 8:00, p. 6 **Interactive Poster Session I**	1:00 to 5:10 pm, p. 7–9 *Invited Session:* **The Search for Extra-Solar Planets** 1:00 pm: *Welcome and Opening Remarks*	11:30 am, p.11 **Tour the James Webb Space Telescope Model**		Noon to 1:00 pm, p. 11 **SPIE Women in Optics Lunch**	6:00 to 7:30, p. 6 **Interactive Poster Session II**	
	8:00 to 9:30 pm, p. 6 *SPIE Technical Group Meeting:* **Adaptive Optics** Chair: Scot Olivier, Lawrence Livermore National Lab.	**From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz **Space Interferometry,** Michael Shao **Space Astrometric Search with Gaia,** Dimitri Pourbaix **Learning About Other Planetary Systems from Space,** George H. Rieke **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, **The Search for Life on Extrasolar Planets,** Sara Seager	1:30 to 2:20 pm, p. 13 *Plenary Presentation:* **Astronomy in Europe: Status and Prospects,** Catherine J. Cesarsky		4:45 to 5:30 pm, p. 49 *Panel Discussion:* **The Future of Optical Interferometry,** Organized by Jean Surdej and Stephen Ridgway *See conf. 6268 for additional details.*		
			4:30 to 6:30 pm, p. 85 *Workshop on:* **Glass Blanks for Large Lenses and Filters in ELTs and WFTs,** *See conf. 6273 for additional details.*		6:30 to 8:00 pm, p. 11 **Networking Reception**		
			5:15 to 6:15 pm, p. 49 *Panel Discussion:* **Relative Merits of Ground, Space, and Antarctic Interferometry,** Organized by: David Buscher, Vincent Coude du Foresto, Michael Shao, *See conf. 6268 for additional details.*				
		7:00 to 9:00, p. 6 **All-Conference Dinner** *(by paid ticket only)*					

Visit the Exhibition p. 14

Special Events

SPIE Technical Group Meeting

Adaptive Optics

Thursday 25 May · 8:00 to 9:30 pm · Salon G1, Crystal Ballroom

Chair: **Scot Olivier,** Lawrence Livermore National Lab.

The SPIE International Technical Group on Adaptive Optics provides a forum for communication within specialized fields of active and adaptive optics. The group is intended for scientists and engineers who are working/interested in these and related disciplines, including electronic controls, computer processing, optical engineering, sensors, mechanical engineering, and practical applications of nonlinear phase conjugation.

Panel on: **Advanced Technology Development for Adaptive Optics**

The SPIE International Technical Group on Adaptive Optics will hold a panel discussion on Advanced Technology Development for Adaptive Optics. Leading experts from around the world will discuss the needs for new adaptive optics technologies, the lessons learned from previous adaptive optics technology development programs, and strategies to develop the next generation of critical adaptive optics technologies for large telescopes. All those interested are welcome to attend and participate in the discussion.

Adaptive optics is established as a requirement for large, ground-based telescopes and high-energy laser systems. This technology is rapidly finding uses in fields such as optical communications, medical imaging, and remote sensing. An international community of researchers from around the world is advancing the state of the art in adaptive optics methods, components and systems.

The SPIE International Technical Group on Adaptive Optics provides a forum for communication within the specialized fields of active and adaptive optics. The group is intended for scientists and engineers who are working or interested in these and related disciplines, including sensor technologies, control systems, real-time computing, optical and mechanical precision engineering.

Interactive Poster Sessions

Orlando World Center Marriott – Royal Salon, Palms Ballroom

Thursday 25 May . . . . . 6:00 to 8:00 pm
Tuesday 30 May . . . . . 6:00 to 7:30 pm

Conference attendees are invited to attend the poster sessions on Thursday and Tuesday evenings. **Since poster sessions are technical events and part of the conference program, it is not appropriate for spouses and families to attend these events. (Paid guest registration badge fees do not include poster sessions or any technical program function.)**

Each evening will represent a different set of conferences. Come view the posters, ask questions, and enjoy light refreshments. Authors of poster papers will be present to answer questions concerning their papers. In addition to the actual interactive sessions, attendees can view posters for each session for approximately 2.5 days as posters will be on display more than just the day of the interactive session (see times below). Attendees are requested to wear their conference registration badges to the poster sessions.

Posters Display Hours

Posters will be on display for each session as follows:

First session (25 May) viewing hours:

Thursday . . . . . 10:00 am to 8:00 pm
(includes interactive session from 6:00 to 8:00 pm)
Friday . . . . . 7:30 am to 7:00 pm
Saturday . . . . . 7:30 am to 2:00 pm

Second session (30 May) viewing hours:

Monday . . . . . 10:00 am to 7:00 pm
Tuesday . . . . . 7:30 am to 8:00 pm
(includes interactive session from 6:00 to 7:30 pm)
Wednesday . . . . . 7:30 am to 1:00 pm

All-Conference Dinner

Friday 26 May · 7:00 to 9:00 pm · Sago Salon, Palms Ballroom
Cost is $75 per person

All attendees are invited to attend an All-Conference Dinner and Presentation on Friday evening. **Tickets for the banquet and presentation are $75 per person and are sold separately from the conference registration.** Ensure your place and purchase your tickets with your preregistration. At the meeting, the ticket purchase deadline is Noon, Thursday 25 May at the SPIE Cashier.

Norman E.Thagard, M.D.

Florida A&M Univ. - Florida State Univ.
College of Engineering
Associate Dean for College Relations
Professor of Electrical Engineering
NASA Astronaut (retired)

NASA Experience: In 1978, Dr. Thagard was selected as one of 35 astronaut candidates from an applicant pool of 8,079. He logged over 140 days in space during five space flights. He was a mission specialist on STS-7 in 1983, Flight Engineer on STS-51B in 1985 and STS-30 in 1989, the Payload Commander on STS-42 in 1992, and was the Cosmonaut Researcher for the 18th Primary Expedition to the Russian Mir Space Station in 1995.

Dr. Thagard first flew on the crew of STS-7, which launched from Kennedy Space Center, Florida, on June 18, 1983. This was the second flight for the Orbiter Challenger and the first flight with a crew of five persons and first American flight with a woman crewmember.

Dr. Thagard then flew on STS-51B, the Spacelab-3 science mission, which launched from Kennedy Space Center on April 29, 1985, aboard the Challenger.

He next served on the crew of STS-30, which launched from Kennedy Space Center, Florida, on May 4, 1989, aboard the Orbiter Atlantis. During this four-day mission, crew members successfully deployed the Magellan Venus-exploration spacecraft, the first U.S. planetary science mission launched since 1978, and the first planetary probe to be deployed from the Shuttle. Magellan arrived at Venus in mid-1990 and mapped almost the entire surface of Venus for the first time, using specialized radar instruments capable of "seeing" through the visually opaque Venusian atmosphere

Dr. Thagard was one of the first NASA astronauts designated as a "Payload Commander," serving in that capacity on STS-42 aboard the Shuttle Discovery, which lifted off from the Kennedy Space Center, Florida, on January 22, 1992.

In 1992, Dr. Thagard was selected to represent the United States as the first American to fly in the Russian space program, serving as the cosmonaut researcher for the Russian Mir 18 mission. Upon launching on a Russian Soyuz rocket from the Baikonaur Cosmodrome, Republic of Kazakhstan, on March 14, 1995, he became the first NASA astronaut to launch from any site other than the Kennedy Space Center and on any non-U.S. spacecraft. After docking with the Russian Mir Space Station on March 16, 1995, the flight continued as the 18th primary expedition to the Mir. Twenty-eight experiments were conducted in the course of the 115-day flight. At its completion, Dr. Thagard was the U.S. record-holder for longest space flight and, with 140 days in space overall, was the most experienced U.S. astronaut ever. The mission, which began from central Asia, ended at Kennedy Space Center, Florida, with a landing aboard the Space Shuttle Orbiter Atlantis on July 7, 1995.

Dr. Thagard retired from NASA on January 3, 1996.

Symposium-Wide Invited Plenary Session

The Search for Extra-Solar Planets

Friday 26 May · 1:00 to 5:10 pm · Salon H, Crystal Ballroom

1:00 pm: **Welcome and Opening Remarks**

Symposium Co-Chairman: **Mark Clampin,** NASA Goddard Space Flight Ctr. (USA)

Chair: **Alan F.M. Moorwood,** European Southern Osbservatory (Germany)

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries**

Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

In the last ten years, more than 160 exoplanets have been detected. These discoveries have revealed the impressive diversity of exoplanet orbital properties. Several statistical properties are already emerging and help constraining the formation mechanisms of these systems.

The past ten years have also witnessed a remarkable improvement of the precision of radial velocity measurements with a gain of about a factor 100. Planets with masses as small as a few earth-masses have been detected. Is it possible to expect further significant progresses of Doppler measurements? Such a possibility could be of interest to permit radial velocity follow-up measurements of planetary transit candidates expected from the COROT and KEPLER space missions: the goal being to get a precise determination of mass-radius relations from terrestrial planets to brown dwarfs.

A radial velocity precision at the level of 0.1 m/s does not seem out of reach. With an observing strategy adapted to minimize the influence of the stellar intrinsic variability (magnetic activity, acoustic modes) we should be in position to explore statistical properties of terrestrial planetary systems.

Michel Mayor is professor of astrophysics at the Geneva University in Switzerland. Since the seventies, he has been involved in the development of spectrographs designed to determine precise stellar radial velocities. The most recent one, the HARPS spectrograph, permits the detection of Doppler shift due to velocity variations as small as a fraction of one meter per second.

In 1995, M. Mayor and D. Queloz discovered the first exoplanet orbiting a solar-type star, 51 Pegasi. With its orbital period of only 4.2 days, 51 Pegasi is the prototype of so-called "Hot Jupiters". This discovery has had a strong impact on planetary formation theory. Over the last ten years, the Geneva team and its collaborators have discovered about half of all exoplanets detected to this day.

M. Mayor has been chairman of the Galactic Structure commission of the International Astronomical Union. At the present time he is a member of the European Southern Observatory Council and foreign associate of the French Academy of Sciences.

Among the most important awards received by M. Mayor we can mention the Balzan Prize 2000, the Einstein Medal 2004 and the Shaw Prize 2005.

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses**

Jaymie M. Matthews, The Univ. of British Columbia (Canada)

The transit of an exoplanet passing in front of its parent star is the only way currently to measure the planet's size directly, and its eclipse by that star is a way to measure its albedo. Ground-based transit searches are hampered by incomplete duty cycles and limited photometric precision, and eclipse measurements - even for giant close-in planets - are difficult if not impossible from the ground. Monitoring from space is required to be sensitive to shallower transits (and hence, smaller planets) over a wider range of orbital periods, as well as to study eclipses in reflected light.

The Canadian Space Agency's MOST (Microvariability & Oscillations of STars) mission represents a new tool in exoplanet transit and eclipse studies, and a precursor to more ambitious missions like COROT and Kepler. The MOST instrument is a 15-cm optical telescope feeding a CCD photometer, placed in low Earth orbit. It is capable of obtaining ultraprecise photometry (sampled several times per minute) for up to 2 months without interruption for many target fields.

MOST has observed the transiting system HD 209458 in 2004 and 2005 for a total of about 2 months. The photometry is being used to (a) study the optical eclipse of the exoplanet, with a depth less than 80 ppm (micromag) to constrain models of the atmosphere and clouds; (b) perform accurate timing of the primary transits to refine the value of the orbital eccentricity and search for other perturbing bodies in the system; and (c) search for transits by other bodies with sizes approaching that of the Earth.

I'll describe the MOST results to date, how they complement NASA Spitzer infrared observations of HD 209458, and what lessions we can learn from them in anticipation of COROT and Kepler.

Dr. Jaymie Mark Matthews is an Associate Professor of Astronomy in the Department of Physics & Astronomy at the University of British Columbia. He is a leading expert in the field of stellar seismology: literally using the surface vibrations of vibrating stars to probe their hidden interiors and histories. To better detect the subtle signatures of these 'ringing' stars, Dr. Matthews became Mission Scientist and Principal Investigator for MOST, a Canadian Space Agency project to study Microvariability & Oscillations of STars from space. MOST became the first all-Canadian scientific satellite to be launched in over three decades, and is Canada's first-ever space observatory, which team members affectionately nicknamed the "Humble Space Telescope" because of its modest size and budget. MOST has also become a powerful tool to study extrasolar planets, through searches of their reflected light signal, interactions with their parent stars, and transits.

Dr. Matthews obtained his B.Sc. degree at the University of Toronto, and his M.Sc. and Ph.D. at the University of Western Ontario. He held Isaac Walton Killam and NSERC Postdoctoral Fellowships at UBC, and an Attache de Recherche position at the Universite de Montreal, before taking on a faculty position at UBC in 1992.

In addition to heading the MOST Project, Dr. Matthews has sat on Canada's scientific steering committees for the international Gemini Twin 8-Metre Telescopes Project and the Far-Ultraviolet Spectroscopic Explorer satellite, and the Joint Committee on Space Astronomy which advises the Canadian Space Agency. He is a member of the International Astronomical Union's Commission on Variable Stars, and a frequent invited review speaker at meetings around the world, from Prague to Porto, Moscow to Mmbatho (South Africa), Cancun to Catania (Italy), Edinburgh to Edmonton, and most recently, Ottawa to Orlando (which is his iterary to travel to the 2006 SPIE Conference.

Astronomy education and public outreach are also very important facets of Dr. Matthews' scientific career. He served two terms on the Board of the H.R. MacMillan Space Centre in Vancouver, and continues to sit on its Programming & Education Committee. Dr. Matthews was awarded a 1999 Killam Prize for teaching excellence in the UBC Faculty of Science, as well as the 2002 Teaching Prize of the Canadian Association of Physicists. He also posed in multiple guises (from a superhero flying in the ozone layer to an X-ray version of Austin Powers) in the Discovery Channel miniseries "Light: More Than Meets The Eye". He has yet to live down being quoted in Discover Magazine as saying "Exploding Star Contains Atoms From Elvis Presley's Brain - Scientists Confirm That The King of Rock & Roll Lived In Another Galaxy 160,000 Years Ago!"

Symposium-Wide Invited Plenary Session: **The Search for Extra-Solar Planets** *continued*

Friday 26 May · 1:00 to 5:10 pm · Salon H, Crystal Ballroom

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?**

Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

The interferometry as an astrophysical research tool has potential unique capabilities for observations of stars with planets.

It provides an elegant and simple way to detect flux from short period orbiting planets and it offer a technical solution to detect the astrometric motion of star hosting planets. I shall review current efforts ongoing at VLTI to carry out and to implement these extra-solar planet research activities.

EDUCATION: Diploma in physics, Geneva University, 1990; Astronomy and Astrophysics certificate, Geneva University, 1992; Ph. D,"Researchs by cross–correlation techniques", Geneva University, 1995

POSITIONS HELD: Post-doc., Geneva University 1996 - 1997; Distinguished Visiting Scientist at Jet Propulsion Lab 1997-1999; Research Associate at Geneva University 2000-2002

CURRENT RESEARCH ACTIVITIES: Development of spectroscopic instruments and reduction software for precise radial velocity measurements: – ELODIE (1990-1993), – CORALIE (1995-1998) – Project scientist for the HARPS spectrograph (2000-2003)

- Detection of planets orbiting stars by radial velocity measurements
- Study of the orbital characteristics of extra-solar planets
- Accurate Measurements of the mass of binary stars by interferometry
- Measurements of the radius of low mass stars by interferometry
- Measurements of the radius of extra-solar planets 1
- Combination of transit detection and radial velocity measurements
- Astrometric planet detection: – Co-PI of the PRIMA DDL consortium (astrometric facility for the VLTI) – Co-I of the EPICS team for SIM (M. Shao PI)
- Co-I of the Corot mission (planet detection by transit)

RESEARCH INTERESTS: Extra-solar planets; Brown Dwarfs and low mass stars; Astrometry; Interferometry

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets**

Michael Shao, Jet Propulsion Lab. (USA)

The ideal location of an observatory to detect extra solar planets is in space. Several missions are being planned both for astrometric detection of Earthlike planets and direct detection of the light from the Planet. This talk will briefly describe the SIM and TPF C-I missions, their capabilities and status. SIM is an astrometric mission with single measurement accuracy of 1 microarcsec. The panet search program with SIM will make ~100 measurements of ~250 nearby stars with sensitivity to 0.5 Earth mass to 5 Earth mass, (0.5 Earth mass for a planet around Alpha Cen in the middle of the habitable zone).

TPF C-I/Darwin are two missions that use nulling/coronagraphic techniques to suppress the light from the star so that the light from the planet can be detected. The talk will briefly review the many methods proposed to directly detect the light from an extra solar planet, including the Picture Project, a sounding rocket with a nulling coronagraph behind a 50cm telescope to fly in 2007.

Dr. Michael Shao is the project scientist for the SIM/Planet Quest mission and the Keck Interferometer project at the Jet Propulsion Lab in Pasadena California. He has been worked in the field of stellar interferometry since finishing his PhD thesis at the Mass Inst of Tech in 1978, buiding a series of long baseline stellar interfrometers first on Mt Wilson, then Mt Palomar.

His current research activities include the SIM project, the Keck project aimed at indirect detection of exoplanets, as well as involvement in a number of coronagraphic projects that involve the use of interferometry. These include a study of a nulling coronagraph for the TPF-C mission, the Gemini extreme AO coronagraph, the Picture project, a nulling coronagraph on a sounding rocket, and a study of a nulling coronagraph for the TMT telescope.

2:50 pm: **Space Astrometric Search with Gaia**

Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

Gaia, the forthcoming European Space Agency mission to be launched by 2012, will take impressively high precision measurements of the position of about one billion stars over a period of five years. Any point source brighter than 21 in the G band will be detected and its position derived. On average, about 70 positions will be accumulated during the mission and any departure from the single star motion will be detected. Most of them will be caused by a stellar secondary but some will also turn out to be due to substellar companions. For a subset of these systems, an orbital solution will be derived, eventually leading to the orbital inclination, i.e. the quantity the spectroscopists need to derive the mass of companion. The 1-dimensional nature of the observations and the distribution of their epochs will nevertheless prevent some orbits from being robustly derived even though the star exhibit a strong orbital wobble. Based on simulated data, this is the case for orbital periods longer than six years or when the signal to noise ratio is below 3.

Besides its impressive astrometric capabilities, Gaia will also carry on multi-band photometry at a precision that makes planetary transits detectable. Although any new planet detected that way will be very welcome, Gaia will improve the statistics of such systems rather than characterizing those newly detected planets. Finally, Gaia will also measure radial velocities but at a precision which makes it useless for planetary detection.

Regardless of whether these planets are detected by astrometry or photometry, the hosting star will always be fully characterized (kinematic membership, luminosity, metallicity, multiplicity, variability, ...) by photo-metric means making Gaia a unique tool for astro-biology as well.

After a PhD thesis focused on resolved double-lined spectroscopic binaries, Dimitri Pourbaix moved to astrometry at the same time as the Hipparcos catalogue was released. Rather than using the output catalogue, he became familiar with the re-processing of the observations thus making possible to improve the model originally used. Since 2000, he has worked with several teams worldwide on the derivation of the astrometric orbit of stellar and substellar companions. Member of several scientific working groups preparing Gaia, Pourbaix was invited to join the embryo of the Data Processing and Analysis Consortium in early 2005. Since mid-2005, he has lead the "Object processing" Coordination Unit, in charge of non-single stars as well as solar system objects. Besides this administrative responsibilities, Pourbaix keeps working on improving the methods to derive orbits and to assess them. Since 2000, he also leads the working group of the International Astronomical Union in charge of the Ninth Catalogue of Spectroscopic Binary Orbits.

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space**

George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

The space missions IRAS (Infrared Astronomy Satellite), HST (Hubble Space Telescope), ISO (Infrared Space Observatory), and now Spitzer have created a new field of direct observations of other planetary systems. The measurements they have made over the past 20 years have for the first time put the solar system into a broad context and let us compare its evolution and current state with many other systems of planets. I will review the discoveries made by these missions and show how they advance our understanding of how the earth formed and reached its current state.

I will also illustrate the possibilities for more progress with future missions such as the James Webb Space Telescope (JWST), Kepler, and SIM (the Space Interferometry Mission.s

George Rieke is a Regents Professor of Astronomy and Planetary Sciences at the University of Arizona. He has written a textbook: "Detection of Light" and a history of the Spitzer Telescope: "The Last of the Great Observatories." He is author or co-author of more than 400 research articles.

His interest in observing other planetary systems arises from observations obtained by his instrument team (the Multiband Imaging Photometer - MIPS) with Spitzer and his role in leading the science team for the Mid-Infrared Instrument (MIRI) for JWST.

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C)**

Wesley A. Traub, Jet Propulsion Lab. (USA)

The "big question" that the average person will ask an astronomer today is, "Are there Earth-like planets?" followed immediately by "Is there life on those planets?" We live in an age when we are privileged to be able to ask such a question, and have a reasonable expectation of receiving an answer, at least within the coming decade. As astronomers and physicists we are even more privileged to be the people who can provide those answers. The Kepler and SIM missions will search for and discover planets down to the few-Earth size and mass, around distant and nearby stars respectively. In favorable cases they will even be able to find Earth-size or mass planets. But to answer the questions, is a given planet habitable, and does it show signs of life, we will need the Terrestrial Planet Finder Coronagraph (TPF-C) and TPF Interferometer (TPF-I) missions. Only these missions can isolated the light of the planet from the confusion of otherwise blinding starlight, and only these missions can perform spectroscopy on the planets. TPF-C and –I will build on the legacy of Kepler and SIM. Together these four missions will provide complete and unambiguous answers to our "big questions." Visible and thermal infrared spectroscopy will tell us if a planet is habitable and shows signs of life. This talk will focus on the imaging capabilities of TPF-C, following the photon from the telescope to the starlight suppression system to the spectroscopic detection back end. I will show how these functions are intimately connected in a way that is different from any previous telescope, and how the entire system is benefiting from new inventions in optics that you will only find in the next editions of optics textbooks.

Wes Traub joined NASA's Jet Propulsion Laboratory in 2005 as project Scientist for the Terrestrial Planet Finder Coronagraph mission, and as Chief Scientist for the Navigator Program, which includes the TPF coronagraph and interferometer missions, SIM, the Keck and LBT interferometers, and the Michelson Science Center. He also retains an active connection with the Harvard-Smithsonian Center for Astrophysics, where he worked for 37 years, and continues as Project Scientist for the Infrared-Optical Telescope Array, and Co-Investigator for the Far Infrared Spectrometer balloon instrument. His main interests are coronagraphs, spectroscopy, interferometry, the stratosphere, the search for Earth-like planets around nearby stars, characterization of these planets, and the search for life on them.

4:30 pm: **Imaging of Extra-Solar Planets from Ground**

Roberto Gilmozzi, European Southern Observatory (Germany)

Abstract not available.

Roberto Gilmozzi is head of the Telescope Systems Division of the European Southern Observatory (ESO). The division is responsible for the development of adaptive optics and of the VLT interferometric infrastructure, and for the OWL extremely large telescope design.

Between 1998 and 2005 he was at ESO's VLT observatory on Cerro Paranal, Chile, first as responsible for science operations and from 1999 as director of the observatory. Before joining ESO in 1994 as head of the optical instrumentation department, he worked for the European Space Agency (ESA), at the International Ultraviolet Explorer observatory in Spain (1983-1988) and later at the STScI in Baltimore (1988-1994). He studied physics in Italy at the University of Rome, and was an ESA postdoc at the Royal Greenwich Observatory in East Sessex, UK (1980-1982).

He has been Principal Investigator of the OWL design study since 1998. His scientific interests include novae, supernovae and their remnants, and the cosmic x-ray background and its relation to the star formation history of the universe.

4:50 pm: **The Search for Life on Extra-Solar Planets**

Sara Seager, Carnegie Institution of Washington (USA)

For thousands of years people have wondered, "Are we alone?" Modern day astronomers are working to answer this question by designing space telescopes to find and characterize Earth-like planets around sun-like stars. Characterization of a planet means obtaining a spectrum to identify absorption features indicative of atmospheric or surface biosignatures—possible evidence of life or habitability. Earth's biosignatures are oxygen, ozone, and water vapor, as well as the vegetation red edge. Carbon dioxide and methane absorption and Rayleigh scattering are other useful atmospheric spectroscopic features. Although Earth is the canonical example used to plan the search for life on extrasolar planets, Earth itself has appeared quite different over the past 4.5 billion years, including extreme climates (e.g., "snowball Earth") as well as an atmosphere without oxygen and possibly rich in methane. Beyond Earth, the first extrasolar planets capable of hosting life could well be discovered in the very near future: massive rocky planets in close orbits around small, dim stars. I will discuss how Earth and paleoEarth as extrasolar planets are a key for searching for life on extrasolar planets. I will also address the potential for life on massive rocky worlds orbiting small stars.

Dr. Sara Seager is a senior research staff member at the Carnegie Institution of Washington. She earned her PhD from Harvard University in 1999 and was a long term member at the Institute for Advanced Study before joining the Carnegie faculty in 2002. Dr. Seager's main research focus is theoretical studies of extrasolar planets including atmospheres, surfaces, and interiors. Her prediction for sodium in the atmosphere of the transiting hot-Jupiter HD209458b led to the first ever extrasolar planet atmosphere detection by the Hubble Space Telescope in 2001. Additionally Dr. Seager was part of a team that initiated direct studies of hot Jupiter atmospheres by thermal emission measurements in the infrared using the Spitzer Space Telescope. In 2004 Dr. Seager was awarded the Harvard University Astronomy Bok Prize for her research. As a member of the Terrestrial Planet Finder Science and Technology Definition team and a member of a wide variety of ground-based projects and space-based concept studies for extrasolar planet missions, Dr. Seager works closely with the optical engineerisng community.

5:10 pm: **Closing Remarks**

Symposium Co-Chairman: **Mark Clampin,** NASA Goddard Space Flight Ctr. (USA)

Student Lunch with the Experts

Friday 26 May · 11:30 am to 12:30 pm
Location: New York/New Orleans Room

Meet distinguished professionals in your field in a fun, informal setting. Network with experts, get a perspective on recent instrumentation developments, and make the most of your conference. This event will feature experts willing to share their accumulated wisdom on career paths in the field of astronomical instrumentation. Lunch is open to all student attendees, but advance sign-up is required at registration by Thursday at 5:00 pm.

Special Invited Session

Young Scientists

Saturday 27 May · 8:30 am to 12:10 pm

Location: Hall of Cities: New York/New Orleans Room

The Instrumentation in Astronomy program will include for the first time a session aimed at showcasing outstanding work by young scientists and engineers. The session will comprise a series of oral presentations selected from the meetings' oral and poster sessions.

8:30 am: **Welcome and Opening Remarks**
Chairman: **Mark Clampin,** NASA Goddard Space Flight Ctr. (USA)

Representative from: **Space Telescopes and Instrumentation I: Optical, Infrared, and Millimeter**

8:40 am: **Toward 1010 contrast for terrestrial exoplanet detection: demonstration of extreme wavefront correction in a shaped-pupil coronagraph,** R. Belikov, A. Give'on, M. A. Carr, Princeton Univ.; J. T. Trauger, F. Shi, K. Balasubramanian, Jet Propulsion Lab.; A. C. Kuhnert, Jet Propulsion Lab; J. N. Kasdin, Princeton Univ. . . . [6265-42]

Representative from: **Space Telescopes and Instrumentation II: Ultraviolet to Gamma Ray**

9:00 am: **DEMON: a proposal for a satellite-borne experiment to study dark matter and dark energy,** A. Berciano-Alba, Univ. of Groningen (Netherlands) and Kapteyn Astronomical Institute (Netherlands); P. F. Borges de Silva, Univ. doPorto (Portugal); H. Eichelberger, Space Research Institute (Austria); F. Giovacchini, Univ. degli Studi di Bologna (Italy); M. Godolt, Astrophysikalisches Institut Potsdam (Germany); G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); M. Lerchster, Leopold-Franzens-Univ. Innsbruck (Austria); V. Lusset, CEA Saclay (France); F. Mattana, Istituto di Fisica Cosmica G. Occhialini (Italy) and Univ. di Milano Bicocca (Italy); Y. Mellier, Institut d'Astrophysique de Paris (France); M. Michalowski, Univ. of Copenhagen (Denmark) and Astronomical Observatory, Adam Mickiewicz Univ. (Poland); C. Monteserin-Sanchez, Univ. de Cantabria (Spain); F. Noviello, National Univ. of Ireland (Ireland); C. Persson, Chalmers Tekniska Högskola (Sweden); A. Santovincenzo, European Space Agency (Netherlands); P. Schneider, Univ. Bonn (Germany); M. Zhang, The Univ. of Manchester (United Kingdom); L. Ostman, Stockholm Univ. (Sweden) . . . . . [6266-115]

Representative from: **Ground-based and Airborne Telescopes**

9:20 am: **Nigel and the optical sky brightness at Dome C, Antarctica,** S. L. Kenyon, M. C. B. Ashley, J. R. Everett, J. S. Lawrence, J. W. V. Storey, Univ. of New South Wales (Australia) . . . . . [6267-34]

Representative from: **Advances in Stellar Interferometry**

9:40 am: **Disks around young stars with VLTI/MIDI,** R. van Boekel, Max-Planck-Institut für Astronomie (Germany); M. Min, Univ. van Amsterdam (Netherlands); C. Leinert, Max-Planck-Institut für Astronomie (Germany); R. Waters, Univ. van Amsterdam (Netherlands); T. F. E. Henning, T. Ratzka, Max-Planck-Institut für Astronomie (Germany); A. Dutrey, Univ. Bordeaux 1 (France); C. Dominik, A. de Koter, Univ. van Amsterdam (Netherlands) . . . . . [6268-23]

10:00 am: Coffee Break

Representative from: **Ground-based and Airborne Instrumentation for Astronomy**

10:30 am: **An image motion compensation system for the multi-object double spectrograph,** J. L. Marshall, B. Atwood, P. L. Byard, D. L. DePoy, M. A. Derwent, J. D. .. Eastman, R. Gonzalez, T. P. O'Brien, D. P. Pappalardo, R. W. Pogge, The Ohio State Univ. . . . . [6269-57]

Representative from: **Observatory Operations: Strategies, Processes, and Systems**

10:50 am: **Cyberinfrastructure to support science and data management for the Dark Energy Survey,** C. Ngeow, W. Barkhouse, J. J. Mohr, C. Beldica, R. L. Plante, T. Alam, Y. D. Cai, G. Daues, Univ. of Illinois; H. Lin, J. T. Annis, C. Stoughton, D. Tucker, Fermi National Accelerator Lab.; R. C. Smith, C. Miller, National Optical Astronomy Observatory . . . . . [6270-77]

Representative from: **Modeling, Systems Engineering, and Project Management for Astronomy II**

11:10 am: **Integrated modeling concepts for OWL,** M. Mueller, F. Koch, European Southern Observatory (Germany) . . . . . [6271-01]

Representative from: **Advances in Adaptive Optics**

11:30 am: Wavefront control for the Gemini Planet Imager, L. Poyneer, Lawrence Livermore National Lab. . . . . [6272-44]

Representative from: **Opto-Mechanical Technologies for Astronomy**

11:50 am: **Eight-inch f5 deformable magnetic-membrane mirror,** M. M. Angel, MIT Lincoln Lab. . . . . [6273-89]

Student Tour of the James Webb Space Telescope Model

Saturday 27 May · 11:30 am

Students meet at the Grand Ballroom Registration Desk by 11:20 am

Get an up-close tour of the full-size model of the James Webb space telescope with representatives from Northrop Grumman Co. Yes, full-size does mean that the model is 80'x40'x40'! Additional tours available. Ask at registration for information and telescope viewing hours.

Early Career Roundtable

Monday 29 May · 11:00 am to12:00 pm · Denver Room

Discuss the opportunities and pitfalls of career navigation with a panel of professionals who have been there and made it through. Early career professionals, post-docs, and career changers are especially invited to this session for some perspectives on making transitions between the worlds of industry, academy, and government. This event is free to all badge holders.

SPIE Women in Optics Lunch

Monday 29 May · Noon to 1:00 pm · Boston Room

Join WiO members and nonmembers for an opportunity to network with other optics professionals, generate new contacts, and expand your resources and referrals. This SPIE-hosted luncheon at Astronomy is the perfect way to meet and develop relationships with others in your field. Advance sign-up is required at the Cashier station by Friday 5:00 pm.

The College of Optics & Photonics: CREOL & FPCE, University of Central Florida Tour

Wednesday 31 May · 1:30 to 4:30 pm
Meet at the SPIE Registration Desk at 1:15 pm

Formed in 1986 as the Center for Research and Education in Optics and Lasers (CREOL), the College of Optics & Photonics: CREOL & FPCE at UCF is internationally recognized as one of the top academic and research programs in optics and photonics. Full information is available at **http://www.optics.ucf.edu/**

The tour of the College will include a brief discussion with Dr. James Harvey and will cover several laboratories. Among the labs to be presented include: the Optical Diagnostics and Applications Lab; the Northrup Grumman EUV Photonics Lab; Ultrafast Photonics Laboratory; Infrared Systems Laboratory; and Nanophotonics Systems Fabrication Facilty.

Onsite registration will be available at the Cashier station on a space-available basis only. Last day to reserve your spot is Tuesday 30 May at noon. There will be a small transportation fee charged to all tour participants.

Networking Receptions

Fairway Terrace, beyond the main pool.

Wednesday 24 May . . . . . 6:30 to 8:00 pm
Monday 29 May . . . . . 6:30 to 8:00 pm

You are invited to relax, meet colleagues, and renew friendships at one of the networking receptions on Wednesday and/or Monday, 6:30 to 8:00 pm. For your enjoyment refreshments will be served. Attendees are requested to wear their conference registration badges.

Spouses and families–**with paid guest registration badges** will be allowed admittance to the networking receptions.

Paid Guest Registration

Extra Tickets for Networking Receptions

Cost is $50 per guest *(including children 12 years or older).*

Tickets for the networking receptions on Wednesday and/or Monday may be purchased for an attendee's guests (including children 12 years or older). Cost is $50 per guest. Guests without a paid guest badge will not be admitted to the receptions. **This price does not include All-Conference Dinner on Friday, 26 May 2006.**

spieworks.com
SPIE-WORKS

Recruiting Services

Bring copies of your open positions to Astronomical Telescopes and Instrumentation and post them on the boards provided for this purpose. While at the meeting you will also be able to review any resumes posted by meeting attendees; look for the notebook located near the job posting boards. If you're searching for highly skilled candidates for hard-to-fill positions this is a great place to start.

If you don't find the candidates you need, SPIEWorks, the SPIE employment website can help you target a skilled group of optics and photonics professionals after the meeting. Contact Robert Dentel at +1 360 715 3705 or email sales@spieworks.com

Membership in SPIE is not required to post jobs.

Employment Opportunities

Bring a copy of your resume to Astronomical Telescopes and Instrumentation and look for the notebook located near the job posting boards; place your resume inside this book for review by interested employers. Plan to stop by these same job boards throughout the meeting and review current employment opportunities.

In addition to our onsite posting boards, SPIEWorks, the SPIE employment website, offers you an online job database, resume posting, and email notification services year round. Visit www.spieworks.com

Wednesday 24 May · 1:00 to 2:00 pm
Salon H, Crystal Ballroom

Welcome and Opening Remarks

Symposium Chairs
Colin Cunningham, UK Astronomy Technology Ctr. (UK)
Jacobus Oschmann, Ball Aerospace & Technologies Corp. (USA)

Introduced by: **Mark Champin,** NASA Goddard Space Lifht Ctr. (USA)

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth
Univ. of California/Santa Cruz/Lick Observatory (USA)

Astronomy has blossomed in the last decade, entering a golden age.

The Hubble Space Telescope and the Keck Telescopes opened up new opportunities for forefront research far beyond what was possible in the 1980s. Numerous other large ground-based telescopes, VLT, Gemini, and others - now some 15 8-m class telescopes worldwide - and the other Great Observatories in space, Chandra and Spitzer, have followed. These increasingly powerful telescopes and missions have resulted from the scientific success and public visibility of the nation's (and the world's) astronomy program. This has led to substantial Administration and Congressional support for astronomy.

As a result astronomers are looking forward, for example, to the completion of the ALMA radio telescope array on the ground and to JWST in space early in the next decade. But increasing pressure on the Federal budget is combining with increases in project costs to dramatically alter the growth rate of new facilities. There now exists a serious disconnect between the goals of the astronomical community, with the many very sophisticated missions and telescopes planned for this decade, as outlined in the recommendations of the National Academy Decadal reports, and the resources available.

Increasingly, astronomers will need to focus on the cost-effectiveness of their programs, minimize duplication of scientific endeavors, and work with the agencies, NASA, NSF and DOE to ensure that there is coordination on projects and science goals. The Astronomy and Astrophysics Advisory Committee (AAAC) has a Congressional charge to advise the three agencies and Congress. This presentation will cover the challenges facing the field and the current recommendations of the AAAC.

Dr Garth Illingworth is a Professor/Astronomer at the University of California, Santa Cruz and UCO/Lick Observatory. His prior position was Deputy-Director of the Space Telescope Science Institute.

Professor Illingworth's scientific interests focus on the formation and evolution of galaxies in the young universe within its first 1-2 billion years. He has had extensive experience with the development of several major facilities including HST, the twin Keck telescopes, and associated instruments. He was Deputy-PI, with PI Holland Ford, of one of HST's most powerful instruments, the HST Advanced Camera, that has produced some of HST's best-known images. He was one of the initiators of the NGST (now JWST) concept in the late 1980s and early 1990s, and has continued this interest in forefront missions with a proposed study of a 20-m class space telescope, utilizing robotic and astronaut capabilities for assembly and system level testing. Dr Illingworth has been involved in numerous committees dealing with telescope development, oversight and management, as well as major committees that deal with astronomy policy. He has chaired many of these, such as the Keck Science Steering Committee, the Space Telescope Institute Council, and currently is chair of the Astronomy and Astrophysics Advisory Committee that advises NASA, NSF and DOE and Congress on the coordination and implementation of astronomical projects.

Thursday 25 May · 8:30 to 9:20 am
Salon H, Crystal Ballroom

Introduced by: **Colin Cunningham,**
UK Astronomy Technology Ctr. (United Kingdom)

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel
Max-Planck-Institut für extraterrestrische Physik (Germany)

Evidence has been accumulating for several decades that quasars, the most luminous objects in the Universe, are powered by accretion of matter onto massive black holes. I will discuss recent observations, employing adaptive optics imaging on large ground-based telescopes that prove the existence of such a massive black hole in the center of our Milky Way, beyond any reasonable doubt. These observations also indicate that the Galactic Center black hole may be rotating rapidly. The central black hole is surrounded by a cluster of young massive stars, partly arranged in two, rotating disks. I discuss possible explanations for this 'paradox of youth'.

EDUCATION

1975 Diploma in physics, Physics and Astronomy Department, University of Bonn, Germany

1978 Ph.D. in physics and astronomy, University of Bonn (Germany): Ph.D. thesis in radio astronomy at the Max-Planck-Institut für Radioastronomie, Bonn, Germany

PROFESSIONAL

1978-80 Postdoctoral Fellow, Center for Astrophysics, Cambridge, Massachusetts; work in radio very long baseline interferometry (VLBI) and 2-20 μm photometry

1980-82 Miller Fellow, University of California, Berkeley; work in far-infrared (50 to 200 μm) spectroscopy

1981-85 Associate Professor, Department of Physics, and Associate Research Astronomer, Space Sciences Laboratory, University of California, Berkeley; work in infrared and submillimeter astrophysics

1985-86 Visiting Professor of Physics, University of California, Berkeley

since 1986 Director at the Max Planck Institute for Extraterrestrial Physics, Garching (Germany), and Scientific Member of the Max-Planck Society; work in infrared, submillimeter and millimeter astrophysics

1987-1999 Visiting Professor, Department of Physics, University of California, Berkeley

since 1988 Honorary Professor at the Ludwig Maximilian University, Munich (Germany)

since 1999 Full Professor ("Class of 1936"), Department of Physics, University of California, Berkeley

since 2004 Managing Director at the Max Planck Institute for Extraterrestrial Physics, Garching (Germany)

Saturday 27 May · 1:30 to 2:20 pm
Salon H, Crystal Ballroom

Introduced by: **Alan F.M. Moorwood,**
European Southern Observatory (Germany)

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky
European Southern Observatory (Germany)

It was in Europe, in Renaissance times, that astronomy began to develop into the science we know today. From the beginning it rested on collaboration and exchange of ideas across national borders. Tycho's observatory or Galileo's telescope revealed the importance of another factor: world-class research infrastructures, allowing accurate measurements to be made, but also attracting talented people from far-away. Less than a hundred years later, Europe saw the establishment of key observatories that were to drive the progress of astronomy in Europe until the end of the 19th century. But after the Second World War, conditions in Europe had seriously deteriorated. The Continent was on its heels, and there had been an exodus of talented scientists, which was to continue for a long time. Luckily, the European governments realised that progress could only be achieved through cooperation among the former adversaries. Thus, 'international organisations' were established with the remit to maintain and develop new research infrastructures, and to promote co-operation in research. Today, ESO and ESA provide European astronomers with world class facilities, from ground facilities like the VLT /VLTI in operation, ALMA in construction and ELT/OWL under study, to space missions such as XMM-Newton and INTEGRAL in operation, Herschel-Planck in construction, missions like Gaia in development and a whole set of new ideas encompassed in the new ESA Cosmic Vision. These are complemented by multinational facilities, such as Gemini, IRAM, JIVE, telescopes in the La Palma Observatory, or studies for SKA.

Catherine Cesarsky was born in France. She received a degree in Physical Sciences at the University of Buenos Aires, graduated with a PhD in Astronomy in 1971 from Harvard University and was then a Research Fellow at the California Institute of Technology.

In 1974, she became a staff member of the Service d'Astrophysique (SAp), Direction des Sciences de la Matière (DSM), Commissariat à l'Energie Atomique (CEA) (France). She led the theoretical group of the SAp (1978-1985), was Head of SAp (1985-1993), then Director of DSM (1994-1999). The DSM encompasses, at the CEA, activities of basic research in physics, chemistry, astrophysics and earth sciences and comprises about 3000 scientists, engineers, technicians, etc.

The first part of her research career was devoted to the high-energy domain: studies of the propagation and composition of galactic cosmic rays, of matter and fields in the diffuse interstellar medium, as well as of the acceleration of particles in supernova and stellar wind shocks.

She then turned to infrared astronomy. She was the Principal Investigator of the ISOCAM camera onboard the ESA Infrared Space Observatory and, as such, led the ISOCAM central programme. She was in particular the Principal Investigator of the ITGES collaboration, which conducted deep surveys with ISOCAM, and revealed the presence of numerous Luminous Infrared Galaxies with redshift ~ 1, responsible for a large part of the peak of the Cosmic Infrared Background. She has received the COSPAR (Committee on Space Research) Space Science Award in 1998.

Since September 1999, Catherine Cesarsky is Director General of ESO, the European Organisation for Astronomical Research in the Southern Hemisphere.

She is the President Elect of the International Astronomical Union (IAU), member of Academia Europaea and of the International Academy of Astronautics, and Foreign member of the US National Academy, of the Royal Society of London and of the Swedish Academy of Sciences.

Tuesday 30 May · 8:30 to 9:20 am
Salon H, Crystal Ballroom

Introduced by: **Jacobus Oschmann,**
Ball Aerospace & Technologies Corp. (USA)

Novel Technology for Optical and Infrared Astronomy

Colin Cunningham
UK Astronomy Technology Ctr. (United Kingdom)

Astronomy is a science based on observation, and consequently major advances in astronomy are frequently the result of application of novel technology. Likewise, technology advances are often pushed by the desires of astronomers for better performance or movement into new parameter space in terms of wavelength or angular resolution. I will show how this process can be stimulated by technology roadmapping, and from that show what I believe to be the key technology challenges in space and ground-based optical and infrared astronomy over the next ten years. This will lead on to some ideas about where novel technologies now being conceived in optics, electronics, materials and nanotechnology could be applied to astronomy in the more distant future. It is noteworthy that most of the technology we use has a long heritage – what could we imagine as an ideal telescope or detector if we look much further into the future?

Colin Cunningham is Director of Technology Development at the UK Astronomy Technology Centre at the Royal Observatory Edinburgh. He is responsible for coordinating instrument studies within the European Framework 6 Extremely Large Telescope Design Study, is chair of the OPTICON Key Technologies Network and

PI of the OPTICON Smart Focal Planes Joint Research Activity. He is also one of the directors of the Smart Optics Faraday Partnership, with responsibility for Technology Transfer between ground-based astronomy and industry, and is one of the chairs of this symposium.

He graduated from Imperial College in 1974 in Electrical Engineering and spent the next eleven years working on biological and environmental instrumentation at the Royal Botanic Gardens, Kew and the Freshwater Biological Association's Windermere Laboratory, during which time he gained an MSc in Biophysics and Bioengineering. A year in industry followed, designing geological bore-hole logging equipment. From 1987 he worked at the Royal Observatory Edinburgh (ROE), as Project Manager and Project Engineer for the highly successful SCUBA bolometer array camera which was installed on the James Clerk Maxwell Telescope in June 1996. He was Chief Engineer and Deputy Director from the start of the UK Astronomy Technology Centre at the ROE in 1998 until 2002 when he took on responsibility for technology development and planning. During this period he was lead systems engineer on the SPIRE instrument for the Herschel Space Telescope. He is a Chartered Engineer and a Fellow of the Institution of Electrical Engineers, and is a member of the SPIE and the Institute of Physics.

Make time for the Premier Exhibition of Astronomical Telescopes and Instrumentation

The SPIE Astronomical Telescopes and Instrumentation exhibition is the can't-miss event for seeing the latest in tools, instruments, devices, and components from large telescopes, ground-based telescopes, ground instruments, astronomy information technologies, space telescopes and instruments, detectors, specialized optics, materials, and systems.

Exhibition Dates: 25–30 May 2006

Palms Ballroom

Thursday 25 May . . . . . 5:30 to 8:00 pm
Friday 26 May . . . . . 10:00 am to 12:30 pm; 1:30 to 4:00 pm
Saturday 27 May . . . 10:00 am to 12:30 pm; 1:30 to 4:00 pm
Sunday 28 May . . . . . Closed
Monday 29 May . . . . 10:00 am to 12:30 pm; 1:30 to 4:00 pm
Tuesday 30 May . . . . 10:00 am to 12:30 pm; 1:30 to 4:00 pm

SPIE thanks the following sponsors for their generous support

Lanyard sponsor

SciMeasure

Friday Morning Coffee Break

Astronomical Research Cameras, Inc.

Exhibition/Poster Reception

Palms Ballroom

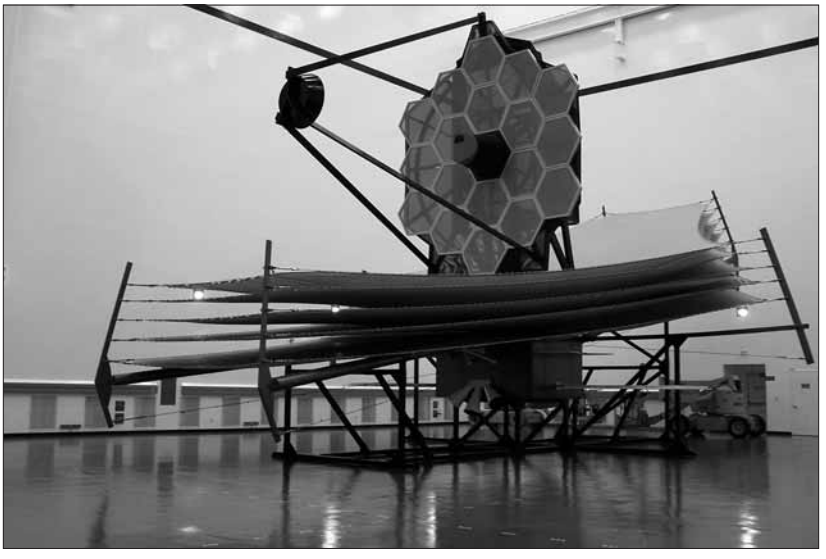
Thursday 25 May · 6:00 to 8:00 pm

A joint poster session and exhibition reception will be held on Thursday evening. Refreshments will be served. Attendees are requested to wear their conference registration badge.

Visit the Exhibition!

List of Exhibitors as of 19 April 2006

4D Technology Corp
ALPAO
AMOS (Advanced Mechanical and Optical Systems)
Angstrom Sciences
Apogee Instruments, Inc.
Asahi Spectra USA Inc.
Astronomical Research Cameras, Inc.
ATK Space Systems
Axsys Technologies, Inc.
Ball Aerospace & Technologies Corp.
Barr Associates Inc.
Blue Line Engineering
Chroma Technology Corp
Coastal Optical Systems, Inc.
CoorsTek
Corning Inc.
Cryoconnect
CSIRO, Australian Centre for Precision Optics
e2v technologies, inc.
EDP Sciences
Engineering Synthesis Design, Inc.
EOS Technologies, Inc.
ESO
Evaporated Metal Films Corp.
Fogale Nanotech
General Dynamics-VertexRSI Controls and Structures
Hampton Controls, Optics Div.
Hextek Corp.
Imagine Optic
ITT
JDS Uniphase
JPL Navigator Program
Kaiser Optical Systems, Inc.
L-3 Brashear
Major Tool & Machine
Michelson Science Center
Mindrum Precision, Inc.
NASA Goddard Space Flight Ctr. - Instrument Systems and Technology Div.
Newport Corp.
Northrop Grumman
Ohara Corp
Omega Optical, Inc.
Optic Technium
Photon Etc Inc.
Photonic Cleaning Technologies
Phytron Inc.
PI (Physik Instrumente) LP
Polymicro Technologies LLC
Rayleigh Optical Corp
SAGEM
SCHOTT North America, Inc.
SciMeasure Analytical Systems, Inc.
SESO
Spectral Instruments Inc.
Spectrum Thin Films Corp.
StarTel
Tinsley Laboratories, Inc.
TNO Science & Industry
Trex Advanced Materials
UK Astronomy Technology Centre
Zygo Corp.



Tour the James Webb Space Telescope Model

Ask at Registration for Location and Additional Information

Viewing Hours

Thursday 25 May . . . . . 5:30 to 8:00 pm
Friday 26 May . . . . . 10:00 am to 4:00 pm
Saturday 27 May . . . . . 10:00 am to 4:00 pm
Sunday 28 May . . . . . Closed
Monday 29 May . . . . . 10:00 am to 4:00 pm
Tuesday 30 May . . . . . 10:00 am to 4:00 pm

Get an up-close tour of the full-size model of the James Webb space telescope with representatives from Northrop Grumman Co. Yes, full-size does mean that the model is 80'x40'x40'!

Wednesday-Wednesday 24-31 May 2006 • Proceedings of SPIE Vol. 6265

Conference Chairs:

John C. Mather, NASA Goddard Space Flight Ctr.

Howard A. MacEwen, SRS Technologies

Mattheus W. de Graauw, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)
Photo not available

Space Telescopes and Instrumentation I: Optical, Infrared, and Millimeter

Program Committee: **James B. Breckinridge**, Jet Propulsion Lab.; **Richard W. Capps**, Jet Propulsion Lab.; **Suzanne Casement**, Northrop Grumman Corp.; **David W. Miller**, Massachusetts Institute of Technology; **Lee D. Peterson**, Univ. of Colorado/Boulder

Wednesday 24 May

SESSION 1

Room: Crystal Ballrooms: G2 . . . . . Wed. 10:00 am to 12:00 pm

Roadmap Overviews

Chair: **John C. Mather,** NASA Goddard Space Flight Ctr.

10:00 am: **USA Space science roadmap** *(Invited Paper),* E. P. Smith, NASA Headquarters . . . . . [6265-01]

10:30 am: **Mirror technology roadmap for optical/IR/FAR space telescopes** *(Invited Paper)***,** H. P. Stahl, NASA Marshall Space Flight Ctr. . . . . [6265-02]

11:00 am: **ESA Space science roadmap** *(Invited Paper)***,** S. Volonte, European Space Agency (France) . . . . . [6265-03]

11:30 am: **Supporting ESA technology roadmap** *(Invited Paper)***,** A. Peacock, European Space Agency (Netherlands) . . . . . [6265-04]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 2

Room: Crystal Ballrooms: G2 . . . . . Wed. 2:15 to 2:55 pm

Current and Planned Missions: SPITZER

Chair: **Mattheus W. M. de Graauw,** SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)

2:15 pm: **The Spitzer Space Telescope: 30 months of scientific highlights and enabling operations strategies,** M. Werner, Jet Propulsion Lab. . . . . [6265-05]

2:35 pm: **Spitzer Space Telescope: dark current and total noise prediction for InSb detector arrays in the infrared array camera (IRAC) for the post-cryogen era,** C. W. McMurtry, J. L. Pipher, W. J. Forrest, Univ. of Rochester . . . . [6265-06]

SESSION 3

Room: Crystal Ballrooms: G2 . . . . . Wed. 2:55 to 5:40 pm

Current and Planned Missions: HERSCHEL

Chair: **Mattheus W. M. de Graauw,** SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)

2:55 pm: **Herschel mission: status and observing opportunities,** G. L. Pilbratt, European Space Research and Technology Ctr. (Netherlands) . . . . . [6265-07]

3:15 pm: **Herschel-SPIRE: design, performance, and scientific capabilities,** M. J. Griffin, Cardiff Univ. (United Kingdom); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom); L. Vigroux, Institut d'Astrophysique de Paris (France) . . . . . [6265-08]

Coffee Break . . . . . 3:35 to 4:00 pm

4:00 pm: **The photodetector array camera and spectrometer (PACS) for the Herschel Space Observatory,** A. Poglitsch, Max-Planck-Institut für extraterrestrische Physik (Germany); C. Waelkens, Katholieke Univ. Leuven (Belgium); O. H. Bauer, Max-Planck-Institut für extraterrestrische Physik (Germany); J. Cepa, Instituto de Astrofísica de Canarias (Spain); H. Feuchtgruber, Max-Planck-Institut für extraterrestrische Physik (Germany); T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); C. A. van Hoof, IMEC (Belgium); F. Kerschbaum, Univ. Wien (Austria); D. Lemke, Max-Planck-Institut für Astronomie (Germany); E. Renotte, Univ. de Liège (Belgium); L. R. Rodriguez, CEA Saclay (France); P. Saraceno, Istituto di Fisica dello spazio Interplanetario (Italy); B. K. P. Vandenbussche, Katholieke Univ. Leuven (Belgium) . . . . . [6265-09]

4:20 pm: **The Herschel-Heterodyne instrument for the far-infrared (HIFI),** M. W. de Graauw, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); E. Caux, Ctr. d'Etude Spatiale des Rayonnements (France); T. G. Phillips, California Institute of Technology; J. Stutzki, Univ. zu Köln (Germany); N. D. Whyborn, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands) . . . . . [6265-10]

4:40 pm: **The Herschel/PACS 2560 bolometers imaging camera,** N. Billot, L. R. Rodriguez, CEA Saclay (France); P. Agnèse, CEA-LETI (France); J. Auguères, CEA Saclay (France); A. Béguin, CEA-LETI (France); A. Bouère, O. Boulade, C. Cara, C. Cloué, É. Doumayrou, CEA Saclay (France); L. Duband, CEA Grenoble (France); B. Horeau, I. Le Mer, J. Le Pennec, J. Martignac, K. Okumura, CEA Saclay (France); V. Reveret, European Southern Observatory (Germany); M. Sauvage, CEA Saclay (France); F. Simoens, CEA Grenoble (France); L. Vigroux, Institut d'Astrophysique de Paris (France) . . . . . [6265-11]

5:00 pm: **Optical performance characterization of HERSCHEL/SPIRE,** B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom); K. Dohlen, Observatoire Astronomique de Marseille-Provence (France); M. J. Ferlet, Rutherford Appleton Lab. (United Kingdom); J. Glenn, Univ. of Colorado/ Boulder; J. J. Bock, Jet Propulsion Lab. . . . . [6265-12]

5:20 pm: **Preliminary results from Herschel-SPIRE flight model testing,** T. L. Lim, B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom); A. Abreu Aramburu, Rutherford Appleton Lab. (United Kingdom) and Univ. of Lethbridge (Canada); J. J. Bock, Jet Propulsion Lab.; M. J. Ferlet, Rutherford Appleton Lab. (United Kingdom); T. R. Fulton, Univ. of Lethbridge (Canada); D. K. Griffin, Rutherford Appleton Lab. (United Kingdom); M. J. Griffin, Cardiff Univ. (United Kingdom); S. J. Leeks, European Space Agency (Spain); D. A. Naylor, Univ. of Lethbridge (Canada); D. Rizzo, Imperial College London (United Kingdom); E. C. Sawyer, Rutherford Appleton Lab. (United Kingdom); B. Schulz, California Institute of Technology; S. D. Sidher, Rutherford Appleton Lab. (United Kingdom); L. D. Spencer, Univ. of Lethbridge (Canada); D. L. Smith, Rutherford Appleton Lab. (United Kingdom); T. J. Waskett, A. L. Woodcraft, Cardiff Univ. (United Kingdom) . . . . . [6265-13]

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 4

Room: Crystal Ballrooms: G2 . . . . . Thurs. 9:35 to 10:15 am

Current and Planned Missions: PLANCK

Chair: **Mattheus W. M. de Graauw,** SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)

9:35 am: **Calibration and testing of the Planck-LFI qualification instrument,** A. Mennella, Univ. degli Studi di Milano (Italy) . . . . . [6265-14]

9:55 am: **Performances of the Planck-HFI cryogenic thermal control system,** C. Leroy, Univ. Paul Sabatier (France); J. Bernard, Ctr. d'Etude Spatiale des Rayonnements (France); J. Fourmond, Institut d'Astrophysique Spatiale (France); J. A. Lamarre, Observatoire de Paris (France); M. Piat, Collège de France (France) . . . . . [6265-15]

Coffee Break . . . . . 10:15 to 10:40 am

SESSION 5

Room: Crystal Ballrooms: G2 . . . . . Thurs. 10:40 to 11:20 am

Current and Planned Missions: HUBBLE

Chair: **Mattheus W. M. de Graauw,** SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)

10:40 am: **Status and performance of HST/wide-field camera 3,** R. A. Kimble, NASA Goddard Space Flight Ctr.; J. W. MacKenty, Space Telescope Science Institute; R. W. O'Connell, Univ. of Virginia . . . . . [6265-16]

11:00 am: **Wide-field camera 3 ground testing and calibration,** H. A. Bushouse, S. M. Baggett, T. Brown, G. F. Hartig, B. Hilbert, J. W. MacKenty, I. N. Reid, M. Robberto, Space Telescope Science Institute; R. J. Hill, R. A. Kimble, O. L. Lupie, NASA Goddard Space Flight Ctr. . . . . [6265-17]

SESSION 6

Room: Crystal Ballrooms: G2 . . . . . Thurs. 11:20 am to 12:00 pm

Current and Planned Missions: SPICA

Chair: **Mattheus W. M. de Graauw,** SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)

11:20 am: **SPICA: 3.5-m cooled telescope mission for mid- and far-infrared astronomy,** T. Nakagawa, Japan Aerospace Exploration Agency (Japan) [6265-18]

11:40 am: **ESI: the far-infrared instrument for the SPICA mission,** B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-19]

SESSION 7

Room: Crystal Ballrooms: G2 . . . . . Thurs. 12:00 to 12:20 pm

Current and Planned Missions: ASTRO-F

Chair: **Mattheus W. M. de Graauw,** SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands)

12:00 pm: **Initial performance of the ASTRO-F,** H. Murakami, Japan Aerospace Exploration Agency (Japan) . . . . . [6265-20]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 8

Room: Crystal Ballrooms: G2 . . . . . Thurs. 1:30 to 2:10 pm

James Webb Space Telescope: Science and General Overview

Chair: **John C. Mather,** NASA Goddard Space Flight Ctr.

1:30 pm: **Science with the James Webb Space Telescope,** J. P. Gardner, J. C. Mather, M. Clampin, NASA Goddard Space Flight Ctr.; R. Doyon, Univ. de Montréal (Canada); M. A. Greenhouse, NASA Goddard Space Flight Ctr.; H. B. Hammel, Space Science Institute; J. B. Hutchings, Institut Herzberg d'astrophysique (Canada); P. Jakobsen, European Space Research and Technology Ctr. (Netherlands); S. J. Lilly, ETH Zürich (Switzerland); K. S. Long, Space Telescope Science Institute; J. I. Lunine, The Univ. of Arizona; M. J. McCaughrean, The Univ. of Exeter (United Kingdom); C. M. Mountain, Space Telescope Science Institute; G. H. Rieke, M. J. Rieke, The Univ. of Arizona/ Steward Observatory; H. Rix, Max-Planck-Institut für Astronomie (Germany); E. P. Smith, NASA Headquarters; G. Sonneborn, NASA Goddard Space Flight Ctr.; M. Stiavelli, H. S. P. Stockman, Space Telescope Science Institute; R. A. Windhorst, Arizona State Univ.; G. S. Wright, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6265-21]

1:50 pm: **James Webb Space Telescope Observatory overview,** M. Clampin, NASA Goddard Space Flight Ctr. . . . . [6265-22]

SESSION 9

Room: Crystal Ballrooms: G2 . . . . . Thurs. 2:10 to 3:10 pm

James Webb Space Telescope: Testing

Chair: **John C. Mather,** NASA Goddard Space Flight Ctr.

2:10 pm: **New approach to cryogenic optical testing the James Webb Space Telescope,** L. D. Feinberg, J. G. Hagopian, C. Diaz, NASA Goddard Space Flight Ctr. . . . . [6265-23]

2:30 pm: **The JWST backplane stability test article: a critical technology demonstration,** J. W. Arenberg, L. Gilman, S. M. Brennan, C. B. Atkinson, Northrop Grumman Space Technology; P. May, D. Moon, K. Patton, J. L. York, S. Backovsky, J. Tucker, Alliant Techsystems Inc.; R. A. M. Keski-Kuha, NASA Goddard Space Flight Ctr.; A. M. Bluth, Swales Aerospace; B. N. Saif, Space Telescope Science Institute; J. R. Kegley, J. K. Russell, NASA Marshall Space Flight Ctr. . . . . [6265-24]

2:50 pm: **Demonstration of the James Webb Space Telescope commissioning on the JWST testbed telescope,** D. S. Acton, A. R. Contos, P. D. Atcheson, Ball Aerospace & Technologies Corp.; D. C. Redding, Jet Propulsion Lab; D. M. Shields, T. C. Towell, Ball Aerospace & Technologies Corp. . . . . [6265-25]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 10

Room: Crystal Ballrooms: G2 . . . . . Thurs. 3:40 to 5:20 pm

James Webb Space Telescope: Optical Telescope Element (OTE)

Chair: **John C. Mather,** NASA Goddard Space Flight Ctr.

3:40 pm: **JWST Observatory stray light performance,** P. A. Lightsey, Z. Wei, Ball Aerospace & Technologies Corp. . . . . [6265-26]

4:00 pm: **Status of the JWST optical telescope element,** C. B. Atkinson, S. C. Texter, Northrop Grumman Space Technology; L. D. Feinberg, R. A. M. Keski-Kuha, NASA Goddard Space Flight Ctr. . . . . [6265-27]

4:20 pm: **Production of large hexagonal O-30 grade beryllium primary mirror blanks for space-based telescope,** J. Hochberger, A. Sayer, K. Smith, Brush Wellman, Inc. . . . . [6265-28]

4:40 pm: **An overview of optical fabrication of the JWST mirror segments at Tinsley,** G. C. Cole, T. Peters, K. W. Johnson, W. Wolff, R. S. Garfield, T. Nassar, H. A. Wong, R. J. Bernier, C. D. Kiikka, J. M. Kincade, T. B. Hull, Tinsley Labs.; B. B. Gallagher, D. M. Chaney, R. J. Brown, Ball Aerospace & Technologies Corp.; A. G. McKay, Northrop Grumman Space Technology . . . . . [6265-29]

5:00 pm: **Point-spread function modeling for the James Webb Space Telescope,** C. R. Cox, P. Hodge, Space Telescope Science Institute . . . [6265-30]

POSTER POPS

Room: Crystal Ballrooms: G2 . . . . . Thurs. 5:20 to 6:00 pm

1-minute presentations

Current and Planned Missions

✔ **Final results of the high-frequency subsystem development for the heterodyne instrument for far infrared,** J. C. Pearson, J. J. Baker, B. Bumble, G. Chattopadhyay, W. Chun, R. J. Dengler, R. R. Ferber, B. P. Finamore, T. C. Gaier, J. J. Gill, W. A. Hatch, H. H. S. Javadi, J. H. Kawamura, Jet Propulsion Lab.; H. G. LeDuc, Jet Propuslion Lab.; R. H. Lin, E. M. Luong, F. W. Maiwald, I. Mehdi, A. Peralta, D. M. Pukala, L. A. Samoska, E. T. Schlecht, M. M. Soria, J. A. Stern, R. M. Tsang, J. R. Velebir, J. S. Ward, S. Weinreb, Jet Propulsion Lab.; A. Karpov, D. Miller, T. G. Phillips, J. Zmuidzinas, California Institute of Technology; A. Maestrini, Univ. Pierre et Marie Curie (France); N. R. Erickson, Univ. of Massachusetts/Amherst; J. Lester, K. T. Liao, Northrop Grumman Space Technology; M. Paquette, Millitech Corp.; A. A. Campbell, Wedge Way . . . . . [6265-105]

✔ **SHIFTS: a simulator for the Herschel imaging Fourier transform spectrometer,** J. V. Lindner, D. A. Naylor, Univ. of Lethbridge (Canada); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-106]

✔ **A comparison of the theoretical and measured performance of the Herschel/SPIRE imaging Fourier transform spectrometer,** L. D. Spencer, D. A. Naylor, Univ. of Lethbridge (Canada); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-107]

✔ **Performance evaluation of the Herschel/SPIRE imaging Fourier transform spectrometer,** D. A. Naylor, Univ. of Lethbridge (Canada); J. Baluteau, Observatoire Astronomique de Marseille-Provence (France); P. Davis-Imhof, Univ. of Lethbridge (Canada); M. J. Ferlet, Rutherford Appleton Lab. (United Kingdom); T. R. Fulton, Univ. of Lethbridge (Canada); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-108]

✔ **Images and spectral performance of WFC3 interference filters,** M. A. Quijada, R. Boucarut, NASA Goddard Space Flight Ctr.; R. C. Telfer, Orbital Sciences Corp.; S. M. Baggett, J. K. Quijano, Space Telescope Science Institute; G. Allen, Barr Associates, Inc.; P. Arsenovic, NASA Goddard Space Flight Ctr. . . . . [6265-109]

✔ **Filters for WFC3,** S. M. Baggett, T. Brown, Space Telescope Science Institute; R. Boucarut, NASA Goddard Space Flight Ctr.; D. F. Figer, G. F. Hartig, Space Telescope Science Institute; R. A. Kimble, NASA Goddard Space Flight Ctr.; J. W. MacKenty, M. Robberto, Space Telescope Science Institute; R. C. Telfer, Orbital Sciences Corp.; M. A. Quijada, NASA Goddard Space Flight Ctr.; J. K. Quijano, Space Telescope Science Institute; P. Arsenovic, NASA Goddard Space Flight Ctr.; G. Allen, Barr Associates, Inc.; B. Hilbert, Space Telescope Science Institute; O. L. Lupie, J. M. Townsend, NASA Goddard Space Flight Ctr. . . . . [6265-110]

✔ **A spectrograph for the supernovae acceleration probe project (SNAP),** A. Ealet, Ctr. de Physique des Particules de Marseille (France); E. Prieto, Lab. d'Astrophysique de Marseille (France) . . . . . [6265-111]

✔ **An IFU spectrograph demonstrator based on slicer technology for the SNAP mission,** M. Aumeunier, Lab. d'Astrophysique de Marseille (France); C. Cerna, Ctr. de Physique des Particules de Marseille (France) . . . . [6265-112]

✔ **Development of NIR detectors and science driven requirements for SNAP,** M. G. Brown, Univ. of Michigan . . . . . [6265-113]

✔ **Development of an MIR coronagraph for the SPICA mission,** K. Enya, S. Tanaka, Japan Aerospace Exploration Agency (Japan); L. Abe, National Astronomical Observatory of Japan (Japan); T. Nakagawa, H. Kataza, Japan Aerospace Exploration Agency (Japan); M. Tamura, J. Nishikawa, N. Murakami, National Astronomical Observatory of Japan (Japan); Y. Itoh, K. Fujita, Kobe Univ. (Japan) . . . . . [6265-114]

✔ **BLISS for SPICA: far-infrared spectroscopy at the background limit,** C. M. Bradford, J. J. Bock, W. Holmes, P. K. Day, M. E. Kenyon, Jet Propulsion Lab.; K. D. Irwin, National Institute of Standards and Technology; M. Harwit, G. J. Stacey, Cornell Univ.; G. Helou, S. Chapman, California Institute of Technology; E. T. Young, The Univ. of Arizona/Steward Observatory; J. Glenn, Univ. of Colorado/ Boulder; G. J. Melnick, Harvard-Smithsonian Ctr. for Astrophysics; D. F. Lester, The Univ. of Texas at Austin; H. W. Yorke, Jet Propulsion Lab.; J. Zmuidzinas, California Institute of Technology; J. Fischer, Naval Research Lab.; H. T. Nguyen, Jet Propulsion Lab.; D. J. Hollenbach, NASA Ames Research Ctr.; M. Wolfire, Univ. of Maryland/College Park; T. Nakagawa, H. Matsuhara, T. Matsumoto, Japan Aerospace Exploration Agency (Japan); T. Onaka, The Univ. of Tokyo (Japan); H. Shibai, Nagoya Univ. (Japan); M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6265-115]

✔ **DPhot photometry method for the Spitzer Space Telescope,** D. G. Elliott, Jet Propulsion Lab. (Retired) . . . . . [6265-116]

JWST

✔ **Detectors for the James Webb Space Telescope near-infrared spectrograph,** B. J. Rauscher, NASA Goddard Space Flight Ctr. . . [6265-117]

✔ **Onboard calibration sources for the mid-infrared instrument (MIRI) on the James Webb Space Telescope,** A. C. H. Glasse, D. Lee, P. M. Parr-Burman, UK Astronomy Technology Ctr. (United Kingdom); D. J. Hayton, Cardiff Univ. (United Kingdom); E. Mazy, Univ. de Liège (Belgium) . . . . . [6265-118]

✔ **Mounting MIRI's double prism,** S. Fischer, C. Straubmeier, A. Eckart, Univ. zu Köln (Germany); L. Rossi, E. Mazy, Univ. de Liège (Belgium) . . . . . [6265-119]

✔ **Development of robust thermo-optical thin-film membranes for the James Webb Space Telescope sunshield,** J. D. Moery, R. Claridge, Northrop Grumman Space Technology . . . . . [6265-120]

✔ **Stray light from galactic sky and zodiacal light for JWST,** Z. Wei, P. A. Lightsey, Ball Aerospace & Technologies Corp. . . . . [6265-121]

✔ **The JWST infrared scanning Shack Hartman system: a new in-process way to measure large mirrors during optical fabrication at Tinsley,** C. D. Kiikka, Tinsley Labs.; D. R. Neal, WaveFront Sciences, Inc.; R. J. Bernier, J. M. Kincade, T. B. Hull, Tinsley Labs.; D. M. Chaney, Ball Aerospace & Technologies Corp. . . . . [6265-122]

✔ **A system of metrology for the JWST mirror segments at Tinsley,** R. J. Bernier, G. C. Cole, C. R. Alongi, T. Peters, J. M. Kincade, T. B. Hull, Tinsley Labs.; B. B. Gallagher, Ball Aerospace & Technologies Corp.; A. G. McKay, Northrop Grumman Space Technology . . . . . [6265-123]

✔ **A system of optical finishing for the JWST beryllium mirror segments at Tinsley,** R. S. Garfield, W. Wolff, T. Peters, G. C. Cole, K. W. Johnson, T. Nassar, H. A. Wong, J. M. Kincade, T. B. Hull, Tinsley Labs.; R. J. Brown, B. B. Gallagher, Ball Aerospace & Technologies Corp.; A. G. McKay, Northrop Grumman Space Technology . . . . . [6265-124]

✔ **Preliminary evaluation of the vibration environment within JSC chamber A using a simultaneous phase-shifting interferometer,** J. B. Hadaway, The Univ. of Alabama in Huntsville; R. Eng, NASA Marshall Space Flight Ctr.; J. Marzouk, Sigma Space Corp.; J. Speed, NASA Johnson Space Ctr. . . . . [6265-125]

✔ **Wave-optics analysis of pupil imaging,** B. H. Dean, B. J. Bos, NASA Goddard Space Flight Ctr. . . . . [6265-159]

TPF

✔ **The Terrestrial Planet Finder coronagraph optical surfaces requirements,** S. B. Shaklan, J. J. Green, D. C. Palacios, Jet Propulsion Lab. . . . . [6265-126]

✔ **Study of coronagraphic techniques,** V. Tolls, Harvard-Smithsonian Ctr. for Astrophysics; M. J. Aziz, Harvard Univ.; R. A. Gonsalves, Tufts Univ.; A. Labeyrie, Observatoire de Haute-Provence (France); R. G. Lyon, NASA Goddard Space Flight Ctr.; G. J. Melnick, Harvard-Smithsonian Ctr. for Astrophysics; S. F. Somerstein, G. Vasudevan, Lockheed Martin Advanced Technology Ctr.; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-127]

✔ **Performance of TPF's high-contrast imaging testbed: modeling and simulations,** E. Sidick, F. Shi, S. A. Basinger, D. Moody, A. E. Lowman, A. C. Kuhnert, J. T. Tauger, Jet Propulsion Lab. . . . . [6265-128]

✔ **The effects of instrumental elliptical polarization on stellar point spread function fine structure,** J. C. Carson, B. D. Kern, J. B. Breckinridge, J. T. Trauger, Jet Propulsion Lab. . . . . [6265-129]

✔ **Fabrication and characteristics of free-standing shaped pupil masks for TPF-coronagraph,** K. Balasubramanian, P. M. Echternach, M. R. Dickie, R. E. Muller, V. E. White, D. J. Hoppe, S. B. Shaklan, Jet Propulsion Lab. and California Institute of Technology; R. Belikov, J. N. Kasdin, R. J. Vanderbei, Princeton Univ. . . . . [6265-130]

✔ **Studying a simple TPF-C: image simulation from start to planet discovery,** J. E. Krist, J. T. Trauger, K. R. Stapelfeldt, D. Moody, Jet Propulsion Lab. . . . . [6265-131]

✔ **The coronagraphic exploration camera (CorECam) instrument concept for TPF,** M. Clampin, NASA Goddard Space Flight Ctr.; H. C. Ford, Johns Hopkins Univ.; D. N. C. Lin, Univ. of California/Santa Cruz/Lick Observatory; R. G. Lyon, NASA Goddard Space Flight Ctr.; S. Seager, Carnegie Institution of Washington; B. J. Rauscher, NASA Goddard Space Flight Ctr.; W. B. Sparks, L. Petro, Space Telescope Science Institute; V. Tolls, Harvard-Smithsonian Ctr. for Astrophysics; M. J. Kuchner, NASA Goddard Space Flight Ctr.; G. D. Illingworth, Univ. of California/Santa Cruz/Lick Observatory; G. J. Melnick, Harvard-Smithsonian Ctr. for Astrophysics; A. Weinberger, Carnegie Institution of Washington; M. Marley, NASA Ames Research Ctr.; M. Shao, Jet Propulsion Lab.; J. Kasting, The Pennsylvania State Univ.; S. D. Horner, Lockheed Martin Advanced Technology Ctr.; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-132]

✔ **Nulling and adaptive optics for very high dynamic range coronagraph,** J. Nishikawa, N. Murakami, L. Abe, M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6265-133]

✔ **Pointing control system for the Eclipse mission,** P. B. Brugarolas, T. Kia, Jet Propulsion Lab. . . . . [6265-134]

✔ **PIAA coronagraph design: system optimization and first laboratory results,** E. Pluzhnik, National Astronomical Observatory of Japan/Subaru Telescope and Institute of Astronomy of Kharkov National Univ. (Ukraine); O. Guyon, National Astronomical Observatory of Japan/Subaru Telescope; S. T. Ridgway, National Optical Astronomy Observatory; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-135]

✔ **Polarization and spectral differential imager using channeled spectrum,** N. Murakami, National Astronomical Observatory of Japan (Japan); N. Baba, Hokkaido Univ. (Japan) . . . . . [6265-136]

✔ **Exo-planet transit analysis using the point spread function,** G. Tremberger, Jr., T. D. Cheung, Queensborough Community College/CUNY . . . . . [6265-138]

✔ **Fractal characteristics of exo-planet transit time series data,** G. Tremberger, Jr., A. Flamholz, P. J. Marchese, D. H. Lieberman, T. D. Cheung, Queensborough Community College/CUNY . . . . . [6265-139]

✔ **A hand-held near-infrared spectrograph for Earth observations,** S. Kanneganti, C. Park, H. M. Hershley, A. W. Smith, M. F. Skrutskie, J. C. Wilson, Univ. of Virginia; W. A. Traub, Jet Propulsion Lab.; C. R. Lam, M. J. Nelson, Univ. of Virginia . . . . . [6265-141]

✔ **Estimated performance of a symmetric nulling coronagraph for exoplanet imaging,** D. Ren, New Jersey Institute of Technology . . . . . [6265-161]

✔ **Primary mirror interrogation and correction for high-contrast imaging,** J. D. Kay, R. Belikov, J. N. Kasdin, M. G. Littman, D. N. Spergel, R. J. Vanderbei, Princeton Univ. . . . . [6265-162]

✔ **Multi-spectral transmittance imaging of HEBS glass occulting masks for TPF-coronagraph,** D. W. Wilson, K. Balasubramanian, J. T. Trauger, R. C. Muller, Jet Propulsion Lab. . . . . [6265-166]

✔Poster Session I

Room: Palms Ballroom: Canary & Royal Salons . Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

Current and Planned Missions

✔ **Final results of the high-frequency subsystem development for the heterodyne instrument for far infrared,** J. C. Pearson, J. J. Baker, B. Bumble, G. Chattopadhyay, W. Chun, R. J. Dengler, R. R. Ferber, B. P. Finamore, T. C. Gaier, J. J. Gill, W. A. Hatch, H. H. S. Javadi, J. H. Kawamura, Jet Propulsion Lab.; H. G. LeDuc, Jet Propuslion Lab.; R. H. Lin, E. M. Luong, F. W. Maiwald, I. Mehdi, A. Peralta, D. M. Pukala, L. A. Samoska, E. T. Schlecht, M. M. Soria, J. A. Stern, R. M. Tsang, J. R. Velebir, J. S. Ward, S. Weinreb, Jet Propulsion Lab.; A. Karpov, D. Miller, T. G. Phillips, J. Zmuidzinas, California Institute of Technology; A. Maestrini, Univ. Pierre et Marie Curie (France); N. R. Erickson, Univ. of Massachusetts/Amherst; J. Lester, K. T. Liao, Northrop Grumman Space Technology; M. Paquette, Millitech Corp.; A. A. Campbell, Wedge Way . . . . . [6265-105]

✔ **SHIFTS: a simulator for the Herschel imaging Fourier transform spectrometer,** J. V. Lindner, D. A. Naylor, Univ. of Lethbridge (Canada); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-106]

✔ **A comparison of the theoretical and measured performance of the Herschel/SPIRE imaging Fourier transform spectrometer,** L. D. Spencer, D. A. Naylor, Univ. of Lethbridge (Canada); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-107]

✔ **Performance evaluation of the Herschel/SPIRE imaging Fourier transform spectrometer,** D. A. Naylor, Univ. of Lethbridge (Canada); J. Baluteau, Observatoire Astronomique de Marseille-Provence (France); P. Davis-Imhof, Univ. of Lethbridge (Canada); M. J. Ferlet, Rutherford Appleton Lab. (United Kingdom); T. R. Fulton, Univ. of Lethbridge (Canada); B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . . . . . [6265-108]

✔ **Images and spectral performance of WFC3 interference filters,** M. A. Quijada, R. Boucarut, NASA Goddard Space Flight Ctr.; R. C. Telfer, Orbital Sciences Corp.; S. M. Baggett, J. K. Quijano, Space Telescope Science Institute; G. Allen, Barr Associates, Inc.; P. Arsenovic, NASA Goddard Space Flight Ctr. . . . . [6265-109]

✔ **Filters for WFC3,** S. M. Baggett, T. Brown, Space Telescope Science Institute; R. Boucarut, NASA Goddard Space Flight Ctr.; D. F. Figer, G. F. Hartig, Space Telescope Science Institute; R. A. Kimble, NASA Goddard Space Flight Ctr.; J. W. MacKenty, M. Robberto, Space Telescope Science Institute; R. C. Telfer, Orbital Sciences Corp.; M. A. Quijada, NASA Goddard Space Flight Ctr.; J. K. Quijano, Space Telescope Science Institute; P. Arsenovic, NASA Goddard Space Flight Ctr.; G. Allen, Barr Associates, Inc.; B. Hilbert, Space Telescope Science Institute; O. L. Lupie, J. M. Townsend, NASA Goddard Space Flight Ctr. . . . . [6265-110]

✔ **A spectrograph for the supernovae acceleration probe project (SNAP),** A. Ealet, Ctr. de Physique des Particules de Marseille (France); E. Prieto, Lab. d'Astrophysique de Marseille (France) . . . . . [6265-111]

✔ **An IFU spectrograph demonstrator based on slicer technology for the SNAP mission,** M. Aumeunier, Lab. d'Astrophysique de Marseille (France); C. Cerna, Ctr. de Physique des Particules de Marseille (France) . . . . [6265-112]

✔ **Development of NIR detectors and science driven requirements for SNAP,** M. G. Brown, Univ. of Michigan . . . . . [6265-113]

✔ **Development of an MIR coronagraph for the SPICA mission,** K. Enya, S. Tanaka, Japan Aerospace Exploration Agency (Japan); L. Abe, National Astronomical Observatory of Japan (Japan); T. Nakagawa, H. Kataza, Japan Aerospace Exploration Agency (Japan); M. Tamura, J. Nishikawa, N. Murakami, National Astronomical Observatory of Japan (Japan); Y. Itoh, K. Fujita, Kobe Univ. (Japan) . . . . . [6265-114]

✔ **BLISS for SPICA: far-infrared spectroscopy at the background limit,** C. M. Bradford, J. J. Bock, W. Holmes, P. K. Day, M. E. Kenyon, Jet Propulsion Lab.; K. D. Irwin, National Institute of Standards and Technology; M. Harwit, G. J. Stacey, Cornell Univ.; G. Helou, S. Chapman, California Institute of Technology; E. T. Young, The Univ. of Arizona/Steward Observatory; J. Glenn, Univ. of Colorado/ Boulder; G. J. Melnick, Harvard-Smithsonian Ctr. for Astrophysics; D. F. Lester, The Univ. of Texas at Austin; H. W. Yorke, Jet Propulsion Lab.; J. Zmuidzinas, California Institute of Technology; J. Fischer, Naval Research Lab.; H. T. Nguyen, Jet Propulsion Lab.; D. J. Hollenbach, NASA Ames Research Ctr.; M. Wolfire, Univ. of Maryland/College Park; T. Nakagawa, H. Matsuhara, T. Matsumoto, Japan Aerospace Exploration Agency (Japan); T. Onaka, The Univ. of Tokyo (Japan); H. Shibai, Nagoya Univ. (Japan); M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6265-115]

✔ **DPhot photometry method for the Spitzer Space Telescope,** D. G. Elliott, Jet Propulsion Lab. (Retired) . . . . . [6265-116]

JWST

✔ **Detectors for the James Webb Space Telescope near-infrared spectrograph,** B. J. Rauscher, NASA Goddard Space Flight Ctr. . . [6265-117]

✔ **Onboard calibration sources for the mid-infrared instrument (MIRI) on the James Webb Space Telescope,** A. C. H. Glasse, D. Lee, P. M. Parr-Burman, UK Astronomy Technology Ctr. (United Kingdom); D. J. Hayton, Cardiff Univ. (United Kingdom); E. Mazy, Univ. de Liège (Belgium) . . . . . [6265-118]

✔ **Mounting MIRI's double prism,** S. Fischer, C. Straubmeier, A. Eckart, Univ. zu Köln (Germany); L. Rossi, E. Mazy, Univ. de Liège (Belgium) . . . . . [6265-119]

✔ **Development of robust thermo-optical thin-film membranes for the James Webb Space Telescope sunshield,** J. D. Moery, R. Claridge, Northrop Grumman Space Technology . . . . . [6265-120]

✔ **Stray light from galactic sky and zodiacal light for JWST,** Z. Wei, P. A. Lightsey, Ball Aerospace & Technologies Corp. . . . . [6265-121]

✔ **The JWST infrared scanning Shack Hartman system: a new in-process way to measure large mirrors during optical fabrication at Tinsley,** C. D. Kiikka, Tinsley Labs.; D. R. Neal, WaveFront Sciences, Inc.; R. J. Bernier, J. M. Kincade, T. B. Hull, Tinsley Labs.; D. M. Chaney, Ball Aerospace & Technologies Corp. . . . . [6265-122]

✔ **A system of metrology for the JWST mirror segments at Tinsley,** R. J. Bernier, G. C. Cole, C. R. Alongi, T. Peters, J. M. Kincade, T. B. Hull, Tinsley Labs.; B. B. Gallagher, Ball Aerospace & Technologies Corp.; A. G. McKay, Northrop Grumman Space Technology . . . . . [6265-123]

✔ **A system of optical finishing for the JWST beryllium mirror segments at Tinsley,** R. S. Garfield, W. Wolff, T. Peters, G. C. Cole, K. W. Johnson, T. Nassar, H. A. Wong, J. M. Kincade, T. B. Hull, Tinsley Labs.; R. J. Brown, B. B. Gallagher, Ball Aerospace & Technologies Corp.; A. G. McKay, Northrop Grumman Space Technology . . . . . [6265-124]

✔ **Preliminary evaluation of the vibration environment within JSC chamber A using a simultaneous phase-shifting interferometer,** J. B. Hadaway, The Univ. of Alabama in Huntsville; R. Eng, NASA Marshall Space Flight Ctr.; J. Marzouk, Sigma Space Corp.; J. Speed, NASA Johnson Space Ctr. . . . . [6265-125]

✔ **Wave-optics analysis of pupil imaging,** B. H. Dean, B. J. Bos, NASA Goddard Space Flight Ctr. . . . . [6265-159]

TPF

✔ **The Terrestrial Planet Finder coronagraph optical surfaces requirements,** S. B. Shaklan, J. J. Green, D. C. Palacios, Jet Propulsion Lab. . . . . [6265-126]

✔ **Study of coronagraphic techniques,** V. Tolls, Harvard-Smithsonian Ctr. for Astrophysics; M. J. Aziz, Harvard Univ.; R. A. Gonsalves, Tufts Univ.; A. Labeyrie, Observatoire de Haute-Provence (France); R. G. Lyon, NASA Goddard Space Flight Ctr.; G. J. Melnick, Harvard-Smithsonian Ctr. for Astrophysics; S. F. Somerstein, G. Vasudevan, Lockheed Martin Advanced Technology Ctr.; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-127]

✔ **Performance of TPF's high-contrast imaging testbed: modeling and simulations,** E. Sidick, F. Shi, S. A. Basinger, D. Moody, A. E. Lowman, A. C. Kuhnert, J. T. Tauger, Jet Propulsion Lab. . . . . [6265-128]

✔ **The effects of instrumental elliptical polarization on stellar point spread function fine structure,** J. C. Carson, B. D. Kern, J. B. Breckinridge, J. T. Trauger, Jet Propulsion Lab. . . . . [6265-129]

✔ **Fabrication and characteristics of free-standing shaped pupil masks for TPF-coronagraph,** K. Balasubramanian, P. M. Echternach, M. R. Dickie, R. E. Muller, V. E. White, D. J. Hoppe, S. B. Shaklan, Jet Propulsion Lab. and California Institute of Technology; R. Belikov, J. N. Kasdin, R. J. Vanderbei, Princeton Univ. . . . . [6265-130]

✔ **Studying a simple TPF-C: image simulation from start to planet discovery,** J. E. Krist, J. T. Trauger, K. R. Stapelfeldt, D. Moody, Jet Propulsion Lab. . . . . [6265-131]

✔ **The coronagraphic exploration camera (CorECam) instrument concept for TPF,** M. Clampin, NASA Goddard Space Flight Ctr.; H. C. Ford, Johns Hopkins Univ.; D. N. C. Lin, Univ. of California/Santa Cruz/Lick Observatory; R. G. Lyon, NASA Goddard Space Flight Ctr.; S. Seager, Carnegie Institution of Washington; B. J. Rauscher, NASA Goddard Space Flight Ctr.; W. B. Sparks, L. Petro, Space Telescope Science Institute; V. Tolls, Harvard-Smithsonian Ctr. for Astrophysics; M. J. Kuchner, NASA Goddard Space Flight Ctr.; G. D. Illingworth, Univ. of California/Santa Cruz/Lick Observatory; G. J. Melnick, Harvard-Smithsonian Ctr. for Astrophysics; A. Weinberger, Carnegie Institution of Washington; M. Marley, NASA Ames Research Ctr.; M. Shao, Jet Propulsion Lab.; J. Kasting, The Pennsylvania State Univ.; S. D. Horner, Lockheed Martin Advanced Technology Ctr.; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-132]

✔ **Nulling and adaptive optics for very high dynamic range coronagraph,** J. Nishikawa, N. Murakami, L. Abe, M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6265-133]

✔ **Pointing control system for the Eclipse mission,** P. B. Brugarolas, T. Kia, Jet Propulsion Lab. . . . . [6265-134]

✔ **PIAA coronagraph design: system optimization and first laboratory results,** E. Pluzhnik, National Astronomical Observatory of Japan/Subaru Telescope and Institute of Astronomy of Kharkov National Univ. (Ukraine); O. Guyon, National Astronomical Observatory of Japan/Subaru Telescope; S. T. Ridgway, National Optical Astronomy Observatory; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-135]

✔ **Polarization and spectral differential imager using channeled spectrum,** N. Murakami, National Astronomical Observatory of Japan (Japan); N. Baba, Hokkaido Univ. (Japan) . . . . . [6265-136]

✔ **Exo-planet transit analysis using the point spread function,** G. Tremberger, Jr., T. D. Cheung, Queensborough Community College/CUNY . . . . . [6265-138]

✔ **Fractal characteristics of exo-planet transit time series data,** G. Tremberger, Jr., A. Flamholz, P. J. Marchese, D. H. Lieberman, T. D. Cheung, Queensborough Community College/CUNY . . . . . [6265-139]

✔ **A hand-held near-infrared spectrograph for Earth observations,** S. Kanneganti, C. Park, H. M. Hershley, A. W. Smith, M. F. Skrutskie, J. C. Wilson, Univ. of Virginia; W. A. Traub, Jet Propulsion Lab.; C. R. Lam, M. J. Nelson, Univ. of Virginia . . . . . [6265-141]

✔ **Estimated performance of a symmetric nulling coronagraph for exoplanet imaging,** D. Ren, New Jersey Institute of Technology . . . . . [6265-161]

✔ **Primary mirror interrogation and correction for high-contrast imaging,** J. D. Kay, R. Belikov, J. N. Kasdin, M. G. Littman, D. N. Spergel, R. J. Vanderbei, Princeton Univ. . . . . [6265-162]

✔ **Multi-spectral transmittance imaging of HEBS glass occulting masks for TPF-coronagraph,** D. W. Wilson, K. Balasubramanian, J. T. Trauger, R. C. Muller, Jet Propulsion Lab. . . . . [6265-166]

Friday 26 May

SESSION 11

Room: Crystal Ballrooms: G2 . . . . . Fri. 8:00 to 10:00 am

James Webb Space Telescope: Wavefront Sensing and Control

Chair: **John C. Mather,** NASA Goddard Space Flight Ctr.

8:00 am: **Aligning and maintaining the optics for the James Webb Space Telescope (JWST) on-orbit: the wavefront sensing and control concept of operations,** A. R. Contos, D. S. Acton, P. D. Atcheson, A. A. Barto, P. A. Lightsey, D. M. Shields, Ball Aerospace & Technologies Corp. . . . . [6265-31]

8:20 am: **Performance of dispersed fringe sensor in the presence of segmented mirror aberrations,** F. Shi, S. A. Basinger, D. C. Redding, Jet Propulsion Lab. . . . . [6265-32]

8:40 am: **Verification of the James Webb Space Telescope coarse phase sensor using the Keck Telescope,** M. J. Albanese, A. Wirth, A. J. Jankevics, T. Gonsiorowski, Adaptive Optics Associates, Inc.; C. M. Ohara, F. Shi, M. Troy, Jet Propulsion Lab.; G. A. Chanan, Univ. of California/Irvine; D. S. Acton, Ball Aerospace & Technologies Corp. . . . . [6265-33]

9:00 am: **James Webb Space Telescope primary mirror deployment ambiguity effects,** J. W. Contreras, P. A. Lightsey, Ball Aerospace & Technologies Corp. . . . . [6265-164]

9:20 am: **Performance of fine-phasing algorithms on the James Webb Space Telescope testbed,** B. H. Dean, NASA Goddard Space Flight Ctr.; D. S. Acton, Ball Aerospace & Technologies Corp.; D. L. Aronstein, S. Shiri, J. S. Smith, J. G. Budinoff, NASA Goddard Space Flight Ctr. . . . . [6265-35]

9:40 am: **Focus determination for the James Webb Space Telescope science instruments: a survey of methods,** P. S. Davila, B. J. Bos, B. H. Dean, J. G. Hagopian, J. M. Howard, B. L. Unger, M. E. Wilson, NASA Goddard Space Flight Ctr. . . . . [6265-36]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 12

Room: Crystal Ballrooms: G2 . . . . . Fri. 10:30 to 11:50 am

James Webb Space Telescope: Instruments

Chair: **John C. Mather,** NASA Goddard Space Flight Ctr.

10:30 am: **The James Webb Space Telescope integrated science instrument module,** M. A. Greenhouse, S. D. Glazer, E. L. Johnson, J. C. McCloskey, L. B. Sheers, P. C. Sullivan, M. F. Voyton, NASA Goddard Space Flight Ctr. . . . . [6265-37]

10:50 am: **The MIRI medium resolution spectrometer for the James Webb Space Telescope,** M. Wells, D. Lee, UK Astronomy Technology Ctr. (United Kingdom); A. Oudenhuysen, Astron (Netherlands); P. R. Hastings, UK Astronomy Technology Ctr. (United Kingdom); J. Pel, Astron (Netherlands); A. C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6265-38]

11:10 am: **Large-format microshutter arrays for JWST NIRSpec,** A. S. Kutyrev, R. G. Arendt, R. Boucarut, T. Hadjimichael, M. D. Jhabvala, T. T. King, G. Kletetschka, M. J. Li, S. H. Moseley, Jr., D. A. Rapchun, R. F. Silverberg, D. Sohl, NASA Goddard Space Flight Ctr. . . . . [6265-39]

11:30 am: **The JWST tunable filter imager (TFI),** R. Doyon, Univ. de Montréal (Canada); J. B. Hutchings, National Research Council Canada (Canada); N. Rowlands, C. E. Evans, E. Greenberg, A. D. Scott, EMS Technologies (Canada); M. Beaulieu, Univ. de Montreal (Canada); R. Abraham, Univ. of Toronto (Canada); L. Ferrarese, National Research Council Canada (Canada); A. W. Fullerton, Space Telescope Science Institute; R. Jayawardhana, Univ. of Toronto (Canada); D. Johnstone, National Research Council Canada (Canada); M. R. Meyer, The Univ. of Arizona/Steward Observatory; J. L. Pipher, Univ. of Rochester; M. Sawicki, Univ. of California/Santa Barbara . . . . . [6265-40]

Lunch Break . . . . . 11:50 am to 1:00 pm

Plenary Presentation
Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 13

Room: Crystal Ballrooms: G2 . . . . . Sat. 8:00 am to 12:10 pm

Terrestrial Planet Finder: Coronagraphy I

Chair: **James B. Breckinridge,** Jet Propulsion Lab.

8:00 am: **A nulling coronagraph for TPF-C,** M. Shao, Jet Propulsion Lab. . . . . [6265-41]

8:20 am: **Toward 10^{10} contrast for terrestrial exoplanet detection: demonstration of extreme wavefront correction in a shaped-pupil coronagraph,** R. Belikov, A. Give'on, M. A. Carr, Princeton Univ.; J. T. Trauger, F. Shi, K. Balasubramanian, Jet Propulsion Lab.; A. C. Kuhnert, Jet Propulsion Lab; J. N. Kasdin, Princeton Univ. . . . . [6265-42]

8:40 am: **Laboratory demonstration of high-contrast imaging technologies for space coronagraphy,** J. T. Trauger, B. Gordon, A. C. Kuhnert, D. Moody, A. F. Niessner, F. Shi, D. W. Wilson, Jet Propulsion Lab.; C. J. Burrows, Metajiva; M. A. Ealey, T. R. Price, Xinetics, Inc. . . . . [6265-43]

9:00 am: **The visible nulling coronagraph: architecture definition and technology development status,** B. M. Levine, M. Shao, J. K. Wallace, D. T. Liu, E. G. Schmidtlin, S. Rao, E. Serabyn, B. P. Mennesson, J. J. Green, F. Aguayo, S. F. Fregoso, Jet Propulsion Lab.; B. F. Lane, Massachusetts Institute of Technology; R. Samuele, Northup-Grumman Space Technology Corp.; C. E. Tuttle, Lockheed Martin Corp. . . . . [6265-44]

9:20 am: **Extrasolar planetary imaging coronagraph (EPIC),** M. Clampin, NASA Goddard Space Flight Ctr. . . . . [6265-45]

9:40 am: **Speckle nulling for exoplanet detection with space-based coronagraphic telescopes,** P. J. Borde, Harvard-Smithsonian Ctr. for Astrophysics; W. A. Traub, Jet Propulsion Lab. . . . . [6265-46]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Decreasing the inner working angle in high-contrast imaging by pupil replication,** F. Spaan, A. H. Greenaway, Heriot-Watt Univ. (United Kingdom) . . . . . [6265-47]

10:50 am: **Hybrid pupil mapping/masking systems for high-contrast imaging,** R. J. Vanderbei, Princeton Univ. . . . . [6265-48]

11:10 am: **Imaging extrasolar terrestrial planets from Space with a PIAA coronagraph,** O. Guyon, National Astronomical Observatory of Japan/Subaru Telescope; E. Pluzhnik, National Astronomical Observatory of Japan, Subaru Telescope; S. T. Ridgway, National Optical Astronomy Observatory; R. A. Woodruff, Lockheed Martin Space Systems Co. . . . . [6265-49]

11:30 am: **Astronomical near-neighbor detection with a four-quadrant phase mask (FQPM) coronagraph,** P. Haguenauer, E. Serabyn, B. P. Mennesson, J. K. Wallace, R. O. Gappinger, M. Troy, E. E. Bloemhof, J. D. Moore, C. D. Koresko, Jet Propulsion Lab. . . . . [6265-50]

11:50 am: **Wavelength dependence of aberrations in the near field: influence and compensation of Fresnel effects in coronographs,** L. A. Pueyo, J. N. Kasdin, M. G. Littman, R. J. Vanderbei, Princeton Univ. . . . . [6265-51]

Lunch Break . . . . . 12:10 to 1:30 pm

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 14

Room: Crystal Ballrooms: G2 . . . . . Sat. 2:35 to 3:15 pm

Terrestrial Planet Finder: Coronagraphy II

Chair: **James B. Breckinridge,** Jet Propulsion Lab.

2:35 pm: **Conventional and Bayesian planet detection algorithms for TPF-C,** N. J. Kasdin, R. Belikov, Princeton Univ.; S. B. Shaklan, S. L. Hunyadi, Jet Propulsion Lab. . . . . [6265-52]

2:55 pm: **Development of binary silicon free-standing image masks for TPF-C,** J. C. Ge, Univ. of Florida; J. Crepp, S. Miller, D. L. McDavitt, The Pennsylvania State Univ. and Univ. of Florida . . . . . [6265-53]

Coffee Break . . . . . 3:15 to 3:40 pm

SESSION 15

Room: Crystal Ballrooms: G2 . . . . . Sat. 3:40 to 5:00 pm

Terrestrial Planet Finder: Interferometry

Chair: **James B. Breckinridge,** Jet Propulsion Lab.

3:40 pm: **Optimal planet detection for a nulling space interferometer,** E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France); L. M. Mugnier, ONERA (France) . . . . . [6265-54]

4:00 pm: **The Fourier-Kelvin stellar interferometer,** R. K. Barry, NASA Goddard Space Flight Ctr. . . . . [6265-55]

4:20 pm: **PEGASE :a space-based nulling interferometer,** J. LeDuigou, Ctr. National d'Études Spatiales (France) and ONERA (France); M. Ollivier, Univ. Paris-Sud II (France); F. Cassaing, ONERA (France); D. Mourard, Observatoire de la Côte d'Azur (France); F. Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); O. Absil, Univ. de Liège (Belgium); R. Cledassou, P. Duchon, M. Delpech, P. Guidotti, Ctr. National d'Études Spatiales (France); A. M. Léger, Univ. Paris-Sud II (France); D. Rouan, Observatoire de Paris à Meudon (France) . . . . . [6265-56]

4:40 pm: **The Fourier-Kelvin stellar interferometer (FKSI) nulling testbed II: closed-loop path length metrology and control subsystem,** B. J. Frey, NASA Goddard Space Flight Ctr. . . . . [6265-57]

Conference presentations will resume Monday 29 May

Monday 29 May

SESSION 16

Room: Crystal Ballrooms: G2 . . . . . Mon. 8:40 to 10:00 am

Terrestrial Planet Finder: Other Concepts

Chair: **James B. Breckinridge,** Jet Propulsion Lab.

8:40 am: **Darwin: a mission overview,** A. L. Karlsson, L. L. A. d'Arcio, R. H. den Hartog, M. C. Fridlund, European Space Agency (Netherlands) . . . . . [6265-58]

9:00 am: **New design for additional sensitivity to extrasolar planet detection by stellar hallo cancellation,** R. Content, Univ. of Durham (United Kingdom) . . . . . [6265-59]

9:20 am: **Characterization of a star/planet simulator for evaluating extrasolar planet detection techniques,** S. E. Kendrick, C. T. Robb, D. C. Ebbets, P. D. Atcheson, Ball Aerospace & Technologies Corp. . . . . [6265-60]

9:40 am: **TPF-CP: a high-throughput 2-m telescope with small inner working angle to image nearby terrestrial exoplanets,** J. R. P. Angel, The Univ. of Arizona/Steward Observatory; O. Guyon, E. Pluzhnik, National Astronomical Observatory of Japan/Subaru Telescope; J. L. Codona, The Univ. of Arizona/ Steward Observatory . . . . . [6265-62]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 17

Room: Crystal Ballrooms: G2 . . . . . Mon. 10:30 am to 12:10 pm

Future Missions: Mission and Telescope Concepts I

Chair: **Howard A. MacEwen,** SRS Technologies

10:30 am: **Architecture concept for a 10-m class space telescope,** D. C. Ebbets, J. DeCino, Ball Aerospace & Technologies Corp.; J. C. Green, Univ. of Colorado/ Boulder . . . . . [6265-63]

10:50 am: **Cosmic infrared background experiment,** J. J. Bock, J. O. Battle, Jet Propulsion Lab.; A. Cooray, Univ. of California/Irvine; B. G. Keating, Univ. of California/San Diego; A. E. Lange, California Institute of Technology; T. Renbarger, Univ. of California/San Diego; I. Sullivan, California Institute of Technology; M. Kawada, Nagoya Univ. (Japan); T. Matsumoto, S. Matsuura, K. Tsumura, T. Wada, Japan Aerospace Exploration Agency (Japan); T. Watabe, Nagoya Univ. (Japan); D. H. Lee, S. Pak, Korea Astronomy and Space Science Institute (South Korea) . . . . . [6265-64]

11:10 am: **A lunar liquid mirror telescope (LLMT) for deep-field infrared observations near the lunar pole,** S. P. Worden, J. R. P. Angel, D. J. Eisenstein, S. Sivanandam, The Univ. of Arizona/Steward Observatory; J. H. Burge, College of Optical Sciences/The Univ. of Arizona; E. F. Borra, C. M. Gosselin, O. Seddiki, Univ. Laval (Canada); S. Thibault, ImmerVision; P. Hickson, The Univ. of British Columbia (Canada); K. B. Ma, Univ. of Houston; B. Foing, European Space Agency (Netherlands); J. L. Josset, SPACE-X, Space Exploration Institute (Switzerland) . . . . . [6265-65]

11:30 am: **The New Worlds Observer: extinguishing Poisson's spot,** W. C. Cash, E. R. Schindhelm, Univ. of Colorado/ Boulder; J. Arenberg, R. S. Polidan, Northrop Grumman Space Technology . . . . . [6265-66]

11:50 am: **New World observer performance: a first look,** J. W. Arenberg, Northrop Grumman Space Technology; W. C. Cash, Univ. of Colorado/Boulder; R. S. Polidan, Northrop Grumman Space Technology . . . . . [6265-67]

Lunch Break . . . . . 12:10 to 1:30 pm

SESSION 18

Room: Crystal Ballrooms: G2 . . . . . Mon. 1:30 to 4:20 pm

Future Missions: Mission and Telescope Concepts II

Chair: **Howard A. MacEwen,** SRS Technologies

1:30 pm: **Science promise and conceptual mission design for SAFIR: the single-aperture far-infrared observatory,** D. F. Lester, The Univ. of Texas at Austin; D. J. Benford, NASA Goddard Space Flight Ctr.; H. W. Yorke, C. M. Bradford, Jet Propulsion Lab.; K. A. Parrish, NASA Goddard Space Flight Ctr.; H. P. Stahl, NASA Marshall Space Flight Ctr. . . . . [6265-68]

1:50 pm: **DUNE: the dark universe explorer,** A. Refregier, O. Boulade, CEA Saclay (France); Y. Mellier, Institut d'Astrophysique de Paris (France); B. Milliard, Lab. d'Astrophysique de Marseille (France); R. Pain, Institut National de Physique Nucléaire et de Physique des Particules (France); J. Michaud, Ctr. National d'Études Spatiales (France); F. Safa, EADS Astrium (France) . . . . . [6265-69]

2:10 pm: **ESPRIT: a space interferometer concept for the far-infrared,** W. Wild, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands) . . . . . [6265-70]

2:30 pm: **SPECS: the submillimeter probe of the evolution of cosmic structure,** S. A. Rinehart, NASA Goddard Space Flight Ctr. . . . . [6265-71]

2:50 pm: **The wide-field infrared survey explorer (WISE),** A. K. Mainzer, Jet Propulsion Lab. . . . . [6265-72]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Fresnel lens optics for astronomical space telescopes,** A. S. Lo, J. W. Arenberg, Northrop Grumman Space Technology . . . . . [6265-73]

4:00 pm: **Photon sieve telescope,** G. P. Andersen, U.S. Air Force Academy . . . . . [6265-74]

SESSION 19

Room: Crystal Ballrooms: G2 . . . . . Mon. 4:20 to 5:40 pm

Future Missions: Solar System Telescopes

Chair: **Howard A. MacEwen,** SRS Technologies

4:20 pm: **Formation flyers applied to solar coronal diagnostics: the ASPIICS mission,** S. Vives, P. L. Lamy, M. Saisse, J. Boit, Lab. d'Astrophysique de Marseille (France); S. L. Koutchmy, Institut d'Astrophysique de Paris (France) . . . . . [6265-75]

4:40 pm: **SIMBIO-SYS: a visible and near-infrared spectrocopic and imaging system for BepiColombo mission to Mercury,** S. Debei, Univ. degli Studi di Padova (Italy); E. Flamini, Agenzia Spaziale Italiana (Italy); F. Capaccioni, Istituto Nazionale di Astrofisica (Italy); L. Colangeli, Osservatorio Astronomico di Capodimonte (Italy); G. Cremonese, Osservatorio Astronomico di Padova (Italy); A. Doressoundiram, Observatoire de Paris à Meudon (France); Y. Langevin, O. Forni, Univ. Paris-Sud II (France); J. L. Josset, SPACE-X, Space Exploration Institute (Switzerland); C. Bettanini, Univ. degli Studi di Padova (Italy); M. T. Capria, P. Cerroni, Istituto Nazionale di Astrofisica (Italy); V. Da Deppo, Univ. degli Studi di Padova (Italy); M. C. De Sanctis, Istituto Nazionale di Astrofisica (Italy); E. Mazzotta Epifani, G. Marra, Osservatorio Astronomico di Capodimonte (Italy); G. Naletto, Univ. degli Studi di Padova (Italy); P. Palumbo, Parthenope Univ. (Italy); G. Piccioni, Istituto Nazionale di Astrofisica (Italy); M. Zaccariotto, Univ. degli Studi di Padova (Italy) . . . . . [6265-77]

5:00 pm: **The near-Earth orbit surveillance satellite,** B. J. Wallace, Defence Research and Development Canada (Canada) . . . . . [6265-78]

5:20 pm: **A novel optical design for planetary surface stereo-imaging: preliminary design of the stereoscopic imaging channel of SIMBIOSYS for the BepiColombo ESA mission,** V. Da Deppo, Univ. degli Studi di Padova (Italy); G. Naletto, Univ. degli Studi di Padova (Italy) and INAF - Osservatorio Astronomico di Torino (Italy); G. Cremonese, Osservatorio Astronomico di Padova (Italy); E. Flamini, Agenzia Spaziale Italiana (Italy) . . . . . [6265-76]

Tuesday 30 May

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy

Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 20

Room: Crystal Ballrooms: G2 . . . . . Tues. 9:35 to 10:35 am

Future Missions: Joint Dark Energy Mission

Chair: **Howard A. MacEwen,** SRS Technologies

9:35 am: **DESTINY candidate architecture for the Joint Dark Energy mission (JDEM),** D. J. Benford, NASA Goddard Space Flight Ctr.; T. R. Lauer, National Optical Astronomy Observatory . . . . . [6265-79]

9:55 am: **Illuminating dark energy with the joint efficient dark-energy investigation (JEDI),** E. S. Cheng, Conceptual Analytics, LLC; E. Baron, D. Branch, Univ. of Oklahoma; S. Casertano, Space Telescope Science Institute; A. P. Crotts, Columbia Univ.; P. Garnavich, Univ. of Notre Dame; A. S. Kutyrev, NASA Goddard Space Flight Ctr.; J. W. MacKenty, Space Telescope Science Institute; L. A. Moustakas, Jet Propulsion Lab.; R. F. Silverberg, NASA Goddard Space Flight Ctr.; G. Squires, California Institute of Technology; Y. Wang, Univ. of Oklahoma; E. L. Wright, Univ. of California/Los Angeles . . . . . [6265-80]

10:15 am: **The joint efficient dark-energy investigation (JEDI): measuring the cosmic expansion history from type Ia supernova,** M. M. Phillips, Carnegie Observatories/Las Campanas Observatory; P. Garnavich, Univ. of Notre Dame; Y. Wang, D. Branch, Univ. of Oklahoma . . . . . [6265-81]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 21

Room: Crystal Ballrooms: G2 . . . . . Tues. 11:00 am to 12:00 pm

Future Missions: Infrastructure

Chair: **Howard A. MacEwen,** SRS Technologies

11:00 am: **Design of a precision test environmental enclosure for large space,** G. S. Agnes, Jet Propulsion Lab. . . . . [6265-82]

11:20 am: **Concept for a large scalable space telescope: in-space assembly,** W. R. Oegerle, L. R. Purves, R. V. Moe, J. G. Budinoff, T. Carnahan, NASA Goddard Space Flight Ctr. . . . . [6265-83]

11:40 am: **On-orbit assembly and servicing of future space observatories,** C. F. Lillie, Northrop Grumman Space Technology . . . . . [6265-84]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 22

Room: Crystal Ballrooms: G2 . . . . . Tues. 1:30 to 5:40 pm

Advanced Technologies: Instruments

Chair: **Lee D. Peterson,** Univ. of Colorado/Boulder

1:30 pm: **Space-qualified mid-infrared illumination sources,** D. J. Hayton, P. Hargrave, Cardiff Univ. (United Kingdom); A. C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6265-86]

1:50 pm: **Behavior of Si:As and Si:Sb detectors in space,** D. Devost, Cornell Univ.; J. van Cleve, Ball Aerospace & Technologies Corp.; G. C. Sloan, Cornell Univ. . . . . [6265-87]

2:10 pm: **Lithium niobate Fabry-Perot etalons in double-pass configuration for spectral filtering in the visible imager magnetograph IMaX for the SUNRISE mission,** A. Alvarez-Herrero, T. Belenguer, C. Pastor, R. L. Heredero, G. Ramos, Instituto Nacional de Técnica Aeroespacial (Spain); V. Martínez-Pillet, J. A. Bonet, Instituto de Astrofísica de Canarias (Spain) . . . . . [6265-88]

2:30 pm: **Cosmic radiation effects on stressed Ge:Ga detectors and curing,** J. M. Stegmaier, D. Lemke, U. Grözinger, S. M. Birkmann, Max-Planck-Institut für Astronomie (Germany); R. O. Katterloher, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6265-89]

2:50 pm: **Remapping the pupil,** S. Lacour, G. S. Perrin, Observatoire de Paris à Meudon (France) . . . . . [6265-90]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Space qualification and performance results of the SIDECAR ASIC,** M. Loose, J. W. Beletic, J. D. Garnett, N. Muradian, Rockwell Scientific Co., LLC . . . . . [6265-91]

4:00 pm: **Astronomy FPA advancements at Rockwell Scientific,** T. Y. Chuh, J. W. Beletic, Rockwell Scientific Co., LLC . . . . . [6265-92]

4:20 pm: **Multiple-element telescope for laser interferometric space antenna,** K. Sun, R. L. Byer, Stanford Univ. . . . . [6265-93]

4:40 pm: **Laser frequency stabilization to molecular resonances for LISA and TPF-C,** V. Leonhardt, J. Camp, NASA Goddard Space Flight Ctr. . . . . [6265-94]

POSTER POPS

Room: Crystal Ballrooms: G2 . . . . . Tues. 5:00 to 5:40 pm

1-minute presentations

Future Mission Concepts

✔ **The Space Infrared Interferometric Telescope (SPIRIT): mission study results,** D. T. Leisawitz, NASA Goddard Space Flight Ctr.; S. Mission Study Team, Consultant . . . . . [6265-137]

✔ **JASMINE simulator,** Y. Yamada, Kyoto Univ. (Japan); N. Gouda, T. Yano, Y. Kobayashi, T. Tsujimoto, M. Suganuma, K. Niwa, National Astronomical Observatory of Japan (Japan) . . . . . [6265-142]

✔ **JASMINE: galactic structure surveyor,** N. Gouda, Y. Kobayashi, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); T. Yano, T. Tsujimoto, M. Suganuma, Y. Niwa, M. Yamauchi, National Astronomical Observatory of Japan (Japan); Y. Kawakatsu, H. Matsuhara, A. Noda, A. Tsuiki, M. Utashima, A. Ogawa, Japan Aerospace Exploration Agency (Japan) . . . . . [6265-143]

✔ **CCD centroiding experiment for JASMINE and ILOM,** T. Yano, H. Araki, N. Gouda, Y. Kobayashi, T. Tsujimoto, T. Nakajima, N. Kawano, S. Tazawa, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); H. Hanada, K. Asari, S. Tsuruta, Y. Kan-ya, National Astronomical Observatory of Japan (Japan) . . . . . [6265-144]

✔ **Nano-JASMINE: a 10-kilogram satellite for space astrometry,** Y. Kobayashi, N. Gouda, National Astronomical Observatory of Japan (Japan); N. Takato, S. Miyazaki, National Astronomical Observatory of Japan/Subaru Telescope; T. Tsujimoto, T. Yano, M. Suganuma, M. Yamauchi, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); S. Nakasuka, N. Sako, The Univ. of Tokyo (Japan) . . . . . [6265-145]

✔ **Aluminum-made 5-cm reflecting telescope for Nano-JASMINE,** M. Suganuma, Y. Kobayashi, N. Gouda, T. Yano, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); N. Takato, National Astronomical Observatory of Japan/Subaru Telescope; M. Yamauchi, National Astronomical Observatory of Japan (Japan) . . . . . [6265-146]

✔ **Laser interferometric high-precision angle monitor for JASMINE,** Y. Niwa, K. Arai, National Astronomical Observatory of Japan (Japan); M. Sakagami, Kyoto Univ. (Japan); N. Gouda, Y. Kobayashi, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); T. Yano, National Astronomical Observatory of Japan (Japan) . . . . . [6265-147]

✔ **Programmatics and development update for the Orion MIDEX star formation survey mission,** P. A. Scowen, Arizona State Univ.; J. A. Morse, NASA Goddard Space Flight Ctr.; M. A. Beasley, Univ. of Colorado/Boulder . . . . . [6265-148]

Future Telescope Concepts

✔ **Off-axis reflecting telescope with axially symmetric optical property and its application to future telescope missions,** S. Chang, Korea Astronomy and Space Science Institute (South Korea) . . . . . [6265-149]

✔ **Zero distortion three mirrors telescope designed for the dark universe explorer space mission,** R. Grange, B. Milliard, Lab. d'Astrophysique de Marseille (France); F. Safa, EADS Astrium (France); A. Refregier, Commissariat à l'Energie Atomique (France); O. Boulade, CEA Saclay (France); E. Bertin, Institut d'Astrophysique de Paris (France) . . . . . [6265-152]

✔ **Enhanced optical design for SAFIR,** P. F. Goldsmith, M. W. Dragovan, C. M. Bradford, H. W. Yorke, B. Khayatian, D. J. Hoppe, W. A. Imbriale, Jet Propulsion Lab. . . . . [6265-153]

✔ **Experiment and modal analysis on the primary mirror structure of Space Solar Telescope,** Z. Chen, R. Zhang, S. Yang, National Astronomical Observatories (China) . . . . . [6265-154]

Advanced Technologies

✔ **Detailed design of the imaging magnetograph eXperiment-ImaX: a visible imager magnetograph for the Sunrise mission,** A. Alvarez-Herrero, T. Belenguer, C. Pastor, L. M. González, R. L. Heredero, G. Ramos, M. Reina, A. Sánchez, J. Villanueva, Instituto Nacional de Técnica Aeroespacial (Spain); V. Martínez-Pillet, J. A. Bonet, M. Collados, L. Jochum, E. Ballesteros Ramirez, J. L. Medina Trujillo, B. Ruiz Cobo, J. C. González, Instituto de Astrofísica de Canarias (Spain); J. C. del Toro Iniesta, A. C. López Jiménez, J. L. Castillo Lorenzo, J. M. Jerónimo, P. Mellado, R. Morales, J. Rodríguez, Instituto de Astrofísica de Andalucía (Spain); V. Domingo, J. L. Gasent-Blesa, P. Rodríquez, Univ. de València (Spain) . . . . . [6265-155]

✔ **Development and use of an L3-CCD camera system for high cadence imaging,** B. J. Sheehan, C. Lane, R. F. Butler, National Univ. of Ireland/Galway (Ireland) . . . . . [6265-156]

✔ **Improved cryogenic optical test capability at Marshall Space Flight Center's x-ray cryogenic test facility,** J. R. Kegley, H. J. Haight, W. D. Hogue, J. Carpenter, R. D. Siler, E. R. Wright, R. Eng, M. A. Baker, J. E. McCracken, NASA Marshall Space Flight Ctr. . . . . [6265-157]

✔ **Wavefront sensing and control architecture for SPOT (spherical primary optical telescope),** B. H. Dean, J. S. Smith, J. G. Budinoff, L. D. Feinberg, J. G. Hagopian, NASA Goddard Space Flight Ctr. . . . . [6265-158]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

Future Mission Concepts

✔ **The Space Infrared Interferometric Telescope (SPIRIT): mission study results,** D. T. Leisawitz, NASA Goddard Space Flight Ctr.; Mission Study Team, SPIRIT . . . . . [6265-137]

✔ **JASMINE simulator,** Y. Yamada, Kyoto Univ. (Japan); N. Gouda, T. Yano, Y. Kobayashi, T. Tsujimoto, M. Suganuma, K. Niwa, National Astronomical Observatory of Japan (Japan) . . . . . [6265-142]

✔ **JASMINE: galactic structure surveyor,** N. Gouda, Y. Kobayashi, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); T. Yano, T. Tsujimoto, M. Suganuma, Y. Niwa, M. Yamauchi, National Astronomical Observatory of Japan (Japan); Y. Kawakatsu, H. Matsuhara, A. Noda, A. Tsuiki, M. Utashima, A. Ogawa, Japan Aerospace Exploration Agency (Japan) . . . . . [6265-143]

✔ **CCD centroiding experiment for JASMINE and ILOM,** T. Yano, H. Araki, N. Gouda, Y. Kobayashi, T. Tsujimoto, T. Nakajima, N. Kawano, S. Tazawa, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); H. Hanada, K. Asari, S. Tsuruta, Y. Kan-ya, National Astronomical Observatory of Japan (Japan) . . . . . [6265-144]

✔ **Nano-JASMINE: a 10-kilogram satellite for space astrometry,** Y. Kobayashi, N. Gouda, National Astronomical Observatory of Japan (Japan); N. Takato, S. Miyazaki, National Astronomical Observatory of Japan/Subaru Telescope; T. Tsujimoto, T. Yano, M. Suganuma, M. Yamauchi, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); S. Nakasuka, N. Sako, The Univ. of Tokyo (Japan) . . . . . [6265-145]

✔ **Aluminum-made 5-cm reflecting telescope for Nano-JASMINE,** M. Suganuma, Y. Kobayashi, N. Gouda, T. Yano, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); N. Takato, National Astronomical Observatory of Japan/Subaru Telescope; M. Yamauchi, National Astronomical Observatory of Japan (Japan) . . . . . [6265-146]

✔ **Laser interferometric high-precision angle monitor for JASMINE,** Y. Niwa, K. Arai, National Astronomical Observatory of Japan (Japan); M. Sakagami, Kyoto Univ. (Japan); N. Gouda, Y. Kobayashi, National Astronomical Observatory of Japan (Japan); Y. Yamada, Kyoto Univ. (Japan); T. Yano, National Astronomical Observatory of Japan (Japan) . . . . . [6265-147]

✔ **Programmatics and development update for the Orion MIDEX star formation survey mission,** P. A. Scowen, Arizona State Univ.; J. A. Morse, NASA Goddard Space Flight Ctr.; M. A. Beasley, Univ. of Colorado/ Boulder . . . . . [6265-148]

Future Telescope Concepts

✔ **Off-axis reflecting telescope with axially symmetric optical property and its applications,** S. Chang, Samsung Advanced Institute of Technology (South Korea) . . . . . [6265-149]

✔ **Zero distortion three mirrors telescope designed for the dark universe explorer space mission,** R. Grange, B. Milliard, Lab. d'Astrophysique de Marseille (France); F. Safa, EADS Astrium (France); A. Refregier, Commissariat à l'Energie Atomique (France); O. Boulade, CEA Saclay (France); E. Bertin, Institut d'Astrophysique de Paris (France) . . . . . [6265-152]

✔ **Enhanced optical design for SAFIR,** P. F. Goldsmith, M. W. Dragovan, C. M. Bradford, H. W. Yorke, B. Khayatian, D. J. Hoppe, W. A. Imbriale, Jet Propulsion Lab. . . . . [6265-153]

✔ **Experiment and modal analysis on the primary mirror structure of Space Solar Telescope,** Z. Chen, R. Zhang, S. Yang, National Astronomical Observatories (China) . . . . . [6265-154]

Advanced Technologies

✔ **Detailed design of the imaging magnetograph eXperiment-ImaX: a visible imager magnetograph for the Sunrise mission,** A. Alvarez-Herrero, T. Belenguer, C. Pastor, L. M. González, R. L. Heredero, G. Ramos, M. Reina, A. Sánchez, J. Villanueva, Instituto Nacional de Técnica Aeroespacial (Spain); V. Martínez-Pillet, J. A. Bonet, M. Collados, L. Jochum, E. Ballesteros Ramirez, J. L. Medina Trujillo, B. Ruiz Cobo, J. C. González, Instituto de Astrofísica de Canarias (Spain); J. C. del Toro Iniesta, A. C. López Jiménez, J. L. Castillo Lorenzo, J. M. Jerónimo, P. Mellado, R. Morales, J. Rodríguez, Instituto de Astrofísica de Andalucía (Spain); V. Domingo, J. L. Gasent-Blesa, P. Rodríquez, Univ. de València (Spain) . . . . . [6265-155]

✔ **Development and use of an L3-CCD camera system for high cadence imaging,** B. J. Sheehan, C. Lane, R. F. Butler, National Univ. of Ireland/Galway (Ireland) . . . . . [6265-156]

✔ **Improved cryogenic optical test capability at Marshall Space Flight Center's x-ray cryogenic test facility,** J. R. Kegley, H. J. Haight, W. D. Hogue, J. Carpenter, R. D. Siler, E. R. Wright, R. Eng, M. A. Baker, J. E. McCracken, NASA Marshall Space Flight Ctr. . . . . [6265-157]

✔ **Wavefront sensing and control architecture for SPOT (spherical primary optical telescope),** B. H. Dean, J. S. Smith, J. G. Budinoff, L. D. Feinberg, J. G. Hagopian, NASA Goddard Space Flight Ctr. . . . . [6265-158]

Wednesday 31 May

SESSION 23

Room: Crystal Ballrooms: G2 . . . . . Wed. 8:00 to 9:20 am

Advanced Technologies: Materials

Chair: **Lee D. Peterson,** Univ. of Colorado/Boulder

8:00 am: **CESIC: a technology for lightweight and cost-effective space instrument structures and mirrors,** M. R. Krödel, ECM Technologies CC (Germany); C. Devilliers, Alcatel Alenia Space (France) . . . . . [6265-95]

8:20 am: **Lightweight instrument mirrors from single-crystal silicon,** V. T. Bly, M. D. Nowak, NASA Goddard Space Flight Ctr.; D. O. Moore, Bullen Ultrasonics, Inc. . . . . [6265-96]

8:40 am: **Cryogenic performance of a lightweight athermal SLMSTM innovative telescope,** M. T. Jacoby, W. A. Goodman, Schafer Corp. . . . [6265-97]

9:00 am: **Chemical vapor composite silicon carbide for space telescopes,** C. T. Tanaka, K. Webb, Trex Enterprises . . . . . [6265-98]

SESSION 24

Room: Crystal Ballrooms: G2 . . . . . Wed. 9:20 to 10:20 am

Advanced Technologies: Modeling

Chair: **Lee D. Peterson,** Univ. of Colorado/Boulder

9:20 am: **A parametric design tool for large space telescope sunshields,** C. G. Paine, C. M. Bradford, M. C. Dragovan, H. W. Yorke, Jet Propulsion Lab. . . . . [6265-99]

9:40 am: **Parametric modeling of space telescope architectures,** S. A. Uebelhart, L. Cohan, E. Jordan, D. J. Howell, D. W. Miller, Massachusetts Institute of Technology . . . . . [6265-100]

10:00 am: **Innovative image analysis software as a technology driver for advances in space telescope design,** K. J. Mighell, National Optical Astronomy Observatory . . . . . [6265-101]

Coffee Break . . . . . 10:20 to 10:40 am

SESSION 25

Room: Crystal Ballrooms: G2 . . . . . Wed. 10:40 to 11:40 am

Advanced Technologies: Other

Chair: **Lee D. Peterson,** Univ. of Colorado/Boulder

10:40 am: **Long-term relative stabilization of environmental motions for testing of advanced telescope missions,** K. Numata, J. Camp, NASA Goddard Space Flight Ctr. . . . . [6265-102]

11:00 am: **Pointing and image stability for spaceborne sensors: from comet impactors to observations of extrasolar planets,** S. E. Kendrick, J. Stober, I. J. Gravseth, Ball Aerospace & Technologies Corp. . . . . [6265-103]

11:20 am: **Novel in-space manufacturing concepts for the development of large space telescopes,** J. T. Mooney, P. J. Reardon, D. A. Gregory, A. Manning, J. Blackmon, The Univ. of Alabama in Huntsville; T. Howsman, P. Williams, Dynamic Concepts, Inc.; W. Brantley, J. M. Rakoczy, K. A. Herren, D. S. Tucker, NASA Marshall Space Flight Ctr.; A. Sharma, Alabama A&M Univ. . . . . [6265-104]

Wednesday-Wednesday 24-31 May 2006 • Proceedings of SPIE Vol. 6266

Conference Chairs:

Martin J. L. Turner, Univ. of Leicester (United Kingdom)

Günther Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany)

Space Telescopes and Instrumentation II: Ultraviolet to Gamma Ray

Wednesday 24 May

SESSION 1

Room: Crystal Ballrooms: Q, P, N ..... Wed. 10:00 am to 12:00 pm

Current Missions

10:00 am: **The Galaxy Evolution Explorer** *(Invited Paper)***,** C. Martin, California Institute of Technology . . . . . [6266-01]

10:40 am: **Operations with the new FUSE Observatory: three-axis control with one reaction wheel,** D. J. Sahnow, J. W. Kruk, Johns Hopkins Univ.; T. B. Ake, Johns Hopkins Univ. and Computer Sciences Corp.; B. G. Andersson, A. F. Berman, W. P. Blair, Johns Hopkins Univ.; R. Boyer, J. Caplinger, Johns Hopkins Univ. and Computer Sciences Corp.; H. M. Calvani, T. Civeit, W. V. Dixon, Johns Hopkins Univ.; M. England, Johns Hopkins Univ. and Computer Sciences Corp.; M. E. Kaiser, Johns Hopkins Univ.; M. Kochte, Johns Hopkins Univ. and Computer Sciences Corp.; H. W. Moos, Johns Hopkins Univ. . . . . [6266-02]

11:00 am: **The AGILE Gamma-Ray mission,** M. Tavani, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-03]

11:20 am: **Swift: results from the first year of the mission,** H. A. Krimm, NASA Goddard Space Flight Ctr. . . . . [6266-04]

11:40 am: **Current status of Suzaku and its early results,** K. Mitsuda, Japan Aerospace Exploration Agency (Japan); H. Kunieda, Nagoya Univ. (Japan); T. Takahashi, Japan Aerospace Exploration Agency (Japan); N. E. White, R. L. Kelley, NASA Goddard Space Flight Ctr. . . . . [6266-05]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 2

Room: Crystal Ballrooms: Q, P, N ..... Wed. 2:15 to 5:00 pm

Science

2:15 pm: **Dynamical measurements of hot gas in stellar systems,** M. A. Barstow, Univ. of Leicester (United Kingdom); M. P. Kowalski, R. G. Cruddace, Naval Research Lab. . . . . [6266-06]

2:35 pm: **Prospects for imaging the Cosmic web,** C. Martin, R. McLean, California Institute of Technology; B. Milliard, Lab. d'Astrophysique de Marseille (France); D. Schiminovich, Columbia Univ. . . . . [6266-07]

2:55 pm: **The science case for UV astrophysics,** A. I. Gomez de Castro, Univ. Complutense de Madrid (Spain); W. Wamsteker, European Space Agency (Spain); M. A. Barstow, Univ. of Leicester (United Kingdom); N. Brosch, Tel Aviv Univ. (Israel); D. de Martino, Osservatorio Astronomico di Capodimonte (Italy); B. Gaensicke, Univ. of Warwick (United Kingdom); R. Gonzalez, Instituto de Astrofi_sica de Andalucia (Spain); W. Kollatschny, Univ. Sternwart Göttingen (Germany); A. Lecavelier, Institute d'Astrophysique de Paris (France); I. Pagano, Osservatorio Astrofisico di Catania (Italy); D. Reimers, Hamburg Univ. of Applied Sciences (Germany); K. Werner, Univ. Tübingen (Germany) . . . . . [6266-08]

3:15 pm: **On the importance of developing a low background wide-field x-ray imager,** S. Molendi, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); S. Borgani, Osservatorio Astronomico di Trieste (Italy); S. Campana, G. Chincarini, O. Citterio, P. Conconi, Osservatorio Astronomico di Brera (Italy); F. Fiore, Osservatorio Astronomico di Roma (Italy); G. Pareschi, Osservatorio Astronomico di Brera (Italy); G. C. Perola, Univ. degli Studi di Roma Tre (Italy); G. Tagliaferri, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-09]

Coffee Break . . . . . 3:35 to 4:00 pm

4:00 pm: **Science with micro-X: the TES microcalorimeter x-ray imaging rocket,** E. Figueroa-Feliciano, NASA Goddard Space Flight Ctr. and Massachusetts Institute of Technology . . . . . [6266-11]

4:20 pm: **Balloon-borne hard x-ray imaging observations of nonthermal phenomena,** H. Kunieda, Nagoya Univ. (Japan) . . . . . [6266-12]

4:40 pm: **High-resolution x-ray spectroscopy with the reflection grating spectrometer of Constellation-X,** E. R. Schindhelm, W. C. Cash, Univ. of Colorado/ Boulder . . . . . [6266-13]

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 3
Room: Crystal Ballrooms: Q, P, N . . . . . Thurs. 9:35 am to 12:20 pm

Small Missions I

9:35 am: **New X-ray Telescope mission (NeXT): current status of mission study** *(Invited Paper)***,** H. Kunieda, Nagoya Univ. (Japan); K. Mitsuda, T. Takahashi, Japan Aerospace Exploration Agency (Japan) . . . . . [6266-15]

10:15 am: **The Nuclear Spectroscopic Telescope array,** F. A. Harrison, California Institute of Technology . . . . . [6266-16]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **Simbol-X: mission overview** *(Invited Paper)***,** P. R. Ferrando, CEA Saclay (France); U. G. Briel, Max-Planck-Institut für extraterrestrische Physik (Germany); O. Citterio, Osservatorio Astronomico di Brera (Italy); R. Cledassou, P. Duchon, Ctr. National d'Études Spatiales (France); F. Fiore, Osservatorio Astronomico di Roma (Italy); P. Giommi, Agenzia Spaziale Italiana (Italy); A. Goldwurm, CEA Saclay (France); G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); P. Laurent, F. Lebrun, O. Limousin, CEA Saclay (France); G. Malaguti, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. Pareschi, Osservatorio Astronomico di Brera (Italy); Y. Rio, CEA Saclay (France); J. Roques, Ctr. d'Etude Spatiale des Rayonnements (France); L. Strüder, Max-Planck-Institut Halbleiterlabor (Germany); G. Tagliaferri, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-17]

11:40 am: **DIOS: the diffuse intergalactic oxygen surveyor,** T. Ohashi, Tokyo Metropolitan Univ. (Japan) . . . . . [6266-18]

12:00 pm: **A new mission to explore the warm-hot intergalactic medium,** J. den Herder, J. S. Kaastra, W. Hermsen, H. F. C. Hoevers, SRON Netherlands Instituut voor Ruimteonderzoek (Netherlands); S. M. Kahn, Kavli Institute for Particle Astrophysics & Cosmology; P. A. J. de Korte, M. Méndez, SRON Netherlands Instituut voor Ruimteonderzoek (Netherlands); F. B. S. Paerels, Columbia Univ.; A. P. Rasmussen, Stanford Linear Accelerator Ctr. . . . . [6266-19]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 4
Room: Crystal Ballrooms: Q, P, N . . . . . Thurs. 1:30 to 5:40 pm

Small Missions II

1:30 pm: **Mission and instrumentation concept for the baryonic structure probe,** D. C. Ebbets, J. DeCino, J. A. Turner-Valle, Ball Aerospace & Technologies Corp.; K. R. Sembach, Space Telescope Science Institute . . . . . [6266-20]

1:50 pm: **SMESE: a combined UV-IR-X-gamma solar mission,** A. A. Millard, Univ. Paris-Sud II (France); F. Auchere, Institut d'Astrophysique Spatiale (France); C. Fang, Nanjing Univ. (China); W. Gan, Purple Mountain Observatory (China); G. Molodij, Observatoire de Paris (France); J. Prado, Ctr. National d'Études Spatiales (France); G. Trottet, Observatoire de Paris (France); J. J. Vial, Univ. Paris-Sud II (France); Y. Yan, National Astronomical Observatories of Chinese Academy (China); J. Wu, Ctr. for Space Science and Applied Research (China) . . . . . [6266-21]

2:10 pm: **ESTREMO: extreme physics in the transient and evolving Cosmos,** L. Piro, A. Bazzano, M. Cappi, E. Caroli, M. Cocchi, L. Colasanti, E. Costa, A. De Rosa, G. Di Cocco, M. Feroci, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); F. Frontera, Univ. degli Studi di Ferrara (Italy); F. Gatti, Univ. degli Studi di Genova (Italy); C. Labanti, G. La Rosa, L. Natalucci, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); E. Pian, Osservatorio Astronomico di Trieste (Italy); P. Soffitta, M. Tavani, P. Ubertini III, G. E. Villa, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-22]

2:30 pm: **Pharos: a high-spectral resolution GRB mission concept,** F. Nicastro, Harvard-Smithsonian Ctr. for Astrophysics and Univ. Nacional Autónoma de México (Mexico); M. Elvis, Harvard-Smithsonian Ctr. for Astrophysics; F. Fiore, Osservatorio Astronomico di Roma (Italy); E. Costa, M. Feroci, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-23]

2:50 pm: **The MIRAX X-ray Astronomy Transient mission,** J. Braga, J. Mejia, Instituto Nacional de Pesquisas Espaciais (Brazil) . . . . . [6266-24]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Optics and focal plane developments for the Lobster X-ray All-sky monitor,** G. W. Fraser, N. P. Bannister, Leicester Univ. (United Kingdom); J. Huovelin, O. R. Vilhu, Univ. of Helsinki (Finland); A. N. Parmar, European Space Agency (Netherlands); M. N. Pavlinsky, Space Research Institute (Russia); F. Frontera, Univ. degli Studi di Ferrara (Italy) . . . . . [6266-25]

4:00 pm: **Spectrum-GR/eROSITA/Lobster Atrophysical mission,** M. N. Pavlinsky, Space Research Institute (Russia); G. Dmitriev, Rosaviakosmos (Russia); G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); A. N. Parmar, European Space Agency (Netherlands); G. W. Fraser, Leicester Univ. (United Kingdom); E. Churazov, M. Gilfanov, R. Sunyaev, Space Research Institute (Russia) and Max Planck Institut für Astrophysik (Germany); A. A. Vikhlinin, Space Research Institute (Russia) and Harvard-Smithsonian Ctr. for Astrophysics; P. Predehl, Max-Planck-Institut für extraterrestrische Physik (Germany); L. Piro, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); V. Pinchuk, D. Gorobets, Rosaviakosmos (Russia) . . . . . [6266-26]

4:20 pm: **eROSITA: an extended x-ray survey telescope,** P. Predehl, A. Deresch, H. Böhringer, P. Friedrich, R. Hartmann, G. Hasinger, H. Hippmann, G. Kettenring, W. Kink, S. Müller, E. Pfeffermann, N. Meidinger, L. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany); A. Schwope, Astrophysikalisches Institut Potsdam (Germany); M. N. Pavlinsky, Space Research Institute (Russia); S. Hofer, T. Stuffler, Kayser-Threde GmbH (Germany); E. Churazov, M. Gilfanov, R. Sunyaev, Max-Planck-Institut für Astrophysik (Germany) . . . . . [6266-27]

4:40 pm: **The extreme physics explorer MIDEX concept,** M. Elvis, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6266-28]

5:00 pm: **POLARIX: a small mission of x-ray polarimetry,** E. Costa, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); R. Bellazzini, Istituto Nazionale di Fisica Nucleare (Italy); P. Soffitta, G. Di Persio, M. Feroci, F. Muleri, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); L. Pacciani, Istituto di Astrofisica Spaziale e Fisica Comica (Italy); A. Rubini, E. Morelli, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. Spandre, L. Baldini, F. Bitti, A. Brez, F. Cavalca, L. Latronico, M. M. Massai, N. Omodei, M. Pinchera, C. Sgro, Istituto Nazionale di Fisica Nucleare (Italy); G. Matt, G. C. Perola, Univ. degli Studi di Roma Tre (Italy); G. Chincarini, Osservatorio Astronomico di Brera (Italy) and Univ. Milano Bicocca (Italy); O. Citterio, G. Pareschi, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-29]

5:20 pm: **FIREBall overview,** R. McLean, California Institute of Technology . . . . . [6266-30]

✔Poster Session I
Room: Palms Ballroom: Canary & Royal Salons . Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

Science

✔ **Spectral classification of sources in XMM-Newton x-ray observation of the rapidly accreting young star V1647 Ori,** B. Mu, J. H. Kastner, Rochester Institute of Technology . . . . . [6266-112]

Future Missions Small

✔ **SuperAGILE at launch,** M. Rapisarda, ENEA (Italy) . . . . . [6266-113]

✔ **VADER: a satellite mission concept for high-precision dark energy studies,** R. Fassbender, Max-Planck-Institut für extraterrestrische Physik (Germany); J. M. Stegmaier, Max-Planck-Institut für Astronomie (Germany); C. Diethart, Univ. Wien (Austria); P. Fertl, Technische Univ. Wien (Austria); M. J. Hayes, Stockholm Univ. (Sweden); S. Köstner, Atominstitut der Österreichischen Universitäten (Austria); A. Kruselburger, Technische Univ. München (Germany); H. Midthaug, Univ. I Oslo (Norway); L. Nati, Univ. degli Studi di Roma/La Sapienza (Italy); E. Valiante, Max-Planck-Institut für extraterrestrische Physik (Germany); A. Weijmans, Leiden Univ. (Netherlands); P. Schuecker, G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6266-114]

✔ **DEMON: a proposal for a satellite-borne experiment to study dark matter and dark energy,** A. Berciano-Alba, Univ. of Groningen (Netherlands) and Kapteyn Astronomical Institute (Netherlands); P. F. Borges de Silva, Univ. do Porto (Portugal); H. Eichelberger, Space Research Institute (Austria); F. Giovacchini, Univ. degli Studi di Bologna (Italy); M. Godolt, Astrophysikalisches Institut Potsdam (Germany); G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); M. Lerchster, Leopold-Franzens-Univ. Innsbruck (Austria); V. Lusset, CEA Saclay (France); F. Mattana, Istituto di Fisica Cosmica G. Occhialini (Italy) and Univ. di Milano Bicocca (Italy); Y. Mellier, Institut d'Astrophysique de Paris (France); M. Michalowski, Univ. of Copenhagen (Denmark) and Astronomical Observatory, Adam Mickiewicz Univ. (Poland); C. Monteserin-Sanchez, Univ. de Cantabria (Spain); F. Noviello, National Univ. of Ireland/Maynooth (Ireland); C. Persson, Chalmers Tekniska Högskola (Sweden); A. Santovincenzo, European Space Agency (Netherlands); P. Schneider, Univ. Bonn (Germany); M. Zhang, The Univ. of Manchester (United Kingdom); L. Ostman, Stockholm Univ. (Sweden) . . . . . [6266-115]

✔ **The AGILE engineering quick look software,** A. Bulgarelli, M. Trifoglio, F. Gianotti, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . [6266-116]

✔ **ASPEX: a prete-a-porter all-sky monitor,** M. Feroci, C. Labanti, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-117]

✔ **The on-ground calibrations of SuperAGILE: I: x-ray pencil beam,** Y. Evangelista, M. Feroci, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-118]

✔ **The on-ground calibrations of SuperAGILE: II: finite distance radioactive sources,** I. Donnarumma, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-119]

UV Instrumentation

✔ **Kirkpatrick Baez spectrograph concepts for future space missions,** S. N. Osterman, W. C. Cash, Univ. of Colorado/ Boulder . . . . . [6266-89]

✔ **A high-spatial-resolution image-intensifier EUV detector for solar space EUV observation,** Q. Song, National Astronomical Observatories (China) . . . . . [6266-120]

✔ **Performance of the GHRS Pt-Ne hollow-cathode lamps after their return from Space and comparison with archival data,** F. Kerber, European Southern Observatory (Germany); D. J. Lindler, Sigma Space Corp.; P. Bristow, D. Lembke, European Southern Observatory (Germany); G. Nave, C. J. Sansonetti, J. Reader, National Institute of Standards and Technology; S. R. Heap, NASA Goddard Space Flight Ctr.; M. R. Rosa, European Southern Observatory (Germany); H. J. Wood, NASA Goddard Space Flight Ctr. . . . . [6266-121]

X-ray Optics

✔ **Use of silicon pore optics for a SF class deployed telescope** *(Invited Paper)***,** M. Bavdaz, D. H. Lumb, T. van der Laan, European Space Agency (Netherlands); A. L. Mieremet, S. Oemwrasingh, M. W. Beijersbergen, cosine Research BV (Netherlands) . . . . . [6266-45]

✔ **Development and performance of the advanced hard x-ray telescope for the balloon experiment,** R. Shibata, Y. Ogasaka, K. Tamura, A. Furuzawa, Y. Tawara, H. Kunieda, T. Miyazawa, K. Shimoda, Y. Fukaya, M. Naitou, T. Iwahara, Nagoya Univ. (Japan) . . . . . [6266-123]

✔ **Measurements of reflectivity of x-ray mirror for Suzaku satellite,** K. Tamura, Y. Ogasaka, M. Naitou, Nagoya Univ. (Japan); Y. Maeda, M. Ebara, A. Itoh, R. Iizuka, Y. Yokoyama, Japan Aerospace Exploration Agency (Japan) . . . . . [6266-124]

✔ **A comparison study of mass-area ratio for large-size x-ray telescope optics in pore and very thin glass sheets configurations,** S. Basso, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-125]

✔ **The Palermo XACT facility: a new 35-m x-ray vacuum beam-line for the development and calibration of next-generation x-ray observatories,** M. Barbera, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy) and Univ. degli Studi di Palermo (Italy); R. Candia, A. Collura, G. Di Cicca, C. Pelliciari, S. Sciortino, S. Varisco, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy) . . . . . [6266-126]

✔ **Diffractive materials characterization for a soft x-ray (0.1-20 keV) fixed exit monochromator system,** C. Pelliciari, M. Barbera, R. Candia, A. Collura, G. Di Cicca, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy); G. Pareschi, Osservatorio Astronomico di Brera (Italy); S. Varisco, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy) . . . . . [6266-127]

✔ **Properties of silicon wafers to be used as x-ray optics,** M. Collon, S. Kraft, M. W. Beijersbergen, cosine Research BV (Netherlands); V. Lehmann, Infineon Technologies AG (Germany); D. Graef, Wacker-Chemie Gmbh (Germany); M. Bavdaz, D. H. Lumb, European Space Agency (Netherlands); M. K. Krumrey, Physikalisch-Technische Bundesanstalt (Germany) . [6266-128]

✔ **Processing of Si wafers for x-ray pore optics production,** M. Collon, S. Kraft, M. W. Beijersbergen, cosine Research BV (Netherlands); V. Lehmann, Infineon Technologies AG (Germany); M. Bavdaz, D. H. Lumb, European Space Agency (Netherlands) . . . . . [6266-129]

✔ **Potential of the PANTER x-ray test facility for calibration of instrumentation for XEUS,** M. J. Freyberg, W. Burkert, B. Budau, G. D. Hartner, G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); M. Collon, S. Kraft, M. W. Beijersbergen, cosine Research BV (Netherlands); M. Bavdaz, D. H. Lumb, K. Wallace, European Space Agency (Netherlands); D. Kampf, Kayser-Threde GmbH (Germany) . . . . . [6266-132]

✔ **Visible light apparatus for preliminary tests of x-ray optics,** C. Pelliciari, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy); M. Barbera, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy) and INAF (Italy); R. Candia, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy); J. Dherbecourt, Institut d'Optique (France); H. W. Schnopper, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6266-133]

✔ **Replicated carbon fiber RICH mirror for AMS-02,** R. C. Romeo, R. N. Martin, Composite Mirror Applications; M. Molina, G. Sardo, Carlo Gavazzi, Inc. (Italy); G. Laurenti, Istituto Nazionale di Fisica Nucleare (Italy) . . . . . [6266-134]

✔ **Effects of micro-meteroid and Space debris impacts in grazing incidence telescopes,** J. D. Carpenter, R. M. Ambrosi, A. A. Wells, Univ. of Leicester (United Kingdom) . . . . . [6266-156]

✔ **Hard X-ray concentrator experiment for Spectrum-X-Gamma mission,** V. A. Arefiev, M. N. Pavlinsky, M. Revnivtsev, E. Churazov, Space Research Institute (Russia); M. Gilfanov, Space Research Institute (Germany); M. A. Kumakhov, N. Semena, I. Lapshov, A. Vikhlinin, R. Sunyaev, Space Research Institute (Russia) . . . . . [6266-157]

Friday 26 May

SESSION 5

Room: Crystal Ballrooms: Q, P, N . . . . . Fri. 8:00 to 11:50 am

UV Instrumentation

8:00 am: **The extreme-UV imaging spectrometer for the JAXA Solar-B mission** *(Invited Paper)***,** J. L. Culhane, Univ. College London (United Kingdom); G. A. Doschek, Naval Research Lab.; T. Watanabe, National Astronomical Observatory of Japan (Japan); A. Smith, Univ. College London (United Kingdom); C. M. Brown, Naval Research Lab.; H. Hara, National Astronomical Observatory of Japan (Japan); L. Harra, A. James, K. al Janabi, Univ. College London (United Kingdom); B. J. Kent, Rutherford Appleton Lab. (United Kingdom); C. M. Korendyke, Naval Research Lab.; J. Lang, Rutherford Appleton Lab. (United Kingdom); J. T. Mariska, S. V. Myers, J. F. Seely, Naval Research Lab.; G. M. Simnett, The Univ. of Birmingham (United Kingdom); J. A. Tandy, Univ. College London (United Kingdom); R. J. Thomas, NASA Goddard Space Flight Ctr.; D. L. Windt, Columbia Univ. . . . . [6266-31]

8:40 am: **Progress toward UV imaging spectroscopy of faint IGM emission,** D. Schiminovich, S. Tuttle, G. Tajiri, Columbia Univ.; R. Grange, B. Milliard, J. Deharveng, Lab. d'Astrophysique de Marseille (France); R. McLean, C. Martin, J. M. Chakan, S. Rahman, California Institute of Technology . . . . . [6266-32]

9:00 am: **The joint astrophysical plasmadynamic experiment extreme-ultraviolet spectrometer: resolving power,** F. B. Berendse, R. G. Cruddace, M. P. Kowalski, W. R. Hunter, G. G. Fritz, Naval Research Lab.; O. H. W. Siegmund, Sensor Sciences LLC; K. F. Heidemann, R. Lenke, A. Seifert, Carl Zeiss Laser Optics GmbH (Germany); T. W. Barbee, Jr., Lawrence Livermore National Lab. . . . . [6266-33]

9:20 am: **The joint astrophysical plasmadynamic experiment (J-PEX) high-resolution EUV spectrometer: diffraction grating efficiency,** M. P. Kowalski, F. B. Berendse, Naval Research Lab.; T. W. Barbee, Jr., Lawrence Livermore National Lab.; W. R. Hunter, SFA Inc.; K. F. Heidemann, R. Lenke, A. Siefert, Carl Zeiss Laser Optics GmbH (Germany); R. G. Cruddace, Naval Research Lab. . . . . [6266-34]

9:40 am: **HIRDES UV spectrographs,** N. Kappelmann, J. Barnstedt, W. Gringel, K. Werner, Eberhard Karls Univ. Tübingen (Germany); R. Graue, D. Kampf, A. Reutlinger, C. Neumann, Kayser-Threde GmbH (Germany); H. Becker-Ross, S. Florek, Institut für Spektrochemie & Angewandte Spektroskopie (Germany); B. Shustov, M. Sachkov, Russian Academy of Sciences (Russia); A. Moisheev, E. Skripunov, Lavochkin Association (Russia); V. E. Panchuk, M. Yushkin, Russian Academy of Sciences (Russia); WIC, Members WOS/UV Implementation Committee (Russia) . . . . . [6266-35]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **A GALEX instrument performance overview and lessons learned** *(Invited Paper)*, P. F. Morrissey, California Institute of Technology . . . . . [6266-36]

11:10 am: **FIREBall instrument,** R. McLean, California Institute of Technology . . . . . [6266-37]

11:30 am: **A novel low-voltage electron-bombarded CCD readout,** P. F. Morrissey, S. M. Kaye, C. Martin, California Institute of Technology; T. J. Jones, S. Nikzad, J. Blacksberg, M. E. Hoenk, Jet Propulsion Lab. . [6266-38]

Lunch Break . . . . . 11:50 am to 1:00 pm

Plenary Presentation
Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 6

Room: Crystal Ballrooms: Q, P, N . . . . . Sat. 8:00 am to 12:30 pm

X-Ray Optics I

8:00 am: **Novel multilayer design for future hard x-ray missions,** F. E. Christensen, C. P. Jensen, K. K. Madsen, Danish National Space Ctr. (Denmark); C. M. H. Chen, California Institute of Technology; M. J. Pivovaroff, Lawrence Livermore National Lab.; P. Hoghoj, A. Dariel, Xenocs SA (France) . . . . . [6266-39]

8:20 am: **Investigation of new material combinations for hard x-ray telescope designs,** C. P. Jensen, K. K. Madsen, F. E. Christensen, Danish National Space Ctr. (Denmark) . . . . . [6266-40]

8:40 am: **Analysis of microroughness evolution in x-ray multilayers by surface topography and x-ray scattering,** R. Canestrari, D. Spiga, G. Pareschi, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-41]

9:00 am: **Multilayer coating development for XEUS,** D. H. Lumb, M. Bavdaz, European Space Agency (Netherlands); F. E. Christensen, Danish National Space Ctr. (Denmark); A. Dariel, P. Hoghoj, Xenocs SA (France); M. K. Krumrey, Physikalisch-Technische Bundesanstalt (Germany); C. P. Jensen, K. K. Madsen, Danish National Space Ctr. (Denmark); E. Ziegler, European Synchrotron Radiation Facility (France) . . . . . [6266-42]

9:20 am: **Design and technology review of the x-ray telescope system on board NeXT mission,** Y. Ogasaka, K. Tamura, R. Shibata, A. Furuzawa, H. Kunieda, K. Yamashita, Nagoya Univ. (Japan); Y. Maeda, Japan Aerospace Exploration Agency (Japan); M. Ishida, Tokyo Metropolitan Univ. (Japan) [6266-43]

9:40 am: **The PPM code in fitting x-ray multilayer reflectivities: measurement of the stack parameters: comparison with TEM results,** D. Spiga, Osservatorio Astronomico di Brera (Italy); A. Mirone, European Synchrotron Radiation Facility (France); R. Canestrari, V. Cotroneo, Osservatorio Astronomico di Brera (Italy); C. Ferrero, European Synchrotron Radiation Facility (France); G. Pareschi, D. Vernani, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-44]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Programmatics of large-scale production of silicon pore optics for future x-ray telescopes,** S. Kraft, M. Collon, M. W. Beijersbergen, cosine Research BV (Netherlands); M. Bavdaz, D. H. Lumb, K. Wallace, A. Peacock, European Space Agency (Netherlands); M. K. Krumrey, Physikalisch-Technische Bundesanstalt (Germany); V. Lehmann, Infineon Technologies AG (Germany) . . . . . [6266-130]

10:50 am: **Metrology, integration, and performance verification of silicon pore optics in Wolter-I configuration,** M. Collon, S. Kraft, M. W. Beijersbergen, cosine Research BV (Netherlands); C. van Baren, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); M. Bavdaz, European Space Agency (Netherlands) . . . . . [6266-131]

11:10 am: **Assembly of silicon pore optics,** R. Gunther, M. Collon, S. Kraft, M. W. Beijersbergen, cosine Research BV (Netherlands); M. Bavdaz, D. H. Lumb, A. Peacock, K. Wallace, European Space Agency (Netherlands) . . . . . [6266-46]

11:30 am: **Developments in glass micropore optics for x-ray applications,** K. Wallace, European Space Agency (Netherlands); M. Collon, cosine Research BV (Netherlands); M. Bavdaz, European Space Agency (Netherlands); R. Fairband, Photonis (France); M. K. Krumrey, Physikalisch-Technische Bundesanstalt (Germany) . . . . . [6266-47]

11:50 am: **Recent development of micropore optics using MEMS technologies,** Y. Ezoe, M. Koshiishi, M. Mita, K. Mitsuda, Japan Aerospace Exploration Agency (Japan); Y. Ishisaki, A. Hoshino, Tokyo Metropolitan Univ. (Japan); Z. Yang, Tokyo Metropolitan Industrial Technology Research Institute (Japan); T. Takano, H. Mekaru, R. Maeda, National Institute of Advanced Industrial Science and Technology (Japan) . . . . . [6266-48]

12:10 pm: **Development of a prototype nickel optic for the Constellation-X Hard X-ray Telescope: IV,** S. E. Romaine, Harvard-Smithsonian Ctr. for Astrophysics; S. Basso, Osservatorio Astronomico di Brera (Italy); R. J. Bruni, Harvard-Smithsonian Ctr. for Astrophysics; W. Burkert, Max-Planck-Institut für extraterrestrische Physik (Germany); O. Citterio, Osservatorio Astronomico di Brera (Italy); G. Conti, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); D. E. Engelhaupt, The Univ. of Alabama in Huntsville; M. J. Freyberg, Max-Planck-Institut für extraterrestrische Physik (Germany); M. Ghigo, Osservatorio Astronomico di Brera (Italy); P. Gorenstein, Harvard-Smithsonian Ctr. for Astrophysics; M. V. Gubarev, NASA Marshall Space Flight Ctr.; G. D. Hartner, Max-Planck-Institut für extraterrestrische Physik (Germany); F. Mazzoleni, Osservatorio Astronomico di Brera (Italy); S. L. O'Dell, NASA Marshall Space Flight Ctr.; G. Pareschi, Osservatorio Astronomico di Brera (Italy); B. D. Ramsey, C. O. Speegle, NASA Marshall Space Flight Ctr.; D. Spiga, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-49]

Lunch Break . . . . . 12:30 to 1:30 pm

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 7

Room: Crystal Ballrooms: Q, P, N . . . . . Sat. 2:35 to 6:15 pm

X-Ray Optics II

2:35 pm: **Replication of Wolter I shaped surface on a two-stage thin-foil substrate,** H. Awaki, K. Heike, K. Okamoto, Ehime Univ. (Japan); Y. Ogasaka, Nagoya Univ. (Japan) . . . . . [6266-50]

2:55 pm: **The demonstration model of four-stage X-ray Telescope for DIOS mission,** Y. Tawara, A. Furuzawa, Y. Ogasaka, R. Shibata, K. Tamura, Nagoya Univ. (Japan) . . . . . [6266-51]

3:15 pm: **In-orbit performance of x-ray telescopes of Suzaku,** Y. Maeda, Japan Aerospace Exploration Agency (Japan) . . . . . [6266-52]

Coffee Break . . . . . 3:35 to 3:55 pm

3:55 pm: **Manufacturing of Wolter-I mirror segments with slumped glass,** P. Friedrich, B. E. Aschenbach, C. Braig, H. W. Bräuninger, G. Hasinger, M. Vongehr, Max-Planck-Institut für extraterrestrische Physik (Germany); S. Basso, O. Citterio, M. Ghigo, F. Mazzoleni, G. Pareschi, Osservatorio Astronomico di Brera (Italy); U. Dinger, W. J. Egle, R. Lenke, Carl Zeiss Laser Optics GmbH (Germany); G. Luichtel, Carl Zeiss Optronics GmbH (Germany); H. Schwarz, Carl Zeiss Laser Optics GmbH (Germany) . . . . . [6266-53]

4:15 pm: **Novel x-ray optics with Si wafers and formed glass,** R. Hudec, A. J. Inneman, L. Pina, V. Semencova, M. Skulinova, REFLEX sro (Czech Republic); M. Mika, V. Brozek, Institute of Chemical Technology (Czech Republic) . . . . . [6266-54]

4:35 pm: **Technology development for high-energy x-ray optics,** M. V. Gubarev, B. D. Ramsey, NASA Marshall Space Flight Ctr.; D. E. Engelhaupt, The Univ. of Alabama in Huntsville; C. O. Speegle, Raytheon Co. . . . . [6266-55]

4:55 pm: **Scaling and mission architecture for high-energy astrophysics,** J. P. Doty, Noqsi Aerospace, Ltd. . . . . [6266-56]

5:15 pm: **Concepts for on-orbit figuring of Gen-X with adaptive x-ray optics,** M. Elvis, M. Juda, D. A. Schwartz, R. J. V. Brissenden, G. Fabbiano, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6266-57]

5:35 pm: **SIMBOL-X: stray-light analysis and engineering solutions,** G. Cusumano, T. Mineo, B. Sacco, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); S. Basso, O. Citterio, G. Pareschi, Osservatorio Astronomico di Brera (Italy); P. Attinà, Alcatel Alenia Space (Italy) . . . . . [6266-58]

5:55 pm: **Fabricate and assemble: a mirror alignment and integration technique for next-generation x-ray telescopes,** W. W. Zhang, NASA Goddard Space Flight Ctr. . . . . [6266-59]

Monday 29 May

SESSION 8

Room: Crystal Ballrooms: Q, P, N . . . . . Mon. 8:30 am to 12:00 pm

Large X-Ray Missions I

8:30 am: **The new XEUS science case** *(Invited Paper)***,** G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); A. Comastri, Osservatorio Astronomico di Bologna (Italy); M. Arnaud, CEA Saclay (France); X. Barcons, Univ. de Cantabria (Spain); D. Barret, Ctr. d'Etude Spatiale des Rayonnements (France); J. A. Bleeker, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); H. Böhringer, Max-Planck-Institut für extraterrestrische Physik (Germany); A. C. Fabian, Univ. of Cambridge (United Kingdom); J. S. Kaastra, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); H. Kunieda, Nagoya Univ. (Japan); M. Mendez, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); A. N. Parmar, European Space Agency (Netherlands); G. G. C. Palumbo, Univ. degli Studi di Bologna (Italy); T. Takahashi, Japan Aerospace Exploration Agency (Japan); M. J. L. Turner, Univ. of Leicester (United Kingdom) . . . . . [6266-60]

9:10 am: **Science drivers for NASA'S Constellation X-ray mission** *(Invited Paper)***,** M. R. Garcia, Harvard-Smithsonian Ctr. for Astrophysics; N. E. White, NASA Goddard Space Flight Ctr.; H. D. Tananbaum, Harvard-Smithsonian Ctr. for Astrophysics; R. Petre, A. E. Hornschemeier, NASA Goddard Space Flight Ctr.; J. A. Bookbinder, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6266-61]

9:50 am: **Constellation-X mission implementation approach and status** *(Invited Paper)***,** N. E. White, NASA Goddard Space Flight Ctr.; H. D. Tananbaum, Harvard-Smithsonian Ctr. for Astrophysics; A. E. Hornschemeier, NASA Goddard Space Flight Ctr.; M. R. Garcia, GSI Group Inc. and Harvard-Smithsonian Ctr. for Astrophysics; R. Petre, NASA Goddard Space Flight Ctr.; J. A. Bookbinder, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6266-62]

Coffee Break . . . . . 10:30 to 11:00 am

11:00 am: **The Constellation-X Spectroscopy X-ray Telescope: recent technology development,** R. Petre, NASA Goddard Space Flight Ctr. . [6266-63]

11:20 am: **The XEUS mission,** A. N. Parmar, European Space Agency (Netherlands); M. Arnaud, CEA Saclay (France); X. Barcons, Univ. de Cantabria (Spain); J. A. Bleeker, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); H. Inoue, Japan Aerospace Exploration Agency (Japan); G. G. C. Palumbo, Univ. degli Studi di Bologna (Italy); M. J. L. Turner, Univ. of Leicester (United Kingdom) . . . . . [6266-64]

11:40 am: **The XEUS X-ray Telescope,** M. Bavdaz, D. H. Lumb, P. A. Gondoin, T. van der Laan, European Space Agency (Netherlands) . . . . . [6266-65]

Lunch Break . . . . . 12:00 to 1:30 pm

SESSION 9

Room: Crystal Ballrooms: Q, P, N . . . . . Mon. 1:30 to 5:40 pm

Large X-Ray Missions II

1:30 pm: **Performance characterization of silicon pore optics,** M. Collon, S. Kraft, R. Gunther, M. W. Beijersbergen, cosine Research BV (Netherlands); M. Bavdaz, D. H. Lumb, K. Wallace, European Space Agency (Netherlands); M. K. Krumrey, Physikalisch-Technische Bundesanstalt (Germany); M. J. Freyberg, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6266-66]

1:50 pm: **Assembling silicon stacks into a modular structure,** R. Graue, D. Kampf, Kayser-Threde GmbH (Germany); S. Kraft, M. Collon, M. W. Beijersbergen, cosine Research BV (Netherlands); K. Wallace, D. H. Lumb, M. Bavdaz, European Space Agency (Netherlands); M. J. Freyberg, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6266-67]

2:10 pm: **Lightweight x-ray mirrors for the Constellation-X mission,** W. W. Zhang, NASA Goddard Space Flight Ctr. . . . . [6266-68]

2:30 pm: **Alignment and x-ray test of a Constellation-X SXT mirror segment pair,** S. M. Owens, T. Meagher, J. Schneider, NASA Goddard Space Flight Ctr.; J. P. Lehan, NASA Goddard Space Flight Ctr. and Universities Space Research Association; T. Hadjimichael, NASA Goddard Space Flight Ctr. and Swales Aerospace; J. W. Stewart, W. W. Zhang, R. Petre, D. A. Content, T. T. Saha, G. A. Wright, NASA Goddard Space Flight Ctr.; W. D. Jones, S. L. O'Dell, J. E. McCracken, M. V. Gubarev, NASA Marshall Space Flight Ctr.; P. B. Reid, W. A. Podgorski, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6266-69]

2:50 pm: **The Constellation-X reflection grating spectrometer,** J. Cottam, NASA Goddard Space Flight Ctr. . . . . [6266-70]

3:10 pm: **Fast timing with XEUS: evaluation of different detector concepts,** E. Kendziorra, M. Martin, A. E. Santangelo, Eberhard Karls Univ. Tübingen (Germany); J. Wilms, Univ. of Warwick (United Kingdom); D. Barret, G. Skinner, Ctr. d'Etude Spatiale des Rayonnements (France); L. Strüder, P. H. Lechner, J. Treis, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6266-71]

Coffee Break . . . . . 3:30 to 4:00 pm

4:00 pm: **EURECA: a European-Japanese microcalorimeter array** *(Invited Paper)***,** P. A. J. de Korte, M. P. Bruijn, L. Gottardi, J. den Herder, H. F. C. Hoevers, J. Van der Kuur, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); P. Helistö, M. S. Kiviranta, VTT Information Technology (Finland); X. Barcons, Univ. de Cantabria (Spain); J. Sese, Univ. de Zaragoza (Spain); L. Fabrega, Institut de Ciència de Materials de Barcelona (Spain); J. V. Anquita, Ctr. Nacional de Microelectrónica (Spain); G. W. Fraser, C. H. Whitford, Univ. of Leicester (United Kingdom); I. D. Hepburn, C. Brockley-Blatt, Univ. College London (United Kingdom); W. Hajdas, A. Mchedlishvili, Paul Scherrer Institut (Switzerland); L. Piro, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); F. Gatti, Istituto Nazionale di Fisica Nucleare (Italy); P. Bastia, Alenia Spazio - LABEN (Italy); N. Y. Yamasaki, K. Mitsuda, Japan Aerospace Exploration Agency (Japan); Y. Ishisaki, Tokyo Metropolitan Univ. (Japan); C. Enss, Ruprecht-Karls-Univ. Heidelberg (Germany) . . . . . [6266-72]

4:40 pm: **The x-ray microcalorimeter spectrometer for the Constellation-X mission** *(Invited Paper)***,** R. E. J. Kelley, NASA Goddard Space Flight Ctr. . . . . [6266-73]

5:20 pm: **High-density arrays of x-ray microcalorimeters for Constellation-X,** C. A. Kilbourne, S. R. Bandler, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, F. M. Finkbeiner, N. Iyomoto, R. L. Kelley, F. S. Porter, NASA Goddard Space Flight Ctr.; T. Saab, Univ. of Florida; J. E. Sadleir, J. White, NASA Goddard Space Flight Ctr. . . . . [6266-74]

Tuesday 30 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy
Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 10

Room: Crystal Ballrooms: Q, P, N . . . . . Tues. 9:35 am to 12:20 pm

Gamma Ray Optics and Instruments I

9:35 am: **A Laue lens for nuclear astrophysics** *(Invited Paper)***,** P. von Balmoos, Ctr. d'Etude Spatiale des Rayonnements (France); on behalf of the MAX collaboration . . . . . [6266-75]

10:15 am: **GRI: the Gamma-Ray Imager mission,** J. Knödlseder, Ctr. d'Etude Spatiale des Rayonnements (France) . . . . . [6266-76]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **The Advanced Compton Telescope** *(Invited Paper)***,** S. E. Boggs, Univ. of California/Berkeley . . . . . [6266-77]

11:40 am: **Results from the Nuclear Compton Telescope prototype flight,** J. D. Bowen, S. E. Boggs, M. Bandstra, W. Coburn, Univ. of California/Berkeley; C. B. Wunderer, Max-Planck-Institut für extraterrestrische Physik (Germany); R. P. Lin, Univ. of California/Berkeley; M. S. Amman, P. N. Luke, Lawrence Berkeley National Lab. and Univ. of California/Berkeley; M. T. Burks, W. W. Craig, N. W. Madden, Lawrence Livermore National Lab.; D. M. Smith, Univ. of California/Santa Cruz; P. von Balmoos, P. Jean, Ctr. d'Etude Spatiale des Rayonnements (France) . . . . . [6266-78]

12:00 pm: **Scientific objectives of a new concept high-energy imager: arc-second imaging, fast timing, and high-sensitivity spectroscopy,** P. Ubertini III, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-79]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 11

Room: Crystal Ballrooms: Q, P, N . . . . . Tues. 1:30 to 4:20 pm

Gamma Ray Optics and Instruments II

1:30 pm: **Gamma-ray lens development status for a European gamma-ray imager,** F. Frontera, Univ. degli Studi di Ferrara (Italy) and Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); A. Pisa, V. Carassiti, F. Evangelisti, Univ. degli Studi di Ferrara (Italy); G. Landini, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. Loffredo, D. Pellicciotta, Univ. degli Studi di Ferrara (Italy) . . . . [6266-80]

1:50 pm: **MGGPOD version 1.1: a Monte Carlo suite for gamma-ray astronomy,** G. Weidenspointner, Ctr. d'Etude Spatiale des Rayonnements (France); S. J. Sturner, Universities Space Research Association and NASA Goddard Space Flight Ctr.; E. I. Novikova, Naval Research Lab.; M. J. Harris, Max-Planck-Institut fuer extraterrestrische Physik (Germany); A. Zoglauer, C. B. Wunderer, Univ. of California/Berkeley; M. R. Kippen, Los Alamos National Lab.; P. F. Bloser, Univ. of New Hampshire . . . . . [6266-81]

2:10 pm: **Germanium Compton focal plane detectors for gamma-ray lenses,** C. B. Wunderer, A. Zoglauer, S. E. Boggs, Univ. of California/Berkeley; G. Weidenspointner, P. von Balmoos, N. Barrière, J. Knödlseder, Ctr. d'Etude Spatiale des Rayonnements (France) . . . . . [6266-82]

2:30 pm: **A hard x-ray focal plane detector for wide-band Laue lens telescope,** E. Caroli, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. Bertuccio, Politecnico di Milano (Italy); Y. Bezsmolnyy, Semiconductor Materials and Instruments Lab. Ltd. (Ukraine); C. Budtz-Jørgensen, Danish National Space Ctr. (Denmark); R. M. Curado da Silva, Univ. de Coimbra (Portugal); S. Del Sordo, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); F. Frontera, Univ. degli Studi di Ferrara (Italy); M. E. Quadrini, P. Ubertini III, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-83]

2:50 pm: **New concept large-area narrow-field CZT telescope for formation flying,** L. Natalucci, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-84]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Development of polarimeter for gamma-ray bursts onboard the Solar-Powered Sail mission,** D. Yonetoku, T. Murakami, Kanazawa Univ. (Japan); S. Gunji, Yamagata Univ. (Japan); T. Mihara, The Institute of Physical and Chemical Research (Japan); F. Tokanai, Yamagata Univ. (Japan); H. Masui, H. Kodaira, Kanazawa Univ. (Japan) . . . . . [6266-86]

4:00 pm: **Second generation crystals for Laue lens application,** N. Barriere, Ctr. d'Etude Spatiale des Rayonnements (France); P. von Balmoos, Ctr. d'Etude Spatiale des Rayonnements (France); P. Bastie, Univ. Joseph Fourier (France); R. K. Smither, Argonne National Lab.; P. Courtois, Institut Laue-Langevin (France); N. V. Abrosimov, Institut für Kristallzüchtung (Germany); K. Andersen, Institut Laue-Langevin (France); H. Halloin, Collège de France (France) . . . . . [6266-87]

SESSION 12

Room: Crystal Ballrooms: Q, P, N . . . . . Tues. 4:20 to 5:00 pm

UV Optics and Instruments

4:20 pm: **Novel ultraviolet instrumentation concepts,** M. N. Beasley, Arizona State Univ. . . . . [6266-122]

4:40 pm: **IFTSUV: an imaging Fourier transform spectrometer in UV for the next solar space missions,** A. A. Millard, J. J. Vial, P. Lemaire, Univ. Paris-Sud II (France) . . . . . [6266-88]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

Large X-ray Missions

✔ **Assembly of thin gratings for soft x-ray telescopes,** M. Akilian, R. K. Heilmann, M. L. Schattenburg, Massachusetts Institute of Technology . . . . . [6266-135]

✔ **Timing performance of DEPMOSFET matrices for XEUS,** M. Martin, E. Kendziorra, T. Schanz, A. E. Santangelo, Univ. Tübingen (Germany); J. Wilms, Univ. of Warwick (United Kingdom); J. Treis, S. Herrmann, L. Strüder, Max-Planck-Institut Halbleiterlabor (Germany); P. H. Lechner, PNSensor GmbH (Germany); D. Barret, Ctr. d'Etude Spatiale des Rayonnements (France); P. Fischer, I. Peric, M. Harter, Univ. Mannheim (Germany) . . . . . [6266-136]

Gamma Ray Optics and Instruments

✔ **The mini-calorimeter of the AGILE satellite,** C. Labanti, M. Marisaldi, F. Fuschino, A. Bulgarelli, F. Gianotti, M. Trifoglio, M. Tavani, A. Argan, G. Di Cocco, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6266-85]

✔ **HEXIS: a test of the detectors and electronics for MIRAX,** S. Suchy, M. R. Pelling, J. A. Tomsick, J. L. Matteson, R. E. Rothschild, Univ. of California/San Diego . . . . . [6266-137]

✔ **Development of position sensitive scintillation counter for balloon-borne hard x-ray telescope,** K. Tamura, H. Kunieda, Y. Ogasaka, A. Furuzawa, R. Shibata, T. Nakamura, K. Ohnishi, Y. Kanou, Nagoya Univ. (Japan); E. Miyata, H. Tsunemi, Osaka Univ. (Japan) . . . . . [6266-155]

X-ray Instrumentation

✔ **The search for signatures of Cosmic bullets,** M. Stuhlinger, European Space Agency (Spain); A. F. Abbey, Univ. of Leicester (United Kingdom); M. G. F. Kirsch, L. Metcalfe, European Space Agency (Spain); S. F. Sembay, Univ. of Leicester (United Kingdom) . . . . . [6266-140]

✔ **Performance characterization of hard x-ray imaging instruments at synchrotron radiation facility SPring-8,** Y. Ogasaka, K. Tamura, R. Shibata, A. Furuzawa, T. Nakamura, M. Naitou, T. Miyazawa, K. Shimoda, K. Onishi, Y. Fukaya, T. Iwahara, Y. Kanou, H. Kunieda, K. Yamashita, Nagoya Univ. (Japan); E. Miyata, K. Mukai, K. Ikegami, H. Tsunemi, Osaka Univ. (Japan); K. Uesugi, Y. Suzuki, Japan Synchrotron Radiation Research Institute (Japan) . . . . . [6266-142]

✔ **State-of-the-art solid state detectors for the low-energy solar x-ray spectrometer payload onboard GSAT2 Indian satellite,** N. M. Vadher, Physical Research Lab. (India) . . . . . [6266-143]

✔ **Development of the collimator response of gas slit camera of MAXI,** M. Morii, M. Matsuoka, S. Ueno, H. Tomida, H. Katayama, K. Kawasaki, T. Yokota, N. Kuramata, Japan Aerospace Exploration Agency (Japan); T. Mihara, M. Kohama, N. Isobe, M. Nakajima, The Institute of Physical and Chemical Research (Japan); H. Tsunemi, E. Miyata, Osaka Univ. (Japan); A. Yoshida, Y. Tsuchiya, Aoyama Gakuin Univ. (Japan); N. Kawai, J. Kataoka, Tokyo Institute of Technology (Japan); H. Negoro, Nihon Univ. (Japan) . . . . . [6266-144]

✔ **Development of fully depleted and back-illuminated charge-coupled devices for soft x-ray imager onboard the NeXT satellite,** S. Takagi, T. G. Tsuru, H. Matsumoto, K. Koyama, T. Inui, M. Ozawa, Kyoto Univ. (Japan); H. Tsunemi, E. Miyata, Osaka Univ. (Japan); H. Ozawa, Japan Aerospace Exploration Agency (Japan); D. Matsuura, Osaka Univ. (Japan); S. Miyazaki, Y. Kamata, National Astronomical Observatory of Japan (Japan); K. Miyaguchi, M. Muramatsu, H. Suzuki, Hamamatsu Photonics K.K. (Japan) . . . . [6266-145]

✔ **Fine-pitch gas electron multipliers for Cosmic x-ray polarimeter,** T. Tamagawa, The Institute of Physical and Chemical Research (Japan); A. Hayato, N. Tsunoda, S. Hashimoto, The Institute of Physical and Chemical Research (Japan) and Tokyo Univ. of Science (Japan); H. Hamagaki, The Univ. of Tokyo (Japan); M. Inuzuka, National Research Institute for Cultural Properties (Japan); F. Tokanai, Yamagata Univ. (Japan); H. Miyasaka, California Institute of Technology; I. Sakurai, Nagoya Univ. (Japan); K. Makishima, The Univ. of Tokyo (Japan) and The Institute of Physical and Chemical Research (Japan) . . . . . [6266-146]

✔ **Development of Cosmic x-ray polarimeter,** A. Hayato, T. Tamagawa, The Institute of Physical and Chemical Research (Japan) and Tokyo Univ. of Science (Japan); M. Kohama, The Institute of Physical and Chemical Research (Japan); N. Tsunoda, M. Miyamoto, S. Hashimoto, The Institute of Physical and Chemical Research (Japan) and Tokyo Univ. of Science (Japan); F. Tokanai, Yamagata Univ. (Japan); H. Hamagaki, The Univ. of Tokyo (Japan); M. Inuzuka, National Research Institute for Cultural Properties (Japan); H. Miyasaka, California Institute of Technology; I. Sakurai, Nagoya Univ. (Japan); K. Makishima, The Univ. of Tokyo (Japan) and The Institute of Physical and Chemical Research (Japan) . . . . . [6266-147]

✔ **First light from a very large area pixel array for high-throughput x-ray polarimetry,** R. Bellazzini, G. Spandre, M. Minuti, Univ. di Pisa (Italy); E. Costa, P. Soffitta, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); A. Brez, Univ. di Pisa (Italy) . . . . . [6266-148]

✔ **A photoelectric polarimeter for XEUS: a new window in x-ray sky,** R. Bellazzini, Univ. degli Studi di Pisa (Italy); E. Costa, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); L. Baldini, F. Bitti, A. Brez, F. Cavalca, L. Latronico, M. M. Massai, N. Omodei, M. Pinchera, S. Carmelo, G. Spandre, Univ. degli Studi di Pisa (Italy); P. Soffitta, G. Di Persio, M. Feroci, F. Muleri, L. Pacciani, A. Rubini, E. Morelli, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. Matt, G. C. Perola, Univ. degli Studi di Roma Tre (Italy) . . . . . [6266-149]

✔ **Thermal shielding of SIMBOL-X x-ray telescope,** A. Collura, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy); P. Attina, Alcatel Alenia Space (Italy); M. Barbera, Osservatorio Astronomico di Palermo Giuseppe S. Vaiana (Italy) and INAF-OAPA (Italy); P. R. Ferrando, CEA Saclay (France); G. Pareschi, Osservatorio Astronomico di Brera (Italy); F. R. Powell, Luxel Corp. . . . . [6266-150]

✔ **Energy response of the x-ray imaging spectrometer (XIS) on Suzaku,** H. Matsumoto, H. Nakajima, H. Yamaguchi, T. G. Tsuru, K. Koyama, Kyoto Univ. (Japan); K. Hayashida, K. Torii, M. Namiki, H. Tsunemi, Osaka Univ. (Japan); H. Murakami, M. Ozaki, T. Dotani, Japan Aerospace Exploration Agency (Japan); B. LaMarr, S. E. Kissel, M. W. Bautz, Massachusetts Institute of Technology . . . . . [6266-151]

✔ **The background properties of Suzaku/XIS,** H. Yamaguchi, H. Nakajima, K. Koyama, T. G. Tsuru, H. Matsumoto, Kyoto Univ. (Japan); H. Tsunemi, K. Hayashida, K. Torii, M. Namiki, Osaka Univ. (Japan); T. Dotani, M. Ozaki, H. Murakami, H. Katayama, Japan Aerospace Exploration Agency (Japan) . . . . . [6266-152]

✔ **In-orbit performance of the Suzaku wideband all-sky monitor,** K. Yamaoka, Aoyama Gakuin Univ. (Japan); M. Ohno, Hiroshima Univ. (Japan); Y. Terada, The Institute of Physical and Chemical Research (RIKEN) (Japan); Y. Endo, K. Abe, K. Onda, S. Matsumura, Saitama Univ. (Japan); S. Sugita, Aoyama Gakuin Univ. (Japan); T. Takahashi, Y. Fukazawa, Hiroshima Univ. (Japan); M. Tashiro, Saitama Univ. (Japan); T. Kamae, Stanford Linear Accelerator Ctr.; M. Kokubun, The Univ. of Tokyo (Japan); A. Kubota, The Institute of Physical and Chemical Research (RIKEN) (Japan); G. M. Madejski, Stanford Linear Accelerator Ctr.; K. Makishima, The Univ. of Tokyo (Japan); T. Mizuno, Hiroshima Univ. (Japan); T. Murakami, Kanazawa Univ. (Japan); K. Nakazawa, Japan Aerospace Exploration Agency (Japan); M. Nomachi, Osaka Univ. (Japan); H. Takahashi, The Univ. of Tokyo (Japan); T. Takahashi, Japan Aerospace Exploration Agency (Japan); T. Tamagawa, The Institute of Physical and Chemical Research (RIKEN) (Japan); S. Watanabe, Japan Aerospace Exploration Agency (Japan); D. Yonetoku, Kanazawa Univ. (Japan) . [6266-153]

✔ **A sounding rocket payload for x-ray observations of the Cygnus loop,** R. L. McEntaffer, E. R. Schindhelm, A. F. Shipley, W. C. Cash, Univ. of Colorado/ Boulder . . . . . [6266-154]

Wednesday 31 May

SESSION 13

Room: Crystal Ballrooms: Q, P, N . . . . . Wed. 8:00 am to 12:30 pm

X-Ray Instrumentation I

8:00 am: **Hard x-ray imager for the NeXT mission,** T. Takahashi, Japan Aerospace Exploration Agency (Japan) . . . . . [6266-90]

8:20 am: **Soft x-ray imager (SXI) onboard the NeXT satellite,** T. G. Tsuru, S. Takagi, H. Matsumoto, T. Inui, M. Ozawa, K. Koyama, Kyoto Univ. (Japan); H. Tsunemi, K. Hayashida, E. Miyata, H. Ozawa, M. Touhiguchi, D. Matsuura, Osaka Univ. (Japan); T. Dotani, M. Ozaki, H. Murakami, Japan Aerospace Exploration Agency (Japan); T. Kohmura, Kogakuin Univ. (Japan); S. Kitamoto, Rikkyo Univ. (Japan); H. Awaki, Ehime Univ. (Japan) . . . . . [6266-91]

8:40 am: **Scientific payload for SIMBOL-X,** G. Pareschi, Osservatorio Astronomico di Brera (Italy); U. G. Briel, Max-Planck-Institut für extraterrestrische Physik (Germany); O. Citterio, Osservatorio Astronomico di Brera (Italy); P. R. Ferrando, CEA Saclay (France); G. Hasinger, Max-Planck-Institut für extraterrestrische Physik (Germany); F. Fiore, Osservatorio Astronomico di Brera (Italy); P. Giommi, Agenzia Spaziale Italiana (Italy); A. Goldwurm, P. Laurent, O. Limousin, CEA Saclay (France); G. Malaguti, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. C. Perola, Univ. degli Studi di Roma Tre (Italy); Y. Rio, CEA Saclay (France); J. Roques, Ctr. d'Etude Spatiale des Rayonnements (France); G. Tagliaferri, Osservatorio Astronomico di Brera (Italy); L. Strüder, Max-Planck-Institut Halbleiterlabor (Germany) . . . . . [6266-92]

9:00 am: **Orbital verification of the performance of Suzaku XIS,** K. Hayashida, K. Torii, M. Namiki, N. Anabuki, S. Katsuda, N. Tawa, T. Miyauchi, H. Tsunemi, Osaka Univ. (Japan); H. Matsumoto, T. G. Tsuru, H. Nakajima, H. Yamaguchi, K. Koyama, Kyoto Univ. (Japan); T. Dotani, M. Ozaki, H. Murakami, H. Katayama, Japan Aerospace Exploration Agency (Japan); S. Kitamoto, Rikkyo Univ. (Japan); H. Awaki, Ehime Univ. (Japan); T. Kohmura, Kogakuin Univ. (Japan); B. LaMarr, E. Miller, S. E. Kissel, M. W. Bautz, R. F. Foster, Massachusetts Institute of Technology . . . . . [6266-93]

9:20 am: **Inflight calibration and performance of the hard x-ray detector (HXD) onboard Suzaku,** Y. Fukazawa, Hiroshima Univ. (Japan); T. Kamae, Stanford Linear Accelerator Ctr.; M. Kokubun, The Univ. of Tokyo (Japan); A. Kubota, Institute of Physical and Chemical Research (Japan); K. Makishima, The Univ. of Tokyo (Japan); T. Mizuno, Hirohsima Univ. (Japan); T. Murakami, Kanazawa Univ. (Japan); K. Nakazawa, Japan Aerospace Exploration Agency (Japan); M. Nomachi, Osaka Univ. (Japan); H. Takahashi, The Univ. of Tokyo (Japan); T. Takahashi, Japan Aerospace Exploration Agency (Japan); T. Tamagawa, Institute of Physical and Chemical Research (Japan); M. Tashiro, Saitama Univ. (Japan); Y. Terada, Institute of Physical and Chemical Research (Japan); S. Watanabe, Japan Aerospace Exploration Agency (Japan); K. Yamaoka, Aoyama Gakuin Univ. (Japan); D. Yonetoku, Kanazawa Univ. (Japan) . . . [6266-94]

9:40 am: **Development of TES microcalorimeters for future x-ray missions,** L. Piro, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); F. Gatti, Istituto Nazionale di Fisica Nucleare (Italy); L. Colasanti, M. Ferrari Toniolo, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); D. Pergolesi, P. Repetto, Istituto Nazionale di Fisica Nucleare (Italy); G. Torrioli, Istituto di Fotonica e Nanotecnologie (Italy); P. Bastia, Alenia Spazio - LABEN (Italy) . . . . . [6266-95]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Development of P-type CCDs for the NeXT: a next Japanese x-ray astronomical satellite mission,** H. Ozawa, M. Tohiguchi, D. Matsuura, E. Miyata, H. Tsunemi, Osaka Univ. (Japan); S. Takagi, T. Inui, T. G. Tsuru, Kyoto Univ. (Japan); Y. Kamata, National Astronomical Observatory of Japan (Japan); H. Nakaya, S. Miyazaki, National Astronomical Observatory of Japan/Subaru Telescope (Japan); K. Miyaguchi, M. Muramatsu, H. Suzuki, Hamamatsu Photonics K.K. (Japan) . . . . . [6266-96]

10:50 am: **Monte Carlo simulations of stacked SDD/CdZnTe X-ray detector arrays as designed for SIMBOL-X,** C. Tenzer, E. Kendziorra, A. E. Santangelo, Eberhard Karls Univ. Tübingen (Germany); P. R. Ferrando, CEA Saclay (France) . . . . . [6266-97]

11:10 am: **Improved x-ray CCD response at very low x-ray energies,** M. W. Bautz, S. E. Kissel, B. LaMarr, G. Y. Prigozhin, Massachusetts Institute of Technology . . . . . [6266-98]

11:30 am: **Verifying the low-energy spectral response models of the CXO ACIS CCDs and the XMM-Newton EPIC CCDs,** P. P. Plucinsky, Harvard-Smithsonian Ctr. for Astrophysics; J. M. DePasquale, Smithsonian Astrophysical Observatory; S. L. Snowden, NASA Goddard Space Flight Ctr. . . . . [6266-99]

11:50 am: **Quantum efficiencies of the XIS CCDs onboard Suzaku,** T. Miyauchi, K. Hayashida, K. Torii, M. Namiki, N. Anabuki, S. Katsuda, N. Tawa, D. Matsuura, H. Tsunemi, Osaka Univ. (Japan); H. Nakajima, H. Yamaguchi, H. Matsumoto, T. G. Tsuru, Kyoto Univ. (Japan); T. Kohmura, Kougakuin Univ. (Japan); H. Katayama, Japan Aerospace Exploration Agency (Japan); E. Miller, B. LaMarr, S. E. Kissel, M. W. Bautz, Massachusetts Institute of Technology . . . . . [6266-100]

12:10 pm: **Developement of the scintillator-deposited charge-coupled device and application for the balloon-borne experiment,** E. Miyata, K. Mukai, K. Ikegami, N. Tawa, N. Anabuki, H. Tsunemi, Osaka Univ. (Japan); Y. Ogasaka, K. Tamura, A. Furuzawa, R. Shibata, Y. Haba, H. Kunieda, Nagoya Univ. (Japan); Y. Saito, T. Yamagami, Japan Aerospace Exploration Agency (Japan); K. Miyaguchi, Hamamatsu Photonics K.K. (Japan) . . . . . [6266-101]

Lunch Break . . . . . 12:30 to 1:40 pm

SESSION 14

Room: Crystal Ballrooms: Q, P, N . . . . . Wed. 1:40 to 4:20 pm

X-Ray Instrumentation II

1:40 pm: **Gas pixel detectors for high-sensitivity x-ray polarimetry,** R. Bellazzini, G. Spandre, A. Brez, L. Baldini, M. Minuti, L. Latronico, N. Omodei, Univ. di Pisa (Italy); E. Costa, P. Soffitta, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); F. Cavalca, Univ. di Pisa (Italy) . . . . . [6266-102]

2:00 pm: **X-ray polarization measurements with a micropattern gas polarimeter,** J. E. Hill, J. K. Black, P. Deines-Jones, K. Jahoda, NASA Goddard Space Flight Ctr.; R. Bellazzini, A. Brez, Istituto Nazionale di Fisica Nucleare (Italy); E. Costa, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); P. Kaaret, The Univ. of Iowa; M. Minuti, G. Spandre, Istituto Nazionale di Fisica Nucleare (Italy); J. H. Swank, NASA Goddard Space Flight Ctr. . . . . [6266-103]

2:20 pm: **X-ray polarimeter with a multilayer-coated CCD,** S. Kitamoto, T. Watanabe, K. Sudoh, J. Satoh, Y. Ohkubo, A. Sekiguchi, M. Tsujimoto, K. Suga, Rikkyo Univ. (Japan); T. Kohmura, Kogakuin Univ. (Japan); S. Okada, Y. Itoh, R. Nakamura, Japan Aerospace Exploration Agency (Japan) . . . . . [6266-104]

2:40 pm: **Wide-field compact detector for hard x-ray polarization measurements,** W. Hajdas, Paul Scherrer Institut (Switzerland); N. Produit, Univ. de Genève (Switzerland); E. Suarez-Garcia, Paul Scherrer Institut (Switzerland); F. Barão, Lab. de Instrumentação e Física Experimental de Partículas (Portugal); S. Deluit, Ctr. d'Etude Spatiale des Rayonnements (Switzerland); C. Leluc, Univ. de Genève (Switzerland); A. Mschedlishvilli, Paul Scherrer Institut (Switzerland); S. Paltani, M. Pohl, D. Rapin, Univ. de Genève (Switzerland); J. Vialle, Le Lab. d'Annecy-le-Vieux de Physique des Particules (France); R. Walter, Univ. de Genève (Switzerland); C. Wigger, A. Zehnder, Paul Scherrer Institut (Switzerland) . . . . . [6266-105]

Coffee Break . . . . . 3:00 to 3:20 pm

3:20 pm: **An x-ray polarimeter for hard x-ray optics,** E. Costa, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); R. Bellazzini, Istituto Nazionale di Fisica Nucleare (Italy); P. Soffitta, G. Di Persio, M. Feroci, F. Muleri, L. Pacciani, A. Rubini, E. Morelli, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); L. Baldini, F. Bitti, A. Brez, F. Cavalca, L. Latronico, M. M. Massai, N. Omodei, M. Pinchera, C. Sgro, G. Spandre, Istituto Nazionale di Fisica Nucleare (Italy); G. Matt, G. C. Perola, Univ. degli Studi di Roma Tre (Italy); O. Citterio, G. Pareschi, Osservatorio Astronomico di Brera (Italy) . . . . . [6266-106]

3:40 pm: **Origins of the instrumental background of the x-ray CCD camera in space studied with Monte Carlo simulation,** H. Murakami, M. Kitsunezuka, M. Ozaki, T. Dotani, Japan Aerospace Exploration Agency (Japan) . . . . [6266-108]

4:00 pm: **JEM-X: three years in Space,** C. Budtz-Jørgensen, N. Lund, S. Brandt, N. J. Westergaard, C. A. Oxborrow, J. Chenevez, I. L. Rasmussen, Danish National Space Ctr. (Denmark) . . . . . [6266-110]

Wednesday-Wednesday 24-31 May 2006 • Proceedings of SPIE Vol. 6267

Conference Chair:
Larry M. Stepp, AURA/Thirty Meter Telescope Project

Ground-based and Airborne Telescopes

Program Committee: **Torben E. Andersen**, Lunds Univ./Lund Observatory (Sweden); **Anthony J. Beasley**, Atacama Large Millimeter Array (Chile); **Javier Castro López-Tarruella**, Instituto de Astrofísica de Canarias (Spain); **Charles F. Claver**, National Optical Astronomy Observatory; **Xiangqun Cui**, Nanjing Institute of Astronomical Optics & Technology (China); **Philippe Dierickx**, European Southern Observatory (Germany); **Richard F. Green**, The Univ. of Arizona/Large Binocular Telescope Observatory; **Matthew W. Johns**, Carnegie Observatories/Giant Magellan Telescope (GMT); **Frank W. Kan**, Simpson Gumpertz & Heger Inc.; **Jacobus G. Meiring**, South African Large Telescope Foundation (South Africa); **Simon J. Radford**, California Institute of Technology; **Thomas A. Sebring**, Cornell Univ./Atacama Telescope; **Donald W. Sweeney**, LSST Corp.; **Jeremy Wagner**, National Solar Observatory

Wednesday 24 May

SESSION 1

Room: Crystal Ballrooms: H . . . . . Wed. 10:00 am to 12:00 pm

Ground-based Telescope Projects I

Chair: **Larry M. Stepp**,
Association of Universities for Research in Astronomy

10:00 am: **The Large Millimeter Telescope** *(Invited Paper)***,** A. Serano, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); F. P. Schloerb, Univ. of Massachusetts/Amherst . . . . . [6267-01]

10:30 am: **The Atacama large millimeter array: overview and status** *(Invited Paper)***,** A. J. Beasley, Atacama Large Millimeter Array (Chile) . . . [6267-02]

11:00 am: **Progress and prospect of LAMOST project,** X. Cui, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-03]

11:20 am: **The 4-m International Liquid Mirror Telescope,** J. M. Surdej, Univ. de Liège (Belgium); J. Chisogne, Advanced Mechanical and Optical Systems (Belgium); J. Claeskens, Univ. de Liège (Belgium); B. Collin, S. Denis, C. Flebus, Advanced Mechanical and Optical Systems (Belgium); C. Jean, A. Magette, J. Manfroid, J. Poels, P. Sprimont, J. Swings, Univ. de Liège (Belgium) . [6267-04]

11:40 am: **Discovery Channel Telescope: progress and status,** B. W. Smith, T. A. Bida, R. L. Millis, H. K. Marshall, E. W. Dunham, Lowell Observatory . . . . . [6267-05]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 2

Room: Crystal Ballrooms: H . . . . . Wed. 2:15 to 3:25 pm

Ground-based Telescope Projects II

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

2:15 pm: **Overview of the Large Synoptic Survey Telescope project** *(Invited Paper)***,** D. W. Sweeney, LSST Corp. . . . . [6267-06]

2:45 pm: **VISTA: status, performance, and lessons,** A. M. McPherson, A. J. Born, UK Astronomy Technology Ctr. (United Kingdom); J. P. Emerson, Queen Mary Univ. of London (United Kingdom); P. F. Jeffers, B. Little, J. M. Stewart, I. Egan, J. Murray, UK Astronomy Technology Ctr. (United Kingdom); W. J. Sutherland, Univ. of Cambridge (United Kingdom) . . . . [6267-07]

3:05 pm: **The GTC project: preparing the first light,** J. Castro López-Tarruella, J. M. Rodrigez Espinosa, P. Alvarez Martin, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-08]

POSTER POPS

Room: Crystal Ballrooms: H . . . . . Wed. 3:25 to 3:35 pm

3-minute presentations

Ground-based Telescope Projects I

✔ **The Magdalena Ridge Observatory 2.4-m Telescope,** G. Pentland, K. Gonzales, EOS Technologies, Inc.; E. V. Ryan, New Mexico Institute of Mining and Technology; K. Harris, Jr., EOS Technologies, Inc. . . . . [6267-104]

✔ **Progress in the ULTRA 1-m Ground-based Telescope,** R. C. Romeo, R. N. Martin, Composite Mirror Applications, Inc.; B. Twarog, B. Anthony-Twarog, R. Taghavi, R. C. Hale, Univ. of Kansas; P. Etzel, San Diego State Univ.; R. A. Fesen, Dartmouth College; S. Shawl, Univ. of Kansas . . . . . [6267-105]

✔ **The Skymapper Telescope,** A. Rakich, M. Blundell, EOS Space Systems Pty. Ltd. (Australia); R. Brunswick, G. Pentland, J. Waltho, T. D. Ferguson, EOS Technologies, Inc. . . . . [6267-106]

Coffee Break . . . . . 3:35 to 4:00 pm

SESSION 3

Room: Crystal Ballrooms: H . . . . . Wed. 4:00 to 5:10 pm

Ground-based Telescope Projects III

Chair: **Jacobus G. Meiring**,
South African Astronomical Observatory (South Africa)

4:00 pm: **Advanced Technology Solar Telescope: a progress report** *(Invited Paper)***,** J. Wagner, T. R. Rimmele, S. L. Keil, Team, ATST, National Solar Observatory . . . . . [6267-09]

4:30 pm: **Progress on the 1.6-meter new solar telescope at Big Bear Solar Observatory,** C. J. Denker, P. R. Goode, D. Ren, A. P. Verdoni, H. Wang, G. Yang, New Jersey Institute of Technology; W. Cao, R. Coulter, R. Fear, J. Nenow, S. Shumko, T. J. Spirock, J. R. Varsik, Big Bear Solar Observatory; J. Chae, Seoul National Univ. (South Korea); J. R. Kuhn, Univ. of Hawai'i at Manoa; Y. Moon, Y. D. Park, Korea Astronomy and Space Science Institute (South Korea); A. Tritschler, National Solar Observatory . . . . . [6267-10]

4:50 pm: **VERITAS: a next-generation very high energy gamma-ray telescope,** K. Gibbs, Smithsonian Astrophysical Observatory . . . . . [6267-11]

POSTER POPS

Room: Crystal Ballrooms: H . . . . . Wed. 5:10 to 5:45 pm

3-minute presentations

Ground-based Telescope Projects II

✔ **Future installations of ground based gamma-ray telescopes,** F. Aharonian, Max-Planck-Institut für Kernphysik (Germany); D. Horns, E. Kendziorra, A. E. Santangelo, Univ. Tübingen (Germany) . . . . . [6267-108]

✔ **Automated 1.3-m near-infrared telescope system triggered by gamma-ray burst,** D. Yonetoku, T. Murakami, Kanazawa Univ. (Japan); Y. Kobayashi, National Astronomical Observatory of Japan (Japan); T. Nakagawa, H. Murakami, Japan Aerospace Exploration Agency (Japan); S. Okuno, H. Masui, S. Kinoshita, H. Kodaira, S. Yoshinari, Kanazawa Univ. (Japan); T. Nakamura, Kyoto Univ. (Japan) . . . . . [6267-109]

✔ **Ground-based gamma-ray observations with H.E.S.S.: status and future,** D. Horns, Univ. Tübingen (Germany); Collaboration, HESS, German-French-English-British-Namibian-Czech-Armenian-South African Consortium (Germany) . . . . . [6267-110]

✔ **BOOTES-IR: near-IR observations by a robotic system in southern Spain,** A. J. Castro-Tirado, A. de Ugarte Postigo, M. Martin Jelínek, R. Cunniffe, S. Castillo Carrión, Instituto de Astrofísica de Andalucía (Spain); P. Kubánek, INTEGRAL Science Data Ctr. (Czech Republic); J. Gorosabel, S. Vitek, Instituto de Astrofísica de Andalucía (Spain); F. M. Zerbi, A. Riva, V. De Caprio, Osservatorio Astronomico di Brera (Italy); P. J. Amado, C. Cárdenas, A. Claret, S. Martín, M. A. Sánchez, Instituto de Astrofísica de Andalucía (Spain); P. García Teodoro, Univ. de Granada (Spain); J. M. Castro Cerón, Univ. of Copenhagen (Denmark); J. Díaz Verdejo, J. M. López Soler, Univ. de Granada (Spain); J. Á. Berná Galiano, Univ. de Alicante (Spain); J. Casares, Instituto de Astrofísica de Canarias (Spain); J. Fabregat, Univ. de València (Spain); C. Sánchez Fernández, European Space Astronomy Ctr. (Spain); P. Conconi, Osservatorio Astronomico di Brera (Italy); S. Guziy, Instituto de Astrofísica de Andalucía (Spain); F. Vitali, Osservatorio Astronomico di Roma (Italy); T. d. J. Mateo Sanguino, Univ. Politécnica de la Rábida (Spain); J. M. Trigo i Rodriguez, Institut d'Estudis Espacials de Catalunya (Spain); M. D. Sabau-Graziati, Instituto Nacional de Técnica Aeroespacial (Spain) . . . . . [6267-111]

✔ **Microthermal measurements of the surface layer and its contribution to the seeing,** J. C. Guerra, Isaac Newton Group of Telescopes (Spain); R. W. Wilson, Univ. of Durham (United Kingdom) . . . . . [6267-112]

✔ **Improvement of the thermal environment around the Subaru Telescope enclosure,** A. Miyashita, Y. Mikami, N. Takato, T. Nishimura, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6267-113]

✔ **Integrating seeing measurements into the operations of solar telescopes,** C. J. Denker, A. P. Verdoni, New Jersey Institute of Technology . . . . [6267-114]

✔ **The thermal control of the New Solar Telescope at Big Bear Observatory,** A. P. Verdoni, C. J. Denker, New Jersey Institute of Technology . . . . [6267-115]

✔ **The DIMM station at Subaru Telescope,** F. Uraguchi, N. Takato, A. Miyashita, T. Usuda, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6267-116]

✔ **Removing the dome turbulence effect from SCIDAR data: a method using evenness properties with Fourier transform,** J. J. Fuensalida, B. M. García-Lorenzo, C. K. Hoegemann, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-117]

✔ **URAT: astrometric requirements and design history,** N. Zacharias, U.S. Naval Observatory; U. Laux, Thüringer Landessternwarte Tautenburg (Germany); A. Rakich, EOS Space Systems Pty. Ltd. (Australia); H. W. Epps, Univ. of California/Santa Cruz . . . . . [6267-134]

Thursday 25 May

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 4

Room: Crystal Ballrooms: H . . . . . Thurs. 9:35 to 10:25 am

Airborne Telescopes I

Chair: **Donald W. Sweeney**, LSST Corp.

9:35 am: **SOFIA: astronomers return to the stratosphere,** S. C. Casey, Universities Space Research Association . . . . . [6267-12]

10:05 am: **SPIDER: a new balloon-borne experiment to measure CMB polarization on large angular scales,** T. E. Montroy, Case Western Reserve Univ.; P. A. R. Ade, Cardiff Univ. (United Kingdom); J. J. Bock, Jet Propulsion Lab.; D. Bond, Canadian Institute for Theoretical Astrophysics, Inc. (Canada); C. Contaldi, Imperial College (United Kingdom); B. Crill, Infrared Processing and Analysis Ctr.; L. Duband, CEA Grenoble (France); S. R. Golwala, California Institute of Technology; M. Halpern, The Univ. of British Columbia (Canada); G. C. Hilton, National Institute of Standards and Technology; W. Holmes, Jet Propulsion Lab.; V. V. Hristov, California Institute of Technology; K. D. Irwin, National Institute of Standards and Technology; W. C. Jones, California Institute of Technology; C. Kuo, Jet Propulsion Lab.; A. E. Lange, California Institute of Technology; C. MacTavish, Univ. of Toronto (Canada); P. V. Mason, California Institute of Technology; B. Netterfield, Univ. of Toronto (Canada); P. Rossinot, California Institute of Technology; J. E. Ruhl, Case Western Reserve Univ. . . . . [6267-13]

POSTER POPS

Room: Crystal Ballrooms: H . . . . . Thurs. 10:25 to 10:30 am

3-minute presentations

Airborne Telescopes

✔ **The SOFIA cavity door: configuration, operation, and potential science implications,** E. F. Erickson, NASA Ames Research Ctr. . . . . [6267-118]

✔ **On sky testing and preliminary sensor alignment for the SOFIA Telescope,** F. Harms, Univ. Stuttgart (Germany); P. G. Waddell, Universities Space Research Association; M. Suess, MT Aerospace AG (Germany); H. P. Röser, Univ. Stuttgart (Germany) . . . . . [6267-153]

Coffee Break . . . . . 10:30 to 11:00 am

SESSION 5

Room: Crystal Ballrooms: H . . . . . Thurs. 11:00 to 11:40 am

Airborne Telescopes II

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

11:00 am: **SUNRISE: high-resolution UV/VIS observations of the Sun from the stratosphere,** A. M. Gandorfer, S. K. Solanki, P. Barthol, M. Schuessler, Max-Planck-Institut für Sonnensystemforschung (Germany); V. Martínez-Pillet, Instituto de Astrofísica de Canarias (Spain); W. Schmidt, Kiepenheuer Institut für Sonnenphysik (Germany); B. W. Lites, National Ctr. for Atmospheric Research; A. M. Title, Lockheed Martin Advanced Technology Ctr. . . . . [6267-14]

11:20 am: **A high-altitude station-keeping astronomical observing platform,** R. A. Fesen, Dartmouth College . . . . . [6267-15]

SESSION 6

Room: Crystal Ballrooms: H . . . . . Thurs. 11:40 am to 12:20 pm

First Light, Commissioning and Early Operations I

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

11:40 am: **The new 1.5-m solar telescope GREGOR: first light and start of commissioning,** R. Volkmer, O. F. von der Lühe II, Kiepenheuer Institut für Sonnenphysik (Germany); F. Kneer, Georg-August-Univ. Göttingen (Germany); A. Hofmann, Astrophysikalisches Institut Potsdam (Germany); T. Berkefeld, P. Caligari, W. Schmidt, D. Soltau, Kiepenheuer Institut für Sonnenphysik (Germany); H. E. Nicklas, K. Puschmann, A. Wittman, Georg-August-Univ. Göttingen (Germany); H. Balthasar, K. G. Strassmeier, Astrophysikalisches Institut Potsdam (Germany); M. Sobotka, M. Klvana, Astronomical Institute AV CR (Czech Republic); M. V. Collados, Instituto de Astrofísica de Canarias (Spain) . . [6267-16]

12:00 pm: **Site acceptation of the commissioning instrument for the Gran Telescopio Canarias,** S. Cuevas, B. Sánchez, Univ. Nacional Autónoma de México (Mexico); V. Bringas, Ctr. de Ingenieria y Desarollo Industrial (Mexico); C. Espejo, R. Flores-Meza, O. Capa, G. Lara, Univ. Nacional Autónoma de México (Mexico); A. Chavoya, G. Anguiano, S. Arciniega, A. Dorantes, J. L. Gonzalez, J. M. Montoya, R. Toral, H. Hernandez, R. Nava, Ctr. de Ingenieria y Desarollo Industrial (Mexico); M. N. Devaney, J. Castro López-Tarruella, L. Cavaller, Instituto de Astrofísica de Canarias (Spain); A. Farah-Simon, J. Godoy, F. J. Cobos, C. Tejada, F. Garfias, Univ. Nacional Autónoma de México (Mexico) . . . . [6267-17]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 7

Room: Crystal Ballrooms: H . . . . . Thurs. 1:30 to 3:10 pm

First Light, Commissioning and Early Operations II

Chair: **Javier Castro López-Tarruella**, Instituto de Astrofísica de Canarias (Spain)

1:30 pm: **The Large Binocular Telescope** *(Invited Paper)***,** J. M. Hill, R. F. Green, J. H. Slagle, Univ. of Arizona . . . . . [6267-18]

2:00 pm: **Completion and commissioning of the Southern African Large Telescope** *(Invited Paper)***,** D. A. H. Buckley, G. P. Swart, J. G. Meiring, South African Astronomical Observatory (South Africa) . . . . . [6267-19]

2:30 pm: **The wide-field eyes of the large binocular telescopes,** R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); E. Giallongo, Osservatorio Astronomico di Roma (Italy); F. Pasian, Osservatorio Astronomico di Trieste (Italy); A. Baruffolo, Osservatorio Astronomico di Padova (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); A. Di Paola, Osservatorio Astronomico di Roma (Italy); J. Farinato, M. Lombini, Osservatorio Astrofisico di Arcetri (Italy); F. Pedichini, R. Speziali, Osservatorio Astronomico di Roma (Italy); R. Smareglia, Osservatorio Astronomico di Trieste (Italy) . . . . . [6267-20]

2:50 pm: **GREGOR AO as a tool for telescope commissioning,** D. Soltau, T. Berkefeld, R. Volkmer, Kiepenheuer-Institut für Sonnenphysik (Germany) . . . . . [6267-21]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 8

Room: Crystal Ballrooms: H . . . . . Thurs. 3:40 to 5:00 pm

First Light, Commissioning and Early Operations III

Chair: **Simon J. Radford**, California Institute of Technology

3:40 pm: **The Green Bank Telescope** *(Invited Paper)***,** R. M. Prestage, National Radio Astronomy Observatory . . . . . [6267-22]

4:00 pm: **First results from CARMA,** D. C. Bock, CARMA . . . . . [6267-23]

4:20 pm: **APEX: the Atacama pathfinder experiment,** R. Güsten, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6267-24]

4:40 pm: **Calibrations of LSST camera and telescope systems,** D. L. Burke, Stanford Linear Accelerator Ctr.; C. F. Claver, National Optical Astronomy Observatory; C. W. Stubbs, Harvard Univ.; C. Smith, National Optical Astronomy Observatory . . . . . [6267-25]

POSTER POPS

Room: Crystal Ballrooms: H . . . . . Thurs. 5:20 to 5:45 pm

3-minute presentations

First Light, Commissioning and Early Operations

✔ **Test observations and spectral analysis preparation for part LAMOST,** A. Luo, National Astronomical Observatories (China) . . . . . [6267-119]

✔ **A new setup for ground-based measurements of solar activity emission at 10μ,** A. M. Melo, Univ. Mackenzie Presbiteriana (Brazil) and Campinas State Univ. (Brazil); R. Marcon, Univ. Estadual de Campinas (Brazil) and Bernard Lyot Observatory (Brazil); P. Kaufmann, Univ. Mackenzie Presbiteriana (Brazil) and Ctr. for Semiconductor Components (Brazil); A. Marun, P. Pereyra, H. Levato, Complejo Astronómico El Leoncito (Argentina) . . . . . [6267-120]

✔ **New filters for NIR-MIR astronomy from Dome C: the case of AMICA,** G. Valentini, Osservatorio Astronomico di Teramo (Italy); D. Magrin, Osservatorio Astronomico di Padova (Italy); A. Riva, Osservatorio Astronomico di Brera (Italy); C. Bonoli, Osservatorio Astronomico di Padova (Italy); M. M. Dolci, G. Di Rico, Osservatorio Astronomico di Teramo (Italy) . [6267-121]

✔ **Meteorologic parameters analysis above Dome C made with ECMWF data,** K. Geissler, Max-Planck-Institut für Astronomie (Germany); E. Masciadri, Osservatorio Astrofisico Arcetri (Italy) . . . . . [6267-122]

✔ **The MMT all-sky camera,** T. E. Pickering, The Univ. of Arizona . . . [6267-123]

✔ **A collaborative site survey for astronomical observations in west China (Tibet),** T. Sasaki, National Astronomical Observatory of Japan/Subaru Telescope; M. Yoshida, National Astronomical Observatory of Japan (Japan); Y. Yao, G. Zhao, National Astronomical Observatories (China); N. Takato, K. Sekiguchi, F. Uraguchi, A. Miyashita, National Astronomical Observatory of Japan/Subaru Telescope (Japan); J. Wang, G. Yang, National Astronomical Observatories (China); N. Ohshima, National Astronomical Observatory of Japan/Subaru Telescope (Japan); N. Okada, National Astronomical Observatory of Japan (Japan); A. Kawai, National Astronomical Observatory of Japan/Subaru Telescope (Japan) . . . . . [6267-124]

✔ **Optical turbulence forecast: towards a new era of ground-based astronomy,** E. Masciadri, Osservatorio Astrofisico di Arcetri (Italy) . [6267-125]

✔ **A coordinated campaign to characterize the atmosphere for LSST science,** C. F. Claver, National Optical Astronomy Observatory; D. L. Burke, Stanford Linear Accelerator Ctr.; S. R. Heathcote, Cerro Tololo Inter-American Observatory (Chile); L. Rosenberg, S. Asztalos, Lawrence Livermore National Lab.; A. Becker, Univ. of Washington; M. C. Britton, B. L. Ellerbroek, California Institute of Technology; D. K. Gilmore, Stanford Linear Accelerator Ctr.; M. Hainout-Rouelle, Gemini Observatory; G. Jurnigann, Univ. of California/Berkeley; S. M. Kahn, Stanford Linear Accelerator Ctr.; V. L. Krabbendam, National Optical Astronomy Observatory; V. Margoniner, Univ. of California/Davis; D. G. Monet, U.S. Naval Observatory; J. R. Peterson, Stanford Linear Accelerator Ctr.; P. Pinto, The Univ. of Arizona/Steward Observatory; P. J. Puxley, Gemini Observatory; A. P. Rasmussen, Stanford Linear Accelerator Ctr.; J. Sebag, National Optical Astronomy Observatory; L. Simms, Stanford Linear Accelerator Ctr.; A. A. Tokovinin, Cerro Tololo Inter-American Observatory (Chile); J. A. Tyson, D. M. Wittman, Univ. of California/Davis . . . . . [6267-151]

Friday 26 May

SESSION 9

Room: Crystal Ballrooms: H . . . . . Fri. 8:00 to 10:00 am

Design of Telescopes to Operate in Antarctica

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

8:00 am: **LAPCAT: the Large Antarctic Plateau Clear-Aperture Telescope,** J. W. V. Storey, Univ. of New South Wales (Australia); J. R. P. Angel, The Univ. of Arizona/Steward Observatory; J. S. Lawrence, Univ. of New South Wales (Australia); P. M. Hinz, The Univ. of Arizona/Steward Observatory; M. C. B. Ashley, M. G. Burton, Univ. of New South Wales (Australia) . . . . . [6267-26]

8:20 am: **A large array of telescopes in Antarctica with all-sky imaging every 5 seconds,** D. G. York, The Univ. of Chicago; L. Wang, Lawrence Berkeley Lab.; C. R. Pennypacker, Univ. of California/Berkeley; X. Cui, Nanjing Institute of Astronomical Optics and Technology (China); E. Cappellaro, Osservatorio Astronomico di Padova (Italy); M. Blouke, Ball Aerospace & Technologies Corp.; D. Q. Lamb, Jr., The Univ. of Chicago; J. W. V. Storey, Univ. of New South Wales (Australia); R. Malina, Observatoire d'Astrophysique de Marseille Provence (France); M. C. B. Ashley, Univ. of New South Wales (Australia); S. Basa, Observatoire d'Astrophysique de Marseille Provence (France); X. Zhou, Beijing Astronomical Observatory (China); D. B. Sandford, The Univ. of Chicago [6267-36]

8:40 am: **An automated optical telescope for Dome A, Antarctica,** A. M. Moore, California Institute of Technology . . . . . [6267-28]

9:00 am: **The International Robotic Antarctic Infrared Telescope (IRAIT),** G. Tosti, M. Busso, F. Roncella, M. Bagaglia, G. Nucciarelli, M. Mariotti, S. Castellini, A. Mancini, Univ. degli Studi di Perugia (Italy); I. Di Varano, M. M. Dolci, Osservatorio di Teramo (Italy); O. Straniero, G. Valentini, G. Di Rico, M. Ragni, Osservatorio Astronomico di Teramo (Italy); C. A. Abia, I. Dominguez, Univ. de Granada (Spain); J. Isern, J. Colomé, Institut d'Estudis Espacials de Catalunya (Spain); F. M. Zerbi, V. De Caprio, Osservatorio Astronomico di Brera (Italy); F. Bortoletto, C. Bonoli, Osservatorio Astronomico di Padova (Italy) . . . . [6267-29]

9:20 am: **The AMICA (Antarctic multiwavelength infrared camera) project,** M. M. Dolci, O. Straniero, G. Valentini, G. Di Rico, M. Ragni, D. Pelusi, I. Di Varano, C. Giuliani, A. Di Cianno, A. Valentini, Osservatorio Astronomico di Teramo (Italy); L. Corcione, Osservatorio Astronomico di Torino (Italy); F. Bortoletto, M. D'Alessandro, C. Bonoli, E. Giro, D. Fantinel, D. Magrin, Osservatorio Astronomico di Padova (Italy); F. M. Zerbi, A. Riva, E. Molinari, P. Conconi, V. De Caprio, Osservatorio Astronomico di Brera (Italy); M. Busso, G. Tosti, G. Nucciarelli, F. Roncella, Univ. degli Studi di Perugia (Italy); C. A. Abia, Univ. de Granada (Spain) . . . . . [6267-30]

9:40 am: **2-m LAMOST-type telescope for the Antarctic,** X. Cui, Nanjing Institute of Astronomical Optics & Technology (China); Y. Zhao, National Astronomical Observatories (China); G. Li, Y. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-31]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 10

Room: Crystal Ballrooms: H . . . . . Fri. 10:30 to 11:50 am

Site Testing in Antarctica

Chair: **Charles F. Claver**, National Optical Astronomy Observatory

10:30 am: **A comparison of possible Antarctic telescope locations,** M. R. Swain, Max-Planck Institut for Astronomie (Germany) and Jet Propulsion Laboratory; H. Gallée, Lab. de Glaciologie et Géophysique de l'Environment (France) . . . . . [6267-32]

10:50 am: **Site testing Dome A, Antarctica,** J. S. Lawrence, M. C. B. Ashley, M. G. Burton, J. W. V. Storey, Univ. of New South Wales (Australia) . . . . [6267-33]

11:10 am: **Nigel and the optical sky brightness at Dome C, Antarctica,** S. L. Kenyon, M. C. B. Ashley, J. R. Everett, J. S. Lawrence, J. W. V. Storey, Univ. of New South Wales (Australia) . . . . . [6267-34]

11:30 am: **The Gattini cameras for optical sky-brightness measurements in Antarctica,** A. M. Moore, California Institute of Technology; E. Aristidi, Univ. de Nice Sophia Antipolis (France); M. C. B. Ashley, Univ. of New South Wales (Australia); M. Candidi, Istituto di Fisica dello Spazio Interplanetario (Italy); J. R. Everett, S. L. Kenyon, J. S. Lawrence, A. Phillips, Univ. of New South Wales (Australia); B. Le Roux, R. Ragazzoni, P. Salinari, Osservatorio Astrofisico di Arcetri (Italy); J. W. V. Storey, M. Taylor, Univ. of New South Wales (Australia); T. Travouillon, California Institute of Technology . . . . . [6267-154]

Lunch Break . . . . . 11:50 am to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 11

Room: Crystal Ballrooms: H . . . . . Sat. 8:00 to 10:00 am

Site Testing and Monitoring I

Chair: **Jeremy Wagner**, National Solar Observatory

8:00 am: **A satellite survey of cloud cover and water vapor in Morocco and southern Spain,** D. A. Erasmus, R. van Rooyen, South African Astronomical Observatory (South Africa) . . . . . [6267-35]

8:20 am: **Generalized SCIDAR measurements at La Silla Observatory,** T. Sadibekova, European Southern Observatory (Germany) and Univ. de Nice Sophia Antipolis (France); M. Le Louarn, M. S. Sarazin, European Southern Observatory (Germany); J. Vernin, Univ. de Nice Sophia Antipolis (France) . . . . . [6267-27]

8:40 am: **The Thirty Meter Telescope site testing robotic computer system,** R. L. Riddle, M. Schoeck, W. Skidmore, California Institute of Technology . . . . . [6267-37]

9:00 am: **LSST site evaluation,** J. Sebag, V. L. Krabbendam, C. F. Claver, J. Barr, J. Barr, A. Saha, National Optical Astronomy Observatory . . . . . [6267-38]

9:20 am: **Analysis of long and systematic campaigns of turbulence profiles with SCIDAR technique for adaptive optics,** J. J. Fuensalida, B. M. García-Lorenzo, J. M. Delgado, J. M. Rodríguez-González, C. K. Hoegemann, Instituto de Astrofísica de Canarias (Spain); E. González-Mendizábal, Instituto de Astrofísica de Canarias (Spain) and INAOE (Mexico); Á. Rodríguez-Hernández, J. Castro, M. Reyes, Instituto de Astrofísica de Canarias (Spain); J. Vernin, Univ. de Nice Sophia Antipolis (France) . . . . . [6267-39]

9:40 am: **High-accuracy DIMM measurements for the TMT site testing program,** L. Wang, Univ. of California/Irvine; M. Schoeck, W. Skidmore, Thirty Meter Telescope Project; E. B. Bustos, J. Seguel, R. D. Blum, Cerro Tololo Inter-American Observatory; G. A. Chanan, Univ. of California/Irvine . . . . . [6267-40]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 12

Room: Crystal Ballrooms: H . . . . . Sat. 10:30 am to 12:20 pm

Site Testing and Monitoring II

Chair: **Matt W. Johns**, Carnegie Observatories

10:30 am: **Site testing for the Advanced Technology Solar Telescope** *(Invited Paper)***,** F. Hill, Team, ATST Site Survey, National Solar Observatory . . . . . [6267-41]

11:00 am: **Measurements of the outer scale of turbulence with optical interferometers,** A. Quirrenbach, Univ. Leiden (Netherlands) . . . . . [6267-42]

11:20 am: **LIDAR system for monitoring turbulence profiles,** G. G. Gimmestad, D. W. Roberts, J. M. Stewart, J. W. Wood, M. W. Dawsey, Georgia Institute of Technology . . . . . [6267-43]

11:40 am: **Automatic determination of atmospheric turbulence wind profiles using wavelets,** B. M. García-Lorenzo, J. J. Fuensalida, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-44]

12:00 pm: **The altitude of the tropopause and its influence on the infrared quality of astronomical sites,** B. M. García-Lorenzo, Instituto de Astrofísica de Canarias (Spain); A. M. Eff-Darwich, Univ. de La Laguna (Spain); J. J. Fuensalida, C. Muñoz-Tuñón, A. M. Varela, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-45]

Lunch Break . . . . . 12:20 to 1:30 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 13

Room: Crystal Ballrooms: H . . . . . Sat. 2:35 to 4:35 pm

Site Testing and Monitoring III

Chair: **Anthony J. Beasley**, Atacama Large Millimeter Array (Chile)

2:35 pm: **Troposphere wind regimes and site topography effects at the Roque de los Muchachos Observatory,** A. M. Varela, C. Muñoz-Tuñón, B. M. García-Lorenzo, J. J. Fuensalida, Instituto de Astrofísica de Canarias (Spain) . . [6267-46]

2:55 pm: **Phase correction studies for ALMA,** J. S. Richer, A. Stirling, R. E. Hills, H. Smith, R. Williamson, Univ. of Cambridge (United Kingdom); R. S. Booth, M. Hagstrom, L. Pettersson, Chalmers Tekniska Högskola (Sweden) . . . [6267-47]

3:15 pm: **Evaluation of sonic anemometers as sensitive optical turbulence measuring for use in the TMT site testing program,** W. Skidmore, California Institute of Technology . . . . . [6267-48]

Coffee Break . . . . . 3:35 to 3:55 pm

3:55 pm: **The astronomical site survey in west China,** Y. Yao, G. Zhao, J. Wang, G. Yang, Y. Shi, J. Ma, J. Shi, E. Sawuti, National Astronomical Observatories (China); L. Tsering, X. Meng, Tibet Univ. (China) . . . . . [6267-49]

4:15 pm: **Measuring boundary layer turbulence with SODARs for the TMT site selection campaign,** T. Travouillon, California Institute of Technology . . [6267-50]

SESSION 14

Room: Crystal Ballrooms: H . . . . . Sat. 4:35 to 4:55 pm

Site Testing and Monitoring IV

Chair: **Donald W. Sweeney**, LSST Corp.

4:35 pm: **Low layer scidar first results,** R. Avila, Univ. Nacional Autónoma de México (Mexico) . . . . . [6267-53]

SESSION 15

Room: Crystal Ballrooms: H . . . . . Sat. 4:55 to 5:35 pm

Control of Local Seeing

Chair: **Donald W. Sweeney**, LSST Corp.

4:55 pm: **Controlling wavefront distortions across a thermal boundary,** R. P. Hubbard, T. R. Rimmele, W. Schoening, N. E. Dalrymple, National Solar Observatory; G. A. Poczulp, National Optical Astronomy Observatory; M. Warner, National Solar Observatory . . . . . [6267-54]

5:15 pm: **TMT studies on the influence of short-term changes of local thermodynamic conditions on the seeing: CFD versus observations,** S. Els, K. Vogiatzis, National Optical Astronomy Observatory; T. Travouillon, California Institute of Technology . . . . . [6267-55]

Conference presentations will resume Monday 29 May

Monday 29 May

SESSION 16

Room: Crystal Ballrooms: H . . . . . Mon. 8:30 to 10:00 am

Future Giant Telescopes I

Chair: **Larry M. Stepp**, Association of Universities for Research in Astronomy

8:30 am: **The OWL concept** *(Invited Paper)***,** R. Gilmozzi, European Southern Observatory (Germany) . . . . . [6267-56]

9:00 am: **Euro50: an alternative European ELT,** A. L. Ardeberg, T. E. Andersen, M. Owner-Petersen, A. Enmark, J. Beckers, P. Linde, Lund Univ. (Sweden); G. Sandberg, J. Cramer, Lunds Tekniska Högskola (Sweden); P. A. Knutsson, Lund Univ. (Sweden) . . . . . [6267-57]

9:20 am: **Scientific requirements for the European ELT,** I. M. Hook, G. B. Dalton, Univ. of Oxford (United Kingdom); R. Gilmozzi, European Southern Observatory (Germany) . . . . . [6267-58]

9:40 am: **Floating sphere telescope: a new design for a 40-m Extremely Large Telescope,** G. Marchiori, F. Rampini, European Industrial Engineering s.r.l. (Italy); P. Salinari, C. Del Vecchio, Osservatorio Astrofisico di Arcetri (Italy) . . . . [6267-59]

POSTER POPS

Room: Crystal Ballrooms: H . . . . . Mon. 10:00 to 10:10 am

3-minute presentations

Future Giant Telescopes I

✔ **Monitoring the night sky with the Cerro Tololo all-sky camera for the TMT and LSST projects,** D. E. Walker, H. E. Schwarz, E. B. Bustos, Cerro Tololo Inter-American Observatory (Chile) . . . . . [6267-51]

✔ **The concept design of the Cornell Caltech Atacama Telescope (CCAT) mount,** D. T. Finley, VertexRSI; A. Gienger, Horizon Systems, Inc.; E. O. Reese, K. G. Hermann, VertexRSI . . . . . [6267-127]

✔ **TMT Telescope structure system: design and development,** K. Szeto, National Research Council Canada (Canada) and Thirty Meter Telescope Project; S. C. Roberts, S. Sun, National Research Council Canada (Canada); L. M. Stepp, Association of Universities for Research in Astronomy; J. E. Nelson, Univ. of California/Santa Cruz; M. H. Gedig, W. Brzezik, N. P. Loewen, D. Tsang, AMEC Dynamic Structures Ltd. (Canada) . . . . . [6267-128]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 17
Room: Crystal Ballrooms: H . . . . . Mon. 10:40 am to 12:20 pm

Future Giant Telescopes II

Chair: **Torben E. Andersen**, Lunds Univ./Lund Observatory (Sweden)

10:40 am: **TMT status report** *(Invited Paper)*, J. E. Nelson, Univ. of California/Santa Cruz; G. H. Sanders, Thirty Meter Telescope Project . . . . . [6267-60]

11:10 am: **The Giant Magellan Telescope (GMT)** *(Invited Paper)*, M. W. Johns, Carnegie Observatories . . . . . [6267-61]

11:40 am: **Exoplanet imaging with the Giant Magellan Telescope,** J. R. P. Angel, J. L. Codona, P. M. Hinz, L. M. Close, The Univ. of Arizona/Steward Observatory . . . . . [6267-62]

12:00 pm: **Mount control system for the CFGT,** X. Xu, Z. Dong, W. Zhou, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-63]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 18
Room: Crystal Ballrooms: H . . . . . Mon. 1:30 to 3:30 pm

Future Giant Telescopes III

Chair: **Philippe Dierickx**, European Southern Observatory (Germany)

1:30 pm: **The Cornell Caltech Atacama Telescope (CCAT): a 25-meter aperture telescope above 5000 meters altitude** *(Invited Paper)*, T. A. Sebring, R. Giovanelli, Cornell Univ.; S. J. Radford, California Institute of Technology . . . . . [6267-64]

2:00 pm: **The square kilometer array** *(Invited Paper)*, Y. Terzian, Cornell Univ. . . . . [6267-65]

2:30 pm: **A large single-aperture telescope for submillimeter astronomy,** W. S. Holland, R. J. Ivison, W. R. F. Dent, I. Robson, A. J. Longmore, T. G. Hawarden, The Royal Observatory Edinburgh (United Kingdom); J. S. Greaves, Univ. of St Andrews (United Kingdom); J. S. Dunlop, Univ. of Edinburgh (United Kingdom) . . . . . [6267-66]

2:50 pm: **Optical design of CCAT,** G. Cortes-Medellin, T. L. Herter, Cornell Univ. . . . . [6267-67]

3:10 pm: **Why not exposed extreme large telescopes?,** H. J. Kärcher, MT Aerospace AG (Germany) . . . . . [6267-68]

Coffee Break . . . . . 3:30 to 4:00 pm

SESSION 19
Room: Crystal Ballrooms: H . . . . . Mon. 4:00 to 5:20 pm

Future Giant Telescopes IV

Chair: **Anthony J. Beasley**, Atacama Large Millimeter Array (Chile)

4:00 pm: **Conceptual design study of the GMT enclosure,** J. Terán, D. H. Neff, M3 Engineering & Technology Corp.; M. W. Johns, Carnegie Observatories . . . . . [6267-69]

4:20 pm: **Enclosure trade studies for the Thirty Meter Telescope,** A. Vasiljevic, Association of Canadian Universities for Research in Astronomy (Canada); N. P. Loewen, AMEC Dynamic Structures Ltd. (Canada); J. T. Fitzsimmons, National Research Council Canada (Canada) . . . . . [6267-70]

4:40 pm: **Feasibility study of Calotte enclosure for Cornell Caltech Atacama Telescope,** N. P. Loewen, W. Brzezik, D. J. Halliday, AMEC Dynamic Structures Ltd. (Canada); T. A. Sebring, Cornell Univ. . . . . [6267-71]

5:00 pm: **Eyelid system for telescope protection,** G. Murga, J. L. Ruiz, A. Vizcargüenaga, J. Pan, Ingeniería, Arquitectura y Consultoría S.A. (Spain) . . . . . [6267-72]

Tuesday 30 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy

Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 20
Room: Crystal Ballrooms: H . . . . . Tues. 9:35 to 10:35 am

Future Giant Telescopes V

Chair: **Thomas A. Sebring**, Cornell Univ.

9:35 am: **30-m Ringy Interferometric Telescope,** Z. Liu, Z. Jin, Y. Li, J. Lin, Yunnan Observatory (China) . . . . . [6267-73]

9:55 am: **Experimental verification of the virtual wavefront sensor concept,** A. V. Goncharov, M. N. Devaney, National Univ. of Ireland/Galway (Ireland); S. Esposito, Istituto Nazionale di Astrofisica (Italy); C. J. Dainty, National Univ. of Ireland/Galway (Ireland) . . . . . [6267-74]

10:15 am: **Extreme adaptive optics correction of the wavefront distortions induced by segments misalignment in ELT,** N. Yaitskova, C. Verinaud, European Southern Observatory (Germany) . . . . . [6267-75]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 21
Room: Crystal Ballrooms: H . . . . . Tues. 11:00 am to 12:20 pm

Segmented Mirror Measurement and Control I

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

11:00 am: **An edge sensor design for the Thirty Meter Telescope,** T. S. Mast, Univ. of California/Santa Cruz; G. A. Chanan, Univ. of California/Irvine; J. E. Nelson, Univ. of California/Santa Cruz; R. H. Minor, R. C. Jared, Lawrence Berkeley National Lab. . . . . [6267-76]

11:20 am: **Design and preliminary test of a primary mirror segment positioning actuator for the Thirty Meter Telescope,** K. R. Lorell, J. Aubrun, S. W. Miller, Marjan Research; R. R. Clappier, Clappier Consulting . . . . . [6267-77]

11:40 am: **Development of a novel actuator concept for position control of segmented mirrors of ELT,** H. Janssen, R. Geurink, M. Teuwen, B. v. Bree, Janssen Precision Engineering B.V. (Netherlands) . . . . . [6267-78]

12:00 pm: **The alignment and phasing system for the Thirty Meter Telescope,** G. A. Chanan, Univ. of California/Irvine and Thirty Meter Telescope Project; M. Troy, Jet Propulsion Lab. and Thirty Meter Telescope Project; J. E. Nelson, Univ. of California/Santa Cruz and Thirty Meter Telescope Project; T. S. Mast, Univ. of California/Santa Cruz . . . . . [6267-79]

Lunch Break . . . . . 12:20 to 1:40 pm

SESSION 22
Room: Crystal Ballrooms: H . . . . . Tues. 1:40 to 2:40 pm

Segmented Mirror Measurement and Control II

Chair: **Javier Castro López-Tarruella**,
Instituto de Astrofísica de Canarias (Spain)

1:40 pm: **Laser metrology sensing and control for large segmented-mirror telescopes,** F. Zhao, S. Rao, A. Ksendzov, H. Kadogawa, Jet Propulsion Lab. . . . . [6267-81]

2:00 pm: **Active surface segmentation analysis of CCAT,** G. Cortes-Medellin, Cornell Univ. . . . . [6267-82]

2:20 pm: **Phase ambiguity solution with the pyramid phasing sensor,** E. Pinna, S. Esposito, A. T. Puglisi, A. Tozzi, L. Busoni, P. Stefanini, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6267-83]

POSTER POPS
Room: Crystal Ballrooms: H . . . . . Tues. 2:40 to 3:00 pm

3-minute presentations

Segmented Mirror Measurement and Control I

✔ **DIPSI: the diffraction image phase sensing instrument for APE,** L. Montoya, M. Reyes, A. Schumacher, E. Hernández, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-130]

✔ **Shack-Hartmann sensor for the active phasing experiment,** F. Y. J. Gonte, L. Noethe, C. Araujo, F. J. Derie, European Southern Observatory (Germany) . . . . . [6267-131]

✔ **ZEUS: a cophasing sensor based on the Zernike phase contrast method,** K. Dohlen, M. Langlois, P. Lanzoni, S. P. Mazzanti, Observatoire Astronomique de Marseille-Provence (France); L. Montoya, M. Reyes, Instituto de Astrofísica de Canarias (Spain); I. Surdej, N. Yaitskova, European Southern Observatory (Germany) . . . . . [6267-132]

✔ **Experimental research on the sampling point number of LAMOST active optics wavefront test,** Y. Zhang, Y. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-133]

✔ **Calculation algorithm of sloping bundles in a mirror-lens telescope based on an afocal two-mirror system,** I. V. Ermakov, D. T. Puryayev, Bauman Moscow State Technical Univ. (Russia) . . . . . [6267-135]

Coffee Break . . . . . 3:00 to 3:40 pm

SESSION 23

Room: Crystal Ballrooms: H . . . . . Tues. 3:40 to 4:40 pm

Segmented Mirror Measurements and Control III

Chair: **Torben E. Andersen**, Lunds Univ./Lund Observatory (Sweden)

3:40 pm: **The active phasing experiment part I: concept and objectives,** N. Yaitskova, F. J. Derie, F. Y. J. Gonte, L. Noethe, I. Surdej, R. Karban, European Southern Observatory (Germany); K. Dohlen, M. Langlois, Observatoire Astronomique de Marseille-Provence (France); S. Esposito, E. Pinna, Osservatorio Astrofisico di Arcetri (Italy); M. Reyes, L. Montoya, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-84]

4:00 pm: **The active phasing experiment part II: design and development,** F. Y. J. Gonte, N. Yaitskova, F. J. Derie, C. Araujo, R. Brast, B. Delabre, P. Dierickx, C. Dupuy, C. Frank, S. Guisard, R. Karban, L. Noethe, I. Surdej, European Southern Observatory (Germany); R. C. Wilhelm, Fogale Nanotech (France); M. Reyes, Instituto de Astrofísica de Canarias (Spain); S. Esposito, Istituto Nazionale di Astrofisica (Italy); M. Langlois, Observatoire Astronomique de Marseille-Provence (France) . . . . . [6267-85]

4:20 pm: **Shape measurements of a segmented mirror with nanometer accuracy: the APE internal metrology,** R. C. Wilhelm, A. Courteville, Fogale nanotech (France); F. Y. J. Gonté, European Southern Observatory (Germany) . . . . . [6267-86]

POSTER POPS

Room: Crystal Ballrooms: H . . . . . Tues. 4:40 to 5:25 pm

3-minute presentations

Segmented Mirror Measurement and Control II

✔ **Results from the capacitive edge sensing system for the active alignment of the SALT primary mirror,** H. Gajjar, J. Swiegers, South African Astronomical Observatory (South Africa); D. Roziere, A. Courteville, S. Buous, B. Luong, Fogale Nanotech (France); J. Menzies, South African Astronomical Observatory (South Africa) . . . . . [6267-80]

✔ **APE segment pattern recognition in new phasing techniques,** I. Surdej, E. Koenig, B. Vandame, N. Yaitskova, European Southern Observatory (Germany) . . . . . [6267-87]

✔ **VISTA Telescope mount: factory testing prior to optics integration,** P. F. Jeffers, B. Stobie, The Royal Observatory Edinburgh (United Kingdom); K. G. Hermann, B. McCreight, General Dynamics Corp. . . . . [6267-136]

✔ **Pointing model for LAMOST experiment set,** H. Wang, Nanjing Institute of Astronomical Optics & Technology (China); Y. Zhao, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-137]

✔ **The Large Binocular Telescope main axis encoders,** S. P. Callahan, D. S. Ashby, T. Hair, J. G. Brynnel, S. Donovan, F. Dionies, The Univ. of Arizona . . . . . [6267-138]

✔ **The Advanced Technology Solar Telescope mount assembly,** M. Warner, National Solar Observatory; M. K. Cho, National Optical Astronomy Observatory; N. E. Dalrymple, B. D. Goodrich, E. R. Hansen, R. P. Hubbard, National Solar Observatory; J. P. Lee, City of Lawton; J. Wagner, National Solar Observatory . . . . . [6267-139]

✔ **Evolution of a co-rotating telescope enclosure for survey applications,** A. Seedsman, EOS Space Systems Pty. Ltd. (Australia) . . . . . [6267-140]

✔ **The Advanced Technology Solar Telescope enclosure,** L. Phelps, National Solar Observatory; J. Barr, National Optical Astronomy Observatory; N. E. Dalrymple, National Solar Observatory; M. Fraser, M3 Engineering & Technology Corp.; E. R. Hansen, R. P. Hubbard, J. Wagner, M. Warner, National Solar Observatory; M. Yalcintas, AMEL Technologies, Inc. . . . . [6267-141]

✔ **Enclosures for a 100-m telescope: baseline conceptual design and alternatives,** M. Quattri, European Southern Observatory (Germany) [6267-142]

✔ **Concept design study of the CCAT facilities,** J. Terán, D. H. Neff, M3 Engineering & Technology Corp.; T. A. Sebring, Cornell Univ. . . . . [6267-143]

✔ **Trajectory planning of cable-suspended parallel robot based on cycloidal motion,** P. Zhuang, Z. Yao, F. Zhou, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-144]

✔ **The feasibility of upgrading the USNO 61" astrometric reflector to a 3.5-m telescope,** M. DiVittorio, U.S. Naval Observatory; G. Pentland, EOS Technologies Inc.; K. Harris, Jr., EOS Technologies, Inc. . . . . [6267-145]

✔ **Improvement of the pointing accuracy of the Subaru Telescope by suppressing vibrations,** T. Kanzawa, D. Tomono, T. Usuda, N. Takato, S. Negishi, S. Sugahara, National Astronomical Observatory of Japan/Subaru Telescope; N. Ito, Mitsubishi Electric Corp. (Japan) . . . . . [6267-146]

✔ **Subaru Telescope: improved performance of Az drive,** S. Negishi, T. Kanzawa, T. Usuda, N. Ohshima, K. Namikawa, National Astronomical Observatory of Japan/Subaru Telescope; T. Ogasawara, N. Itoh, Mitsubishi Electric Corp. (Japan) . . . . . [6267-147]

✔ **Telescope image quality improvement: the 3m60 status,** A. Gilliotte, European Southern Observatory (Chile) . . . . . [6267-148]

✔ **JCMT Telescope structure modifications and facility upgrades for Scuba-2 instrument,** T. Chylek, S. C. Craig, T. C. Chuter, Joint Astronomy Ctr.; H. J. Lewsley, M3 Engineering & Technology Corp.; E. A. Hileman, National Optical Astronomy Observatory . . . . . [6267-149]

✔ **CTIO V. M. Blanco 4-m Telescope and the Dark Energy survey,** T. M. C. Abbott, R. Catarutti, E. Mondaca, A. Montane, G. Schumacher, R. Tighe, A. R. Walker, National Optical Astronomy Observatory; D. Allspach, H. Cease, B. Flaugher, Fermi National Accelerator Lab.; J. Peoples, National Optical Astronomy Observatory; A. Stefanik, Fermi National Accelerator Lab.; J. J. Thaler, Univ. of Illinois at Urbana-Champaign . . . . . [6267-150]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

Ground-based Telescope Projects I

✔ **The Magdalena Ridge Observatory 2.4-m Telescope,** G. Pentland, K. Gonzales, EOS Technologies, Inc.; E. V. Ryan, New Mexico Institute of Mining and Technology; K. Harris, Jr., EOS Technologies, Inc. . . . . [6267-104]

✔ **Progress in the ULTRA 1-m Ground-based Telescope,** R. C. Romeo, R. N. Martin, Composite Mirror Applications, Inc.; B. Twarog, B. Anthony-Twarog, R. Taghavi, R. C. Hale, Univ. of Kansas; P. Etzel, San Diego State Univ.; R. A. Fesen, Dartmouth College; S. Shawl, Univ. of Kansas . . . . . [6267-105]

✔ **The Skymapper Telescope,** A. Rakich, M. Blundell, EOS Space Systems Pty. Ltd. (Australia); R. Brunswick, G. Pentland, J. Waltho, T. D. Ferguson, EOS Technologies, Inc. . . . . [6267-106]

Ground-based Telescope Projects II

✔ **Future installations of ground based gamma-ray telescopes,** F. Aharonian, Max-Planck-Institut für Kernphysik (Germany); D. Horns, E. Kendziorra, A. E. Santangelo, Univ. Tübingen (Germany) . . . . . [6267-108]

✔ **Automated 1.3-m near-infrared telescope system triggered by gamma-ray burst,** D. Yonetoku, T. Murakami, Kanazawa Univ. (Japan); Y. Kobayashi, National Astronomical Observatory of Japan (Japan); T. Nakagawa, H. Murakami, Japan Aerospace Exploration Agency (Japan); S. Okuno, H. Masui, S. Kinoshita, H. Kodaira, S. Yoshinari, Kanazawa Univ. (Japan); T. Nakamura, Kyoto Univ. (Japan) . . . . . [6267-109]

✔ **Ground-based gamma-ray observations with H.E.S.S.: status and future,** D. Horns, Univ. Tübingen (Germany); H. Collaboration, German-French-English-British-Namibian-Czech-Armenian-South African Consortium (Germany) . . . . . [6267-110]

✔ **BOOTES-IR: near-IR observations by a robotic system in southern Spain,** A. J. Castro-Tirado, A. de Ugarte Postigo, M. Martin Jelínek, R. Cunniffe, S. Castillo Carrión, Instituto de Astrofísica de Andalucía (Spain); P. Kubánek, INTEGRAL Science Data Ctr. (Czech Republic); J. Gorosabel, S. Vitek, Instituto de Astrofísica de Andalucía (Spain); F. M. Zerbi, A. Riva, V. De Caprio, Osservatorio Astronomico di Brera (Italy); P. J. Amado, C. Cárdenas, A. Claret, S. Martín, M. A. Sánchez, Instituto de Astrofísica de Andalucía (Spain); P. García Teodoro, Univ. de Granada (Spain); J. M. Castro Cerón, Univ. of Copenhagen (Denmark); J. Díaz Verdejo, J. M. López Soler, Univ. de Granada (Spain); J. Á. Berná Galiano, Univ. de Alicante (Spain); J. Casares, Instituto de Astrofísica de Canarias (Spain); J. Fabregat, Univ. de València (Spain); C. Sánchez Fernández, European Space Astronomy Ctr. (Spain); P. Conconi, Osservatorio Astronomico di Brera (Italy); S. Guziy, Instituto de Astrofísica de Andalucía (Spain); F. Vitali, Osservatorio Astronomico di Roma (Italy); T. d. J. Mateo Sanguino, Univ. Politécnica de la Rábida (Spain); J. M. Trigo i Rodriguez, Institut d'Estudis Espacials de Catalunya (Spain); M. D. Sabau-Graziati, Instituto Nacional de Técnica Aeroespacial (Spain) . . . . . [6267-111]

✔ **Microthermal measurements of the surface layer and its contribution to the seeing,** J. C. Guerra, Isaac Newton Group of Telescopes (Spain); R. W. Wilson, Univ. of Durham (United Kingdom) . . . . . [6267-112]

✔ **Improvement of the thermal environment around the Subaru Telescope enclosure,** A. Miyashita, Y. Mikami, N. Takato, T. Nishimura, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6267-113]

✔ **Integrating seeing measurements into the operations of solar telescopes,** C. J. Denker, A. P. Verdoni, New Jersey Institute of Technology . . . . [6267-114]

✔ **The thermal control of the New Solar Telescope at Big Bear Observatory,** A. P. Verdoni, C. J. Denker, New Jersey Institute of Technology . . . . [6267-115]

✔ **The DIMM station at Subaru Telescope,** F. Uraguchi, N. Takato, A. Miyashita, T. Usuda, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6267-116]

✔ **Removing the dome turbulence effect from SCIDAR data: a method using evenness properties with Fourier transform,** J. J. Fuensalida, B. M. García-Lorenzo, C. K. Hoegemann, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-117]

✔ **URAT: astrometric requirements and design history,** N. Zacharias, U.S. Naval Observatory; U. Laux, Thüringer Landessternwarte Tautenburg (Germany); A. Rakich, EOS Space Systems Pty. Ltd. (Australia); H. W. Epps, Univ. of California/Santa Cruz . . . . . [6267-134]

Airborne Telescopes

✔ **The SOFIA cavity door: configuration, operation, and potential science implications,** E. F. Erickson, NASA Ames Research Ctr. . . . . [6267-118]

✔ **On sky testing and preliminary sensor alignment for the SOFIA Telescope,** F. Harms, Univ. Stuttgart (Germany); P. G. Waddell, Universities Space Research Association; M. Suess, MT Aerospace AG (Germany); H. P. Röser, Univ. Stuttgart (Germany) . . . . . [6267-153]

First Light, Commissioning and Early Operations

✔ **Test observations and spectral analysis preparation for part LAMOST,** A. Luo, National Astronomical Observatories (China) . . . . . [6267-119]

✔ **A new setup for ground-based measurements of solar activity emission at 10μ,** A. M. Melo, Univ. Mackenzie Presbiteriana (Brazil) and Campinas State Univ. (Brazil); R. Marcon, Univ. Estadual de Campinas (Brazil) and Bernard Lyot Observatory (Brazil); P. Kaufmann, Univ. Mackenzie Presbiteriana (Brazil) and Ctr. for Semiconductor Components (Brazil); A. Marun, P. Pereyra, H. Levato, Complejo Astronómico El Leoncito (Argentina) . . . . . [6267-120]

✔ **New filters for NIR-MIR astronomy from Dome C: the case of AMICA,** G. Valentini, Osservatorio Astronomico di Teramo (Italy); D. Magrin, Osservatorio Astronomico di Padova (Italy); A. Riva, Osservatorio Astronomico di Brera (Italy); C. Bonoli, Osservatorio Astronomico di Padova (Italy); M. M. Dolci, G. Di Rico, Osservatorio Astronomico di Teramo (Italy) . [6267-121]

✔ **Meteorologic parameters analysis above Dome C made with ECMWF data,** K. Geissler, Max-Planck-Institut für Astronomie (Germany); E. Masciadri, Osservatorio Astrofisico Arcetri (Italy) . . . . . [6267-122]

✔ **The MMT all-sky camera,** T. E. Pickering, The Univ. of Arizona . . . [6267-123]

✔ **A collaborative site survey for astronomical observations in west China (Tibet),** T. Sasaki, National Astronomical Observatory of Japan/Subaru Telescope; M. Yoshida, National Astronomical Observatory of Japan (Japan); Y. Yao, G. Zhao, National Astronomical Observatories (China); N. Takato, K. Sekiguchi, F. Uraguchi, A. Miyashita, National Astronomical Observatory of Japan/Subaru Telescope (Japan); J. Wang, G. Yang, National Astronomical Observatories (China); N. Ohshima, National Astronomical Observatory of Japan/Subaru Telescope (Japan); N. Okada, National Astronomical Observatory of Japan (Japan); A. Kawai, National Astronomical Observatory of Japan/Subaru Telescope (Japan) . . . . . [6267-124]

✔ **Optical turbulence forecast: towards a new era of ground-based astronomy,** E. Masciadri, Osservatorio Astrofisico di Arcetri (Italy) . [6267-125]

✔ **A coordinated campaign to characterize the atmosphere for LSST science,** C. F. Claver, National Optical Astronomy Observatory; D. L. Burke, Stanford Linear Accelerator Ctr.; S. R. Heathcote, Cerro Tololo Inter-American Observatory (Chile); L. Rosenberg, S. Asztalos, Lawrence Livermore National Lab.; A. Becker, Univ. of Washington; M. C. Britton, B. L. Ellerbroek, California Institute of Technology; D. K. Gilmore, Stanford Linear Accelerator Ctr.; M. Hainout-Rouelle, Gemini Observatory; G. Jurnigann, Univ. of California/Berkeley; S. M. Kahn, Stanford Linear Accelerator Ctr.; V. L. Krabbendam, National Optical Astronomy Observatory; V. Margoniner, Univ. of California/Davis; D. G. Monet, U.S. Naval Observatory; J. R. Peterson, Stanford Linear Accelerator Ctr.; P. Pinto, The Univ. of Arizona/Steward Observatory; P. J. Puxley, Gemini Observatory; A. P. Rasmussen, Stanford Linear Accelerator Ctr.; J. Sebag, National Optical Astronomy Observatory; L. Simms, Stanford Linear Accelerator Ctr.; A. A. Tokovinin, Cerro Tololo Inter-American Observatory (Chile); J. A. Tyson, D. M. Wittman, Univ. of California/Davis . . . . . [6267-151]

Future Giant Telescopes I

✔ **Monitoring the night sky with the Cerro Tololo all-sky camera for the TMT and LSST projects,** D. E. Walker, H. E. Schwarz, E. B. Bustos, Cerro Tololo Inter-American Observatory (Chile) . . . . . [6267-51]

✔ **The concept design of the Cornell Caltech Atacama Telescope (CCAT) mount,** D. T. Finley, VertexRSI; A. Gienger, Horizon Systems, Inc.; E. O. Reese, K. G. Hermann, VertexRSI . . . . . [6267-127]

✔ **TMT Telescope structure system: design and development,** K. Szeto, National Research Council Canada (Canada) and Thirty Meter Telescope Project; S. C. Roberts, S. Sun, National Research Council Canada (Canada); L. M. Stepp, Association of Universities for Research in Astronomy; J. E. Nelson, Univ. of California/Santa Cruz; M. H. Gedig, W. Brzezik, N. P. Loewen, D. Tsang, AMEC Dynamic Structures Ltd. (Canada) . . [6267-128]

Segmented Mirror Measurement and Control I

✔ **DIPSI: the diffraction image phase sensing instrument for APE,** L. Montoya, M. Reyes, A. Schumacher, E. Hernández, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-130]

✔ **Shack-Hartmann sensor for the active phasing experiment,** F. Y. J. Gonte, L. Noethe, C. Araujo, F. J. Derie, European Southern Observatory (Germany) . . . . . [6267-131]

✔ **ZEUS: a cophasing sensor based on the Zernike phase contrast method,** K. Dohlen, M. Langlois, P. Lanzoni, S. P. Mazzanti, Observatoire Astronomique de Marseille-Provence (France); L. Montoya, M. Reyes, Instituto de Astrofísica de Canarias (Spain); I. Surdej, N. Yaitskova, European Southern Observatory (Germany) . . . . . [6267-132]

✔ **Experimental research on the sampling point number of LAMOST active optics wavefront test,** Y. Zhang, Y. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-133]

✔ **Calculation algorithm of sloping bundles in a mirror-lens telescope based on an afocal two-mirror system,** I. V. Ermakov, D. T. Puryayev, Bauman Moscow State Technical Univ. (Russia) . . . . . [6267-135]

Segmented Mirror Measurement and Control II

✔ **Results from the capacitive edge sensing system for the active alignment of the SALT primary mirror,** H. Gajjar, J. Swiegers, South African Astronomical Observatory (South Africa); D. Roziere, A. Courteville, S. Buous, B. Luong, Fogale Nanotech (France); J. Menzies, South African Astronomical Observatory (South Africa) . . . . . [6267-80]

✔ **APE segment pattern recognition in new phasing techniques,** I. Surdej, E. Koenig, B. Vandame, N. Yaitskova, European Southern Observatory (Germany) . . . . . [6267-87]

✔ **VISTA Telescope mount: factory testing prior to optics integration,** P. F. Jeffers, B. Stobie, The Royal Observatory Edinburgh (United Kingdom); K. G. Hermann, B. McCreight, General Dynamics Corp. . . . . [6267-136]

✔ **Pointing model for LAMOST experiment set,** H. Wang, Nanjing Institute of Astronomical Optics & Technology (China); Y. Zhao, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-137]

✔ **The Large Binocular Telescope main axis encoders,** S. P. Callahan, D. S. Ashby, T. Hair, J. G. Brynnel, S. Donovan, F. Dionies, The Univ. of Arizona . . . . . [6267-138]

✔ **The Advanced Technology Solar Telescope mount assembly,** M. Warner, National Solar Observatory; M. K. Cho, National Optical Astronomy Observatory; N. E. Dalrymple, B. D. Goodrich, E. R. Hansen, R. P. Hubbard, National Solar Observatory; J. P. Lee, City of Lawton; J. Wagner, National Solar Observatory . . . . . [6267-139]

✔ **Evolution of a co-rotating telescope enclosure for survey applications,** A. Seedsman, EOS Space Systems Pty. Ltd. (Australia) . . . . . [6267-140]

✔ **The Advanced Technology Solar Telescope enclosure,** L. Phelps, National Solar Observatory; J. Barr, National Optical Astronomy Observatory; N. E. Dalrymple, National Solar Observatory; M. Fraser, M3 Engineering & Technology Corp.; E. R. Hansen, R. P. Hubbard, J. Wagner, M. Warner, National Solar Observatory; M. Yalcintas, AMEL Technologies, Inc. . . . . [6267-141]

✔ **Enclosures for a 100-m telescope: baseline conceptual design and alternatives,** M. Quattri, European Southern Observatory (Germany) [6267-142]

✔ **Concept design study of the CCAT facilities,** J. Terán, D. H. Neff, M3 Engineering & Technology Corp.; T. A. Sebring, Cornell Univ. . . . . [6267-143]

✔ **Trajectory planning of cable-suspended parallel robot based on cycloidal motion,** P. Zhuang, Z. Yao, F. Zhou, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6267-144]

✔ **The feasibility of upgrading the USNO 61" astrometric reflector to a 3.5-m telescope,** M. DiVittorio, U.S. Naval Observatory; G. Pentland, EOS Technologies Inc.; K. Harris, Jr., EOS Technologies, Inc. . . . . [6267-145]

✔ **Improvement of the pointing accuracy of the Subaru Telescope by suppressing vibrations,** T. Kanzawa, D. Tomono, T. Usuda, N. Takato, S. Negishi, S. Sugahara, National Astronomical Observatory of Japan/Subaru Telescope; N. Ito, Mitsubishi Electric Corp. (Japan) . . . . . [6267-146]

✔ **Subaru Telescope: improved performance of Az drive,** S. Negishi, T. Kanzawa, T. Usuda, N. Ohshima, K. Namikawa, National Astronomical Observatory of Japan/Subaru Telescope; T. Ogasawara, N. Itoh, Mitsubishi Electric Corp. (Japan) . . . . . [6267-147]

✔ **Telescope image quality improvement: the 3m60 status,** A. Gilliotte, European Southern Observatory (Chile) . . . . . [6267-148]

✔ **JCMT Telescope structure modifications and facility upgrades for Scuba-2 instrument,** T. Chylek, S. C. Craig, T. C. Chuter, Joint Astronomy Ctr.; H. J. Lewsley, M3 Engineering & Technology Corp.; E. A. Hileman, National Optical Astronomy Observatory . . . . . [6267-149]

✔ **CTIO V. M. Blanco 4-m Telescope and the Dark Energy survey,** T. M. C. Abbott, R. Catarutti, E. Mondaca, A. Montane, G. Schumacher, R. Tighe, A. R. Walker, National Optical Astronomy Observatory; D. Allspach, H. Cease, B. Flaugher, Fermi National Accelerator Lab.; J. Peoples, National Optical Astronomy Observatory; A. Stefanik, Fermi National Accelerator Lab.; J. J. Thaler, Univ. of Illinois at Urbana-Champaign . . . . . [6267-150]

Wednesday 31 May

SESSION 24

Room: Crystal Ballrooms: H . . . . . Wed. 8:00 to 9:20 am

Telescope Mechanics

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

8:00 am: **Assembly and tests of the GTC 10-m telescope mechanics,** L. Cavaller, B. Siegel, Instituto de Astrofísica de Canarias (Spain) . . . . . [6267-88]

8:20 am: **LSST telescope mount concept,** D. R. Neill, National Optical Astronomy Observatory . . . . . [6267-89]

8:40 am: **Vortex shedding from a 12-m antenna,** N. Ukita, M. Saito, B. Ikenoue, National Astronomical Observatory of Japan (Japan); J. G. Mangum, N. Emerson, A. Otarola, National Radio Astronomy Observatory . . . . . [6267-90]

9:00 am: **Characterization of the lightweight telescope developed for the NPOI,** J. R. Andrews, C. C. Wilcox, S. R. Restaino, T. Martinez, Naval Research Lab.; S. W. Teare, New Mexico Institute of Mining and Technology; F. Santiago, Univ. de Puerto Rico Mayagüez . . . . . [6267-91]

SESSION 25

Room: Crystal Ballrooms: H . . . . . Wed. 9:20 to 10:00 am

New Telescope Concepts I

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

9:20 am: **Towards the arrival of SZ cluster surveys: the arcminute microkelvin imager small array (AMI-SA),** T. Kaneko, Univ. of Cambridge (United Kingdom) . . . . . [6267-152]

9:40 am: **A global network of robotic telescopes,** P. C. Rees, A. G. Mansfield, Telescope Technologies Ltd. (United Kingdom); S. Taylor, W. Rosing, Las Cumbres Observatory . . . . . [6267-93]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 26

Room: Crystal Ballrooms: H . . . . . Wed. 10:30 to 10:50 am

New Telescope Concepts II

Chair: **Charles F. Claver**, National Optical Astronomy Observatory

10:30 am: **The second-generation CCD/transit instrument (CTI-II) precision astrometric and photometric survey,** J. T. McGraw, M. R. Ackermann, W. H. Gerstle, W. T. Williams, P. C. Zimmer, The Univ. of New Mexico . . [6267-94]

SESSION 27

Room: Crystal Ballrooms: H . . . . . Wed. 10:50 am to 12:30 pm

Observatory Upgrade Programs

Chair: **Charles F. Claver**, National Optical Astronomy Observatory

10:50 am: **SUBARU Telescope: current performances and future upgrade plans,** T. Usuda, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6267-95]

11:10 am: **Imaging performance of the Hobby-Eberly Telescope,** P. Palunas, P. J. MacQueen, J. A. Booth, R. E. Calder, J. R. Fowler, M. D. Shetrone, S. C. Odewahn, P. R. Segura, G. L. Wesley, G. A. Damm, J. Martin, P. S. Odoms, The Univ. of Texas at Austin . . . . . [6267-96]

11:30 am: **The wide-field upgrade for the Hobby-Eberly Telescope,** J. A. Booth, P. J. MacQueen, J. M. Good, G. L. Wesley, G. J. Hill, P. Palunas, P. R. Segura, R. E. Calder, The Univ. of Texas at Austin . . . . . [6267-97]

11:50 am: **VLBI in transition,** A. Szomoru, H. J. van Langevelde, J. Anderson, M. Kettenis, F. Olnon, H. Verkouter, Joint Institute for VLBI in Europe (Netherlands) . . . . . [6267-98]

12:10 pm: **Phase coherence of the EVLA Radio Telescope,** S. J. Durand, J. M. Jackson, National Radio Astronomy Observatory . . . . . [6267-99]

Lunch Break . . . . . 12:30 to 1:30 pm

SESSION 28

Room: Crystal Ballrooms: H . . . . . Wed. 1:30 to 2:50 pm

Telescope Optical Designs

Chair: **Philippe Dierickx**, European Southern Observatory (Germany)

1:30 pm: **ATST optical design,** E. R. Hansen, R. P. Hubbard, National Solar Observatory; M. Liang, National Optical Astronomy Observatory . . . . . [6267-100]

1:50 pm: **Are curved focal planes necessary for wide-field survey telescopes?,** M. R. Ackermann, Sandia National Labs.; J. T. McGraw, The Univ. of New Mexico . . . . . [6267-101]

2:10 pm: **URAT: the FASA2 design,** A. Rakich, EOS Technologies, Inc. [6267-102]

2:30 pm: **Novel optical designs for consumer astronomical telescopes and their application to professional imaging,** P. Wise, Cape Instruments (United Kingdom); A. Hodgson, Alan Hodgson Consulting (United Kingdom) . . [6267-103]

Thursday-Tuesday 25-30 May 2006 • Proceedings of SPIE Vol. 6268

Conference Chairs:

John D. Monnier, Univ. of Michigan

Markus Schöller, European Southern Observatory (Chile)

William C. Danchi, NASA Goddard Space Flight Ctr.
Photo not available

Advances in Stellar Interferometry

Program Committee: **Marc Barillot**, Alcatel Alenia Space (France); **Jean-Philippe Berger**, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); **Michelle J. Creech-Eakman**, New Mexico Institute of Mining and Technology; **Francoise Delplancke**, European Southern Observatory (Germany); **G. Charmaine Gilbreath**, Naval Research Lab.; **Michael J. Ireland**, California Institute of Technology; **Oliver P. Lay**, Jet Propulsion Lab.; **Charles F. Lillie**, Northrop Grumman Space Technology; **Rafael Millan-Gabet**, California Institute of Technology; **Andreas Quirrenbach**, Univ. Leiden/Leiden Observatory (Netherlands); **Theo A. Ten Brummelaar**, Georgia State Univ./The CHARA Array; **Wesley A. Traub**, Jet Propulsion Lab.; **Gerd P. Weigelt**, Max-Planck-Institut für Radioastronomie (Germany); **John S. Young**, Univ. of Cambridge (United Kingdom)

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

Welcome and Opening Remarks

Room: Crystal Ballrooms: G1 . . . . . Thurs. 9:35 am

Chair: **John D. Monnier**, Univ. of Michigan

SESSION 1

Room: Crystal Ballrooms: G1 . . . . . Thurs. 9:45 to 10:35 am

Interferometry Overview Talks

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

9:45 am: **Advances in science with stellar interferometers 2004-2006** *(Invited Paper)***,** P. R. Lawson, Jet Propulsion Lab. . . . . [6268-01]

10:05 am: **First astrophysical results from AMBER/VLTI** *(Invited Paper)***,** F. Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); R. G. Petrov, Univ. de Nice Sophia Antipolis (France); Consortium, AMBER, Consultant (France) . . . . . [6268-02]

10:20 am: **Nulling at the Keck interferometer** *(Invited Paper)***,** M. M. Colavita, E. Serabyn, Jet Propulsion Lab.; P. L. Wizinowich, W.M. Keck Observatory; R. L. Akeson, California Institute of Technology . . . . . [6268-03]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 2

Room: Crystal Ballrooms: G1 . . . . . Thurs. 11:00 am to 12:15 pm

Status Reports: Visible Light

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

11:00 am: **SUSI: an update on instrumental developments and science** *(Invited Paper)***,** J. Davis, M. J. Ireland, J. North, A. P. Jacob, S. M. Owens, G. Robertson, W. J. Tango, P. G. Tuthill, The Univ. of Sydney (Australia) . [6268-04]

11:15 am: **Activities in the COAST group: 2004-2006** *(Invited Paper)***,** C. A. Haniff, J. E. Baldwin, F. Baron, Univ. of Cambridge (United Kingdom); A. G. Basden, N. A. Bharmal, Univ. of Durham (United Kingdom); R. C. Boysen, D. F. Buscher, J. Coyne, R. J. Dace, M. Fisher, C. D. Mackay, R. J. Neill, B. O'Donovan, E. B. Seneta, X. Sun, H. Thorsteinsson, P. J. Warner, D. M. A. Wilson, J. S. Young, Univ. of Cambridge (United Kingdom) . . . . . [6268-05]

11:30 am: **The Navy prototype optical interferometer (NPOI)** *(Invited Paper)***,** K. J. Johnston, U.S. Naval Observatory . . . . . [6268-06]

11:45 am: **Recent progress and future prospects of the GI2T interferometer** *(Invited Paper)***,** D. Mourard, Observatoire de la Côte d'Azur (France) . . . [6268-07]

12:00 pm: **MIRA status report: recent progress of MIRA-I.2 and future plans** *(Invited Paper)***,** M. Yoshizawa, J. Nishikawa, N. Ohishi, S. Suzuki, Y. Torii, H. Iwashita, K. Kubo, K. Matsuda, N. Murakami, National Astronomical Observatory of Japan (Japan); A. Matsukawa, National Astronomical Observatory of Japan (Japan) and Hosei Univ. (Japan); T. Nishimura, N. Okayasu, National Astronomical Observatory of Japan (Japan) and Nippon Univ. (Japan); S. Watanabe, National Astronomical Observatory of Japan (Japan) and Hosei Univ. (Japan) . . . . . [6268-08]

Lunch Break . . . . . 12:15 to 1:30 pm

SESSION 3

Room: Crystal Ballrooms: G1 . . . . . Thurs. 1:30 to 3:10 pm

Thesis Results and More

1:30 pm: **Detection of the inner debris disk of Vega with CHARA/FLUOR,** O. Absil, Univ. de Liège (Belgium); E. di Folco, Observatoire Astronomique de l'Univ. de Genève (Switzerland); A. Mérand, V. Coudé du Foresto, Observatoire de Paris à Meudon (France); J. Augereau, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); J. P. Aufdenberg, National Optical Astronomy Observatory; P. Kervella, Observatoire de Paris à Meudon (France); S. T. Ridgway, National Optical Astronomy Observatory; T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; H. A. McAlister, Georgia State Univ. . . . . [6268-09]

1:50 pm: **Calibration of non-spatially filtered data in optical interferometry,** M. J. Ireland, California Institute of Technology . . . . . [6268-10]

2:10 pm: **Experimental control results from a tethered formation flight testbed for NASA's SPECS mission,** S. Chung, D. Adams, D. W. Miller, Massachusetts Institute of Technology; E. C. Lorenzini, Harvard-Smithsonian Ctr. for Astrophysics; D. T. Leisawitz, NASA Goddard Space Flight Ctr. . . . . [6268-11]

2:30 pm: **Infra arcsec-infra mJy astronomy: exoplanetary scene models for exo-Earth detection - the IR and interferometric nulling,** A. Belu, Univ. de Nice Sophia Antipolis (France); M. Ollivier, G. Lagache, Univ. Paris-Sud II (France); O. Germain, S. Dunne, Starlab Barcelona S.L. (Spain); S. Bonnot, D. Miras, R. Krawczyk, Alcatel Alenia Space (France); R. H. den Hartog, M. C. Fridlund, C. Erd, European Space Agency (Netherlands); F. Vakili, Univ. de Nice Sophia Antipolis (France) . . . . . [6268-13]

2:50 pm: **Disks around young stars with VLTI/MIDI,** R. van Boekel, Max-Planck-Institut für Astronomie (Germany); M. Min, Univ. van Amsterdam (Netherlands); C. Leinert, Max-Planck-Institut für Astronomie (Germany); R. Waters, Univ. van Amsterdam (Netherlands); T. F. E. Henning, T. Ratzka, Max-Planck-Institut für Astronomie (Germany); A. Dutrey, Univ. Bordeaux 1 (France); C. Dominik, A. de Koter, Univ. van Amsterdam (Netherlands) . . . . . [6268-23]

Coffee Break . . . . . 3:10 to 3:30 pm

SESSION 4

Room: Crystal Ballrooms: G1 . . . . . Thurs. 3:30 to 4:00 pm

Interferometry Progress Reports

Chair: **Rafael Millan-Gabet**, California Institute of Technology

3:30 pm: **Recent progress at the Palomar testbed interferometer** *(Invited Paper)*, R. L. Akeson, California Institute of Technology . . . . . [6268-15]

3:45 pm: **Scientific results from high-precision astrometry at the Palomar testbed interferometer** *(Invited Paper)*, M. W. Muterspaugh, California Institute of Technology; B. F. Lane, Massachusetts Institute of Technology; M. Konacki, Polish Academy of Sciences (Poland); B. F. Burke, Massachusetts Institute of Technology; M. M. Colavita, Jet Propulsion Lab.; S. R. Kulkarni, California Institute of Technology; M. Shao, Jet Propulsion Lab. . . . . [6268-16]

POSTER POPS

Room: Crystal Ballrooms: G1 . . . . . Thurs. 4:00 to 4:20 pm

1-minute presentations

Space Technologies

✔ **Design concepts for a relocatable telescope and enclosure system for interferometric applications,** R. Brunswick, G. Pentland, C. Vanegas, Jr., K. Harris, Jr., EOS Technologies, Inc.; A. Seedsman, EOS Space Systems Pty. Ltd. (Australia) . . . . . [6268-96]

✔ **Picometer level modeling of a shared vertex double corner cube in the Space Interferometry mission kite testbed,** G. M. Kuan, F. G. Dekens, B. Nemati, Jet Propulsion Lab. . . . . [6268-97]

✔ **Design and cryogenic test of optical delay line for DARWIN,** K. Ergenzinger, J. F. Pittet, EADS Astrium GmbH (Germany); A. Maerki, Contraves Space AG (Switzerland) . . . . . [6268-98]

✔ **The least-squares calibration on the micro-arcsecond metrology test bed,** C. Zhai, M. H. Milman, M. W. Regehr, Jet Propulsion Lab. . . . . [6268-100]

✔ **The ESA DARWIN breadboard cryogenic optical delay line verification program,** F. Kamphues, T. C. van den Dool, W. Gielesen, TNO (Netherlands); J. Benoit, Alcatel Alenia Space (France); Y. Stockman, Univ. de Liège (Belgium); G. Velsink, Dutch Space B.V. (Netherlands) . . . . . [6268-101]

✔ **Corner cube model for internal metrology system of Space Interferometer mission (SIM),** X. Wang, California Institute of Technology; R. P. Korechoff, M. Heflin, L. Sievers, Jet Propulsion Lab. . . . . [6268-102]

✔ **A combined nulling and imaging pupil-plane beam-combiner for DARWIN,** R. P. H. Haaksman, C. P. de Vries, J. den Herder, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); A. Vosteen, TNO (Netherlands); A. L. Mieremet, cosine Research BV (Netherlands) . . . . . [6268-103]

✔ **Optical modeling of the wide-field imaging interferometry testbed (WIIT),** A. K. Thompson, Swales Aerospace; A. J. Martino, S. A. Rinehart, D. T. Leisawitz, B. J. Frey, D. B. Leviton, NASA Goddard Space Flight Ctr. . . . . [6268-104]

Science Highlights

✔ **VLTI-AMBER observations of Eta Carinae with high spatial resolution and spectral resolutions of 1,500 and 10,000,** G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); R. G. Petrov, Univ. de Nice Sophia Antipolis (France); O. Chesneau, Observatoire de la Côte d'Azur (France); A. Domiciano de Souza, Jr., Univ. de Nice Sophia Antipolis (France); T. M. Driebe, Max-Planck-Institut für Radioastronomie (Germany); R. Foy, Ctr. de Recherche Astronomique de Lyon (France); D. Fraix-Burnet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); K. Hofmann, S. Kraus, Max-Planck-Institut für Radioastronomie (Germany); F. Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); A. Marconi, Osservatorio Astrofisico di Arcetri (Italy); P. Mathias, Observatoire de la Côte d'Azur (France); F. A. Millour, Univ. de Nice Sophia Antipolis (France); J. Monin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); K. Ohnaka, Max-Planck-Institut für Radioastronomie (Germany); F. T. Rantakyrö, European Southern Observatory (Chile); A. Richichi, European Southern Observatory (Germany); D. Schertl, Max-Planck-Institut für Radioastronomie (Germany); M. Schoeller, European Southern Observatory (Chile); P. Stee, Observatoire de la Côte d'Azur (France); L. Testi, Osservatorio Astrofisico di Arcetri (Italy); Consortium, AMBER, Consultant (France) . . . . . [6268-105]

✔ **The Star 12 Persei and separated fringe packet binaries (SFPB),** W. G. Bagnuolo, Jr., Georgia State Univ.; T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; H. A. McAlister, D. R. Gies, Georgia State Univ.; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-106]

✔ **Preliminary thesis report on using the CHARA Array as a binary and multiple star survey tool,** C. D. Farrington, Georgia State Univ. . . . [6268-107]

✔ **VLTI/MIDI observation of the silicate carbon star Hen 38 (IRAS08002-3803): silicate dust reservoir spatially resolved for the first time,** K. Ohnaka, T. M. Driebe, K. Hofmann, T. Preibisch, D. Schertl, G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6268-108]

✔ **Interferometric study of Betelgeuse in H band,** X. Haubois, G. S. Perrin, S. Lacour, Observatoire de Paris à Meudon (France); S. C. Meimon, ONERA (France); J. M. Woillez, Observatoire de Paris à Meudon (France); P. A. Schuller, Harvard-Smithsonian Ctr. for Astrophysics; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-109]

Phase Referencing

✔ **Picometer differential phase measurements,** G. Vasisht, E. R. Ligon III, M. M. Colavita, Jet Propulsion Lab. . . . . [6268-110]

✔ **VLTI-PRIMA fringe tracking testbed,** R. N. Abuter, F. Eisenhauer, S. Rabien, M. Haug, Max-Planck-Institut für extraterrestrische Physik (Germany); A. Wallander, S. A. Lévêque, S. Ménardi, F. Delplancke, J. Sahlmann, N. Schuhler, European Southern Observatory (Germany) . . . . . [6268-134]

Nulling

✔ **Conceptual design of the ALADDIN Antarctic nulling interferometer,** M. Barillot, P. Courteau, Alcatel Alenia Space (France); O. Absil, Univ. de Liège (Belgium); V. Coudé du Foresto, Observatoire de Paris à Meudon (France); M. R. Swain, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-113]

✔ **Laboratory progress toward a near infrared rotating sub-aperture nuller,** B. P. Mennesson, P. Haguenauer, Jet Propulsion Lab. . . . . [6268-114]

✔ **Characterization of common path phase sensing in nulling interferometry,** P. C. Hill, P. M. Hinz, T. J. McMahon, J. Kraus, T. Connors, The Univ. of Arizona/Steward Observatory . . . . . [6268-115]

✔ **Nulling interferometry without achromatic phase shifters: latest results,** J. Spronck, S. F. Pereira, J. J. M. Braat, Technische Univ. Delft (Netherlands) . . . . . [6268-116]

✔ **Science performance and systematic errors in free-flying nulling interferometers,** R. H. den Hartog, L. L. A. d'Arcio, A. Stankov, A. L. Karlsson, M. C. Fridlund, European Space Agency (Netherlands) . . . . . [6268-164]

SESSION 4 (Continued)

Room: Crystal Ballrooms: G1 . . . . . Thurs. 4:20 to 5:05 pm

4:20 pm: **Recent progress at the CHARA Interferometric Array** *(Invited Paper)*, H. A. McAlister, Georgia State Univ.; T. A. ten Brummelaar, L. Sturmann, J. Sturmann, N. H. Turner, Georgia State Univ./The CHARA Array; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-17]

4:35 pm: **Cepheids at high-angular resolution** *(Invited Paper)*, A. Mérand, Observatoire de Paris à Meudon (France) . . . . . [6268-18]

4:50 pm: **IOTA: recent science and technology** *(Invited Paper)*, F. P. Schloerb, Univ. of Massachusetts/Amherst; J. Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); N. P. Carleton, Harvard-Smithsonian Ctr. for Astrophysics; P. Haguenauer, Jet Propulsion Lab.; P. Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. R. Labeye, CEA-LETI (France); M. G. Lacasse, Harvard-Smithsonian Ctr. for Astrophysics; F. Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); R. Millan-Gabet, California Institute of Technology; J. D. Monnier, Univ. of Michigan; M. R. Pearlman, Harvard-Smithsonian Ctr. for Astrophysics; E. Pedretti, Univ. of Michigan; K. Rousselet-Perraut, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); S. D. Ragland, W.M. Keck Observatory; P. A. Schuller, Harvard-Smithsonian Ctr. for Astrophysics; W. A. Traub, Jet Propulsion Lab.; G. Wallace, Univ. of Massachusetts/Amherst . . . . . [6268-19]

POSTER POPS

Room: Crystal Ballrooms: G1 . . . . . Thurs. 5:05 to 5:45 pm

1-minute presentations

New Technology

✔ **Integrated optic beam combiners in Lithium Niobate for stellar interferometer,** G. Li, K. A. Winick, J. D. Monnier, Univ. of Michigan; J. Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-117]

✔ **A freely available real-time operating system well suited for astronomy and the physical sciences,** E. Pedretti, J. D. Monnier, Univ. of Michigan; N. D. Thureau, Univ. of Michigan and Univ. of Cambridge (United Kingdom); P. Muirhead, M. Zhao, A. Tannirkulam, Univ. of Michigan . . . . . [6268-118]

✔ **The wide-field imaging interferometry testbed (WIIT): recent results,** S. A. Rinehart, D. T. Leisawitz, D. B. Leviton, A. J. Martino, B. J. Frey, NASA Goddard Space Flight Ctr.; A. K. Thompson, Swales Aerospace; L. G. Mundy, Univ. of Maryland/College Park; T. Armstrong, T. A. Pauls, Naval Research Lab.; R. G. Lyon, NASA Goddard Space Flight Ctr. . . . . [6268-119]

✔ **A fast amplified fringe modulator system and waveform optimisation,** H. Thorsteinsson, D. F. Buscher, Univ. of Cambridge (United Kingdom) . . . . . [6268-120]

✔ **Measurement of spatial filtering capabilities of single mode infrared fibers,** A. Ksendzov, E. E. Bloemhof, V. E. White, J. K. Wallace, R. O. Gappinger, Jet Propulsion Lab.; J. S. Sanghera, L. E. Busse, W. J. Kim, P. C. Pureza, V. Q. Nguyen, I. D. Aggarwal, Naval Research Lab.; S. Shalem, A. Katzir, Tel Aviv Univ. (Israel) . . . . . [6268-121]

✔ **A eight telescope laboratory interferometer for VITRUV,** J. Laurent, M. Benisty, J. Berger, K. Rousselet-Perraut, P. Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-123]

✔ **BRISE: a multipupose bench for cophasing sensors,** F. Cassaing, B. Sorrente, I. Mocoeur, L. M. Mugnier, ONERA (France) . . . . . [6268-124]

✔ **Using differential phases in optical interferometry,** H. R. Schmitt, Naval Research Lab. and Interferometrics, Inc.; T. A. Pauls, Naval Research Lab.; C. Tycner, U.S. Naval Observatory; J. T. Armstrong, R. B. Hindsley, Naval Research Lab.; D. M. Peterson, Stony Brook Univ.; A. M. Jorgensen, Los Alamos National Lab.; D. Mozurkewich, Seabrook Engineering; G. C. Gilbreath, Naval Research Lab. . . . . [6268-125]

✔ **Software tools for optical interferometry,** N. D. Thureau, Univ. of Michigan and Univ. of Cambridge (United Kingdom); J. D. Monnier, Univ. of Michigan . . . . . [6268-126]

✔ **On the relationship between Cn^2 and humidity,** C. O. Font Jimenez, E. A. Roura, F. Santiago, M. P. J. L. Chang, Univ. de Puerto Rico Mayagüez; E. S. Oh, S. R. Restaino, C. C. Wilcox, Naval Research Lab. . . . . [6268-127]

✔ **Applying the Huang-Hilbert decomposition to horizontal light propagation C_n^2 data,** E. A. Roura, C. O. Font Jimenez, F. Santiago, M. P. J. L. Chang, Univ. de Puerto Rico Mayagüez . . . . . [6268-128]

✔ **An analysis of the phase dispersion in the symmetric beam combiner,** H. Tang, F. Zhao, Jet Propulsion Lab. . . . . [6268-129]

✔ **Search for temporal coherence in the sky,** E. N. Ribak, Technion - Israel Institute of Technology (Israel) . . . . . [6268-160]

Imaging

✔ **Reconstruction of aperture-synthesis images from LBT LINC-NIRVANA data using the Richardson-Lucy and space-variant building block method,** K. Hofmann, T. M. Driebe, M. Heininger, D. Schertl, G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6268-130]

✔ **Aperture synthesis image reconstruction study for the mid-infrared VLTI imager MATISSE,** K. Hofmann, S. Kraus, Max-Planck-Institut für Radioastronomie (Germany); B. Lopez, Observatoire de la Côte d'Azur (France); G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); S. Wolf, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-131]

✔ **Effects of array configuration and sub-aperture size on the optical transfer function of Fizeau imaging interferometer,** Z. Wu, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6268-132]

Future Instruments

✔ **The Michigan infrared fringe tracker: design and fabrication,** D. H. Berger, J. D. Monnier, Univ. of Michigan; R. Millan-Gabet, California Institute of Technology; T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; P. Muirhead, Cornell Univ.; E. Pedretti, N. D. Thureau, Univ. of Michigan . . . . . [6268-111]

✔ **The LINC-NIRVANA fringe and flexure tracker: cryo-ambient mechanical design,** T. Bertram, Univ. zu Köln (Germany); H. Baumeister, Max-Planck-Institut für Astronomie (Germany); C. Straubmeier, S. Rost, Y. Wang, A. Eckart, Univ. zu Köln (Germany) . . . . . [6268-133]

✔ **MATISSE a four beams combiner in the mid-infrared for the VLTI,** S. Lagarde, Observatoire de la Côte d'Azur (France) . . . . . [6268-135]

✔ **Expected performances and error budget for VITRUV,** E. Herwats, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) and Univ. of Liège (Belgium); F. Malbet, J. Le Bouquin, J. Berger, M. Benisty, L. Jocou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. R. Labeye, CEA-LETI (France); E. P. Le Coarer, P. Y. Kern, K. Rousselet-Perraut, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-136]

✔ **Engineering overview of the conceptual design and hardware/software implementation proposed for the Magdalena Ridge Observatory interferometer,** C. B. Parameswariah, T. A. Coleman, J. E. Kern, New Mexico Institute of Mining and Technology . . . . . [6268-137]

✔ **The LINC-NIRVANA fringe and flexure tracker: image analysis concept and fringe tracking performance,** T. Bertram, Univ. zu Köln (Germany); C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); C. Straubmeier, S. Rost, Y. Wang, A. Eckart, Univ. zu Köln (Germany) . . . . . [6268-138]

✔ **VEGA: a visible spectrograph and polarimeter for CHARA,** D. Mourard, A. Blazit, D. Bonneau, Y. Bresson, J. Clausse, F. Hénault, S. Lagarde, A. Marcotto, G. Merlin, A. Roussel, Observatoire de la Côte d'Azur (France); K. Rousselet-Perraut, J. Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); R. Foy, I. Tallon-Bosc, M. Tallon, E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France); H. A. McAlister, T. A. ten Brummelaar, Georgia State Univ.; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-162]

✔ **VEGA: a visible spectrograph and polarimeter for CHARA science cases description,** P. Stee, D. Mourard, D. Bonneau, S. Lagarde, P. Mathias, N. Nardetto, Observatoire de la Côte d'Azur (France); P. Berlioz-Arthaud, R. Foy, Ctr. de Recherche Astronomique de Lyon (France); A. Domiciano de Souza, Jr., Univ. de Nice Sophia Antipolis (France); P. Harmanec, Charles Univ. in Prague (Czech Republic); R. G. Petrov, Univ. de Nice Sophia Antipolis (France); S. S. Jankov, Observatoire de la Côte d'Azur (France); P. Kervella, Observatoire de Paris à Meudon (France); P. Koubsky, Academy of Sciences of the Czech Republic (Czech Republic); J. Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); A. Mérand, Georgia State Univ.; C. Stehle, Observatoire de Paris à Meudon (France) . . . . . [6268-163]

✔ **Reviving intensity interferometry: micro-arcsec imaging from the ground,** A. Ofir, Tel Aviv Univ. (Israel) . . . . . [6268-165]

Facilities

✔ **Nine channel tip/tilt detector at the CHARA Array,** L. Sturmann, J. Sturmann, T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; H. A. McAlister, Georgia State Univ. . . . . [6268-139]

✔ **Keck interferometer beamline characterizations,** M. A. Hrynevych, S. D. Ragland, J. M. Woillez, W.M. Keck Observatory; M. M. Colavita, Jet Propulsion Lab. and California Institute of Technology . . . . . [6268-140]

✔ **Characterization of the optical throughput performance of the Navy prototype optical interferometer (NPOI),** X. Zhang, J. T. Armstrong, Naval Research Lab.; J. H. Clark III, U.S. Naval Observatory; G. C. Gilbreath, R. L. Lucke, S. R. Restaino, Naval Research Lab.; D. Mozurkewich, Seabrook Engineering; J. A. Benson, D. J. Hutter, U.S. Naval Observatory; N. M. White, Lowell Observatory; H. R. Schmitt, Naval Research Lab.; J. P. Walton, U.S. Naval Observatory . . . . . [6268-141]

✔ **Design and performance of the Keck angle tracker,** S. L. Crawford, A. J. Booth, M. M. Colavita, E. Hovland, Jet Propulsion Lab.; S. D. Ragland, W.M. Keck Observatory . . . . . [6268-142]

✔ **Pipeline reductions of VLTI/MIDI data and quality control,** C. A. Hummel, European Southern Observatory (Chile); I. Percheron, European Southern Observatory (Germany) . . . . . [6268-143]

✔ **MROI's automated alignment system,** C. A. Jurgenson, New Mexico Institute of Mining and Technology; D. F. Buscher, Univ. of Cambridge (United Kingdom); J. E. Kern, M. J. Creech-Eakman, New Mexico Institute of Mining and Technology; C. A. Haniff, J. S. Young, Univ. of Cambridge (United Kingdom) . . . . . [6268-144]

✔ **Controlling IOTA: aspects of software and hardware,** P. A. Schuller, N. P. Carleton, Harvard-Smithsonian Ctr. for Astrophysics; P. F. Cone, Baker Research Inc.; M. G. Lacasse, Harvard-Smithsonian Ctr. for Astrophysics; E. Pedretti, Univ. of Michigan; F. P. Schloerb, Univ. of Massachusetts/Amherst; W. A. Traub, Jet Propulsion Lab.; G. Wallace, Univ. of Massachusetts/Amherst . . . . . [6268-145]

✔ **Temperature and humidity environmental conditions in the VLTI,** F. Puech, S. A. Lévêque, M. S. Sarazin, European Southern Observatory (Germany); R. J. Mathar, Univ. Leiden (Netherlands) . . . . . [6268-146]

✔ **The VLTI auxiliary telescopes: measured performances,** B. Koehler, M. Kraus, J. M. Moresmau, K. Wirenstrand, P. Duhoux, R. Karban, L. Andolfato, F. Y. J. Gonte, European Southern Observatory (Germany) . . . . . [6268-147]

✔ **Adaptive optics quality metrics and user constraints set for VLTI,** I. Percheron, M. Wittkowski, R. Donaldson, E. Fedrigo, European Southern Observatory (Germany); C. Lidman, S. Morel, F. T. Rantakyrö, M. Schoeller, European Southern Observatory (Chile); A. Wallander, European Southern Observatory (Germany) . . . . . [6268-148]

✔ **RF survey for the Magdalena Ridge Observatory interferometer site,** C. B. Parameswariah, C. A. Jurgenson, New Mexico Institute of Mining and Technology . . . . . [6268-149]

✔ **IRIS: a versatile infrared tilt sensor for commissioning and operation of the VLTI,** P. B. Gitton, S. A. Lévêque, T. Phan Duc, G. Avila, European Southern Observatory (Germany); A. Ramirez, European Southern Observatory (Chile) . . . . . [6268-150]

Exoplanets

✔ **A survey and characterization of extrasolar planetary systems host stars,** E. K. Baines, Georgia State Univ. . . . . [6268-151]

✔ **The PRIMA Astrometric Planet search: goals and prospects,** S. Reffert, Univ. Leiden (Netherlands); D. Ségransan, Observatoire Astronomique de l'Univ. de Genève (Switzerland); R. Launhardt, T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); D. Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland); A. Quirrenbach, W. J. Jaffe, Univ. Leiden (Netherlands); F. A. Pepe, Observatoire Astronomique de l'Univ. de Genève (Switzerland); J. Setiawan, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-152]

✔ **SIM-PlanetQuest: detection and characterization of terrestrial planets in the habitable zone,** A. M. Tanner, J. H. Catanzarite, M. Shao, Jet Propulsion Lab. . . . . [6268-153]

Calibration

✔ **Early type stars as calibrators for ground-based optical interferometry,** J. Yoon, D. M. Peterson, Stony Brook Univ.; J. H. Clark III, U.S. Naval Observatory; J. T. Armstrong, G. C. Gilbreath, T. A. Pauls, H. R. Schmitt, Naval Research Lab. . . . . [6268-154]

✔ **High precision calibration of interferometric data through the removal of fixed-pattern residuals,** C. Tycner, J. A. Benson, D. J. Hutter, U.S. Naval Observatory; H. R. Schmitt, Naval Research Lab.; R. T. Zavala, U.S. Naval Observatory . . . . . [6268-155]

✔ **Characterization of the NPOI fringe scanning stroke,** A. M. Jorgensen, Los Alamos National Lab.; D. Mozurkewich, Seabrook Engineering; J. L. Murphy, M. Sapantaie, J. T. Armstrong, G. C. Gilbreath, R. B. Hindsley, T. A. Pauls, H. R. Schmitt, Naval Research Lab.; D. J. Hutter, U.S. Naval Observatory . . . . . [6268-156]

✔ **Analysis of calibration errors for both short and long stroke white light experiments,** X. Pan, Jet Propulsion Lab. . . . . [6268-157]

Antarctica

✔ **Study of the scientific potential of a three 50cm telescopes interferometer at Dome C,** B. Valat, F. Schmider, Univ. de Nice Sophia Antipolis (France); B. Lopez, Observatoire de la Côte d'Azur (France); R. G. Petrov, M. Vannier, F. Vakili, Univ. de Nice Sophia Antipolis (France) . . . . . [6268-158]

✔ **Study on transport of assembled interferometer to Antarctica,** E. R. Lanford, M. Guillon, K. Knepper, V. Olson, D. Roche, Harvey Mudd College; M. R. Swain, Max-Planck-Institut für Astronomie (Germany); P. Little, Harvey Mudd College . . . . . [6268-159]

✔Poster Session I

Room: Palms Ballroom: Canary & Royal Salons . Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

Space Technologies

✔ **Design concepts for a relocatable telescope and enclosure system for interferometric applications,** R. Brunswick, G. Pentland, C. Vanegas, Jr., K. Harris, Jr., EOS Technologies, Inc.; A. Seedsman, EOS Space Systems Pty. Ltd. (Australia) . . . . . [6268-96]

✔ **Picometer level modeling of a shared vertex double corner cube in the Space Interferometry mission kite testbed,** G. M. Kuan, F. G. Dekens, B. Nemati, Jet Propulsion Lab. . . . . [6268-97]

✔ **Design and cryogenic test of optical delay line for DARWIN,** K. Ergenzinger, J. F. Pittet, EADS Astrium GmbH (Germany); A. Maerki, Contraves Space AG (Switzerland) . . . . . [6268-98]

✔ **The least-squares calibration on the micro-arcsecond metrology test bed,** C. Zhai, M. H. Milman, M. W. Regehr, Jet Propulsion Lab. . . . . [6268-100]

✔ **The ESA DARWIN breadboard cryogenic optical delay line verification program,** F. Kamphues, T. C. van den Dool, W. Gielesen, TNO (Netherlands); J. Benoit, Alcatel Alenia Space (France); Y. Stockman, Univ. de Liège (Belgium); G. Velsink, Dutch Space B.V. (Netherlands) . . . . . [6268-101]

✔ **Corner cube model for internal metrology system of Space Interferometer mission (SIM),** X. Wang, California Institute of Technology; R. P. Korechoff, M. Heflin, L. Sievers, Jet Propulsion Lab. . . . . [6268-102]

✔ **A combined nulling and imaging pupil-plane beam-combiner for DARWIN,** R. P. H. Haaksman, C. P. de Vries, J. den Herder, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); A. Vosteen, TNO (Netherlands); A. L. Mieremet, cosine Research BV (Netherlands) . . . . . [6268-103]

✔ **Optical modeling of the wide-field imaging interferometry testbed (WIIT),** A. K. Thompson, Swales Aerospace; A. J. Martino, S. A. Rinehart, D. T. Leisawitz, B. J. Frey, D. B. Leviton, NASA Goddard Space Flight Ctr. . . . . [6268-104]

Science Highlights

✔ **VLTI-AMBER observations of Eta Carinae with high spatial resolution and spectral resolutions of 1,500 and 10,000,** G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); R. G. Petrov, Univ. de Nice Sophia Antipolis (France); O. Chesneau, Observatoire de la Côte d'Azur (France); A. Domiciano de Souza, Jr., Univ. de Nice Sophia Antipolis (France); T. M. Driebe, Max-Planck-Institut für Radioastronomie (Germany); R. Foy, Ctr. de Recherche Astronomique de Lyon (France); D. Fraix-Burnet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); K. Hofmann, S. Kraus, Max-Planck-Institut für Radioastronomie (Germany); F. Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); A. Marconi, Osservatorio Astrofisico di Arcetri (Italy); P. Mathias, Observatoire de la Côte d'Azur (France); F. A. Millour, Univ. de Nice Sophia Antipolis (France); J. Monin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); K. Ohnaka, Max-Planck-Institut für Radioastronomie (Germany); F. T. Rantakyrö, European Southern Observatory (Chile); A. Richichi, European Southern Observatory (Germany); D. Schertl, Max-Planck-Institut für Radioastronomie (Germany); M. Schoeller, European Southern Observatory (Chile); P. Stee, Observatoire de la Côte d'Azur (France); L. Testi, Osservatorio Astrofisico di Arcetri (Italy); A. Consortium, Consultant (France) . . . . . [6268-105]

✔ **The Star 12 Persei and separated fringe packet binaries (SFPB),** W. G. Bagnuolo, Jr., Georgia State Univ.; T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; H. A. McAlister, D. R. Gies, Georgia State Univ.; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-106]

✔ **Preliminary thesis report on using the CHARA Array as a binary and multiple star survey tool,** C. D. Farrington, Georgia State Univ. . . . [6268-107]

✔ **VLTI/MIDI observation of the silicate carbon star Hen 38 (IRAS08002-3803): silicate dust reservoir spatially resolved for the first time,** K. Ohnaka, T. M. Driebe, K. Hofmann, T. Preibisch, D. Schertl, G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6268-108]

✔ **Interferometric study of Betelgeuse in H band,** X. Haubois, G. S. Perrin, S. Lacour, Observatoire de Paris à Meudon (France); S. C. Meimon, ONERA (France); J. M. Woillez, Observatoire de Paris à Meudon (France); P. A. Schuller, Harvard-Smithsonian Ctr. for Astrophysics; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-109]

Phase Referencing

✔ **Picometer differential phase measurements,** G. Vasisht, E. R. Ligon III, M. M. Colavita, Jet Propulsion Lab. . . . . [6268-110]

✔ **VLTI-PRIMA fringe tracking testbed,** R. N. Abuter, F. Eisenhauer, S. Rabien, M. Haug, Max-Planck-Institut für extraterrestrische Physik (Germany); A. Wallander, S. A. Lévêque, S. Ménardi, F. Delplancke, J. Sahlmann, N. Schuhler, European Southern Observatory (Germany) . . . . . [6268-134]

Nulling

✔ **Conceptual design of the ALADDIN Antarctic nulling interferometer,** M. Barillot, P. Courteau, Alcatel Alenia Space (France); O. Absil, Univ. de Liège (Belgium); V. Coudé du Foresto, Observatoire de Paris à Meudon (France); M. R. Swain, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-113]

✔ **Laboratory progress toward a near infrared rotating sub-aperture nuller,** B. P. Mennesson, P. Haguenauer, Jet Propulsion Lab. . . . . [6268-114]

✔ **Characterization of common path phase sensing in nulling interferometry,** P. C. Hill, P. M. Hinz, T. J. McMahon, J. Kraus, T. Connors, The Univ. of Arizona/ Steward Observatory . . . . . [6268-115]

✔ **Nulling interferometry without achromatic phase shifters: latest results,** J. Spronck, S. F. Pereira, J. J. M. Braat, Technische Univ. Delft (Netherlands) . . . . . [6268-116]

✔ **Science performance and systematic errors in free-flying nulling interferometers,** R. H. den Hartog, L. L. A. d'Arcio, A. Stankov, A. L. Karlsson, M. C. Fridlund, European Space Agency (Netherlands) . . . . . [6268-164]

New Technology

✔ **Integrated optic beam combiners in Lithium Niobate for stellar interferometer,** G. Li, K. A. Winick, J. D. Monnier, Univ. of Michigan; J. Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-117]

✔ **A freely available real-time operating system well suited for astronomy and the physical sciences,** E. Pedretti, J. D. Monnier, Univ. of Michigan; N. D. Thureau, Univ. of Michigan and Univ. of Cambridge (United Kingdom); P. Muirhead, M. Zhao, A. Tannirkulam, Univ. of Michigan . . . . . [6268-118]

✔ **The wide-field imaging interferometry testbed (WIIT): recent results,** S. A. Rinehart, D. T. Leisawitz, D. B. Leviton, A. J. Martino, B. J. Frey, NASA Goddard Space Flight Ctr.; A. K. Thompson, Swales Aerospace; L. G. Mundy, Univ. of Maryland/College Park; T. Armstrong, T. A. Pauls, Naval Research Lab.; R. G. Lyon, NASA Goddard Space Flight Ctr. . . . . [6268-119]

✔ **A fast amplified fringe modulator system and waveform optimisation,** H. Thorsteinsson, D. F. Buscher, Univ. of Cambridge (United Kingdom) . . . . . [6268-120]

✔ **Measurement of spatial filtering capabilities of single mode infrared fibers,** A. Ksendzov, E. E. Bloemhof, V. E. White, J. K. Wallace, R. O. Gappinger, Jet Propulsion Lab.; J. S. Sanghera, L. E. Busse, W. J. Kim, P. C. Pureza, V. Q. Nguyen, I. D. Aggarwal, Naval Research Lab.; S. Shalem, A. Katzir, Tel Aviv Univ. (Israel) . . . . . [6268-121]

✔ **A eight telescope laboratory interferometer for VITRUV,** J. Laurent, M. Benisty, J. Berger, K. Rousselet-Perraut, P. Y. Kern, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-123]

✔ **BRISE: a multipupose bench for cophasing sensors,** F. Cassaing, B. Sorrente, I. Mocoeur, L. M. Mugnier, ONERA (France) . . . . . [6268-124]

✔ **Using differential phases in optical interferometry,** H. R. Schmitt, Naval Research Lab. and Interferometrics, Inc.; T. A. Pauls, Naval Research Lab.; C. Tycner, U.S. Naval Observatory; J. T. Armstrong, R. B. Hindsley, Naval Research Lab.; D. M. Peterson, Stony Brook Univ.; A. M. Jorgensen, Los Alamos National Lab.; D. Mozurkewich, Seabrook Engineering; G. C. Gilbreath, Naval Research Lab. . . . . [6268-125]

✔ **Software tools for optical interferometry,** N. D. Thureau, Univ. of Michigan and Univ. of Cambridge (United Kingdom); J. D. Monnier, Univ. of Michigan . . . . . [6268-126]

✔ **On the relationship between Cn2 and humidity,** C. O. Font Jimenez, E. A. Roura, F. Santiago, M. P. J. L. Chang, Univ. de Puerto Rico Mayagüez; E. S. Oh, S. R. Restaino, C. C. Wilcox, Naval Research Lab. . . . . [6268-127]

✔ **Applying the Huang-Hilbert decomposition to horizontal light propagation C_n^2 data,** E. A. Roura, C. O. Font Jimenez, F. Santiago, M. P. J. L. Chang, Univ. de Puerto Rico Mayagüez . . . . . [6268-128]

✔ **An analysis of the phase dispersion in the symmetric beam combiner,** H. Tang, F. Zhao, Jet Propulsion Lab. . . . . [6268-129]

✔ **Search for temporal coherence in the sky,** E. N. Ribak, Technion - Israel Institute of Technology (Israel) . . . . . [6268-160]

Imaging

✔ **Reconstruction of aperture-synthesis images from LBT LINC-NIRVANA data using the Richardson-Lucy and space-variant building block method,** K. Hofmann, T. M. Driebe, M. Heininger, D. Schertl, G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6268-130]

✔ **Aperture synthesis image reconstruction study for the mid-infrared VLTI imager MATISSE,** K. Hofmann, S. Kraus, Max-Planck-Institut für Radioastronomie (Germany); B. Lopez, Observatoire de la Côte d'Azur (France); G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); S. Wolf, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-131]

✔ **Effects of array configuration and sub-aperture size on the optical transfer function of Fizeau imaging interferometer,** Z. Wu, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6268-132]

Future Instruments

✔ **The Michigan infrared fringe tracker: design and fabrication,** D. H. Berger, J. D. Monnier, Univ. of Michigan; R. Millan-Gabet, California Institute of Technology; T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; P. Muirhead, Cornell Univ.; E. Pedretti, N. D. Thureau, Univ. of Michigan . . . . . [6268-111]

✔ **The LINC-NIRVANA fringe and flexure tracker: cryo-ambient mechanical design,** T. Bertram, Univ. zu Köln (Germany); H. Baumeister, Max-Planck-Institut für Astronomie (Germany); C. Straubmeier, S. Rost, Y. Wang, A. Eckart, Univ. zu Köln (Germany) . . . . . [6268-133]

✔ **MATISSE a four beams combiner in the mid-infrared for the VLTI,** S. Lagarde, Observatoire de la Côte d'Azur (France) . . . . . [6268-135]

✔ **Expected performances and error budget for VITRUV,** E. Herwats, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) and Univ. of Liège (Belgium); F. Malbet, J. Le Bouquin, J. Berger, M. Benisty, L. Jocou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. R. Labeye, CEA-LETI (France); E. P. Le Coarer, P. Y. Kern, K. Rousselet-Perraut, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-136]

✔ **Engineering overview of the conceptual design and hardware/software implementation proposed for the Magdalena Ridge Observatory interferometer,** C. B. Parameswariah, T. A. Coleman, J. E. Kern, New Mexico Institute of Mining and Technology . . . . . [6268-137]

✔ **The LINC-NIRVANA fringe and flexure tracker: image analysis concept and fringe tracking performance,** T. Bertram, Univ. zu Köln (Germany); C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); C. Straubmeier, S. Rost, Y. Wang, A. Eckart, Univ. zu Köln (Germany) . . . . . [6268-138]

✔ **VEGA: a visible spectrograph and polarimeter for CHARA,** D. Mourard, A. Blazit, D. Bonneau, Y. Bresson, J. Clausse, F. Hénault, S. Lagarde, A. Marcotto, G. Merlin, A. Roussel, Observatoire de la Côte d'Azur (France); K. Rousselet-Perraut, J. Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); R. Foy, I. Tallon-Bosc, M. Tallon, E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France); H. A. McAlister, T. A. ten Brummelaar, Georgia State Univ.; S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-162]

✔ **VEGA: a visible spectrograph and polarimeter for CHARA science cases description,** P. Stee, D. Mourard, D. Bonneau, S. Lagarde, P. Mathias, N. Nardetto, Observatoire de la Côte d'Azur (France); P. Berlioz-Arthaud, R. Foy, Ctr. de Recherche Astronomique de Lyon (France); A. Domiciano de Souza, Jr., Univ. de Nice Sophia Antipolis (France); P. Harmanec, Charles Univ. in Prague (Czech Republic); R. G. Petrov, Univ. de Nice Sophia Antipolis (France); S. S. Jankov, Observatoire de la Côte d'Azur (France); P. Kervella, Observatoire de Paris à Meudon (France); P. Koubsky, Academy of Sciences of the Czech Republic (Czech Republic); J. Le Bouquin, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); A. Mérand, Georgia State Univ.; C. Stehle, Observatoire de Paris à Meudon (France) . . . . . [6268-163]

✔ **Reviving intensity interferometry: micro-arcsec imaging from the ground,** A. Ofir, Tel Aviv Univ. (Israel) . . . . . [6268-165]

Facilities

✔ **Nine channel tip/tilt detector at the CHARA Array,** L. Sturmann, J. Sturmann, T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; H. A. McAlister, Georgia State Univ. . . . . [6268-139]

✔ **Keck interferometer beamline characterizations,** M. A. Hrynevych, S. D. Ragland, J. M. Woillez, W.M. Keck Observatory; M. M. Colavita, Jet Propulsion Lab. and California Institute of Technology . . . . . [6268-140]

✔ **Characterization of the optical throughput performance of the Navy prototype optical interferometer (NPOI),** X. Zhang, J. T. Armstrong, Naval Research Lab.; J. H. Clark III, U.S. Naval Observatory; G. C. Gilbreath, R. L. Lucke, S. R. Restaino, Naval Research Lab.; D. Mozurkewich, Seabrook Engineering; J. A. Benson, D. J. Hutter, U.S. Naval Observatory; N. M. White, Lowell Observatory; H. R. Schmitt, Naval Research Lab.; J. P. Walton, U.S. Naval Observatory . . . . . [6268-141]

✔ **Design and performance of the Keck angle tracker,** S. L. Crawford, A. J. Booth, M. M. Colavita, E. Hovland, Jet Propulsion Lab.; S. D. Ragland, W.M. Keck Observatory . . . . . [6268-142]

✔ **Pipeline reductions of VLTI/MIDI data and quality control,** C. A. Hummel, European Southern Observatory (Chile); I. Percheron, European Southern Observatory (Germany) . . . . . [6268-143]

✔ **MROI's automated alignment system,** C. A. Jurgenson, New Mexico Institute of Mining and Technology; D. F. Buscher, Univ. of Cambridge (United Kingdom); J. E. Kern, M. J. Creech-Eakman, New Mexico Institute of Mining and Technology; C. A. Haniff, J. S. Young, Univ. of Cambridge (United Kingdom) . . . . . [6268-144]

✔ **Controlling IOTA: aspects of software and hardware,** P. A. Schuller, N. P. Carleton, Harvard-Smithsonian Ctr. for Astrophysics; P. F. Cone, Baker Research Inc.; M. G. Lacasse, Harvard-Smithsonian Ctr. for Astrophysics; E. Pedretti, Univ. of Michigan; F. P. Schloerb, Univ. of Massachusetts/Amherst; W. A. Traub, Jet Propulsion Lab.; G. Wallace, Univ. of Massachusetts/Amherst . . . . . [6268-145]

✔ **Temperature and humidity environmental conditions in the VLTI,** F. Puech, S. A. Lévêque, M. S. Sarazin, European Southern Observatory (Germany); R. J. Mathar, Univ. Leiden (Netherlands) . . . . . [6268-146]

✔ **The VLTI auxiliary telescopes: measured performances,** B. Koehler, M. Kraus, J. M. Moresmau, K. Wirenstrand, P. Duhoux, R. Karban, L. Andolfato, F. Y. J. Gonte, European Southern Observatory (Germany) . . . . . [6268-147]

✔ **Adaptive optics quality metrics and user constraints set for VLTI,** I. Percheron, M. Wittkowski, R. Donaldson, E. Fedrigo, European Southern Observatory (Germany); C. Lidman, S. Morel, F. T. Rantakyrö, M. Schoeller, European Southern Observatory (Chile); A. Wallander, European Southern Observatory (Germany) . . . . . [6268-148]

✔ **RF survey for the Magdalena Ridge Observatory interferometer site,** C. B. Parameswariah, C. A. Jurgenson, New Mexico Institute of Mining and Technology . . . . . [6268-149]

✔ **IRIS: a versatile infrared tilt sensor for commissioning and operation of the VLTI,** P. B. Gitton, S. A. Lévêque, T. Phan Duc, G. Avila, European Southern Observatory (Germany); A. Ramirez, European Southern Observatory (Chile) . . . . . [6268-150]

Exoplanets

✔ **A survey and characterization of extrasolar planetary systems host stars,** E. K. Baines, Georgia State Univ. . . . . [6268-151]

✔ **The PRIMA Astrometric Planet search: goals and prospects,** S. Reffert, Univ. Leiden (Netherlands); D. Ségransan, Observatoire Astronomique de l'Univ. de Genève (Switzerland); R. Launhardt, T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); D. Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland); A. Quirrenbach, W. J. Jaffe, Univ. Leiden (Netherlands); F. A. Pepe, Observatoire Astronomique de l'Univ. de Genève (Switzerland); J. Setiawan, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-152]

✔ **SIM-PlanetQuest: detection and characterization of terrestrial planets in the habitable zone,** A. M. Tanner, J. H. Catanzarite, M. Shao, Jet Propulsion Lab. . . . . [6268-153]

Calibration

✔ **Early type stars as calibrators for ground-based optical interferometry,** J. Yoon, D. M. Peterson, Stony Brook Univ.; J. H. Clark III, U.S. Naval Observatory; J. T. Armstrong, G. C. Gilbreath, T. A. Pauls, H. R. Schmitt, Naval Research Lab. . . . . [6268-154]

✔ **High precision calibration of interferometric data through the removal of fixed-pattern residuals,** C. Tycner, J. A. Benson, D. J. Hutter, U.S. Naval Observatory; H. R. Schmitt, Naval Research Lab.; R. T. Zavala, U.S. Naval Observatory . . . . . [6268-155]

✔ **Characterization of the NPOI fringe scanning stroke,** A. M. Jorgensen, Los Alamos National Lab.; D. Mozurkewich, Seabrook Engineering; J. L. Murphy, M. Sapantaie, J. T. Armstrong, G. C. Gilbreath, R. B. Hindsley, T. A. Pauls, H. R. Schmitt, Naval Research Lab.; D. J. Hutter, U.S. Naval Observatory . . . . . [6268-156]

✔ **Analysis of calibration errors for both short and long stroke white light experiments,** X. Pan, Jet Propulsion Lab. . . . . [6268-157]

Antarctica

✔ **Study of the scientific potential of a three 50cm telescopes interferometer at Dome C,** B. Valat, F. Schmider, Univ. de Nice Sophia Antipolis (France); B. Lopez, Observatoire de la Côte d'Azur (France); R. G. Petrov, M. Vannier, F. Vakili, Univ. de Nice Sophia Antipolis (France) . . . . . [6268-158]

✔ **Study on transport of assembled interferometer to Antarctica,** E. R. Lanford, M. Guillon, K. Knepper, V. Olson, D. Roche, Harvey Mudd College; M. R. Swain, Max-Planck-Institut für Astronomie (Germany); P. Little, Harvey Mudd College . . . . . [6268-159]

Friday 26 May

SESSION 5

Room: Crystal Ballrooms: G1 . . . . . Fri. 8:10 to 9:55 am

Status Reports

Chair: **Michelle J. Creech-Eakman**, New Mexico Institute of Mining and Technology

8:10 am: **The Berkeley infrared spatial interferometer** *(Invited Paper, Presentation Only)***,** C. H. Townes, Univ. of California/Berkeley . . . . . [6268-20]

8:25 am: **Evolution of dust shell structure and asymmetry around 6 Mira-type stars,** K. Tatebe, A. Chandler, D. D. Snyder Hale, C. H. Townes, Univ. of California/Berkeley . . . . . [6268-21]

8:40 am: **Recent progress at the VLT interferometer** *(Invited Paper)***,** M. Schöller, European Southern Observatory (Chile) . . . . . [6268-22]

9:00 am: **Status of the scientific observations with MIDI on the VLTI** *(Invited Paper)***,** T. Ratzka, Max-Planck-Institut für Astronomie (Germany) [6268-51]

9:15 am: **Recent progress at the Keck interferometer** *(Invited Paper)***,** P. L. Wizinowich, W.M. Keck Observatory; M. M. Colavita, Jet Propulsion Lab.; R. L. Akeson, California Institute of Technology . . . . . [6268-24]

9:35 am: **Keck interferometer V2 science** *(Invited Paper)***,** R. Millan-Gabet, California Institute of Technology . . . . . [6268-25]

Coffee Break . . . . . 9:55 to 10:30 am

SESSION 6

Room: Crystal Ballrooms: G1 . . . . . Fri. 10:30 to 11:50 am

OHANA and Space

Chair: **Oliver P. Lay**, Jet Propulsion Lab.

10:30 am: **Lessons and prospects after first 'OHANA fringes,** G. S. Perrin, Observatoire de Paris à Meudon (France) . . . . . [6268-26]

10:45 am: **SIM: status and recent progress** *(Invited Paper)***,** B. Nemati, Jet Propulsion Lab. . . . . [6268-27]

11:00 am: **Status and recent progress of the Darwin mission in the Cosmic Vision program** *(Invited Paper)***,** R. H. den Hartog, M. C. Fridlund, L. L. A. d'Arcio, A. L. Karlsson, European Space Agency (Netherlands) . . . . . [6268-28]

11:20 am: **TPF-I: status and recent progress** *(Invited Paper)***,** C. A. Beichman, Jet Propulsion Lab. . . . . [6268-29]

11:35 am: **TPF-C: status and recent progress** *(Invited Paper)***,** W. A. Traub, Jet Propulsion Lab. . . . . [6268-30]

Lunch Break . . . . . 11:50 am to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 7

Room: Crystal Ballrooms: G1 . . . . . Sat. 8:00 to 10:00 am

Phase-Referencing and Future Instrumentation

Chair: **John D. Monnier**, Univ. of Michigan

8:00 am: **PRIMA for the VLTI: a status report,** F. Delplancke, L. Andolfato, P. Ballester, J. A. de Jong, F. J. Derie, P. Duhoux, R. Frahm, P. B. Gitton, A. Glindemann, R. Karban, S. A. Lévêque, S. Ménardi, T. Phan Duc, F. Puech, J. Sahlmann, N. Schuhler, B. Valat, A. Wallander, European Southern Observatory (Germany) . . . . . [6268-31]

8:15 am: **Calibration strategy and error budget for dual-star interferometry,** A. Quirrenbach, Univ. Leiden (Netherlands); F. Delplancke, European Southern Observatory (Germany); T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); W. J. Jaffe, Univ. Leiden (Netherlands); R. Launhardt, Max-Planck-Institut für Astronomie (Germany); R. S. le Poole, R. J. Mathar, Univ. Leiden (Netherlands); F. A. Pepe, D. Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland); S. Reffert, Univ. Leiden (Netherlands); R. N. Tubbs, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6268-32]

8:30 am: **Toward complex visibilities using optical interferometry: multi-wavelength phase referencing,** T. A. Pauls, H. R. Schmitt, Naval Research Lab.; C. Tycner, U.S. Naval Observatory; J. T. Armstrong, Naval Research Lab.; J. A. Benson, U.S. Naval Observatory; J. H. Clark III, G. C. Gilbreath, R. B. Hindsley, Naval Research Lab.; D. J. Hutter, U.S. Naval Observatory; A. M. Jorgensen, Los Alamos National Lab. . . . . [6268-33]

8:45 am: **Double-Fourier spatio-spectral decoding,** P. G. Tuthill, The Univ. of Sydney (Australia); T. A. ten Brummelaar, Georgia State Univ./The CHARA Array; M. J. Ireland, California Institute of Technology; S. T. Ridgway, National Optical Astronomy Observatory; H. A. McAlister, Georgia State Univ.; N. H. Turner, Georgia State Univ./The CHARA Array . . . . . [6268-34]

9:00 am: **VITRUV: a milli-arcsec spectro-imager for the VLTI,** F. Malbet, P. Y. Kern, J. Berger, K. Rousselet-Perraut, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. Garcia, Univ. do Porto (Portugal); L. Jocou, E. P. Le Coarer, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. R. Labeye, CEA-LETI (France); J. Le Bouquin, M. Benisty, E. Herwats, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-35]

9:15 am: **MATISSE: perspective of imaging in the mid-infrared at the VLTI,** B. Lopez, Observatoire de la Côte d'Azur (France); S. Wolf, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-36]

9:30 am: **ALADDIN: an optimized nulling ground based demonstrator for DARWIN,** V. Coudé du Foresto, Observatoire de Paris à Meudon (France); O. Absil, Univ. de Liège (Belgium); M. R. Swain, Max-Planck-Institut für Astronomie (Germany); F. Vakili, Univ. de Nice Sophia Antipolis (France); M. Barillot, Alcatel Alenia Space (France) . . . . . [6268-37]

9:45 am: **GRAVITY: the AO-assisted, two-object beam-combiner instrument for the VLTI,** S. Rabien, Max-Planck-Institut für extraterrestrische Physik (Germany); G. S. Perrin, Observatoire de Paris à Meudon (France); A. Eckart, Univ. zu Köln (Germany); F. Eisenhauer, Max-Planck-Institut für extraterrestrische Physik (Germany); P. J. Lena, Observatoire de Paris à Meudon (France); R. Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany) and Univ. of California/Berkeley; R. N. Abuter, T. Paumard, Max-Planck-Institut für extraterrestrische Physik (Germany); W. Brandner, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-53]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 8

Room: Crystal Ballrooms: G1 . . . . . Sat. 10:30 to 11:15 am

Antarctica

Chair: **Michael J. Ireland**, California Institute of Technology

10:30 am: **Deep sky observations with Dome C optical interferometers,** E. Thami, Cadi Ayyad Univ. (Morocco) and Univ. de Nice Sophia Antipolis (France); R. G. Petrov, Univ. de Nice Sophia Antipolis (France); M. Lazrek, Z. Z. Benkhaldoun, Cadi Ayyad Univ. (Morocco) . . . . . [6268-39]

10:45 am: **Telescope design considerations and a unique approach to delay line construction for the proposed Antarctic interferometer at Dome C,** R. Brunswick, B. H. Cook, G. Pentland, EOS Technologies, Inc.; P. Sperber, Fachhochschule Deggendorf (Germany) . . . . . [6268-40]

11:00 am: **Concept study and validation of Antarctic telescope tower,** E. R. Lanford, Harvey Mudd College; M. R. Swain, Max-Planck-Institut für Astronomie (Germany); P. Little, Harvey Mudd College . . . . . [6268-41]

Lunch Break/Poster Viewing . . . . . 11:15 am to 1:30 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 9

Room: Crystal Ballrooms: G1 . . . . . Sat. 2:35 to 5:00 pm

Nulling

Chair: **Theo A. ten Brummelaar**, Georgia State Univ.

2:35 pm: **Science observations with the Keck interferometer nuller,** E. Serabyn, Jet Propulsion Lab. . . . . [6268-42]

2:50 pm: **Measuring extended structure in stars using the Keck interferometer nuller,** C. D. Koresko, M. M. Colavita, E. Serabyn, A. J. Booth, J. I. Garcia, Jet Propulsion Lab. . . . . [6268-43]

3:05 pm: **Water vapor measurement and compensation in the near- and mid-infrared with the Keck interferometer nuller,** C. D. Koresko, M. M. Colavita, E. Serabyn, A. J. Booth, J. I. Garcia, Jet Propulsion Lab. . . . . [6268-44]

3:20 pm: **Progress in testing exo-planet signal extraction on the TPF-I planet detection testbed,** S. R. Martin, K. M. Liewer, P. Szwaykowski, F. M. Loya, Jet Propulsion Lab. . . . . [6268-45]

Coffee Break . . . . . 3:35 to 4:00 pm

4:00 pm: **Multi-axial nulling interferometry: demonstration of deep nulling and investigations of polarization effects,** C. Buisset, Observatoire de la Côte d'Azur (France) and Alcatel Alenia Space (France); X. Rejeaunier, Alcatel Alenia Space (France); Y. Rabbia, Observatoire de la Côte d'Azur (France); C. Ruilier, M. Barillot, Alcatel Alenia Space (France); L. O. Lierstuen, Kongsberg Defense and Aerospace (Norway); J. M. Perdigues Armengol, European Space Research and Technology Ctr. (Netherlands) . . . . . [6268-46]

4:15 pm: **Removing systematic error in nulling interferometers,** O. P. Lay, Jet Propulsion Lab. . . . . [6268-47]

4:30 pm: **Nulling interferometry for exo-planet detection using polarization properties,** J. Spronck, S. F. Pereira, J. J. M. Braat, Technische Univ. Delft (Netherlands) . . . . . [6268-48]

4:45 pm: **Adaptive nulling for the Terrestrial Planet Finder interferometer,** R. D. Peters, O. P. Lay, Jet Propulsion Lab.; A. Hirai, National Institute of Advanced Industrial Science and Technology (Japan); M. Jeganathan, Jet Propulsion Lab. . . . . [6268-49]

SESSION 10

Room: Crystal Ballrooms: G1 . . . . . Sat. 5:00 to 6:15 pm

Exoplanet Surveying

Chair: **Françoise Delplancke**, European Southern Observatory (Germany)

5:00 pm: **The potential of ALADDIN for Darwin precursor exoplanet science,** M. R. Swain, Jet Propulsion Lab. and Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-50]

PANEL DISCUSSION

Room: Crystal Ballrooms: G1 . . . . . Sat. 5:15 to 6:15 pm

Relative Merits of Ground, Space, and Antarctic Interferometry

Organized by **David Buscher,** Univ. of Cambridge (United Kingdom); **Vincent Coude du Foresto,** Observatoire de Paris à Meudon (France); **Michael Shao,** Jet Propulsion Lab. (USA)

Interferometric arrays impose an unusually demanding combination of requirements on site selection: kilometer-sized "footprints", exceptional temporal and spatial seeing, good transparency, good dimensional stability and low vibration, and ease of access for debugging and upgrading. Different locations on Earth and in space satisfy each of these requirements to greater or lesser extents and the optimal location for an interferometer depends critically on the science application. This panel discussion will look at the relationship between the interferometric applications and the siting of the array, the future timelines for projects sited on conventional Earth-based observatory locations, in Antarctica, in space and on the Moon, and the possible synergies, scientific, technical and logistical between projects sited in these different locations. The format will consist of a set of introductory talks by the panelists followed by an open discussion of the issues described above.

Conference presentations will resume Monday 29 May

Monday 29 May

SESSION 11

Room: Crystal Ballrooms: G1 . . . . . Mon. 8:30 to 10:00 am

New Techniques

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

8:30 am: **10-micron interferometry of the disk and wind of the massive young star MWC349A,** S. Albrecht, A. Quirrenbach, Univ. Leiden (Netherlands); R. N. Tubbs, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6268-14]

8:45 am: **CHARA/FLUOR update,** A. Mérand, V. Coudé du Foresto, Observatoire de Paris à Meudon (France); A. Kellerer, European Southern Observatory (Germany); T. A. ten Brummelaar, Georgia State Univ./The CHARA Array [6268-88]

9:00 am: **Detection of gaps in protoplanetary disks with DARWIN,** E. Herwats, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) and Univ. of Liège (Belgium); F. Malbet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); O. Absil, Univ. de Liège (Belgium); A. M. Léger, M. Ollivier, Univ. Paris-Sud II (France) . . . . . [6268-52]

9:15 am: **Coherent integrations, fringe modeling, and bootstrapping with the NPOI,** A. M. Jorgensen, Los Alamos National Lab.; D. Mozurkewich, Seabrook Engineering; H. R. Schmitt, J. T. Armstrong, G. C. Gilbreath, R. B. Hindsley, T. A. Pauls, Naval Research Lab.; D. M. Peterson, Stony Brook Univ. . . . [6268-54]

9:30 am: **The imaging fringe and flexure tracker of LINC-NIRVANA: basic opto-mechanical design and principle of operation,** C. Straubmeier, T. Bertram, A. Eckart, S. Rost, Y. Wang, Univ. zu Köln (Germany); T. M. Herbst, Max-Planck-Institut für Astronomie (Germany); R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6268-55]

9:45 am: **Interferometric observations of the galactic center: LBT and VLTI,** A. Eckart, Univ. zu Köln (Germany) . . . . . [6268-56]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 12

Room: Crystal Ballrooms: G1 . . . . . Mon. 10:30 to 11:45 am

New Methods

10:30 am: **Interferometric observations of Nova Aql 2005,** B. F. Lane, Massachusetts Institute of Technology; A. Retter, The Pennsylvania State Univ.; J. A. Eisner, Univ. of California/Berkeley; R. R. Thompson, California Institute of Technology; M. W. Muterspaugh, Massachusetts Institute of Technology . . . . . [6268-161]

10:45 am: **Beam combination, all with all,** E. N. Ribak, Technion - Israel Institute of Technology (Israel) . . . . . [6268-57]

11:00 am: **The control system for the Keck interferometer nuller,** A. J. Booth, M. M. Colavita, J. I. Garcia, C. D. Koresko, Jet Propulsion Lab. . . . . [6268-59]

11:15 am: **Experiences from the first open time observations with AMBER,** F. T. Rantakyrö, European Southern Observatory (Chile); P. Ballester, European Southern Observatory (Germany); S. Brillant, E. Galliano, C. A. Hummel, A. Kaufer, M. Kiekebusch, P. Mardones, S. Morel, European Southern Observatory (Chile); I. Percheron, M. Petr-Gotzens, A. Richichi, European Southern Observatory (Germany); T. Rivinius, M. Schöller, S. Stefl, M. Vannier, European Southern Observatory (Chile); M. Wittkowski, European Southern Observatory (Germany) . . . . . [6268-60]

11:30 am: **Thermal and deadtime effects in APD pulse detectors: a unified model,** D. M. Peterson, Stony Brook Univ.; D. Mozurkewich, Seabrook Engineering; C. A. Hummel, European Southern Observatory (Chile) . . . [6268-61]

Lunch Break . . . . . 11:45 am to 1:30 pm

SESSION 13

Room: Crystal Ballrooms: G1 . . . . . Mon. 1:30 to 3:15 pm

Imaging

Chair: **Andreas Quirrenbach**, Leiden Univ. (Netherlands)

1:30 pm: **Michigan infrared combiner: commissioning results at the CHARA Array,** J. D. Monnier, E. Pedretti, N. D. Thureau, Univ. of Michigan; T. A. ten Brummelaar, J. Sturmann, Georgia State Univ./The CHARA Array; H. A. McAlister, Georgia State Univ.; R. Millan-Gabet, California Institute of Technology; J. Berger, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); A. Tannirkulam, M. Zhao, P. Muirhead, Univ. of Michigan . . . . . [6268-62]

1:45 pm: **Interferometric imaging of MIRA stars and Betelgeuse,** S. Lacour, G. S. Perrin, Observatoire de Paris à Meudon (France); S. C. Meimon, ONERA; J. M. Woillez, W.M. Keck Observatory; P. A. Schuller, Harvard-Smithsonian Ctr. for Astrophysics; X. Haubois, Observatoire de Paris à Meudon (France); S. T. Ridgway, National Optical Astronomy Observatory . . . . . [6268-63]

2:00 pm: **Beam combiner studies for MROI,** F. Baron, D. F. Buscher, J. Coyne, Univ. of Cambridge (United Kingdom); M. J. Creech-Eakman, New Mexico Institute of Mining and Technology; C. A. Haniff, Univ. of Cambridge (United Kingdom); C. A. Jurgenson, New Mexico Institute of Mining and Technology; J. S. Young, Univ. of Cambridge (United Kingdom) . . . . . [6268-64]

2:15 pm: **Direct imaging in interferometry: technical aspects and preliminary results of a test bench,** F. Patru, D. Mourard, Observatoire de la Côte d'Azur (France); O. Lardiere, Osservatorio Astrofisico di Arcetri (Italy); L. Delage, F. Reynaud, Institut de Recherche en Communications Optiques et Microondes (France) . . . . . [6268-65]

2:30 pm: **Monte-Carlo imaging for optical interferometry,** M. J. Ireland, California Institute of Technology; J. D. Monnier, N. D. Thureau, Univ. of Michigan . . . . . [6268-67]

2:45 pm: **MIRA: an effective imaging algorithm for optical interferometry,** E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France) . . . . . [6268-68]

3:00 pm: **2006 interferometry imaging beauty contest,** P. R. Lawson, Jet Propulsion Lab.; W. Cotton, National Radio Astronomy Observatory; C. A. Hummel, European Southern Observatory (Chile); F. Baron, J. S. Young, Univ. of Cambridge (United Kingdom); S. C. Meimon, G. Le Besnerais, L. M. Mugnier, ONERA (France); M. J. Ireland, California Institute of Technology; J. D. Monnier, Univ. of Michigan; E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France); R. T. Zavala, U.S. Naval Observatory; S. Kraus, K. Hofmann, G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany); J. Pott, European Southern Observatory (Germany); R. Sridharan, Space Telescope Science Institute; D. A. Hope, The Univ. of New Mexico . . . . . [6268-69]

Coffee Break . . . . . 3:15 to 4:00 pm

SESSION 14

Room: Crystal Ballrooms: G1 . . . . . Mon. 4:00 to 4:45 pm

Future Interferometer Facilities

Chair: **Jean-Philippe Berger**,
Lab. d'Astrophysique de l'Observatoire de Grenoble (France)

4:00 pm: **Magdalena Ridge Observatory interferometer: status update** *(Invited Paper)***,** M. J. Creech-Eakman, New Mexico Institute of Mining and Technology; D. F. Buscher, Univ. of Cambridge (United Kingdom); T. A. Coleman, New Mexico Institute of Mining and Technology; C. A. Haniff, Univ. of Cambridge (United Kingdom); C. A. Jurgenson, J. E. Kern, D. A. Klinglesmith III, C. B. Parameswariah, V. D. Romero, A. Shtromberg, D. J. Westpfahl, New Mexico Institute of Mining and Technology; J. S. Young, Univ. of Cambridge (United Kingdom) . . . . . [6268-70]

4:15 pm: **Toward interferometry with the Large Binocular Telescope** *(Invited Paper)***,** P. M. Hinz, The Univ. of Arizona/Steward Observatory; T. M. Herbst, Max-Planck-Institut für Astronomie (Germany) . . . . . [6268-71]

4:30 pm: **Beyond the fringe: an update on the construction of LINC-NIRVANA, a Fizeau imaging interferometer for the LBT,** T. M. Herbst, Max-Planck-Institut für Astronomie (Germany); A. Eckart, Univ. zu Köln (Germany); R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); G. P. Weigelt, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6268-72]

Best Dissertation Prize

Room: Crystal Ballrooms: G1 . . . . . Mon. 4:45 pm

Presented by: **John D. Monnier**, Univ. of Michigan

Sponsored by: New Focus™ A Division of Bookham

PANEL DISCUSSION

Room: Crystal Ballrooms: G1 . . . . . Mon. 4:45 to 5:30 pm

The Future of Optical Interferometry

Organized by **Jean Surdej,** Univ. de Liège (Belgium) and **Stephen Ridgway,** National Optical Astronomy Observatory (USA)

A panel discussion will address the future of interferometry, including science directions for today and tomorrow, how to better integrate interferometry into "mainstream" astronomy, augmentations of existing facilities, possible future array projects of scale, and planning processes in the national and international communities.

Tuesday 30 May

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy

Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 15

Room: Crystal Ballrooms: G1 . . . . . Tues. 9:35 to 10:35 am

Exoplanets

Chair: **Markus Schöller**, European Southern Observatory (Chile)

9:35 am: **Astrometric exoplanets search with PRIMA at VLTI: the project,** F. A. Pepe, Observatoire Astronomique de l'Univ. de Genève (Switzerland); T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); D. Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland); A. Quirrenbach, Univ. Leiden (Netherlands); A. Glindemann, P. Ballester, European Southern Observatory (Germany); H. Baumeister, P. Bizenberger, Max-Planck-Institut für Astronomie (Germany); H. Bleuler, École Polytechnique Fédérale de Lausanne (Switzerland); F. Delplancke, F. J. Dérie, European Southern Observatory (Germany); M. Fleury, Observatoire Astronomique de l'Univ. de Genève (Switzerland); D. Gillet, École Polytechnique Fédérale de Lausanne (Switzerland); W. J. Jaffe, Univ. Leiden (Netherlands); J. A. de Jong, European Southern Observatory (Germany); R. Köhler, Univ. Leiden (Netherlands); R. Launhardt, Max-Planck-Institut für Astronomie (Germany); C. Maire, Observatoire Astronomique de l'Univ. de Genève (Switzerland); R. J. Mathar, Univ. Leiden (Netherlands); D. Mégevand, Observatoire Astronomique de l'Univ. de Genève (Switzerland); Y. Michellod, P. Mullhaupt, École Polytechnique Fédérale de Lausanne (Switzerland); T. Phan Duc, European Southern Observatory (Germany); S. Reffert, Univ. Leiden (Netherlands); L. Sache, École Polytechnique Fédérale de Lausanne (Switzerland); Y. Salvadé, École d'ingénieurs Arc (Switzerland); D. Ségransan, Observatoire Astronomique de l'Univ. de Genève (Switzerland); J. Setiawan, Max-Planck-Institut für Astronomie (Germany); D. Sosnowska, Observatoire Astronomique de l'Univ. de Genève (Switzerland); K. Wagner, Max-Planck-Institut für Astronomie (Germany); L. J. Weber, Observatoire Astronomique de l'Univ. de Genève (Switzerland); R. Wuethrich, École Polytechnique Fédérale de Lausanne (Switzerland); L. Zago, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland) . . . . . [6268-73]

9:50 am: **Astrometric search for terrestrial planets with SIM-PlanetQuest,** M. Shao, Jet Propulsion Lab. . . . . [6268-74]

10:05 am: **Scientific rationale for exoplanet characterization from 3 to 8-microns: the FKSI mission,** W. C. Danchi, R. K. Barry, D. Deming, M. J. Kuchner, NASA Goddard Space Flight Ctr.; J. D. Monnier, Univ. of Michigan; J. K. Rajagopal, NASA Goddard Space Flight Ctr.; L. G. Mundy, Univ. of Maryland/ College Park; J. Richardson, NASA Goddard Space Flight Ctr.; S. Seager, Carnegie Institute of Washington; W. A. Traub, Jet Propulsion Lab. . . . . [6268-75]

10:20 am: **Exo-earth atmosphere direct analysis by appropriate combination of detection methods,** P. Gori, Univ. di Corsica (France); F. Vakili, Univ. de Nice Sophia Antipolis (France) . . . . . [6268-76]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 16

Room: Crystal Ballrooms: G1 . . . . . Tues. 11:00 am to 12:15 pm

Space Missions and Technology

Chair: **Marc Barillot**,
École Polytechnique Fédérale de Lausanne (Switzerland)

11:00 am: **The Stellar Imager (SI) Vision mission,** K. G. Carpenter, NASA Goddard Space Flight Ctr.; C. J. Schrijver, Lockheed Martin Advanced Technology Ctr.; M. Karovska Neily, Harvard-Smithsonian Ctr. for Astrophysics . . . . [6268-77]

11:15 am: **SIM-PlanetQuest progress report,** J. C. Marr IV, Jet Propulsion Lab. . . . . [6268-78]

11:30 am: **Successful completion of SIM-PlanetQuest technology,** R. A. Laskin, Jet Propulsion Lab. . . . . [6268-79]

11:45 am: **Results from SIM's Thermo-Opto-Mechanical (TOM3) testbed,** R. Goullioud, C. A. Lindensmith, I. Hahn, Jet Propulsion Lab. . . . . [6268-80]

12:00 pm: **Instrument pointing control system for the Stellar Interferometry mission: PlanetQuest,** P. B. Brugarolas, B. H. Kang, Jet Propulsion Lab.[6268-81]

Lunch Break . . . . . 12:15 to 1:30 pm

SESSION 17

Room: Crystal Ballrooms: G1 . . . . . Tues. 1:30 to 3:00 pm

Space Technology

Chair: **Charles F. Lillie**, Northrop Grumman Space Technology

1:30 pm: **LISA interferometry,** G. Mueller, Univ. of Florida . . . . . [6268-82]

1:45 pm: **DARWIN mission and configuration trade-off,** O. Wallner, K. Ergenzinger, R. Flatscher II, U. A. Johann, EADS Astrium GmbH (Germany) . . . . . [6268-83]

2:00 pm: **Terrestrial Planet Finder interferometer: technology status and plans,** P. R. Lawson, A. Ahmed, R. O. Gappinger, A. Ksendov, O. P. Lay, S. R. Martin, R. D. Peters, D. P. Scharf, J. K. Wallace, B. Ware, Jet Propulsion Lab. . . . . [6268-84]

2:15 pm: **Current status of formation flying technology for TPF-I,** A. Ahmed, Jet Propulsion Lab. . . . . [6268-85]

2:30 pm: **Angle sensor for metrology of free-flying spacecraft formations,** E. M. E. Sabatke, J. W. Leitch, A. Pierce, Ball Aerospace & Technologies Corp. . . . . [6268-86]

2:45 pm: **DARWIN fringe sensor: experimental results on the BRISE bench,** F. Cassaing, I. Mocoeur, ONERA (France); F. Baron, Univ. of Cambridge (United Kingdom); S. Hofer, H. Thiele, Kayser-Threde GmbH (Germany) . . . . . [6268-87]

Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 18

Room: Crystal Ballrooms: G1 . . . . . Tues. 3:30 to 5:30 pm

New Technology

Chair: **G. Charmaine Gilbreath**, Naval Research Lab.

3:30 pm: **New four telescopes integrated recombiner for next generation stellar interferometry imaging instruments,** P. R. Labeye, P. Noel, CEA-LETI (France) . . . . . [6268-38]

3:45 pm: **Characterization of 4-beam integrated optics combiners for the VLTI-VITRUV instrument,** M. Benisty, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6268-89]

4:00 pm: **Integrated optics for mid-infrared nulling interferometry,** L. Labadie, P. Y. Kern, L. Abel-Tiberini, B. Arezki, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); M. Barillot, Alcatel Alenia Space (France); J. Broquin, École Nationale Supérieure d'Electronique et de Radioélectricité de Grenoble (France); A. Delboulbé, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. R. Labeye, CEA-LETI (France); A. Pradel, Univ. Montpellier II (France); C. Ruilier, Alcatel Alenia Space (France); P. Saguet, École Nationale Supérieure d'Electronique et de Radioélectricité de Grenoble (France); C. Vigreux, Univ. Montpellier II (France) . . . . . [6268-90]

4:15 pm: **Development of broadband infrared single-mode fibers for the DARWIN mission,** L. K. Cheng, A. Faber, W. Gielesen, TNO TPD (Netherlands); J. Lucas, C. Boussard, P. Houizot, Univ. de Rennes I (France); J. P. N. Pereira do Carmo, European Space Agency (Netherlands) . . . . . [6268-91]

4:30 pm: **Development of extremely coherent single mode fiber bundle arrays for high contrast imaging of extrasolar planets with TPF-C,** J. C. Ge, D. L. McDavitt, S. Miller, Univ. of Florida . . . . . [6268-95]

4:45 pm: **Demonstration of spectral calibration for stellar interferometry,** R. T. Demers, G. Vasisht, A. Kissil, E. Kwack, Jet Propulsion Lab. . . . . [6268-92]

5:00 pm: **Design and testing of an innovative delay line for the MROI,** D. F. Buscher, R. C. Boysen, R. J. Dace, M. Fisher, C. A. Haniff, E. B. Seneta, X. Sun, D. M. A. Wilson, J. S. Young, Univ. of Cambridge (United Kingdom) . . . . . [6268-93]

5:15 pm: **Infrared achromatic phase shifters using modulated total internal reflection,** D. Mawet, P. Riaud, C. J. M. Lenaerts, S. L. M. Habraken, J. J. D. Loicq, D. P. G. Vandormael, Univ. de Liège (Belgium) . . . . . [6268-94]

Thursday-Monday 25-29 May 2006 • Proceedings of SPIE Vol. 6269

Conference Chairs:
Ian S. McLean, Univ. of California/ Los Angeles;

Masanori Iye, National Astronomical Observatory of Japan (Japan)

Ground-based and Airborne Instrumentation for Astronomy

Program Committee: **Mark M. Casali**, European Southern Observatory (Germany); **Sean C. Casey**, Universities Space Research Association; **David Crampton**, National Research Council Canada/Herzberg Institute of Astrophysics (Canada); **Stephen S. Eikenberry**, Univ. of Florida; **Suzanne K. Ramsay-Howat**, UK Astronomy Technology Ctr. (United Kingdom); **José M. Rodríguez Espinosa**, Instituto de Astrofísica de Canarias (Spain); **Douglas A. Simons**, Gemini Observatory; **Oskar F. von der Lühe II**, Kiepenheuer Institut für Sonnenphysik (Germany)

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 1

Room: Crystal Ballrooms: J1 . . . . . Thurs. 9:35 am to 12:30 pm

Overview of Instrumentation at Major Observatories I

Chair: **Suzanne K. Ramsay-Howat**,
UK Astronomy Technology Ctr. (United Kingdom)

9:35 am: **Instrumentation development at the W. M. Keck Observatory** *(Invited Paper)*, I. S. McLean, Univ. of California/Los Angeles; S. M. Adkins, W. M. Keck Observatory . . . . . [6269-01]

10:05 am: **Instrumentation at the ESO VLT** *(Invited Paper)*, A. F. M. Moorwood, European Southern Observatory (Germany) . . . . . [6269-02]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **Current and future Subaru instruments** *(Invited Paper)*, M. Iye, National Astronomical Observatory of Japan (Japan) . . . . . [6269-03]

11:30 am: **Gemini Observatory's current and future instrumentation program** *(Invited Paper)*, D. A. Simons, J. B. Jensen, C. d'Orgeville, P. M. Gray, M. Lazo, R. Rogers, M. P. Sheehan, J. K. White, Gemini Observatory . . . . . [6269-04]

12:00 pm: **Present and future instrumentation for the Hobby-Eberly Telescope** *(Invited Paper)*, G. J. Hill, P. J. MacQueen, P. Palunas, J. A. Booth, The Univ. of Texas at Austin . . . . . [6269-05]

Lunch Break . . . . . 12:30 to 1:30 pm

SESSION 2

Room: Crystal Ballrooms: J1 . . . . . Thurs. 1:30 to 3:00 pm

Overview of Instrumentation at Major Observatories II

Chair: **Suzanne K. Ramsay-Howat**,
UK Astronomy Technology Ctr. (United Kingdom)

1:30 pm: **The GTC facility instruments: main features and readiness status** *(Invited Paper)*, J. M. Rodríguez Espinosa, P. Alvarez Martin, Instituto de Astrofísica de Canarias (Spain) . . . . . [6269-06]

2:00 pm: **An overview of instrumentation for the Large Binocular Telescope** *(Invited Paper)*, R. M. Wagner, The Univ. of Arizona . . . . . [6269-07]

2:30 pm: **Status of the SALT first-generation instruments** *(Invited Paper)*, D. A. H. Buckley, D. E. O'Donoghue, South African Astronomical Observatory (South Africa); K. H. Nordsieck, E. B. Burgh, Univ. of Wisconsin/Madison; P. L. Cottrell, Univ. of Canterbury (New Zealand) . . . . . [6269-08]

Coffee Break . . . . . 3:00 to 3:20 pm

SESSION 3

Room: Crystal Ballrooms: J1 . . . . . Thurs. 3:20 to 4:20 pm

Optical Imaging

Chair: **Masanori Iye**,
National Astronomical Observatory of Japan (Japan)

3:20 pm: **HyperSuprime: project overview,** S. Miyazaki, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-09]

3:35 pm: **LSST camera system overview,** D. K. Gilmore, S. M. Kahn, M. Nordby, D. L. Burke, Stanford Linear Accelerator Ctr.; P. O'Connor, Brookhaven National Lab.; J. Oliver, Harvard Univ.; V. Radeka, Brookhaven National Lab.; T. Schalk, R. Schindler, Stanford Linear Accelerator Ctr. . . . . [6269-10]

3:50 pm: **LINC-NIRVANA: optical design of an interferometric imaging camera,** P. Bizenberger, Max-Planck-Institut für Astronomie (Germany); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); S. E. Egner, T. M. Herbst, Max-Planck-Institut für Astronomie (Germany); R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); W. Xu, Optical System Engineering (Germany) . . . . . [6269-11]

4:05 pm: **Tunable H-alpha Lyot filter with advanced servo system and image processing: instrument design and new scientific results with the Dutch Open Telescope,** F. C. M. Bettonvil, R. H. Hammerschlag, A. P. L. Jägers, P. Sütterlin, R. J. Rutten, Univ. Utrecht (Netherlands) . . . . . [6269-12]

POSTER POPS

Room: Crystal Ballrooms: J1 . . . . . Thurs. 4:20 to 5:20 pm

1-minute presentations

Session A

✔ **The CCD imaging systems for LAMOST,** S. Zou, G. Wang, National Astronomical Observatories (China) . . . . . [6269-13]

✔ **Near-infrared direct vision prism for wide-wavelength coverage spectroscopy at Subaru Telescope,** N. Takato, H. Terada, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-52]

✔ **WFMOS: a feasibility study for Gemini,** S. C. Barden, A. J. McGrath, S. Miziarski, Anglo-Australian Observatory (Australia); R. M. Myers, S. L. Morris, Univ. of Durham (United Kingdom); K. Glazebrook, S. A. Smee, R. H. Barkhouser, John Hopkins Univ.; G. B. Dalton, Univ. of Oxford (United Kingdom) . . . . . [6269-76]

✔ **ELT Doppler imaging and exoplanet studies,** M. M. Casali, European Southern Observatory (Germany) . . . . . [6269-77]

✔ **A large-format imager for the SkyMapper Survey Telescope,** A. P. Oates, P. G. Conroy, A. Granlund, E. Kowald, M. F. Waterson, M. I. Dawson, M. Petkovic, A. Vaccarella, B. Schmidt, S. C. Keller, The Australian National Univ. (Australia) . . . . . [6269-78]

✔ **Optics integration of the OMM wide-field visible camera (Panoramix-II),** S. Thibault, ImmerVision (Canada); M. Wang, P. Côté, M. Savard, Institut National d'Optique (Canada); L. Drissen, Univ. Laval (Canada) . . . . . [6269-80]

✔ **Simplifying the prime focus corrector of the Discovery Channel Telescope,** M. J. MacFarlane, Goodrich Corp.; E. W. Dunham, Lowell Observatory . . . . . [6269-81]

✔ **Science requirements for the design of the LSST camera,** S. M. Kahn, Stanford Linear Accelerator Ctr.; Z. Ivesic, Univ. of Washington; J. A. Tyson, Univ. of California/Davis . . . . . [6269-117]

✔ **The integral-field unit for ESI on Keck II,** A. I. Sheinis, Univ. of Wisconsin/Madison . . . . . [6269-118]

✔ **Preliminary optical design for a 2.2 degree diameter prime focuscorrector for the Blanco 4-meter Telescope,** S. M. Kent, Fermi National Accelerator Lab.; M. Gladders, Carnegie Observatories; R. Bernstein, B. C. Bigelow, Univ. of Michigan; A. P. Doel, D. Brooks, S. P. Worswick, Univ. College London (United Kingdom); T. M. Abbott, A. R. Walker, Cerro Tololo Inter-American Observatory (Chile); B. Flaugher, Fermi National Accelerator Lab. . . [6269-119]

✔ **Preliminary design of the collision avoidance device on the fiber positioning units of LAMOST,** Z. Chao, Z. Zhikun, J. Yi, H. Hu, Univ. of Science and Technology of China (China) . . . . . [6269-120]

✔ **Modeling and simulation of LAMOST focal plane,** Z. Chao, J. Yi, P. Xiaobo, X. Xing, Univ. of Science and Technology of China (China) . . . . . [6269-121]

✔ **Implementary scheme of parallel controllable optical fiber positioning system for LAMOST,** H. Hu, Univ. of Science and Technology of China (China) . . . . . [6269-122]

✔ **Preliminary study on the measurement system for LAMOST small focal plane fiber positioning system,** J. Yi, X. Xing, Z. Chao, T. Yong, Univ. of Science and Technology of China (China) . . . . . [6269-123]

✔ **Study on photoelectric guider for the LAMOST,** G. Li, T. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6269-224]

✔ **Development of simultaneous imaging polarimeter,** K. Fujita, Y. Itoh, M. Nishida, T. Mukai, Kobe Univ. (Japan) . . . . . [6269-124]

✔ **HyperSuprime: optics,** Y. Komiyama, S. Miyazaki, Y. Doi, H. Nakaya, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-125]

✔ **LUCIFER status report: Summer 2006,** H. G. Mandel, I. Appenzeller, G. Andre, F. Carmen, H. Jochen, R. Johanna, W. Seifert, Landessternwarte Heidelberg-Königstuhl (Germany); R. Lenzen, B. Grimm, T. M. Herbst, W. Laun, M. Lehmitz, R. Rohloff, Max-Planck-Institut für Astronomie (Germany); M. Jütte, K. L. Polsterer, V. Knierim, T. Luks, R. Dettmar, Ruhr-Univ. Bochum (Germany); R. Hofmann, H. Gemperlein, H. Weisz, Max-Planck-Institut für extraterrestrische Physik (Germany); P. Weiser, Fachhochschule Mannheim (Germany) . . . . . [6269-126]

✔ **HyperSuprime: electronics,** H. Nakaya, S. Miyazaki, National Astronomical Observatory of Japan/Subaru Telescope; Y. Komiyama, National Astronomical Observatory of Japan (Japan); Y. Doi, National Astronomical Observatory of Japan/Subaru Telescope; Y. Kamata, National Astronomical Observatory of Japan (Japan) . . . . . [6269-127]

✔ **LAIWO: a new wide-field CCD-camera for Wise Observatory,** H. Baumeister, I. Afonso, K. Marien, R. Klein, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-128]

✔ **BLAST autonomous daytime star cameras,** M. Rex, Univ. of Pennsylvania; E. Chapin, The Univ. of British Columbia (Canada); M. J. Devlin, J. Klein, Univ. of Pennsylvania; E. Pascale, D. Wiebe, Univ. of Toronto (Canada) . . [6269-129]

✔ **HyperSuprime: mechanics,** Y. Doi, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-130]

✔ **CCD characterization for DES,** J. Estrada, Fermi National Accelerator Lab. . . . . [6269-131]

✔ **SWIFT: an adaptive optics assisted I and z band integral-field spectrograph,** N. A. Thatte, M. Tecza, F. Clarke, T. Goodsall, R. L. Davies, Univ. of Oxford (United Kingdom) . . . . . [6269-132]

✔Poster Session I

Room: Palms Ballroom: Canary & Royal Salons Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

Session A

✔ **The CCD imaging systems for LAMOST,** S. Zou, G. Wang, National Astronomical Observatories (China) . . . . . [6269-13]

✔ **Near-infrared direct vision prism for wide-wavelength coverage spectroscopy at Subaru Telescope,** N. Takato, H. Terada, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-52]

✔ **WFMOS: a feasibility study for Gemini,** S. C. Barden, A. J. McGrath, S. Miziarski, Anglo-Australian Observatory (Australia); R. M. Myers, S. L. Morris, Univ. of Durham (United Kingdom); K. Glazebrook, S. A. Smee, R. H. Barkhouser, John Hopkins Univ.; G. B. Dalton, Univ. of Oxford (United Kingdom) . . . . . [6269-76]

✔ **ELT Doppler imaging and exoplanet studies,** M. M. Casali, European Southern Observatory (Germany) . . . . . [6269-77]

✔ **A large-format imager for the SkyMapper Survey Telescope,** A. P. Oates, P. G. Conroy, A. Granlund, E. Kowald, M. F. Waterson, M. I. Dawson, M. Petkovic, A. Vaccarella, B. Schmidt, S. C. Keller, The Australian National Univ. (Australia) . . . . . [6269-78]

✔ **Optics integration of the OMM wide-field visible camera (Panoramix-II),** S. Thibault, ImmerVision (Canada); M. Wang, P. Côté, M. Savard, Institut National d'Optique (Canada); L. Drissen, Univ. Laval (Canada) . . . . . [6269-80]

✔ **Simplifying the prime focus corrector of the Discovery Channel Telescope,** M. J. MacFarlane, Goodrich Corp.; E. W. Dunham, Lowell Observatory . . . . . [6269-81]

✔ **The prime focus imaging spectrograph for the Southern African Large Telescope: structural and mechanical design and commissioning,** M. P. Smith, K. H. Nordsieck, E. B. Burgh, J. W. Percival, Univ. of Wisconsin/Madison . . . . . [6269-82]

✔ **The dual-imaging camera for the VLT Planet Finder instrument,** M. P. Langlois, Observatoire Astronomique de Marseille-Provence (France); J. Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); K. Dohlen, Observatoire Astronomique de Marseille-Provence (France); I. Egan, A. J. Longmore, UK Astronomy Technology Ctr. (United Kingdom); L. Martin, Observatoire Astronomique de Marseille-Provence (France); D. Mouillet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); C. Moutou, Observatoire Astronomique de Marseille-Provence (France); P. Puget, Observatoire de Paris à Meudon (France); P. Rabou, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); M. Saisse, Observatoire Astronomique de Marseille-Provence (France) . . . . . [6269-83]

✔ **The Dark Energy survey,** B. Flaugher, Fermi National Accelerator Lab. . . . . [6269-84]

✔ **ELT site prospect in Morocco: aerosol characterization,** B. Aziza, S. El Arbi, Cady Ayyad Univ. (Morocco); B. K. Zouhair, L. Mohamed, Cadi Ayyad Univ. (Morocco) . . . . . [6269-86]

✔ **A new-generation multi-object high-throughput Doppler instrument for a planet survey at the SDSS Telescope,** J. C. Ge, B. Zhao, X. Wan, A. Hariharan, S. Mahadevan, J. C. van Eyken, C. DeWitt, P. Guo, Univ. of Florida . . . . . [6269-87]

✔ **OSIRIS assembly and integration,** J. Cepa, M. Aguiar-Gonzalez, Instituto de Astrofísica de Canarias (Spain); E. Alfaro, Instituto de Astrofísica de Andalucía (Spain); J. Bland-Hawthorn, Anglo-Australian Observatory (Australia); H. O. Castañeda, Instituto de Astrofísica de Canarias (Spain); F. J. Cobos, Univ. Nacional Autonoma de Mexico (Mexico); S. Correa, Instituto de Astrofísica de Canarias (Spain); C. Espejo, A. Farah-Simon, Univ. Nacional Autonoma de Mexico (Mexico); A. B. Fragoso-Lopez, J. V. Gigante, Instituto de Astrofísica de Canarias (Spain); F. Garfias, J. J. González, Univ. Nacional Autonoma de Mexico (Mexico); V. Gonzalez-Escalera, Instituto de Astrofísica de Canarias (Spain); J. I. Gonzalez-Serrano, Univ. de Cantabria (Spain); B. Hernández, A. Herrera, G. A. Herrera, E. Joven, J. C. Lopez-Ruiz, Instituto de Astrofísica de Canarias (Spain); C. Militello, Univ. de La Laguna (Spain); L. P. Cano, A. Pérez, J. L. Rasilla, Instituto de Astrofísica de Canarias (Spain); B. Sánchez, C. Tejada, Univ. Nacional Autonoma de Mexico (Mexico) . . . . . [6269-89]

✔ **Wide-field spectroscopy with ELTs,** R. M. Bacon, Observatoire de Lyon (France); J. Cuby, Lab. d'Astrophysique de Marseille (France); J. Hammer, Observatoire de Paris à Meudon (France) . . . . . [6269-90]

✔ **Simultaneous spectral differential imaging with a focal plane holographic diffuser,** D. Lafrenière, R. Doyon, É. Artigau, Univ. de Montréal (Canada); C. Marois, Lawrence Livermore National Lab.; D. Nadeau, R. Racine, M. Beaulieu, Univ. de Montréal (Canada) . . . . . [6269-91]

✔ **Design of a multi-object, high-throughput, low-resolution fiber spectrograph for WFMOS,** S. A. Smee, R. H. Barkhouser, K. Glazebrook, Johns Hopkins Univ. . . . . [6269-92]

✔ **VIRUS: a massively replicated integral-field spectrograph for HET,** G. J. Hill, P. J. MacQueen, P. Palunas, The Univ. of Texas at Austin; A. Kelz, M. M. Roth, Astrophysikalisches Institut Potsdam (Germany); F. Grupp, Univ.-Sternwarte München (Germany) . . . . . [6269-93]

✔ **Data reduction software of the X-Shooter spectrograph,** P. Goldoni, Commissariat à l'Energie Atomique (France) and DSM/DAPNIA/SAp (France); F. Royer, P. Francois, Observatoire de Paris (France); G. Blanc, Univ. Paris 7-Denis Diderot (France); M. Horrobin, Univ. van Amsterdam (Netherlands); J. Vernet, A. Modigliani, European Southern Observatory (Germany) . [6269-94]

✔ **Optical design of spectrograph for CODEX,** H. Dekker, B. Delabre, European Southern Observatory (Germany) . . . . . [6269-95]

✔ **Design of Hermes:a high-resolution fiber-fed spectrograph for the Mercator Telescope,** G. Raskin, H. Van Winckel, Katholieke Univ. Leuven (Belgium); H. Lehmann, Thüringer Landessternwarte Tautenburg (Germany) . . . . . [6269-96]

✔ **Simultaneous infrared-visible imager/spectrograph: a multi-purpose instrument for the Magdalena Ridge Observatory 2.4-m Telescope,** M. B. Vincent, E. V. Ryan, New Mexico Institute of Mining and Technology . . . . . [6269-97]

✔ **The spectrum of Th-Ar hollow cathode lamps in the 900-4500 nm region: establishing wavelength standards for the calibration of VLT spectrographs,** F. Kerber, European Southern Observatory (Germany); G. Nave, C. J. Sansonetti, National Institute of Standards and Technology; P. Bristow, H. U. Kaufl, S. D'Odorico, M. R. Rosa, European Southern Observatory (Germany) . . . . . [6269-98]

✔ **Noise studies of externally dispersed interferometry for Doppler velocimetry and spectroscopy,** D. J. Erskine, Lawrence Livermore National Lab.; J. J. Edelstein, Univ. of California/Berkeley; J. P. Lloyd, Cornell Univ. . . . . [6269-99]

✔ **Measurements of stellar magnetic fields with FORS1 in spectro-polarimetric mode,** S. R. Hubrig, T. Szeifert, M. Schoeller, European Southern Observatory (Chile); R. S. Schnerr, Univ. van Amsterdam (Netherlands) . . . . . [6269-100]

✔ **A study of the UVES instrumental polarization,** S. R. Hubrig, N. Nesvacil, G. Mathys, C. Ledoux, European Southern Observatory (Chile) . . . . [6269-101]

✔ **Implementation of a long-slit mode in the UV-visual echelle spectrograph (UVES) at the ESO VLT with interference filters,** S. R. Hubrig, European Southern Observatory (Chile); G. Avila, European Southern Observatory (Germany); A. Kaufer, European Southern Observatory (Chile); H. Dekker, S. D'Odorico, European Southern Observatory (Germany); R. Schmutzer, M. Marchesi, European Southern Observatory (Chile); B. Wolff, European Southern Observatory (Germany); N. Nesvacil, European Southern Observatory (Chile) . . . . . [6269-102]

✔ **A fiber feed system for a multiple object Doppler instrument at Sloan Telescope,** X. Wan, J. C. Ge, A. Hariharan, P. Guo, Univ. of Florida . [6269-103]

✔ **An optical spectrograph design for a new-generation multiple-object Doppler instrument,** B. Zhao, J. C. Ge, Univ. of Florida . . . . . [6269-104]

✔ **A multi-object multi-field spectrometer and imager for a European ELT,** C. J. Evans, C. R. Cunningham, UK Astronomy Technology Ctr. (United Kingdom); S. L. Morris, Univ. of Durham (United Kingdom); T. G. Hawarden, UK Astronomy Technology Ctr. (United Kingdom); J. R. Allington-Smith, F. Assemat, Univ. of Durham (United Kingdom); S. K. Ramsay Howat, E. Atad-Ettedgui, P. R. Hastings, UK Astronomy Technology Ctr. (United Kingdom); I. M. Hook, G. B. Dalton, Univ. of Oxford (United Kingdom) . . . . . [6269-105]

✔ **BESO: a high-resolution spectrograph for the Hexapod Telescope,** I. Steiner, Ruhr-Univ. Bochum (Germany); W. Seifert, O. Stahl, Landessternwarte Heidelberg-Königstuhl (Germany); R. Lemke, R. Chini, Ruhr-Univ. Bochum (Germany); I. Appenzeller, Landessternwarte Heidelberg-Königstuhl (Germany) . . . . . [6269-106]

✔ **The optical design of X-Shooter for the VLT,** P. Spano, Univ. degli Studi di Palermo (Italy); B. Delabre, European Southern Observatory (Germany); A. N. Soerensen, Niels Bohr Institute (Denmark); F. Rigal, ASTRON (Netherlands); A. de Ugarte Postigo, Instituto de Astrofísica de Andalucia (Spain); R. Mazzoleni, European Southern Observatory (Germany); G. Sacco, Univ. degli Studi di Palermo (Italy); P. Conconi, Osservatorio Astronomico di Brera (Italy) . . . . . [6269-107]

✔ **The integral-field spectrograph on board on the Planet Finder instrument for the VLT,** J. Antichi, R. U. Claudi, M. Turatto, R. G. Gratton, A. Baruffolo, S. Desidera, Osservatorio Astronomico di Padova (Italy); J. Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) . . . . . [6269-108]

✔ **The X-Shooter spectrograph: a new concept of mechanical assembly for a multiple-arm Cassegrain instrument,** N. Michaelsen, Niels Bohr Institute (Denmark); V. De Caprio, Osservatorio Astronomico di Brera (Italy); N. C. Jessen, Danish National Space Ctr. (Denmark); J. Lizon, R. Mazzoleni, European Southern Observatory (Germany); M. Riva, M. Tintori, Osservatorio Astronomico di Brera (Italy); D. W. Wistisen, Niels Bohr Institute (Denmark); H. Dekker, European Southern Observatory (Germany); P. Kjærgaard-Rasmussen, Niels Bohr Institute (Denmark); F. M. Zerbi, Osservatorio Astronomico di Brera (Italy) . . . . . [6269-110]

✔ **A high-resolution optical spectrograph for the Thirty Meter Telescope: design and performance,** S. N. Osterman, C. S. Froning, M. A. Beasley, J. C. Green, S. Beland, Univ. of Colorado/Boulder . . . . . [6269-111]

✔ **The Carnegie Planet Finder spectrograph,** J. D. Crane, S. A. Shectman, Carnegie Observatories; R. P. Butler, Carnegie Institution of Washington . . . . . [6269-112]

✔ **The optical design of the wide-field optical spectrograph for the Thirty Meter Telescope,** J. S. Pazder, J. M. Fletcher, C. L. Morbey, National Research Council Canada (Canada) . . . . . [6269-114]

✔ **X-Shooter: a UV to K band, intermediate resolution VLT spectrograph,** S. D'Odorico, European Southern Observatory (Germany) . . . . . [6269-115]

✔ **A polarization encoding differential photometer and polarimeter (PEPPER) for extrasolar planet and debris disk studies,** D. E. Potter, M. C. Graham, The Univ. of Arizona/Steward Observatory . . . . . [6269-116]

✔ **Science requirements for the design of the LSST camera,** S. M. Kahn, Stanford Linear Accelerator Ctr.; Z. Ivesic, Univ. of Washington; J. A. Tyson, Univ. of California/Davis . . . . . [6269-117]

✔ **The integral-field unit for ESI on Keck II,** A. I. Sheinis, Univ. of Wisconsin/Madison . . . . . [6269-118]

✔ **Preliminary optical design for a 2.2 degree diameter prime focuscorrector for the Blanco 4-meter Telescope,** S. M. Kent, Fermi National Accelerator Lab.; M. Gladders, Carnegie Observatories; R. Bernstein, B. C. Bigelow, Univ. of Michigan; A. P. Doel, D. Brooks, S. P. Worswick, Univ. College London (United Kingdom); T. M. Abbott, A. R. Walker, Cerro Tololo Inter-American Observatory (Chile); B. Flaugher, Fermi National Accelerator Lab. . . [6269-119]

✔ **Preliminary design of the collision avoidance device on the fiber positioning units of LAMOST,** Z. Chao, Z. Zhikun, J. Yi, H. Hu, Univ. of Science and Technology of China (China) . . . . . [6269-120]

✔ **Modeling and simulation of LAMOST focal plane,** Z. Chao, J. Yi, P. Xiaobo, X. Xing, Univ. of Science and Technology of China (China) . . . . . [6269-121]

✔ **Implementary scheme of parallel controllable optical fiber positioning system for LAMOST,** H. Hu, Univ. of Science and Technology of China (China) . . . . . [6269-122]

✔ **Preliminary study on the measurement system for LAMOST small focal plane fiber positioning system,** J. Yi, X. Xing, Z. Chao, T. Yong, Univ. of Science and Technology of China (China) . . . . . [6269-123]

✔ **Study on photoelectric guider for the LAMOST,** G. Li, T. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6269-224]

✔ **Development of simultaneous imaging polarimeter,** K. Fujita, Y. Itoh, M. Nishida, T. Mukai, Kobe Univ. (Japan) . . . . . [6269-124]

✔ **HyperSuprime: optics,** Y. Komiyama, S. Miyazaki, Y. Doi, H. Nakaya, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-125]

✔ **LUCIFER status report: Summer 2006,** H. G. Mandel, I. Appenzeller, G. Andre, F. Carmen, H. Jochen, R. Johanna, W. Seifert, Landessternwarte Heidelberg-Königstuhl (Germany); R. Lenzen, B. Grimm, T. M. Herbst, W. Laun, M. Lehmitz, R. Rohloff, Max-Planck-Institut für Astronomie (Germany); M. Jütte, K. L. Polsterer, V. Knierim, T. Luks, R. Dettmar, Ruhr-Univ. Bochum (Germany); R. Hofmann, H. Gemperlein, H. Weisz, Max-Planck-Institut für extraterrestrische Physik (Germany); P. Weiser, Fachhochschule Mannheim (Germany) . . . . . [6269-126]

✔ **HyperSuprime: electronics,** H. Nakaya, S. Miyazaki, National Astronomical Observatory of Japan/Subaru Telescope; Y. Komiyama, National Astronomical Observatory of Japan (Japan); Y. Doi, National Astronomical Observatory of Japan/Subaru Telescope; Y. Kamata, National Astronomical Observatory of Japan (Japan) . . . . . [6269-127]

✔ **LAIWO: a new wide-field CCD-camera for Wise Observatory,** H. Baumeister, I. Afonso, K. Marien, R. Klein, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-128]

✔ **BLAST autonomous daytime star cameras,** M. Rex, Univ. of Pennsylvania; E. Chapin, The Univ. of British Columbia (Canada); M. J. Devlin, J. Klein, Univ. of Pennsylvania; E. Pascale, D. Wiebe, Univ. of Toronto (Canada) . . [6269-129]

✔ **HyperSuprime: mechanics,** Y. Doi, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-130]

✔ **CCD characterization for DES,** J. Estrada, Fermi National Accelerator Lab. . . . . [6269-131]

✔ **SWIFT: an adaptive optics assisted I and z band integral-field spectrograph,** N. A. Thatte, M. Tecza, F. Clarke, T. Goodsall, R. L. Davies, Univ. of Oxford (United Kingdom) . . . . . [6269-132]

Session B

✔ **Exoplanet detection with simultaneous spectral differential imaging: effects of out-of-pupil-plane optical aberrations,** C. Marois, D. W. Phillion, B. A. Macintosh, Lawrence Livermore National Lab. . . . . [6269-133]

✔ **Theoretical and experimental study of fiber modal noise in astronomical spectrophotometry,** J. W. Corbett, J. R. Allington-Smith, Univ. of Durham (United Kingdom) . . . . . [6269-134]

✔ **LIINUS: a design study for interferometric imaging spectroscopy at the LBT,** A. Krabbe, Univ. zu Köln (Germany); F. Mueller-Sanchez, Max-Planck-Institut für extraterrestrische Physik (Germany); C. Gal, Univ. zu Köln (Germany); F. Eisenhauer, M. Haug, Max-Planck-Institut für extraterrestrische Physik (Germany); C. Iserlohe, Univ. zu Köln (Germany); T. M. Herbst, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-135]

✔ **Conceptual design for a high-resolution infrared spectrograph for the 8-m Gemini Telescopes,** K. H. Hinkle, National Optical Astronomy Observatory; S. S. Eikenberry, Univ. of Florida; R. R. Joyce, M. Liang, G. P. Muller, National Optical Astronomy Observatory . . . . . [6269-136]

✔ **ISLE: a general purpose near-infrared imager and medium-resolution spectrograph for the 1.88-m telescope at OAO,** K. Yanagisawa, Y. Shimizu, K. Okita, S. Nagayama, Y. Sato, H. Koyano, T. Okada, I. Iwata, E. Watanabe, M. Yoshida, National Astronomical Observatory of Japan (Japan); T. Yamamuro, Genesia Corp. (Japan); S. Okumura, Japan Space Guard Association (Japan) . . . . . [6269-137]

✔ **FRIDA: integral-field spectrograph and imager for the adaptive optics system of the Gran Telescopio Canarias,** A. Lopez, S. Cuevas, B. Sánchez, Univ. Nacional Autónoma de México (Mexico); S. S. Eikenberry, Univ. of Florida; F. J. Fuentes, A. Watson, Univ. Nacional Autónoma de México (Mexico); F. Garzon Lopez, A. Prieto, P. L. Hamersley, J. J. Díaz, Instituto de Astrofísica de Canarias (Spain); C. Espejo, R. Flores-Meza, Univ. Nacional Autónoma de México (Mexico); V. Bringas, Ctr. de Ingenieria y Desarollo Industrial (Mexico); J. Gallegos, Univ. Complutense de Madrid (Spain); R. Pello, Observatoire Mid-Pyrénées (France) . . . . . [6269-138]

✔ **Optical design of the KMOS slicer system,** R. Content, Univ. of Durham (United Kingdom) . . . . . [6269-139]

✔ **WINERED: warm high-resolution near-infrared spectrograph,** Y. Ikeda, N. Kobayashi, S. Kondo, C. Yasui, K. Motohara, The Univ. of Tokyo (Japan) . . . . . [6269-140]

✔ **Design of the TMT mid-infrared echelle: science drivers and design overview,** J. H. Elias, National Optical Astronomy Observatory; A. T. Tokunaga, Univ. of Hawai'i at Manoa; M. J. Richter, Univ. of California/Davis; J. S. Carr, Naval Research Lab.; M. R. Chun, Univ. of Hawai'i at Hilo; M. C. Liu, Univ. of Hawai'i at Manoa; J. H. Lacy, The Univ. of Texas at Austin; J. Najita, National Optical Astronomy Observatory; M. E. Ressler, Jet Propulsion Lab.; S. E. Strom, M. Liang, National Optical Astronomy Observatory; T. W. Bond, Univ. of Hawai'i at Manoa . . . . . [6269-141]

✔ **The HiCIAO camera for the Subaru Telescope,** K. W. Hodapp, Univ. of Hawai'i at Hilo; M. Tamura, National Astronomical Observatory of Japan (Japan); H. Takami, O. Guyon, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-142]

✔ **Cosmic web imager,** R. McLean, California Institute of Technology [6269-143]

✔ **An infrared integral field-unit specialized for speckle suppression and the detection of extrasolar planets,** J. Lavigne, R. Doyon, Univ. de Montréal (Canada); S. Thibault, ImmerVision (Canada) . . . . . [6269-144]

✔ **Design considerations for a high-spectral resolution mid-IR echelle spectrograph on the Thirty-Meter Telescope,** A. T. Tokunaga, T. W. Bond, Univ. of Hawai'i at Manoa; J. H. Elias, National Optical Astronomy Observatory; M. R. Chun, Univ. of Hawai'i at Hilo; M. J. Richter, Univ. of California/Davis; M. Liang, L. G. Daggert, National Optical Astronomy Observatory; E. V. Tollestrup, Univ. of Hawai'i at Hilo; M. E. Ressler, Jet Propulsion Lab.; J. S. Carr, Naval Research Lab.; M. C. Liu, Univ. of Hawai'i at Manoa [6269-145]

✔ **The spectrometer optics of GIANO at TNG,** S. Gennari, I. Mochi, Osservatorio Astrofisico di Arcetri (Italy); S. L. Donati, Univ. degli Studi di Firenze (Italy); E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy); P. Sandri, Gestione Silo Srl (Italy) . . . . . [6269-146]

✔ **The cryogenics of GIANO at TNG,** S. Gennari, I. Mochi, Osservatorio Astrofisico di Arcetri (Italy); E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy); R. Tomelleri, Tomelleri s.r.l. (Italy) . . . . . [6269-147]

✔ **The preslit system for GIANO at TNG,** P. Bruno, F. Leone, Osservatorio Astrofisico di Catania (Italy); E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy) . . . . . [6269-148]

✔ **Calibration of the ZnSe pre-disperser on ESO's cryogenic IR echelle spectrograph (CRIRES): comparison of the first results from CRIRES and the laboratory data from CHARMS,** F. Kerber, European Southern Observatory (Germany); B. J. Frey, D. B. Leviton, NASA Goddard Space Flight Ctr.; P. Bristow, H. U. Kaufl, J. Pirard, M. R. Rosa, European Southern Observatory (Germany) . . . . . [6269-149]

✔ **Preliminary optical design for the TMT mid-infrared adaptive optics system and echelle spectrograph,** M. Liang, J. H. Elias, National Optical Astronomy Observatory; A. T. Tokunaga, Univ. of Hawai'i at Manoa; M. R. Chun, Univ. of Hawai'i at Hilo; M. J. Richter, Univ. of California/Davis . . . . . [6269-150]

✔ **The fiber multi-object spectrograph V: results of engineering run,** M. Kimura, National Astronomical Observatory of Japan/Subaru Telescope and Kyoto Univ. (Japan); T. Maihara, F. Iwamuro, S. Eto, K. Ohta, M. Sakai, Kyoto Univ. (Japan); M. Akiyama, N. Tamura, J. Noumaru, National Astronomical Observatory of Japan/Subaru Telescope; D. Mochida, Kyoto Univ. (Japan) . . . . . [6269-151]

✔ **FLAMINGOS-2 OIWFS,** B. M. Leckie, W. R. Gardhouse, J. M. Fletcher, R. Wooff, T. Hardy, National Research Council Canada (Canada) . . . [6269-152]

✔ **Near-infrared precision radial velocities with TripleSpec externally dispersed interferometry (T-EDI),** J. P. Lloyd, Cornell Univ.; J. J. Edelstein, Univ. of California/Berkeley; D. J. Erskine, Lawrence Livermore National Lab.; T. L. Herter, Cornell Univ. . . . . [6269-153]

✔ **Upgrading the near-infrared camera and spectrograph for the Subaru Telescope (IRCS) for the new adaptive optics system,** H. Terada, T. Pyo, N. Takato, R. Potter, H. M. Weber, National Astronomical Observatory of Japan/Subaru Telescope; N. Kobayashi, The Univ. of Tokyo (Japan); A. T. Tokunaga, Univ. of Hawai'i at Manoa . . . . . [6269-154]

✔ **A high-spectral resolution tandem Fabry-Perot spectrometer for 17-micrometer wavelength,** T. Nagayama, T. Nagata, T. Zenno, Kyoto Univ. (Japan); C. Nagashima, M. Kurita, S. Sato, M. Kobayashi, K. Haraguchi, M. Kawada, Nagoya Univ. (Japan); H. Kataza, Japan Aerospace Exploration Agency (Japan); Y. K. Okamoto, Ibaraki Univ. (Japan) . . . . . [6269-156]

✔ **The first results and current development of SpIOMM: an imaging Fourier transform spectrometer for astronomy,** A. Bernier, L. Drissen, Univ. Laval (Canada); F. Grandmont, Univ. Laval (Canada) and ABB Bomem (Canada); J. Rochon, M. Charlebois, J. Lavigne, Univ. Laval (Canada) . . . . . [6269-157]

✔ **The UK FMOS spectrograph,** G. B. Dalton, I. J. Lewis, Univ. of Oxford (United Kingdom); I. A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); G. J. Murray, N. Dipper, Univ. of Durham (United Kingdom); D. G. Bonfield, Univ. of Oxford (United Kingdom); T. Fourd, Rutherford Appleton Lab. (United Kingdom) . . . . . [6269-158]

✔ **Development of configurable slit unit for GTC-EMIR,** M. Teuwen, H. Janssen, R. Geurink, Janssen Precision Engineering BV (Netherlands); P. Redondo, J. J. Diaz-Garcia, Instututo de Astrofísica de Canarias (Spain) . . . . . [6269-159]

✔ **Design of the Gemini near-infrared spectrograph,** J. H. Elias, R. R. Joyce, M. Liang, G. P. Muller, E. A. Hileman, J. R. George, National Optical Astronomy Observatory . . . . . [6269-160]

✔ **Instrumentation development for an astrophysical imaging Fourier transform spectro-polarimeter,** C. A. Jurgenson, New Mexico Institute of Mining and Technology; R. E. Stencel, Univ. of Denver; J. N. Stout, Univ. of Oxford (United Kingdom); M. J. Creech-Eakman, New Mexico Institute of Mining and Technology . . . . . [6269-161]

✔ **Optical design of the high-resolution near-infrared spectrograph,** M. Liang, National Optical Astronomy Observatory; S. S. Eikenberry, Univ. of Florida; K. H. Hinkle, R. R. Joyce, G. P. Muller, D. Sprayberry, National Optical Astronomy Observatory . . . . . [6269-162]

✔ **Enhancements over the electronic control for OSIRIS-GTC Fabry-Perot tunable filters,** G. A. Herrera, J. V. Gigante, Instituto de Astrofísica de Canarias (Spain) . . . . . [6269-163]

✔ **Opto-mechanical design of the KMOS spectrograph module,** M. Tecza, Univ. of Oxford (United Kingdom); I. A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); I. J. Lewis, J. Lynn, S. Yang, N. A. Thatte, Univ. of Oxford (United Kingdom) . . . . . [6269-164]

✔ **Mechanical design of the Gemini high-resolution near-infrared spectrograph,** G. P. Muller, E. A. Hileman, K. H. Hinkle, R. R. Joyce, M. Liang, D. Sprayberry, National Optical Astronomy Observatory; S. S. Eikenberry, Univ. of Florida . . . . . [6269-165]

✔ **A near-infrared immersion grating spectrograph for the Giant Magellan Telescope,** D. T. Jaffe, D. J. Mar, The Univ. of Texas at Austin; D. Warren, Consultant; P. R. Segura, J. P. Marsh, The Univ. of Texas at Austin . [6269-166]

✔ **Fabrication and performance of silicon immersion gratings for infrared spectroscopy,** J. P. Marsh, D. J. Mar, D. T. Jaffe, The Univ. of Texas at Austin . . . . . [6269-167]

✔ **The MOAO system for the TMT IRMOS near-infrared multi-object spectrograph,** D. R. Andersen, National Research Council Canada (Canada); S. S. Eikenberry, Univ. of Florida; J. M. Fletcher, W. R. Gardhouse, National Research Council Canada (Canada); D. T. Gavel, Univ. of California/Santa Cruz; R. Guzman, R. Julian, Univ. of Florida; J. Veran, National Research Council Canada (Canada) . . . . . [6269-168]

✔ **FISICA: the Florida imager slicer for infrared cosmology and astrophysics,** S. S. Eikenberry, R. J. Elston, S. N. Raines, R. Guzman, J. Julian, N. Gruel, Univ. of Florida; G. D. Boreman, College of Optics and Photonics/Univ. of Central Florida; P. E. Glenn, C. G. Hull-Allen, Bauer Associates; J. M. Hoffman, J. M. Rodgers, K. P. Thompson, Optical Research Associates; S. D. Flint, B. H. Myrick, L. E. Comstock, Corning NetOptix . . . . . [6269-169]

✔ **TEXES on Gemini,** J. H. Lacy, D. T. Jaffe, The Univ. of Texas at Austin; M. J. Richter, Univ. of California/Davis; T. K. Greathouse, Lunar and Planetary Institute; P. R. Segura, M. Bitner, The Univ. of Texas at Austin . . . . . [6269-170]

✔ **Infrared multi-object spectrograph of MOIRCS,** C. Tokoku, R. Suzuki, K. Omata, National Astronomical Observatory of Japan/Subaru Telescope; M. Konishi, T. Yoshikawa, National Astronomical Observatory of Japan/Subaru Telescope and Tohoku Univ. (Japan); T. Nishimura, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-171]

✔ **Development of infrared array control system for WINERED,** S. Kondo, K. Motohara, C. Yasui, N. Kobayashi, The Univ. of Tokyo (Japan); Y. Ikeda, Genesia Corp. (Japan) . . . . . [6269-172]

✔ **Optical design of WINERED: warm infrared echelle spectrograph,** C. Yasui, The Univ. of Tokyo (Japan); Y. Ikeda, Genesia Corp. (Japan); S. Kondo, K. Motohara, N. Kobayashi, The Univ. of Tokyo (Japan) . . . . . [6269-173]

✔ **First results with OSIRIS: NIR-imaging spectroscopy at the diffraction limit,** A. Krabbe, Univ. zu Köln (Germany); J. E. Larkin, Univ. of California/Los Angeles; C. Iserlohe, Univ. zu Köln (Germany); M. Baraczys, Univ. of California/ Los Angeles; A. Quirrenbach, Univ. Leiden (Netherlands); M. W. McElwain, J. L. Weiss, S. A. Wright, Univ. of California/Los Angeles . . . . . [6269-174]

✔ **The case of a planetary spectrograph for ELTs: NOCTUA,** H. Kaeufl, B. Delabre, F. Kerber, European Southern Observatory (Germany) . . [6269-175]

✔ **Near-infrared integral-field spectroscopy of HD209458,** A. Krabbe, Univ. zu Köln (Germany); J. E. Larkin, Univ. of California/Los Angeles; C. Iserlohe, Univ. zu Köln (Germany); M. Barczys, M. W. McElwain, J. L. Weiss, S. A. Wright, Univ. of California/Los Angeles; D. Angerhausen, Univ. zu Köln (Germany); I. Song, Gemini Observatory . . . . . [6269-176]

✔ **The NIR upgrade to the SALT Robert Stobie spectrograph,** A. I. Sheinis, M. Bershady, J. Gallagher, A. J. Barger, K. H. Nordsieck, E. M. Wilcots, M. Wolf, Univ. of Wisconsin/Madison . . . . . [6269-177]

✔ **The measurement of defocus value for focal plane of LAMOST,** Z. Zhou, X. Xing, C. Zhai, H. Hu, Univ. of Science and Technology of China (China) . . . . . [6269-178]

✔ **Control software and user interface in the Canarias infrared camera experiment (CIRCE),** A. Marin-Franch, M. V. Charcos-Llorens, M. L. Edwards, S. S. Eikenberry, Univ. of Florida . . . . . [6269-179]

✔ **KASINICS: KASI near-infrared camera system,** S. Cha, Chungbuk National Univ. (South Korea) and Korea Astronomy and Space Science Institute (South Korea); H. Jin, I. Yuk, S. Lee, W. Nam, S. Pak, B. Moon, J. Han, D. Lee, J. Park, J. Kyeong, Korea Astronomy and Space Science Institute (South Korea); G. Kim, Korea Basic Science Institute (South Korea); C. Kim, Chungbuk National Univ. (South Korea) . . . . . [6269-180]

✔ **Polarimetric capabilities with the Canarias infrared camera experiment (CIRCE),** M. V. Charcos-Llorens, M. L. Edwards, S. S. Eikenberry, A. Marin-Franch, Univ. of Florida . . . . . [6269-181]

✔ **A description of the NEWFIRM mosaic detector mount,** J. R. George, R. G. Probst, J. R. Andrew, P. Schmitt, National Optical Astronomy Observatory . . . . . [6269-182]

✔ **The Canarias infrared camera experiment (CIRCE): optical and opto-mechanical design and manufacture,** M. L. Edwards, S. S. Eikenberry, A. Marin-Franch, M. Charcos Llorens, Univ. of Florida; J. M. Rodgers, Optical Research Associates; N. Raines, C. C. Packham, J. Julian, Univ. of Florida . . . . . [6269-183]

✔ **Removal of central obscuration and spiders for coronagraphy,** L. Abe, J. Nishikawa, N. Murakami, M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6269-184]

✔ **SIR-POL: a JHKs-simultaneous imaging polarimeter for the IRSF 1.4-m,** R. Kandori, N. Kusakabe, M. Tamura, National Astronomical Observatory of Japan (Japan); T. Nagayama, Kyoto Univ. (Japan); C. Nagashima, Nagoya Univ. (Japan); Y. Nakajima, J. Hashimoto, National Astronomical Observatory of Japan (Japan); J. H. Hough, P. W. Lucas, Univ. of Hertfordshire (United Kingdom); M. Fukagawa, California Institute of Technology; T. Nagata, Kyoto Univ. (Japan); S. Sato, Nagoya Univ. (Japan) . . . . . [6269-185]

✔ **Observational capabilities and technical solution of a thermal and MIR instrument for ELTs as OWL,** R. Lenzen, Max-Planck-Institut für Astronomie (Germany); B. R. Brandl, Leiden Univ. (Netherlands); L. B. Venema, ASTRON (Netherlands); H. Kaeufl, European Southern Observatory (Germany) [6269-186]

✔ **Prolate apodized Lyot coronagraph for VLT-Planet Finder: laboratory tests and performances in presence of wavefront residual errors,** G. Guerri, J. Daban, Univ. de Nice Sophia Antipolis (France); L. Abe, National Astronomical Observatory of Japan (Japan); P. Bendjoya, F. Vakili, M. Carbillet, Univ. de Nice Sophia Antipolis (France) . . . . . [6269-187]

✔ **The REMIR cryogenics restyling,** F. Vitali, Osservatorio Astronomico di Roma (Italy); J. Lizon, European Southern Observatory (Germany); G. Ihle, European Southern Observatory (Chile); M. Accardo, European Southern Observatory (Germany); L. Gonzales, P. Sinclaire, J. C. Pineda, A. Pizarro, J. J. Valenzuela, European Southern Observatory (Chile); P. Conconi, Osservatorio Astronomico di Brera (Italy); F. D'Alessio, Osservatorio Astronomico di Roma (Italy); V. De Caprio, M. Riva, E. Molinari, Osservatorio Astronomico di Brera (Italy); G. Chincarini, Univ. degli Studi di Milano Bicocca (Italy); F. M. Zerbi, Osservatorio Astronomico di Brera (Italy); M. Rodonò, Osservatorio Astrofisico di Catania (Italy); S. Covino, Osservatorio Astronomico di Brera (Italy); V. Testa, Osservatorio Astronomico di Roma (Italy); G. Tosti, Univ. degli Studi di Perugia (Italy); L. A. Antonelli, Osservatorio Astronomico di Roma (Italy); G. Malaspina, Osservatorio Astronomico di Brera (Italy); E. Palazzi, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6269-188]

✔ **Status of the EMIR mechanical system,** V. Sánchez de la Rosa, S. Barrera, S. Becerril, S. Correa, J. Perez-Espinos, P. Redondo, R. Restrepo, P. Saavedra, F. Tenegi, J. Patrón, F. Garzon Lopez, Instituto de Astrofísica de Canarias (Spain) . . . . . [6269-189]

✔ **The LINC-NIRVANA IR cryostat,** W. Laun, H. Baumeister, P. Bizenberger, Max Planck Institut für Astronomie (Germany) . . . . . [6269-190]

✔ **The CAMCAO NIR camera: integration and first results,** A. Amorim, J. Lima, Univ. de Lisboa (Portugal); J. M. Rebordao, INETI-DOP (Portugal); J. Pinhao, Univ. de Coimbra (Portugal); L. Gurriana, Univ. de Lisboa (Portugal); A. P. Cabral, INETI-DOP (Portugal); E. Marchetti, G. Finger, J. Lizon, European Southern Observatory (Germany); F. D. Santos, Univ. de Lisboa (Portugal); R. F. Marques, R. Alves, Univ. de Coimbra (Portugal); R. Barros, Univ. de Lisboa (Portugal) . . . . . [6269-191]

✔ **A proposed implementation of a ground layer adaptive optics system on the Gemini Telescope,** K. Szeto, D. R. Andersen, D. Crampton, National Research Council Canada (Canada); S. L. Morris, Univ. of Durham (United Kingdom); M. Lloyd-Hart, The Univ. of Arizona/Steward Observatory; R. M. Myers, Univ. of Durham (United Kingdom); J. B. Jensen, Gemini Observatory; J. M. Fletcher, W. R. Gardhouse, National Research Council Canada (Canada); N. M. Milton, The Univ. of Arizona/Steward Observatory; J. S. Pazder, National Research Council Canada (Canada); J. A. Stoesz, National Research Council Canada (Canada) and Univ. of Victoria (Canada); D. Simons, Gemini Observatory; A. A. Tokovinin, Cerro Tololo Inter-American Observatory (Chile); J. Veran, National Research Council Canada (Canada) . . . . . [6269-192]

✔ **Addition of a polarization analysis capability to the Fan Mountain near-infrared camera,** D. A. McDavid, S. Kanneganti, C. Park, M. F. Skrutskie, J. C. Wilson, Univ. of Virginia . . . . . [6269-193]

✔ **Control system architecture for AMICA: the antarctic NIR/MIR camera for IRAIT,** F. Bortoletto, M. D'Alessandro, E. Giro, Osservatorio Astronomico di Padova (Italy); L. Corcione, Osservatorio Astronomico di Torino (Italy); D. Pelusi, C. Giuliani, A. Di Cianno, Osservatorio Astronomico di Teramo (Italy) . . . . . [6269-194]

✔ **FLITECAM: a 1-5 micron camera and spectrometer for SOFIA,** I. S. McLean, E. C. D. Smith, Univ. of California/Los Angeles . . . . . [6269-195]

✔ **The LINC-NIRVANA patrol camera,** D. Lorenzetti, F. D'Alessio, G. Li Causi, F. Pedichini, R. Speziali, F. Vitali, Osservatorio Astronomico di Roma (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); J. Farinato, R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); F. R. Briegel, F. De Bonis, W. Gaessler, R. Soci, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-226]

Session C

✔ **CORONA: progress report on the Dome C prototype APKC coronagraph,** G. Guerri, J. Daban, F. Vakili, Univ. de Nice Sophia Antipolis (France); L. Abe, National Astronomical Observatory of Japan (Japan); E. Aristidi, K. Agabi, P. Bendjoya, F. Schmider, Univ. de Nice Sophia Antipolis (France); B. Lopez, Observatoire de la Côte d'Azur (France) . . . . . [6269-196]

✔ **The gas absorption cell for GIANO at TNG,** F. D'Amato, Istituto Nazionale di Ottica Applicata (Italy); O. Ernesto, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy) . . . . . [6269-197]

✔ **Development of a test N-band image slicer: optical design,** Y. K. Okamoto, Ibaraki Univ. (Japan); H. Kataza, Japan Aerospace Exploration Agency (Japan); K. Mitsui, National Astronomical Observatory of Japan (Japan); T. Onaka, The Univ. of Tokyo (Japan) . . . . . [6269-198]

✔ **A new acquisition, guiding and image quality monitoring system for the W. M. Keck Observatory,** S. M. Adkins, R. H. Matsuda, W. M. Keck Observatory . . . . . [6269-199]

✔ **The imaging Bragg tunable filter,** S. Blais-Ouellette, Photon Etc. Inc. (Canada); K. Taylor, California Institute of Technology; E. H. Wishnow, Lawrence Livermore National Lab.; O. Daigle, M. Ducharme, J. Moquin, Photon Etc. Inc. (Canada) . . . . . [6269-200]

✔ **Calibration method with separation patterns of a single camera,** W. Li, J. Chu, Univ. of Science and Technology of China (China) . . . . . [6269-201]

✔ **Performance of F2T2 tandem tunable etalon,** A. D. Scott, EMS Technologies, Inc. (Canada); M. Javed, York Univ. (Canada); R. Abraham, Univ. of Toronto (Canada); S. S. Eikenberry, Team, F2T2, Univ. of Florida . [6269-202]

✔ **Initial operations of an water vapour monitor (IRMA) at Gemini South, Las Campanas Observatories and in the TMT site testing role,** R. R. Phillips, D. A. Naylor, Univ. of Lethbridge (Canada) . . . . . [6269-204]

✔ **New progress of research on the measuring system for the fiber position of LAMOST,** J. Lei, W. Gang, Sr., National Astronomical Observatories (China) . . . . . [6269-206]

✔ **RINGO: a novel ring polarimeter for rapid GRB followup,** I. A. Steele, S. Bates, D. Carter, Liverpool John Moores Univ. (United Kingdom); D. Clarke, Glasgow Univ. (United Kingdom); A. Melandri, C. J. Mottram, C. Mundell, A. Scott, R. J. Smith, J. Swindlehurst, Liverpool John Moores Univ. (United Kingdom) . . . . . [6269-207]

✔ **VPHGs abused,** E. Molinari, A. G. Bianco, P. Conconi, G. Crimi, V. De Caprio, A. Riva, M. Riva, M. Tintori, G. Toso, F. M. Zerbi, Osservatorio Astronomico di Brera (Italy) . . . . . [6269-208]

✔ **Photometrical scrambling gain and focal ratio degradation in fibers for astronomical instruments,** G. Avila, M. Albertsen, European Southern Observatory (Germany) . . . . . [6269-209]

✔ **Calibration strategies for instrumental polarization at the 10^-5 level,** F. Snik, Univ. Utrecht (Netherlands) . . . . . [6269-210]

✔ **Revitalizing the LNA 1.6-m Telescope with a versatile instrument support module,** F. G. Santoro, Lab. Nacional de Astrofísica (Brazil); T. E. Ingerson, Association of Universities for Research in Astronomy . . . . . [6269-211]

✔ **Performance of large chemically etched silicon grisms for infrared spectroscopy,** D. J. Mar, J. P. Marsh, D. T. Jaffe, The Univ. of Texas at Austin; L. D. Keller, Ithaca College; K. A. Ennico, NASA Ames Research Ctr. [6269-212]

✔ **An investigation of active deformable mirror correctors for fixed liquid telescopes interferometer,** S. Thibault, ImmerVision (Canada); N. Robitaille, E. F. Borra, Univ. Laval (Canada) . . . . . [6269-213]

✔ **Flexure mounts for high-performance astronomical lenses,** R. G. Fata, V. Kradinov, D. G. Fabricant, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6269-214]

✔ **Ground-layer turbulence profiling using a lunar SHABAR,** A. M. Moore, California Institute of Technology; M. C. B. Ashley, J. R. Everett, J. S. Lawrence, Univ. of New South Wales (Australia); B. Le Roux, Osservatorio Astrofisico di Arcetri (Italy); A. Phillips, Univ. of New South Wales (Australia); R. Ragazzoni, P. Salinari, Osservatorio Astrofisico di Arcetri (Italy); J. W. V. Storey, M. Taylor, Univ. of New South Wales (Australia) . . . . [6269-216]

✔ **Wide-field imaging on 8- to 100-meter class telescopes,** G. Gentile, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); R. Ragazzoni, C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); A. Baruffolo, Osservatorio Astronomico di Padova (Italy); J. Farinato, I. Foppiani, M. Lombini, Osservatorio Astrofisico di Arcetri (Italy); E. Giallongo, A. Di Paola, F. Pedichini, R. Speziali, Osservatorio Astronomico di Roma (Italy) . . . . . [6269-217]

✔ **IRMOS: the near-infrared multi-object spectrograph for the TMT,** S. S. Eikenberry, Univ. of Florida; D. R. Andersen, National Research Council Canada (Canada); R. Guzman, Univ. of Florida; J. M. Fletcher, W. R. Gardhouse, National Research Council Canada (Canada); J. Ziegert, S. Hamner, R. Julian, Univ. of Florida; B. M. Leckie, J. Veran, National Research Council Canada (Canada); D. T. Gavel, Univ. of California/Santa Cruz; S. Cuevas, Univ. Nacional Autónoma de México (Mexico); W. N. Rambold, Rambold Consulting Group (Canada) . . . . . [6269-218]

✔ **AGAR-AGAR: a VPHG-based high-efficiency narrow-band imager for ELTs operated at the diffraction limit at NIR wavelengths,** F. M. Zerbi, A. G. Bianco, P. Conconi, V. De Caprio, E. Molinari, P. Spanò, A. Riva, M. Riva, M. Tintori, G. Toso, D. Tresoldi, R. Felletti, Osservatorio Astronomico di Brera (Italy) . . . . . [6269-219]

✔ **Development of the readout controller for KASINICS,** S. Cho, Korea Astronomy and Space Science Institute (South Korea) and Kyung Hee Univ. (South Korea); H. Jin, U. Nam, S. Lee, K. Kong, I. Yuk, Y. Park, S. Pak, W. Han, Korea Astronomy and Space Science Institute (South Korea); S. S. Kim, Kyung Hee Univ. (South Korea) . . . . . [6269-220]

✔ **Development of an IFU for diffraction-limited 3D spectroscopy and polarimetry,** D. Ren, New Jersey Institute of Technology; C. U. Keller, C. Plymate, National Solar Observatory . . . . . [6269-222]

✔ **Detecting extrasolar planets with integral-field spectroscopy at VLT,** A. Berton, Max-Planck-Institut für Astronomie (Germany); R. G. Gratton, Osservatorio Astronomico di Padova (Italy); M. Feldt, T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); S. Desidera, Osservatorio Astronomico di Padova (Italy) . . . . . [6269-223]

✔ **Purpose and design of the VLBI instrument for ATST,** H. Uitenbroek, A. Tritschler, National Solar Observatory; T. E. Berger, Lockheed Martin Advanced Technology Ctr.; H. K. An, The Univ. of Alabama in Huntsville . . . . . [6269-225]

Friday 26 May

SESSION 4

Room: Crystal Ballrooms: J1 . . . . . Fri. 8:00 to 11:45 am

Optical Spectroscopy

Chair: **David Crampton**, National Research Council Canada (Canada)

8:00 am: **IMACS: the wide-field imaging spectrograph on Magellan-Baade,** A. M. Dressler, Observatories of the Carnegie Institution of Washington; B. C. Bigelow, Univ. of Michigan; T. S. Hare, Observatories of the Carnegie Institution of Washington . . . . . [6269-15]

8:15 am: **Performance of AAOmega: the AAT multi-purpose fiber-fed spectrograph,** G. A. Smith, W. Saunders, R. G. Sharp, V. Churilov, A. Lankshear, J. P. Dawson, D. Correl, L. G. Waller, D. Mayfield, R. Heald, T. Farrel, R. Haynes, G. Frost, Anglo-Australian Observatory (Australia) . . . . . [6269-16]

8:30 am: **Performance of the PMAS 3D spectrophotometer,** M. M. Roth, A. Kelz, Astrophysikalisches Institut Potsdam (Germany) . . . . . [6269-17]

8:45 am: **The multi-object double spectrographs for the Large Binocular Telescope,** R. W. Pogge, B. Atwood, S. R. Belville, D. F. Brewer, P. L. Byard, D. L. DePoy, M. A. Derwent, J. Eastwood, R. Gonzalez, A. Krygier, J. R. Marshall, P. Martini, J. A. Mason, T. P. O'Brien, P. S. Osmer, D. P. Pappalardo, D. P. Steinbrecher, E. J. Teiga, D. H. Weinberg, The Ohio State Univ. . . . . [6269-18]

9:00 am: **Probing unexplored territories with MUSE: a second-generation instrument for the VLT,** R. M. Bacon, Observatoire de Lyon (France) . . [6269-19]

9:15 am: **VisIRIS: a visible/IR imaging spectropolarimeter based on birefringent fiber optics image slicer,** H. Lin, Univ. of Hawai'i at Manoa [6269-20]

9:30 am: **Getting ELMER ready for science: laboratory tests,** M. L. García Vargas, J. M. Rodríguez Espinosa, J. M. Martín Fleitas, R. Kholey, E. Sánchez-Blanco, P. L. Hammersley, M. Maldonado, R. Vilela, Gran Telescopio Canarias S.A. (Spain) . . . . . [6269-21]

9:45 am: **A multi-purpose fiber-fed VPHG spectrograph for LAMOST,** Z. Hu, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6269-22]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Instruments without optics: an integrated photonic spectrograph,** J. Bland-Hawthorn, A. J. Horton, Anglo-Australian Observatory (Australia) . . . . . [6269-23]

10:45 am: **Accurate time-resolved optical photospectroscopy with superconducting tunnel junction arrays,** D. D. E. Martin, P. Verhoeve, R. A. Hijmering, A. Peacock, A. van Dordrecht, European Space Agency (Netherlands) . . . . . [6269-24]

11:00 am: **The exoplanet hunter HARPS: unequalled accuracy and perspectives toward 1 cm/s precision,** C. Lovis, F. A. Pepe, Observatoire Astronomique de l'Univ. de Genève (Switzerland); F. Bouchy, Observatoire de Haute-Provence (France); G. Lo Curto, European Southern Observatory (Chile); M. Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland); L. Pasquini, European Southern Observatory (Germany); D. Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland); G. Rupprecht, European Southern Observatory (Germany); S. Udry, Observatoire Astronomique de l'Univ. de Genève (Switzerland); S. Zucker, Weizmann Institute of Science (Israel) . . . . . [6269-25]

11:15 am: **The Planet Finder instrument for VLT,** K. Dohlen, Observatoire Astronomique de Marseille-Provence (France); J. Beuzit, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); M. Feldt, Max-Planck-Institut für Astronomie (Germany); D. Mouillet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. Puget, Observatoire de Paris à Meudon (France); F. P. Wildi, Ecole d'Ingénieurs du Canton de Vaud (Switzerland); J. Charton, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); C. Moutou, Observatoire Astronomique de Marseille-Provence (France); A. J. Longmore, UK Astronomy Technology Ctr. (United Kingdom); T. Fusco, ONERA (France); A. Boccaletti, P. Baudoz, Observatoire de Paris à Meudon (France); P. Rabou, P. Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); M. Langlois, M. Saisse, Observatoire Astronomique de Marseille-Provence (France); R. G. Gratton, J. Antici, Osservatorio Astronomico di Padova (Italy); A. Berton, Max-Planck-Institut für Astronomie (Germany); H. Schmid, ETH Zürich (Switzerland); R. Waters, Univ. van Amsterdam (Netherlands) . . . . . [6269-26]

11:30 am: **Direct spectroscopic detection of exo-planets using image slicer based IFS,** N. A. Thatte, M. Tecza, F. Clarke, Univ. of Oxford (United Kingdom); R. N. Abuter, Max-Planck-Institut für extraterrestrische Physik (Germany) [6269-27]

Lunch Break . . . . . 11:45 am to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 5

Room: Crystal Ballrooms: J1 . . . . . Sat. 8:20 to 11:20 am

Infrared Imaging

Chair: **Douglas A. Simons**, Gemini Observatory

8:20 am: **Detecting the polarization signatures of extra-solar planets,** J. H. Hough, P. W. Lucas, Univ. of Hertfordshire (United Kingdom); J. A. Bailey, Macquarie Univ. (Australia); M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6269-28]

8:35 am: **Design of a polarimeter for extrasolar planetary systems characterization,** C. U. Keller, Univ. Utrecht (Netherlands) . . . . . [6269-29]

8:50 am: **Clio: a 3-5 micron AO planet-finding camera, status report,** S. Sivanandam, P. M. Hinz, A. N. Heinze, The Univ. of Arizona/Steward Observatory; M. E. Freed, College of Optical Sciences/The Univ. of Arizona . . . . . [6269-31]

9:05 am: **Concept and science of HiCIAO,** M. Tamura, L. Abe, National Astronomical Observatory of Japan (Japan); K. W. Hodapp, Univ. of Hawai'i at Hilo; H. Suto, National Astronomical Observatory of Japan (Japan); H. Takami, O. Guyon, National Astronomical Observatory of Japan/Subaru Telescope; T. Nakajima, J. Morino, N. Ukita, R. Kandori, National Astronomical Observatory of Japan (Japan); T. Nishimura, R. Suzuki, M. Hayashi, National Astronomical Observatory of Japan/Subaru Telescope; J. Nishikawa, N. Murakami, J. Hashimoto, National Astronomical Observatory of Japan (Japan) . . . . . [6269-32]

9:20 am: **HAWK-I: the new wide-field IR imager for the VLT,** M. M. Casali, J. Pirard, European Southern Observatory (Germany) . . . . . [6269-33]

9:35 am: **The VISTA IR camera,** G. B. Dalton, M. E. Caldwell, K. Ward, Rutherford Appleton Lab. (United Kingdom); P. Clark, Univ. of Durham (United Kingdom); M. Strachan, UK Astronomy Technology Ctr. (United Kingdom); W. J. Sutherland, Univ. of Cambridge (United Kingdom) . . . . . [6269-34]

9:50 am: **The UKIRT wide-field camera (WFCAM): commissioning and performance on the telescope,** P. Hirst, Joint Astronomy Ctr.; M. M. Casali, European Southern Observatory (Germany) . . . . . [6269-35]

Coffee Break . . . . . 10:05 to 10:35 am

10:35 am: **CFHT-WIRCAM: interlaced science and guiding readout with the HAWAII-2RG sensor,** M. R. Baril, J. Ward, D. Teeple, Canada-France-Hawaii Telescope; S. Wang, Academia Sinica (Taiwan); K. K. Ho, L. Albert, G. A. Barrick, Canada-France-Hawaii Telescope . . . . . [6269-36]

10:50 am: **MegaMIR: a Fizeau thermal infrared camera for the LBT,** A. K. Mainzer, Jet Propulsion Lab.; E. T. Young, P. M. Hinz, The Univ. of Arizona/ Steward Observatory; M. W. Werner, J. H. Hong, M. E. Ressler, Jet Propulsion Lab. . . . . [6269-37]

11:05 am: **FORCAST: the facility mid-infrared camera for SOFIA,** J. D. Adams, T. L. Herter, Cornell Univ.; L. D. Keller, Ithaca College; G. E. Gull, B. E. Pirger, J. Schoenwald, M. Berthoud, G. J. Stacey, T. Nikola, Cornell Univ. . . . . [6269-38]

POSTER POPS

Room: Crystal Ballrooms: J1 . . . . . Sat. 11:20 am to 12:30 pm

1-minute presentations

Session B

✔ **Exoplanet detection with simultaneous spectral differential imaging: effects of out-of-pupil-plane optical aberrations,** C. Marois, D. W. Phillion, B. A. Macintosh, Lawrence Livermore National Lab. . . . . [6269-133]

✔ **Theoretical and experimental study of fiber modal noise in astronomical spectrophotometry,** J. W. Corbett, J. R. Allington-Smith, Univ. of Durham (United Kingdom) . . . . . [6269-134]

✔ **LIINUS: a design study for interferometric imaging spectroscopy at the LBT,** A. Krabbe, Univ. zu Köln (Germany); F. Mueller-Sanchez, Max-Planck-Institut für extraterrestrische Physik (Germany); C. Gal, Univ. zu Köln (Germany); F. Eisenhauer, M. Haug, Max-Planck-Institut für extraterrestrische Physik (Germany); C. Iserlohe, Univ. zu Köln (Germany); T. M. Herbst, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-135]

✔ **Conceptual design for a high-resolution infrared spectrograph for the 8-m Gemini Telescopes,** K. H. Hinkle, National Optical Astronomy Observatory; S. S. Eikenberry, Univ. of Florida; R. R. Joyce, M. Liang, G. P. Muller, National Optical Astronomy Observatory . . . . . [6269-136]

✔ **ISLE: a general purpose near-infrared imager and medium-resolution spectrograph for the 1.88-m telescope at OAO,** K. Yanagisawa, Y. Shimizu, K. Okita, S. Nagayama, Y. Sato, H. Koyano, T. Okada, I. Iwata, E. Watanabe, M. Yoshida, National Astronomical Observatory of Japan (Japan); T. Yamamuro, Genesia Corp. (Japan); S. Okumura, Japan Space Guard Association (Japan) . . . . . [6269-137]

✔ **FRIDA: integral-field spectrograph and imager for the adaptive optics system of the Gran Telescopio Canarias,** A. Lopez, S. Cuevas, B. Sánchez, Univ. Nacional Autónoma de México (Mexico); S. S. Eikenberry, Univ. of Florida; F. J. Fuentes, A. Watson, Univ. Nacional Autónoma de México (Mexico); F. Garzon Lopez, A. Prieto, P. L. Hamersley, J. J. Díaz, Instituto de Astrofísica de Canarias (Spain); C. Espejo, R. Flores-Meza, Univ. Nacional Autónoma de México (Mexico); V. Bringas, Ctr. de Ingenieria y Desarollo Industrial (Mexico); J. Gallegos, Univ. Complutense de Madrid (Spain); R. Pello, Observatoire Mid-Pyrénées (France) . . . . . [6269-138]

✔ **Optical design of the KMOS slicer system,** R. Content, Univ. of Durham (United Kingdom) . . . . . [6269-139]

✔ **WINERED: warm high-resolution near-infrared spectrograph,** Y. Ikeda, N. Kobayashi, S. Kondo, C. Yasui, K. Motohara, The Univ. of Tokyo (Japan) . . . . . [6269-140]

✔ **Design of the TMT mid-infrared echelle: science drivers and design overview,** J. H. Elias, National Optical Astronomy Observatory; A. T. Tokunaga, Univ. of Hawai'i at Manoa; M. J. Richter, Univ. of California/Davis; J. S. Carr, Naval Research Lab.; M. R. Chun, Univ. of Hawai'i at Hilo; M. C. Liu, Univ. of Hawai'i at Manoa; J. H. Lacy, The Univ. of Texas at Austin; J. Najita, National Optical Astronomy Observatory; M. E. Ressler, Jet Propulsion Lab.; S. E. Strom, M. Liang, National Optical Astronomy Observatory; T. W. Bond, Univ. of Hawai'i at Manoa . . . . . [6269-141]

✔ **The HiCIAO camera for the Subaru Telescope,** K. W. Hodapp, Univ. of Hawai'i at Hilo; M. Tamura, National Astronomical Observatory of Japan (Japan); H. Takami, O. Guyon, National Astronomical Observatory of Japan/ Subaru Telescope . . . . . [6269-142]

✔ **Cosmic web imager,** R. McLean, California Institute of Technology [6269-143]

✔ **An infrared integral field-unit specialized for speckle suppression and the detection of extrasolar planets,** J. Lavigne, R. Doyon, Univ. de Montréal (Canada); S. Thibault, ImmerVision (Canada) . . . . . [6269-144]

✔ **Design considerations for a high-spectral resolution mid-IR echelle spectrograph on the Thirty-Meter Telescope,** A. T. Tokunaga, T. W. Bond, Univ. of Hawai'i at Manoa; J. H. Elias, National Optical Astronomy Observatory; M. R. Chun, Univ. of Hawai'i at Hilo; M. J. Richter, Univ. of California/Davis; M. Liang, L. G. Daggert, National Optical Astronomy Observatory; E. V. Tollestrup, Univ. of Hawai'i at Hilo; M. E. Ressler, Jet Propulsion Lab.; J. S. Carr, Naval Research Lab.; M. C. Liu, Univ. of Hawai'i at Manoa [6269-145]

✔ **The spectrometer optics of GIANO at TNG,** S. Gennari, I. Mochi, Osservatorio Astrofisico di Arcetri (Italy); S. L. Donati, Univ. degli Studi di Firenze (Italy); E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy); P. Sandri, Gestione Silo Srl (Italy) . . . . . [6269-146]

✔ **The cryogenics of GIANO at TNG,** S. Gennari, I. Mochi, Osservatorio Astrofisico di Arcetri (Italy); E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy); R. Tomelleri, Tomelleri s.r.l. (Italy) . . . . . [6269-147]

✔ **The preslit system for GIANO at TNG,** P. Bruno, F. Leone, Osservatorio Astrofisico di Catania (Italy); E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy) . . . . . [6269-148]

✔ **Calibration of the ZnSe pre-disperser on ESO's cryogenic IR echelle spectrograph (CRIRES): comparison of the first results from CRIRES and the laboratory data from CHARMS,** F. Kerber, European Southern Observatory (Germany); B. J. Frey, D. B. Leviton, NASA Goddard Space Flight Ctr.; P. Bristow, H. U. Kaufl, J. Pirard, M. R. Rosa, European Southern Observatory (Germany) . . . . . [6269-149]

✔ **Preliminary optical design for the TMT mid-infrared adaptive optics system and echelle spectrograph,** M. Liang, J. H. Elias, National Optical Astronomy Observatory; A. T. Tokunaga, Univ. of Hawai'i at Manoa; M. R. Chun, Univ. of Hawai'i at Hilo; M. J. Richter, Univ. of California/ Davis . . . . . [6269-150]

✔ **The fiber multi-object spectrograph V: results of engineering run,** M. Kimura, National Astronomical Observatory of Japan/Subaru Telescope and Kyoto Univ. (Japan); T. Maihara, F. Iwamuro, S. Eto, K. Ohta, M. Sakai, Kyoto Univ. (Japan); M. Akiyama, N. Tamura, J. Noumaru, National Astronomical Observatory of Japan/Subaru Telescope; D. Mochida, Kyoto Univ. (Japan) . . . . . [6269-151]

✔ **FLAMINGOS-2 OIWFS,** B. M. Leckie, W. R. Gardhouse, J. M. Fletcher, R. Wooff, T. Hardy, National Research Council Canada (Canada) . . . [6269-152]

✔ **Near-infrared precision radial velocities with TripleSpec externally dispersed interferometry (T-EDI),** J. P. Lloyd, Cornell Univ.; J. J. Edelstein, Univ. of California/Berkeley; D. J. Erskine, Lawrence Livermore National Lab.; T. L. Herter, Cornell Univ. . . . . [6269-153]

✔ **Upgrading the near-infrared camera and spectrograph for the Subaru Telescope (IRCS) for the new adaptive optics system,** H. Terada, T. Pyo, N. Takato, R. Potter, H. M. Weber, National Astronomical Observatory of Japan/ Subaru Telescope; N. Kobayashi, The Univ. of Tokyo (Japan); A. T. Tokunaga, Univ. of Hawai'i at Manoa . . . . . [6269-154]

✔ **A high-spectral resolution tandem Fabry-Perot spectrometer for 17-micrometer wavelength,** T. Nagayama, T. Nagata, T. Zenno, Kyoto Univ. (Japan); C. Nagashima, M. Kurita, S. Sato, M. Kobayashi, K. Haraguchi, M. Kawada, Nagoya Univ. (Japan); H. Kataza, Japan Aerospace Exploration Agency (Japan); Y. K. Okamoto, Ibaraki Univ. (Japan) . . . . . [6269-156]

✔ **The first results and current development of SpIOMM: an imaging Fourier transform spectrometer for astronomy,** A. Bernier, L. Drissen, Univ. Laval (Canada); F. Grandmont, Univ. Laval (Canada) and ABB Bomem (Canada); J. Rochon, M. Charlebois, J. Lavigne, Univ. Laval (Canada) . . . . . [6269-157]

✔ **The UK FMOS spectrograph,** G. B. Dalton, I. J. Lewis, Univ. of Oxford (United Kingdom); I. A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); G. J. Murray, N. Dipper, Univ. of Durham (United Kingdom); D. G. Bonfield, Univ. of Oxford (United Kingdom); T. Fourd, Rutherford Appleton Lab. (United Kingdom) . . . . . [6269-158]

✔ **Development of configurable slit unit for GTC-EMIR,** M. Teuwen, H. Janssen, R. Geurink, Janssen Precision Engineering BV (Netherlands); P. Redondo, J. J. Diaz-Garcia, Instututo de Astrofísica de Canarias (Spain) . . . . . [6269-159]

✔ **Design of the Gemini near-infrared spectrograph,** J. H. Elias, R. R. Joyce, M. Liang, G. P. Muller, E. A. Hileman, J. R. George, National Optical Astronomy Observatory . . . . . [6269-160]

✔ **Instrumentation development for an astrophysical imaging Fourier transform spectro-polarimeter,** C. A. Jurgenson, New Mexico Institute of Mining and Technology; R. E. Stencel, Univ. of Denver; J. N. Stout, Univ. of Oxford (United Kingdom); M. J. Creech-Eakman, New Mexico Institute of Mining and Technology . . . . . [6269-161]

✔ **Optical design of the high-resolution near-infrared spectrograph,** M. Liang, National Optical Astronomy Observatory; S. S. Eikenberry, Univ. of Florida; K. H. Hinkle, R. R. Joyce, G. P. Muller, D. Sprayberry, National Optical Astronomy Observatory . . . . . [6269-162]

✔ **Enhancements over the electronic control for OSIRIS-GTC Fabry-Perot tunable filters,** G. A. Herrera, J. V. Gigante, Instituto de Astrofísica de Canarias (Spain) . . . . . [6269-163]

✔ **Opto-mechanical design of the KMOS spectrograph module,** M. Tecza, Univ. of Oxford (United Kingdom); I. A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); I. J. Lewis, J. Lynn, S. Yang, N. A. Thatte, Univ. of Oxford (United Kingdom) . . . . . [6269-164]

✔ **Mechanical design of the Gemini high-resolution near-infrared spectrograph,** G. P. Muller, E. A. Hileman, K. H. Hinkle, R. R. Joyce, M. Liang, D. Sprayberry, National Optical Astronomy Observatory; S. S. Eikenberry, Univ. of Florida . . . . . [6269-165]

✔ **A near-infrared immersion grating spectrograph for the Giant Magellan Telescope,** D. T. Jaffe, D. J. Mar, The Univ. of Texas at Austin; D. Warren, Consultant; P. R. Segura, J. P. Marsh, The Univ. of Texas at Austin . [6269-166]

✔ **Fabrication and performance of silicon immersion gratings for infrared spectroscopy,** J. P. Marsh, D. J. Mar, D. T. Jaffe, The Univ. of Texas at Austin . . . . . [6269-167]

✔ **The MOAO system for the TMT IRMOS near-infrared multi-object spectrograph,** D. R. Andersen, National Research Council Canada (Canada); S. S. Eikenberry, Univ. of Florida; J. M. Fletcher, W. R. Gardhouse, National Research Council Canada (Canada); D. T. Gavel, Univ. of California/Santa Cruz; R. Guzman, R. Julian, Univ. of Florida; J. Veran, National Research Council Canada (Canada) . . . . . [6269-168]

✔ **FISICA: the Florida imager slicer for infrared cosmology and astrophysics,** S. S. Eikenberry, R. J. Elston, S. N. Raines, R. Guzman, J. Julian, N. Gruel, Univ. of Florida; G. D. Boreman, College of Optics and Photonics/Univ. of Central Florida; P. E. Glenn, C. G. Hull-Allen, Bauer Associates; J. M. Hoffman, J. M. Rodgers, K. P. Thompson, Optical Research Associates; S. D. Flint, B. H. Myrick, L. E. Comstock, Corning NetOptix . . . . . [6269-169]

✔ **TEXES on Gemini,** J. H. Lacy, D. T. Jaffe, The Univ. of Texas at Austin; M. J. Richter, Univ. of California/Davis; T. K. Greathouse, Lunar and Planetary Institute; P. R. Segura, M. Bitner, The Univ. of Texas at Austin . . . . . [6269-170]

✔ **Infrared multi-object spectrograph of MOIRCS,** C. Tokoku, R. Suzuki, K. Omata, National Astronomical Observatory of Japan/Subaru Telescope; M. Konishi, T. Yoshikawa, National Astronomical Observatory of Japan/Subaru Telescope and Tohoku Univ. (Japan); T. Nishimura, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-171]

✔ **Development of infrared array control system for WINERED,** S. Kondo, K. Motohara, C. Yasui, N. Kobayashi, The Univ. of Tokyo (Japan); Y. Ikeda, Genesia Corp. (Japan) . . . . . [6269-172]

✔ **Optical design of WINERED: warm infrared echelle spectrograph,** C. Yasui, The Univ. of Tokyo (Japan); Y. Ikeda, Genesia Corp. (Japan); S. Kondo, K. Motohara, N. Kobayashi, The Univ. of Tokyo (Japan) . . . . . [6269-173]

✔ **First results with OSIRIS: NIR-imaging spectroscopy at the diffraction limit,** A. Krabbe, Univ. zu Köln (Germany); J. E. Larkin, Univ. of California/Los Angeles; C. Iserlohe, Univ. zu Köln (Germany); M. Baraczys, Univ. of California/Los Angeles; A. Quirrenbach, Univ. Leiden (Netherlands); M. W. McElwain, J. L. Weiss, S. A. Wright, Univ. of California/Los Angeles . . . . . [6269-174]

✔ **The case of a planetary spectrograph for ELTs: NOCTUA,** H. Kaeufl, B. Delabre, F. Kerber, European Southern Observatory (Germany) . . [6269-175]

✔ **Near-infrared integral-field spectroscopy of HD209458,** A. Krabbe, Univ. zu Köln (Germany); J. E. Larkin, Univ. of California/Los Angeles; C. Iserlohe, Univ. zu Köln (Germany); M. Barczys, M. W. McElwain, J. L. Weiss, S. A. Wright, Univ. of California/Los Angeles; D. Angerhausen, Univ. zu Köln (Germany); I. Song, Gemini Observatory . . . . . [6269-176]

✔ **The NIR upgrade to the SALT Robert Stobie spectrograph,** A. I. Sheinis, M. Bershady, J. Gallagher, A. J. Barger, K. H. Nordsieck, E. M. Wilcots, M. Wolf, Univ. of Wisconsin/Madison . . . . . [6269-177]

✔ **The measurement of defocus value for focal plane of LAMOST,** Z. Zhou, X. Xing, C. Zhai, H. Hu, Univ. of Science and Technology of China (China) . . . . . [6269-178]

✔ **Control software and user interface in the Canarias infrared camera experiment (CIRCE),** A. Marin-Franch, M. V. Charcos-Llorens, M. L. Edwards, S. S. Eikenberry, Univ. of Florida . . . . . [6269-179]

✔ **KASINICS: KASI near-infrared camera system,** S. Cha, Chungbuk National Univ. (South Korea) and Korea Astronomy and Space Science Institute (South Korea); H. Jin, I. Yuk, S. Lee, W. Nam, S. Pak, B. Moon, J. Han, D. Lee, J. Park, J. Kyeong, Korea Astronomy and Space Science Institute (South Korea); G. Kim, Korea Basic Science Institute (South Korea); C. Kim, Chungbuk National Univ. (South Korea) . . . . . [6269-180]

✔ **Polarimetric capabilities with the Canarias infrared camera experiment (CIRCE),** M. V. Charcos-Llorens, M. L. Edwards, S. S. Eikenberry, A. Marin-Franch, Univ. of Florida . . . . . [6269-181]

✔ **A description of the NEWFIRM mosaic detector mount,** J. R. George, R. G. Probst, J. R. Andrew, P. Schmitt, National Optical Astronomy Observatory . . . . . [6269-182]

✔ **The Canarias infrared camera experiment (CIRCE): optical and opto-mechanical design and manufacture,** M. L. Edwards, S. S. Eikenberry, A. Marin-Franch, M. Charcos Llorens, Univ. of Florida; J. M. Rodgers, Optical Research Associates; N. Raines, C. C. Packham, J. Julian, Univ. of Florida . . . . . [6269-183]

✔ **Removal of central obscuration and spiders for coronagraphy,** L. Abe, J. Nishikawa, N. Murakami, M. Tamura, National Astronomical Observatory of Japan (Japan) . . . . . [6269-184]

✔ **SIR-POL: a JHKs-simultaneous imaging polarimeter for the IRSF 1.4-m,** R. Kandori, N. Kusakabe, M. Tamura, National Astronomical Observatory of Japan (Japan); T. Nagayama, Kyoto Univ. (Japan); C. Nagashima, Nagoya Univ. (Japan); Y. Nakajima, J. Hashimoto, National Astronomical Observatory of Japan (Japan); J. H. Hough, P. W. Lucas, Univ. of Hertfordshire (United Kingdom); M. Fukagawa, California Institute of Technology; T. Nagata, Kyoto Univ. (Japan); S. Sato, Nagoya Univ. (Japan) . . . . . [6269-185]

✔ **Observational capabilities and technical solution of a thermal and MIR instrument for ELTs as OWL,** R. Lenzen, Max-Planck-Institut für Astronomie (Germany); B. R. Brandl, Leiden Univ. (Netherlands); L. B. Venema, ASTRON (Netherlands); H. Kaeufl, European Southern Observatory (Germany) [6269-186]

✔ **Prolate apodized Lyot coronagraph for VLT-Planet Finder: laboratory tests and performances in presence of wavefront residual errors,** G. Guerri, J. Daban, Univ. de Nice Sophia Antipolis (France); L. Abe, National Astronomical Observatory of Japan (Japan); P. Bendjoya, F. Vakili, M. Carbillet, Univ. de Nice Sophia Antipolis (France) . . . . . [6269-187]

✔ **The REMIR cryogenics restyling,** F. Vitali, Osservatorio Astronomico di Roma (Italy); J. Lizon, European Southern Observatory (Germany); G. Ihle, European Southern Observatory (Chile); M. Accardo, European Southern Observatory (Germany); L. Gonzales, P. Sinclaire, J. C. Pineda, A. Pizarro, J. J. Valenzuela, European Southern Observatory (Chile); P. Conconi, Osservatorio Astronomico di Brera (Italy); F. D'Alessio, Osservatorio Astronomico di Roma (Italy); V. De Caprio, M. Riva, E. Molinari, Osservatorio Astronomico di Brera (Italy); G. Chincarini, Univ. degli Studi di Milano Bicocca (Italy); F. M. Zerbi, Osservatorio Astronomico di Brera (Italy); M. Rodonò, Osservatorio Astrofisico di Catania (Italy); S. Covino, Osservatorio Astronomico di Brera (Italy); V. Testa, Osservatorio Astronomico di Roma (Italy); G. Tosti, Univ. degli Studi di Perugia (Italy); L. A. Antonelli, Osservatorio Astronomico di Roma (Italy); G. Malaspina, Osservatorio Astronomico di Brera (Italy); E. Palazzi, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6269-188]

✔ **Status of the EMIR mechanical system,** V. Sánchez de la Rosa, S. Barrera, S. Becerril, S. Correa, J. Perez-Espinos, P. Redondo, R. Restrepo, P. Saavedra, F. Tenegi, J. Patrón, F. Garzon Lopez, Instituto de Astrofísica de Canarias (Spain) . . . . . [6269-189]

✔ **The LINC-NIRVANA IR cryostat,** W. Laun, H. Baumeister, P. Bizenberger, Max Planck Institut für Astronomie (Germany) . . . . . [6269-190]

✔ **The CAMCAO NIR camera: integration and first results,** A. Amorim, J. Lima, Univ. de Lisboa (Portugal); J. M. Rebordao, INETI-DOP (Portugal); J. Pinhao, Univ. de Coimbra (Portugal); L. Gurriana, Univ. de Lisboa (Portugal); A. P. Cabral, INETI-DOP (Portugal); E. Marchetti, G. Finger, J. Lizon, European Southern Observatory (Germany); F. D. Santos, Univ. de Lisboa (Portugal); R. F. Marques, R. Alves, Univ. de Coimbra (Portugal); R. Barros, Univ. de Lisboa (Portugal) . . . . . [6269-191]

✔ **A proposed implementation of a ground layer adaptive optics system on the Gemini Telescope,** K. Szeto, D. R. Andersen, D. Crampton, National Research Council Canada (Canada); S. L. Morris, Univ. of Durham (United Kingdom); M. Lloyd-Hart, The Univ. of Arizona/Steward Observatory; R. M. Myers, Univ. of Durham (United Kingdom); J. B. Jensen, Gemini Observatory; J. M. Fletcher, W. R. Gardhouse, National Research Council Canada (Canada); N. M. Milton, The Univ. of Arizona/Steward Observatory; J. S. Pazder, National Research Council Canada (Canada); J. A. Stoesz, National Research Council Canada (Canada) and Univ. of Victoria (Canada); D. Simons, Gemini Observatory; A. A. Tokovinin, Cerro Tololo Inter-American Observatory (Chile); J. Veran, National Research Council Canada (Canada) . . . . . [6269-192]

✔ **Addition of a polarization analysis capability to the Fan Mountain near-infrared camera,** D. A. McDavid, S. Kanneganti, C. Park, M. F. Skrutskie, J. C. Wilson, Univ. of Virginia . . . . . [6269-193]

✔ **Control system architecture for AMICA: the antarctic NIR/MIR camera for IRAIT,** F. Bortoletto, M. D'Alessandro, E. Giro, Osservatorio Astronomico di Padova (Italy); L. Corcione, Osservatorio Astronomico di Torino (Italy); D. Pelusi, C. Giuliani, A. Di Cianno, Osservatorio Astronomico di Teramo (Italy) . . . . . [6269-194]

✔ **FLITECAM: a 1-5 micron camera and spectrometer for SOFIA,** I. S. McLean, E. C. D. Smith, Univ. of California/Los Angeles . . . . . [6269-195]

✔ **The LINC-NIRVANA patrol camera,** D. Lorenzetti, F. D'Alessio, G. Li Causi, F. Pedichini, R. Speziali, F. Vitali, Osservatorio Astronomico di Roma (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); J. Farinato, R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); F. R. Briegel, F. De Bonis, W. Gaessler, R. Soci, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-226]

Lunch Break . . . . . 12:30 to 1:30 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 6

Room: Crystal Ballrooms: J1 . . . . . Sat. 2:35 to 6:15 pm

Infrared Spectroscopy I

Chair: **Ian S. McLean**, Univ. of California/Los Angeles

2:35 pm: **Commissioning of CRIRES: the high-resolution infrared spectrograph for ESO's VLT,** H. Kaeufl, P. Ballester, P. Biereichel, P. Bristow, B. Delabre, R. J. Dorn, S. Eschbaumer, R. Esteves, G. Finger, G. Fischer, D. Gojak, G. Huster, Y. Jung, F. Kerber, J. Lizon, L. K. Lundin, L. H. Mehrgan, M. Meyer, A. F. M. Moorwood, J. Paufique, J. Pirard, E. Pozna, A. Seifahrt, R. Siebenmorgen, A. Silber, B. Sokar, J. Stegmeier, M. Wold, M. M. Casali, J. Kirchbaumer, S. Uttenthaler, European Southern Observatory (Germany) . . . . . [6269-39]

2:50 pm: **VISIR two years after its installation at the VLT,** P. Lagage, E. Pantin, CEA Saclay (France); A. Smette, European Southern Observatory (Chile); C. Doucet, CEA Saclay (France); J. Pel, Astron (Netherlands) . . . . . [6269-40]

3:05 pm: **Performance of the Gemini near-infrared spectrograph,** J. H. Elias, National Optical Astronomy Observatory; B. Rodgers, Gemini Observatory (Chile); R. R. Joyce, National Optical Astronomy Observatory; M. Lazo, Gemini Observatory; G. W. Doppmann, C. Winge, Gemini Observatory (Chile); A. Rodríguez-Ardila, Lab. Nacional de Astrofísica (Brazil) . . . . . [6269-41]

3:20 pm: **Commissioning of the IRMOS MEMS spectrometer,** J. W. MacKenty, Space Telescope Science Institute; R. G. Ohl IV, M. A. Greenhouse, NASA Goddard Space Flight Ctr.; R. F. Green, The Univ. of Arizona . . . . . [6269-42]

Coffee Break . . . . . 3:35 to 4:00 pm

4:00 pm: **MOIRCS: multi-object infrared camera and spectrograph,** T. Ichikawa, Tohoku Univ. (Japan); R. Suzuki, C. Tokoku, National Astronomical Observatory of Japan/Subaru Telescope and Tohoku Univ. (Japan); Y. Katsuno, National Astronomical Observatory of Japan/Subaru Telescope; M. Konishi, T. Yoshikawa, National Astronomical Observatory of Japan/Subaru Telescope and Tohoku Univ. (Japan); T. Yamada, National Astronomical Observatory of Japan (Japan); I. Tanaka, K. Omata, T. Nishimura, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6269-43]

4:15 pm: **FLAMINGOS-2: the Gemini facility wide-field imager and multi-object near-infrared spectrograph,** S. S. Eikenberry, R. J. Elston, S. N. Raines, J. Julian, K. T. Hanna, D. B. Hon, R. Julian, R. Bandyopadhyay, R. Corley, D. Rashkin, J. G. Bennett, C. Murphy, Univ. of Florida; B. M. Leckie, W. R. Gardhouse, J. M. Fletcher, R. Wooff, J. Dunn, National Research Council Canada (Canada) . . . . . [6269-44]

4:30 pm: **EMIR: the GTC NIR multi-object imager spectrograph,** F. Garzon Lopez, D. Abreu, S. Barrera, S. Becerril, L. M. Cairós, J. J. Diaz-Garcia, A. B. Fragoso-Lopez, F. Gago Rodriguez, P. López, J. Patrón, J. Perez-Espinos, J. L. Rasilla, P. Redondo, R. Restrepo, P. Saavedra, V. Sánchez de la Rosa, F. Tenegi, M. Vallbé, Instituto de Astrofísica de Canarias (Spain) . . . . . [6269-45]

4:45 pm: **The GIANO at TNG spectrometer,** E. Oliva, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy); C. Baffa, V. Biliotti, Osservatorio Astrofisico di Arcetri (Italy); P. Bruno, Osservatorio Astrofisico di Catania (Italy); F. D'Amato, Istituto Nazionale di Ottica Applicata (Italy); S. L. Donati, Univ. degli Studi di Firenze (Italy); G. Falcini, S. Gennari, Osservatorio Astrofisico di Arcetri (Italy); F. Ghinassi, Telescopio Nazionale Galileo (Spain); E. Giani, Osservatorio Astrofisico di Arcetri (Italy); M. Gonzalez, Telescopio Nazionale Galileo (Spain); F. Leone, Osservatorio Astrofisico di Catania (Italy); M. Lolli, Osservatorio Astronomico di Bologna (Italy); M. Lodi, Telescopio Nazionale Galileo (Spain); R. Maiolino, F. Mannucci, Osservatorio Astrofisico di Arcetri (Italy); G. Marcucci, Univ. degli Studi di Firenze (Italy); I. Mochi, Osservatorio Astrofisico di Arcetri (Italy); P. Montegriffo, E. Rossetti, Osservatorio Astronomico di Bologna (Italy); S. Scuderi, Osservatorio Astrofisico di Catania (Italy); M. Sozzi, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6269-46]

5:00 pm: **OSIRIS: a diffraction limited integral-field spectrograph for Keck,** J. E. Larkin, M. Barczys, Univ. of California/Los Angeles; A. Krabbe, Univ. zu Köln (Germany) . . . . . [6269-47]

5:15 pm: **FMOS: the fiber multiple-object spectrograph IV: performance of OHS-based spectrograph,** F. Iwamuro, T. Maihara, K. Ohta, S. Eto, M. Sakai, Kyoto Univ. (Japan); M. Akiyama, M. Kimura, N. Tamura, J. Noumaru, H. Karoji, National Astronomical Observatory of Japan/Subaru Telescope; G. B. Dolton, I. J. Lewis, Univ. of Oxford (United Kingdom); I. A. J. Tosh, Rutherford Appleton Lab. (United Kingdom); G. J. Murrey, N. A. Dipper, D. J. Robertoson, Univ. of Durham (United Kingdom); P. R. Gillingham, S. Smedley, G. A. Smith, G. Frost, Anglo-Australian Observatory (Australia) . . . . . [6269-48]

5:30 pm: **Design of the KMOS multi-object integral-field spectrograph,** R. M. Sharples, Univ. of Durham (United Kingdom) . . . . . [6269-49]

5:45 pm: **The first high-resolution silicon immersion grating spectrograph,** J. C. Ge, D. L. McDavitt, S. Mahadevan, B. Zhao, A. Hariharan, Univ. of Florida . . . . . [6269-50]

6:00 pm: **The T-EDI instrument for near-IR radial velocity surveys,** J. J. Edelstein, Univ. of California/Berkeley; D. J. Erskine, Lawerence Livermore National Lab.; J. P. Lloyd, T. L. Herter, Cornell Univ.; M. R. Marckwordt, M. Feuerstein, Univ. of California/Berkeley . . . . . [6269-51]

POSTER POPS

Room: Crystal Ballrooms: J1 . . . . . Sat. 6:15 to 6:45 pm

1-minute presentations

Session C

✔ **CORONA: progress report on the Dome C prototype APKC coronagraph,** G. Guerri, J. Daban, F. Vakili, Univ. de Nice Sophia Antipolis (France); L. Abe, National Astronomical Observatory of Japan (Japan); E. Aristidi, K. Agabi, P. Bendjoya, F. Schmider, Univ. de Nice Sophia Antipolis (France); B. Lopez, Observatoire de la Côte d'Azur (France) . . . . . [6269-196]

✔ **The gas absorption cell for GIANO at TNG,** F. D'Amato, Istituto Nazionale di Ottica Applicata (Italy); O. Ernesto, Telescopio Nazionale Galileo (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy) . . . . . [6269-197]

✔ **Development of a test N-band image slicer: optical design,** Y. K. Okamoto, Ibaraki Univ. (Japan); H. Kataza, Japan Aerospace Exploration Agency (Japan); K. Mitsui, National Astronomical Observatory of Japan (Japan); T. Onaka, The Univ. of Tokyo (Japan) . . . . . [6269-198]

✔ **A new acquisition, guiding and image quality monitoring system for the W. M. Keck Observatory,** S. M. Adkins, R. H. Matsuda, W. M. Keck Observatory . . . . . [6269-199]

✔ **The imaging Bragg tunable filter,** S. Blais-Ouellette, Photon Etc. Inc. (Canada); K. Taylor, California Institute of Technology; E. H. Wishnow, Lawrence Livermore National Lab.; O. Daigle, M. Ducharme, J. Moquin, Photon Etc. Inc. (Canada) . . . . . [6269-200]

✔ **Calibration method with separation patterns of a single camera,** W. Li, J. Chu, Univ. of Science and Technology of China (China) . . . . . [6269-201]

✔ **Performance of F2T2 tandem tunable etalon,** A. D. Scott, EMS Technologies, Inc. (Canada); M. Javed, York Univ. (Canada); R. Abraham, Univ. of Toronto (Canada); S. S. Eikenberry, F. Team, Univ. of Florida . . . . [6269-202]

✔ **Initial operations of an water vapour monitor (IRMA) at Gemini South, Las Campanas Observatories and in the TMT site testing role,** R. R. Phillips, D. A. Naylor, Univ. of Lethbridge (Canada) . . . . . [6269-204]

✔ **New progress of research on the measuring system for the fiber position of LAMOST,** J. Lei, W. Gang, Sr., National Astronomical Observatories (China) . . . . . [6269-206]

✔ **RINGO: a novel ring polarimeter for rapid GRB followup,** I. A. Steele, S. Bates, D. Carter, Liverpool John Moores Univ. (United Kingdom); D. Clarke, Glasgow Univ. (United Kingdom); A. Melandri, C. J. Mottram, C. Mundell, A. Scott, R. J. Smith, J. Swindlehurst, Liverpool John Moores Univ. (United Kingdom) . . . . . [6269-207]

✔ **VPHGs abused,** E. Molinari, A. G. Bianco, P. Conconi, G. Crimi, V. De Caprio, A. Riva, M. Riva, M. Tintori, G. Toso, F. M. Zerbi, Osservatorio Astronomico di Brera (Italy) . . . . . [6269-208]

✔ **Photometrical scrambling gain and focal ratio degradation in fibers for astronomical instruments,** G. Avila, M. Albertsen, European Southern Observatory (Germany) . . . . . [6269-209]

✔ **Calibration strategies for instrumental polarization at the 10^-5 level,** F. Snik, Univ. Utrecht (Netherlands) . . . . . [6269-210]

✔ **Revitalizing the LNA 1.6-m Telescope with a versatile instrument support module,** F. G. Santoro, Lab. Nacional de Astrofísica (Brazil); T. E. Ingerson, Association of Universities for Research in Astronomy . . . . . [6269-211]

✔ **Performance of large chemically etched silicon grisms for infrared spectroscopy,** D. J. Mar, J. P. Marsh, D. T. Jaffe, The Univ. of Texas at Austin; L. D. Keller, Ithaca College; K. A. Ennico, NASA Ames Research Ctr. [6269-212]

✔ **An investigation of active deformable mirror correctors for fixed liquid telescopes interferometer,** S. Thibault, ImmerVision (Canada); N. Robitaille, E. F. Borra, Univ. Laval (Canada) . . . . . [6269-213]

✔ **Flexure mounts for high-performance astronomical lenses,** R. G. Fata, V. Kradinov, D. G. Fabricant, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6269-214]

✔ **Ground-layer turbulence profiling using a lunar SHABAR,** A. M. Moore, California Institute of Technology; M. C. B. Ashley, J. R. Everett, J. S. Lawrence, Univ. of New South Wales (Australia); B. Le Roux, Osservatorio Astrofisico di Arcetri (Italy); A. Phillips, Univ. of New South Wales (Australia); R. Ragazzoni, P. Salinari, Osservatorio Astrofisico di Arcetri (Italy); J. W. V. Storey, M. Taylor, Univ. of New South Wales (Australia) . . . . [6269-216]

✔ **Wide-field imaging on 8- to 100-meter class telescopes,** G. Gentile, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); R. Ragazzoni, C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); A. Baruffolo, Osservatorio Astronomico di Padova (Italy); J. Farinato, I. Foppiani, M. Lombini, Osservatorio Astrofisico di Arcetri (Italy); E. Giallongo, A. Di Paola, F. Pedichini, R. Speziali, Osservatorio Astronomico di Roma (Italy) . . . . . [6269-217]

✔ **IRMOS: the near-infrared multi-object spectrograph for the TMT,** S. S. Eikenberry, Univ. of Florida; D. R. Andersen, National Research Council Canada (Canada); R. Guzman, Univ. of Florida; J. M. Fletcher, W. R. Gardhouse, National Research Council Canada (Canada); J. Ziegert, S. Hamner, R. Julian, Univ. of Florida; B. M. Leckie, J. Veran, National Research Council Canada (Canada); D. T. Gavel, Univ. of California/Santa Cruz; S. Cuevas, Univ. Nacional Autónoma de México (Mexico); W. N. Rambold, Rambold Consulting Group (Canada) . . . . . [6269-218]

✔ **AGAR-AGAR: a VPHG-based high-efficiency narrow-band imager for ELTs operated at the diffraction limit at NIR wavelengths,** F. M. Zerbi, A. G. Bianco, P. Conconi, V. De Caprio, E. Molinari, P. Spanò, A. Riva, M. Riva, M. Tintori, G. Toso, D. Tresoldi, R. Felletti, Osservatorio Astronomico di Brera (Italy) . . . . . [6269-219]

✔ **Development of the readout controller for KASINICS,** S. Cho, Korea Astronomy and Space Science Institute (South Korea) and Kyung Hee Univ. (South Korea); H. Jin, U. Nam, S. Lee, K. Kong, I. Yuk, Y. Park, S. Pak, W. Han, Korea Astronomy and Space Science Institute (South Korea); S. S. Kim, Kyung Hee Univ. (South Korea) . . . . . [6269-220]

✔ **Development of an IFU for diffraction-limited 3D spectroscopy and polarimetry,** D. Ren, New Jersey Institute of Technology; C. U. Keller, C. Plymate, National Solar Observatory . . . . . [6269-222]

✔ **Detecting extrasolar planets with integral-field spectroscopy at VLT,** A. Berton, Max-Planck-Institut für Astronomie (Germany); R. G. Gratton, Osservatorio Astronomico di Padova (Italy); M. Feldt, T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); S. Desidera, Osservatorio Astronomico di Padova (Italy) . . . . . [6269-223]

✔ **Purpose and design of the VLBI instrument for ATST,** H. Uitenbroek, A. Tritschler, National Solar Observatory; T. E. Berger, Lockheed Martin Advanced Technology Ctr.; H. K. An, The Univ. of Alabama in Huntsville . . . . . [6269-225]

Conference presentations will resume Monday 29 May

Monday 29 May

SESSION 7

Room: Crystal Ballrooms: J1 . . . . . Mon. 8:30 to 9:30 am

Infrared Spectroscopy II

Chair: **Sean C. Casey**, Universities Space Research Association

8:30 am: **FIFI LS: the far-infrared initegral-field spectrometer for SOFIA,** R. Klein, Univ. of California/Berkeley; A. Poglitsch, W. Raab, N. Geis, Max-Planck-Institut für extraterrestrische Physik (Germany); M. Hamidouche, Univ. of Illinois at Urbana-Champaign; R. Hönle, Max-Planck-Institut für extraterrestrische Physik (Germany); L. W. Looney, Univ. of Illinois at Urbana-Champaign; W. Viehhauser, R. Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany); E. E. Haller, Univ. of California/Berkeley; T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany) . . . . . [6269-53]

8:45 am: **Characterizing the system performance of FIFI LS: the field-imaging far-infrared line spectrometer for SOFIA,** W. Raab, A. Poglitsch, Max-Planck-Institut für extraterrestrische Physik (Germany); R. Klein, Univ. of California/Berkeley; R. Hönle, M. Schweizer, W. Viehhauser, N. Geis, R. Genzel, Max-Planck-Institut für extraterrestrische Physik (Germany); L. W. Looney, M. Hamidouche, Univ. of Illinois at Urbana-Champaign; T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); E. E. Haller, Univ. of California/Berkeley . . . . . [6269-54]

9:00 am: **Development and future use of the echelon-cross-echelle spectrograph on SOFIA,** M. J. Richter, Univ. of California/Davis; J. H. Lacy, D. T. Jaffe, D. J. Mar, J. Goertz, W. M. Moller, S. Holmes, The Univ. of Texas at Austin; T. K. Greathouse, Lunar and Planetary Institute . . . . . [6269-55]

9:15 am: **Grism spectroscopy with FLITECAM,** E. C. D. Smith, I. S. McLean, Univ. of California/Los Angeles . . . . . [6269-56]

SESSION 8

Room: Crystal Ballrooms: J1 . . . . . Mon. 9:30 am to 12:00 pm

New Methods

Chair: **Mark M. Casali**, European Southern Observatory (Germany)

9:30 am: **An image motion compensation system for the multi-object double spectrograph,** J. L. Marshall, B. Atwood, P. L. Byard, D. L. DePoy, M. A. Derwent, J. D. Eastman, R. Gonzalez, T. P. O'Brien, D. P. Pappalardo, R. W. Pogge, The Ohio State Univ. . . . . [6269-57]

9:45 am: **Coupling light into fiber bundles at the diffraction limit,** A. J. Horton, J. Bland-Hawthorn, Anglo-Australian Observatory (Australia) . . . . . [6269-58]

10:00 am: **Advances in diamond-turned surfaces enable unique cost-effective optical system solutions,** L. E. Comstock, Corning NetOptix; J. M. Kunick, Corning Tropel Corp. . . . . [6269-59]

Coffee Break . . . . . 10:15 to 10:45 am

10:45 am: **POSM: a new concept for fiber positioning,** A. M. Moore, R. G. Dekany, R. M. Smith, K. Taylor, California Institute of Technology . . . . . [6269-60]

11:00 am: **High-contrast phase apodization at the MMT: design and on-sky tests,** J. L. Codona, P. M. Hinz, M. A. Kenworthy, J. R. P. Angel, N. J. Woolf, The Univ. of Arizona/Steward Observatory . . . . . [6269-61]

11:15 am: **The Keck-I Cassegrain atmospheric dispersion corrector,** A. C. Phillips, J. S. Miller, D. J. Cowley, V. Wallace, Univ. of California/Santa Cruz . . . . . [6269-62]

11:30 am: **Atmospheric lines suppressing filters: toward a mature technology,** S. Blais-Ouellette, Photon Etc. Inc. (Canada); K. Matthews, California Institute of Technology; É. Artigau, Univ. de Montréal (Canada); F. Havermeyer, C. Moser, Ondax, Inc.; D. Psaltis, California Institute of Technology; G. J. Steckman, Ondax, Inc. . . . . [6269-63]

11:45 am: **Grism performance for mid-IR (5-40 microns) spectroscopy,** K. A. Ennico, NASA Ames Research Ctr.; D. J. Mar, D. T. Jaffe, J. P. Marsh, The Univ. of Texas at Austin; L. D. Keller, Ithaca College; T. L. Herter, Cornell Univ.; T. P. Greene, NASA Ames Research Ctr.; J. D. Adams, Cornell Univ. . . . [6269-64]

Lunch Break . . . . . 12:00 to 1:10 pm

SESSION 9

Room: Crystal Ballrooms: J1 . . . . . Mon. 1:10 to 5:35 pm

ELT Instrumentation

Chair: **Stephen S. Eikenberry**, Univ. of Florida

1:10 pm: **ELT instrument concepts: impact on telescope and adaptive optics design** *(Invited Paper)***,** C. R. Cunningham, E. Atad-Ettadgui, UK Astronomy Technology Ctr. (United Kingdom); R. M. Bacon, Observatoire de Lyon (France); B. R. Brandl, Leiden Univ. (Netherlands); J. Cuby, Lab. d'Astrophysique de Marseille (France); W. R. F. Dent, UK Astronomy Technology Ctr. (United Kingdom); S. D'Odorico, European Southern Observatory (Germany); G. B. Dalton, Rutherford Appleton Lab. (United Kingdom); I. Egan, UK Astronomy Technology Ctr. (United Kingdom); J. Hammer, Observatoire de Paris à Meudon (France); N. N. Hubin, European Southern Observatory (Germany); P. Jagourel, Observatoire de Paris à Meudon (France); R. Lenzen, Max-Planck-Institut für Astronomie (Germany); S. L. Morris, Univ. of Durham (United Kingdom); E. Prieto, Lab. d'Astrophysique de Marseille (France); A. Quirrenbach, Univ. Leiden (Netherlands); M. Redfern, National Univ. of Ireland/Galway (Ireland) . . . [6269-65]

1:40 pm: **On the way to the instrumentation plan for the European ELT: instrument concepts for the primary goals of extragalactic science and for cosmology** *(Invited Paper)***,** S. D'Odorico, European Southern Observatory (Germany) . . . . . [6269-66]

2:10 pm: **Instrument concepts and scientific opportunities for TMT** *(Invited Paper)***,** D. Crampton, L. Simard, National Research Council Canada (Canada) . . . . . [6269-67]

2:40 pm: **On the performance of ELTs and of their associated instrumentation,** J. Cuby, E. Prieto, Lab. d'Astrophysique de Marseille (France) . . . . . [6269-68]

2:55 pm: **A conceptual design for HROS on the Thirty-Meter Telescope: a new concept for a ground-based high-resolution optical spectrograph,** C. S. Froning, S. N. Osterman, M. A. Beasley, J. C. Green, S. Beland, Univ. of Colorado/Boulder . . . . . [6269-69]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **QuantEYE: a quantum-optics instrument for extremely large telescopes,** G. Naletto, C. Barbieri, Univ. degli Studi di Padova (Italy); D. Dravins, Lund Univ. (Sweden); T. Occhipinti, F. Tamburini, V. Da Deppo, S. Fornasier, M. D'Onofrio, Univ. degli Studi di Padova (Italy); R. A. E. Fosbury, European Southern Observatory (Germany); R. Nilsson, H. Uthas, Lund Univ. (Sweden) . . . . . [6269-74]

3:55 pm: **WFOS: a wide-field optical spectrograph for the Thirty Meter Telescope,** J. S. Pazder, National Research Council Canada (Canada); R. Abraham, Univ. of Toronto (Canada); A. Anthony, National Research Council Canada (Canada); S. L. Ellison, Univ. of Victoria (Canada); J. M. Fletcher, T. Hardy, National Research Council Canada (Canada); M. Hudson, Univ. of Waterloo (Canada); S. C. Roberts, S. Sun, National Research Council Canada (Canada) . . . . . [6269-70]

4:10 pm: **TiPi: a deployable integral-field spectrograph concept for TMT,** K. Taylor, M. C. Britton, A. M. Moore, California Institute of Technology; E. Prieto, Lab. d'Astrophysique de Marseille (France) . . . . . [6269-71]

4:25 pm: **A wide-field IR spectrograph for the Giant Magellan Telescope,** D. G. Fabricant, E. N. Hertz, W. R. Brown, B. A. McLeod, Harvard-Smithsonian Ctr. for Astrophysics; J. R. P. Angel, The Univ. of Arizona/Steward Observatory . . . . . [6269-72]

4:40 pm: **FROG: the fully reconfigurable optical gear,** F. Pedichini, A. Di Paola, R. Speziali, Osservatorio Astronomico di Roma (Italy) . . . . . [6269-73]

4:55 pm: **MIDIR/TOWL: the thermal/mid-IR instrument for OWL,** B. R. Brandl, Leiden Univ. (Netherlands); R. Lenzen, Max-Planck-Institut für Astronomie (Germany); L. B. Venema, Astron (Netherlands); A. C. H. Glasse, UK Astronomy Technology Ctr. (United Kingdom); H. Kaeufl, European Southern Observatory (Germany) . . . . . [6269-75]

5:10 pm: **Calibration techniques for next-generation astronomical systems,** C. W. Stubbs, Harvard Univ.; J. L. Tonry, Univ. of Hawai'i at Manoa; S. Slater, Harvard Univ.; J. R. Masiero, Univ. of Hawai'i at Manoa; R. C. Smith, National Optical Astronomy Observatory/Cerro Tololo Inter-American Observatory (Chile); ESSENCE Supernova Team, LSST, Project . . . . . [6269-221]

Closing Remarks . . . . . 5:25 to 5:35 pm

Thursday-Saturday 25-27 May 2006 • Proceedings of SPIE Vol. 6270

Conference Chairs:
David R. Silva, AURA/
Thirty Meter Telescope

Rodger E. Doxsey, Space Telescope
Science Institute

Observatory Operations: Strategies, Processes, and Systems

Program Committee: **Roger J. V. Brissenden**, Harvard-Smithsonian Ctr. for Astrophysics; **Suzanne R. Dodd**, California Institute of Technology; **Robert Goodrich**, W.M. Keck Observatory; **Jeremy Mould**, National Optical Astronomy Observatory; **Mark M. Phillips**, Carnegie Observatories/Las Campanas Observatory (Chile); **Phil J. Puxley**, National Science Foundation; **Jason Spyromilio**, European Southern Observatory (Chile); **Hiroshi Terada**, National Astronomical Observatory of Japan/ Subaru Telescope

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 1

Room: Crystal Ballrooms: L, K . . . . . Thurs. 9:35 am to 12:00 pm

Observatory Operations I

9:35 am: **NASA's Spitzer Space Telescope's operational mission experience and lessons learned,** R. K. Wilson, C. P. Scott, Jet Propulsion Lab. . . . [6270-01]

9:55 am: **The Spitzer Space Telescope's performance,** S. R. Dodd, D. Levine, California Institute of Technology . . . . . [6270-02]

10:15 am: **Quality interaction between mission assurance and project team members,** H. H. Kwong-Fu, R. K. Wilson, Jet Propulsion Lab. . . . . [6270-03]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **The challenges of GALEX,** K. Forster, T. Conrow, California Institute of Technology; D. Schiminovich, Columbia Univ.; K. D. Erickson, Jet Propulsion Lab.; J. F. McNeill, Jr., The Aerospace Corp.; C. Martin, California Institute of Technology; M. Morais, The Aerospace Corp. . . . . [6270-04]

11:20 am: **The Chandra X-ray center: a combined science and operations center,** R. J. Brissenden, Smithsonian Astrophysical Observatory; J. D. Holmes, Harvard-Smithsonian Ctr. for Astrophysics; E. M. Mattison, D. A. Schwartz, D. P. Shropshire, Smithsonian Astrophysical Observatory . . . . . [6270-05]

11:40 am: **Fifteen years of observing from low Earth orbit,** R. E. Doxsey, Space Telescope Science Institute . . . . . [6270-06]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Thurs. 12:00 to 12:20 pm

3-minute presentations

✔ **Spitzer pre-launch mission operations system: the road to launch,** C. P. Scott, R. K. Wilson, Jet Propulsion Lab. . . . . [6270-41]

✔ **The Spitzer science center: system description and lessons learned due to two years of operations,** L. Bennett, S. Comeau, D. Levine, S. R. Dodd, California Institute of Technology . . . . . [6270-42]

✔ **Insulating legacy observatory ground systems from evolving interface standards,** J. D. Holmes, Harvard-Smithsonian Ctr. for Astrophysics [6270-43]

✔ **Chandra hardware and systems: keeping things running,** L. C. Paton, Smithsonian Astrophysical Observatory . . . . . [6270-44]

✔ **Adapative software solutions: lessons learned from Chandra flight operations,** D. P. Shropshire, S. Bucher, J. Rose, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-45]

✔ **Chandra monitoring and trends analysis,** B. Spitzbart, S. J. Wolk, T. Isobe, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-46]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 2

Room: Crystal Ballrooms: L, K . . . . . Thurs. 1:30 to 2:50 pm

Observatory Operations II

1:30 pm: **Magellan Telescope operations,** M. M. Phillips, Carnegie Institution/ Las Campanas Observatory (Chile) . . . . . [6270-07]

1:50 pm: **La Silla Paranal Observatory operations,** J. Spyromilio, European Southern Observatory (Germany) . . . . . [6270-08]

2:10 pm: **VLT(I) instrument operations and maintenance at the Paranal Observatory,** A. Kaufer, J. L. Alvarez, E. Bendek Selman, F. Caruso, R. Castillo, J. Jimenez, G. Gillet, N. Haddad, A. Leiva, M. Marchesi, P. Mardones, M. Riquelme, P. Robert, U. Weilenmann, European Southern Observatory (Chile) . . . . . [6270-09]

2:30 pm: **Current status of science operation at Subaru,** J. Noumaru, T. Nishimura, S. S. Hayashi, H. Terada, T. Fuselier, J. Hasegawa, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6270-10]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Thurs. 2:50 to 3:10 pm

3-minute presentations

Observatory Operations

✔ **Optimum observing modes for the Herschel/SPIRE system,** B. Sibthorpe, T. J. Waskett, M. J. Griffin, Cardiff Univ. (United Kingdom) . . . . . [6270-47]

✔ **Applications of system modeling for upgrading and predictive maintenance of VLT instruments,** E. Bendek Selman, F. Caruso, A. Kaufer, M. Marchesi, U. Weilenmann, European Southern Observatory (Chile) [6270-48]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 2 (continued) . . . . . Thurs. 3:40 to 5:20 pm

3:40 pm: **Operations model for the Large Binocular Telescope,** R. F. Green, Large Binocular Telescope Observatory; R. M. Wagner, Large Binocular Telescope Observatory and The Ohio State Univ.; J. G. Brynnel, Large Binocular Telescope Observatory; J. M. Hill, Large Binocular Telescope Observatory and The Univ. of Arizona/Steward Observatory; J. H. Slagle, Large Binocular Telescope Observatory . . . . . [6270-11]

4:00 pm: **LGSAO operations at the W. M. Keck Observatory,** D. Le Mignant, W.M. Keck Observatory; A. H. Bouchez, California Institute of Technology; R. D. Campbell, J. C. Y. Chin, A. Conrad, M. A. van Dam, E. M. Johansson, R. E. Lafon, J. E. Lyke, C. Melcher, R. P. Mouser, D. M. Summers, P. J. Stomski, Jr., C. Wilburn, P. L. Wizinowich, R. Goodrich, B. A. Schaefer, W.M. Keck Observatory . . . . . [6270-12]

4:20 pm: **Developing an observatory wide engineering process,** M. J. Hess, W.M. Keck Observatory . . . . . [6270-13]

4:40 pm: **LSST operation simulations,** K. H. Cook, Lawrence Livermore National Lab.; F. Delgado, Cerro Tololo Inter-American Observatory; R. Allsman, M. Miller, National Optical Astronomy Observatory/LSST Corp.; A. Saha, Cerro Tololo Inter-American Observatory; P. Pinto, The Univ. of Arizona/Steward Observatory . . . . . [6270-14]

5:00 pm: **Reliability centered maintenance,** W. R. Ansorge, RAMS-CON Management Consultants (Germany) . . . . . [6270-15]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Thurs. 5:20 to 5:40 pm

3-minute presentations

Observatory Operations

✔ **Spitzer observatory operations: increasing efficiency in mission operations,** C. P. Scott, B. E. Kahr, M. A. Sarrel, Jet Propulsion Lab. [6270-49]

✔ **The mission operations system for WISE,** I. H. Heinrichsen, Jet Propulsion Lab. . . . . [6270-50]

✔ **LSST operation simulator implementarion,** F. Delgado, Cerro Tololo Inter-American Observatory (Chile); K. H. Cook, M. Miller, National Optical Astronomy Observatory; R. Allsman, LSST Corp.; F. Pierfederici, European Southern Observatory (Germany) . . . . . [6270-51]

✔ **Observatory software for the Thirty-Meter Telescope (TMT),** J. Dunn, National Research Council Canada (Canada); C. Boyer, California Institute of Technology; P. N. Daly, National Optical Astronomy Observatory; K. K. Gillies, Gemini Observatory; B. W. Marshall, National Optical Astronomy Observatory; D. Silva, California Institute of Technology . . . . . [6270-52]

✔ **LIDAR for measuring atmospheric extinction,** M. Dawsey, D. W. Roberts, G. G. Gimmestad, Georgia Tech Research Institute; J. T. McGraw, P. C. Zimmer, J. Fitch, The Univ. of New Mexico . . . . . [6270-53]

✔ **Configuration management brings visibility into your project,** W. R. Ansorge, RAMS-CON Management Consultants (Germany) . . . . . [6270-54]

✔Poster Session I

Room: Palms Ballroom: Canary & Royal Salons . Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

Observatory Operations

✔ **Spitzer pre-launch mission operations system: the road to launch,** C. P. Scott, R. K. Wilson, Jet Propulsion Lab. . . . . [6270-41]

✔ **The Spitzer science center: system description and lessons learned due to two years of operations,** L. Bennett, S. Comeau, D. Levine, S. R. Dodd, California Institute of Technology . . . . . [6270-42]

✔ **Insulating legacy observatory ground systems from evolving interface standards,** J. D. Holmes, Harvard-Smithsonian Ctr. for Astrophysics [6270-43]

✔ **Chandra hardware and systems: keeping things running,** L. C. Paton, Smithsonian Astrophysical Observatory . . . . . [6270-44]

✔ **Adapative software solutions: lessons learned from Chandra flight operations,** D. P. Shropshire, S. Bucher, J. Rose, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-45]

✔ **Chandra monitoring and trends analysis,** B. Spitzbart, S. J. Wolk, T. Isobe, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-46]

✔ **Optimum observing modes for the Herschel/SPIRE system,** B. Sibthorpe, T. J. Waskett, M. J. Griffin, Cardiff Univ. (United Kingdom) . . . . . [6270-47]

✔ **Applications of system modeling for upgrading and predictive maintenance of VLT instruments,** E. Bendek Selman, F. Caruso, A. Kaufer, M. Marchesi, U. Weilenmann, European Southern Observatory (Chile) [6270-48]

✔ **Spitzer observatory operations: increasing efficiency in mission operations,** C. P. Scott, B. E. Kahr, M. A. Sarrel, Jet Propulsion Lab. [6270-49]

✔ **The mission operations system for WISE,** I. H. Heinrichsen, Jet Propulsion Lab. . . . . [6270-50]

✔ **LSST operation simulator implementarion,** F. Delgado, Cerro Tololo Inter-American Observatory (Chile); K. H. Cook, M. Miller, National Optical Astronomy Observatory; R. Allsman, LSST Corp.; F. Pierfederici, European Southern Observatory (Germany) . . . . . [6270-51]

✔ **Observatory software for the Thirty-Meter Telescope (TMT),** J. Dunn, National Research Council Canada (Canada); C. Boyer, California Institute of Technology; P. N. Daly, National Optical Astronomy Observatory; K. K. Gillies, Gemini Observatory; B. W. Marshall, National Optical Astronomy Observatory; D. Silva, California Institute of Technology . . . . . [6270-52]

✔ **LIDAR for measuring atmospheric extinction,** M. Dawsey, D. W. Roberts, G. G. Gimmestad, Georgia Tech Research Institute; J. T. McGraw, P. C. Zimmer, J. Fitch, The Univ. of New Mexico . . . . . [6270-53]

✔ **Configuration management brings visibility into your project,** W. R. Ansorge, RAMS-CON Management Consultants (Germany) . . . . . [6270-54]

Instrument Operations

✔ **Chandra's ACIS gain shift and impacts on instrument operations,** N. R. Adams-Wolk, Smithsonian Astrophysical Observatory; R. Buehler, Massachusetts Institute of Technology; P. P. Plucinksy, Smithsonian Astrohysical Observatory . . . . . [6270-55]

✔ **Monte Carlo processes for including Chandra instrument response uncertainties in parameter estimation studies,** J. J. Drake, P. W. Ratzlaff, V. L. Kashyap, R. J. Edgar, D. Jerius, A. Siemiginowska, A. A. Vikhlinin, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-56]

✔ **An historical fluence analysis on the Chandra X-ray Observatory and implications for continued radiation monitoring,** J. M. DePasquale, P. P. Plucinsky, D. A. Schwartz, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-57]

✔ **The Hubble Space Telescope attitude observer anomaly,** M. M. Van Arsdall, P. R. Ramsey, S. R. Swain, Lockheed Martin Corp. . . . . [6270-58]

✔ **The impact of temporal variations of the HST optical PSF on science observations,** R. B. Makidon, M. D. Lallo, S. Casertano, R. L. Gilliland, M. Sirianni, Space Telescope Science Institute; J. E. Krist, Jet Propulsion Lab. . . . . [6270-59]

✔ **Modification of the HST guide star acquisition logic for two-gyro science,** L. Dunham, Vantage Systems, Inc.; A. J. Bradley, Spacecraft System Engineer Services; M. Wenz, Lockheed Martin Corp.; B. Vreeland, NASA . . . . . [6270-60]

✔ **The temporal optical behavior of HST: focus and aberration history,** M. D. Lallo, R. B. Makidon, S. Casertano, Space Telescope Science Institute; J. E. Krist, Jet Propulsion Lab. . . . . [6270-61]

✔ **The correlation algorithm for location of light spot,** J. Chu, Univ. of Science and Technology of China (China) . . . . . [6270-62]

✔ **SPhyNX-S: stellar physics next generation x-ray spectrometer,** J. J. Drake, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-63]

✔ **MONET/North: a very fast 1.2m robotic telescope,** K. Bischoff, Halfmann Teleskoptechnik GmbH & Co. KG (Germany); G. Tuparev, Tuparev Technologies (Netherlands); F. V. Hessman, Georg-August-Univ. Göttingen (Germany); I. Nikolova, Technical Univ. Sofia (Bulgaria) . . . . . [6270-64]

✔ **Performace trends for the x-ray imaging spectrometer on Suzaku,** B. LaMarr, M. W. Bautz, S. E. Kissel, E. Miller, G. Y. Prigozhin, Massachusetts Institute of Technology; N. Tawa, T. Miyauchi, Osaka Univ. (Japan); H. Nakajima, Kyoto Univ. (Japan) . . . . . [6270-65]

✔ **Quality control for multi-detector instruments: a test bed with VIMOS,** B. Wolff, R. W. Hanuschik, M. Neeser, European Southern Observatory (Germany) . . . . . [6270-66]

✔ **Model based wavelength calibration for CRIRES,** P. Bristow, H. Kaeufl, F. Kerber, J. Pirard, M. R. Rosa, R. Siebenmorgen, A. Silber, European Southern Observatory (Germany) . . . . . [6270-67]

Data Management

✔ **The Chandra X-ray Observatory data processing system,** I. N. Evans, M. L. Cresitello-Dittmar, S. Doe, J. D. Evans, G. Fabbiano, G. Germain, K. J. Glotfelty, D. A. Plummer, P. Zografou, Smithsonian Astrophysical Observatory . . . . . [6270-68]

✔ **CIAO: Chandra's user analysis system,** A. Fruscione, J. McDowell, Smithsonian Astrophysical Observatory; M. A. Nowak, Massachusetts Institute of Technology . . . . . [6270-69]

✔ **The Chandra automated processing system: challenges, design enhancements, and lessons learned,** D. A. Plummer, J. D. Grier, S. Masters, Smithsonian Astrophysical Observatory . . . . . [6270-70]

✔ **The Chandra X-ray Observatory calibration database (CalDB): building, planning, and improving,** D. E. Graessle, I. N. Evans, K. J. Glotfelty, X. H. He, J. D. Evans, A. H. Rots, G. Fabbiano, R. J. V. Brissenden, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-71]

✔ **Sptizer science archive interface,** J. L. Chavez, California Institute of Technology . . . . . [6270-72]

✔ **Data quality analysis at the Spitzer science center,** V. Mannings, R. R. Laher, California Institute of Technology . . . . . [6270-73]

✔ **IRACproc: a software suite for processing and analyzing Spitzer/IRAC data,** M. T. Schuster, Harvard-Smithsonian Ctr. for Astrophysics and Univ. of Minnesota; M. Marengo, B. M. Patten, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-74]

✔ **The VIRUS data reduction pipeline: draft,** C. A. Goessl, Univ.-Sternwarte München (Germany); N. Drory, The Univ. of Texas at Austin; H. Relke, Univ.-Sternwarte München (Germany); K. Gebhardt, The Univ. of Texas at Austin; F. Grupp, Univ.-Sternwarte München (Germany); G. J. Hill, The Univ. of Texas at Austin; U. Hopp, Univ.-Sternwarte München (Germany); P. J. MacQueen, The Univ. of Texas at Austin . . . . . [6270-75]

✔ **Introducing hidden Markov models to LAMOST automatic data processing,** J. Chen, National Astronomical Observatories (China) . . [6270-76]

✔ **Cyberinfrastructure to support science and data management for the Dark Energy Survey,** C. Ngeow, W. Barkhouse, J. J. Mohr, C. Beldica, R. L. Plante, T. Alam, Y. D. Cai, G. Daues, Univ. of Illinois; H. Lin, J. T. Annis, C. Stoughton, D. Tucker, Fermi National Accelerator Lab.; R. C. Smith, C. Miller, National Optical Astronomy Observatory . . . . . [6270-77]

✔ **The LSST moving object pipeline,** K. Barnard, The Univ. of Arizona; A. Connolly, Univ. of Pittsburgh; L. Denneau, Univ. of Hawai'i at Manoa; A. Efrat, The Univ. of Arizona; J. N. Heasley, R. Jedicke, Univ. of Hawai'i at Manoa; J. M. Kubica, Carnegie Mellon Univ.; B. Moon, The Univ. of Arizona; A. Moore, Carnegie Mellon Univ.; S. Morris, P. Rao, The Univ. of Arizona . . . . . [6270-78]

✔ **LSST data management infrastructure,** D. Dossa, Lawrence Livermore National Lab.; R. C. Smith, R. Lambert, Cerro Tololo Inter-American Observatory (Chile); M. Butler, C. C. Cribbs, R. L. Plante, Univ. of Illinois at Urbana-Champaign; J. P. Kantor, LSST Corp. . . . . [6270-79]

✔ **VLT VISIR: controlling data quality and instrument performance,** D. Dobrzycka, European Southern Observatory (Germany); A. Smette, M. F. Sterzik, European Southern Observatory (Chile); L. K. Lundin, Y. Jung, R. Siebenmorgen, European Southern Observatory (Germany) . . . . . [6270-80]

✔ **Observation metadata handling system at the European Southern Observatory,** A. Dobrzycki, D. Brandt, D. Giot, J. Lockhart, J. Rodriguez, N. Rossat, M. Vuong, European Southern Observatory (Germany) . . . [6270-81]

✔ **Quality control and instruments monitoring for the VLTI,** I. Percheron, European Southern Observatory (Germany) . . . . . [6270-82]

Observation Planning and Scheduling

✔ **Spitzer Space Telescope proposal process,** S. J. Laine, N. Silbermann, L. M. Rebull, L. Storrie-Lombardi, California Institute of Technology . [6270-83]

✔ **The CXO mission planning process: managing and implementing constraints,** B. S. Williams, K. R. Gage, Northrop Grumman Space Technology . . . . . [6270-84]

✔ **How operational issues impact science peer review,** B. S. Blacker, D. Macchetto, D. Golombek, Space Telescope Science Institute . . . . [6270-85]

✔ **External and internal user support for service mode observations with ESO-VLT,** P. Nass, F. Comeron, S. Marteau, D. R. Silva, European Southern Observatory (Germany) . . . . . [6270-86]

✔ **Optimal sampling of periodic signals using autonomous agents,** E. S. Saunders, T. Naylor, A. Allan, The Univ. of Exeter (United Kingdom) . . . . . [6270-87]

Friday 26 May

SESSION 3

Room: Crystal Ballrooms: L, K . . . . . Fri. 8:20 to 8:40 am

Instrument Operations

8:20 am: **Performance of Hubble's science instruments,** J. C. Blades, R. C. Bohlin, M. D. Lallo, W. B. Sparks, Space Telescope Science Institute . . . . . [6270-17]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Fri. 8:40 to 9:20 am

3-minute presentations

Instrument Operations

✔ **Chandra's ACIS gain shift and impacts on instrument operations,** N. R. Adams-Wolk, Smithsonian Astrophysical Observatory; R. Buehler, Massachusetts Institute of Technology; P. P. Plucinksy, Smithsonian Astrohysical Observatory . . . . . [6270-55]

✔ **Monte Carlo processes for including Chandra instrument response uncertainties in parameter estimation studies,** J. J. Drake, P. W. Ratzlaff, V. L. Kashyap, R. J. Edgar, D. Jerius, A. Siemiginowska, A. A. Vikhlinin, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-56]

✔ **An historical fluence analysis on the Chandra X-ray Observatory and implications for continued radiation monitoring,** J. M. DePasquale, P. P. Plucinsky, D. A. Schwartz, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-57]

✔ **The Hubble Space Telescope attitude observer anomaly,** M. M. Van Arsdall, P. R. Ramsey, S. R. Swain, Lockheed Martin Corp. . . . . [6270-58]

✔ **The impact of temporal variations of the HST optical PSF on science observations,** R. B. Makidon, M. D. Lallo, S. Casertano, R. L. Gilliland, M. Sirianni, Space Telescope Science Institute; J. E. Krist, Jet Propulsion Lab. . . . . [6270-59]

✔ **Modification of the HST guide star acquisition logic for two-gyro science,** L. Dunham, Vantage Systems, Inc.; A. J. Bradley, Spacecraft System Engineer Services; M. Wenz, Lockheed Martin Corp.; B. Vreeland, NASA . . . . . [6270-60]

✔ **The temporal optical behavior of HST: focus and aberration history,** M. D. Lallo, R. B. Makidon, S. Casertano, Space Telescope Science Institute; J. E. Krist, Jet Propulsion Lab. . . . . [6270-61]

✔ **The correlation algorithm for location of light spot,** J. Chu, Univ. of Science and Technology of China (China) . . . . . [6270-62]

✔ **SPhyNX-S: stellar physics next generation x-ray spectrometer,** J. J. Drake, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-63]

✔ **MONET/North: a very fast 1.2m robotic telescope,** K. Bischoff, Halfmann Teleskoptechnik GmbH & Co. KG (Germany); G. Tuparev, Tuparev Technologies (Netherlands); F. V. Hessman, Georg-August-Univ. Göttingen (Germany); I. Nikolova, Technical Univ. Sofia (Bulgaria) . . . . . [6270-64]

✔ **Performace trends for the x-ray imaging spectrometer on Suzaku,** B. LaMarr, M. W. Bautz, S. E. Kissel, E. Miller, G. Y. Prigozhin, Massachusetts Institute of Technology; N. Tawa, T. Miyauchi, Osaka Univ. (Japan); H. Nakajima, Kyoto Univ. (Japan) . . . . . [6270-65]

✔ **Quality control for multi-detector instruments: a test bed with VIMOS,** B. Wolff, R. W. Hanuschik, M. Neeser, European Southern Observatory (Germany) . . . . . [6270-66]

✔ **Model based wavelength calibration for CRIRES,** P. Bristow, H. Kaeufl, F. Kerber, J. Pirard, M. R. Rosa, R. Siebenmorgen, A. Silber, European Southern Observatory (Germany) . . . . . [6270-67]

SESSION 4

Room: Crystal Ballrooms: L, K . . . . . Fri. 9:20 to 11:50 am

Virtual and Networked Observatories

9:20 am: **Operating a heterogeneous telescope network,** A. Allan, The Univ. of Exeter (United Kingdom); K. Bischoff, Halfmann Teleskoptechnik GmbH & Co. KG (Germany); M. J. Burgdorf, Liverpool John Moores Univ. (United Kingdom); B. E. Cavanagh, Joint Astronomy Ctr.; D. Christian, Queen's Univ. Belfast (United Kingdom); N. R. Clay, Liverpool John Moores Univ (United Kingdom); R. Dickens, Latterfrosken Software Development Ltd. (United Kingdom); F. Economou, Joint Astronomy Ctr.; M. Fadavi, Jackson State Univ.; S. N. Frazer, Liverpool John Moores Univ. (United Kingdom); T. Granzer, Astrophysikalisches Institut Potsdam (Germany); S. Grosvenor, NASA Goddard Space Flight Ctr.; F. V. Hessman, Georg-August-Univ. Göttingen (Germany); T. Jenness, Joint Astronomy Ctr.; A. P. Koratkar, Univ. of Maryland/Baltimore County; M. J. Lehner, Harvard-Smithsonian Ctr. for Astrophysics; C. J. Mottram, Liverpool John Moores Univ. (United Kingdom); T. Naylor, E. S. Saunders, The Univ. of Exeter (United Kingdom); N. H. Solomos, Hellenic Naval Academy (Greece); I. A. Steele, Liverpool John Moores Univ. (United Kingdom); G. Tuparev, Tuparev Technologies (Netherlands); T. Vestrand, R. R. White, Los Alamos National Lab.; S. A. Yost, Univ. of Michigan . . . . . [6270-18]

9:40 am: **Unifying access to services: ESO's user portal,** A. M. Chavan, L. E. Tacconi-Garman, M. Peron, F. Sogni, T. Canavan, European Southern Observatory (Germany) . . . . . [6270-19]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **VOEvent and sky transients in the NOAO science archive,** R. L. Seaman, P. Warner, National Optical Astronomy Observatory . . . . . [6270-20]

10:50 am: **Managing science data in the Virtual Observatory era,** D. J. Schade, National Research Council Canada (Canada) . . . . . [6270-21]

11:10 am: **Networking observers and observatories with remote telescope markup language,** F. V. Hessman, Georg-August-Univ. Göttingen (Germany); G. Tuparev, Tuparev Technologies Inc. (Netherlands); A. Allan, The Univ. of Exeter (United Kingdom) . . . . . [6270-22]

11:30 am: **A free market in telescope time II: a test implementation,** I. A. Steele, N. R. Clay, Liverpool John Moores Univ. (United Kingdom); J. Cohen, W. Lee, Imperial College London (United Kingdom); C. J. Mottram, Liverpool John Moores Univ. (United Kingdom) . . . . . [6270-23]

Lunch Break . . . . . 11:50 am to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 5

Room: Crystal Ballrooms: L, K . . . . . Sat. 8:20 to 9:40 am

Data Management

8:20 am: **The Chandra X-ray center data system: supporting the mission of the Chandra X-ray Observatory,** J. D. Evans, M. L. Cresitello-Dittmar, S. Doe, I. N. Evans, G. Fabbiano, G. Germain, K. J. Glotfelty, D. A. Plummer, P. Zografou, Smithsonian Astrophysical Observatory . . . . . [6270-24]

8:40 am: **Chandra data archive operations: lessons learned,** M. L. McCollough, A. H. Rots, S. Winkelman, Smithsonian Astrophysical Observatory . . . . [6270-25]

9:00 am: **Chandra data processing: lessons learned and challenges met,** J. S. Nichols, C. S. Anderson, D. L. Morgan, P. J. Mendygral, Smithsonian Astrophysical Observatory . . . . . [6270-26]

9:20 am: **The Gaia Data Flow System (GDFS) project: the UK's contribution to the Gaia Data Processing and Analysis Consortium,** N. A. Walton, Univ. of Cambridge (United Kingdom); M. S. Cropper, Univ. College London (United Kingdom); G. F. Gilmore, M. J. Irwin, F. van Leeuwen, Univ. of Cambridge (United Kingdom); S. R. Rosen, Univ. College London (United Kingdom) . . . . . [6270-27]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Sat. 9:40 to 10:20 am

3-minute presentations

Data Management

✔ **The Chandra X-ray Observatory data processing system,** I. N. Evans, M. L. Cresitello-Dittmar, S. Doe, J. D. Evans, G. Fabbiano, G. Germain, K. J. Glotfelty, D. A. Plummer, P. Zografou, Smithsonian Astrophysical Observatory . . . . . [6270-68]

✔ **CIAO: Chandra's user analysis system,** A. Fruscione, J. McDowell, Smithsonian Astrophysical Observatory; M. A. Nowak, Massachusetts Institute of Technology . . . . . [6270-69]

✔ **The Chandra automated processing system: challenges, design enhancements, and lessons learned,** D. A. Plummer, J. D. Grier, S. Masters, Smithsonian Astrophysical Observatory . . . . . [6270-70]

✔ **The Chandra X-ray Observatory calibration database (CalDB): building, planning, and improving,** D. E. Graessle, I. N. Evans, K. J. Glotfelty, X. H. He, J. D. Evans, A. H. Rots, G. Fabbiano, R. J. V. Brissenden, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-71]

✔ **Sptizer science archive interface,** J. L. Chavez, California Institute of Technology . . . . . [6270-72]

✔ **Data quality analysis at the Spitzer science center,** V. Mannings, R. R. Laher, California Institute of Technology . . . . . [6270-73]

✔ **IRACproc: a software suite for processing and analyzing Spitzer/IRAC data,** M. T. Schuster, Harvard-Smithsonian Ctr. for Astrophysics and Univ. of Minnesota; M. Marengo, B. M. Patten, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6270-74]

✔ **The VIRUS data reduction pipeline: draft,** C. A. Goessl, Univ.-Sternwarte München (Germany); N. Drory, The Univ. of Texas at Austin; H. Relke, Univ.-Sternwarte München (Germany); K. Gebhardt, The Univ. of Texas at Austin; F. Grupp, Univ.-Sternwarte München (Germany); G. J. Hill, The Univ. of Texas at Austin; U. Hopp, Univ.-Sternwarte München (Germany); P. J. MacQueen, The Univ. of Texas at Austin . . . . . [6270-75]

✔ **Introducing hidden Markov models to LAMOST automatic data processing,** J. Chen, National Astronomical Observatories (China) . . [6270-76]

✔ **Cyberinfrastructure to support science and data management for the Dark Energy Survey,** C. Ngeow, W. Barkhouse, J. J. Mohr, C. Beldica, R. L. Plante, T. Alam, Y. D. Cai, G. Daues, Univ. of Illinois; H. Lin, J. T. Annis, C. Stoughton, D. Tucker, Fermi National Accelerator Lab.; R. C. Smith, C. Miller, National Optical Astronomy Observatory . . . . . [6270-77]

Coffee Break . . . . . 10:20 to 10:50 am

SESSION 5 (continued)

Room: Crystal Ballrooms: L, K . . . . . Sat. 10:50 am to 12:10 pm

10:50 am: **Designing a multi-petabyte database for LSST,** J. Becla, A. Hanushevsky, Stanford Linear Accelerator Ctr.; S. Nikolaev, G. M. Abdulla, Lawrence Livermore National Lab.; A. Szalay, M. Nieto-Santisteban, A. R. Thakar, Johns Hopkins Univ.; J. Gray, Microsoft Corp. . . . . [6270-29]

11:10 am: **VISTA data flow system: status and lessons,** J. P. Emerson, Queen Mary Univ. of London (United Kingdom); M. J. Irwin, Univ. of Cambridge (United Kingdom); N. C. Hambly, Univ. of Edinburgh (United Kingdom) . . . . . [6270-30]

11:30 am: **Data reduction pipelines for the Very Large Telescope,** P. Ballester, K. Banse, S. Castro, R. W. Hanuschik, R. N. Hook, C. Izzo, Y. Jung, European Southern Observatory (Germany); A. Kaufer, European Southern Observatory (Chile); J. M. Larsen, T. Licha, L. K. Lundin, A. Modigliani, M. Peron, R. M. Palsa, J. Vinther, C. Sabet, European Southern Observatory (Germany) . . . . . [6270-31]

11:50 am: **Valuation, policy and software strategy,** N. M. Radziwill, National Radio Astronomy Observatory . . . . . [6270-32]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Sat. 12:10 to 12:30 pm

3-minute presentations

Data Management

✔ **The LSST moving object pipeline,** K. Barnard, The Univ. of Arizona; A. Connolly, Univ. of Pittsburgh; L. Denneau, Univ. of Hawai'i at Manoa; A. Efrat, The Univ. of Arizona; J. N. Heasley, R. Jedicke, Univ. of Hawai'i at Manoa; J. M. Kubica, Carnegie Mellon Univ.; B. Moon, The Univ. of Arizona; A. Moore, Carnegie Mellon Univ.; S. Morris, P. Rao, The Univ. of Arizona . . . . . [6270-78]

✔ **LSST data management infrastructure,** D. Dossa, Lawrence Livermore National Lab.; R. C. Smith, R. Lambert, Cerro Tololo Inter-American Observatory (Chile); M. Butler, C. C. Cribbs, R. L. Plante, Univ. of Illinois at Urbana-Champaign; J. P. Kantor, LSST Corp. . . . . [6270-79]

✔ **VLT VISIR: controlling data quality and instrument performance,** D. Dobrzycka, European Southern Observatory (Germany); A. Smette, M. F. Sterzik, European Southern Observatory (Chile); L. K. Lundin, Y. Jung, R. Siebenmorgen, European Southern Observatory (Germany) . . . . . [6270-80]

✔ **Observation metadata handling system at the European Southern Observatory,** A. Dobrzycki, D. Brandt, D. Giot, J. Lockhart, J. Rodriguez, N. Rossat, M. Vuong, European Southern Observatory (Germany) . . . [6270-81]

✔ **Quality control and instruments monitoring for the VLTI,** I. Percheron, European Southern Observatory (Germany) . . . . . [6270-82]

Lunch Break . . . . . 12:30 to 1:30 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 6

Room: Crystal Ballrooms: L, K . . . . . Sat. 2:35 to 3:15 pm

Observation Planning and Scheduling

2:35 pm: **Queue observing at Gemini,** P. J. Puxley, Gemini Observatory (Chile); I. Jorgensen, Gemini Observatory . . . . . [6270-33]

2:55 pm: **Integrating quick-response target of opportunity observations at Gemini,** K. K. Gillies, S. Walker, Gemini Observatory . . . . . [6270-34]

POSTER POPS

Room: Crystal Ballrooms: L, K . . . . . Sat. 3:15 to 3:35 pm

3-minute presentations

Observation Planning and Scheduling

✔ **Spitzer Space Telescope proposal process,** S. J. Laine, N. Silbermann, L. M. Rebull, L. Storrie-Lombardi, California Institute of Technology . [6270-83]

✔ **The CXO mission planning process: managing and implementing constraints,** B. S. Williams, K. R. Gage, Northrop Grumman Space Technology . . . . . [6270-84]

✔ **How operational issues impact science peer review,** B. S. Blacker, D. Macchetto, D. Golombek, Space Telescope Science Institute . . . . [6270-85]

✔ **External and internal user support for service mode observations with ESO-VLT,** P. Nass, F. Comeron, S. Marteau, D. R. Silva, European Southern Observatory (Germany) . . . . . [6270-86]

✔ **Optimal sampling of periodic signals using autonomous agents,** E. S. Saunders, T. Naylor, A. Allan, The Univ. of Exeter (United Kingdom) . . . . . [6270-87]

Coffee Break . . . . . 3:35 to 4:00 pm

SESSION 6 (continued)

Room: Crystal Ballrooms: L, K . . . . . Sat. 4:00 to 6:00 pm

4:00 pm: **VLT service mode operations at seven years,** F. Comeron, European Southern Observatory (Germany); G. Mathys, A. Kaufer, O. Hainaut, European Southern Observatory (Chile) . . . . . [6270-35]

4:20 pm: **Planning and scheduling of the Hubble Space Telescope in the 2-gyro regime,** D. S. Adler, P. J. Royle, W. Workman III, D. C. Taylor, Space Telescope Science Institute . . . . . [6270-36]

4:40 pm: **Planning and scheduling the Spitzer Space Telescope,** S. J. Barba, California Institute of Technology . . . . . [6270-37]

5:00 pm: **Observation program scheduling for LINC-NIRVANA,** J. Berwein, Max-Planck-Institut für Astronomie (Germany) . . . . . [6270-38]

5:20 pm: **Observation preparation software for LINC-NIRVANA,** A. I. Pavlov, Max-Planck-Institut für Astronomie (Germany); W. Gaessler, Max-Planck Institut für Astronomie (Germany) . . . . . [6270-39]

5:40 pm: **A new graphical user interface for observatory control,** J. R. Fowler, The Univ. of Texas at Austin . . . . . [6270-40]

Tuesday-Wednesday 30-31 May 2006 • Proceedings of SPIE Vol. 6271

Conference Chairs:
Martin J. Cullum, European Southern Observatory (Germany)

George Z. Angeli, AURA/Thirty Meter Telescope Project

Modeling, Systems Engineering, and Project Management for Astronomy II

Program Committee: **Torben E. Andersen**, Lunds Univ./Lund Observatory (Sweden); **Matthew C. Britton**, California Institute of Technology; **Eric R. Hansen**, National Solar Observatory; **Christoph Haupt**, European Southern Observatory (Germany); **Marie B. Levine**, Jet Propulsion Lab.; **David W. Miller**, Massachusetts Institute of Technology; **Hermine Schnetler**, UK Astronomy Technology Ctr. (United Kingdom); **Donald W. Sweeney**, LSST Corp.

Tuesday 30 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am
Novel Technology for Optical and Infrared Astronomy
Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 1
Room: Crystal Ballrooms: L, K . . . . . Tues. 9:35 to 10:35 am
Modeling I: Ground-Based Telescopes
Chairs: **Martin J. Cullum**, European Southern Observatory (Germany); **George Z. Angeli**, AURA/Thirty Meter Telescope Project

9:35 am: **Integrated modeling concepts for OWL,** M. Mueller, F. Koch, European Southern Observatory (Germany) . . . . . [6271-01]

9:55 am: **Status of the integrated model of the Euro50,** A. Enmark, T. E. Andersen, Lund Univ. (Sweden); M. T. Browne, National Univ. of Ireland/Galway (Ireland); M. Owner-Petersen, Lund Univ. (Sweden); A. Shearer, National Univ. of Ireland/Galway (Ireland) . . . . . [6271-02]

10:15 am: **Optimised external computation for the Euro50 MATLAB based integrated model,** M. T. Browne, National Univ. of Ireland/Galway (Ireland); A. Enmark, T. E. Andersen, Lund Univ. (Sweden); A. Shearer, National Univ. of Ireland/Galway (Ireland) . . . . . [6271-03]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 2
Room: Crystal Ballrooms: L, K . . . . . Tues. 11:00 am to 12:20 pm
Project Management
Chair: **Martin J. Cullum**, European Southern Observatory (Germany)

11:00 am: **Cost of Quality (CoQ) metrics for telescope operations and project management,** N. M. Radziwill, National Radio Astronomy Observatory . [6271-04]

11:20 am: **Project management at a university,** J. A. Eaton, Tennessee State Univ. . . . . [6271-05]

11:40 am: **Reliability, availability, and maintainability a key issue for ELTs,** W. R. Ansorge, RAMS-CON Management Consultants (Germany) . . . . . [6271-06]

12:00 pm: **The role of project science in the Chandra X-Ray Observatory,** S. L. O'Dell, M. C. Weisskopf, NASA Marshall Space Flight Ctr. and National Space Science and Technology Ctr. . . . . [6271-07]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 3
Room: Crystal Ballrooms: L, K . . . . . Tues. 1:30 to 3:10 pm
Systems Engineering I: Space Telescopes and Instruments
Chair: **Donald W. Sweeney**, LSST Corp.

1:30 pm: **Findings of the NASA Agency study on the long-term Agency plan for the verification of large space telescope observatories,** J. A. Crooke, J. A. Gunderson, NASA Headquarters; J. G. Hagopian, NASA Goddard Space Flight Ctr.; M. B. Levine, Jet Propulsion Lab.; K. M. Lyons, The Aerospace Corp.; M. A. Shaw, NASA Headquarters . . . . . [6271-08]

1:50 pm: **The advanced modeling, simulation and analysis capability roadmap vision for engineering: Part I - future observatory missions,** T. A. Zang, NASA Langley Research Ctr.; M. D. Lieber, Ball Aerospace & Technologies Corp.; C. D. Norton, Jet Propulsion Lab.; K. Fucik, Northrop Grumman Space Technology . . . . . [6271-09]

2:10 pm: **Optical verification of the James Webb Space Telescope,** B. K. McComas, R. E. Rifelli, Northrop Grumman Space Technology; A. A. Barto, A. R. Contos, Ball Aerospace & Technologies Corp.; T. L. Whitman, C. Wells, ITT Space Systems LLC; J. G. Hagopian, NASA Goddard Space Flight Ctr. . [6271-10]

2:30 pm: **Test configuration evaluation of the James Webb Space Telescope,** T. L. Whitman, T. Scorse, ITT Space Systems LLC . . . . . [6271-11]

2:50 pm: **Johnson Space Center vacuum chamber A as a partial metering structure for the James Webb Space Telescope optical testing,** K. M. Patterson, C. L. Buttaccio, G. D. Peck, Jr., ITT Space Systems LLC . . . . . [6271-12]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 4
Room: Crystal Ballrooms: L, K . . . . . Tues. 3:40 to 5:20 pm
Systems Engineering II: Ground-Based Telescopes
Hermine Schnetler, UK Astronomy Technology Ctr. (United Kingdom)

3:40 pm: **A formal requirements management tool for system engineering: first results,** M. Zamparelli, European Southern Observatory (Germany) [6271-13]

4:00 pm: **System engineering in the ALMA project,** C. Haupt, European Southern Observatory (Germany); R. Sramek, National Radio Astronomy Observatory; K. Morita, National Astronomical Observatory of Japan (Japan) . . . . . [6271-14]

4:20 pm: **Systems engineering for the conceptual design of the Thirty Meter Telescope,** G. Z. Angeli, California Institute of Technology; S. E. Strom, National Optical Astronomy Observatory; T. M. Erm, California Institute of Technology . . . . . [6271-15]

4:40 pm: **Systems engineering: can rigour and creativity co-exists?,** H. Schnetler, I. Egan, P. Rees, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6271-17]

5:00 pm: **Applied systems engineering in a small scale project,** M. Meijers, R. Jager, A. Oudenhuysen, G. Kroes, J. Pel, Astron (Netherlands) . . . . . [6271-18]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

✔ **Data modeling for analytical astronomical simulation VV&A,** M. Barnett, Computer Sciences Corp.; H. M. Jaenisch, dtech Systems Inc.; J. W. Handley, Sparta, Inc.; D. A. Grover, Washington Square Associates, Inc. . . . . [6271-40]

✔ **Thermal modeling of cooled instrument: from the WIRCam IR camera to CCD Peltier cooled compact packages,** P. Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); S. Hurrell, P. Wheeler, e2v technologies ltd. (United Kingdom); J. Gach, Lab. d'Astrophysique de Marseille (France); M. D. Downing, European Southern Observatory (Germany); E. Stadler, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. Balard, Lab. d'Astrophysique de Marseille (France); C. Guillaume, Observatoire Astronomique de Marseille-Provence (France); N. N. Hubin, European Southern Observatory (Germany); J. J. Diaz-Garcia, Instituto de Astrofísica de Canarias (Spain); W. A. F. Suske, P. R. Jorden, e2v technologies ltd. (United Kingdom) . . . . . [6271-41]

✔ **Bringing it all together: a unique approach to requirements for wavefront sensing and control on the James Webb Space Telescope (JWST),** A. R. Contos, D. S. Acton, P. D. Atcheson, A. A. Barto, P. A. Lightsey, D. M. Shields, Ball Aerospace & Technologies Corp. . . . . [6271-42]

✔ **Modeling the costs of developing and supporting detector controllers in a multi-instrument observatory,** C. D. Guzman, Association of Universities for Research in Astronomy/Gemini Observatory; E. Zarate, Univ. de Chile (Chile) . . . . . [6271-43]

✔ **A survey of ground operations tools developed To simulate the pointing of space telescopes and the design for WISE,** B. E. Fabinsky, D. Royer, I. H. Heinrichsen, Jet Propulsion Lab. . . . . [6271-44]

✔ **SPITZER bandmerge GUI,** M. Z. Pesenson, J. Fowler, R. R. Laher, California Institute of Technology . . . . . [6271-45]

✔ **Study on measuring precision of LAMOST fiber positioning measurement system,** J. Yi, Z. Chao, X. Xing, Y. Gu, Univ. of Science and Technology of China (China) . . . . . [6271-46]

✔ **Architecture of the integrated model of the Euro50,** A. Enmark, T. E. Andersen, Lund Univ. (Sweden); M. T. Browne, National Univ. of Ireland/Galway (Ireland); M. Owner-Petersen, Lund Univ. (Sweden); A. Shearer, National Univ. of Ireland/Galway (Ireland) . . . . . [6271-47]

✔ **TMT studies on thermal seeing modeling: mirror and dome seeing model validation,** K. Vogiatzis, R. S. Upton, National Optical Astronomy Observatory . . . . . [6271-48]

✔ **Integrated modeling approach for an active optics system,** P. Schipani, F. Perrotta, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6271-49]

✔ **Sphere measurement error analysis,** Z. Zhou, C. Zhai, X. Xing, H. Hu, Univ. of Science and Technology of China (China) . . . . . [6271-50]

✔ **Making it real: computer graphics and astronomical instrumentation,** A. J. McGrath, Anglo-Australian Observatory (Australia) . . . . . [6271-51]

✔ **Managing astronomical infrastructure projects,** W. R. Ansorge, RAMS-CON Management Consultants (Germany) . . . . . [6271-52]

✔ **Tailoring of a life cycle model for an astronomical infrastructure project,** W. R. Ansorge, RAMS-CON Management Consultants (Germany) . . . [6271-53]

✔ **Numerical modeling of influence telescope segment placement at aperture and its quality on focusing radiated field,** A. P. Maryasov, Institute of Applied Optics (Ukraine); N. P. Maryasov, National Aviation Univ. (Ukraine) . . . . . [6271-54]

✔ **Optical transfer function calculation for TMT optical error budget,** L. Jolissaint, National Research Council Canada (Canada); B. L. Ellerbroek, G. Z. Angeli, California Institute of Technology . . . . . [6271-56]

✔ **Practical aspects of image system validation using trans-illumination,** G. J. Baker, R. M. Bell, Jr., G. C. Robins, A. T. Cochrane, Lockheed Martin Advanced Technology Ctr. . . . . [6271-57]

✔ **System analysis tools for an ELT at ESO,** M. Mueller, F. Koch, European Southern Observatory (Germany) . . . . . [6271-59]

✔ **Stray-light sources from pupil mask edges and mitigation techniques for the TPF coronagraph,** D. P. Ceperley, A. R. Neureuther, Univ. of California/Berkeley; M. D. Lieber, Ball Aerospace & Technologies Corp.; J. N. Kasdin, Princeton Univ. . . . . [6271-60]

✔ **Project management during construction of an observatory,** E. J. Bakker, M. J. Creech-Eakman, C. Cormier, New Mexico Institute of Mining and Technology . . . . . [6271-61]

Wednesday 31 May

SESSION 5

Room: Crystal Ballrooms: L, K . . . . . Wed. 8:00 am to 12:10 pm

Modeling I: Ground-Based Telescopes II

Chair: **George Z. Angeli**, AURA/Thirty Meter Telescope Project

8:00 am: **Limitations on Earth-like planet detection with Extremely Large Telescopes,** C. Cavarroc, A. Boccaletti, P. Baudoz, Observatoire de Paris à Meudon (France); T. Fusco, ONERA (France); D. Rouan, Observatoire de Paris à Meudon (France) . . . . . [6271-19]

8:20 am: **Mitigation of third order spherical, coma, and astigmatism using segmented mirrors,** J. W. Contreras, Ball Aerospace & Technologies Corp. . . . . [6271-20]

8:40 am: **LSST optical design sensitivity analysis,** M. Liang, National Optical Astronomy Observatory; L. G. Seppala, Lawrence Livermore National Lab.; D. W. Sweeney, LSST Corp.; C. F. Claver, V. L. Krabbendam, J. Sebag, National Optical Astronomy Observatory; J. H. Burge, College of Optical Sciences/The Univ. of Arizona . . . . . [6271-21]

9:00 am: **A multi-layered thermal model of backup structures for mm-wavelength radio telescopes,** A. Greve, IRAM-Domaine Univ. de Grenoble (France); D. R. Smith, Mechanical Engineering Research Laboratory P.C.; M. Bremer, IRAM-Domaine Univ. de Grenoble (France) . . . . . [6271-22]

9:20 am: **Perturbation rejection control strategy for OWL,** B. Sedghi, European Southern Observatory (Germany); L. Miskovic, École Polytechnique Fédérale de Lausanne (Switzerland); M. Dimmler, European Southern Observatory (Germany) . . . . . [6271-23]

9:40 am: **Modeling wind-buffeting of the Thirty Meter Telescope,** D. G. MacMynowski, California Institute of Technology; C. A. Blaurock, Nightsky Systems, Inc.; G. Z. Angeli, T. M. Erm, California Institute of Technology [6271-25]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **TMT wind model validation with measurements on Keck and Gemini,** T. M. Erm, G. Z. Angeli, California Institute of Technology . . . . . [6271-26]

10:50 am: **Strategies for estimating mirror and dome seeing for TMT,** K. Vogiatzis, National Optical Astronomy Observatory; J. T. Fitzsimmons, M. Sun, National Research Council Canada (Canada) . . . . . [6271-27]

11:10 am: **Lessons learned from parametric structural modeling of a large ground based observatory,** D. J. Howell, S. A. Uebelhart, D. W. Miller, Massachusetts Institute of Technology . . . . . [6271-28]

11:30 am: **Wind vibration analyses of Giant Magellan Telescope,** F. W. Kan, D. W. Eggers, Simpson Gumpertz & Heger Inc. . . . . [6271-29]

11:50 am: **Active alignment and figure correction of the Advanced Technology Solar Telescope,** R. S. Upton, National Optical Astronomy Observatory . . . . . [6271-30]

Lunch Break . . . . . 12:10 to 1:40 pm

SESSION 6

Room: Crystal Ballrooms: L, K . . . . . Wed. 1:40 to 4:30 pm

Modeling II: Space Telescopes and Instruments

Chairs: **Christoph Haupt**, European Southern Observatory (Germany);
George Z. Angeli, AURA/Thirty Meter Telescope Project;
Martin J. Cullum, European Southern Observatory (Germany)

1:40 pm: **Evaluating the end-to-end performance of TPF-C with vector propagation models: Part II - wave propagation,** M. D. Lieber, Ball Aerospace & Technologies Corp.; A. R. Neureuther, D. P. Ceperley, Univ. of California/Berkeley; N. J. Kasdin, Princeton Univ.; D. J. Hoppe, A. R. Eisenman, Jet Propulsion Lab. . . . . [6271-31]

2:00 pm: **Broadband optical performance modeling of TPFC,** D. M. Palacios, Jet Propulsion Lab. . . . . [6271-32]

2:20 pm: **Dynamic tailoring and tuning of structurally-connected TPF interferometer,** R. A. Masterson, Charles Stark Draper Lab., Inc.; D. W. Miller, Massachusetts Institute of Technology . . . . . [6271-33]

2:40 pm: **Fidelity of telescope subsystem models and the influence on simulation accuracy,** D. J. Howell, O. L. de Weck, D. W. Miller, Massachusetts Institute of Technology . . . . . [6271-34]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Systems engineering and performance modeling of the Gemini high-resolution near-infrared spectrograph (HRNIRS),** S. S. Eikenberry, Univ. of Florida; K. H. Hinkle, D. Joyce, M. Liang, G. P. Muller, E. Heileman, National Optical Astronomy Observatory; J. C. Ge, C. C. Packham, R. Julian, Univ. of Florida; N. A. Gaughan, D. Sprayberry, National Optical Astronomy Observatory . . . . . [6271-35]

3:50 pm: **Thermal models of the Planck/LFI QM/FM instruments,** M. Tomasi, A. Mennella, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); G. Baldan, Laben Spa (Italy); L. Terenzi, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy); M. Lapolla, Laben Spa (Italy); G. Morgante, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6271-36]

4:10 pm: **Thermal distortion analysis of James Webb Space Telescope's (JWST) integrated science instrument module (ISIM),** E. Cofie, Mega Engineering; J. D. Johnston, NASA Goddard Space Flight Ctr.; P. Bagdanove, Mega Engineering; J. A. Crane, Swales Aerospace; E. Matzinger, NASA Goddard Space Flight Ctr. . . . . [6271-39]

Wednesday-Wednesday 24-31 May 2006 • Proceedings of SPIE Vol. 6272

Conference Chairs:
Brent L. Ellerbroek, CELT Development Corp.

Domenico Bonaccini Calia, European Southern Observatory (Germany)

Advances in Adaptive Optics II

Wednesday 24 May

SESSION 1

Room: Crystal Ballrooms: J2 . . . . . Wed. 10:00 am to 12:00 pm

Laser Guide Star and Multi-Conjugate AO Field Tests I

Chair: **Robert Q. Fugate**, Air Force Research Lab.

10:00 am: **LGS AO at Keck Observatory: routine operations and remaining challenges,** D. Le Mignant, M. A. van Dam, W.M. Keck Observatory; A. H. Bouchez, California Institute of Technology; R. D. Campbell, J. C. Y. Chin, A. Conrad, S. K. Hartman, E. M. Johansson, R. E. Lafon, J. E. Lyke, C. Melcher, R. P. Mouser, D. M. Summers, P. J. Stomski, Jr., C. Wilburn, P. L. Wizinowich, W.M. Keck Observatory . . . . . [6272-01]

10:20 am: **Laboratory test results on the multi-conjugate and multi-object adaptive optics testbed and implications for AO on the Thirty Meter Telescope,** S. M. Ammons, R. Kupke, B. J. Bauman, D. T. Gavel, D. R. Dillon, M. R. Reinig, C. E. Max, Univ. of California/Santa Cruz . . . . . [6272-175]

10:40 am: **Tomographic reconstruction of stellar wavefronts from multiple laser guide stars,** C. J. Baranec, M. Lloyd-Hart, N. M. Milton, T. E. Stalcup, Jr., M. Snyder, J. R. P. Angel, The Univ. of Arizona/Steward Observatory . . . [6272-03]

11:00 am: **Laser guide star adaptive optics at Palomar Observatory,** A. H. Bouchez, R. G. Dekany, California Institute of Technology; J. R. Angione, G. L. Brack, Jet Propulsion Lab.; J. Cromer, California Institute of Technology; S. R. Guiwits, Jet Propulsion Lab.; E. J. Kibblewhite, The Univ. of Chicago; A. Morrissett, H. L. Petrie, California Institute of Technology; J. Roberts, J. C. Shelton, T. Q. Trinh, M. Troy, T. Truong, Jet Propulsion Lab.; V. Velur, California Institute of Technology . . . . . [6272-04]

11:20 am: **Multi-conjugate solar adaptive optics with the VTT and GREGOR,** T. Berkefeld, O. F. von der Lühe II, D. Soltau, Kiepenheuer Institut für Sonnenphysik (Germany) . . . . . [6272-05]

11:40 am: **Progress with solar multi-conjugate adaptive optics at NSO,** T. R. Rimmele, C. Richards, S. L. Hegwer, National Solar Observatory; J. M. Roche, The Univ. of Alabama in Huntsville . . . . . [6272-06]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 2

Room: Crystal Ballrooms: J2 . . . . . Wed. 2:15 to 2:35 pm

Laser Guide Star and Multi-Conjugate AO Field Tests II

Chair: **Robert Q. Fugate**, Air Force Research Lab.

2:15 pm: **First light of the ESO laser guide star facility,** D. Bonaccini Calia, European Southern Observatory (Germany); R. I. Davies, Max-Planck-Institut für extraterrestrische Physik (Germany); W. K. P. Hackenberg, European Southern Observatory (Germany); S. Rabien, Max Planck Institut für Extraterrestrische Physik (Germany) . . . . . [6272-195]

SESSION 3

Room: Crystal Ballrooms: J2 . . . . . Wed. 2:35 to 6:00 pm

Adaptive Optics Programs I

Chair: **Mark R. Chun**, Univ. of Hawai'i at Hilo

2:35 pm: **ESO adaptive optics program,** N. N. Hubin, European Southern Observatory (Germany) . . . . . [6272-07]

2:55 pm: **Adaptive optics developments at Keck Observatory,** P. L. Wizinowich, W.M. Keck Observatory . . . . . [6272-08]

3:15 pm: **First light AO system for LBT: toward on-sky operation,** S. Esposito, A. Riccardi, A. Tozzi, A. T. Puglisi, E. Pinna, R. N. Tubbs, M. Xompero, D. Zanotti, L. Fini, L. Busoni, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-10]

Coffee Break . . . . . 3:35 to 4:00 pm

4:00 pm: **The ESO adaptive optics facility,** S. Stroebele, R. Arsenault, D. Bonaccini Calia, R. D. Conzelmann, B. Delabre, R. Donaldson, M. Duchateau, European Southern Observatory (Germany); S. Esposito, Osservatorio Astrofisico di Arcetri (Italy); E. Fedrigo, W. K. P. Hackenberg, N. N. Hubin, M. Le Louarn, S. Oberti, European Southern Observatory (Germany); R. Stuik, Leiden Univ. (Netherlands); E. Vernet, European Southern Observatory (Germany) . . . [6272-11]

4:20 pm: **Status of Subaru laser guide star AO system,** H. Takami, S. A. Colley, M. C. Dinkins, M. Eldred, G. Taras, O. Guyon, M. Hattori, Y. Hayano, M. Itoh, National Astronomical Observatory of Japan/Subaru Telescope; M. Iye, National Astronomical Observatory of Japan (Japan); S. Oya, Y. Saito, M. Watanabe, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6272-12]

4:40 pm: **A conceptual design for the Thirty Meter Telescope adaptive optics systems,** B. L. Ellerbroek, C. Boyer, M. C. Britton, California Institute of Technology; S. Browne, The Optical Sciences Co.; R. A. Buchroeder, Optical Design Service; M. K. Cho, National Optical Astronomical Observatory; M. R. Chun, Univ. of Hawai'i at Hilo; R. M. Clare, California Institute of Technology; L. G. Daggert, National Optical Astronomical Observatory; R. G. Dekany, California Institute of Technology; J. H. Elias, National Optical Astronomical Observatory; D. A. Erickson, National Research Council Canada (Canada); R. Flicker, W. M. Keck Observatory; D. T. Gavel, Univ. of California/ Santa Cruz; L. Gilles, California Institute of Technology; G. Herriot, National Research Council Canada (Canada); M. R. Hunten, R. R. Joyce, M. Liang, National Optical Astronomical Observatory; B. A. Macintosh, Lawrence Livermore National Laboratory; I. P. Powell, S. C. Roberts, National Research Council Canada (Canada); E. Ruch, Sagem SA (France); J. Sinquin, CILAS (France); M. J. Smith, J. A. Stoesz, National Research Council Canada (Canada); M. Troy, Jet Propulsion Lab.; G. A. Tyler, The Optical Sciences Co.; J. Veran, National Research Council Canada (Canada); C. R. Vogel, Q. Yang, Montana State Univ.-Bozeman . . . . . [6272-13]

5:00 pm: **Design of the adaptive optics systems for GMT,** M. Lloyd-Hart, J. R. P. Angel, The Univ. of Arizona/Steward Observatory; M. W. Johns, Carnegie Observatories; J. H. Burge, College of Optical Sciences/The Univ. of Arizona; N. M. Milton, K. B. Powell, The Univ. of Arizona/Steward Observatory; S. Hvisc, College of Optical Sciences/The Univ. of Arizona; B. Cuerden, M. J. Rademacher, The Univ. of Arizona/Steward Observatory . . . . . [6272-14]

5:20 pm: **Adaptive optics R&D funded by the European FP 6,** N. N. Hubin, European Southern Observatory (Germany) . . . . . [6272-15]

5:40 pm: **PALM-3000: visible light AO on the 5.1-m Telescope,** R. G. Dekany, A. H. Bouchez, M. C. Britton, V. Velur, California Institute of Technology . . [6272-196]

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 4

Room: Crystal Ballrooms: J2 . . . . . Thurs. 9:35 to 10:35 am

Astronomical Results and Performance Characterization

Chair: **Julian C. Christou**, Univ. of California/Santa Cruz

9:35 am: **Substellar, stellar, and galactic astronomy from laser guide star adaptive optics,** M. C. Liu, Univ. of Hawai'i/Manoa . . . . . [6272-16]

9:55 am: **Analysis of multi-band near-infrared binary star imaging with the Lick Observatory NGS AO system,** K. J. Mighell, National Optical Astronomy Observatory; J. C. Christou, Univ. of California/Santa Cruz; J. D. Drummond, Air Force Research Lab. . . . . [6272-17]

10:15 am: **Characterization of the Lick Observatory adaptive optics point spread function,** J. C. Christou, Univ. of California/Santa Cruz; S. Gladysz, M. Redfern, National Univ. of Ireland/Galway (Ireland) . . . . . [6272-18]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 5

Room: Crystal Ballrooms: J2 . . . . . Thurs. 11:00 am to 12:20 pm

Extreme AO Systems

Chair: **Anne-Marie Lagrange**,
Lab. d'Astrophysique de l'Observatoire de Grenoble (France)

11:00 am: **Design of the extreme AO system for the Planet Finder instrument on the VLT,** T. Fusco, C. Petit, ONERA (France); G. Rousset, Observatoire de Paris à Meudon (France); K. Dohlen, Observatoire Astronomique de Marseille-Provence (France); J. Chatron, P. Rabou, P. Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. Baudoz, Observatoire de Paris à Meudon (France); J. Beuzit, D. Mouillet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); P. Puget, Observatoire de Paris à Meudon (France); M. E. Kasper, M. D. Downing, E. Fredigo, N. N. Hubin, European Southern Observatory (Germany); F. P. Wildi, West Switzerland Univ. of Applied Sciences (Switzerland) . . . . . [6272-19]

11:20 am: **The Gemini Planet Imager,** B. A. Macintosh, Lawrence Livermore National Lab.; J. R. Graham, Univ. of California/Berkeley; D. W. Palmer, Lawrence Livermore National Lab.; R. Doyon, Univ. de Montréal (Canada); D. T. Gavel, Univ. of California/Santa Cruz; J. E. Larkin, Univ. of California/Los Angeles; B. R. Oppenheimer, American Museum of Natural History; L. Poyneer, Lawrence Livermore National Lab.; L. K. Saddlemyer, National Research Council Canada (Canada); A. Sivaramakrishnan, American Museum of Natural History; J. K. Wallace, Jet Propulsion Lab.; J. Veran, National Research Council Canada (Canada) . . . . . [6272-20]

11:40 am: **Outcome of the study of an Earth-like Planet Finder for the 100-m OWL Telescope,** C. Verinaud, M. E. Kasper, N. N. Hubin, European Southern Observatory (Germany) . . . . . [6272-21]

12:00 pm: **Extreme adaptive optics for the Thirty Meter Telescope,** B. A. Macintosh, Lawrence Livermore National Lab.; M. Troy, Jet Propulsion Lab.; R. Doyon, Univ. de Montréal (Canada); K. L. Baker, Lawrence Livermore National Lab.; J. R. Graham, Univ. of California/Berkeley; E. Serabyn, Jet Propulsion Lab. . . . . [6272-22]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 6

Room: Crystal Ballrooms: J2 . . . . . Thurs. 1:30 to 3:10 pm

AO Systems for Extremely Large Telescopes

Chair: **Brent L. Ellerbroek**, California Institute of Technology

1:30 pm: **Conceptual design of AO systems for the European Extremely Large Telescope,** E. Marchetti, B. Delabre, E. Fedrigo, N. N. Hubin, J. Kolb, M. Le Louarn, S. Oberti, European Southern Observatory (Germany) . . . [6272-23]

1:50 pm: **NFIRAOS: TMT narrow-field near-infrared facility adaptive optics,** G. Herriot, National Research Council Canada (Canada); P. Hickson, The Univ. of British Columbia (Canada); B. L. Ellerboek, California Institute of Technology; D. R. Andersen, T. J. Davidge, D. A. Erickson, I. P. Powell, National Research Council Canada (Canada); R. M. Clare, L. Gilles, C. Boyer, California Institute of Technology; M. J. Smith, L. K. Saddlemyer, J. Véran, National Research Council Canada (Canada) . . . . . [6272-24]

2:10 pm: **Adaptive optics designs for an infrared multi-object spectrograph on TMT,** D. T. Gavel, Univ. of California/Santa Cruz; B. J. Bauman, Lawrence Livermore National Lab.; R. G. Dekany, M. C. Britton, California Institute of Technology; D. R. Andersen, National Research Council Canada (Canada) . . . . . [6272-25]

2:30 pm: **Design of the TMT mid-infrared adaptive optics system,** M. R. Chun, Univ. of Hawai'i at Hilo; J. Elias, National Optical Astronomy Observatory; B. L. Ellerbroek, California Institute of Technology; M. Liang, National Optical Astronomy Observatory; T. W. Bond, Univ. of Hawai'i at Manoa; R. M. Clare, California Institute of Technology; A. T. Tokunaga, Univ. of Hawai'i at Manoa; M. Richter, Univ. of California/Davis; L. G. Daggert, National Optical Astronomy Observatory . . . . . [6272-26]

2:50 pm: **ONIRICA: an infrared camera for OWL with MCAO low-order partial correction,** J. Farinato, R. Ragazzoni, C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); B. Le Roux, M. Lombini, Osservatorio Astrofisico di Arcetri (Italy); G. Bertelli, Osservatorio Astronomico di Padova (Italy); M. Castellano, Osservatorio Astronomico di Roma (Italy); R. Falomo, Osservatorio Astronomico di Padova (Italy); A. Fontana, Osservatorio Astronomico di Roma (Italy); W. Gaessler, Max-Planck-Institut für Astronomie (Germany); A. Grazian, Osservatorio Astronomico di Roma (Italy); L. Greggio, Osservatorio Astronomico di Padova (Italy); T. M. Herbst, H. Rix, Max-Planck-Institut für Astronomie (Germany); S. Dodorico, E. Marchetti, European Southern Observatory (Germany) . . . . . [6272-27]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 7

Room: Crystal Ballrooms: J2 . . . . . Thurs. 3:40 to 5:40 pm

Large Adaptive Mirrors

Chair: **Armando Riccardi**, Osservatorio Astrofisico di Arcetri (Italy)

3:40 pm: **Deformable secondary mirrors for the LBT adaptive optics system,** H. M. Martin, G. Brusa Zappellini, B. Cuerden, S. M. Miller III, The Univ. of Arizona/Steward Observatory; A. Riccardi, Osservatorio Astrofisico di Arcetri (Italy); B. K. Smith, The Univ. of Arizona/Steward Observatory . . . . . [6272-28]

4:00 pm: **A deformable secondary mirror for the VLT,** R. Arsenault, European Southern Observatory (Germany); R. Biasi, MicroGate S.r.l. (Italy); D. Gallieni, ADS International Srl (Italy); A. Riccardi, Osservatorio Astrofisico de Arcetri (Italy); N. N. Hubin, E. Fedrigo, R. Donaldson, S. Oberti, S. Stroebele, European Southern Observatory (Germany) . . . . . [6272-29]

4:20 pm: **Riding the hub: characterization of the MMT adaptive secondary performance,** P. M. Hinz, M. A. Kenworthy, D. L. Miller, V. Vaitheeswaran, G. Brusa Zappellini, The Univ. of Arizona/Steward Observatory . . . . . [6272-30]

4:40 pm: **Manufacturing of lightweight glass segments for adaptive optics,** M. Ghigo, S. Basso, O. Citterio, F. Mazzoleni, D. Vernani, Osservatorio Astronomico di Brera (Italy) . . . . . [6272-31]

5:00 pm: **A new concept for large deformable mirrors for ELTs,** T. E. Andersen, M. Owner-Petersen, A. L. Ardeberg, Lunds Univ. (Sweden) . . . . . [6272-32]

5:20 pm: **ASSIST: the adaptive secondary setup and instrument stimulator,** R. Stuik, Leiden Univ. (Netherlands); R. Arsenault, B. Delabre, European Southern Observatory (Germany); S. Esposito, Osservatorio Astrofisico di Arcetri (Italy); P. Hallibert, Leiden Univ. (Netherlands); N. N. Hubin, European Southern Observatory (Germany); A. Quirrenbach, Univ. Leiden (Netherlands); A. Riccardi, Osservatorio Astrofisico di Arcetri (Italy); S. Stroebele, European Southern Observatory (Germany); R. Vink, Leiden Univ. (Netherlands) . . . . . [6272-33]

Technical Group Meeting
Room: Crystal Ballrooms: Salons G1 .... Thurs. 8:00 to 9:30 pm
Adaptive Optics

Friday 26 May

SESSION 8

Room: Crystal Ballrooms: J2 ..... Fri. 8:00 to 10:00 am

Real-Time-Control Systems

Chair: **Peter L. Wizinowich**, W.M. Keck Observatory

8:00 am: **SPARTA: the ESO standard platform for adaptive optics real-time applications,** E. Fedrigo, R. Donaldson, C. Soenke, European Southern Observatory (Germany); R. M. Myers, S. J. Goodsell, C. D. Saunter, D. Geng, Univ. of Durham (United Kingdom) ..... [6272-34]

8:20 am: **TMT adaptive optics systems control architecture,** C. Boyer, B. L. Ellerbroek, California Institute of Technology; G. Herriot, National Research Council Canada (Canada); S. L. Browne, G. A. Tyler, The Optical Sciences Co. ..... [6272-35]

8:40 am: **The wavefront control system for the advanced technology Solar Telescope,** T. R. Rimmele, C. Richards, S. L. Hegwer, R. P. Hubbard, E. R. Hansen, National Solar Observatory; J. M. Roche, Univ of Alabama in Huntsville; R. S. Upton, National Optical Astronomy Observatory ..... [6272-36]

9:00 am: **Tomagraphic wavefront correction for the Large Synoptic Survey Telescope,** D. W. Phillion, S. Hvisc, S. S. Olivier, L. G. Seppala, Lawrence Livermore National Lab. ..... [6272-37]

9:20 am: **Image motion control in the Lick adaptive optics system: compensating for flexure and differential atmospheric refraction,** S. A. Severson, J. C. Christou, E. L. Gates, D. T. Gavel, Univ. of California/Santa Cruz ..... [6272-38]

9:40 am: **Modal Fourier wavefront reconstruction on graphics processing units,** J. M. Rodríguez-Ramos, J. G. Marichal-Hernández, F. L. Rosa, Univ. de La Laguna (Spain) ..... [6272-39]

Coffee Break ..... 10:00 to 10:30 am

SESSION 9

Room: Crystal Ballrooms: J2 ..... Fri. 10:30 to 11:30 am

Natural Guide Star AO Field Tests

Chair: **Glen Herriot**, National Research Council Canada (Canada)

10:30 am: **On-sky results of the adaptive optics MACAO for the new IR-spectrograph CRIRES at VLT,** J. Paufique, P. Biereichel, B. Delabre, R. Donaldson, E. Fedrigo, European Southern Observatory (Germany); P. Gigan, Observatoire de Paris à Meudon (France); D. Gojak, N. N. Hubin, M. E. Kasper, H. Kaeufl, J. Lizon, S. Oberti, J. Pirard, E. Pozna, J. Santos, S. Stroebele, European Southern Observatory (Germany) ..... [6272-40]

10:50 am: **Results from the GMT ground-layer AO experiment at the Magellan Telescopes,** A. E. Athey, S. A. Shectman, Carnegie Observatories .... [6272-41]

11:10 am: **PYRAMIR: first on-sky results from an infrared pyramid wavefront sensor,** M. Feldt, P. Diethard, S. Hippler, T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); J. Aceituno, Ctr. Astronomico Hispano Aleman (Spain) ..... [6272-42]

Lunch Break ..... 11:30 am to 1:00 pm

Plenary Presentation
Room: Crystal Ballrooms: Salon H ..... Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 12

Room: Crystal Ballrooms: J2 ..... Sat. 8:00 to 10:00 am

Conventional Wavefront Sensors and Concepts

Chair: **Doug Simons**, Gemini Observatory

8:00 am: **Comparison and optimization of centroid algorithms for Shack-Hartmann-based wavefront sensors,** T. Fusco, ONERA (France); S. Thomas, Cerro Tololo Inter-American Observatory (Chile); M. Nicolle, ONERA (France); A. A. Tokovinin, Cerro Tololo Inter-American Observatory (Chile); V. Michau, ONERA (France); G. Rousset, Observatoire de Paris à Meudon (France) [6272-56]

8:20 am: **Laser guide star Shack-Hartman wavefront sensor modeling: matched filtering, wavefront sensor nonlinearity, and impact of sodium layer variability for the Thirty Meter Telescope,** L. Gilles, B. L. Ellerbroek, California Institute of Technology ..... [6272-57]

8:40 am: **The use of maximum-likelihood to enhance the operation of Shack-Hartmann wavefront sensors,** T. D. Farrell, M. N. Devaney, National Univ. of Ireland/Galway (Ireland); H. H. Barrett, The Univ. of Arizona; C. J. Dainty, National Univ. of Ireland/Galway (Ireland) ..... [6272-58]

9:00 am: **Lick Observatory adaptive optics wavefront sensor upgrades,** D. W. Palmer, Lawrence Livermore National Lab.; D. T. Gavel, E. L. Gates, Univ. of California/Santa Cruz ..... [6272-59]

9:20 am: **The design and optimization of detectors for adaptive optics wavefront sensing,** S. M. Adkins, W. M. Keck Observatory; O. Azucena, J. E. Nelson, Univ. of California/Santa Cruz ..... [6272-60]

9:40 am: **Impact of EMCCD technology on AO wavefront sensing accuracy: from theory to practice,** T. Fusco, B. Neichel, C. Petit, J. Montri, J. Conan, V. Michau, ONERA (France); M. D. Downing, N. N. Hubin, European Southern Observatory (Germany) ..... [6272-61]

Coffee Break ..... 10:00 to 10:30 am

SESSION 11

Room: Crystal Ballrooms: J2 . . . . . Sat. 10:30 am to 12:30 pm

Laser Systems, Facilities, and Concepts

Chair: **Sebastian Rabien**,
Max-Planck-Institut für extraterrestrische Physik (Germany)

10:30 am: **20-W and 50-W solid state sodium beacon guide star laser systems for the Keck I and Gemini South Telescopes,** A. K. Hankla, J. Bartholomew, K. Groff, I. Lee, I. T. McKinnie, G. Moule, N. Rogers, A. J. Tracy, P. VanHoudt, Coherent Technologies, Inc.; S. M. Adkins, W. M. Keck Observatory; C. d'Orgeville, Gemini Observatory . . . . . [6272-50]

10:50 am: **The laser guide star facility for the Thirty Meter Telescope,** R. R. Joyce, National Optical Astronomy Observatory; C. Boyer, California Institute of Technology; L. G. Daggert, National Optical Astronomy Observatory; B. L. Ellerbroek, California Institute of Technology; E. A. Hileman, M. R. Hunten, M. Liang, National Optical Astronomy Observatory . . . . . [6272-51]

11:10 am: **Focus errors from tracking sodium layer altitude variations with laser guide star adaptive optics for the Thirty Meter Telescope,** G. Herriot, National Research Council Canada (Canada); P. Hickson, The Univ. of British Columbia (Canada); B. L. Ellerbroek, California Institute of Technology; C. Y. She, Colorado State Univ. . . . . [6272-52]

11:30 am: **A compact modular scalable versatile laser guidestar system architecture for 8-100m telescopes,** A. J. Tracy, J. W. Hobbs, I. T. McKinnie, C. A. Lopez, A. K. Hankla, W. J. Alford, Coherent Technologies, Inc. . . . [6272-53]

11:50 am: **The tilt from its wavelength derivative and ELP-OA,** R. Foy, J. Girard, X. Rondeau, M. Tallon, E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France) . . . . . [6272-54]

12:10 pm: **AFIRE: fiber Raman laser for laser guide star adaptive optics,** D. Bonaccini Calia, W. K. P. Hackenberg, European Southern Observatory (Germany); S. V. Chernikov, IPF Technology (United Kingdom); Y. Feng, L. Taylor, European Southern Observatory (Germany) . . . . . [6272-55]

Lunch Break . . . . . 12:30 to 1:30 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 10

Room: Crystal Ballrooms: J2 . . . . . Sat. 2:35 to 5:00 pm

High Precision Wavefront Control

Chair: **Hideki Takami**,
National Astronomical Observatory of Japan/Subaru Telescope

2:35 pm: **Wavefront control for the Gemini Planet Imager,** L. Poyneer, Lawrence Livermore National Lab. . . . . [6272-44]

2:55 pm: **Comparison of algorithms for ExAO wavefront reconstruction,** G. A. Tyler, J. L. Vaughn, W. Moretti, The Optical Sciences Co.; Q. Yang, C. R. Vogel, Montana State Univ-Bozeman . . . . . [6272-45]

3:15 pm: **Wavefront amplitude and phase correction using pupil-shape diversity,** A. Give'on, J. N. Kasdin, R. J. Vanderbei, Princeton Univ. . . . . [6272-46]

Coffee Break . . . . . 3:35 to 4:00 pm

4:00 pm: **Amplitude and phase-controlled adaptive optics system,** I. V. Pham, Lockheed Martin Corp. . . . . [6272-47]

4:20 pm: **Woofer-tweeter tip-tilt control for NFIRAOS on TMT,** J. Véran, G. Herriot, National Research Council Canada (Canada) . . . . . [6272-48]

4:40 pm: **Nonlinear control for pyramid sensors in adaptive optics,** O. Wulff, D. P. Looze, Univ. of Massachusetts/Amherst . . . . . [6272-49]

SESSION 13

Room: Crystal Ballrooms: J2 . . . . . Sat. 5:00 to 6:20 pm

Multi-Conjugate AO and Control System Lab Tests

Chair: **Michael Lloyd-Hart**, The Univ. of Arizona/Steward Observatory

5:00 pm: **MAD: GLAO and MCAO experimental results,** E. Marchetti, R. Brast, B. Delabre, R. Donaldson, E. Fedrigo, C. Frank, N. N. Hubin, J. Kolb, M. Le Louarn, J. Lizon, S. Oberti, F. Quiros-Pacheco, R. Reiss, J. Santos, S. Tordo, European Southern Observatory (Germany); A. Baruffolo, P. Bagnara, Osservatorio Astronomico di Padova (Italy) . . . . . [6272-62]

5:20 pm: **Laboratory for adaptive optics at UC Santa Cruz: project status and plans,** D. T. Gavel, Univ. of California/Santa Cruz . . . . . [6272-63]

5:40 pm: **The woofer-tweeter experiment,** R. Conan, C. H. Bradley, P. J. Hampton, A. Hilton, B. Wallace, O. Keskin, O. Mead-Robins, J. D. Kennedy, Univ. of Victoria (Canada) . . . . . [6272-64]

6:00 pm: **First laboratory demonstration of Kalman-based optimal control for XAO and closed-loop simplified MCAO,** C. Petit, J. Conan, T. Fusco, J. Montri, ONERA (France); C. Kulcsar, H. Raynaud, Univ. Paris XIII (France); D. Rabaud, Shaktiware (France) . . . . . [6272-65]

Conference presentations will resume Monday 29 May

Monday 29 May

SESSION 14

Room: Crystal Ballrooms: J2 . . . . . Mon. 8:30 to 10:10 am

Analytical Studies

Chair: **Miska Le Louarn**, European Southern Observatory (Germany)

8:30 am: **Task performance in astronomical adaptive optics,** H. H. Barrett, College of Optical Sciences/The Univ. of Arizona; K. J. Myers, U.S. Food and Drug Administration; M. N. Devaney, C. J. Dainty, National Univ. of Ireland/Galway (Ireland) . . . . . [6272-66]

8:50 am: **Influence of telescope diameter on adaptive optics design rules and performance,** J. Conan, B. Neichel, T. Fusco, ONERA (France); E. Gendron, G. Rousset, Observatoire de Paris à Meudon (France) . . . . . [6272-67]

9:10 am: **Strehl ratio and image sharpness for adaptive optics,** J. C. Christou, Univ. of California/Santa Cruz; K. J. Mighell, National Optical Astronomy Observatories; R. B. Makidon, Space Telescope Science Institute . . . . . [6272-68]

9:30 am: **Correctability limitations imposed by spherical-wave scintillation in multi-conjugate adaptive optics,** L. H. Lee, Lockheed Martin Advanced Technology Ctr. . . . . [6272-69]

9:50 am: **Large DM AO systems: synthetic IM or calibration on sky?,** S. Oberti, R. Muradore, European Southern Observatory (Germany); S. Esposito, Osservatorio Astrofisico di Arcetri (Italy); R. Arsenault, E. Fedrigo, M. E. Kasper, J. Kolb, E. Marchetti, F. Quiros-Pacheco, C. Soenke, European Southern Observatory (Germany) . . . . . [6272-70]

Coffee Break . . . . . 10:10 to 10:40 am

SESSION 15

Room: Crystal Ballrooms: J2 . . . . . Mon. 10:40 am to 12:20 pm

MEMS and Deformable Mirror Modeling

Chair: **Norbert N. Hubin**, European Southern Observatory (Germany)

10:40 am: **Characterizing the potential of MEMS deformable mirrors for astronomical adaptive optics,** K. M. Morzinski, Univ. of California/Santa Cruz; B. A. Macintosh, Lawrence Livermore National Lab.; S. A. Severson, Univ. of California/Santa Cruz; J. W. Evans, Lawrence Livermore National Lab.; D. R. Dillon, D. T. Gavel, C. E. Max, Univ. of California/Santa Cruz; D. W. Palmer, Lawrence Livermore National Lab. . . . . [6272-71]

11:00 am: **Electrostatic micro-deformable mirror for adaptive optics,** F. Zamkotsian, A. Liotard, P. Lanzoni, Lab. d'Astrophysique de Marseille (France); V. Conedera, N. Fabre, H. Camon, Lab. d'Analyse et d'Architecture des Systèmes (France) . . . . . [6272-72]

11:20 am: **Modelling and open-loop control of MEMS deformable mirrors,** C. R. Vogel, Q. Yang, Montana State Univ.-Bozeman . . . . . [6272-73]

11:40 am: **A fast high-fidelity model for the deformation of continuous facesheet deformable mirrors,** G. J. Baker, Lockheed Martin Advanced Technology Ctr. . . . . [6272-74]

12:00 pm: **Construction and testing of an adaptive deformable mirror with distributed control,** R. F. M. M. Hamelinck, N. Rosielle, M. Steinbuch, Technische Univ. Eindhoven (Netherlands); R. Ellenbroek, M. H. G. Verhaegen, Technische Univ. Delft (Netherlands); N. J. Doelman, TNO TPD (Netherlands) . . . . . [6272-75]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 16

Room: Crystal Ballrooms: J2 . . . . . Mon. 1:30 to 3:10 pm

Pyramid and Layer-Oriented Wavefront Sensing

Chair: **Roberto Ragazzoni**, Osservatorio Astrofisico di Arcetri (Italy)

1:30 pm: **PYRAMIR: construction and integration of the World's first infrared pyramid sensor,** P. Diethard, S. Hippler, M. Feldt, P. Bizenberger, H. Baumeister, U. Mall, Max-Planck-Institut für Astronomie (Germany); S. Ligori, Osservatorio Astronomico di Torino (Italy); T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany) . . . . . [6272-76]

1:50 pm: **Laboratory testing the layer-oriented wavefront sensor for the multiconjugate adaptive optics demonstrator,** C. Arcidiacono, M. Lombini, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); J. Farinato, R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-77]

2:10 pm: **Two-sided pyramid wavefront sensor in the direct phase mode,** D. W. Phillion, Lawrence Livermore National Lab. . . . . [6272-78]

2:30 pm: **The MCAO wavefront sensing system of LINC-NIRVANA: the multiple FoV layer-oriented concept toward the sky,** J. Farinato, R. Ragazzoni, C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); M. Lombini, Osservatorio Astrofisico di Arcetri (Italy); T. M. Herbst, M. Kuerster, P. Bizenberger, F. R. Briegel, F. De Bonis, S. E. Egner, W. Gaessler, L. Mohr, A. I. Pavlov, R. Rohloff, R. Soci, Max-Planck-Institut für Astronomie (Germany); D. Lorenzetti, F. D'Alessio, G. Li Causi, F. Pedichini, F. Vitali, Osservatorio Astronomico di Roma (Italy) . . . . . [6272-79]

2:50 pm: **SUPY: an infrared pyramid wavefront sensor for Subaru,** M. Feldt, Max-Planck-Institut für Astronomie (Germany); Y. Hayano, H. Takami, T. Usuda, M. Watanabe, National Astronomical Observatory of Japan/Subaru Telescope; M. Iye, National Astronomical Observatory of Japan (Japan); M. Goto, P. Bizenberger, S. Hippler, S. E. Egner, P. Diethard, Max-Planck-Institut für Astronomie (Germany) . . . . . [6272-81]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 17

Room: Crystal Ballrooms: J2 . . . . . Mon. 3:40 to 5:20 pm

High Contrast Imaging Studies

Chair: **Bruce A. Macintosh**, Lawrence Livermore National Lab.

3:40 pm: **Post processing of coronagraphic and differential imaging for direct extrasolar planet detection from the ground,** J. Sauvage, T. Fusco, L. M. Mugnier, ONERA (France); G. Rousset, Observatoire de Paris à Meudon (France) . . . . . [6272-82]

4:00 pm: **Effects of diffraction and static wavefront errors on high-contrast imaging from the Thirty Meter Telescope,** M. Troy, Jet Propulsion Lab.; G. A. Chanan, Univ. of California/Irvine and Thirty Meter Telescope Project; I. Crossfield, P. J. Dumont, J. J. Green, Jet Propulsion Lab.; B. A. Macintosh, Lawrence Livermore National Lab.; M. Shao, Jet Propulsion Lab. . . . . [6272-83]

4:20 pm: **Contrast limits with the simultaneous differential extrasolar Planet Imager (SDI) at the VLT and MMT,** B. A. Biller, L. M. Close, The Univ. of Arizona/Steward Observatory; R. Lenzen, W. Brandner, E. Masciadri, Max-Planck-Institut für Astronomie (Germany); D. W. McCarthy, Jr., The Univ. of Arizona/Steward Observatory; T. F. E. Henning, Max-Planck-Institut für Astronomie (Germany); E. Nielsen, The Univ. of Arizona/Steward Observatory; M. E. Hartung, Max-Planck-Institut für Astronomie (Germany) . . . . . [6272-84]

4:40 pm: **Computationally efficient analytic transformation from the phase psd to the intensity psf,** D. W. Phillion, Lawrence Livermore National Lab. . . . . [6272-85]

5:00 pm: **Effects of atmospheric dispersion on the PSF background level,** M. Owner-Petersen, Lunds Univ. (Sweden) . . . . . [6272-86]

Tuesday 30 May

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy

Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 18

Room: Crystal Ballrooms: J2 . . . . . Tues. 9:35 to 10:35 am

Adaptive Opitcs Programs II

Chair: **Richard M. Myers**, Univ. of Durham (United Kingdom)

9:35 am: **Status progress of AdOpt at TNG and offer to the international astronomical community,** M. Cecconi, A. Ghedina, Istituto Nazionale di Astrofisica (Spain); P. Bagnara, A. Baruffolo, Osservatorio Astronomico di Padova (Italy); W. Gaessler, Max Planck Institute für Astronomie (Germany); G. Cresci, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); J. Farinato, F. Mannucci, Osservatorio Astrofisico di Arcetri (Italy); R. Ragazzoni, Osservatorio Astrofisico di Arcetri-INAF (Italy) . . . . . [6272-87]

9:55 am: **GLAS: engineering a common-user Rayleigh laser guide star for adaptive optics on the William Herschel Telescope,** R. G. Talbot, D. C. Abrams, R. Bassom, M. F. Blanken, D. Cano, A. K. Chopping, K. M. Dee, Isaac Newton Group of Telescopes (Spain); N. A. Dipper, Univ. of Durham (United Kingdom); E. Elswijk, Astron (Netherlands); T. S. Gregory, Isaac Newton Group of Telescopes (Spain); R. ter Horst, Astron (Netherlands); R. A. Humphreys, Univ. of Durham (United Kingdom); P. D. Jolley, Isaac Newton Group of Telescopes (Spain); R. McDermid, Leiden Univ. (Netherlands); T. J. Morris, R. M. Myers, Univ. of Durham (United Kingdom); S. Pico, Isaac Newton Group of Telescopes (Spain); J. H. Pragt, Astron (Netherlands); S. G. Rees, J. Rey, Isaac Newton Group of Telescopes (Spain); M. Reyes, Instituto de Astrofísica de Canarias (Spain); R. G. M. Rutten, Isaac Newton Group of Telescopes (Spain); A. Schoenmaker, Astron (Netherlands); J. Skvarc, Isaac Newton Group of Telescopes (Spain); N. Tromp, Astron (Netherlands); S. M. Tulloch, Isaac Newton Group of Telescopes (Spain); A. Veninga, Astron (Netherlands) . . . . . [6272-88]

10:15 am: **VASAO: visible all sky adaptive optics,** C. Veillet, Canada-France-Hawaii Telescope; R. Foy, Ctr. de Recherche Astronomique de Lyon (France); J. Pique, Univ. Joseph Fourier (France); O. Lai, D. A. Salmon, Canada-France-Hawaii Telescope . . . . . [6272-89]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 19

Room: Crystal Ballrooms: J2 . . . . . Tues. 11:00 am to 12:20 pm

Extreme AO Lab Tests

Chair: **Bruce A. Macintosh**, Lawrence Livermore National Lab.

11:00 am: **The extreme adaptive optics testbed at UCSC: current results and coronographic upgrade,** S. A. Severson, Univ. of California/Santa Cruz; B. J. Bauman, Lawrence Livermore National Lab.; D. R. Dillon, Univ. of California/Santa Cruz; J. W. Evans, Lawrence Livermore National Lab.; D. T. Gavel, Univ. of California/Santa Cruz; B. A. Macintosh, Lawrence Livermore National Lab.; K. M. Morzinski, Univ. of California/Santa Cruz; D. W. Palmer, L. Poyneer, Lawrence Livermore National Lab. . . . . [6272-90]

11:20 am: **Extreme adaptive optics system optimization with the high-order test bench,** E. Vernet-Viard, M. E. Kasper, C. Verinaud, E. Fedrigo, N. N. Hubin, European Southern Observatory (Germany); S. Esposito, E. Pinna, A. T. Puglisi, A. Tozzi, Osservatorio Astrofisico di Arcetri (Italy); A. G. Basden, S. J. Goodsell, G. D. Love, R. M. Myers, Univ. of Durham (United Kingdom) . . . . . [6272-91]

11:40 am: **A laboratory experiment for demonstrating post-coronagraph wavefront sensing and control for extreme adaptive optics,** J. K. Wallace, Jet Propulsion Lab.; R. Samuele, Northrop Grumman Space Technology; R. D. Bartos, G. Vasisht, Jet Propulsion Lab. . . . . [6272-92]

12:00 pm: **Laboratory demonstration of focal plane anti-halo apodization (AHA) techniques,** N. Putnam, J. L. Codona, J. R. P. Angel, The Univ. of Arizona/Steward Observatory . . . . . [6272-93]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 20

Room: Crystal Ballrooms: J2 . . . . . Tues. 1:30 to 3:10 pm

Innovative Deformable Mirror Technologies

Chair: **Armando Riccardi**, Osservatorio Astrofisico di Arcetri (Italy)

1:30 pm: **Deformable nanolaminate optics,** S. S. Olivier, A. P. Papavasiliou, T. W. Barbee, Jr., R. R. Miles, C. C. Walton, Lawrence Livermore National Lab.; K. Chang, M. B. Cohn, MicroAssembly Technologies, Inc. . . . . [6272-94]

1:50 pm: **Nano-engineered ferro-fluid deformable mirrors: a progress report,** S. Thibault, ImmerVision (Canada); D. Brousseau, M. Rioux, S. Senkow, J. Déry, E. F. Borra, A. R. Ritcey, Univ. Laval (Canada) . . . . . [6272-95]

2:10 pm: **Development of a liquid-based deformable mirror,** E. M. Vuelban, N. Bhattacharya, J. J. M. Braat, Technische Univ. Delft (Netherlands) . . . [6272-96]

2:30 pm: **Two new technologies for deformable mirrors,** J. Charton, L. Jocou, R. Douet, Lab. d'Astrophysique de l'Observatoire de Grenoble (France) [6272-97]

2:50 pm: **A carbon fiber composite active mirror: design and testing,** S. Kendrew, A. P. Doel, D. Brooks, A. M. King, Univ. College London (United Kingdom); C. Dorn, R. M. Dwan, G. Dando, QinetiQ Ltd. (United Kingdom); I. M. Richardson, G. Evans, Cobham Composites Ltd. (United Kingdom) [6272-98]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 21

Room: Crystal Ballrooms: J2 . . . . . Tues. 3:40 to 5:40 pm

Wavefront Reconstruction Theory

Chair: **Brent L. Ellerbroek**, California Institute of Technology

3:40 pm: **Wavefront reconstruction algorithms for next-generation adaptive optics systems,** C. Correia, E. Fedrigo, European Southern Observatory (Germany) . . . . . [6272-99]

4:00 pm: **Adaptive optics H2-optimal control design applied on an experimental setup,** K. J. G. Hinnen, Technische Univ. Delft (Netherlands); N. J. Doelman, TNO TPD (Netherlands); M. H. G. Verhaegen, Technische Univ. Delft (Netherlands) . . . . . [6272-100]

4:20 pm: **Fourier-domain algorithm for the fitting step of multiconjugate adaptive optics,** Q. Yang, C. R. Vogel, Montana State Univ.-Bozeman [6272-101]

4:40 pm: **On the use of the fractal preconditioner in a closed-loop adaptive optics system,** C. Béchet, M. Tallon, E. M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France) . . . . . [6272-102]

5:00 pm: **Minimum variance iterative method with fractal preconditioner for wavefront reconstruction on extremely large telescopes,** E. M. Thiébaut, M. Tallon, Ctr. de Recherche Astronomique de Lyon (France) . . . . . [6272-103]

5:20 pm: **Adaptive optics control in wind by image translation,** D. M. Wiberg, D. T. Gavel, L. Johnson, Univ. of California/Santa Cruz . . . . . [6272-104]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

Laser Guide Star and Multi-Conjugate AO Field Tests

✔ **Laser guide star upgrade of Altair at Gemini North,** M. Boccas, G. Arriagada, Gemini Observatory (Chile); M. D. C. Bec, S. Chan, C. D'Orgeville, A. W. Ebbers, K. Grace, B. Irarrazaval, E. James, D. G. O'Connor, F. J. Rigaut, M. P. Sheehan, J. K. White, Gemini Observatory . . . . . [6272-09]

Adaptive Optics Programs I

✔ **Detection atmospheric tip-tilt for lunar laser ranging,** Y. Xiong, National Astronomical Observatories (China) . . . . . [6272-124]

✔ **Enhancements and developments on NAOMI,** M. F. Blanken, C. R. Benn, P. D. Jolley, T. Gregory, Isaac Newton Group of Telescopes (Spain) . [6272-125]

✔ **Low-order AO system in LAMOST,** X. Yuan, X. Cui, G. Liu, Y. Zhang, Y. Qi, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6272-126]

✔ **GLAS: launching Rayleigh lasers from the WHT,** P. D. Jolley, T. S. Gregory, Issac Newton Group of Telescopes (Spain) . . . . . [6272-127]

✔ **Multi-conjugate adaptive optics for ELTs,** E. Meyer, S. A. Kellner, W. Gaessler, Max-Planck-Institut für Astronomie (Germany); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); R. Ragazzoni, J. Farinato, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-128]

✔ **Real-time software for GLAS on WHT,** J. Skvarc, Isaac Newton Group of Telescopes (Spain) . . . . . [6272-129]

Astronomical Results and Performance Characterization

✔ **High-contrast M-band AO imaging: observations and processing techniques from Clio data,** A. N. Heinze, P. M. Hinz, S. Sivanandam, The Univ. of Arizona/Steward Observatory . . . . . [6272-130]

✔ **PSF reconstruction for NAOS-CONICA,** Y. Clenet, Observatoire de Paris à Meudon (France); M. E. Kasper, European Southern Observatory (Germany); E. Gendron, Observatoire de Paris à Meudon (France); D. Gratadour, Gemini Observatory; T. Fusco, ONERA (France); G. Rousset, Observatoire de Paris à Meudon (France); C. Lidman, European Southern Observatory (Chile); S. E. Egner, Max-Planck-Institut für Astronomie (Germany); O. Marco, N. M. Ageorges, European Southern Observatory (Chile) . . . . . [6272-131]

✔ **Precision imaging with adaptive optics aperture masking interferometry at AEOS,** J. P. Lloyd, Cornell Univ.; P. G. Tuthill, The Univ. of Sydney (Australia); F. Martinache, Cornell Univ.; T. A. Ten Brummelaar, N. H. Turner, Georgia State Univ.; H. C. Woodruff, The Univ. of Sydney (Australia) . . . . . [6272-132]

✔ **Real-time real-sky dual-conjugate adaptive optics experiment,** P. A. Knutsson, M. Owner-Petersen, Lunds Univ. (Sweden) . . . . . [6272-133]

✔ **Long-exposure point spread function estimation from Shack-Hartmann adaptive optics loop data: validation and results,** J. Marino, New Jersey Institute of Technology; T. R. Rimmele, National Solar Observatory . [6272-134]

Extreme AO Systems

✔ **Extreme adaptive optics using an off-axis subaperture on a ground-based telescope,** E. Serabyn, Jet Propulsion Lab. . . . . [6272-135]

Real-Time Control Systems

✔ **Testing FPGAs for real-time control of adaptive optics in giant telescopes,** L. F. Rodriguez-Ramos, A. Alonso, J. M. Delgado, F. Gago Rodriguez, J. V. Gigante, G. A. Herrera, M. Reyes, T. Viera, Instituto de Astrofísica de Canarias (Spain) . . . . . [6272-136]

✔ **AdOpt electronics: a flexible hardware and software platform for adaptive optics computing and control,** R. Biasi, M. Andrighettoni, D. Pescoller, Microgate S.r.l. (Italy) . . . . . [6272-137]

✔ **Limitations of high-performance real-time parallel off-the-shelf computers for next-generation AO systems,** T. I. Golota, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6272-138]

✔ **FPGA cluster for high-performance AO real-time control system,** D. Geng, R. M. Myers, A. G. Basden, N. A. Dipper, S. J. Goodsell, C. D. Saunter, Univ. of Durham (United Kingdom) . . . . . [6272-139]

✔ **Configurable system-on-chip solution for low-cost AO real-time control,** D. Geng, C. D. Saunter, A. G. Basden, N. A. Dipper, S. J. Goodsell, R. M. Myers, Univ. of Durham (United Kingdom) . . . . . [6272-140]

Natural Guide Star AO Field Tests

✔ **Application of 1.2-m adaptive optics system for astronomy,** Y. Xiong, National Astronomical Observatories (China) . . . . . [6272-141]

Laser Systems, Facilities, and Concepts

✔ **The EOS high-power solid state sodium guide star laser for AO systems,** C. H. Smith, Y. Gao, EOS Space Systems Pty. Ltd. (Australia) . . . . . [6272-142]

✔ **Second-generation laser traffic control: algorithm changes supporting Mauna Kea, La Palma and future multi-telescope/laser sites,** D. M. Summers, W.M. Keck Observatory; N. Apostolakos, G. Talbot, The Isaac Newton Group of Telescopes (Spain) . . . . . [6272-143]

✔ **Transmission characteristics of high-power 589-nm laser beam in photonic crystal fiber,** M. Ito, Y. Hayano, National Astronomical Observatory of Japan/Subaru Telescope; N. Saito, The Institute of Physical and Chemical Research (Japan); K. Akagawa, Megaopto Co., Ltd. (Japan); M. Kato, The Institute of Physical and Chemical Research (Japan); Y. Saito, National Astronomical Observatory of Japan/Subaru Telescope; A. Takazawa, Megaopto Co., Ltd. (Japan); H. Takami, National Astronomical Observatory of Japan/Subaru Telescope; M. Iye, National Astronomical Observatory of Japan (Japan); S. Wada, The Institute of Physical and Chemical Research (Japan); S. A. Colley, M. C. Dinkins, M. Eldred, T. I. Golota, O. Guyon, M. Hattori, S. Oya, M. Watanabe, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6272-144]

✔ **589-nm sum-frequency generation laser for the LGS/AO of Subaru Telescope,** Y. Saito, Y. Hayano, National Astronomical Observatory of Japan/Subaru Telescope; N. Saito, The Institute of Physical and Chemical Research (Japan); K. Akagawa, Megaopto Co., Ltd. (Japan); M. Kato, The Institute of Physical and Chemical Research (Japan); M. Ito, National Astronomical Observatory of Japan/Subaru Telescope; A. Takazawa, Megaopto Co., Ltd. (Japan); S. A. Colley, M. C. Dinkins, M. Eldred, T. I. Golota, O. Guyon, M. Hattori, S. Oya, M. Watanabe, H. Takami, National Astronomical Observatory of Japan/Subaru Telescope; M. Iye, National Astronomical Observatory of Japan (Japan); S. Wada, The Institute of Physical and Chemical Research (Japan) . . . . . [6272-145]

✔ **The laser guide star facility for Subaru Telescope,** Y. Hayano, Y. Saito, M. Ito, National Astronomical Observatory of Japan/Subaru Telescope; N. Saito, M. Kato, The Institute of Physical and Chemical Research (Japan); K. Akagawa, A. Takazawa, Megaopto Co., Ltd. (Japan); S. A. Colley, M. C. Dinkins, M. Eldred, T. I. Golota, O. Guyon, M. Hattori, S. Oya, M. Watanabe, H. Takami, National Astronomical Observatory of Japan/Subaru Telescope; S. Wada, Megaopto Co., Ltd. (Japan); M. Iye, National Astronomical Observatory of Japan (Japan) . . . . . [6272-146]

✔ **The Rayleigh technical demonstrator: a novel concepts platform,** N. A. Bharmal, Univ. of Durham (United Kingdom); D. Bonaccini Calia, European Southern Observatory (Germany); T. Butterley, C. N. Dunlop, S. J. Goodsell, Univ. of Durham (United Kingdom); R. Holzlöhner, European Southern Observatory (Germany); T. J. Morris, R. M. Myers, Univ. of Durham (United Kingdom) . . . . . [6272-147]

✔ **589-nm Na D2-line generation via frequency doubling of a Raman fiber amplifier: as source for LGS-assisted AO,** L. R. Taylor, Y. Feng, W. K. P. Hackenberg, D. Bonaccini Calia, European Southern Observatory (Germany); J. Chovan, International Laser Ctr. (Slovak Republic) . . . [6272-148]

✔ **Design of a narrow-band 589-nm laser by direct Raman shift in single-mode fiber,** Y. Feng, D. Bonaccini Calia, W. K. P. Hackenberg, European Southern Observatory (Germany); S. V. Chernikov, IPF Technology (United Kingdom) . . . . . [6272-149]

✔ **Ultra-low loss hollow-core photonic crystal fibers at 589-nm for LGS-assisted AO,** R. Holzlöhner, European Southern Observatory (Germany); B. J. Mangan, Technical Univ. of Denmark (Denmark); D. Bonaccini Calia, W. K. P. Hackenberg, European Southern Observatory (Germany) . . [6272-150]

✔ **First results from LGS-AO operation of the ESO NACO and SINFONI systems,** M. E. Kasper, S. Stroebele, D. Bonaccini Calia, European Southern Observatory (Germany); R. I. Davies, Max-Planck-Institut für extraterrestrische Physik (Germany); E. Fedrigo, W. K. P. Hackenberg, C. Soenke, European Southern Observatory (Germany); S. Rabien, Max-Planck-Institut für extraterrestrische Physik (Germany); R. Donaldson, European Southern Observatory (Germany); T. Ott, Max-Planck-Institut für extraterrestrische Physik (Germany); G. Zins, Lab d'Astrophysique de l'Observatoire de Grenoble (France); N. N. Hubin, European Southern Observatory (Germany); H. Bonnet, European Southern Observatory (Chile); J. Lizon, European Southern Observatory (Germany); N. M. Ageorges, European Southern Observatory (Chile) . . . . . [6272-151]

✔ **Resonant electro-optical modulator for high laser-power single-mode fiber relay,** W. K. P. Hackenberg, European Southern Observatory (Germany); M. Zaehringer, Kayser-Threde GmbH (Germany); A. Silber, European Southern Observatory (Germany) . . . . . [6272-152]

✔ **Laser guide star projection for large telescopes,** E. N. Ribak, Technion - Israel Institute of Technology (Israel) . . . . . [6272-201]

Wavefront Sensors and Detectors

✔ **New micro-lithography techniques for the manufacture of wavefront sensors for the FALCON concept,** F. Chemla, E. Gendron, Observatoire de Paris à Meudon (France) . . . . . [6272-153]

✔ **MCP-Medipix2 hybrid detector for AO wavefront sensors,** J. V. Vallerga, J. B. McPhate, O. H. W. Siegmund, Univ. of California/Berkeley; B. Mikulec, A. G. Clark, Univ. de Genève (Switzerland) . . . . . [6272-154]

✔ **High-speed single optical photon counting,** L. Strüder, G. Lutz, Max-Planck-Institut für extraterrestrische Physik (Germany); P. Holl, PNSensor GmbH (Germany); R. Hartmann, N. Meidinger, H. Soltau, R. H. Richter, Max-Planck-Institut für extraterrestrische Physik (Germany); R. Eckardt, K. Heinzinger, PNSensor GmbH (Germany); M. Schnecke, G. Schaller, Max-Planck-Institut für extraterrestrische Physik (Germany); C. Koitsch, PNSensor GmbH (Germany); F. Schopper, G. Kanbach, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6272-155]

Multi-Conjugate AO and Control System Lab. Tests

✔ **PSF reconstruction from 2 DMs woofer-tweeter adaptive optics bench,** O. Keskin, R. Conan, C. H. Bradley, Univ. of Victoria (Canada) . . . . . [6272-156]

✔ **Scientific goals for the MMT's multi-laser-guided adaptive optics,** M. Lloyd-Hart, T. E. Stalcup, Jr., The Univ. of Arizona/Steward Observatory; C. J. Baranec, College of Optical Sciences/The Univ. of Arizona; N. M. Milton, M. Snyder, J. R. P. Angel, M. J. Rademacher, P. M. Hinz, The Univ. of Arizona/Steward Observatory . . . . . [6272-157]

Analytical Studies

✔ **Spatial frequency-domain modeling of adaptive optics compensation of primary mirror misalignment and figure errors for the Thirty Meter Telescope,** B. L. Ellerbroek, L. Gilles, California Institute of Technology . . . . . [6272-158]

✔ **Comparison of tip-tilt controllers for laser guide star adaptive optics,** D. P. Looze, Univ. of Massachusetts/Amherst; M. A. van Dam, W.M. Keck Observatory . . . . . [6272-159]

✔ **Constraining the GLAO parameter space with turbulence profile statistics,** J. A. Stoesz, National Research Council Canada (Canada) . . . . . [6272-160]

✔ **Evaluation of ground-layer adaptive optics for the wide-field optical spectrograph on the TMT,** J. A. Stoesz, S. C. Roberts, National Research Council Canada (Canada); B. L. Ellerbroek, M. C. Britton, California Institute of Technology . . . . . [6272-161]

MEMS and Deformable Mirror Modeling

✔ **Fitting error analysis for the VLT deformable secondary mirror,** A. Riccardi, M. Xompero, L. Busoni, Osservatorio Astrofisico di Arcetri (Italy) . . . [6272-162]

Pyramid and Layer-Oriented Wavefront Sensing

✔ **Integration, testing, and laboratory characterization of the mid-high layer wavefront sensor for LINC-NIRVANA,** M. Lombini, Osservatorio Astrofisico di Arcetri (Italy) and Osservatorio Astronomico di Bologna (Italy); I. Foppiani, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); J. Farinato, R. Ragazzoni, Osservatorio Astrofisico di Arcetri (Italy); G. Bregoli, C. Ciattaglia, Osservatorio Astronomico di Bologna (Italy); G. Cosentino, Univ. degli Studi di Bologna (Italy); G. Innocenti, Osservatorio Astronomico di Bologna (Italy); F. De Bonis, S. E. Egner, W. Gaessler, T. M. Herbst, M. Kuester, J. Schmidt, R. Soci, Max-Planck-Institut für Astronomie (Germany); C. Arcidiacono, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-80]

✔ **Pyramid based low-order wavefront sensors for laser guide star adaptive optics systems,** V. Velur, California Institute of Technology . . . . . [6272-164]

✔ **Pyramid wavefront sensing: theory and component technology development at LAO,** J. A. Johnson, D. T. Gavel, R. Kupke, Univ. of California/Santa Cruz; B. J. Bauman, Lawrence Livermore National Lab. . . . . [6272-165]

Adaptive Optics Programs II

✔ **Performance of deformable mirror for Subaru LGSAO system,** S. Oya, A. Bouvier, O. Guyon, M. Watanabe, Y. Hayano, H. Takami, National Astronomical Observatory of Japan/Subaru Telescope; M. Iye, National Astronomical Observatory of Japan (Japan); S. A. Colley, M. C. Dinkins, M. Eldred, T. I. Golota, M. Hattori, M. Itoh, Y. Saito, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6272-166]

✔ **An application of AO to x-ray imaging,** M. Tsujimoto, S. Kitamoto, Y. Ohkubo, A. Sekiguchi, J. Sato, Rikkyo Univ. (Japan) . . . . . [6272-167]

✔ **Laser guide star multi-conjugate adaptive optics performance of the Thirty Meter Telescope with elongated beacons and matched filtering,** L. Gilles, B. L. Ellerbroek, California Institute of Technology; J. Veran, National Research Council Canada (Canada) . . . . . [6272-169]

✔ **A MEMs-based speckle spectrometer,** A. I. Sheinis, L. Nigra, Univ. of Wisconsin/Madison; M. Kuhlen, Univ. of California/Santa Cruz . . . . [6272-171]

AO Lab. Tests

✔ **A reflective Gaussian coronagraph for ExAO: laboratory performance,** R. Park, L. M. Close, N. Siegler, T. E. Stalcup, Jr., The Univ. of Arizona . . . . . [6272-172]

✔ **HORATIO: the Leiden high-order adaptive optics testbed,** R. Stuik, B. R. Brandl, P. Hallibert, A. Quirrenbach, R. Vink, Leiden Univ. (Netherlands) . . . . . [6272-173]

✔ **MANU-CHAO: a laboratory ground-layer adaptive optics experiment,** S. E. Egner, W. Gaessler, Max-Planck-Institut für Astronomie (Germany); R. Ragazzoni, B. Le Roux, J. Farinato, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astrofisico di Bologna (Italy); C. Arcidiacono, M. Lombini, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-174]

Innovative Deformable Mirror Technologies

✔ **Selecting the electromagnetical actuator of the ELT primary mirror,** C. Del Vecchio, Osservatorio Astrofisico di Arcetri (Italy); F. Marignetti, Univ. degli Studi di Cassino (Italy) . . . . . [6272-176]

✔ **Active polishing of a 2-mm thin shell for large adaptive secondary mirrors,** E. Hugot, M. Ferrari, Lab. d'Astrophysique de Marseille (France); D. Fappani, Société Européenne de Systèmes Optiques (France) . . . . . [6272-177]

✔ **Optical figuring specifications for thin shells to be used in adaptive telescope mirrors,** A. Riccardi, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-178]

✔ **Adaptive secondary mirrors for LBT: first unit preliminary characterization,** R. Biasi, Microgate S.r.l. (Italy); D. Gallieni, ADS International s.r.l. (Italy); A. Riccardi, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-179]

✔ **Thermal deformable mirror,** C. A. Caicedo, Adaptive Optics Associates, Inc. . . . . [6272-202]

Wavefront Reconstruction Theory

✔ **Analysis of post-coronagraph wavefront sensing and correction for the proposed TMT Planet Formation Imager,** G. Vasisht, J. C. Shelton, M. Shao, M. Troy, B. M. Levine, J. K. Wallace, Jet Propulsion Lab. . . . . [6272-180]

✔ **Full wave front reconstruction in the Fourier domain,** E. N. Ribak, Y. Carmon, A. Talmi, O. Glaser, Technion - Israel Institute of Technology (Israel) . . . . . [6272-200]

Turbulence, Anisoplanatism, and Sky Coverage

✔ **The MPIA multipurpose laboratory atmospheric turbulence simulator,** S. Hippler, W. Brandner, D. J. Butler, S. E. Egner, T. F. E. Henning, F. Hormuth, Max-Planck-Institut für Astronomie (Germany) . . . . . [6272-181]

✔ **Beyond conventional use of the generalized SCIDAR,** S. E. Egner, E. Masciadri, Max-Planck-Institut für Astronomie (Germany); D. L. McKenna, The Univ. of Arizona/Steward Observatory . . . . . [6272-182]

✔ **SCIDAR measurements on Mt. Graham: recent results,** S. E. Egner, E. Masciadri, Max-Planck-Institut für Astronomie (Germany); D. L. McKenna, The Univ. of Arizona/Steward Observatory; T. M. Herbst, Max-Planck-Institut für Astronomie (Germany) . . . . . [6272-183]

✔ **Full characterization of the turbulence generator MAPS for MCAO,** J. Kolb, S. Oberti, E. Marchetti, European Southern Observatory (Germany) [6272-184]

Simulation Studies and Tools

✔ **Adaptive wavelets applied to multi-conjugate AO for ELT,** K. J. Jones, Rice Univ. . . . . [6272-185]

✔ **Simulations of ground-layer adaptive optics for extremely large telescopes,** V. A. Korkiakoski, M. Le Louarn, F. Quiros, C. Verinaud, European Southern Observatory (Germany) . . . . . [6272-186]

✔ **Modeling a GLAO system for the Gemini Observatory,** D. R. Andersen, D. Crampton, K. Szeto, National Research Council Canada (Canada); S. L. Morris, Univ. of Durham (United Kingdom); M. Lloyd-Hart, The Univ. of Arizona/Steward Observatory; R. M. Myers, Univ. of Durham (United Kingdom); J. A. Stoesz, National Research Council Canada (Canada); T. Butterley, Univ. of Durham (United Kingdom); N. M. Milton, The Univ. of Arizona/Steward Observatory; R. W. Wilson, Univ. of Durham (United Kingdom); J. Veran, National Research Council Canada (Canada) . . . . . [6272-187]

Innovative Wavefront Sensing Concepts

✔ **Multiple guide star unit: Palomar's tomograph,** V. Velur, California Institute of Technology . . . . . [6272-188]

✔ **Interferometric wavefront sensors for extreme adaptive optics on the Thirty Meter Telescope,** K. L. Baker, B. A. Macintosh, D. W. Phillion, B. J. Bauman, L. Poyneer, Lawrence Livermore National Lab. . . . . [6272-189]

✔ **Multi-inverse bessel beams: wavefront sensing with sodium LGS at ELTs,** S. A. Kellner, Max-Planck-Institut für Astronomie (Germany); R. Ragazzopni, Osservatorio Astrofisico di Arcetri (Italy); E. Diolaiti, Osservatorio Astronomico di Bologna (Italy); W. Gaessler, Max-Planck-Institut für Astronomie (Germany); J. Farinato, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-190]

✔ **Measurements of phase and amplitude aberrations of the wavefront in a shaped pupil coronagraph,** R. Belikov, A. Give'on, L. A. Pueyo, M. A. Carr, J. N. Kasdin, Princeton Univ. . . . . [6272-191]

Calibration and Control Topics

✔ **Implementation of modal optimization system of Subaru-188 adaptive optics,** M. Hattori, T. I. Golota, O. Guyon, M. C. Dinkins, S. Oya, S. A. Colley, M. Eldred, M. Watanabe, M. Itoh, Y. Saito, Y. Hayano, H. Takami, National Astronomical Observatory of Japan/Subaru Telescope; M. Iye, National Astronomical Observatory of Japan (Japan) . . . . . [6272-192]

✔ **LQ control design for adaptive optics systems based on MIMO identified model,** R. Muradore, E. Fedrigo, European Southern Observatory (Germany) . . . . . [6272-193]

✔ **Modified correlation tracking algorithm for tip-tilt correction system and project ANGARA on the Big Solar Vacuum Telescope,** P. A. Konyaev, V. P. Lukin, O. Emallev, N. N. Botugina, Institute of Atmospheric Optics (Russia); V. Grigir'ev, Insitute of Solar-Terrestrial Physics (Russia); P. G. Kovadlo, Institute of Solar-Terrestrial Physics (Russia); V. Lavrinov, A. Leonid, Institute of Atmospheric Optics (Russia) . . . . . [6272-194]

Wednesday 31 May

SESSION 22

Room: Crystal Ballrooms: J2 . . . . . Wed. 8:00 to 10:00 am

Turbulence, Anisoplanatism, and Sky Coverage

Chair: **Miska Le Louarn**, European Southern Observatory (Germany)

8:00 am: **The effect of temporal fluctuations in r0 on AO performance,** R. N. Tubbs, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-105]

8:20 am: **Time-varying stochastic turbulence model,** C. R. Vogel, Montana State Univ.-Bozeman . . . . . [6272-112]

8:40 am: **Simulation of anisoplanatism of adaptive optical system in inhomogeneous turbulent atmosphere,** M. Moradi, M.V. Lomonosov Moscow State Univ. (Russia) . . . . . [6272-113]

9:00 am: **Angular anisoplanatic error in laser guide star adaptive optics,** M. A. van Dam, W.M. Keck Observatory . . . . . [6272-106]

9:20 am: **Sky coverage and tip/tilt error analysis for the Thirty Meter Telescope,** R. M. Clare, B. L. Ellerbroek, California Institute of Technology; D. R. Andersen, G. Herriot, J. Veran, National Research Council Canada (Canada) . . . . . [6272-107]

9:40 am: **Wide-field self-referenced AO observations at Palomar,** M. C. Britton, California Institute of Technology . . . . . [6272-108]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 23

Room: Crystal Ballrooms: J2 . . . . . Wed. 10:30 am to 12:30 pm

Simulation Studies and Tools

Chair: **Curtis R. Vogel**, Montana State Univ.-Bozeman

10:30 am: **Simulation of AO systems for OWL,** M. Le Louarn, C. Verinaud, V. Korkiakoski, N. N. Hubin, E. Marchetti, European Southern Observatory (Germany) . . . . . [6272-109]

10:50 am: **Multi-conjugate adaptive optics performance comparison of wavefront reconstruction and fitting algorithms for the Thirty Meter Telescope: MGPCG, FDPCG, and order-N tomography,** L. Gilles, B. L. Ellerbroek, California Institute of Technology; Q. Yang, C. R. Vogel, Montana State Univ.-Bozeman; A. J. Ahmadia, Columbia Univ.; G. A. Tyler, J. L. Vaughn, The Optical Sciences Co. . . . . [6272-110]

11:10 am: **Performance predictions of the GLAS Rayleigh laser guide star adaptive optics system for the 4.2-m William Herschel Telescope,** T. J. Morris, R. W. Wilson, R. M. Myers, T. Butterley, Univ. of Durham (United Kingdom); R. G. M. Rutten, G. Talbot, Isaac Newton Group of Telescopes (Spain) [6272-111]

11:30 am: **Digital versus analog comparison of adaptive optics systems,** D. P. Looze, Univ. of Massachusetts/Amherst . . . . . [6272-198]

11:50 am: **Acceleration of AO simulation using programmable logic,** A. G. Basden, R. W. Wilson, Univ. of Durham (United Kingdom) . . . . . [6272-114]

12:10 pm: **Sparse-aperture adaptive optics,** P. G. Tuthill, The Univ. of Sydney (Australia); J. P. Lloyd, Cornell Univ.; J. D. Monnier, Univ. of Michigan; F. Martinache, Cornell Univ.; M. J. Ireland, California Institute of Technology; H. C. Woodruff, The Univ. of Sydney (Australia); T. A. ten Brummelaar, N. H. Turner, Georgia State Univ./The CHARA Array; C. H. Townes, Univ. of California/Berkeley . . . . . [6272-199]

Lunch Break . . . . . 12:30 to 1:30 pm

SESSION 24

Room: Crystal Ballrooms: J2 . . . . . Wed. 1:30 to 4:10 pm

Innovative Wavefront Sensing Concepts

Chair: **Domenico Bonaccini Calia**, European Southern Observatory (Germany)

1:30 pm: **Whack-a-speckle: focal plane wavefront sensing in theory and practice with a deformable secondary mirror and 5-micron camera,** M. A. Kenworthy, P. M. Hinz, J. R. P. Angel, A. N. Heinze, S. Sivanandam, The Univ. of Arizona/Steward Observatory . . . . . [6272-115]

1:50 pm: **High-contrast imaging with focal plane wavefront sensing for ground-based telescopes,** O. Guyon, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6272-116]

2:10 pm: **Polychromatic laser guide star using a single laser at 330 nm,** J-P Pique, I Moldovan, V. Fesquet, H. Guillet de Chatellus, Univ. Joseph Fourier (France) . . . . . [6272-203]

2:30 pm: **Fast holographic wavefront sensor: sensing without computing,** G. P. Andersen, U.S. Air Force Academy . . . . . [6272-118]

2:50 pm: **Wavefront sensing by multi-wavelenghts phase diversity,** X. Rondeau, E. M. Thiébaut, M. Tallon, R. Foy, Ctr. de Recherche Astronomique de Lyon (France) . . . . . [6272-119]

Coffee Break . . . . . 3:10 to 3:30 pm

3:30 pm: **Scalable analog wavefront sensor with subpixel resolution,** M. J. Wilcox, U.S. Air Force Academy and Hyperacuity Systems . . . . . [6272-120]

3:50 pm: **Laser interferometry guided adaptive optics for large telescopes,** S. Rabien, R. I. Davies, F. Eisenhauer, R. Genzel, T. Ott, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6272-197]

SESSION 25

Room: Crystal Ballrooms: J2 . . . . . Wed. 4:10 to 5:10 pm

Calibration and Control Topics

Chair: **Mitchell Troy**, Jet Propulsion Lab.

4:10 pm: **High-SNR measurement of interaction matrix on-sky and in lab,** S. Esposito, Osservatorio Astrofisico di Arcetri (Italy); S. Oberti, European Southern Observatory (Germany); A. T. Puglisi, E. Pinna, A. Tozzi, R. N. Tubbs, A. Riccardi, M. Xompero, D. Zanotti, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6272-121]

4:30 pm: **Eliminating the static aberrations in an MCAO system,** J. Kolb, European Southern Observatory (Germany) . . . . . [6272-122]

4:50 pm: **Distributed control in adaptive optics: DM and atmospheric turbulence modeling,** R. Ellenbroek, M. H. G. Verhaegen, Technische Univ. Delft (Netherlands); R. F. M. M. Hamelinck, Technische Univ. Eindhoven (Netherlands); N. J. Doelman, TNO TPD (Netherlands) . . . . . [6272-123]

Wednesday-Wednesday 24-31 May 2006 • Proceedings of SPIE Vol. 6273

Conference Chairs:
Eli Atad-Ettedgui, UK Astronomy Technology Ctr. (United Kingdom)

Joseph Antebi, Simpson Gumpertz & Heger Inc.

Dietrich Lemke, Max-Planck-Institut für Astronomie (Germany)

Optomechanical Technologies for Astronomy

Wednesday 24 May

SESSION 1

Room: Crystal Ballrooms: A, B . . . . . Wed. 10:00 am to 12:00 pm

Optical Fabrication for Large Telescopes I

Chair: **Eli Atad-Ettedgui**,
UK Astronomy Technology Ctr. (United Kingdom)

10:00 am: **Review of Corning's capabilities around ULE blank manufacturing for an extremely large telescope,** R. R. VanBrocklin, M. J. Edwards, B. J. Wells, Corning Inc. . . . . [6273-01]

10:20 am: **Comparison of Corning 7972 ULE® material to other mirror materials for segmented and large monolithic mirror blanks,** R. Sabia, M. J. Edwards, R. R. VanBrocklin, B. J. Wells, Corning Inc. . . . . [6273-02]

10:40 am: **Cesic for extreme large telescopes,** M. R. Krödel, J. Lichtscheindl, ECM GmbH (Germany) . . . . . [6273-03]

11:00 am: **Current manufacturing capabilities at GE energy for opto-mechanical applications,** J. Boy, General Electric Co. . . . . [6273-04]

11:20 am: **Homogeneity of the linear thermal expansion coefficient of ZERODUR® measured with improved accuracy,** R. Jedamzik, R. Müller, P. Hartmann, SCHOTT AG (Germany) . . . . . [6273-05]

11:40 am: **Gran Telescopio Canarias optics manufacturing: final report,** R. Geyl, SAGEM SA (France) . . . . . [6273-06]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm
Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment
Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 2

Room: Crystal Ballrooms: A, B . . . . . Wed. 2:15 to 3:35 pm

Optical Fabrication for Large Telescopes II

Chair: **Daniel R. Blanco**,
Association of Universities for Research in Astronomy

2:15 pm: **Wheel wear and surface/subsurface qualities with precision grinding optical materials,** P. R. Shore, X. P. Tonnellier, X. Luo, D. J. Stephenson, Cranfield Univ. (United Kingdom); R. Evans, Optic Technium (United Kingdom); D. D. Walker, Univ. College London (United Kingdom) . . . . . [6273-07]

2:35 pm: **Automated optical fabrication: first results from the new precessions 1.2m CNC polishing machine,** D. D. Walker, Univ. College London (United Kingdom) and Zeeko Ltd. (United Kingdom); R. R. Freeman, G. McCavana, R. Morton, D. Riley, V. Doubrovski, X. Wei, Zeeko Ltd. (United Kingdom); R. Evans, G. Yu, Optic Technium (United Kingdom); A. T. H. Beaucamp, Zeeko Ltd. (United Kingdom); C. R. Dunn, D. Brooks, A. M. King, Univ. College London (United Kingdom) . . . . . [6273-08]

2:55 pm: **A new reactive atom plasma technology (RAPT) for precision machining: the etching of ULE optical surfaces,** C. Fanara, P. R. Shore, J. R. Nicholls, Cranfield Univ. (United Kingdom); N. Lyford, P. R. Sommer, P. Fiske, RAPT Industries Inc. . . . . [6273-09]

3:15 pm: **Rapid damage-free shaping of silicon carbide using reactive atom plasma (RAP) processing,** A. Chang, Y. Verma, J. Kelley, N. Lyford, P. R. Sommer, D. Proscia, K. Futtere, G. J. Gardopee, J. Lee, T. Kyler, J. W. Berrett, RAPT Industries Inc. . . . . [6273-10]

Coffee Break . . . . . 3:35 to 4:00 pm

SESSION 3

Room: Crystal Ballrooms: A, B . . . . . Wed. 4:00 to 5:40 pm

Optical Fabrication for Large Telescopes III

Chair: **Peter Hartmann**, SCHOTT AG (Germany)

4:00 pm: **Manufacture of the second 8.4m primary mirror for the Large Binocular Telescope,** H. M. Martin, R. G. Allen, B. Cuerden, D. A. Ketelsen, S. D. Miller, The Univ. of Arizona/Steward Observatory; J. M. Sasian, College of Optical Sciences/The Univ. of Arizona; M. T. Tuell, S. H. Warner, The Univ. of Arizona/Steward Observatory . . . . . [6273-105]

4:20 pm: **Method of stressed lap shape control for large mirror fabrication,** Y. Zheng, Y. Li, D. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-12]

4:40 pm: **Design and manufacture of 8.4m primary mirror segments and supports for the GMT,** H. M. Martin, J. R. P. Angel, The Univ. of Arizona/Steward Observatory; J. H. Burge, College of Optical Sciences/The Univ. of Arizona; B. Cuerden, W. B. Davison, J. S. Kingsley, L. B. Kot, S. D. Miller, P. A. Strittmatter, The Univ. of Arizona/Steward Observatory; C. Zhao, College of Optical Sciences/ The Univ. of Arizona . . . . . [6273-13]

5:00 pm: **Manufacturing and testing the Gemini secondary mirror #3,** R. Geyl, SAGEM SA (France) . . . . . [6273-15]

5:20 pm: **Manufacture of a 1.7-m prototype of the GMT primary mirror segments,** H. M. Martin, The Univ. of Arizona/Steward Observatory; J. H. Burge, College of Optical Sciences/The Univ. of Arizona; S. D. Miller, B. K. Smith, The Univ. of Arizona/Steward Observatory; R. Zehnder, C. Zhao, College of Optical Sciences/The Univ. of Arizona . . . . . [6273-16]

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am
The Central Black Hole and Nuclear Star Cluster of the Galaxy
Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 4

Room: Crystal Ballrooms: A, B . . . . . Thurs. 9:35 to 10:35 am

Optical Fabrication for Large Telescopes IV

Chair: **Christopher V. White**, Jet Propulsion Lab.

9:35 am: **Large optical glass lenses for ELTs,** P. Hartmann, R. Jedamzik, SCHOTT AG (Germany) . . . . . [6273-17]

9:55 am: **Corning: supplier of multiple optical materials for telescope projects,** R. R. VanBrocklin, D. W. Navan, K. McLean, B. J. Wells, Corning Inc. . . . . [6273-18]

10:15 am: **LSST primary/tertiary monolithic mirror design,** V. L. Krabbendam, National Optical Astronomy Observatory; J. H. Burge, College of Optical Sciences/The Univ. of Arizona; C. F. Claver, National Optical Astronomy Observatory; B. Cuerden, W. B. Davison, The Univ. of Arizona/Steward Observatory; W. J. Gressler, National Optical Astronomy Observatory; J. S. Kingsley, H. M. Martin, The Univ. of Arizona/Steward Observatory; D. R. Neill, National Optical Astronomy Observatory; M. H. Rascon, The Univ. of Arizona/Steward Observatory; J. Sebag, National Optical Astronomy Observatory . . . . . [6273-19]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 5

Room: Crystal Ballrooms: A, B . . . . . Thurs. 11:00 am to 12:20 pm

Optical Testing and Metrology for Large Telescopes

Chair: **Eli Atad-Ettedgui**,
The Royal Observatory Edinburgh (United Kingdom)

11:00 am: **Photon sieve null corrector,** G. P. Andersen, U.S. Air Force Academy . . . . . [6273-20]

11:20 am: **Cost-effective, subaperture approaches to finishing and testing astronomical optics,** M. Tricard, A. b. Shorey, R. W. Hallock, P. E. Murphy, QED Technologies Inc. . . . . [6273-21]

11:40 am: **Design and analysis for interferometric testing of the GMT primary mirror segments,** J. H. Burge, College of Optical Sciences/The Univ. of Arizona; L. B. Kot, H. M. Martin, The Univ. of Arizona/Steward Observatory; C. Zhao, R. Zehnder, College of Optical Sciences/The Univ. of Arizona . . . . . [6273-22]

12:00 pm: **LSST wavefront sensing and alignment system,** C. F. Claver, W. J. Gressler, V. L. Krabbendam, National Optical Astronomy Observatory; S. S. Olivier, D. W. Phillion, L. G. Seppala, Lawrence Livermore National Lab.; R. S. Upton, National Optical Astronomy Observatory . . . . . [6273-23]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 6

Room: Crystal Ballrooms: A, B . . . . . Thurs. 1:30 to 3:10 pm

Optical Fabrication for Large Telescopes V

Chair: **V. Alfonso Feria**, Jet Propulsion Lab.

1:30 pm: **Nanoengineered parabolic liquid mirrors,** E. F. Borra, G. Gagné, L. Faucher, A. R. Ritcey, Univ. Laval (Canada) . . . . . [6273-24]

1:50 pm: **CFRP panel concept design study for the CCAT,** R. N. Martin, R. C. Romeo, Composite Mirror Applications; J. S. Kingsley, The Univ. of Arizona/Steward Observatory . . . . . [6273-25]

2:10 pm: **Manufacturing report of CESIC optics for the Gregor Telescope,** M. R. Krödel, ECM GmbH (Germany); R. Volkmer, Kiepenheuer Institut für Sonnenphysik (Germany); G. Luichtel, Carl Zeiss Laser Optics GmbH (Germany) . . . . . [6273-26]

2:30 pm: **Development of lightweight, stiff, stable, replicated glass mirrors for the Cornell Caltech Atacama Telescope (CCAT),** D. N. Strafford, S. M. DeSmitt, P. T. Kupinski, ITT Industries; T. A. Sebring, Cornell Univ. . . . . [6273-27]

2:50 pm: **Meter-class, lightweight, CFRP composite mirrors for the ULTRA Telescope,** R. C. Romeo, R. N. Martin, Composite Mirror Applications . [6273-28]

Coffee Break . . . . . 3:10 to 3:40 pm

SESSION 7

Room: Crystal Ballrooms: A, B . . . . . Thurs. 3:40 to 5:40 pm

Optical Fabrication for Large Telescopes VI

Chair: **Eli Atad-Ettedgui**,
The Royal Observatory Edinburgh (United Kingdom)

3:40 pm: **The aluminizing system for the 8.4-meter diameter LBT primary mirrors,** B. Atwood, D. P. Pappalardo, T. P. O'Brien, The Ohio State Univ.; J. M. Hill, The Univ. of Arizona; J. A. Mason, R. Belville, D. P. Steinbrecher, D. F. Brewer, E. J. Teiga, The Ohio State Univ.; B. A. Sabol, New Mexico Institute of Mining and Technology; J. Howard, Arizona State Univ.; L. Miglietta, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6273-29]

4:00 pm: **The technical challenge of large ELT filters,** T. Doehring, K. Loosen, P. Hartmann, SCHOTT AG (Germany) . . . . . [6273-30]

4:20 pm: **Lightweight isothermal high thermal inertia aluminum mirror,** L. G. Fantano, S. M. Irish, R. G. Ohl IV, NASA Goddard Space Flight Ctr.; T. R. Knowles, Energy Science Labs., Inc. . . . . [6273-31]

4:40 pm: **LSST reflective coating development,** J. Sebag, V. L. Krabbendam, G. A. Poczulp, D. R. Neill, National Optical Astronomy Observatory . . . . [6273-32]

5:00 pm: **LSST camera optics,** S. S. Olivier, L. G. Seppala, Lawrence Livermore National Lab.; D. K. Gilmore, Stanford Linear Accelerator Ctr.; L. C. Hale, W. T. Whistler, Lawrence Livermore National Lab. . . . . [6273-33]

5:20 pm: **New type immersion grating, VPH grating and quasi-Bragg grating,** N. Ebizuka, The Institute of Physical and Chemical Research (Japan) . [6273-110]

Friday 26 May

SESSION 8

Room: Crystal Ballrooms: A, B . . . . . Fri. 8:00 to 10:00 am

Telescope Structures, Drives, and Enclosures I

Chair: **Joseph Antebi**, Simpson Gumpertz & Heger Inc.

8:00 am: **CFRP structure for the LBT instrument LINC-NIRVANA,** R. Rohloff, N. Münch, A. Böhm, Max-Planck-Institut für Astronomie (Germany); W. Schlossmacher, Ingenieurbüro Schlossmacher (Germany); C. Schöppinger, H. Neugeboren, H. Wittke, H. Wichmann, INVENT GmbH (Germany) . . . [6273-35]

8:20 am: **CFRP lightweight structures for extremely large telescopes,** N. C. Jessen, H. U. Nørgaard-Nielsen, Danish National Space Ctr. (Denmark); J. Schroll, xperion GmbH (Denmark) . . . . . [6273-36]

8:40 am: **CFRP composite optical telescope assembly for the 1m ULTRA project,** R. N. Martin, R. C. Romeo, Composite Mirror Applications . . . . [6273-37]

9:00 am: **Safety factors for composite and joint design in astronomical telescopes,** J. Cheng, National Radio Astronomy Observatory . . . . . [6273-38]

9:20 am: **Design optimization of connections in large radio telescopes,** D. P. Valentine, F. W. Kan, J. Antebi, Simpson Gumpertz & Heger Inc. . . [6273-39]

9:40 am: **Achievable alignment accuracy and surface hardness of a large welded azimuth track,** D. R. Smith, Mechanical Engineering Research Laboratory P.C. . . . . [6273-40]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 9

Room: Crystal Ballrooms: A, B . . . . . Fri. 10:30 to 11:50 am

Telescope Structures, Drives, and Enclosures II

Chair: **David R. Smith**,
Mechanical Engineering Research Laboratory P.C.

10:30 am: **Large bearings with incorporated gears, high stiffness and precision for the Swedish Solar Telescope (SST) on La Palma,** R. H. Hammerschlag, F. C. M. Bettonvil, A. P. L. Jägers, Univ. Utrecht (Netherlands); G. B. Scharmer, Royal Swedish Academy of Sciences (Sweden) . . . . . [6273-119]

10:50 am: **Track level compensation look-up table improves antenna pointing precision,** W. Gawronski, F. Baher, E. Gama, Jet Propulsion Lab. . . . . [6273-42]

11:10 am: **Replacing the Keck 1 dome shutter drive system,** M. J. Hess, W.M. Keck Observatory . . . . . [6273-43]

11:30 am: **Update on slip and wear in multi-layer azimuth track systems,** F. W. Kan, G. Juneja, J. Antebi, Simpson Gumpertz & Heger Inc. . . . . [6273-44]

Lunch Break . . . . . 11:50 am to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 10

Room: Crystal Ballrooms: A, B . . . . . Sat. 8:00 to 10:00 am

Active Optics and Mirror Supports

Chair: **Daniel R. Blanco**,
Association of Universities for Research in Astronomy

8:00 am: **Development of segment support assemblies for the Thirty Meter Telescope,** E. R. Ponslet, Hytec, Inc.; D. R. Blanco, M. K. Cho, National Optical Astronomy Observatory; T. S. Mast, J. E. Nelson, Univ. of California/Santa Cruz; A. Ponchione, Hytec, Inc.; M. J. Sirota, Thirty Meter Telescope Project; V. Stephens, Hytec, Inc.; L. M. Stepp, Association of Universities for Research in Astronomy; A. Tubb, E. Williams, Hytec, Inc. . . . . [6273-45]

8:20 am: **Control and support of 4-meter class secondary and tertiary mirrors for the Thirty Meter Telescope,** D. R. Blanco, M. K. Cho, L. G. Daggert, J. DeVries, B. Fitz-Patrick, E. A. Hileman, M. D. Nickerson, E. T. Pearson, National Optical Astronomy Observatory . . . . . [6273-46]

8:40 am: **Ultra weighted support panels for main mirrors in the Extremely Large Telescope,** F. Rampini, G. Marchiori, European Industrial Engineering s.r.l. (Italy) . . . . . [6273-47]

9:00 am: **M1 mirror print-thru investigation and performance on the thermo-opto-mechanical testbed for the Space Interferometry mission,** V. A. Feria, D. Van Buren, J. C. Lam, Jet Propulsion Lab. . . . . [6273-48]

9:20 am: **Primary mirror actuator testing,** S. E. Mathews, B. Cuerden, The Univ. of Arizona/Steward Observatory . . . . . [6273-49]

9:40 am: **Optimization of the ATST primary mirror support system,** M. K. Cho, National Opitcal Astronomy Observatory; R. S. Price, National Solar Observatory; I. K. Moon, The Univ. of Arizona . . . . . [6273-50]

Coffee Break . . . . . 10:00 to 10:30 am

SESSION 11

Room: Crystal Ballrooms: A, B . . . . . Sat. 10:30 am to 12:10 pm

Active Optics and Mirror Supports II

Chair: **David Montgomery**,
UK Astronomy Technology Ctr. (United Kingdom)

10:30 am: **Precision, range, bandwidth, and other tradeoffs in large hexapods for ground-based telescopes,** E. H. Anderson, M. F. Cash, C. A. Smith, G. W. Pettit, CSA Engineering, Inc. . . . . [6273-51]

10:50 am: **ADS hexapods controller: features and performances,** P. G. Lazzarini, P. Fumi, ADS International s.r.l. (Italy) . . . . . [6273-52]

11:10 am: **Progress of the array of microwave background anisotropy (AMiBA),** P. A. Raffin, Y. Huang, P. M. Koch, M. Chen, Institute of Astronomy and Astrophysics (Taiwan) . . . . . [6273-53]

11:30 am: **Introduction of four different driving systems used in LAMOST focal plane,** G. Wang, X. Jiang, Y. Wang, G. Li, B. Gu, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-54]

11:50 am: **Development of a PZT ceramic linear, long travel high resolution actuator with micro/picometer resolution for active optical collimation,** H. Marth, Physik Instrumente GmbH & Co. (Germany); B. Lula, Physik Instrumente LP . . . . . [6273-56]

Lunch Break . . . . . 12:10 to 1:30 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm

Astronomy in Europe: Status and Prospects

Catherine J. Cesarsky, European Southern Observatory (Germany)

Break . . . . . 2:20 to 2:35 pm

SESSION 12

Room: Crystal Ballrooms: A, B . . . . . Sat. 2:35 to 4:15 pm

Active Optics and Mirror Supports III

Chair: **Joseph Antebi**, Simpson Gumpertz & Heger Inc.

2:35 pm: **Precision polyimide single surface thin film shell apertures and active boundary control,** E. M. Flint, J. L. Hall, J. E. Lindler, Mevicon Inc.; L. J. Bradford, United Applied Technologies; M. Reggelbrugge, C. Rankine, Rhombus CGI . . . . . [6273-57]

2:55 pm: **Nano-actuators for segmented and adaptive mirrors,** T. C. van den Dool, F. Kamphues, J. R. Nijenhuis, J. A. C. M. Pijnenburg, TNO (Netherlands); R. P. A. van Haendel, R. F. M. M. Hamelinck, Technische Univ. Eindhoven (Netherlands) and TNO (Netherlands) . . . . . [6273-58]

Coffee Break . . . . . 3:15 to 3:35 pm

3:35 pm: **A dynamically aligned, step scanning mechanism for an imaging Fourier transform spectrometer for astronomy,** J. Landry, F. Grandmont, ABB Bomem, Inc. (Canada) . . . . . [6273-59]

3:55 pm: **Towers for telescopes with extreme stability: active or passive?,** R. H. Hammerschlag, F. C. M. Bettonvil, A. P. L. Jägers, Univ. Utrecht (Netherlands) . . . . . [6273-61]

Workshop on

Room: Crystal Ballrooms: A, B . . . . . Sat. 4:30 to 6:30 pm

Glass Blanks for Large Lenses and Filters in ELTs and WFTs

Large wide-field telescopes and extremely large telescopes will need large transmitting optics like lenses, prisms and filters with diameters or edge lengths of 0.5 - 1 m and above. The requirements on maximum admissible wave front distortions contributed by these elements increase significantly. The availability of such high quality blanks will be a crucial aspect for the success of the telescopes and is far from being guaranteed at present.

This workshop addresses optical designers and project managers of such telescopes.

Tentative results will be targets, schedules and starting agenda for developments.

Agenda

4:30 pm: **Introductory Remarks,** Peter Hartmann, SCHOTT AG (Germany)

4:40 pm: **Presentation on Large Lenses and Filters**

5:10 pm: **Discussion**

6:10 pm: **Agreement on Development Program**

Conference presentations will resume Monday 29 May

Monday 29 May

SESSION 13

Room: Crystal Ballrooms: A, B . . . . . Mon. 8:30 to 9:50 am

Smart Focal Planes I

Chair: **David Montgomery**, UK Astronomy Technology Ctr. (United Kingdom)

8:30 am: **Low-cost multi-integral field unit (IFU) with high-quality optical polishing,** E. Prieto, S. Vives, Lab. d'Astrophysique de Marseille (France) . . . . . [6273-62]

8:50 am: **Micro-mirror array for multi-object spectroscopy,** F. Zamkotsian, Lab. d'Astrophysique de Marseille (France); S. Waldis, W. Noell, Univ. de Neuchâtel (Switzerland); K. ElHadi, P. Lanzoni, Lab. d'Astrophysique de Marseille (France) . . . . . [6273-63]

9:10 am: **Modeling a slicer mirror using Zemax user-defined surface,** S. Vives, E. Prieto, M. Aumeunier, Lab. d'Astrophysique de Marseille (France) . . . [6273-64]

9:30 am: **SMART-MOS: a NIR imager-MOS for the ELT,** F. Garzon Lopez, Instituto de Astrofísica de Canarias (Spain); E. Atad-Ettedgui, UK Astronomy Technology Ctr. (United Kingdom); P. L. Hammersley, Instituto de Astrofísica de Canarias (Spain); D. M. Henry, C. J. Norrie, UK Astronomy Technology Ctr. (United Kingdom); F. Zamkotsian, Lab. d'Astrophysique de Marseille (France); V. Sánchez de la Rosa, S. Barrera, Instituto de Astrofísica de Canarias (Spain) . . . . . [6273-66]

Coffee Break . . . . . 9:50 to 10:20 am

SESSION 14

Room: Crystal Ballrooms: A, B . . . . . Mon. 10:20 am to 12:00 pm

Smart Focal Planes II

Chair: **Paul R. Shore**, Cranfield Univ. (United Kingdom)

10:20 am: **Design and manufacture of micro-lens arrays using freeform machining techniques,** J. Schmoll, D. J. Robertson, D. A. Ryder, Univ. of Durham (United Kingdom) . . . . . [6273-67]

10:40 am: **Smart-MOMSI instrument concept and technology development,** C. J. Norrie, C. R. Cunningham, E. Atad-Ettedgui, UK Astronomy Technology Ctr. (United Kingdom); F. Bortolleto, Osservatorio Astronomico di Padova (Italy); P. R. Hastings, UK Astronomy Technology Ctr. (United Kingdom); R. Haynes, Anglo-Australian Observatory (Australia); I. R. Parry, Univ. of Cambridge (United Kingdom); L. Pina, REFLEX sro (Czech Republic); J. H. Pragt, ASTRON (Netherlands); E. Prieto, Lab. d'Astrophysique de Marseille (France); S. K. Ramsay Howat, UK Astronomy Technology Ctr. (United Kingdom); J. Schmoll, Univ. of Durham (United Kingdom); L. Zago, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); F. Zamkotsian, Lab. d'Astrophysique Marseille (France) . . . . . [6273-68]

11:00 am: **It's alive: performance and control of prototype Starbug actuators,** R. Haynes, A. J. McGrath, S. Smedley, R. Muller, S. Miziarski, P. R. Gillingham, G. Frost, D. B. Correll, J. K. Brzeski, Anglo-Australian Observatory (Australia) . . . . . [6273-69]

11:20 am: **Deployable payloads with Starbug,** A. J. McGrath, R. Haynes, Anglo-Australian Observatory (Australia) . . . . . [6273-70]

11:40 pm: **New beam steering mirror concept and metrology system for multi-IFU,** F. Madec, E. Prieto, P. Blanc, M. Ferrari, J. Cuby, Lab. d'Astrophysique de Marseille (France) . . . . . [6273-71]

Lunch Break . . . . . 12:00 to 2:00 pm

SESSION 15

Room: Crystal Ballrooms: A, B . . . . . Mon. 2:00 to 3:00 pm

Smart Focal Planes III

Chair: **Eric Prieto**, Lab. d'Astrophysique de Marseille (France)

2:00 pm: **Development of diamond machined mirror arrays for integral field spectroscopy,** D. Lee, M. Wells, C. J. Dickson, UK Astronomy Technology Ctr. (United Kingdom); P. R. Shore, P. M. Morantz, Cranfield Univ. (United Kingdom) . . . . . [6273-74]

2:20 pm: **Semiconductor fabrication techniques for producing an ultra-flat reflective slit,** T. E. Vandervelde, M. Cabral, J. C. Wilson, M. F. Skrutskie, Univ. of Virginia . . . . . [6273-75]

2:40 pm: **Analysis for method of creating thin film masks of arbitrarily-varying transmittance,** C. E. Boone, Lockheed Martin Advanced Technology Ctr.; M. Reale, Lockheed Martin Space Systems Co.; S. F. Somerstein, Lockheed Martin Advanced Technology Ctr. . . . . [6273-76]

Coffee Break . . . . . 3:00 to 3:30 pm

POSTER POPS

Room: Crystal Ballrooms: A, B . . . . . Mon. 3:30 pm

3-minute presentations

Optical Fabrication for Large Telescopes

Chair: **Eli Atad-Ettedgui**, The Royal Observatory Edinburgh (United Kingdom)

✔ **Ultra low thermal expansion material for telescope mirror substrate,** K. Nakajima, T. Nakajima, N. Kawasaki, Y. Owari, H. Minamikawa, Ohara Inc. (Japan) . . . . . [6273-101]

✔ **Toric mirrors and active optics: degenerated configuration for spherical monomode deformable mirrors,** E. Hugot, G. R. Lemaitre, M. Ferrari, Lab. d'Astrophysique de Marseille (France) . . . . . [6273-102]

✔ **The process used to create the 4.3-meter primary mirror blank for the Discovery Channel Telescope,** B. J. Wells, M. J. Edwards, R. R. VanBrocklin, Corning Inc. . . . . [6273-103]

✔ **Large magnetron sputtering coating plant working with a mode of scan,** W. Guo, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-106]

✔ **Gemini's protected silver coatings: first two years in operation,** T. B. Vucina, M. Boccas, Gemini Observatory (Chile); C. Ah Hee, Gemini Observatory; C. Araya, Gemini Observatory (Chile) . . . . . [6273-107]

✔ **VST correctors transmission,** G. Marra, D. Mancini, Osservatorio Astronomico di Capodimonte (Italy); G. Sedmak, Univ. degli Studi di Trieste (Italy); M. Capaccioli, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-108]

✔ **In-situ aluminization of the MMT Observatory's 6.5m primary mirror,** J. T. Williams, D. L. Clark, The Univ. of Arizona . . . . . [6273-109]

Optical Testing and Metrology

✔ **Swing arm profilometer for large telescope mirror element metrology,** M. J. Callender, A. Efstathiou, C. W. King, Univ. College London (United Kingdom); D. D. Walker, Univ. College London (United Kingdom) and Zeeko Ltd. (United Kingdom); A. E. Gee, Univ. College London (United Kingdom); A. J. Lewis, S. Oldfield, R. Steel, National Physical Lab. (United Kingdom) . . . . . [6273-111]

✔ **Use of computer generated holograms for alignment of complex null correctors,** R. Zehnder, J. H. Burge, C. Zhao, College of Optical Sciences/The Univ. of Arizona . . . . . [6273-112]

✔ **Alternate surface measurements for GMT primary mirror segments,** J. H. Burge, T. Zobrist, College of Optical Sciences/The Univ. of Arizona; L. B. Kot, H. M. Martin, The Univ. of Arizona/Steward Observatory; C. Zhao, College of Optical Sciences/The Univ. of Arizona . . . . . [6273-113]

✔ **Focal plane metrology for the LSST camera,** A. P. Rasmussen, Stanford Linear Accelerator Ctr.; L. C. Hale, Lawrence Livermore National Lab.; P. K. Kim, E. Lee, M. L. Perl, Stanford Linear Accelerator Ctr.; P. Z. Takacs, Brookhaven National Lab.; T. S. Thurston, Stanford Linear Accelerator Ctr. . . . . [6273-114]

Smart Focal Planes

✔ **Multi-slit mask fabrication on spherical electroformed shell substrates,** T. P. O'Brien, J. D. Eastman, The Ohio State Univ. . . . . [6273-72]

✔ **Design and fabrication issues for large immersion gratings,** P. J. Kuzmenko, P. J. Davis, S. L. Little, L. C. Hale, Lawrence Livermore National Lab. . . . . [6273-115]

✔ **A scalable pick-off technology for multi-object instruments,** P. R. Hastings, D. A. Clarke, K. Laidlaw, S. A. McLay, C. J. Norrie, S. K. Ramsay-Howat, H. Schnettler, UK Astronomy Technology Ctr. (United Kingdom); P. Spanoudakis, P. Schwab, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); J. H. Pragt, R. van den Brink, ASTRON (Netherlands); R. Haynes, Anglo-Australian Observatory (Australia) . . . . . [6273-116]

✔ **Wideband all-glass linear polarizer for VIS-NIR applications,** R. Gafsi, K. R. Rossington, P. A. Schrauth, Corning Inc. . . . . [6273-117]

Telescope Structures, Drives, and Enclosures

✔ **Tracking performance estimation of the CFGT under wind disturbance,** D. Yang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-41]

✔ **Tracking system of 2m LAMOST-style telescope for the Antarctic plateau,** B. Gu, G. Wang, X. Jiang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-118]

✔ **Study of the yoke for a 10m class telescope,** L. Cavaller, B. Siegel, J. Marrero, A. Villegas López, Instituto de Astrofísica de Canarias (Spain) . . . . . [6273-120]

✔ **A new look for Gemini: rapid-cured composites for an exchangeable top-end,** S. Miziarski, A. J. McGrath, Anglo-Australian Observatory (Australia); N. Milby, D. E. Brosius, M. J. Van Bertouch, Quickstep Technologies Pty. Ltd. (Australia) . . . . . [6273-121]

✔ **Study on H-Infinity control for LAMOST main axes,** W. Zhou, X. Xu, Z. Dong, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-122]

✔ **Finite element analysis of a 2m telescope assembly,** Z. Fu, Beijing Technology and Business Univ. (China) . . . . . [6273-123]

✔ **A cost effective direct drive option for the Thirty Meter Telescope,** T. M. Erm, California Institute of Technology; A. Seppey, ETEL S.A. (Switzerland) . . . . . [6273-124]

✔ **Study on a photoelectric guider for the LAMOST Telescope,** G. Li, T. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-125]

✔ **A unique truss for large segmented-mirror telescopes,** X. Gong, K. Chen, X. Cui, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-126]

✔ **VISTA secondary mirror drive performance and test results,** E. M. Geijo, NTE S.A. (Spain); L. Zago, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); J. M. Casalta Escuer, M. Canchado, NTE S.A. (Spain) [6273-154]

Tuesday 30 May

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy

Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 16

Room: Crystal Ballrooms: A, B . . . . . Tues. 9:35 to 10:15 am

Space Instruments and Systems I

Chair: **Dietrich Lemke**, Max-Planck-Institut für Astronomie (Germany)

9:35 am: **Dimensional stability of Hexoloy SA(r) silicon carbide and Zerodur(tm) glass-ceramic using hydroxide-catalysis bonding for optical systems in space,** A. M. Preston, G. Mueller, R. Cruz, J. I. Thorpe, R. Delgadillo, Univ. of Florida . . . . . [6273-77]

9:55 am: **Development and sizing of the JWST integrated science instrument module (ISIM) metering structure,** C. O. Kunt, Swales Aerospace; J. D. Johnston, NASA Goddard Space Flight Ctr.; S. Hendricks, Swales Aerospace; A. E. Bartoszyk, Swales Aeropace . . . . . [6273-78]

Coffee Break . . . . . 10:15 to 11:00 am

SESSION 17

Room: Crystal Ballrooms: A, B . . . . . Tues. 11:00 am to 12:20 pm

Space Instrumentation and Systems II

Chair: **V. Alfonso Feria**, Jet Propulsion Lab.

11:00 am: **The grating and filter wheels for the JWST NIRSpec instrument,** K. Weidlich, M. Fischer, Carl Zeiss AG (Germany); M. Trunz, Ingenieurbüro für Strukturmechanik Trunz (Germany); D. Lemke, R. Hofferbert, U. Grözinger, Max-Planck-Institut für Astronomie (Germany); G. Königsreiter, C. Neugebauer, Austrian Aerospace GmbH (Austria) . . . . . [6273-80]

11:20 am: **Cryogenic filter- and spectrometer wheels for the mid infrared instrument (MIRI) of the James Webb Space Telescope (JWST),** D. Lemke, A. Böhm, F. de Bonis, M. Ebert, U. Grözinger, T. F. E. Henning, R. Hofferbert, A. Huber, S. Kuhlmann, J. Ramos, R. Rohloff, Max-Planck-Institut für Astronomie (Germany); K. Weidlich, G. Luichtel, M. Trunz, Carl Zeiss AG (Germany) . [6273-81]

11:40 am: **The cold focal plane chopper of HERSCHEL's PACS instrument,** D. Lemke, R. Hofferbert, O. Krause, A. Böhm, Max-Planck-Institut für Astronomie (Germany); J. Katzer, F. S. Hoeller, M. Salvasohn, Carl Zeiss AG (Germany) . . . . . [6273-82]

12:00 pm: **Theoferometer for the construction of precision optomechanical assemblies,** A. M. Korzun, Univ. of Maryland/College Park and NASA Goddard Space Flight Ctr.; R. W. Toland, R. G. Ohl IV, NASA Goddard Space Flight Ctr.; R. M. Sanner, Univ. of Maryland/College Park; V. Holmes, Swales Aerospace; L. R. Worrel, Jr., NASA Goddard Space Flight Ctr. . . . . [6273-83]

Lunch Break . . . . . 12:20 to 2:00 pm

SESSION 18

Room: Crystal Ballrooms: A, B . . . . . Tues. 2:00 to 3:00 pm

Space Instrumentation and Systems III

Chair: **Dietrich Lemke**, Max-Planck-Institut für Astronomie (Germany)

2:00 pm: **Image slicer prototype dynamic study: post-vibration expertise,** C. Rossin, P. Blanc, J. Boit, P. Laurent, E. Prieto, Lab. d'Astrophysique de Marseille (France) . . . . . [6273-85]

2:20 pm: **Preliminary optical and thermomechanical design of the High Resolution Imaging Channel for the BepiColombo mission to Mercury,** G. Marra, Osservatorio Astronomico di Capodimonte (Italy); S. Debei, Univ. degli Studi di Padova (Italy); L. Colangeli, Osservatorio Astronomico di Capodimonte (Italy); C. Bettanini, Univ. degli Studi di Padova (Italy); E. Mazzotta Epifani, Osservatorio Astronomico di Capodimonte (Italy); P. Palumbo, Univ. degli Studi di Napoli Federico II (Italy); G. Parzianello, M. Zaccariotto, Univ. degli Studi di Padova (Italy); E. Flamini, Agenzia Spaziale Italiana (Italy) . . . . . [6273-86]

2:40 pm: **Optical and mechanical design for a Mercury solar simulator,** S. Debei, P. Ramous, Univ. degli Studi di Padova (Italy) . . . . . [6273-87]

Coffee Break . . . . . 3:00 to 3:30 pm

POSTER POPS

Room: Crystal Ballrooms: A, B . . . . . Tues. 3:30 pm

3-minute presentations

Active Optics and Mirror Supports

Chair: **V. Alfonso Feria**, Jet Propulsion Lab.

✔ **Performance and upgrades of active optics on Gemini Telescopes,** M. Boccas, T. B. Vucina, Gemini Observatory (Chile) . . . . . [6273-55]

✔ **Active optics correction forces for the VST 2.6m primary mirror,** P. Schipani, F. Perrotta, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-127]

✔ **Stewart platform kinematics and secondary mirror aberration control,** P. Schipani, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-128]

✔ **Design and development of the segment mirror support system of the LAMOST Telescope,** D. Yang, F. Jiang, Y. Chen, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-129]

✔ **VST secondary mirror active system,** F. Cortecchia, Osservatorio Astronomico di Capodimonte (Italy); M. Dario, Osservatorio astronomico di Capodimonte (Italy); G. Marra, L. Ferragina, D. Fierro, M. Capaccioli, Osservatorio Astronomico di Capodimonte (Italy); G. Sedmak, Osservatorio Astronomico di Trieste (Italy) . . . . . [6273-130]

✔ **Differentiation of secondary tilt and decenter through the use of off-axis wavefront sensing and aberration measurement,** M. DiVittorio, A. Rhodes, U.S. Naval Observatory . . . . . [6273-131]

✔ **ASM: scaled down active segmented mirror developed to simulate a segmented primary mirror,** C. Dupuy, F. Y. J. Gonte, C. Frank, R. Brast, M. Nylund, F. J. Derie, European Southern Observatory (Germany) . [6273-132]

Space Instrumentation and Systems

✔ **Prototyping of diamond machined optics for the KMOS- and JWST NIRSpec integral field units,** C. M. Dubbeldam, D. J. Robertson, D. A. Ryder, Univ. of Durham (United Kingdom) . . . . . [6273-133]

✔ **Fibre Bragg gratings as an alignment aid in JWST MIRI,** T. J. Stevenson, J. Sykes, P. Samara-Ratna, J. P. Pye, Univ. of Leicester (United Kingdom) . . . . . [6273-134]

✔ **Methods for correlating autocollimation and coordinate metrology in spacecraft systems development,** J. E. Gill, K. W. Redman, ManTech International Corp.; R. G. Ohl IV, NASA Goddard Space Flight Ctr. . [6273-135]

✔ **Metrology and test requirements for movement of the RAS/HOMS test facility to NASA-GSFC,** G. W. Wenzel, K. W. Redman, ManTech International Corp.; W. L. Eichhorn, NASA Goddard Space Flight Ctr. . . . . [6273-136]

✔ **Optimizing and testing of primary mirror supporting system in Space Solar Telescope,** R. Zhang, Z. Chen, S. Yang, National Astronomical Observatories (China) . . . . . [6273-137]

✔ **Studies in thin diffraction gratings for flight applications,** A. F. Shipley, R. L. McEntaffer, W. C. Cash, Univ. of Colorado/ Boulder . . . . . [6273-138]

Ground-based Cryogenically Cooled Instrumentation

✔ **The EMIR detector translation unit: a cryogenic high-precision 3-DoF parallel mechanism,** L. Zago, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); L. M. Racz, Energen, Inc.; S. Droz, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); A. Molins, NTE S.A. (Spain) . [6273-139]

✔ **Mounting of large lenses in infrared instruments,** J. L. Lizon a l'Allemand, G. Huster, European Southern Observatory (Germany) . . . . . [6273-140]

✔ **Alignment-invariant mirror holder for cryogenic environment and its application to GIANO-TNG,** I. Mochi, C. Baffa, S. L. Donati, G. Falcini, S. Gennari, E. Oliva, Osservatorio Astrofisico di Arcetri (Italy); L. Origlia, Osservatorio Astronomico di Bologna (Italy); R. Tomelleri, Tomelleri s.r.l. (Italy) . . . . . [6273-141]

✔ **X-Shooter near-IR spectrograph arm: design and manufacturing methods,** R. Navarro, E. Elswijk, M. de Haan, S. H. Hanenburg, R. ter Horst, P. Kleszcz, J. Kragt, J. H. Pragt, F. Rigal, R. Roelfsema, A. Schoenmaker, N. Tromp, L. B. Venema, ASTRON (Netherlands); P. Groot, Radboud Univ. Nijmegen (Netherlands); L. Kaper, Univ. van Amsterdam (Netherlands) . . . . . [6273-142]

✔ **A kinematic, flexure-based mechanism for precise, parallel motion for the hertz variable-delay polarization modulator (VPM),** G. M. Voellmer, D. T. Chuss, M. L. Jackson, S. H. Moseley, Jr., E. J. Wollack, NASA Goddard Space Flight Ctr.; M. M. Krejny, G. Novak, Northwestern Univ. . . . . [6273-143]

✔ **LSST detector module and raft assembly metrology concepts,** P. Z. Takacs, P. O'Connor, V. Radeka, G. Mahler, Brookhaven National Lab.; J. C. Geary, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6273-144]

Opto-mechanical Components in Instrumentation

✔ **Integral field unit for X-Shooter,** I. Guinouard, D. Horville, M. Puech, J. Hammer, J. Amans, Observatoire de Paris à Meudon (France); H. Dekker, R. Mazzoleni, European Southern Observatory (Germany) . . . . . [6273-145]

✔ **Prospects for machined immersion gratings in the near infrared and visible wavelengths,** P. J. Kuzmenko, Lawrence Livermore National Lab. . . . . [6273-146]

✔ **High efficiency germanium immersion gratings,** P. J. Kuzmenko, P. J. Davis, S. L. Little, L. M. Little, Lawrence Livermore National Lab. . . . . [6273-147]

✔ **Advances in infrared and imaging fibers for astronomical instrumentation,** R. Haynes, Anglo-Australian Observatory (Australia); P. McNamara, The Univ. of Sydney (Australia); J. D. Marcel, Anglo-Australian Observatory (Australia) . . . . . [6273-148]

✔ **New developments in photochromic materials for volume phase holographic gratings,** A. G. Bianco, Osservatorio Astronomico di Brera (Italy); C. Bertarelli, Politecnico di Milano (Italy); P. Conconi, E. Molinari, Osservatorio Astronomico di Brera (Italy); C. Quaglia, Politecnico di Milano (Italy); G. Toso, F. M. Zerbi, Osservatorio Astronomico di Brera (Italy); G. Zerbi, Politecnico di Milano (Italy) . . . . . [6273-149]

✔ **Prototype development of the IFU for VIRUS,** A. Kelz, Astrophysikalisches Institut Potsdam (Germany) . . . . . [6273-151]

✔ **Application of fiber tapers for astronomy,** J. Marcel, The Univ. of Sydney (Australia); R. Haynes, J. Bland-Hawthorn, Anglo-Australian Observatory (Australia) . . . . . [6273-153]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

Optical Fabrication for Large Telescopes

✔ **Ultra low thermal expansion material for telescope mirror substrate,** K. Nakajima, T. Nakajima, N. Kawasaki, Y. Owari, H. Minamikawa, Ohara Inc. (Japan) . . . . . [6273-101]

✔ **Toric mirrors and active optics: degenerated configuration for spherical monomode deformable mirrors,** E. Hugot, G. R. Lemaitre, M. Ferrari, Lab. d'Astrophysique de Marseille (France) . . . . . [6273-102]

✔ **The process used to create the 4.3-meter primary mirror blank for the Discovery Channel Telescope,** B. J. Wells, M. J. Edwards, R. R. VanBrocklin, Corning Inc. . . . . [6273-103]

✔ **Large magnetron sputtering coating plant working with a mode of scan,** W. Guo, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-106]

✔ **Gemini's protected silver coatings: first two years in operation,** T. B. Vucina, M. Boccas, Gemini Observatory (Chile); C. Ah Hee, Gemini Observatory; C. Araya, Gemini Observatory (Chile) . . . . . [6273-107]

✔ **VST correctors transmission,** G. Marra, D. Mancini, Osservatorio Astronomico di Capodimonte (Italy); G. Sedmak, Univ. degli Studi di Trieste (Italy); M. Capaccioli, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-108]

✔ **In-situ aluminization of the MMT Observatory's 6.5m primary mirror,** J. T. Williams, D. L. Clark, The Univ. of Arizona . . . . . [6273-109]

Optical Testing and Metrology

✔ **Swing arm profilometer for large telescope mirror element metrology,** M. J. Callender, A. Efstathiou, C. W. King, Univ. College London (United Kingdom); D. D. Walker, Univ. College London (United Kingdom) and Zeeko Ltd. (United Kingdom); A. E. Gee, Univ. College London (United Kingdom); A. J. Lewis, S. Oldfield, R. Steel, National Physical Lab. (United Kingdom) . . . . . [6273-111]

✔ **Use of computer generated holograms for alignment of complex null correctors,** R. Zehnder, J. H. Burge, C. Zhao, College of Optical Sciences/The Univ. of Arizona . . . . . [6273-112]

✔ **Alternate surface measurements for GMT primary mirror segments,** J. H. Burge, T. Zobrist, College of Optical Sciences/The Univ. of Arizona; L. B. Kot, H. M. Martin, The Univ. of Arizona/Steward Observatory; C. Zhao, College of Optical Sciences/The Univ. of Arizona . . . . . [6273-113]

✔ **Focal plane metrology for the LSST camera,** A. P. Rasmussen, Stanford Linear Accelerator Ctr.; L. C. Hale, Lawrence Livermore National Lab.; P. K. Kim, E. Lee, M. L. Perl, Stanford Linear Accelerator Ctr.; P. Z. Takacs, Brookhaven National Lab.; T. S. Thurston, Stanford Linear Accelerator Ctr. . . . . [6273-114]

Smart Focal Planes

✔ **Multi-slit mask fabrication on spherical electroformed shell substrates,** T. P. O'Brien, J. D. Eastman, The Ohio State Univ. . . . . [6273-72]

✔ **Design and fabrication issues for large immersion gratings,** P. J. Kuzmenko, P. J. Davis, S. L. Little, L. C. Hale, Lawrence Livermore National Lab. . . . . [6273-115]

✔ **A scalable pick-off technology for multi-object instruments,** P. R. Hastings, D. A. Clarke, K. Laidlaw, S. A. McLay, C. J. Norrie, S. K. Ramsay-Howat, H. Schnettler, UK Astronomy Technology Ctr. (United Kingdom); P. Spanoudakis, P. Schwab, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); J. H. Pragt, R. van den Brink, ASTRON (Netherlands); R. Haynes, Anglo-Australian Observatory (Australia) . . . . . [6273-116]

✔ **Wideband all-glass linear polarizer for VIS-NIR applications,** R. Gafsi, K. R. Rossington, P. A. Schrauth, Corning Inc. . . . . [6273-117]

Telescope Structures, Drives, and Enclosures

✔ **Tracking performance estimation of the CFGT under wind disturbance,** D. Yang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-41]

✔ **Tracking system of 2m LAMOST-style telescope for the Antarctic plateau,** B. Gu, G. Wang, X. Jiang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-118]

✔ **Study of the yoke for a 10m class telescope,** L. Cavaller, B. Siegel, J. Marrero, A. Villegas López, Instituto de Astrofísica de Canarias (Spain) . . . . . [6273-120]

✔ **A new look for Gemini: rapid-cured composites for an exchangeable top-end,** S. Miziarski, A. J. McGrath, Anglo-Australian Observatory (Australia); N. Milby, D. E. Brosius, M. J. Van Bertouch, Quickstep Technologies Pty. Ltd. (Australia) . . . . . [6273-121]

✔ **Study on H-Infinity control for LAMOST main axes,** W. Zhou, X. Xu, Z. Dong, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-122]

✔ **Finite element analysis of a 2m telescope assembly,** Z. Fu, Beijing Technology and Business Univ. (China) . . . . . [6273-123]

✔ **A cost effective direct drive option for the Thirty Meter Telescope,** T. M. Erm, California Institute of Technology; A. Seppey, ETEL S.A. (Switzerland) . . . . . [6273-124]

✔ **Study on a photoelectric guider for the LAMOST Telescope,** G. Li, T. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-125]

✔ **A unique truss for large segmented-mirror telescopes,** X. Gong, K. Chen, X. Cui, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-126]

✔ **VISTA secondary mirror drive performance and test results,** E. M. Geijo, NTE S.A. (Spain); L. Zago, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); J. M. Casalta Escuer, M. Canchado, NTE S.A. (Spain) [6273-154]

Active Optics and Mirror Supports

✔ **Performance and upgrades of active optics on Gemini Telescopes,** M. Boccas, T. B. Vucina, Gemini Observatory (Chile) . . . . . [6273-55]

✔ **Active optics correction forces for the VST 2.6m primary mirror,** P. Schipani, F. Perrotta, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-127]

✔ **Stewart platform kinematics and secondary mirror aberration control,** P. Schipani, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-128]

✔ **Design and development of the segment mirror support system of the LAMOST Telescope,** D. Yang, F. Jiang, Y. Chen, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6273-129]

✔ **VST secondary mirror active system,** F. Cortecchia, Osservatorio Astronomico di Capodimonte (Italy); M. Dario, Osservatorio astronomico di Capodimonte (Italy); G. Marra, L. Ferragina, D. Fierro, M. Capaccioli, Osservatorio Astronomico di Capodimonte (Italy); G. Sedmak, Osservatorio Astronomico di Trieste (Italy) . . . . . [6273-130]

✔ **Differentiation of secondary tilt and decenter through the use of off-axis wavefront sensing and aberration measurement,** M. DiVittorio, A. Rhodes, U.S. Naval Observatory . . . . . [6273-131]

✔ **ASM: scaled down active segmented mirror developed to simulate a segmented primary mirror,** C. Dupuy, F. Y. J. Gonte, C. Frank, R. Brast, M. Nylund, F. J. Derie, European Southern Observatory (Germany) . [6273-132]

Space Instrumentation and Systems

✔ **Prototyping of diamond machined optics for the KMOS- and JWST NIRSpec integral field units,** C. M. Dubbeldam, D. J. Robertson, D. A. Ryder, Univ. of Durham (United Kingdom) . . . . . [6273-133]

✔ **Fibre Bragg gratings as an alignment aid in JWST MIRI,** T. J. Stevenson, J. Sykes, P. Samara-Ratna, J. P. Pye, Univ. of Leicester (United Kingdom) . . . . . [6273-134]

✔ **Methods for correlating autocollimation and coordinate metrology in spacecraft systems development,** J. E. Gill, K. W. Redman, ManTech International Corp.; R. G. Ohl IV, NASA Goddard Space Flight Ctr. . [6273-135]

✔ **Metrology and test requirements for movement of the RAS/HOMS test facility to NASA-GSFC,** G. W. Wenzel, K. W. Redman, ManTech International Corp.; W. L. Eichhorn, NASA Goddard Space Flight Ctr. . . . . [6273-136]

✔ **Optimizing and testing of primary mirror supporting system in Space Solar Telescope,** R. Zhang, Z. Chen, S. Yang, National Astronomical Observatories (China) . . . . . [6273-137]

✔ **Studies in thin diffraction gratings for flight applications,** A. F. Shipley, R. L. McEntaffer, W. C. Cash, Univ. of Colorado/ Boulder . . . . . [6273-138]

Ground-based Cryogenically Cooled Instrumentation

✔ **The EMIR detector translation unit: a cryogenic high-precision 3-DoF parallel mechanism,** L. Zago, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); L. M. Racz, Energen, Inc.; S. Droz, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); A. Molins, NTE S.A. (Spain) . [6273-139]

✔ **Mounting of large lenses in infrared instruments,** J. L. Lizon a l'Allemand, G. Huster, European Southern Observatory (Germany) . . . . . [6273-140]

✔ **Alignment-invariant mirror holder for cryogenic environment and its application to GIANO-TNG,** I. Mochi, C. Baffa, S. L. Donati, G. Falcini, S. Gennari, E. Oliva, Osservatorio Astrofisico di Arcetri (Italy); L. Origlia, Osservatorio Astronomico di Bologna (Italy); R. Tomelleri, Tomelleri s.r.l. (Italy) . . . . . [6273-141]

✔ **X-Shooter near-IR spectrograph arm: design and manufacturing methods,** R. Navarro, E. Elswijk, M. de Haan, S. H. Hanenburg, R. ter Horst, P. Kleszcz, J. Kragt, J. H. Pragt, F. Rigal, R. Roelfsema, A. Schoenmaker, N. Tromp, L. B. Venema, ASTRON (Netherlands); P. Groot, Radboud Univ. Nijmegen (Netherlands); L. Kaper, Univ. van Amsterdam (Netherlands) . . . . . [6273-142]

✔ **A kinematic, flexure-based mechanism for precise, parallel motion for the hertz variable-delay polarization modulator (VPM),** G. M. Voellmer, D. T. Chuss, M. L. Jackson, S. H. Moseley, Jr., E. J. Wollack, NASA Goddard Space Flight Ctr.; M. M. Krejny, G. Novak, Northwestern Univ. . . . . [6273-143]

✔ **LSST detector module and raft assembly metrology concepts,** P. Z. Takacs, P. O'Connor, V. Radeka, G. Mahler, Brookhaven National Lab.; J. C. Geary, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6273-144]

Opto-mechanical Components in Instrumentation

✔ **Integral field unit for X-Shooter,** I. Guinouard, D. Horville, M. Puech, J. Hammer, J. Amans, Observatoire de Paris à Meudon (France); H. Dekker, R. Mazzoleni, European Southern Observatory (Germany) . . . . . [6273-145]

✔ **Prospects for machined immersion gratings in the near infrared and visible wavelengths,** P. J. Kuzmenko, Lawrence Livermore National Lab. . . . . [6273-146]

✔ **High efficiency germanium immersion gratings,** P. J. Kuzmenko, P. J. Davis, S. L. Little, L. M. Little, Lawrence Livermore National Lab. . . . . [6273-147]

✔ **Advances in infrared and imaging fibers for astronomical instrumentation,** R. Haynes, Anglo-Australian Observatory (Australia); P. McNamara, The Univ. of Sydney (Australia); J. D. Marcel, Anglo-Australian Observatory (Australia) . . . . . [6273-148]

✔ **New developments in photochromic materials for volume phase holographic gratings,** A. G. Bianco, Osservatorio Astronomico di Brera (Italy); C. Bertarelli, Politecnico di Milano (Italy); P. Conconi, E. Molinari, Osservatorio Astronomico di Brera (Italy); C. Quaglia, Politecnico di Milano (Italy); G. Toso, F. M. Zerbi, Osservatorio Astronomico di Brera (Italy); G. Zerbi, Politecnico di Milano (Italy) . . . . . [6273-149]

✔ **Prototype development of the IFU for VIRUS,** A. Kelz, Astrophysikalisches Institut Potsdam (Germany) . . . . . [6273-151]

✔ **Application of fiber tapers for astronomy,** J. Marcel, The Univ. of Sydney (Australia); R. Haynes, J. Bland-Hawthorn, Anglo-Australian Observatory (Australia) . . . . . [6273-153]

Wednesday 31 May

SESSION 19

Room: Crystal Ballrooms: A, B . . . . . Wed. 8:00 to 10:00 am

Opto-Mechanical Components in Instrumentation

Chair: **Alson E. Hatheway**, Alson E. Hatheway, Inc.

8:00 am: **Eight-inch f5 deformable magnetic-membrane mirror,** M. M. Angel, MIT Lincoln Lab. . . . . [6273-89]

8:20 am: **Innovative slicer design and manufacturing,** F. Laurent, E. Renault, R. M. Bacon, Observatoire de Lyon (France); B. Delabre, European Southern Observatory (Germany); J. Dubois, F. Hénault, J. Kosmalski, Observatoire de Lyon (France) . . . . . [6273-90]

8:40 am: **Large format silicon immersion gratings for high resolution infrared spectroscopy,** J. C. Ge, S. Miller, D. L. McDavitt, B. Zhao, Univ. of Florida . . . . . [6273-91]

9:00 am: **Focusing a NIR adaptive optics imager: experience with GSAOI,** M. C. Doolan, G. J. Bloxham, P. G. Conroy, C. Jenkins, P. J. McGregor, D. Stevanovic, J. Van Harmelen, L. E. Waldron, M. F. Waterson, R. Zhelem, The Australian National Univ. (Australia) . . . . . [6273-92]

9:20 am: **VST atmospheric dispersion correction simulation by ray-tracing,** G. Marra, D. Mancini, Osservatorio Astronomico di Capodimonte (Italy); G. Sedmak, Univ. degli Studi di Trieste (Italy); M. Capaccioli, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-93]

9:40 am: **VST correctors opto-mechanical system,** G. Marra, D. Mancini, O. Caputi, F. Cortecchia, Osservatorio Astronomico di Capodimonte (Italy); G. Sedmak, Univ. degli Studi di Trieste (Italy); M. Capaccioli, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6273-94]

Coffee Break . . . . . 10:00 to 10:20 am

SESSION 20

Room: Crystal Ballrooms: A, B . . . . . Wed. 10:20 am to 12:00 pm

Ground-based Cryogenically Cooled Instrumentation

Chair: **David Montgomery**, UK Astronomy Technology Ctr. (United Kingdom)

10:20 am: **Opto-mechanical design of SCUBA-2,** E. Atad-Ettedgui, T. Peacocke, D. Montgomery, H. McGregor, D. C. Gostick, M. C. Cliff, UK Astronomy Technology Ctr. (United Kingdom); I. J. Saunders, L. Ploeg, M. Dorrepaal, B. van Venrooij, TNO (Netherlands) . . . . . [6273-96]

10:40 am: **Cryogenic mounts for large fused silica lenses,** T. R. Froud, I. A. J. Tosh, R. L. Edeson, Rutherford Appleton Lab. (United Kingdom) . [6273-97]

11:00 am: **Temperature-dependent refractive index of silicon and germanium,** B. J. Frey, D. B. Leviton, NASA Goddard Space Flight Ctr. . . . . [6273-98]

11:20 am: **Temperature dependent refractive index measurements of synthetic fused silica,** D. B. Leviton, B. J. Frey, NASA Goddard Space Flight Ctr. . . . . [6273-99]

11:40 am: **SWIFT image slicer: large format, compact, low scatter image slicing,** M. Tecza, N. A. Thatte, F. Clarke, T. Goodsall, Univ. of Oxford (United Kingdom); D. E. L. Freeman, Consultant (United Kingdom) . . . . . [6273-100]

Wednesday-Friday 24-26 May 2006 • Proceedings of SPIE Vol. 6274

Conference Chairs:
Hilton Lewis, California Association for Research in Astronomy/W.M. Keck Observatory

Alan Bridger, UK Astronomy Technology Ctr. (United Kingdom)

Advanced Software and Control for Astronomy

Program Committee: **Gianluca Chiozzi**, European Southern Observatory (Germany); **Kim K. Gillies**, Gemini Observatory; **Bret D. Goodrich**, National Solar Observatory; **Robert I. Kibrick**, Univ. of California/Santa Cruz; **Nicole M. Radziwill**, National Radio Astronomy Observatory; **Gianni Raffi**, European Southern Observatory (Germany); **David L. Terrett**, Rutherford Appleton Lab. (United Kingdom)

Wednesday 24 May

SESSION 1

Room: Crystal Ballrooms: D, E . . . . . Wed. 10:00 am to 12:00 pm

Project Reports

10:00 am: **Thoughts on the future of scientific computing: a Java slant** *(Invited Paper, Presentation Only)***,** J. Gosling, Sun Microsystems, Inc. . . [6274-84]

11:00 am: **The telescope control system supervisory controller for the Thirty Meter Telescope (TMT),** R. E. Marshall, P. N. Daly, National Optical Astronomy Observatory; M. J. Sirota, Thirty Meter Telescope Project . . . . . [6274-01]

11:20 am: **The Large Synoptic Survey Telescope control system,** G. Schumacher, National Optical Astronomy Observatory; M. Warner, National Optical Astronomy Observatory (Chile); V. L. Krabbendam, National Optical Astronomy Observatory . . . . . [6274-02]

11:40 am: **Software for the EVLA: an update,** B. J. Butler, G. van Moorsel, B. Waters, S. Witz, S. Loveland, National Radio Astronomy Observatory . . [6274-03]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 2

Room: Crystal Ballrooms: D, E . . . . . Wed. 2:15 to 3:15 pm

Software Design I

2:15 pm: **A standard Python environment for software applications at the Robert C. Byrd Green Bank Telescope (GBT),** A. L. Shelton, N. M. Radziwill, National Radio Astronomy Observatory . . . . . [6274-05]

2:35 pm: **Application development using the ALMA common software,** G. Chiozzi, A. Caproni, B. Jeram, H. Sommer, V. Wang, European Southern Observatory (Germany); M. Plesko, M. Sekoranja, K. Zagar, Cosylab (Slovenia); D. W. Fugate, Univ. of Calgary (Canada); S. Harrington, National Radio Astronomy Observatory; R. Cirami, P. Di Marcantonio, Osservatorio Astronomico di Trieste (Italy) . . . . . [6274-06]

2:55 pm: **Integrating the CERN laser alarm system with the ALMA common software,** A. Caproni, European Southern Observatory (Germany); K. Sigerud, European Organization for Nuclear Research (Switzerland); K. Zagar, Cosylab (Slovenia) . . . . . [6274-07]

Coffee Break . . . . . 3:15 to 4:00 pm

SESSION 3

Room: Crystal Ballrooms: D, E . . . . . Wed. 4:00 to 5:20 pm

Software Design II

4:00 pm: **What do telescopes, databases and compute clusters have in common?,** A. Allan, The Univ. of Exeter (United Kingdom); A. J. Adamson, B. E. Cavanagh, F. Economou, Joint Astronomy Ctr.; S. N. Frazer, Liverpool John Moores Univ. (United Kingdom); T. Jenness, Joint Astronomy Ctr.; C. J. Mottram, Liverpool John Moores Univ. (United Kingdom); T. Naylor, E. S. Saunders, The Univ. of Exeter (United Kingdom); I. A. Steele, Liverpool John Moores Univ. (United Kingdom); W. T. Vestrand, R. R. White, Los Alamos National Lab. [6274-08]

4:20 pm: **Interconnecting astronomical networks: a primer regarding the development of heterogeneous telescope networks,** R. R. White, Los Alamos National Lab.; A. Allan, The Univ. of Exeter (United Kingdom); S. M. Evans, W. T. Vestrand, J. A. Wren, P. Wozniak, Los Alamos National Lab. . . . . [6274-09]

4:40 pm: **Event-driven James Webb Space Telescope operations using on-board JavaScripts,** V. A. Balzano, D. Zak, Space Telescope Science Institute . . . . . [6274-10]

5:00 pm: **Proposing a small pattern language for building detector controller software systems,** J. C. Lopez-Ruiz, Instituto de Astrofísica de Canarias (Spain) . . . . . [6274-11]

Thursday 25 May

Plenary Presentation

Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 4

Room: Crystal Ballrooms: D, E . . . . . Thurs. 9:35 to 10:35 am

Software Design III

9:35 am: **MOPEX: a software package for astronomical image processing and visualization,** D. Makovoz, T. Roby, I. Khan, B. Hartley, California Institute of Technology . . . . . [6274-12]

9:55 am: **A common framework for astronomical observing tools,** D. A. Clarke, A. Bridger, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6274-13]

10:15 am: **Defining common software for the Thirty Meter Telescope,** K. K. Gillies, Gemini Observatory (Chile); J. Dunn, National Research Council Canada (Canada); D. Silva, California Institute of Technology . . . . . [6274-14]

Coffee Break . . . . . 10:35 to 11:00 am

SESSION 5

Room: Crystal Ballrooms: D, E . . . . . Thurs. 11:00 am to 12:20 pm

Telescope and Instrumentation Control I

11:00 am: **Software control of the three active surfaces of the Thirty Meter Telescope,** P. N. Daly, R. E. Marshall, National Optical Astronomy Observatory; M. J. Sirota, Thirty Meter Telescope Project . . . . . [6274-15]

11:20 am: **Pointing algorithms for binocular telescopes,** D. L. Terrett, Rutherford Appleton Lab. (United Kingdom) . . . . . [6274-16]

11:40 am: **Auto-alignment and image tracking system for the SUNRISE Telescope,** W. Schmidt, T. Berkefeld, B. Feger, R. Friedlein, K. Gerber, F. Heidecke, T. Kentischer, M. Sigwarth, D. Soltau, E. Wälde, Kiepenheuer Institut für Sonnenphysik (Germany) . . . . . [6274-17]

12:00 pm: **Infrared guiding with faint stars with the wide-field infrared camera at CFHT,** M. Riopel, Univ. du Québec à Montréal (Canada); D. Teeple, Canada-France-Hawaii Telescope . . . . . [6274-18]

Lunch Break . . . . . 12:20 to 1:40 pm

SESSION 6

Room: Crystal Ballrooms: D, E . . . . . Thurs. 1:40 to 3:00 pm

Telescope and Instrumentation Control II

1:40 pm: **CFHT WIRCam software architecture and implementation,** T. A. Vermeulen, D. Teeple, L. Albert, P. Martin, T. Forveille, Canada-France-Hawaii Telescope; C. Yan, Institute of Astronomy and Astrophysics (Taiwan) . . . [6274-19]

2:00 pm: **Real-time control system for the Keck nuller: methods and maintenance,** J. I. Garcia, M. M. Colavita, A. J. Booth, Jet Propulsion Lab. . . . . [6274-20]

2:20 pm: **The ESO-VLT X-SHOOTER instrument software in the VLT dnvironment,** M. Vidali, P. Di Marcantonio, P. Santin, Osservatorio Astronomico di Trieste (Italy); J. Vernet, European Southern Observatory (Germany); A. Zacchei, Osservatorio Astronomico di Trieste (Italy) . . . . . [6274-22]

2:40 pm: **Lucifer VR: a virtual instrument for the LBT,** K. L. Polsterer, M. Jütte, V. Knierim, Ruhr-Univ. Bochum (Germany); M. Lehmitz, Max-Planck-Institut für Astronomie (Germany) . . . . . [6274-30]

Coffee Break . . . . . 3:00 to 3:40 pm

SESSION 7

Room: Crystal Ballrooms: D, E . . . . . Thurs. 3:40 to 5:00 pm

Software Engineering and Maintenance I

3:40 pm: **An extensible, standards-based control system on a budget,** J. M. Ford, G. Langston, J. Shelton, T. L. Weadon, National Radio Astronomy Observatory . . . . . [6274-25]

4:00 pm: **Autonomous quality assurance and troubleshooting,** N. M. Radziwill, National Radio Astronomy Observatory; R. F. DuPlain, National Radio Astronomy Observatory and Univ. of Cincinnati; J. J. Brandt, National Radio Astronomy Observatory . . . . . [6274-26]

4:20 pm: **Managing the evolution of the LSST data management system,** J. P. Kantor, LSST Corp. . . . . [6274-27]

4:40 pm: **Software systems design management,** B. D. Goodrich, National Solar Observatory . . . . . [6274-28]

✔Poster Session I

Room: Palms Ballroom: Canary & Royal Salons . Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

✔ **Design and implementation of the primary and secondary mirror control system for NST,** G. Yang, New Jersey Institute of Technology . . . . . [6274-23]

✔ **The ultra-low speed research on friction drive of large telescope,** F. Du, D. Wang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6274-38]

✔ **Pluggable services in the ATST software control system,** S. B. Wampler, National Optical Astronomy Observatory . . . . . [6274-40]

✔ **A C++ class library for telescope pointing,** D. L. Terrett, Rutherford Appleton Lab. (United Kingdom) . . . . . [6274-41]

✔ **Software kits for measuring photometric redshifts,** D. Wang, National Astronomical Observatories (China) . . . . . [6274-42]

✔ **A system integrated with query, cross-matching, visualization,** D. Gao, Y. Zhang, Y. Zhao, National Astronomical Observatories (China) . . . . [6274-43]

✔ **An astronomical data mining application framework in China-VO,** C. Liu, D. Wang, B. Liu, D. Gao, C. Cui, Y. Zhao, National Astronomical Observatories (China) . . . . . [6274-44]

✔ **Time synchronization within the ALMA software infrastructure,** R. Amestica, National Radio Astronomy Observatory; B. Gustafsson, European Southern Observatory (Germany); R. G. Marson, National Radio Astronomy Observatory . . . . . [6274-45]

✔ **The active optics control software for the VST Telescope,** P. Schipani, M. Brescia, L. Marty, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6274-46]

✔ **Guiding and adapter/rotator control software approach: the VST case,** P. Schipani, M. Brescia, L. Marty, G. Spirito, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6274-47]

✔ **The VST axes control software,** M. Brescia, P. Schipani, L. Marty, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6274-48]

✔ **A Matlab based toolbox for active optics,** P. Schipani, F. Perrotta, Osservatorio Astronomico di Capodimonte (Italy) . . . . . [6274-49]

✔ **Control system design for high-precision magnetic analyzer,** J. Wang, L. Liu, Y. Zeng, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6274-50]

✔ **Japanese Virtual Observatory (JVO) as an advanced astronomical research enviroment,** Y. Shirasaki, M. Tanaka, S. Honda, S. Kawanomoto, Y. Mizumoto, M. Ohishi, National Astronomical Observatory of Japan (Japan); N. Yasuda, The Univ. of Tokyo (Japan); Y. Masunaga, Ochanomizu Univ. (Japan); Y. Ishihara, J. Tsutumi, Fujitsu Ltd. (Japan); H. Nakamoto, Y. Kobayashi, M. Sakamoto, Systems Engineering Consultants Co., Ltd. (Japan) . . . . . [6274-52]

✔ **Remote wireless control for LAMOST,** L. Xu, X. Xu, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6274-53]

✔ **Bulk data transfer distributer: a high performance multicast model in ALMA ACS,** R. Cirami, P. Di Marcantonio, Osservatorio Astronomico di Trieste (Italy); G. Chiozzi, B. Jeram, European Southern Observatory (Germany) . . . . . [6274-54]

✔ **Specsim: the MIRI medium resolution spectrometer simulator,** N. P. F. Lorente, A. C. H. Glasse, G. S. Wright, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6274-55]

✔ **SNOWS: Sierra Nevada Observatory weather system,** L. P. Costillo Iciarra, J. M. Ibáñez Mengual, B. Aparicio del Moral, A. J. Garcia Segura, Instituto de Astrofísica de Andalucia (Spain) . . . . . [6274-57]

✔ **The Java based control software of the LUCIFER instrument,** M. Jütte, K. L. Polsterer, V. Knierim, T. Luks, T. Muhlack, R. Dettmar, Ruhr-Univ. Bochum (Germany) . . . . . [6274-58]

✔ **New control systems for the 1.5-m and 0.9-m telescopes at Sierra Nevada Observatory,** L. P. Costillo Iciarra, J. L. Ramos Mas, B. Aparicio del Moral, J. M. Ibáñez Mengual, M. Herranz de la Revilla, A. J. Garcia Segura, Instituto de Astrofísica de Andalucia (Spain) . . . . . [6274-59]

✔ **Searching eSTAR in SDSS DR4,** Z. Liu, J. Yang, F. Wu, Institute of Automation (China); Y. Zhao, National Astronomical Observatories (China) . . . . . [6274-60]

✔ **The control system architecture of AMICA, a robotic instrument in an extreme environment,** G. Di Rico, M. Ragni, Osservatorio Astronomico di Teramo (Italy); L. Corcione, Osservatorio Astronomico di Torino (Italy); E. Giro, D. Fantinel, Osservatorio Astronomico di Padova (Italy) . . . . . [6274-61]

✔ **Remir-NCS: the new control software for RemIr camera,** F. D'Alessio, F. Vitali, V. Testa, L. A. Antonelli, Osservatorio Astronomico di Roma (Italy); E. Molinari, Osservatorio Astronomico di Brera (Italy); G. Chincarini, Univ. degli Studi di Milano Bicocca (Italy); F. M. Zerbi, Osservatorio Astronomico di Brera (Italy); M. Rodonò, Osservatorio Astrofisico di Catania (Italy); S. Covino, Osservatorio Astronomico di Brera (Italy); G. Tosti, Univ. degli Studi di Perugia (Italy); P. Conconi, G. Malaspina, Osservatorio Astronomico di Brera (Italy); E. Palazzi, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . [6274-62]

✔ **The Linc-Nirvana common software,** F. R. Briegel, Max-Planck-Institut für Astronomie (Germany) . . . . . [6274-63]

✔ **User interaction with the LUCIFER control software,** V. Knierim, M. Jütte, K. L. Polsterer, Ruhr-Univ. Bochum (Germany) . . . . . [6274-64]

✔ **The LINC-NIRVANA fringe and flexure tracker: Linux real-time solutions,** Y. Wang, T. Bertram, S. Rost, C. Straubmeier, A. Eckart, Univ. zu Köln (Germany) . . . . . [6274-65]

✔ **The LINC-NIRVANA fringe and flexure tracker: piston control strategies,** S. Rost, T. Bertram, C. Straubmeier, Y. Wang, A. Eckart, Univ. zu Köln (Germany) . . . . . [6274-66]

✔ **Object-oriented communications for the NST's telescope control system: design and implementation,** S. Shumko, Big Bear Solar Observatory; G. Yang, New Jersey Institute of Technology . . . . . [6274-68]

✔ **Active remote observing system for the 1-m telescope at Tonantzintla Observatory,** A. Bernal, L. A. Martinez-Vazquez, F. Garfias, H. Hernandez, F. Angeles, Univ. Nacional Autónoma de México (Mexico) . . . . . [6274-69]

✔ **The EMIR observing program manager system: multi-slit positioner software,** J. Richard, California Institute of Technology and Observatoire Mid-Pyrénées (France); S. Brau-Nogue, S. Baratchart, H. Valentin, R. Pello, Observatoire Mid-Pyrénées (France) . . . . . [6274-70]

✔ **Design of a telescope pointing and tracking subsystem for the Big Bear Solar Observatory New Solar Telescope,** J. R. Varsik, Big Bear Solar Observatory; G. Yang, New Jersey Institute of Technology . . . . . [6274-71]

✔ **A comparison of exposure meter systems for three planet-hunting spectrometers: Hamilton, HIRES and APF,** R. I. Kibrick, D. A. Clarke, W. T. S. Deich, D. Tucker, Univ. of California/Santa Cruz . . . . . [6274-72]

✔ **RTS2: a powerful robotic observatory manager,** P. Kubanek, Integral Science Data Ctr. (Switzerland); M. Jelinek, A. de Ugarte Postigo, S. Vitek, Instituto de Astrofísica de Andalucia (Spain); M. Nekola, Czech Technical Univ. in Prague (Czech Republic); J. French, National Univ. of Ireland/Dublin (Ireland) . . . . . [6274-73]

✔ **Another look at web-enabled instrument monitoring and control,** W. T. S. Deich, S. L. Allen, Univ. of California/Santa Cruz . . . . . [6274-74]

✔ **Execution of configurations using the ATST controller,** B. D. Goodrich, National Solar Observatory . . . . . [6274-75]

✔ **The telescope control system of the New Solar Telescope at Big Bear Solar Observatory,** G. Yang, New Jersey Institute of Technology; J. R. Varsik, S. Shumko, Big Bear Solar Observatory; C. J. Denker, New Jersey Institute of Technology; S. Choi, Korea Astronomy and Space Science Institute (South Korea); H. Wang, New Jersey Institute of Technology . . . . . [6274-76]

✔ **Control of a woofer tweeter system of deformable mirrors,** P. J. Hampton, R. Conan, C. H. Bradley, P. Agathoklis, Univ. of Victoria (Canada) . . . [6274-77]

✔ **The virtual camera specification at the Dunn Solar Tower,** C. Berst, National Solar Observatory . . . . . [6274-78]

✔ **Distributed computing architecture for image-based wavefront sensing and 2 D FFTs,** J. S. Smith, B. H. Dean, NASA Goddard Space Flight Ctr. . . . . [6274-79]

✔ **LSST camera control system,** S. L. Marshall, Stanford Linear Accelerator Ctr.; J. J. Thaler, Univ. of Illinois at Urbana-Champaign; T. A. Schalk, Univ. of California/Santa Cruz; M. Huffer, S. Luitz, Stanford Linear Accelerator Ctr. . . . . [6274-80]

✔ **The Large Binocular Telescope mount control system architecture,** D. S. Ashby, The Univ. of Arizona; D. L. McKenna, The Univ. of Arizona/ Steward Observatory; J. G. Brynnel, T. Sargent, D. Cox, J. Little, The Univ. of Arizona; K. B. Powell, G. Holmberg, The Univ. of Arizona/Steward Observatory . . . . . [6274-82]

✔ **Subaru Telescope control system: results in last five years and upgrade plans,** S. Sugahara, D. Tomono, T. Usuda, T. Kanzawa, Y. Nabeshima, National Astronomical Observatory of Japan/Subaru Telescope; Y. Uematsu, S. Miki, N. Ito, Mitsubishi Electric Corp. (Japan) . . . . . [6274-83]

✔ **GIANO: software design and acquisition facilities,** E. Rossetti, P. Montegriffo, Osservatorio Astronomico di Bologna (Italy); C. Baffa, E. Giani, Osservatorio Astrofisico di Arcetri (Italy); E. Oliva, Osservatorio Astrofisico di Arcetri (Spain); L. Origlia, Osservatorio Astronomico di Bologna (Italy) [6274-85]

Friday 26 May

SESSION 8

Room: Crystal Ballrooms: D, E . . . . . Fri. 8:40 to 9:20 am

Communications

8:40 am: **Optimizing interactive performance for long-distance remote observing,** R. I. Kibrick, S. L. Allen, Univ. of California/Santa Cruz; A. R. Conrad, G. D. Wirth, W.M. Keck Observatory . . . . . [6274-31]

9:00 am: **Design and implementation of a novel software hub to control heterogeneous network of robotic observatories,** G. Tuparev, Tuparev Technologies (Netherlands); F. V. Hessman, Georg-August-Univ. Göttingen (Germany); I. Nikolova, B. Zlatanov, D. Michova, I. V. Popova, Tuparev Technologies (Bulgaria); K. Bischoff, Halfmann Teleskoptechnik GmbH & Co. KG (Germany) . . . . . [6274-32]

SESSION 9

Room: Crystal Ballrooms: D, E . . . . . Fri. 9:20 to 11:30 am

Telescope and Instrument Control III

9:20 am: **GIANO: the versatile acquisition system,** C. Baffa, V. Biliotti, S. Gennari, E. Giani, E. Oliva, Osservatorio Astrofisico di Arcetri (Italy); L. Origlia, E. Rossetti, Osservatorio Astronomico di Bologna (Italy); M. Sozzi, Osservatorio Astrofisico di Arcetri (Italy) . . . . . [6274-33]

9:40 am: **Control of AzTEC on the JCMT using the LMT monitor and control system,** K. Souccar, Univ. of Massachusetts/Amherst . . . . . [6274-34]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **Perfromance of the JCMT chopping secondary mirror after a major hardware upgrade,** C. A. Walther, T. C. Chuter, Joint Astronomy Ctr. . . [6274-35]

10:50 am: **Real-time controls software infrastructure for the Magdalena Ridge Observatory interferometer: initial results with RTC framework,** T. A. Coleman, New Mexico Institute of Mining and Technology; T. G. Lockhart, Jet Propulsion Lab. . . . . [6274-36]

11:10 am: **Application of SQL database to the control system of MOIRCS,** T. Yoshikawa, K. Omata, M. Konishi, National Astronomical Observatory of Japan/ Subaru Telescope; T. Ichikawa, Tohoku Univ. (Japan); R. Suzuki, C. Tokoku, Y. Katsuno, T. Nishimura, National Astronomical Observatory of Japan/Subaru Telescope . . . . . [6274-37]

Lunch Break . . . . . 11:30 am to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Monday-Wednesday 29-31 May 2006 • Proceedings of SPIE Vol. 6275

Millimeter and Submillimeter Detectors and Instrumentation for Astronomy III

Conference Chairs: **Jonas Zmuidzinas**, California Institute of Technology
Photo not available

Wayne S. Holland, UK Astronomy Technology Ctr. (United Kingdom)

Stafford Withington, Univ. of Cambridge (United Kingdom)
Photo not available
William D. Duncan, National Institute of Standards and Technology
Photo not available

Monday 29 May

SESSION 1

Room: Crystal Ballrooms: D, E . . . . . Mon. 8:30 am to 12:00 pm

Detectors

8:30 am: **Silicon bolometers large arrays applied for the sub-mm photometer of Herschel/PACS,** F. Simoens, P. Agnèse, A. Béguin, CEA-LETI (France); L. R. Rodriguez, CEA Saclay (France) . . . . . [6275-01]

8:50 am: **A study on the use of the PACS bolometer arrays on submillimeter ground-based telescopes,** V. Reveret, European Southern Observatory (Chile); P. André, B. Horeau, J. Le Pennec, L. R. Rodriguez, CEA Saclay (France); P. Agnèse, CEA-LETI (France) . . . . . [6275-02]

9:10 am: **ARTEMIS: filled bolometer arrays for sub-millimeter instrumentation of the next-generation telescopes,** M. Talvard, P. André, L. R. Rodriguez, V. Minier, CEA Saclay (France); A. Benoit, Ctr. National de la Recherche Scientifique (France); F. P. Pajot, Univ. Paris-Sud II (France); L. Vigroux, Institut d'Astrophysique de Paris (France); O. Boulade, E. Doumayrou, D. Dubreuil, G. A. Durand, P. Gallais, B. Horeau, P. Lagage, J. Le Pennec, M. Lortholary, J. Martignac, C. Veyssiere, CEA Saclay (France) . . . . . [6275-03]

9:30 am: **Performance of SIS photon detectors for superconductive imaging submillimeter-wave camera (SISCAM),** H. Matsuo, H. Nagata, Y. Mori, J. Kobayashi, National Astronomical Observatory of Japan (Japan); T. Okaniwa, The Toho Univ. (Japan); T. Yamakura, Univ. of Tsukuba (Japan); S. Ariyoshi, The Institute of Physical and Chemical Research (Japan) . . . . . [6275-04]

9:50 am: **Long wavelength response of unstressed and stressed Ge:Ga detectors,** H. Hübers, S. Pavlov, DLR (Germany); K. Holldack, U. Schade, G. Wüstefeld, Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung GmbH (Germany) . . . . . [6275-05]

Coffee Break . . . . . 10:10 to 10:40 am

10:40 am: **A photon counting hot-electron bolometer for Space THz spectroscopy** *(Presentation Only),* B. S. Karasik, J. H. Kawamura, W. R. McGrath, Jet Propulsion Lab.; J. Wei, D. Olaya, M. E. Gershenson, S. Pereverzev, Rutgers Univ.; A. V. Sergeev, SUNY/Univ. at Buffalo . . . . . [6275-06]

11:00 am: **A microstrip coupled TES detector,** L. Dunlop, D. J. Goldie, S. Withington, Univ. of Cambridge (United Kingdom); G. Yassin, Univ. of Oxford (United Kingdom) . . . . . [6275-07]

11:20 am: **Progress on background-limited membrane-isolated TES bolometers for SPICA,** M. E. Kenyon, P. K. Day, C. M. Bradford, H. G. Leduc, J. J. Bock, Jet Propulsion Lab. . . . . [6275-08]

11:40 am: **An array of antenna coupled transition edge sensor bolometers,** R. C. O'Brient, Univ. of California/Berkeley . . . . . [6275-09]

Lunch Break . . . . . 12:00 to 1:00 pm

SESSION 2

Room: Crystal Ballrooms: D, E . . . . . Mon. 1:00 to 2:40 pm

Detectors/Cryogenics

1:00 pm: **Far infrared through millimeter backshort-under-grid arrays,** C. A. Allen, D. J. Benford, J. A. Chervenak, D. T. Chuss, J. G. Staguhn, T. M. Miller, S. H. Moseley, Jr., E. J. Wollack, NASA Goddard Space Flight Ctr. . . . . [6275-10]

1:20 pm: **Measuring two-millimeter radiation with one-millimeter TES bolometers for ACT,** M. D. Niemack, Princeton Univ. . . . . [6275-11]

1:40 pm: **A miniature dilution refrigerator for sub-Kelvin detector arrays,** G. Teleberg, L. Piccirillo, Cardiff Univ. (United Kingdom) . . . . . [6275-12]

2:00 pm: **Thermal design of the SPICA/ESI instrument,** D. K. Griffin, Rutherford Appleton Lab. (United Kingdom) . . . . . [6275-13]

2:20 pm: **Subscale cryo-thermal tests of a large 4 K space telescope,** M. J. DiPirro, D. T. Leisawitz, S. Ollendorf, A. N. Mattern, J. J. Francis, M. L. Jackson, J. G. Tuttle, NASA Goddard Space Flight Ctr. . . . . [6275-14]

SESSION 3

Room: Crystal Ballrooms: D, E . . . . . Mon. 2:40 to 5:10 pm

Heterodyne Detectors and Cameras

2:40 pm: **Heterodyne single-pixel facility instrumentation for APEX Telescope,** V. Y. Belitsky, I. Lapkin, R. R. Monje, V. Vassilev, Chalmers Tekniska Högskola (Sweden); C. Risacher, European Southern Observatory (Chile); A. Pavolotsky, D. Meledin, M. Olberg, M. Pantaleev, R. S. Booth, Chalmers Tekniska Högskola (Sweden) . . . . . [6275-15]

3:00 pm: **Heterodyne receiver at 2.5 THz with quantum cacsade laser and hot electron bolometric mixer,** H. Hübers, S. Pavlov, H. Richter, A. D. Semenov, DLR (Germany); A. Tredicucci, R. Köhler, L. Mahler, Scuola Normale Superiore di Pisa (Italy); H. E. Beere, E. H. Linfield, D. A. Ritchie, Univ. of Cambridge (United Kingdom) . . . . . [6275-16]

Coffee Break . . . . . 3:20 to 3:50 pm

3:50 pm: **2.5THz multipixel heterodyne receiver based on NbN HEB mixers,** S. Cherednichenko, V. Drakinskiy, Chalmers Tekniska Högskola (Sweden); J. B. Baubert, J. Krieg, Observatoire de Paris (France); H. Hubers, A. D. Semenov, DLR (Germany); G. N. Gol'tsman, Moscow State Pedagogical Univ. (Russia) . . . . . [6275-18]

4:10 pm: **A 385-500 GHz SIS mixer for APEX Telescope,** R. R. Monje, V. Y. Belitsky, V. Vassilev, A. Pavolotsky, I. Lapkin, Chalmers Tekniska Högskola (Sweden) . . . . . [6275-19]

4:30 pm: **GREAT: the German first light heterodyne instrument for SOFIA,** U. U. Graf, Univ. zu Köln (Germany); S. Heyminck, R. Güsten, Max-Planck-Institut für Radioastronomie (Germany); P. Hartogh, Max-Planck-Institut für Sonnensystemforschung (Germany); H. Hübers, DLR (Germany); D. Rabanus, Univ. zu Köln (Germany); H. L. Röser, Univ. Stuttgart (Germany); J. Stutzki, Univ. zu Köln (Germany); P. van der Wal, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6275-20]

4:50 pm: **Terahertz waveguide HEB mixers using silicon-on-insulator substrates,** A. J. Skalare, J. A. Stern, I. Mehdi, F. W. Maiwald, Jet Propulsion Lab. . . . . [6275-21]

Tuesday 30 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Tues. 8:30 to 9:20 am

Novel Technology for Optical and Infrared Astronomy

Colin R. Cunningham,
UK Astronomy Technology Ctr. (United Kingdom)

Break . . . . . 9:20 to 9:35 am

SESSION 4

Room: Crystal Ballrooms: D, E . . . . . Tues. 9:35 to 11:50 am

Heterodyne Detectors and Cameras/Optics

9:35 am: **Heterodyne array instruments for submillimeter wavelengths,** A. J. Skalare, G. Chattopadhyay, I. Mehdi, J. S. Ward, E. T. Schlecht, P. H. Siegel, Jet Propulsion Lab. . . . . [6275-22]

9:55 am: **CHAMP+: a powerful sub-mm array for APEX,** C. Kasemann, R. Güsten, S. Heyminck, B. Klein, T. Klein, S. D. Philipp, Max-Planck-Institut für Radioastronomie (Germany); A. M. Baryshev, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands) . . . . . [6275-23]

10:15 am: **Supercam, a 64 pixel heterodyne imaging array for the 870 micron atmospheric window,** C. E. Groppi, C. K. Walker, C. Kulesa, D. R. Golish, P. Gensheimer, A. S. Hedden, S. Bussmann, The Univ. of Arizona/Steward Observatory; S. Weinreb, T. B. H. Kuiper, Jet Propulsion Lab.; J. W. Kooi, California Institute of Technology; A. W. Lichtenberger, Univ. of Virginia; G. Narayanan, Univ. of Massachusetts/Amherst . . . . . [6275-24]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **A CSO submillimeter active optics system,** M. Leong, Caltech Submillmeter Observatory; R. Peng, H. Yoshida, R. Chamberlin, Caltech Submillimeter Observatory; T. G. Phillips, California Institute of Technology . . . . . [6275-25]

11:20 am: **Optical physics of imaging and interferometric phased arrays** *(Invited Paper)***,** S. Withington, G. Saklatvala, M. P. Hobson, Univ. of Cambridge (United Kingdom) . . . . . [6275-26]

Lunch Break . . . . . 11:50 am to 12:50 pm

SESSION 5

Room: Crystal Ballrooms: D, E . . . . . Tues. 12:50 to 2:50 pm

Optics

12:50 pm: **Simulations of multimode bolometric interferometers,** G. Saklatvala, M. P. Hobson, S. Withington, Univ. of Cambridge (United Kingdom) . . . . . [6275-27]

1:10 pm: **A test setup for the characterization of FIR filters under cryogenic conditions,** S. M. Birkmann, U. Grözinger, J. M. Stegmaier, E. Pitz, D. Lemke, Max-Planck-Institut für Astronomie (Germany) . . . . . [6275-28]

1:30 pm: **Thermal filtering for large aperture cryogenic detector arrays,** C. E. Tucker, P. A. R. Ade, Cardiff Univ. (United Kingdom) . . . . . [6275-29]

1:50 pm: **A review of metal mesh filters** *(Invited Paper)***,** P. A. R. Ade, G. Pisano, C. E. Tucker, S. O. Weaver, Cardiff Univ. (United Kingdom) . . . . . [6275-30]

2:10 pm: **Electromagnetic considerations for Planar bolometer arrays in the single mode limit,** E. J. Wollack, D. T. Chuss, S. H. Moseley, Jr., NASA Goddard Space Flight Ctr. . . . . [6275-31]

2:30 pm: **A modal theory of detectors,** G. Saklatvala, S. Withington, M. P. Hobson, Univ. of Cambridge (United Kingdom) . . . . . [6275-32]

SESSION 6

Room: Crystal Ballrooms: D, E . . . . . Tues. 2:50 to 5:00 pm

FTS/Spectrometers/Interferometers

2:50 pm: **Millimeter-wave bolometric interferometer,** A. Korotkov, J. Kim, G. S. Tucker, Brown Univ.; A. Gault, P. O. Hyland, S. Malu, P. T. Timbie, Univ. of Wisconsin/Madison; P. A. R. Ade, C. Calderon, L. Piccirillo, Cardiff Univ. (United Kingdom) . . . . . [6275-33]

3:10 pm: **Water vapor in the atmosphere: an examination for CARMA phase correction,** Y. Shiao, L. W. Looney, Univ. of Illinois at Urbana-Champaign; D. P. Woody, California Institute of Technology; R. L. Plambeck, A. D. Bolatto, Univ. of California/Berkeley . . . . . [6275-34]

Coffee Break . . . . . 3:30 to 4:00 pm

4:00 pm: **Fundamental limits to wavefront sensing in the submillimeter,** E. Serabyn, Jet Propulsion Lab. . . . . [6275-35]

4:20 pm: **Z-Spec: a broadband, direct-detection, millimeter-wave spectrometer - instrument status and first results,** L. Earle, Univ. of Colorado/Boulder; P. A. R. Ade, Cardiff Univ. (United Kingdom); J. E. Aguirre, Univ. of Colorado/Boulder; J. O. Battle, J. J. Bock, C. M. Bradford, M. W. Dragovan, Jet Propulsion Lab.; L. Duband, CEA Grenoble (France); J. Glenn, Univ. of Colorado/Boulder; G. S. Griffin, V. V. Hristov, California Institute of Technology; P. R. Maloney, Univ. of Colorado/Boulder; H. Matsuhara, Japan Aerospace Exploration Agency (Japan); B. J. Naylor, California Institute of Technology; H. T. Nguyen, M. Yun, Jet Propulsion Lab.; J. Zmuidzinas, California Institute of Technology . . . . . [6275-37]

4:40 pm: **Fast Fourier transform spectrometers (FFTS),** B. Klein, I. Krämer, S. D. Philipp, Max-Planck-Institut für Radioastronomie (Germany) . . . . . [6275-38]

✔Poster Session II

Room: Palms Ballroom: Canary & Royal Salons . . Tues. 6:00 to 7:30 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Tuesday from 6:00 to 7:30 pm.

Poster Session II: Authors may set up their posters starting Monday at 10:00 am. All posters must be removed no later than Wednesday 2:00 pm.

Detectors

✔ **Kinetic inductance detectors for 200μm astronomy,** S. Doyle, P. D. Mauskopf, C. J. Dunscombe, A. Porch, Cardiff Univ. (United Kingdom) . . . . . [6275-61]

✔ **Two-dimensional electron gas cold electron bolometer with superconducting contacts,** D. Morozov, I. D. Bacchus, P. D. Mauskopf, Cardiff Univ. (United Kingdom); M. Henini, The Univ. of Nottingham (United Kingdom); M. Elliott, C. J. Dunscombe, Cardiff Univ. (United Kingdom) . . . . . [6275-62]

✔ **Fabricating transition-edge bolometers and the SQUID readout on one chip,** T. May, S. Anders, L. Fritzsch, R. Boucher, V. Zakosarenko, H. Meyer, Institut für Physikalische Hochtechnologie e.V. (Germany); E. Kreysa, N. S. Jethava, Max-Planck-Institut für Radioastronomie (Germany) . . [6275-63]

✔ **Power dependence of phase noise in microwave kinetic inductance detectors,** J. Gao, J. Zmuidzinas, A. Vayonakis, S. Kumar, California Institute of Technology; B. A. Mazin, P. K. Day, H. G. LeDuc, Jet Propulsion Lab. . . . . [6275-64]

✔ **Distributed antenna-coupled transition edge sensors,** P. K. Day, H. G. LeDuc, Jet Propulsion Lab.; J. Zmuidzinas, California Institute of Technology . . . . . [6275-65]

✔ **Development of a GaAs based BIB detector for sub-mm wavelengths,** L. A. Reichertz, Univ. of California/Berkeley; J. W. Beeman, Lawrence Berkeley National Lab.; B. L. Cardozo, Univ. of Michigan; G. H. Jakob, R. O. Katterloher, Max-Planck-Institut für extraterrestrische Physik (Germany); N. M. Haegel, Naval Postgraduate School; E. E. Haller, Lawrence Berkeley National Lab. . . . . [6275-66]

Heterodyne Detectors and Cameras

✔ **A sideband separation SIS mixer for 275-370 GHz for the APEX Telescope,** C. Risacher, European Southern Observatory (Chile); R. R. Monje, V. Vassilev, A. Pavolotsky, V. Y. Belitsky, Chalmers Tekniska Högskola (Sweden) . [6275-17]

✔ **Waveguide coupling of superconducting planar circuits for millimeter wave detection,** W. Hsieh, N. T. Cao, D. T. Chuss, A. J. Kogut, M. Limon, S. H. Moseley, Jr., G. Schneider, E. H. Sharp, T. R. Stevenson, D. E. Travers, K. U-yen, E. J. Wollack, NASA Goddard Space Flight Ctr. . . . . [6275-67]

✔ **Development of 1.25 THz SIS mixer for Herschel Space Observatory,** A. Karpov, D. Miller, F. R. Rice, California Institute of Technology; J. A. Stern, B. Bumble, H. G. LeDuc, Jet Propulsion Lab.; J. Zmuidzinas, California Institute of Technology . . . . . [6275-79]

Optics

✔ **Elevation angle dependence of the SMA antenna focus position,** S. Matsushita, Academia Sinica (Taiwan); M. Saito, K. Sakamoto, National Astronomical Observatory of Japan (Japan); T. R. Hunter, N. A. Patel, T. K. Sridharan, R. W. Wilson, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6275-68]

✔ **Displacement sensors applied on active optics in astronomical telescope,** Y. Qi, Z. Zhang, Nanjing Institute of Astronomical Optics & Technology (China) . . . . . [6275-69]

FTS/Spectrometers/Interferometers

✔ **Characterization of instrumental phase stability,** D. Kubo, Institute of Astronomy and Astrophysics; T. R. Hunter, Harvard-Smithsonian Ctr. for Astrophysics; R. D. Christensen, Smithsonian Institution . . . . . [6275-36]

✔ **Preliminary design of FTS-2: an imaging Fourier transform spectrometer for SCUBA-2,** D. A. Naylor, B. G. Gom, B. Zhang, Univ. of Lethbridge (Canada) . . . . . [6275-70]

✔ **Astronomical mm and sub-mm observations with Multi-Fourier Transform interferometer in 2005 and 2006,** I. S. Ohta, National Astronomical Observatory of Japan (Japan); M. Hattori, J. Takahashi, Y. Chinone, Y. Luo, Tohoku Univ. (Japan); H. Matsuo, National Astronomical Observatory of Japan (Japan) . . . . . [6275-71]

✔ **A fast Fourier transform spectrometer design for submillimeter site testing,** M. V. Velazquez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) . . . . . [6275-80]

Cameras

✔ **Finite-element modelling of magnetic shielding for SCUBA-2,** M. I. Hollister, Univ. of Edinburgh (United Kingdom); M. D. Audley, Univ. of Cambridge (United Kingdom); W. D. Duncan, National Institute of Standards and Technology; W. S. Holland, UK Astronomy Technology Ctr. (United Kingdom) . . . . [6275-72]

✔ **Development of superconductive imaging submillimeter-wave camera with nine detector elements (SISCAM-9),** Y. Mori, T. Okaniwa, M. Nakahashi, National Astronomical Observatory of Japan (Japan); S. Ariyoshi, The Institute of Physical and Chemical Research (Japan); H. Matsuo, National Astronomical Observatory of Japan (Japan) . . . . . [6275-73]

CMB/CMBpol/Polarimetry

✔ **Developing microstrip-coupled TES bolometers for CLOVER,** M. D. Audley, R. W. Barker, M. Crane, R. J. Dace, D. Glowacka, D. J. Goldie, A. N. Lasenby, H. M. Stevenson, V. N. Tsaneva, S. Withington, Univ. of Cambridge (United Kingdom); P. K. Grimes, G. Yassin, Univ. of Oxford (United Kingdom); B. J. Johnson, L. Piccirillo, G. Pisano, Cardiff Univ. (United Kingdom); K. D. Irwin, National Institute of Standards and Technology; M. Halpern, The Univ. of British Columbia (Canada) . . . . . [6275-75]

✔ **Investigation of planar switches for large format CMB polarization instruments,** P. K. Grimes, G. Yassin, C. E. North, M. E. Jones, Univ. of Oxford (United Kingdom); P. D. Mauskopf, Cardiff Univ. (United Kingdom); L. S. Kuzmin, Chalmers Tekniska Högskola (Sweden) . . . . . [6275-76]

Readout/Electronics

✔ **15 pixels digital autocorrelation spectrometer system,** C. Lee, Korea Astronomy and Space Science Institute (South Korea) . . . . . [6275-77]

✔ **Progress on GaAs cryogenic readout circuits for SISCAM,** H. Nagata, J. Kobayashi, H. Matsuo, National Astronomical Observatory of Japan (Japan); M. Akiba, M. Fujiwara, National Institute of Information and Communications Technology (Japan) . . . . . [6275-78]

Wednesday 31 May

SESSION 7

Room: Crystal Ballrooms: D, E . . . . . Wed. 8:00 to 9:20 am

Herschel and Planck

8:00 am: **Data analysis of the Planck/LFI ground-test campaign,** M. Tomasi, Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy) . . . . . [6275-39]

8:20 am: **The 300mK system for Herschel-SPIRE,** P. Hargrave, Cardiff Univ. (United Kingdom); J. J. Bock, Jet Propulsion Lab.; C. Brockley-Blatt, MSSL (United Kingdom); J. Coker, Univ. College London (United Kingdom); L. Duband, CEA Grenoble (France); A. Goizel, D. K. Griffin, B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom); B. Winter, Univ. College London (United Kingdom) . . . . . [6275-40]

8:40 am: **Performance of flight-model on-board calibration sources on Herschel-SPIRE,** P. Hargrave, T. J. Waskett, Cardiff Univ. (United Kingdom); T. L. Lim, B. M. Swinyard, Rutherford Appleton Lab. (United Kingdom) . [6275-41]

9:00 am: **Proton irradiation of PACS stressed Gallium doped Germanium detector arrays to simulate L2-orbit conditions,** R. O. Katterloher, L. Barl, A. Poglitsch, Max-Planck-Institut für extraterrestrische Physik (Germany); P. Royer, Katholieke Univ. Leuven (Belgium); J. M. Stegmaier, Max-Planck-Institut für Astronomie (Germany) . . . . . [6275-42]

SESSION 8

Room: Crystal Ballrooms: D, E . . . . . Wed. 9:20 to 11:40 am

Herschel/Cameras

9:20 am: **Low noise, low power readout electronics circuit development in standard CMOS technology for 4 K applications,** P. Merken, T. Souverijns, J. Putzeys, Y. Creten, C. A. Van Hoof, IMEC (Belgium) . . . . . [6275-43]

9:40 am: **The band 3 and 4 flight model mixer units for HIFI,** G. de Lange, B. D. Jackson, L. de Jong, W. M. Laauwen, SRON Nationaal Instituut voor Ruimteonderzoek (Netherlands); T. Zijlstra, M. Kroug, T. M. K. Klapwijk, Technische Univ. Delft (Netherlands) . . . . . [6275-44]

10:00 am: **A report of the laboratory performance of the flight bolometric detector arrays for SPIRE/Herschel,** H. T. Nguyen, Jet Propulsion Lab. [6275-45]

Coffee Break . . . . . 10:20 to 10:40 am

Keynote Presentation

10:40 am: **Direct detection cameras** *(Invited Paper)***,** K. D. Irwin, National Institute of Standards and Technology . . . . . [6275-46]

SESSION 9

Room: Crystal Ballrooms: D, E . . . . . Wed. 11:40 am to 12:40 pm

Cameras I

11:40 am: **A superconducting bolometer camera for the APEX telescope,** N. S. Jethava, E. Kreysa, W. Esch, Max-Planck-Institut für Radioastronomie (Germany); T. May, S. Anders, L. Fritzsch, R. Boucher, H. Meyer, Institut für Physikalische Hochtechnologie e.V. (Germany) . . . . . [6275-47]

12:00 pm: **A 90GHz bolometer array for the Green Bank Telescope,** S. R. Dicker, M. J. Devlin, Univ. of Pennsylvania; B. S. Mason, National Radio Astronomy Observatory; P. Korngut, Univ. of Pennsylvania; D. J. Benford, S. H. Moseley, Jr., J. A. Chervenak, NASA Goddard Space Flight Ctr.; K. D. Irwin, National Institute of Standards and Technology; C. E. Tucker, Cardiff Univ. (United Kingdom) . . . . . [6275-48]

12:20 pm: **First astronomical images with an array of multiplexed superconducting bolometers,** D. J. Benford, J. G. Staguhn, T. J. Ames, C. A. Allen, J. A. Chervenak, NASA Goddard Space Flight Ctr.; C. R. Kennedy, Univ. of Notre Dame; S. Lefranc, Univ. Paris-Sud II (France); S. F. Maher, Science Systems and Applications, Inc.; S. H. Moseley, Jr., NASA Goddard Space Flight Ctr.; F. P. Pajot, C. Rioux, Univ. Paris-Sud II (France); R. A. Shafer, G. M. Voellmer, NASA Goddard Space Flight Ctr. . . . . [6275-49]

Lunch Break . . . . . 12:40 to 1:40 pm

SESSION 10

Room: Crystal Ballrooms: D, E . . . . . Wed. 1:40 to 2:40 pm

Cameras II

1:40 pm: **GISMO: a 2-millimeter bolometer camera for the IRAM 30-m Telescope,** J. G. Staguhn, D. J. Benford, C. A. Allen, S. H. Moseley, Jr., T. J. Ames, NASA Goddard Space Flight Ctr.; W. Brunswig, Instituto de RadioAstronomía Milimétrica (Spain); D. T. Chuss, NASA Goddard Space Flight Ctr.; S. F. Maher, Science Systems and Applications, Inc.; C. T. Marx, T. M. Miller, NASA Goddard Space Flight Ctr.; S. Navarro, Instituto de RadioAstronomía Milimétrica (Spain); E. H. Sharp, E. J. Wollack, NASA Goddard Space Flight Ctr. . . . . [6275-50]

2:00 pm: **SCUBA-2: a 10,000 pixel submillimeter camera for the James Clerk Maxwell Telescope,** W. S. Holland, M. J. MacIntosh, A. E. Fairley, D. Kelly, D. Montgomery, D. C. Gostick, E. Atad-Ettedgui, M. A. Ellis, I. Robson, M. I. Hollister, UK Astronomy Technology Ctr. (United Kingdom); P. A. R. Ade, A. L. Woodcraft, D. Bintley, I. Walker, Cardiff Univ. (United Kingdom); K. D. Irwin, G. C. Hilton, W. D. Duncan, C. D. Reintsema, National Institute of Standards and Technology; A. J. Walton, W. Parkes, C. C. Dunare, Univ. of Edinburgh (United Kingdom); M. Fich, J. B. Kycia, Univ. of Waterloo (Canada); M. Halpern, D. Scott, A. Gibb, J. Molnar, The Univ. of British Columbia (Canada); S. C. Craig, T. Chylek, T. Jenness, F. Economou, G. R. Davis, Joint Astronomy Ctr. . . . . [6275-51]

2:20 pm: **Characterization of SCUBA-2 1280 pixel submillimeter superconducting bolometer arrays,** A. L. Woodcraft, P. A. R. Ade, D. Bintley, J. S. House, C. L. Hunt, R. V. Sudiwala, Cardiff Univ. (United Kingdom); W. B. Doriese, W. D. Duncan, G. C. Hilton, K. D. Irwin, C. D. Reintsema, J. N. Ullom, National Institute of Standards and Technology; M. D. Audley, Univ. of Cambridge (United Kingdom); M. A. Ellis, W. S. Holland, M. J. MacIntosh, UK Astronomy Technology Ctr. (United Kingdom); C. C. Dunare, W. Parkes, A. J. Walton, Univ. of Edinburgh (United Kingdom); J. B. Kycia, Univ. of Waterloo (Canada); M. Halpern, The Univ. of British Columbia (Canada) . . . . . [6275-52]

SESSION 11

Room: Crystal Ballrooms: D, E . . . . . Wed. 2:40 to 5:40 pm

CMB/CMBpol/Polarimetry

2:40 pm: **Instrumentation for the CCAT Telescope,** G. J. Stacey, Cornell Univ.; S. R. Golwala, California Institute of Technology; C. M. Bradford, C. D. Dowell, Jet Propulsion Lab.; G. Cortes-Medellin, T. Nikola, Cornell Univ.; J. Zmuidzinas, California Institute of Technology; T. L. Herter, Cornell Univ.; S. J. Radford, California Institute of Technology; J. P. Lloyd, Cornell Univ. . . . . [6275-53]

3:00 pm: **SHARP: the SHARC-II polarimeter for CSO,** H. Li, Northwestern Univ.; M. Attard, The Univ. of Western Ontario (Canada); D. T. Chuss, NASA Goddard Space Flight Ctr.; J. Davidson, J. L. Dotson, NASA Ames Research Ctr.; C. D. Dowell, California Institute of Technology; R. H. Hildebrand, The Univ. of Chicago; M. Houde, The Univ. of Western Ontario (Canada); L. Kirby, The Univ. of Chicago; M. M. Krejny, Northwestern Univ.; A. Lazarian, Univ. of Wisconsin/ Madison; L. Leeuw, The Univ. of Chicago; S. H. Moseley, Jr., NASA Goddard Space Flight Ctr.; G. Novak, Northwestern Univ.; H. Shinnaga, Caltech Submillimeter Observatory; J. E. Vaillancourt, The Univ. of Chicago; F. Yusef-Zadeh, Northwestern Univ. . . . . [6275-54]

3:20 pm: **Initial operation of the array of microwave background anisotropy (AMiBA),** C. T. Li, M. Chen, H. Jiang, Y. Hwang, C. Han, P. Martin-Cocher, Institute of Astronomy and Astrophysics (Taiwan) . . . . . [6275-55]

Coffee Break . . . . . 3:40 to 4:00 pm

4:00 pm: **The primordial anisotropy polarization pathfinder array (PAPPA): instrument overview and status,** D. T. Chuss, N. T. Cao, D. J. Fixsen, G. F. Hinshaw, A. J. Kogut, M. Limon, S. H. Moseley, Jr., E. H. Sharp, K. U-Yen, E. J. Wollack, T. R. Stevenson, W. Hsieh, NASA Goddard Space Flight Ctr.; M. J. Devlin, S. R. Dicker, C. Semisch, Univ. of Pennsylvania; N. G. Phillips, NASA Goddard Space Flight Ctr.; K. D. Irwin, National Institute of Standards and Technology; N. S. Barker, Univ. of Virginia . . . . . [6275-56]

4:20 pm: **The Robinson gravitational wave background telescope,** K. W. Yoon, California Institute of Technology; P. A. R. Ade, Cardiff Univ. (United Kingdom); D. Barkats, California Institute of Technology; J. O. Battle, Jet Propulsion Lab.; E. Bierman, Univ. of California/San Diego; J. J. Bock, Jet Propulsion Lab.; J. Brevik, H. C. Chiang, A. Crites, California Institute of Technology; C. D. Dowell, Jet Propulsion Lab.; L. Duband, CEA Grenoble (France); G. S. Griffin, E. F. Hivon, California Institute of Technology; W. L. Holzapfel, Univ. of California/Berkeley; V. V. Hristov, California Institute of Technology; B. G. Keating, Univ. of California/ San Diego; J. M. Kovac, C. Kuo, A. E. Lange, E. M. Leitch, P. V. Mason, California Institute of Technology; Y. D. Takahashi, Univ. of California/Berkeley; T. Renbarger, Univ. of California/San Diego; L. C. Weintraub, California Institute of Technology; D. Woolsey, Univ. of California/Berkeley . . . . . [6275-57]

4:40 pm: **Clover: a high-sensitivity polarization instrument for CMB B-mode observations,** P. G. Calisse, P. A. R. Ade, Cardiff Univ. (United Kingdom); M. D. Audley, Univ. of Cambridge (United Kingdom); P. Cabella, Univ. of Oxford (United Kingdom); A. D. Challinor, Univ. of Cambridge (United Kingdom); P. Ferreira, Univ. of Oxford (United Kingdom); W. K. Gear, Cardiff Univ. (United Kingdom); D. J. Goldie, Univ. of Cambridge (United Kingdom); P. K. Grimes, Univ. of Oxford (United Kingdom); K. Isaac, Cardiff Univ. (United Kingdom); M. E. Jones, Univ. of Oxford (United Kingdom); B. Kiernan, Cardiff Univ. (United Kingdom); M. Craine, R. W. Barker, K. Grainge, Univ. of Cambridge (United Kingdom); P. F. Horner, B. J. Johnson, Cardiff Univ. (United Kingdom); A. N. Lasenby, Univ. of Cambridge (United Kingdom); B. Maffei, P. D. Mauskopf, S. J. Melhuish, Cardiff Univ. (United Kingdom); C. E. North, Univ. of Oxford (United Kingdom); A. Orlando, S. M. Parsley, L. Piccirillo, L. Pietranera, O. E. Mallie, G. Pisano, G. Savini, Cardiff Univ. (United Kingdom); H. Stephenson, Univ. of Cambridge (United Kingdom); A. C. Taylor, Univ. of Oxford; G. Teleberg, I. Thomas, Cardiff Univ. (United Kingdom); V. N. Tsaneva, Univ. of Cambridge (United Kingdom); C. E. Tucker, R. Tucker, I. Walker, S. Wilcox, Cardiff Univ. (United Kingdom); S. Withington, Univ. of Cambridge (United Kingdom); G. Yassin, Univ. of Oxford; L. Dunlop, D. Glowacka, D. T. O'Dea, G. Rocha, Univ. of Cambridge (United Kingdom); A. C. Readhead, California Institute of Technology . . . . . [6275-58]

5:00 pm: **Antenna-coupled TES bolometers for CMB polarimetry,** C. Kuo, California Institute of Technology and Jet Propulsion Lab.; J. J. Bock, Jet Propulsion Lab.; S. R. Golwala, California Institute of Technology; M. E. Kenyon, Jet Propulsion Lab.; A. E. Lange, California Institute of Technology; H. G. LeDuc, Jet Propulsion Lab.; P. Rossinot, A. Vayonakis, G. Wang, J. Zmuidzinas, California Institute of Technology . . . . . [6275-59]

5:20 pm: **The variable-delay polarization modulator,** M. M. Krejny, Northwestern Univ.; D. T. Chuss, NASA Goddard Space Flight Ctr.; G. Novak, Northwestern Univ.; G. M. Voellmer, E. J. Wollack, NASA Goddard Space Flight Ctr.; C. K. Walker, The Univ. of Arizona/Steward Observatory; D. J. Benford, J. G. Staguhn, S. H. Moseley, Jr., NASA Goddard Space Flight Ctr.; C. Kulesa, C. Y. Drouet d'Aubigny, D. R. Golish, A. S. Hedden, The Univ. of Arizona/Steward Observatory; R. F. Loewenstein, The Univ. of Chicago . . . . . [6275-60]

Wednesday-Saturday 24-27 May 2006 • Proceedings of SPIE Vol. 6276

Conference Chairs:
David A. Dorn, Ball Aerospace & Technologies Corp.

Andrew D. Holland, Brunel Univ. (United Kingdom)

High Energy, Optical, and Infrared Detectors for Astronomy II

Program Committee: **Ken J. Ando**, Raytheon Vision Systems; **Mark W. Bautz**, Massachusetts Institute of Technology; **James W. Beletic**, Rockwell Scientific Co., LLC; **Morley Blouke**, Ball Aerospace & Technologies Corp.; **Carl Budtz-Jørgensen**, Danish National Space Ctr. (Denmark); **Barry E. Burke**, MIT Lincoln Lab.; **Mark Clampin**, NASA Goddard Space Flight Ctr.; **Gerd Finger**, European Southern Observatory (Germany); **James D. Garnett**, Rockwell Scientific Co., LLC; **Fiona A. Harrison**, California Institute of Technology; **Alan W. Hoffman**, Raytheon Vision Systems; **Paul R. Jorden**, e2v technologies ltd. (United Kingdom); **Satoshi Miyazaki**, National Astronomical Observatory of Japan; **Ali Mohammadzadeh**, European Space Agency (France); **Peter J. Pool**, e2v technologies ltd. (United Kingdom); **Lothar Strüder**, Max-Planck-Institut für extraterrestrische Physik (Germany) and Max-Planck-Institut Halbleiterlabor (Germany); **Tadayuki Takahashi**, Japan Aerospace Exploration Agency (Japan); **Hiroshi Tsunemi**, Osaka Univ. (Japan)

Wednesday 24 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Wed. 1:00 to 2:00 pm

Challenges for Astronomy and Astrophysics Projects in a Changing Budget Environment

Garth Illingworth, Univ. of California/Santa Cruz/Lick Observatory

Break . . . . . 2:00 to 2:15 pm

SESSION 1
Room: Crystal Ballrooms: F . . . . . Wed. 2:15 to 3:35 pm

Visible Detectors

2:15 pm: **The LSST sensor technologies studies,** J. C. Geary, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6276-01]

2:35 pm: **Radiation damage in HST CCDs,** M. Sirianni, European Space Agency; M. Mutchler, J. Biretta, Space Telescope Science Institute . . . . . [6276-02]

2:55 pm: **Development of hybridized focal plane technologies,** M. P. Lesser, D. B. Ouellette, The Univ. of Arizona/Steward Observatory . . . . . [6276-03]

3:15 pm: **Commercialization of full depletion scientific CCDs,** P. R. Jorden, K. Ball, R. Bell, D. J. Burt, K. Hadfield, P. Jerram, P. J. Pool, A. Pike, e2v technologies ltd. (United Kingdom); A. D. Holland, N. Murray, Brunel Univ. (United Kingdom) . . . . . [6276-04]

Coffee Break . . . . . 3:35 to 4:00 pm

SESSION 2
Room: Crystal Ballrooms: F . . . . . Wed. 4:00 to 5:40 pm

CCD and Visible Detectors I

4:00 pm: **Large area detectors and new sensor technologies at Fairchild Imaging,** P. Vu, Fairchild Imaging . . . . . [6276-05]

4:20 pm: **Current progress of active pixel sensor developments for future European Space Agency planetary and sun observation missions,** L. Duvet, D. D. E. Martin, A. Owens, European Space Agency (Netherlands) . . . . . [6276-06]

4:40 pm: **Performance, evaluation and limitations of a CMOS hybrid visible silicon imager hybridized to a Rockwell 2RG multiplexer as a new detector for ground-based astronomy,** R. J. Dorn, S. Eschbaumer, G. Finger, M. Meyer, L. Mehrgan, J. Stegmeier, European Southern Observatory (Germany) . . . . [6276-07]

5:00 pm: **High photopeak efficiency gamma-ray detector for upcoming Laue Lens missions,** D. J. Clark, A. J. Dean, A. J. Bird, Univ. of Southampton (United Kingdom) . . . . . [6276-08]

5:20 pm: **Status of 0.250mm-thick CCD packaging for the Dark Energy Survey camera array,** G. E. Derylo, Fermi National Accelerator Lab. . . . [6276-09]

Thursday 25 May

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Thurs. 8:30 to 9:20 am

The Central Black Hole and Nuclear Star Cluster of the Galaxy

Reinhard Genzel,
Max-Planck-Institut für extraterrestrische Physik (Germany)

Break . . . . . 9:20 to 9:35 am

SESSION 3
Room: Crystal Ballrooms: F . . . . . Thurs. 9:35 am to 12:20 pm

CCD and Visible Detectors II

9:35 am: **The CCD riddle: a) signal vs time: linear; b) variance vs signal: non-linear,** M. D. Downing, S. Deiries, D. Baade, European Southern Observatory (Germany) . . . . . [6276-10]

9:55 am: **The OmegaCAM 16K x 16K CCD detector system for the ESO VST,** O. Iwert, D. Baade, European Southern Observatory (Germany); A. Baruffolo, Osservatorio Astronomico di Padova (Italy); G. Hess, European Southern Observatory (Germany); H. Hess, Univ. Sternwart Göttingen (Germany); K. Kuijken, Univ. Leiden (Netherlands); J. Lizon, A. Silber, European Southern Observatory (Germany) . . . . . [6276-11]

10:15 am: **CCD development at Lawrence Berkeley National Laboratory,** C. J. Bebek, K. S. Dawson, J. H. Emes, M. H. Fabricius, J. A. Fairfield, D. E. Groom, S. E. Holland, A. Karcher, W. F. Kolbe, N. P. Palaio, N. A. Roe, J. Saha, G. Wang, Lawrence Berkeley National Lab. . . . . [6276-12]

Coffee Break . . . . . 10:35 to 11:00 am

11:00 am: **Delta-doped high purity silicon CCDs with high QE from UV to NIR for SNAP and Orion Missions,** S. Nikzad, J. Blacksberg, M. E. Hoenk, S. T. Elliott, Jet Propulsion Lab. . . . . [6276-13]

11:20 am: **Analysis of the charge collection process in pnCCDs,** N. J. Kimmel, Max-Planck-Institut für extraterrestrische Physik (Germany); R. Hartmann, P. Holl, PNSensor GmbH (Germany); N. Meidinger, R. H. Richter, L. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6276-14]

11:40 am: **High-speed CCD camera at NAOC,** Z. Zhao, B. Ye, National Astronomical Observatories (China) . . . . . [6276-15]

12:00 pm: **Interpixel capacitance in large format CMOS hybrid arrays,** G. Finger, R. J. Dorn, S. Eschbaumer, L. Mehrgan, M. Meyer, A. F. M. Moorwood, J. Stegmeier, European Southern Observatory (Germany) . . . . . [6276-16]

Lunch Break . . . . . 12:20 to 1:30 pm

SESSION 4

Room: Crystal Ballrooms: F . . . . . Thurs. 1:30 to 5:20 pm

IR Detectors I

1:30 pm: **High-speed imaging photon-counting system,** O. Ryan, M. Redfern, A. Shearer, National Univ. of Ireland/Galway (Ireland) . . . . . [6276-18]

1:50 pm: **A dedicated L3 vision CCD for adaptive optics applications,** M. D. Downing, J. Reyes Moreno, N. N. Hubin, M. E. Kasper, European Southern Observatory (Germany); P. R. Jorden, P. J. Pool, S. Denney, W. A. F. Suske, D. J. Burt, K. Hadfield, R. Bell, P. Wheeler, M. Skegg, e2v technologies ltd. (United Kingdom); P. Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); J. Gach, Lab. d'Astrophysique de Marseille (France); M. Meyer, D. Baade, European Southern Observatory (Germany); P. Balard, Lab. d'Astrophysique de Marseille (France); C. Guillaume, Observatoire Astronomique de Marseille-Provence (France); E. Stadler, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); T. Fusco, ONERA (France); J. J. Diaz-Garcia, Instituto de Astrofísica de Canarias (Spain) . . . . . [6276-19]

2:10 pm: **Photon counting camera for high-resolution astronomy,** O. Ryan, M. Redfern, A. Shearer, National Univ. of Ireland/Galway (Ireland) . . . . . [6276-20]

2:30 pm: **The effects of cosmic rays and solar flares on the IRAC detectors: the first two years of in-flight operation,** J. L. Hora, B. M. Patten, G. G. Fazio, Harvard-Smithsonian Ctr. for Astrophysics; W. J. Glaccum, California Institute of Technology . . . . . [6276-21]

2:50 pm: **Characterization of L3CCDs for Gaia RVS,** D. R. Smith, Brunel Univ. (United Kingdom); D. J. Walton, Mullard Space Science Lab. (United Kingdom); R. Ingley, A. D. Holland, Brunel Univ. (United Kingdom); M. S. Cropper, Mullard Space Science Lab. (United Kingdom) . . . . . [6276-22]

Coffee Break . . . . . 3:10 to 3:40 pm

3:40 pm: **Real-time processing for optimal photon-counting performances,** X. Rondeau, E. M. Thiébaut, R. Foy, Ctr. de Recherche Astronomique de Lyon (France); A. Blazit, Observatoire de la Côte d'Azur (France) . . . . . [6276-23]

4:00 pm: **Fundamental performance differences between CMOS and CCD imagers,** J. Janesick, J. T. Andrews, Sarnoff Corp.; S. T. Elliott, Jet Propulsion Lab. . . . . [6276-77]

4:20 pm: **Characterization and performance of HAWAII-2RG focal plane arrays for NIFS and GSAOI,** M. F. Waterson, P. J. McGregor, J. Van Harmelen, M. I. Dawson, M. C. Doolan, The Australian National Univ. (Australia) . . . [6276-25]

4:40 pm: **High-speed multiple window readout of Hawaii-1RG detector for a radial velocity experiment,** N. N. Bezawada, D. J. Ives, UK Astronomy Technology Ctr. (United Kingdom) . . . . . [6276-26]

5:00 pm: **Performance of new IR detectors for wide field camera 3,** R. J. Hill, A. Waczynski, R. Foltz, E. M. Malumuth, Y. Wen, N. R. Collins, R. A. Kimble, NASA Goddard Space Flight Ctr.; M. Robberto, Space Telescope Science Institute . . . . . [6276-27]

✔Poster Session I

Room: Palms Ballroom: Canary & Royal Salons . Thurs. 6:00 to 8:00 pm

The following posters will be on display during an extended poster session. Authors will be present for discussion during the official Poster Reception on Thursday from 6:00 to 8:00 pm.

Poster Session I: Authors may set up their posters starting Thursday at 10:00 am. All posters must be removed no later than Saturday 2:00 pm.

✔ **Characterization of the H1RG detector for NICFPS instrument,** S. Beland, F. Hearty, Univ. of Colorado/ Boulder . . . . . [6276-51]

✔ **Faint fluxes performances of L3CCD,** C. Carignan, O. Daigle, Univ. de Montréal (Canada) . . . . . [6276-52]

✔ **FlyEyes: PUEO performance using CCID detector,** K. K. Ho, J. Cuillandre, P. Puget, D. A. Salmon, O. Lai, Canada-France-Hawaii Telescope; G. A. Luppino, Univ. of Hawai'i at Manoa; J. W. Beletic, Rockwell Scientific Co., LLC; M. R. Baril, J. Ward, Canada-France-Hawaii Telescope . . . [6276-53]

✔ **Characterization of an e2v L3 CCD for photon-counting Fabry-Perot spectroscopy,** Y. Wen, B. J. Rauscher, R. G. Baker, A. Waczynski, B. Mott, B. E. Woodgate, NASA Goddard Space Flight Ctr. . . . . [6276-56]

✔ **New algorithm for absolute CTE measurement,** B. Li, C. Wang, C. He, Kunming Univ. of Science and Technology (China) . . . . . [6276-58]

✔ **Evaluation and observation results of CMOS imager as detector for astronomy,** Y. Shang, B. Ye, Q. Song, National Astronomical Observatories (China) . . . . . [6276-59]

✔ **Radioluminescence in quartz-polymer fibers in λ-radiation field of (60)Co source,** M. Baydjanov, Phonon Scientific Industrial Association (Uzbekistan) and Institute of Nuclear Physics (Uzbekistan); M. Ashurov, Phonon Scientific Industrial Association (Uzbekistan); E. M. Gasanov, Institute of Nuclear Physics (Uzbekistan); J. Ibragimov, Phonon Scientific Industrial Association (Uzbekistan); I. Nuritdinov, Institute of Nuclear Physics (Uzbekistan); I. Rustamov, Phonon Scientific Industrial Association (Uzbekistan); B. S. Yuldashev, Institute of Nuclear Physics (Uzbekistan) . . . . . [6276-60]

✔ **An infrared imaging system based on SWIR FPA of Sofradir,** J. Deng, B. Ye, National Astronomical Observatories (China); S. Wang, Beijing Normal Univ. (China); Z. Qiu, National Univ. of Defense Technology (China) . . . . . [6276-61]

✔ **Calculation for optimal design of interdigital transducer in AOTF,** H. Xu, J. Yang, Tianjin Univ. (China) . . . . . [6276-64]

✔ **The design of EUV CCD camera for the Space Solar Telescope,** Y. Shang, Q. Song, B. Li, National Astronomical Observatories (China) . . . . . [6276-65]

✔ **Temperature dependence of charge transfer inefficiency in Chandra x-ray CCDs,** C. E. Grant, M. W. Bautz, S. E. Kissel, B. LaMarr, G. Y. Prigozhin, Massachusetts Institute of Technology . . . . . [6276-66]

✔ **An ASIC for delta sigma digitization of technical CCD video,** J. P. Doty, Noqsi Aerospace, Ltd.; H. Tsunemi, H. Ozawa, D. Matsuura, Osaka Univ. (Japan); H. Ikeda, Japan Aerospace Exploration Agency (Japan) . . . . [6276-67]

✔ **Development of pixellated CdZnTe detector for the InFOCuS balloon experiment,** T. Okajima, NASA Goddard Space Flight Ctr. and Johns Hopkins Univ.; J. Tueller, H. A. Krimm, S. D. Barthlemy, NASA Goddard Space Flight Ctr. . . . . [6276-68]

✔ **Development of extended InGaAs detectors for astronomical applications,** M. J. Nelson, M. F. Skrutskie, Univ. of Virginia; M. Bush, Sensors Unlimited, Inc.; S. Kanneganti, C. Park, O. Fox, Univ. of Virginia . . . . . [6276-69]

✔ **Magnetic microcalorimeter development for x-ray astronomy,** S. R. Bandler, T. R. Stevenson, W. Hsieh, NASA Goddard Space Flight Ctr.; J. Beyer, Physikalisch-Technische Bundesanstalt (Germany) . . . . . [6276-71]

✔ **CATAVIÑA: new infrared camera for the SPM,** A. I. Iriarte, I. Cruz-Gonzalez, L. A. Martinez-Vazquez, S. J. Tinoco, G. Lara, E. Ruiz Schneider, E. Sohn, A. Bernal, F. Angeles, A. Moreno, F. Murillo, R. Langarica, E. Luna-Aguilar, L. Salas, V. Cajero, Univ. Nacional Autónoma de México (Mexico) . . . [6276-72]

✔ **Recent results of the fully-depleted back-illuminated CCD developed by Hamamatsu,** Y. Kamata, S. Miyazaki, H. Nakaya, National Astronomical Observatory of Japan (Japan); E. Miyata, H. Tsunemi, Osaka Univ. (Japan); T. G. Tsuru, S. Takagi, Kyoto Univ. (Japan); K. Miyaguchi, M. Muramatsu, H. Suzuki, Hamamatsu Photonics K.K. (Japan) . . . . . [6276-73]

✔ **Ta/Al microwave kinetic inductance strip detectors,** M. E. Eckart, California Institute of Technology; B. A. Mazin, B. Bumble, Jet Propulsion Lab.; S. R. Golwala, California Institute of Technology . . . . . [6276-74]

✔ **Silicon sensor thickness optimization for LSST,** P. O'Connor, V. Radeka, Brookhaven National Lab.; D. F. Figer, Space Telescope Science Institute; J. C. Geary, Harvard-Smithsonian Ctr. for Astrophysics; D. K. Gilmore, Stanford Linear Accelerator Ctr.; J. Oliver, C. W. Stubbs, Harvard Univ.; P. Z. Takacs, Brookhaven National Lab.; J. A. Tyson, Univ. of California/Davis . . . . [6276-75]

✔ **Highly integrated readout for CZT,** R. McLean, California Institute of Technology . . . . . [6276-76]

✔ **High and low background Si:As IBC detectors for mid-IR astronomy, MIRI progress and future developments at Raytheon,** A. W. Hoffman, E. Corrales, P. J. Love, R. S. Holcombe, Raytheon Vision Systems . . . . . [6276-79]

Friday 26 May

SESSION 5

Room: Crystal Ballrooms: F . . . . . Fri. 8:00 to 10:00 am

IR Detectors II

8:00 am: **Near infrared detectors for SNAP,** M. Schubnell, Univ. of Michigan . . . . . [6276-29]

8:20 am: **Noise and zero point drift in 1.7um cutoff detectors for SNAP,** R. M. Smith, California Instuitute of Technology . . . . . [6276-30]

8:40 am: **Characterization of NIR InGaAs imager arrays for the JDEM SNAP mission concept,** S. Seshadri, Jet Propulsion Lab. . . . . [6276-31]

9:00 am: **Detectivity enhancement in HgCdTe photodiodes with improved processing,** H. R. Vydyanath, Avyd Devices, Inc.; L. Becker, U.S. Army Space and Missile Defense Command; T. K. Ooi, U.S. Army Aviation and Missile Research, Development and Engineering Ctr.; R. Olshove, J. W. Bangs, Raytheon Vision Systems . . . . . [6276-32]

9:20 am: **An infrared photon-counting photometer based on the edge-illuminated solid-state photomultiplier,** D. Moon, California Institute of Technology; S. S. Eikenberry, Univ. of Florida; G. G. Fazio, Harvard-Smithsonian Ctr. for Astrophysics . . . . . [6276-33]

9:40 am: **Testing of a visible/infra-red low noise, fast readout wavefront sensor for all-sky adaptive optics,** M. A. Kenworthy, P. M. Hinz, S. Sivanandam, The Univ. of Arizona/Steward Observatory; F. J. Low, Infrared Labs., Inc. [6276-34]

Coffee Break . . . . . 10:00 to 10:20 am

SESSION 6

Room: Crystal Ballrooms: F . . . . . Fri. 10:20 am to 12:00 pm

High Energy Detectors I

10:20 am: **Performance and evaluation of the infrared AO sensor CALICO,** L. H. Mehrgan, R. J. Dorn, S. Eschbaumer, G. Finger, M. Meyer, J. Stegmeier, European Southern Observatory (Germany) . . . . . [6276-35]

10:40 am: **High-performance FPGA based array system controller,** B. E. Pirger, J. Schoenwald, T. L. Herter, G. E. Gull, J. D. Adams, Cornell Univ. . . . . [6276-36]

11:00 am: **Large infrared and visible arrays for low background applications: current state of the art and future developments at Raytheon,** A. W. Hoffman, D. Acton, E. Corrales, P. J. Love, R. S. Holcombe, Raytheon Vision Systems . . . . . [6276-78]

11:20 am: **Development of pixel-readout mu-PICs (micro pixel chambers) for X-ray polarimetry,** H. Katagiri, K. Ono, H. Uchiyama, T. G. Tsuru, H. Matsumoto, Kyoto Univ. (Japan); M. Ueno, Tokyo Institute of Technology (Japan); T. Nagayoshi, Waseda Univ. (Japan); Y. Hyodo, T. Tanimori, K. Miuchi, H. Kubo, Kyoto Univ. (Japan) . . . . . [6276-38]

11:40 am: **Advancements in DEPMOSFET device developments for XEUS,** J. Treis, Max-Planck-Institut für extraterrestrische Physik (Germany); P. H. Lechner, PNSensor GmbH (Germany); O. Hälker, S. Herrmann, S. Wölfel, L. Strüder, G. Lutz, R. H. Richter, Max-Planck-Institut für extraterrestrische Physik (Germany); P. Fischer, I. Peric, M. Harter, Univ. Mannheim (Germany); M. Porro, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . . [6276-17]

Lunch Break . . . . . 12:00 to 1:00 pm

Plenary Presentation

Room: Crystal Ballrooms: Salon H . . . . . Fri. 1:00 to 5:10 pm

Invited Session on

The Search for Extra-Solar Planets

1:00 pm: **Welcome and Opening Remarks**

1:10 pm: **From Gaseous Giant Planets to Rocky Planets: Ten Years of Exoplanet Discoveries,** Michel Mayor, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

1:50 pm: **Space Observations of Exoplanetary Transits and Eclipses,** Jaymie M. Matthews, The Univ. of British Columbia (Canada)

2:10 pm: **What Role for the Interferometry in the Search and the Characterization of Extra-Solar Planets?,** Didier Queloz, Observatoire Astronomique de l'Univ. de Genève (Switzerland)

2:30 pm: **Space Interferometry and the Search of Extra Solar Planets,** Michael Shao, Jet Propulsion Lab. (USA)

2:50 pm: **Space Astrometric Search with Gaia,** Dimitri Pourbaix, Univ. Libre de Bruxelles (Belgium)

3:10 pm: **Break**

3:50 pm: **Learning About Other Planetary Systems from Space,** George H. Rieke, The Univ. of Arizona/Steward Observatory (USA)

4:10 pm: **Direct Imaging of Earth-like Planets from Space (TPF-C),** Wesley A. Traub, Jet Propulsion Lab. (USA)

4:30 pm: **Imaging of Extra-Solar Planets from Ground,** Roberto Gilmozzi, European Southern Observatory (Germany)

4:50 pm: **Search for Extra-Solar Life,** Sara Seager, Carnegie Institution of Washington (USA)

Saturday 27 May

SESSION 7

Room: Crystal Ballrooms: F . . . . . Sat. 8:00 am to 12:30 pm

High Energy Detectors II

8:00 am: **The MAGIC Cherenkov Gamma-Ray Observatory,** D. Ferenc, Univ. of California/Davis . . . . . [6276-39]

8:20 am: **Development of N-type CCDs for the NeXT, a next Japanese x-ray astronomical satellite mission,** D. Matsuura, M. Tohiguchi, H. Ozawa, E. Miyata, H. Tsunemi, Osaka Univ. (Japan); S. Takagi, T. Inui, T. G. Tsuru, Kyoto Univ. (Japan); Y. Kamata, National Astronomical Observatory of Japan (Japan); S. Miyazaki, H. Nakaya, National Astronomical Observatory of Japan/Subaru Telescope; K. Miyaguchi, H. Muramatsu, H. Suzuki, Hamamatsu Photonics K.K. (Japan) . . . . . [6276-40]

8:40 am: **Superconducting tunnel junction detectors for soft x-ray astrophysics,** P. Verhoeve, R. A. Hijmering, D. D. E. Martin, A. Peacock, European Space Agency (Netherlands); A. G. Kozorezov, Lancaster Univ. (United Kingdom); R. Venn, Cambridge Microfab Ltd. (United Kingdom) . . . . . [6276-41]

9:00 am: **GaAs x-ray imaging arrays,** D. H. Lumb, A. Owens, D. D. E. Martin, European Space Agency (Netherlands) . . . . . [6276-42]

9:20 am: **Expanding the Constellation-X field of view with position-sensitive x-ray microcalorimeters,** E. Figueroa-Feliciano, NASA Goddard Space Flight Ctr. . . . . [6276-43]

9:40 am: **Novel high-resolution readout for UV and X-ray photon counting detectors with microchannel plates,** A. S. Tremsin, O. H. W. Siegmund, J. V. Vallerga, J. S. Hull, Univ. of California/Berkeley . . . . . [6276-44]

Coffee Break . . . . . 10:00 to 10:30 am

10:30 am: **The focal plane of the SIMBOL-X Space mission,** B. Dirks, O. Limousin, P. R. Ferrando, CEA Saclay (France); G. Pareschi, Osservatorio Astronomico di Brera (Italy); J. Roques, Ctr. d'Etude Spatiale des Rayonnements (France); L. Strüder, Max-Planck-Institut Halbleiterlabor (Germany) . . . . [6276-45]

10:50 am: **Systematic testing and results of x-ray CCDs developed for ROSITA and other applications,** N. Meidinger, Max-Planck-Institut für extraterrestrische Physik (Germany); R. Hartmann, P. Holl, PNSensor GmbH (Germany); E. Hyde, G. Hasinger, S. Herrmann, L. Strüder, Max-Planck-Institut für extraterrestrische Physik (Germany); H. Soltau, PNSensor GmbH (Germany) . . . . . [6276-46]

11:10 am: **Imaging spectroscopy with Ta/Al DROIDs: performance for different geometry's,** R. A. Hijmering, P. Verhoeve, D. D. E. Martin, A. Peacock, European Space Agency (Netherlands); A. G. Kozorezov, Lancaster Univ. (United Kingdom); R. Venn, Cambridge Microfab Ltd. (United Kingdom) . . . . . [6276-47]

11:30 am: **Active x-ray pixel sensors with scalable pixel size from 1.000 μm^2 to 10^8 μm^2 in Heaven and on Earth,** L. Strüder, G. Lutz, P. H. Lechner, Max-Planck-Institut für extraterrestrische Physik (Germany); H. Soltau, PNSensor GmbH (Germany); R. H. Richter, J. Treis, C. Zhang, Max-Planck-Institut für extraterrestrische Physik (Germany); R. Eckardt, PNSensor GmbH (Germany); S. Wölfl, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . [6276-48]

11:50 am: **A TDMA SQUID multiplexer for the read-out of high-speed large-format detector arrays,** C. D. Reintsema, J. A. Beall, W. D. Duncan, W. B. Doriese, L. Ferriera, G. C. Hilton, K. D. Irwin, D. Schmidt, J. N. Ullom, L. R. Vale, Y. Xu, National Institute of Standards and Technology . . . . . [6276-49]

12:10 pm: **Development of new photon detectors for high-energy neutrino astronomy,** D. Ferenc, E. Lorenz, Univ. of California/Davis . . . . . [6276-50]

Lunch Break . . . . . 12:30 to 1:30 pm

Plenary Presentation
Room: Crystal Ballroom: Salon H . . . . . Sat. 1:30 to 2:20 pm
Astronomy in Europe: Status and Prospects
Catherine J. Cesarsky, European Southern Observatory (Germany)

A

B

Participants List

Bold = SPIE Member

Banse, Klaus [6270-31]S5
Baraczys, Matthew [6269-174]S10b
Baranec, Christoph J. [6272-03]S1, [6272-157]S26h
Barão, Fernando [6266-105]S14
Baratchart, Sebastien [6274-70]S10
Barba, Stephen J. [6270-37]S6
Barbee, Troy W. [6266-33]S5, [6266-34]S5, [6272-94]S20
Barbera, Marco [6266-126]S15d, [6266-127]S15d, [6266-133]S15d, [6266-150]S16g
Barbieri, Cesare [6269-74]S9
Barcons, Xavier 6266 ProgComm, [6266-60]S8, [6266-64]S8, [6266-72]S9
Barczys, Matthew [6269-47]S6, [6269-176]S10b
Barden, Samuel C. [6269-76]S10a
Barger, Amy J. [6269-177]S10b
Baril, Marc R. [6269-36]S5, [6276-53]S8
Barillot, Marc 6268 ProgComm
Barillot, Marc 6268 S16 SessChr
Barillot, Marc [6268-37]S7, [6268-46]S9, [6268-90]S18, [6268-113]S19d
Barkats, Denis [6275-57]S11
Barker, N. Scott [6275-56]S11
Barker, Robert W. [6275-58]S11, [6275-75]S12f
Barkhouse, Wayne [6270-77]S7c
Barkhouser, Robert H. [6269-76]S10a, [6269-92]S10a
Barl, Lothar [6275-42]S7
Barnard, Kobus [6270-78]S7c
Barnett, Marvin [6271-40]S7
Barnstedt, Juergen [6266-35]S5
Baron, Eddie [6265-80]S20
Baron, Fabien [6268-05]S2, [6268-64]S13, [6268-69]S13, [6268-87]S17
Barr, Jeff [6267-38]S11, [6267-141]S29h
Barr, Josh [6267-38]S11
Barrera, Sonia [6269-45]S6, [6269-189]S10b, [6273-66]S13
Barret, Didier [6266-60]S8, [6266-71]S9, [6266-136]S16e
Barrett, Harrison H. [6272-58]S12, [6272-66]S14
Barrick, Gregory A. [6269-36]S5
Barrière, Nicolas [6266-82]S11, [6266-87]S11
Barros, Rui [6269-191]S10b
Barry, Richard K. [6265-55]S15, [6268-75]S15
Barstow, Martin A. 6266 ProgComm, [6266-06]S2, [6266-08]S2
Barthlemy, Scott D. [6276-68]S8
Barthol, Peter [6267-14]S5
Bartholomew, Jarett [6272-50]S11
Barto, Allison A. [6265-31]S11, [6271-10]S3, [6271-42]S7
Bartos, Randall D. [6272-92]S19
Bartoszyk, Andrew E. [6273-78]S16
Baruffolo, Andrea [6267-20]S7, [6269-108]S10a, [6269-217]S10c, [6272-62]S13, [6272-87]S18, [6276-11]S3
Baryshev, Andrey M. [6275-23]S4
Basa, Stephane [6267-36]S9
Basden, Alastair G. [6268-05]S2, [6272-91]S19, [6272-114]S23, [6272-139]S26d, [6272-140]S26d
Basinger, Scott A. [6265-32]S11, [6265-128]S26c
Basso, Stefano [6266-49]S6, [6266-53]S7, [6266-58]S7, [6266-125]S15d, [6272-31]S7
Bassom, Richard [6272-88]S18
Bastia, Paolo [6266-72]S9, [6266-95]S13
Bastie, Pierre [6266-87]S11
Bates, Stuart [6269-207]S10c
Battle, John O. [6265-64]S17, [6275-37]S6, [6275-57]S11
Baubert, Jean B. [6275-18]S3
Baudoz, Pierre [6269-26]S4, [6271-19]S5, [6272-19]S5
Bauer, Otto H. [6265-09]S3
Bauman, Brian J. [6272-25]S6, [6272-90]S19, [6272-165]S26k, [6272-175]S1, [6272-189]S26r
Baumeister, Harald [6268-73]S15, [6268-133]S19g, [6269-128]S10a, [6269-190]S10b, [6272-76]S16
Bautz, Mark W. [6266-93]S13, [6266-98]S13, [6266-100]S13, [6266-151]S16g, [6270-65]S7b, 6276 ProgComm, [6276-66]S8
Bavdaz, Marcos [6266-42]S6, [6266-45]S15d, [6266-46]S6, [6266-47]S6, [6266-65]S8, [6266-66]S9, [6266-67]S9, [6266-128]S15d, [6266-129]S15d, [6266-130]S6, [6266-131]S6, [6266-132]S15d
Baydjanov, Maksudbek [6276-60]S8
Bazzano, Angela 6266 ProgComm, [6266-22]S4
Beall, James A. [6276-49]S7
Beasley, Anthony J. 6267 ProgComm, 6267 S19 SessChr, 6267 S13 SessChr, [6267-02]S1
Beasley, Matthew A. [6265-148]S27a
Beasley, Matthew N. [6266-122]S12
Beasley, Matthew A. [6269-69]S9, [6269-111]S10a
Beaucamp, Anthony T. H. [6273-08]S2
Beaulieu, Mathilde [6265-40]S12, [6269-91]S10a
Bebek, Christopher J. [6276-12]S3
Bec, Matthieu D. C. [6272-09]S26
Becerril, Santiago [6269-45]S6, [6269-189]S10b
Béchet, Clémentine [6272-102]S21
Becker, Andrew [6267-151]S29d
Becker, Latika [6276-32]S5
Becker-Ross, Helmut [6266-35]S5
Beckers, Jacques [6267-57]S16
Becla, Jacek [6270-29]S5
Beeman, Jeffrey W. [6275-66]S12a
Beere, Harvey E. [6275-16]S3
Béguin, Alain [6265-11]S3, [6275-01]S1
Beichman, Charles A. [6268-29]S6
Beijersbergen, Marco W. [6266-45]S15d, [6266-46]S6, [6266-66]S9, [6266-67]S9, [6266-128]S15d, [6266-129]S15d, [6266-130]S6, [6266-131]S6, [6266-132]S15d
Beland, Stephane [6269-69]S9, [6269-111]S10a, [6276-51]S8
Beldica, Cristina [6270-77]S7c
Belenguer, Tomás [6265-88]S22, [6265-155]S27c
Beletic, James W. [6265-91]S22, [6265-92]S22, 6276 ProgComm, [6276-53]S8
Belikov, Ruslan [6265-42]S13, [6265-52]S14, [6265-130]S26c, [6265-162]S26c, [6272-191]S26r
Belitsky, Victor Y. [6275-15]S3, [6275-17]S12b, [6275-19]S3
Bell, Ray [6276-04]S1, [6276-19]S4
Bell, Raymond M. [6271-57]S7
Bellazzini, Ronaldo [6266-29]S4, [6266-102]S14, [6266-103]S14, [6266-106]S14, [6266-148]S16g, [6266-149]S16g
Belu, Adrian [6268-13]S3
Belville, Ralph [6273-29]S7
Belville, Stanley R. [6269-18]S4
Bendek Selman, Eduardo [6270-09]S2, [6270-48]S7a
Bendjoya, Philippe [6269-187]S10b, [6269-196]S10c
Benford, Dominic J. [6265-68]S18, [6265-79]S20, [6275-10]S2, [6275-48]S9, [6275-49]S9, [6275-50]S10, [6275-60]S11
Benisty, Myriam [6268-35]S7, [6268-89]S18, [6268-123]S19e, [6268-136]S19g
Benkhaldoun, Zouhair Z. [6268-39]S8
Benn, Chris R. [6272-125]S26a
Bennett, J. Greg [6269-44]S6
Bennett, Lee [6270-42]S7a
Bennett, Richard J. [6273-65]S13
Benoit, Alain [6275-03]S1
Benoit, Jeremie [6268-101]S19a
Benson, James A. [6268-33]S7, [6268-141]S19h, [6268-155]S19j
Berciano-Alba, Alicia [6266-115]S15b
Berendse, Frederick B. [6266-33]S5, [6266-34]S5
Berger, David H. [6268-111]S19g
Berger, Jean-Philippe 6268 ProgComm, 6268 S14 SessChr, [6268-19]S4, [6268-35]S7, [6268-62]S13, [6268-117]S19e, [6268-123]S19e, [6268-136]S19g
Berger, Thomas E. [6269-225]S10c
Berkefeld, Thomas [6267-16]S6, [6267-21]S7, [6272-05]S1, [6274-17]S5
Berlioz-Arthaud, Paul [6268-163]S19g
Berman, Alice F. [6266-02]S1
Berná Galiano, José Ángel [6267-111]S29b
Bernal, Abel [6274-69]S10, [6276-72]S8
Bernard, Jean-Philippe [6265-15]S4
Bernier, Anne-Pier [6269-157]S10b
Bernier, Robert J. [6265-29]S10, [6265-122]S26b, [6265-123]S26b
Bernstein, Rebecca [6269-119]S10a
Berrett, John W. [6273-10]S2
Bershady, Matt [6269-177]S10b
Berst, Chris [6274-78]S10
Bertarelli, Chiara [6273-149]S21h
Bertelli, Giampaolo [6272-27]S6
Berthoud, Marc [6269-38]S5
Bertin, Emmanuel [6265-152]S27b
Berton, Alessandro [6269-26]S4, [6269-223]S10c
Bertram, Thomas [6268-55]S11, [6268-133]S19g, [6268-138]S19g, [6274-65]S10, [6274-66]S10
Bertuccio, Giuseppe [6266-83]S11
Berwein, Juergen [6270-38]S6
Bettanini, Carlo [6265-77]S19, [6273-86]S18
Bettonvil, Felix C. M. [6269-12]S3, [6273-61]S12, [6273-119]S9
Beuzit, Jean-Luc [6269-26]S4, [6269-83]S10a, [6269-108]S10a, [6272-19]S5
Beyer, Joern [6276-71]S8
Bezawada, Nagaraja N. [6276-26]S4
Bezsmolnyy, Yuriy [6266-83]S11
Bharmal, Nazim A. [6268-05]S2, [6272-147]S26f
Bhattacharya, Nandini [6272-96]S20
Bianco, Andrea G. [6269-208]S10c, [6269-219]S10c, [6273-149]S21h
Biasi, Roberto [6272-29]S7, [6272-137]S26d, [6272-179]S26n
Bida, Thomas A. [6267-05]S1
Biereichel, Peter [6269-39]S6, [6272-40]S9
Bierman, Evan [6275-57]S11
Bigelow, Bruce C. [6269-15]S4, [6269-119]S10a
Bignami, Giovanni F. 6266 ProgComm
Biliotti, Valdemaro [6269-46]S6, [6274-33]S9
Biller, Beth A. [6272-84]S17
Billot, Nicolas [6265-11]S3
Bintley, Dan [6275-51]S10, [6275-52]S10
Bird, Anthony J. [6276-08]S2
Biretta, John [6276-02]S1
Birkmann, Stephan M. [6265-89]S22, [6275-28]S5
Bischoff, Karsten [6270-18]S4, [6270-64]S7b, [6274-32]S8
Bitner, Martin [6269-170]S10b
Bitti, Francesco [6266-29]S4, [6266-106]S14, [6266-149]S16g
Bizenberger, Peter [6268-73]S15, [6269-11]S3, [6269-190]S10b, [6272-76]S16, [6272-79]S16, [6272-81]S16
Black, J. K. [6266-103]S14
Blacker, Brett S. [6270-85]S7d
Blackmon, Jim [6265-104]S25
Blacksberg, Jordana [6266-38]S5, [6276-13]S3
Blades, John C. [6270-17]S3
Blair, William P. [6266-02]S1
Blais-Ouellette, Sebastien [6269-63]S8, [6269-200]S10c
Blanc, Guillaume [6269-94]S10a
Blanc, Pierre-Eric [6273-71]S14, [6273-85]S18
Blanco, Daniel R. 6273 ProgComm, 6273 S2 SessChr, 6273 S10 SessChr, [6273-45]S10, [6273-46]S10
Bland-Hawthorn, Jonathan [6269-23]S4, [6269-58]S8, [6269-89]S10a, [6273-153]S21h
Blanken, Maarten F. [6272-88]S18, [6272-125]S26a
Blaurock, Carl A. [6271-25]S5
Blazit, Alain [6268-162]S19g, [6276-23]S4
Bleeker, Johan A. 6266 ProgComm, [6266-60]S8, [6266-64]S8
Bleuler, Hannes [6268-73]S15
Bloemhof, Eric E. [6265-50]S13, [6268-121]S19e
Bloser, Peter F. [6266-81]S11
Blouke, Morley [6267-36]S9, 6276 ProgComm, 6276 S2 SessChr
Bloxham, Gabe J. [6273-92]S19
Blum, Robert D. [6267-40]S11
Blundell, Mark [6267-106]S29a
Bluth, A. M. [6265-24]S9
Bly, Vincent T. [6265-96]S23
Boccaletti, Anthony [6269-26]S4, [6271-19]S5
Boccas, Maxime [6272-09]S26, [6273-55]S21e, [6273-107]S21a
Bock, Douglas C. [6267-23]S8
Bock, James J. [6265-12]S3, [6265-13]S3, [6265-64]S17, [6265-115]S26a, [6267-13]S4, [6275-08]S1, [6275-37]S6, [6275-40]S7, [6275-57]S11, [6275-59]S11
Boggs, Steven E. [6266-77]S10, [6266-78]S10, [6266-82]S11
Bohlin, Ralph C. [6270-17]S3
Böhm, Armin [6273-35]S8, [6273-81]S17, [6273-82]S17
Böhringer, Hans [6266-27]S4, [6266-60]S8
Boit, Jean-Lucien [6265-75]S19, [6273-85]S18
Bolatto, Alberto D. [6275-34]S6

C

Participants List

Bold = SPIE Member

Castellano, Marcello [6272-27]S6
Castellini, Sonia [6267-29]S9
Castillo, Roberto [6270-09]S2
Castillo Carrión, Sebastián [6267-111]S29b
Castillo Lorenzo, Jose Luis [6265-155]S27c
Castro, Julio [6267-39]S11
Castro, Sandra [6270-31]S5
Castro Cerón, José María [6267-111]S29b
Castro López-Tarruella, Javier 6267 ProgComm, 6267 S22 SessChr, 6267 S7 SessChr, [6267-08]S2, [6267-17]S6
Castro-Tirado, Alberto J. [6267-111]S29b
Catanzarite, Joseph H. [6268-153]S19i
Catarutti, Rolando [6267-150]S29h
Caux, Emmanuel [6265-10]S3
Cavalca, Francesco [6266-29]S4, [6266-102]S14, [6266-106]S14, [6266-149]S16g
Cavaller, Lluis [6267-17]S6, [6267-88]S24, [6273-120]S21d
Cavanagh, Brad E. [6270-18]S4, [6274-08]S3
Cavarroc, Céline [6271-19]S5
Cease, Herman [6267-150]S29h
Cecconi, Massimo [6272-87]S18
Cepa, Jordi [6265-09]S3, [6269-89]S10a
Ceperley, Daniel P. [6271-31]S6, [6271-60]S7
Cerna, Cedric [6265-112]S26a
Cerroni, Priscilla [6265-77]S19
Cesarsky, Catherine J. MeetingVIP, [AS200-03]S
Cha, Sang-mok [6269-180]S10b
Chae, Jongchul [6267-10]S3
Chakan, James M. [6266-32]S5
Challinor, Anthony D. [6275-58]S11
Chamberlin, Richard [6275-25]S4
Chan, Simon [6272-09]S26
Chanan, Gary A. [6265-33]S11, [6267-40]S11, [6267-76]S21, [6267-79]S21, [6272-83]S17
Chandler, Ashley [6268-21]S5
Chaney, David M. [6265-29]S10, [6265-122]S26b
Chang, Andrew [6273-10]S2
Chang, Kevin [6272-94]S20
Chang, Mark P. J. L. [6268-127]S19e, [6268-128]S19e
Chang, Seunghyuk [6265-149]S27b
Chao, Zhai [6269-120]S10a, [6269-121]S10a, [6269-123]S10a, [6271-46]S7
Chapin, Edward [6269-129]S10a
Chapman, Scott [6265-115]S26a
Charcos Llorens, Miguel [6269-183]S10b
Charcos-Llorens, Miguel V. [6269-179]S10b, [6269-181]S10b
Charlebois, Maxime [6269-157]S10b
Charton, Julien [6269-26]S4, [6272-97]S20
Chatron, Julien [6272-19]S5
Chattopadhyay, Goutam [6265-105]S26a, [6275-22]S4
Chavan, Alberto M. [6270-19]S4
Chavez, Joe L. [6270-72]S7c
Chavoya, Armando [6267-17]S6
Chemla, Fanny [6272-153]S26g
Chen, C. M. H. [6266-39]S6
Chen, Jianjun [6270-76]S7c
Chen, Kunxing [6273-126]S21d
Chen, Ming-Tang [6273-53]S11, [6275-55]S11
Chen, Yingxiu [6273-129]S21e
Chen, Zhiyuan [6265-154]S27b, [6273-137]S21f
Chenevez, Jerome [6266-110]S14
Cheng, Edward S. [6265-80]S20
Cheng, Jingquan [6273-38]S8
Cheng, Lun K. [6268-91]S18
Cherednichenko, Sergey [6275-18]S3
Chernikov, Stanislav V. [6272-55]S11, [6272-149]S26f
Chervenak, James A. [6266-74]S9, [6275-10]S2, [6275-48]S9, [6275-49]S9
Chesneau, Olivier [6268-105]S19b
Cheung, Tak D. [6265-138]S26c, [6265-139]S26c
Chiang, Hsin C. [6275-57]S11
Chin, Jason C. Y. [6270-12]S2, [6272-01]S1
Chincarini, Guido [6266-09]S2, [6266-29]S4, [6269-188]S10b, [6274-62]S10
Chini, Rolf [6269-106]S10a
Chinone, Yuji [6275-71]S12d
Chiozzi, Gianluca SC644 Inst, 6274 ProgComm, [6274-06]S2, [6274-54]S10
Chisogne, Jean-Pierre [6267-04]S1
Cho, Myung K. [6267-139]S29h, [6272-13]S3, [6273-45]S10, [6273-46]S10, [6273-50]S10
Cho, Seoung-Hyun [6269-220]S10c
Choi, Seonghwan [6274-76]S10
Chopping, Alan K. [6272-88]S18
Chovan, Jozef [6272-148]S26f
Christensen, Finn E. [6266-39]S6, [6266-40]S6, [6266-42]S6
Christensen, Robert D. [6275-36]S12d
Christian, Damien [6270-18]S4
Christou, Julian C. 6272 ProgComm, 6272 S4 SessChr, [6272-17]S4, [6272-18]S4, [6272-38]S8, [6272-68]S14
Chu, Jiaru [6269-201]S10c, [6270-62]S7b
Chuh, Thomas Y. [6265-92]S22
Chun, Mark R. [6269-141]S10b, [6269-145]S10b, [6269-150]S10b, 6272 ProgComm, 6272 S3 SessChr, [6272-13]S3, [6272-26]S6
Chun, William [6265-105]S26a
Chung, Soon-Jo [6268-11]S3
Churazov, Eugene [6266-26]S4, [6266-157]S15d
Churazov, Evgeniy [6266-27]S4
Churilov, Vladimir [6269-16]S4
Chuss, David T. [6273-143]S21g, [6275-10]S2, [6275-31]S5, [6275-50]S10, [6275-54]S11, [6275-56]S11, [6275-60]S11, [6275-67]S12b
Chuter, Timothy C. [6267-149]S29h, [6274-35]S9
Chylek, Tomas [6267-149]S29h, [6275-51]S10
Ciattaglia, Costantino [6272-80]S26k
Cirami, Roberto [6274-06]S2, [6274-54]S10
Citterio, Oberto [6266-09]S2, [6266-17]S3, [6266-29]S4, [6266-49]S6, [6266-53]S7, [6266-58]S7, [6266-92]S13, [6266-106]S14, [6272-31]S7
Civeit, Thomas [6266-02]S1
Claeskens, Jean-Francois [6267-04]S1
Clampin, Mark SympChair, [6265-21]S8, [6265-22]S8, [6265-45]S13, [6265-132]S26c, 6276 ProgComm, AS100 Chr
Clappier, Robert R. [6267-77]S21
Clare, Richard M. [6272-13]S3, [6272-24]S6, [6272-26]S6, [6272-107]S22
Claret, Antonio [6267-111]S29b
Claridge, Rex [6265-120]S26b
Clark, Allan G. [6272-154]S26g
Clark, David J. [6276-08]S2
Clark, Dusty L. [6273-109]S21a
Clark, James H. [6268-33]S7, [6268-141]S19h, [6268-154]S19j
Clark, Paul [6269-34]S5
Clarke, David [6269-207]S10c
Clarke, David A. [6273-116]S21c, [6274-13]S4
Clarke, De A. [6274-72]S10
Clarke, Fraser [6269-27]S4, [6269-132]S10a, [6273-100]S20
Claudi, Riccardo U. [6269-108]S10a
Clausse, Jean-Michel [6268-162]S19g
Claver, Charles F. 6267 ProgComm, 6267 S10 SessChr, 6267 S26 SessChr, 6267 S27 SessChr, [6267-25]S8, [6267-38]S11, [6267-151]S29d, [6271-21]S5, [6273-19]S4, [6273-23]S5
Clay, Neil R. [6270-18]S4, [6270-23]S4
Cledassou, Rodolphe [6265-56]S15, [6266-17]S3
Clenet, Yann [6272-131]S26b
Cliff, Mark C. [6273-96]S20
Cliffe, Mark R. [6273-65]S13
Close, Laird M. [6267-62]S17, [6272-84]S17, [6272-172]S26m
Cloué, Christelle [6265-11]S3
Cobos, Francisco J. [6267-17]S6, [6269-89]S10a
Coburn, Wayne [6266-78]S10
Cocchi, Massimo [6266-22]S4
Cochrane, Andrew T. [6271-57]S7
Codona, Johanan L. [6265-62]S16, [6267-62]S17, [6269-61]S8, [6272-93]S19
Cofie, Emmanuel [6271-39]S6
Cohan, Lucy [6265-100]S24
Cohen, Jeremy [6270-23]S4
Cohn, Michael B. [6272-94]S20
Coker, John [6275-40]S7
Colangeli, Luigi [6265-77]S19, [6273-86]S18
Colasanti, Luca [6266-22]S4, [6266-95]S13
Colavita, M. Mark [6268-03]S1, [6268-16]S4, [6268-24]S5, [6268-43]S9, [6268-44]S9, [6268-59]S12, [6268-110]S19c, [6268-140]S19h, [6268-142]S19h, [6274-20]S6
Cole, Glen C. [6265-29]S10, [6265-123]S26b, [6265-124]S26b
Coleman, Thomas A. [6268-70]S14, [6268-137]S19g, [6274-36]S9
Collados, Manolo [6265-155]S27c
Collados, Manuel V. [6267-16]S6
Colley, Stephen A. [6272-12]S3, [6272-144]S26f, [6272-145]S26f, [6272-146]S26f, [6272-166]S26l, [6272-192]S26s
Collin, Bill [6267-04]S1
Collins, Nicholas R. [6276-27]S4
Collon, Maximilien [6266-46]S6, [6266-47]S6, [6266-66]S9, [6266-67]S9, [6266-128]S15d, [6266-129]S15d, [6266-130]S6, [6266-131]S6, [6266-132]S15d
Collura, Alfonso [6266-126]S15d, [6266-127]S15d, [6266-150]S16g
Colomé, Josep [6267-29]S9
Comastri, Andrea [6266-60]S8
Comeau, Susan [6270-42]S7a
Comeron, Fernando [6270-35]S6, [6270-86]S7d
Comstock, Lovell E. [6269-59]S8, [6269-169]S10b
Conan, Jean-Marc [6272-61]S12, [6272-65]S13, [6272-67]S14
Conan, Rodolphe [6272-64]S13, [6272-156]S26h, [6274-77]S10
Conconi, Paolo [6266-09]S2, [6267-30]S9, [6267-111]S29b, [6269-107]S10a, [6269-188]S10b, [6269-208]S10c, [6269-219]S10c, [6273-149]S21h, [6274-62]S10
Cone, Peter F. [6268-145]S19h
Conedera, Veronique [6272-72]S15
Connolly, Andrew [6270-78]S7c
Connors, Tom [6268-115]S19d
Conrad, Al [6270-12]S2, [6272-01]S1
Conrad, Albert R. [6274-31]S8
Conrow, Tim [6270-04]S1
Conroy, Peter G. [6269-78]S10a, [6273-92]S19
Contaldi, Carlo [6267-13]S4
Content, David A. [6266-69]S9
Content, Robert [6265-59]S16, [6269-139]S10b
Conti, Giancarlo [6266-49]S6
Contos, Adam R. [6265-25]S9, [6265-31]S11, [6271-10]S3, [6271-42]S7
Contreras, James W. [6265-164]S11, [6271-20]S5
Conzelmann, Ralf D. [6272-11]S3
Cook, Bruce H. [6268-40]S8
Cook, Kem H. [6270-14]S2, [6270-51]S7a
Cooray, Asantha [6265-64]S17
Corbett, Jason W. [6269-134]S10b
Corcione, Leonardo [6267-30]S9, [6269-194]S10b, [6274-61]S10
Corley, Richard [6269-44]S6
Cormier, C. [6271-61]S7
Corrales, Elizabeth [6276-78]S6, [6276-79]S8
Correa, Santiago [6269-89]S10a, [6269-189]S10b
Correia, Carlos [6272-99]S21
Correl, David [6269-16]S4
Correll, David B. [6273-69]S14
Cortecchia, Fausto [6273-94]S19, [6273-130]S21e
Cortes-Medellin, German [6267-67]S18, [6267-82]S22, [6275-53]S11
Cosentino, Giorgio [6272-80]S26k
Costa, Enrico 6266 ProgComm, [6266-22]S4, [6266-23]S4, [6266-29]S4, [6266-102]S14, [6266-103]S14, [6266-106]S14, [6266-148]S16g, [6266-149]S16g
Costillo Iciarra, Luis P. [6274-57]S10, [6274-59]S10
Côté, Patrice [6269-80]S10a
Cotroneo, Vincenzo [6266-44]S6
Cottam, Jean [6266-70]S9
Cotton, William [6268-69]S13
Cottrell, Peter L. [6269-08]S2
Coudé du Foresto, Vincent [6268-09]S3, [6268-37]S7, [6268-88]S11, [6268-113]S19d
Coulter, Roy [6267-10]S3
Courteau, Pascal [6268-113]S19d
Courteville, Alain [6267-80]S29h, [6267-86]S23
Courtois, Pierre [6266-87]S11
Covino, Stefano [6269-188]S10b, [6274-62]S10
Cowley, David J. [6269-62]S8
Cox, Colin R. [6265-30]S10
Cox, Dan [6274-82]S10
Coyne, Julien [6268-05]S2, [6268-64]S13
Craig, Simon C. [6267-149]S29h, [6275-51]S10
Craig, William W. [6266-78]S10
Craine, Michael [6275-58]S11
Cramer, John [6267-57]S16
Crampton, David 6269 ProgComm, 6269 S4 SessChr, [6269-67]S9, [6269-192]S10b, [6272-187]S26q

D

Participants List

Bold = SPIE Member

Domiciano de Souza, Armando [6268-105]S19b, [6268-163]S19g
Domingo, Vicente [6265-155]S27c
Dominguez, Inma [6267-29]S9
Dominik, Carsten [6268-23]S3
Donaldson, Robert [6268-148]S19h, [6272-11]S3, [6272-29]S7, [6272-34]S8, [6272-40]S9, [6272-62]S13, [6272-151]S26f
Donati, Simone L. [6269-46]S6, [6269-146]S10b, [6273-141]S21g
Dong, Zhiming [6267-63]S17, [6273-122]S21d
Donnarumma, Immacolata [6266-119]S15b
D'Onofrio, Mauro [6269-74]S9
Donovan, Shane [6267-138]S29h
Doolan, Matthew C. [6273-92]S19, [6276-25]S4
Doppmann, Gregory W. [6269-41]S6
Dorantes, Ariel [6267-17]S6
Doressoundiram, Alain [6265-77]S19
d'Orgeville, Celine [6269-04]S1, [6272-09]S26, [6272-50]S11
Doriese, William B. [6275-52]S10, [6276-49]S7
Dorn, Chris [6272-98]S20
Dorn, David A. 6276 Chr, 6276 S1 SessChr, 6276 S4 SessChr
Dorn, Reinhold J. [6269-39]S6, [6276-07]S2, [6276-16]S3, [6276-35]S6
Dorrepaal, Michiel [6273-96]S20
Doschek, George A. [6266-31]S5
Dossa, Don [6270-79]S7c
Dotani, Tadayasu [6266-91]S13, [6266-93]S13, [6266-108]S14, [6266-151]S16g, [6266-152]S16g
Dotson, Jessie L. [6275-54]S11
Doty, John P. [6266-56]S7, [6276-67]S8
Doubrovski, Vladimir [6273-08]S2
Doucet, Coralie [6269-40]S6
Douet, Richard [6272-97]S20
Doumayrou, Éric [6265-11]S3, [6275-03]S1
Dowell, Charles D. [6275-53]S11, [6275-54]S11, [6275-57]S11
Downing, Mark D. [6271-41]S7, [6272-19]S5, [6272-61]S12, [6276-10]S3, [6276-19]S4
Doxsey, Rodger E. 6270 Chr, [6270-06]S1
Doyle, Simon [6275-61]S12a
Doyon, Rene [6265-21]S8, [6265-40]S12, [6269-91]S10a, [6269-144]S10b, [6272-20]S5, [6272-22]S5
Dragovan, Mark C. [6265-99]S24
Dragovan, Mark W. [6265-153]S27b, [6275-37]S6
Drake, Jeremy J. [6270-56]S7b, [6270-63]S7b
Drakinskiy, Vladimir [6275-18]S3
Dravins, Dainis [6269-74]S9
Dressler, Alan M. [6269-15]S4
Driebe, Thomas M. [6268-105]S19b, [6268-108]S19b, [6268-130]S19f
Drissen, Laurent [6269-80]S10a, [6269-157]S10b
Drory, Niv [6270-75]S7c
Drouet d'Aubigny, Christian Y. [6275-60]S11
Droz, Serge [6273-139]S21g
Drummond, Jack D. [6272-17]S4
Du, Fujia [6274-38]S10
Duband, Lionel [6265-11]S3, [6267-13]S4, [6275-37]S6, [6275-40]S7, [6275-57]S11
Dubbeldam, Cornelis M. [6273-133]S21f
Dubois, Jean-Pierre [6273-90]S19
Dubreuil, Didier [6275-03]S1
Ducharme, Marie-Eve [6269-200]S10c
Duchateau, Michel [6272-11]S3
Duchon, Paul [6265-56]S15, [6266-17]S3
Duhoux, Philippe [6268-31]S7, [6268-147]S19h
Dumont, Philip J. [6272-83]S17
Dunare, Camelia C. [6275-51]S10, [6275-52]S10
Duncan, William D. 6275 Chr, [6275-51]S10, [6275-52]S10, [6275-72]S12e, [6276-49]S7
Dunham, Edward W. [6267-05]S1, [6269-81]S10a
Dunham, Larry [6270-60]S7b
Dunlop, Colin N. [6272-147]S26f
Dunlop, James S. [6267-66]S18
Dunlop, Louisa [6275-07]S1, [6275-58]S11
Dunn, Christina R. [6273-08]S2
Dunn, Jennifer [6269-44]S6, [6270-52]S7a, [6274-14]S4
Dunne, Stephen [6268-13]S3
Dunscombe, Christopher J. [6275-61]S12a, [6275-62]S12a
DuPlain, Ronald F. [6274-26]S7
Dupuy, Christophe [6267-85]S23, [6273-132]S21e
Durand, Gilles A. [6275-03]S1
Durand, Steven J. [6267-99]S27
Dutrey, Anne [6268-23]S3
Duvet, Ludovic [6276-06]S2
Dwan, Richard M. [6272-98]S20

E

Ealet, Anne [6265-111]S26a
Ealey, Mark A. [6265-43]S13
Earle, Lieko [6275-37]S6
Eastman, Jason D. [6269-57]S8, [6273-72]S21c
Eastwood, Jason [6269-18]S4
Eaton, Joel A. [6271-05]S2
Ebara, Masatoshi [6266-124]S15d
Ebbers, Angelic W. [6272-09]S26
Ebbets, Dennis C. [6265-60]S16, [6265-63]S17, [6266-20]S4
Ebert, Monica [6273-81]S17
Ebizuka, Noboru [6273-110]S7
Echternach, Pierre M. [6265-130]S26c
Eckardt, Rouven [6272-155]S26g, [6276-48]S7
Eckart, Andreas [6265-119]S26b, [6268-53]S7, [6268-55]S11, [6268-56]S11, [6268-72]S14, [6268-133]S19g, [6268-138]S19g, [6274-65]S10, [6274-66]S10
Eckart, Megan E. [6276-74]S8
Economou, Frossie [6270-18]S4, [6274-08]S3, [6275-51]S10
Edelstein, Jerry J. [6269-51]S6, [6269-99]S10a, [6269-153]S10b
Edeson, Ruben L. [6273-97]S20
Edgar, Richard J. [6270-56]S7b
Edwards, Mary J. [6273-01]S1, [6273-02]S1, [6273-103]S21a
Edwards, Michelle L. [6269-179]S10b, [6269-181]S10b, [6269-183]S10b
Eff-Darwich, Antonio M. [6267-45]S12
Efrat, Alon [6270-78]S7c
Efstathiou, Apostolos [6273-111]S21b
Egan, Ian [6267-07]S2, [6269-65]S9, [6269-83]S10a, [6271-17]S4
Eggers, Daniel W. [6271-29]S5
Egle, Wilhelm J. [6266-53]S7
Egner, Sebastian E. [6269-11]S3, [6272-79]S16, [6272-80]S26k, [6272-81]S16, [6272-131]S26b, [6272-174]S26m, [6272-181]S26p, [6272-182]S26p, [6272-183]S26p
Eichelberger, Hans [6266-115]S15b
Eichhorn, William L. [6273-136]S21f
Eikenberry, Stephen S. 6269 ProgComm, 6269 S9 SessChr, [6269-44]S6, [6269-136]S10b, [6269-138]S10b, [6269-162]S10b, [6269-165]S10b, [6269-168]S10b, [6269-169]S10b, [6269-179]S10b, [6269-181]S10b, [6269-183]S10b, [6269-202]S10c, [6269-218]S10c, [6271-35]S6, [6276-33]S5
Eisenhauer, Frank [6268-53]S7, [6268-134]S19c, [6269-135]S10b, [6272-197]S24
Eisenman, Allan R. [6271-31]S6
Eisenstein, Daniel J. [6265-65]S17
Eisner, Joshua A. [6268-161]S12
El Arbi, Siher [6269-86]S10a
Eldred, Michael [6272-12]S3, [6272-144]S26f, [6272-145]S26f, [6272-146]S26f, [6272-166]S26l, [6272-192]S26s
ElHadi, Kacem [6273-63]S13
Elias, Jay [6272-26]S6
Elias, Jonathan H. [6269-41]S6, [6269-141]S10b, [6269-145]S10b, [6269-150]S10b, [6269-160]S10b, [6272-13]S3
Ellenbroek, Rogier [6272-75]S15
Ellenbroek, Rogier [6272-123]S25
Ellerbroek, Brent L. [6267-151]S29d, [6271-56]S7, 6272 Chr, 6272 S6 SessChr, 6272 S21 SessChr, [6272-13]S3, [6272-24]S6, [6272-26]S6, [6272-35]S8, [6272-51]S11, [6272-52]S11, [6272-57]S12, [6272-107]S22, [6272-110]S23, [6272-158]S26i, [6272-161]S26i, [6272-169]S26l
Elliott, David G. [6265-116]S26a
Elliott, Martin [6275-62]S12a
Elliott, Stythe T. [6276-13]S3, [6276-77]S4
Ellis, Maureen A. [6275-51]S10, [6275-52]S10
Ellison, Sara L. [6269-70]S9
Els, Sebastian [6267-55]S15
Elston, Richard J. [6269-44]S6, [6269-169]S10b
Elswijk, Eddy [6272-88]S18, [6273-142]S21g
Elvis, Martin [6266-23]S4, [6266-28]S4, [6266-57]S7
Emallev, Oleg [6272-194]S26s
Emerson, James P. [6267-07]S2, [6270-30]S5
Emerson, Nicholas [6267-90]S24
Emes, John H. [6276-12]S3
Endo, Yasuhiko [6266-153]S16g
Eng, Ron [6265-125]S26b, [6265-157]S27c
Engelhaupt, Darell E. [6266-49]S6, [6266-55]S7
England, Martin [6266-02]S1
Enmark, Anita [6267-57]S16, [6271-02]S1, [6271-03]S1, [6271-47]S7
Ennico, Kimberly A. [6269-64]S8, [6269-212]S10c
Enss, Christian [6266-72]S9
Enya, Keigo [6265-114]S26a
Epps, Harland W. [6267-134]S29b
Erasmus, David A. [6267-35]S11
Erd, Christian [6268-13]S3
Ergenzinger, Klaus [6268-83]S17, [6268-98]S19a
Erickson, Darren A. [6272-13]S3, [6272-24]S6
Erickson, Edwin F. [6267-118]S29c
Erickson, Kerry D. [6270-04]S1
Erickson, Neal R. [6265-105]S26a
Erm, Toomas M. [6271-15]S4, [6271-25]S5, [6271-26]S5, [6273-124]S21d
Ermakov, Ilia V. [6267-135]S29g
Ernesto, Oliva [6269-197]S10c
Erskine, David J. [6269-51]S6, [6269-99]S10a, [6269-153]S10b
Esch, Walter [6275-47]S9
Eschbaumer, Siegfried [6269-39]S6, [6276-07]S2, [6276-16]S3, [6276-35]S6
Espejo, Carlos [6267-17]S6, [6269-89]S10a, [6269-138]S10b
Esposito, Simone [6267-74]S20, [6267-83]S22, [6267-84]S23, [6267-85]S23, [6272-10]S3, [6272-11]S3, [6272-33]S7, [6272-70]S14, [6272-91]S19, [6272-121]S25
Esteves, Raul [6269-39]S6
Estrada, Juan [6269-131]S10a
Eto, Shigeru [6269-48]S6, [6269-151]S10b
Etzel, Paul [6267-105]S29a
Evangelista, Yuri [6266-118]S15b
Evangelisti, Federico [6266-80]S11
Evans, Christopher J. [6269-105]S10a
Evans, Clinton E. [6265-40]S12
Evans, Glynn [6272-98]S20
Evans, Ian N. [6270-24]S5, [6270-68]S7c
Evans, Ian N. [6270-71]S7c
Evans, Janet D. [6270-24]S5, [6270-68]S7c, [6270-71]S7c
Evans, Julia W. [6272-71]S15, [6272-90]S19
Evans, Rob [6273-07]S2, [6273-08]S2
Evans, Stuart M. [6274-09]S3
Everett, Jon R. [6267-34]S10, [6267-154]S10, [6269-216]S10c
Ezoe, Yuichiro [6266-48]S6

F

Fabbiano, Giuseppina [6266-57]S7, [6270-24]S5, [6270-68]S7c, [6270-71]S7c
Faber, Anne-Jans [6268-91]S18
Fabian, Andrew C. [6266-60]S8
Fabinsky, Beth E. [6271-44]S7
Fabre, Norbert [6272-72]S15
Fabrega, Lourdes [6266-72]S9
Fabregat, Juan [6267-111]S29b
Fabricant, Daniel G. [6269-72]S9, [6269-214]S10c
Fabricius, Maximilian H. [6276-12]S3
Fadavi, Mehri [6270-18]S4
Fairband, Ray [6266-47]S6
Fairfield, Jessamyn A. [6276-12]S3
Fairley, Alasdair E. [6275-51]S10
Falcini, Gilberto [6269-46]S6, [6273-141]S21g
Falomo, Renato [6272-27]S6
Fanara, Carlo [6273-09]S2
Fang, Cheng [6266-21]S4
Fantano, Louis G. [6273-31]S7
Fantinel, Daniela [6267-30]S9, [6274-61]S10
Fappani, Denis [6272-177]S26n
Farah-Simon, Alejandro [6267-17]S6, [6269-89]S10a
Farinato, Jacopo [6267-20]S7, [6269-217]S10c, [6269-226]S10b, [6272-27]S6, [6272-77]S16, [6272-79]S16, [6272-80]S26k, [6272-87]S18, [6272-128]S26a, [6272-174]S26m, [6272-190]S26r
Farrel, Tony [6269-16]S4
Farrell, Thomas D. [6272-58]S12
Farrington, Christopher D. [6268-107]S19b
Fassbender, Rene [6266-114]S15b
Fata, Robert G. [6269-214]S10c
Faucher, Luc [6273-24]S6
Fazio, Giovanni G. [6276-21]S4, [6276-33]S5

G

Participants List

Bold = SPIE Member

H

Participants List

Bold = SPIE Member

I

J

K

Participants List

Bold = SPIE Member

L

Laurenti, Giuliano [6266-134]S15d
Laux, Uwe [6267-134]S29b
Lavigne, Jean-François [6269-144]S10b
Lavigne, Jean-François [6269-157]S10b
Lavrinov, Vitalii [6272-194]S26s
Lawrence, Jon S. [6267-26]S9, [6267-33]S10, [6267-34]S10, [6267-154]S10, [6269-216]S10c
Lawson, Peter R. [6268-01]S1, [6268-69]S13, [6268-84]S17
Lay, Oliver P. 6268 ProgComm, 6268 S6 SessChr, [6268-47]S9, [6268-49]S9, [6268-84]S17
Lazarian, Alexander [6275-54]S11
Lazo, Manuel [6269-04]S1, [6269-41]S6
Lazrek, Mohamed [6268-39]S8, [6269-86]S10a
Lazzarini, Paolo G. [6273-52]S11
Le Besnerais, Guy [6268-69]S13
Le Bouquin, Jean-Baptiste [6268-35]S7, [6268-136]S19g, [6268-162]S19g, [6268-163]S19g
Le Coarer, Etienne P. [6268-35]S7, [6268-136]S19g
Le Louarn, Miska [6267-27]S11, 6272 ProgComm, 6272 S22 SessChr, 6272 S14 SessChr, [6272-11]S3, [6272-23]S6, [6272-62]S13, [6272-109]S23, [6272-186]S26q
Le Mer, Isabelle [6265-11]S3
Le Mignant, David [6270-12]S2, [6272-01]S1
Le Pennec, Jean [6265-11]S3, [6275-02]S1, [6275-03]S1
le Poole, Rudolf S. [6268-32]S7
Le Roux, Brice [6267-154]S10, [6269-216]S10c, [6272-27]S6, [6272-174]S26m
Lebrun, Francois [6266-17]S3
Lecavelier, Alain [6266-08]S2
Lechner, Peter H. [6266-71]S9, [6266-136]S16e, [6276-17]S6, [6276-48]S7
Leckie, Brian M. [6269-44]S6, [6269-152]S10b, [6269-218]S10c
Ledoux, Cedric [6269-101]S10a
LeDuc, Henry G. [6265-105]S26a, [6275-08]S1, [6275-59]S11, [6275-64]S12a, [6275-65]S12a, [6275-79]S12b
LeDuigou, Jean-Michel [6265-56]S15
Lee, Changhoon [6275-77]S12g
Lee, Dae Hee [6265-64]S17
Lee, David [6265-38]S12, [6265-118]S26b, [6273-74]S15
Lee, Dea-Hee [6269-180]S10b
Lee, Eric [6273-114]S21b
Lee, Ian [6272-50]S11
Lee, Jeonghwa [6273-10]S2
Lee, Joon P. [6267-139]S29h
Lee, Lawton H. [6272-69]S14
Lee, Sungho [6269-180]S10b, [6269-220]S10c
Lee, William [6270-23]S4
Leeks, Sarah J. [6265-13]S3
Leeuw, Lerothodi [6275-54]S11
Lefranc, Sebastien [6275-49]S9
Léger, Alain M. [6265-56]S15, [6268-52]S11
Lehan, John P. [6266-69]S9
Lehmann, Holger [6269-96]S10a
Lehmann, Volker [6266-128]S15d, [6266-129]S15d, [6266-130]S6
Lehmitz, Michael [6269-126]S10a, [6274-30]S6
Lehner, Matthew J. [6270-18]S4
Lei, Jia [6269-206]S10c
Leinert, Christoph [6268-23]S3
Leisawitz, David T. [6265-137]S27a, [6268-11]S3, [6268-104]S19a, [6268-119]S19e, [6275-14]S2
Leitch, Erik M. [6275-57]S11
Leitch, James W. [6268-86]S17
Leiva, Alfredo [6270-09]S2
Leluc, Catherine [6266-105]S14
Lemaire, Philippe [6266-88]S12
Lemaitre, Gerard R. [6273-102]S21a
Lembke, Dominik [6266-121]S15c
Lemke, Dietrich [6265-09]S3, [6265-89]S22, 6273 Chr, 6273 S16 SessChr, 6273 S18 SessChr, [6273-80]S17, [6273-81]S17, [6273-82]S17, [6275-28]S5
Lemke, Roland [6269-106]S10a
Lena, Pierre J. [6268-53]S7
Lenaerts, Cédric J. M. [6268-94]S18
Lenke, Ralf [6266-33]S5, [6266-34]S5, [6266-53]S7
Lenzen, Rainer [6269-65]S9, [6269-75]S9, [6269-126]S10a, [6269-186]S10b, [6272-84]S17
Leone, Franco [6269-46]S6, [6269-148]S10b
Leong, Melanie [6275-25]S4
Leonhardt, Volker [6265-94]S22
Leonid, Antoshkin [6272-194]S26s
Lerchster, Michael [6266-115]S15b
Leroy, Christophe [6265-15]S4
Lesser, Michael P. [6276-03]S1
Lester, Daniel F. [6265-68]S18, [6265-115]S26a
Lester, Jeff [6265-105]S26a
Levato, Hugo [6267-120]S29d
Lévêque, Samuel A. [6268-31]S7, [6268-134]S19c, [6268-146]S19h, [6268-150]S19h
Levine, B. M. [6265-44]S13, [6272-180]S26o
Levine, Deborah [6270-02]S1, [6270-42]S7a
Levine, Marie B. 6271 ProgComm, [6271-08]S3
Leviton, Douglas B. [6268-104]S19a, [6268-119]S19e, [6269-149]S10b, [6273-98]S20, [6273-99]S20
Lewis, Andrew J. [6273-111]S21b
Lewis, Hilton 6274 Chr
Lewis, Ian J. [6269-48]S6, [6269-158]S10b, [6269-164]S10b
Lewsley, Harry J. [6267-149]S29h
Li, Binhua [6274-51]S10, [6276-58]S8, [6276-65]S8
Li, Chao Te [6275-55]S11
Li, Guangyu [6268-117]S19e
Li, Guoping [6267-31]S9, [6269-224]S10a, [6273-54]S11, [6273-125]S21d
Li, Huabai [6275-54]S11
Li, Mary J. [6265-39]S12
Li, Weimin [6269-201]S10c
Li, Yan [6267-73]S20
Li, Ying [6273-12]S3
Li Causi, Gianluca [6269-226]S10b, [6272-79]S16
Liang, Ming [6267-100]S28, [6269-136]S10b, [6269-141]S10b, [6269-145]S10b, [6269-150]S10b, [6269-160]S10b, [6269-162]S10b, [6269-165]S10b, [6271-21]S5, [6271-35]S6, [6272-13]S3, [6272-26]S6, [6272-51]S11
Liao, K. T. [6265-105]S26a
Licha, Tom [6270-31]S5
Lichtenberger, Arthur W. [6275-24]S4
Lichtscheindl, Josef [6273-03]S1
Lidman, Christopher [6268-148]S19h, [6272-131]S26b
Lieber, Michael D. [6271-09]S3, [6271-31]S6, [6271-60]S7
Lieberman, David H. [6265-139]S26c
Lierstuen, Lars O. [6268-46]S9
Liewer, Kurt M. [6268-45]S9
Lightsey, Paul A. [6265-26]S10, [6265-31]S11, [6265-121]S26b, [6265-164]S11, [6271-42]S7
Ligon, Edgar R. [6268-110]S19c
Ligori, Sebastiano [6272-76]S16
Lillie, Charles F. [6265-84]S21, 6268 ProgComm, 6268 S17 SessChr
Lilly, Simon J. [6265-21]S8
Lim, Tanya L. [6265-13]S3, [6275-41]S7
Lima, Jorge [6269-191]S10b
Limon, Michele [6275-56]S11, [6275-67]S12b
Limousin, Olivier [6266-17]S3, [6266-92]S13, [6276-45]S7
Lin, Douglas N. C. [6265-132]S26c
Lin, Haosheng [6269-20]S4
Lin, Huan [6270-77]S7c
Lin, Jing [6267-73]S20
Lin, Robert H. [6265-105]S26a
Lin, Robert P. [6266-78]S10
Linde, Peter [6267-57]S16
Lindensmith, Christian A. [6268-80]S16
Lindler, Don J. [6266-121]S15c
Lindler, Jason E. [6273-57]S12
Lindner, John V. [6265-106]S26a
Linfield, Edmund H. [6275-16]S3
Liotard, Arnaud [6272-72]S15
Lites, Bruce W. [6267-14]S5
Little, Bryan [6267-07]S2
Little, John [6274-82]S10
Little, Liesl M. [6273-147]S21h
Little, Patrick [6268-41]S8, [6268-159]S19k
Little, Steve L. [6273-115]S21c, [6273-147]S21h
Littman, Michael G. [6265-51]S13, [6265-162]S26c
Liu, Bo [6274-44]S10
Liu, Chao [6274-44]S10
Liu, Duncan T. [6265-44]S13
Liu, Genrong [6272-126]S26a
Liu, Liqiang [6274-50]S10
Liu, Michael C. [6269-141]S10b, [6269-145]S10b, [6272-16]S4
Liu, Yangbin [6274-51]S10
Liu, Zhong [6267-73]S20
Liu, Zhongtian [6274-60]S10
Lizon, Jean-Louis [6269-39]S6, [6269-110]S10a, [6269-188]S10b, [6269-191]S10b, [6272-40]S9, [6272-62]S13, [6272-151]S26f, [6276-11]S3
Lizon a l'Allemand, Jean Louis [6273-140]S21g
Lloyd, James P. [6269-51]S6, [6269-99]S10a, [6269-153]S10b, [6272-132]S26b, [6272-199]S23, [6275-53]S11
Lloyd-Hart, Michael [6269-192]S10b, 6272 ProgComm, 6272 S13 SessChr, [6272-03]S1, [6272-14]S3, [6272-157]S26h, [6272-187]S26q
Lo, Amy S. [6265-73]S18
Lo Curto, Gaspare [6269-25]S4
Lockhart, John [6270-81]S7c
Lockhart, Thomas G. [6274-36]S9
Lodi, Marcello [6269-46]S6
Loewen, Nathan P. [6267-70]S19, [6267-71]S19, [6267-128]S29e
Loewenstein, Robert F. [6275-60]S11
Loffredo, Gianluca [6266-80]S11
Loicq, Jérôme J. D. [6268-94]S18
Lolli, Marco [6269-46]S6
Lombini, Matteo [6267-20]S7, [6269-217]S10c, [6272-27]S6, [6272-77]S16, [6272-79]S16, [6272-80]S26k, [6272-174]S26m
Lomheim, Terrence S. SC503 Inst
Long, Knox S. [6265-21]S8
Longmore, Andrew J. [6267-66]S18, [6269-26]S4, [6269-83]S10a
Looney, Leslie W. [6269-53]S7, [6269-54]S7, [6275-34]S6
Loose, Markus [6265-91]S22
Loosen, Klaus-Dieter [6273-30]S7
Loots, Anita [6271-16]S4
Looze, Douglas P. [6272-49]S10, [6272-159]S26i, [6272-198]S23
Lopez, Alberto [6269-138]S10b
Lopez, Bruno [6268-36]S7, [6268-131]S19f, [6268-158]S19k, [6269-196]S10c
Lopez, Camilo A. [6272-53]S11
López, Pablo [6269-45]S6
López Jiménez, Antonio C. [6265-155]S27c
López Soler, Juan Manuel [6267-111]S29b
Lopez-Ruiz, José C. [6269-89]S10a, [6274-11]S3
Lorell, Kenneth R. [6267-77]S21
Lorente, Nuria P. F. [6274-55]S10
Lorenz, Eckart [6276-50]S7
Lorenzetti, Dario [6269-226]S10b, [6272-79]S16
Lorenzini, Enrico C. [6268-11]S3
Lortholary, Michel [6275-03]S1
Love, Gordon D. [6272-91]S19
Love, Peter J. [6276-78]S6, [6276-79]S8
Loveland, Susan [6274-03]S1
Lovis, Christophe [6269-25]S4
Low, Frank J. [6276-34]S5
Lowman, Andrew E. [6265-128]S26c
Loya, Frank M. [6268-45]S9
Lucas, Jacques [6268-91]S18
Lucas, Philip W. [6269-28]S5, [6269-185]S10b
Lucke, Robert L. [6268-141]S19h
Luichtel, Georg [6266-53]S7, [6273-26]S6, [6273-81]S17
Luitz, Steffen [6274-80]S10
Luke, Paul N. [6266-78]S10
Lukin, Vladimir P. [6272-194]S26s
Luks, Thomas [6269-126]S10a, [6274-58]S10
Lula, Brian [6273-56]S11
Lumb, David H. [6266-42]S6, [6266-45]S15d, [6266-46]S6, [6266-65]S8, [6266-66]S9, [6266-67]S9, [6266-128]S15d, [6266-129]S15d, [6266-130]S6, [6266-132]S15d, [6276-42]S7
Luna-Aguilar, Esteban [6276-72]S8
Lund, Niels [6266-110]S14
Lundin, Lars K. [6269-39]S6, [6270-31]S5, [6270-80]S7c
Lunine, Jonathan I. [6265-21]S8
Luo, Ali [6267-119]S29d
Luo, Xichun [6273-07]S2
Luo, Yuan [6275-71]S12d
Luong, Bruno [6267-80]S29h
Luong, Edward M. [6265-105]S26a
Lupie, Olivia L. [6265-17]S5, [6265-110]S26a
Luppino, Gerard A. [6276-53]S8
Lusset, Vincent [6266-115]S15b
Lutz, Gerhard [6272-155]S26g, [6276-17]S6, [6276-48]S7
Lyford, Nicholas [6273-09]S2, [6273-10]S2
Lyke, James E. [6270-12]S2, [6272-01]S1
Lynn, James [6269-164]S10b
Lyon, Richard G. [6265-127]S26c, [6265-132]S26c, [6268-119]S19e
Lyons, Katrina M. [6271-08]S3

Participants List

Bold = SPIE Member

M

Participants List

Bold = SPIE Member

N

O

P

Participants List

Bold = SPIE Member

Q

R

S

Participants List

Bold = SPIE Member

Schulz, Bernhard [6265-13]S3
Schumacher, Achim [6267-130]S29g
Schumacher, German [6267-150]S29h, [6274-02]S1
Schuster, Michael T. [6270-74]S7c
Schwab, Philippe [6273-116]S21c
Schwartz, Dan A. [6270-57]S7b
Schwartz, Daniel A. [6266-57]S7, [6270-05]S1
Schwarz, Herbert [6266-53]S7
Schwarz, Hugo E. [6267-51]S29e
Schweizer, Mario [6269-54]S7
Schwope, Axel [6266-27]S4
Sciortino, Salvatore [6266-126]S15d
Scorse, Thomas [6271-11]S3
Scott, Alan D. [6265-40]S12, [6269-202]S10c
Scott, Alan [6269-207]S10c
Scott, Charles P. [6270-01]S1, [6270-41]S7a, [6270-49]S7a
Scott, Douglas [6275-51]S10
Scowen, Paul A. [6265-148]S27a
Scuderi, Salvo [6269-46]S6
Seager, Sara MeetingVIP, [6265-132]S26c, [6268-75]S15, [AS100-09]S
Seaman, Robert L. [6270-20]S4
Sebag, Jacques [6267-38]S11, [6267-151]S29d, [6271-21]S5, [6273-19]S4, [6273-32]S7
Sebring, Thomas A. 6267 ProgComm, 6267 S20 SessChr, [6267-64]S18, [6267-71]S19, [6267-143]S29h, [6273-27]S6
Seddiki, Omar [6265-65]S17
Sedghi, Babak [6271-23]S5
Sedmak, Giorgio [6273-93]S19, [6273-94]S19, [6273-108]S21a, [6273-130]S21e
Seedsman, Adam [6267-140]S29h, [6268-96]S19a
Seely, John F. [6266-31]S5
Ségransan, Damien [6268-73]S15, [6268-152]S19i
Seguel, Juan [6267-40]S11
Segura, Pedro R. [6267-96]S27, [6267-97]S27, [6269-166]S10b, [6269-170]S10b
Seifahrt, Andreas [6269-39]S6
Seifert, Andreas [6266-33]S5
Seifert, Walter [6269-106]S10a, [6269-126]S10a
Sekiguchi, Akiko [6266-104]S14, [6272-167]S26l
Sekiguchi, Kazuhiro [6267-124]S29d
Sekoranja, Matej [6274-06]S2
Sembach, Kenneth R. [6266-20]S4
Sembay, Steven F. [6266-140]S16g
Semena, N. [6266-157]S15d
Semencova, Veronika [6266-54]S7
Semenov, Alexei D. [6275-16]S3, [6275-18]S3
Semisch, Christopher [6275-56]S11
Seneta, Eugene B. [6268-05]S2, [6268-93]S18
Senkow, Stephany [6272-95]S20
Seppala, Lynn G. [6271-21]S5, [6272-37]S8, [6273-23]S5, [6273-33]S7
Seppey, Annick [6273-124]S21d
Serabyn, Eugene [6265-44]S13, [6265-50]S13, [6268-03]S1, [6268-42]S9, [6268-43]S9, [6268-44]S9, [6272-22]S5, [6272-135]S26c, [6275-35]S6
Serano, Alfonso [6267-01]S1
Sergeev, Andrei V. [6275-06]S1
Sese, Javier [6266-72]S9
Seshadri, S. [6276-31]S5
Setiawan, Johny [6268-73]S15, [6268-152]S19i
Severson, Scott A. [6272-38]S8, [6272-71]S15, [6272-90]S19
Sgro, Carmelo [6266-29]S4, [6266-106]S14
Shafer, Richard A. [6275-49]S9
Shah, Amish B. [6269-501]S
Shah, Vishal M. [6269-501]S
Shaklan, Stuart B. [6265-52]S14, [6265-126]S26c, [6265-130]S26c
Shalem, Shaul [6268-121]S19e
Shang, Yuanyuan [6276-59]S8, [6276-65]S8
Shao, Michael MeetingVIP, [6265-41]S13, [6265-44]S13, [6265-132]S26c, [6268-16]S4, [6268-74]S15, [6268-153]S19i, [6272-83]S17, [6272-180]S26o, [AS100-04]S
Sharma, Anup [6265-104]S25
Sharp, Elmer H. [6275-50]S10, [6275-56]S11, [6275-67]S12b
Sharp, Robert G. [6269-16]S4
Sharples, Ray M. [6269-49]S6
Shaw, Marcus A. [6271-08]S3
Shawl, Steve [6267-105]S29a
She, Chiao Y. [6272-52]S11
Shearer, Andrew [6271-02]S1, [6271-03]S1, [6271-47]S7, [6276-18]S4, [6276-20]S4
Shectman, Stephen A. [6269-112]S10a, [6272-41]S9
Sheehan, Brendan J. [6265-156]S27c
Sheehan, Michael P. [6269-04]S1, [6272-09]S26
Sheers, Lisa B. [6265-37]S12
Sheinis, Andrew I. [6269-118]S10a, [6269-177]S10b, [6272-171]S26l
Shelton, Amy L. [6274-05]S2
Shelton, Jean C. [6272-04]S1, [6272-180]S26o
Shelton, John [6274-25]S7
Shetrone, Matthew D. [6267-96]S27
Shi, Fang [6265-32]S11, [6265-33]S11, [6265-42]S13, [6265-43]S13, [6265-128]S26c
Shi, Jun [6267-49]S13
Shi, Yang [6267-49]S13
Shiao, Yu-Shao [6275-34]S6
Shibai, Hiroshi [6265-115]S26a
Shibata, Ryo [6266-43]S6, [6266-51]S7, [6266-101]S13, [6266-123]S15d, [6266-142]S16g, [6266-155]S16f
Shields, Duncan M. [6265-25]S9, [6265-31]S11, [6271-42]S7
Shimizu, Yasuhiro [6269-137]S10b
Shimoda, Kenta [6266-123]S15d, [6266-142]S16g
Shinnaga, Hiroko [6275-54]S11
Shipley, Ann F. SC561 Inst, [6266-154]S16g, [6273-138]S21f
Shirasaki, Yuji [6274-52]S10
Shiri, Sharam [6265-35]S11
Shore, Paul R. 6273 ProgComm, 6273 S14 SessChr, [6273-07]S2, [6273-09]S2, [6273-74]S15
Shorey, Aric b. [6273-21]S5
Shropshire, Daniel P. [6270-05]S1
Shropshire, Daniel P. [6270-45]S7a
Shtromberg, Alisa [6268-70]S14
Shumko, Sergiy [6267-10]S3, [6274-68]S10, [6274-76]S10
Shustov, Boris [6266-35]S5
Sibthorpe, Bruce [6270-47]S7a
Sidher, Sunil D. [6265-13]S3
Sidick, Erkin [6265-128]S26c
Siebenmorgen, Ralf [6269-39]S6, [6270-67]S7b, [6270-80]S7c
Siefert, Andreas [6266-34]S5
Siegel, Benjamin [6267-88]S24, [6273-120]S21d
Siegel, Peter H. [6275-22]S4
Siegler, Nicholas [6272-172]S26m
Siegmund, Oswald H. W. [6266-33]S5, [6272-154]S26g, [6276-44]S7
Siemiginowska, Aneta [6270-56]S7b
Sievers, Lisa [6268-102]S19a
Sigerud, Katarina [6274-07]S2
Sigwarth, Michael [6274-17]S5
Silber, Armin [6269-39]S6, [6270-67]S7b, [6272-152]S26f, [6276-11]S3
Silbermann, Nancy [6270-83]S7d
Siler, Richard D. [6265-157]S27c
Silva, David R. 6270 Chr, [6270-52]S7a, [6270-86]S7d, [6274-14]S4
Silverberg, Robert F. [6265-39]S12, [6265-80]S20
Simard, Luc [6269-67]S9
Simms, Lance [6267-151]S29d
Simnett, George M. [6266-31]S5
Simoens, François [6265-11]S3, [6275-01]S1
Simons, Doug [6269-192]S10b, 6272 S12 SessChr
Simons, Douglas A. 6269 ProgComm, 6269 S5 SessChr, [6269-04]S1, 6272 ProgComm
Sinclaire, Peter [6269-188]S10b
Sinquin, Jean-Christophe [6272-13]S3
Sirianni, Marco [6270-59]S7b, [6276-02]S1
Sirota, Mark J. [6273-45]S10, [6274-01]S1, [6274-15]S5
Sivanandam, Suresh [6265-65]S17, [6269-31]S5, [6272-115]S24, [6272-130]S26b, [6276-34]S5
Sivaramakrishnan, Anand [6272-20]S5
Skalare, Anders J. [6275-21]S3, [6275-22]S4
Skegg, Michael [6276-19]S4
Skidmore, Warren [6267-37]S11, [6267-40]S11, [6267-48]S13
Skinner, Gerry [6266-71]S9
Skripunov, Evgeny [6266-35]S5
Skrutskie, Michael F. [6265-141]S26c, [6269-193]S10b, [6273-75]S15, [6276-69]S8
Skulinova, Michaela [6266-54]S7
Skvarc, Jure [6272-88]S18, [6272-129]S26a
Slagle, James H. [6267-18]S7, [6270-11]S2
Slater, Sara [6269-221]S9
Sloan, Gregory C. [6265-87]S22
Smareglia, Riccardo [6267-20]S7
Smedley, Scott [6269-48]S6, [6273-69]S14
Smee, Stephen A. [6269-76]S10a, [6269-92]S10a
Smette, Alain [6269-40]S6, [6270-80]S7c
Smith, Aaron W. [6265-141]S26c
Smith, Alan [6266-31]S5
Smith, Bryan K. [6272-28]S7, [6273-16]S3
Smith, Byron W. [6267-05]S1
Smith, Charles [6267-25]S8
Smith, Christian A. [6273-51]S11
Smith, Craig H. [6272-142]S26f
Smith, David L. [6265-13]S3
Smith, David M. [6266-78]S10
Smith, David R. [6271-22]S5, 6273 ProgComm, 6273 S9 SessChr, [6273-40]S8
Smith, David R. [6276-22]S4
Smith, Eric P. [6265-01]S1, [6265-21]S8
Smith, Erin C. D. [6269-56]S7, [6269-195]S10b
Smith, Greg A. [6269-16]S4, [6269-48]S6
Smith, Harry [6267-47]S13
Smith, Jeffrey S. [6265-35]S11, [6265-158]S27c, [6274-79]S10
Smith, Keith [6265-28]S10
Smith, Malcolm J. [6272-13]S3, [6272-24]S6
Smith, Michael P. [6269-82]S10a
Smith, R. C. [6269-221]S9
Smith, R. C. [6270-77]S7c
Smith, R. C. [6270-79]S7c
Smith, Robert J. [6269-207]S10c
Smith, Roger M. [6269-60]S8, [6276-30]S5
Smither, Robert K. [6266-87]S11
Snik, Frans [6269-210]S10c
Snowden, Steven L. [6266-99]S13
Snyder, Miguel [6272-03]S1, [6272-157]S26h
Snyder Hale, David D. [6268-21]S5
Sobotka, Michal [6267-16]S6
Soci, Roberto [6269-226]S10b, [6272-79]S16, [6272-80]S26k
Soenke, Christian [6272-34]S8, [6272-70]S14, [6272-151]S26f
Soerensen, Anton Norup [6269-107]S10a
Soffitta, Paolo [6266-22]S4, [6266-29]S4, [6266-102]S14, [6266-106]S14, [6266-148]S16g, [6266-149]S16g
Sogni, Fabio [6270-19]S4
Sohl, Dave [6265-39]S12
Sohn, Erika [6276-72]S8
Sokar, Barbara [6269-39]S6
Solanki, Sami K. [6267-14]S5
Solomos, Nikolaos H. [6270-18]S4
Soltau, Dirk [6267-16]S6, [6267-21]S7, [6272-05]S1, [6274-17]S5
Soltau, Heike [6272-155]S26g, [6276-46]S7, [6276-48]S7
Somerstein, Stephen F. [6265-127]S26c, [6273-76]S15
Sommer, Heiko [6274-06]S2
Sommer, Phillip R. [6273-09]S2, [6273-10]S2
Song, Inseok [6269-176]S10b
Song, Qian [6266-120]S15c, [6276-59]S8, [6276-65]S8
Sonneborn, George [6265-21]S8
Soria, Mary M. [6265-105]S26a
Sorrente, Béatrice [6268-124]S19e
Sosnowska, Danuta [6268-73]S15
Souccar, Kamal [6274-34]S9
Souverijns, Tim [6275-43]S8
Sozzi, Mauro [6269-46]S6, [6274-33]S9
Spaan, Frank [6265-47]S13
Spandre, Gloria [6266-29]S4, [6266-102]S14, [6266-103]S14, [6266-106]S14, [6266-148]S16g, [6266-149]S16g
Spano, Paolo [6269-107]S10a, [6269-219]S10c
Spanoudakis, Peter [6273-116]S21c
Sparks, William B. [6265-132]S26c, [6270-17]S3
Speed, John [6265-125]S26b
Speegle, Chet O. [6266-49]S6, [6266-55]S7
Spencer, Locke D. [6265-13]S3, [6265-107]S26a
Sperber, Peter [6268-40]S8
Spergel, David N. [6265-162]S26c
Speziali, Roberto [6267-20]S7, [6269-73]S9, [6269-217]S10c, [6269-226]S10b
Spiga, Daniele [6266-41]S6, [6266-44]S6, [6266-49]S6
Spirito, Gianfranco [6274-47]S10
Spirock, Thomas J. [6267-10]S3
Spitzbart, Bradley [6270-46]S7a
Sprayberry, David [6269-162]S10b, [6269-165]S10b, [6271-35]S6

T

Participants List

Bold = SPIE Member

Thaler, Jon J. [6267-150]S29h, [6274-80]S10
Thami, Elhalkouj [6268-39]S8
Thatte, Niranjan A. [6269-27]S4, [6269-132]S10a, [6269-164]S10b, [6273-100]S20
Thibault, Simon [6265-65]S17, [6269-80]S10a, [6269-144]S10b, [6269-213]S10c, [6272-95]S20
Thiébaut, Eric M. [6265-54]S15, [6268-68]S13, [6268-69]S13, [6268-162]S19g, [6272-54]S11, [6272-102]S21, [6272-103]S21, [6272-119]S24, [6276-23]S4
Thiele, Hans [6268-87]S17
Thomas, Ian [6275-58]S11
Thomas, Roger J. [6266-31]S5
Thomas, Sandrine [6272-56]S12
Thompson, Anita K. [6268-104]S19a, [6268-119]S19e
Thompson, Kevin P. [6269-169]S10b
Thompson, Robert R. [6268-161]S12
Thorpe, James I. [6273-77]S16
Thorsteinsson, Hrobjartur [6268-05]S2, [6268-120]S19e
Thureau, Nathalie D. [6268-62]S13, [6268-67]S13, [6268-111]S19g, [6268-118]S19e, [6268-126]S19e
Thurston, Timothy S. [6273-114]S21b
Tighe, Roberto [6267-150]S29h
Timbie, Peter T. [6275-33]S6
Tinoco, Silvio J. [6276-72]S8
Tintori, Matteo [6269-110]S10a, [6269-208]S10c, [6269-219]S10c
Title, Alan M. [6267-14]S5
Todd, Stephen P. [6273-65]S13
Tohiguchi, Masakuni [6266-96]S13, [6276-40]S7
Tokanai, Fuyuki [6266-86]S11, [6266-146]S16g, [6266-147]S16g
Tokoku, Chihilo [6269-43]S6
Tokoku, Chihiro [6269-171]S10b, [6274-37]S9
Tokovinin, Andrei A. [6267-151]S29d, [6269-192]S10b, [6272-56]S12
Tokunaga, Alan T. [6269-141]S10b, [6269-145]S10b, [6269-150]S10b, [6269-154]S10b, [6272-26]S6
Toland, Ronald W. [6273-83]S17
Tollestrup, Eric V. [6269-145]S10b
Tolls, Volker [6265-127]S26c, [6265-132]S26c
Tomasi, Maurizio [6271-36]S6, [6275-39]S7
Tomelleri, Raffaele [6269-147]S10b, [6273-141]S21g
Tomida, Hiroshi [6266-144]S16g
Tomono, Daigo [6267-146]S29h, [6274-83]S10
Tomsick, John A. [6266-137]S16f
Tonnellier, Xavier P. [6273-07]S2
Tonry, John L. [6269-221]S9
Toral, Rafael [6267-17]S6
Tordo, Sebastien [6272-62]S13
Torii, Ken'ichi [6266-100]S13, [6266-152]S16g
Torii, Ken'ichi [6266-93]S13, [6266-151]S16g
Torii, Yasuo [6268-08]S2
Torrioli, Guido [6266-95]S13
Tosh, Ian A. J. [6269-48]S6, [6269-158]S10b, [6269-164]S10b, [6273-97]S20
Toso, Giorgio [6269-208]S10c, [6269-219]S10c, [6273-149]S21h
Tosti, Gino [6267-29]S9, [6267-30]S9, [6269-188]S10b, [6274-62]S10
Touhiguchi, Masakuni [6266-91]S13
Towell, Timothy C. [6265-25]S9
Townes, Charles H. [6268-20]S5, [6268-21]S5, [6272-199]S23
Townsend, Jacqueline M. [6265-110]S26a
Tozzi, Andrea [6267-83]S22, [6272-10]S3, [6272-91]S19, [6272-121]S25
Tracy, Allen J. [6272-50]S11, [6272-53]S11
Traub, Wesley A. MeetingVIP, [6265-46]S13, [6265-141]S26c, 6268 ProgComm, 6268 S1 SessChr, 6268 S2 SessChr, [6268-19]S4, [6268-30]S6, [6268-75]S15, [6268-145]S19h, [6268-166]SA, [AS100-07]S
Trauger, John T. [6265-42]S13, [6265-43]S13, [6265-129]S26c, [6265-131]S26c, [6265-166]S26c
Travers, Douglas E. [6275-67]S12b
Travouillon, Tony [6267-50]S13, [6267-55]S15, [6267-154]S10
Tredicucci, Alessandro [6275-16]S3
Treis, Johannes [6266-71]S9, [6266-136]S16e, [6276-17]S6, [6276-48]S7
Tremberger, George [6265-138]S26c, [6265-139]S26c
Tremsin, Anton S. [6276-44]S7
Tresoldi, Daniela [6269-219]S10c
Tricard, Marc [6273-21]S5
Trifoglio, Massimo [6266-85]S16f, [6266-116]S15b
Trigo i Rodriguez, Josep María [6267-111]S29b
Trinh, Thang Q. [6272-04]S1
Tritschler, Alexandra [6267-10]S3, [6269-225]S10c
Tromp, Niels [6272-88]S18, [6273-142]S21g
Trottet, Gerard [6266-21]S4
Troy, Mitchell [6265-33]S11, [6265-50]S13, [6267-79]S21, 6272 ProgComm, 6272 S25 SessChr, [6272-04]S1, [6272-13]S3, [6272-22]S5, [6272-83]S17, [6272-180]S26o
Trunz, Michael [6273-80]S17
Trunz, Michael [6273-81]S17
Truong, Tuan [6272-04]S1
Tsaneva, Vassilka N. [6275-58]S11, [6275-75]S12f
Tsang, Dominic [6267-128]S29e
Tsang, Raymond M. [6265-105]S26a
Tsering, Lhapa [6267-49]S13
Tsuchiya, Yuichiro [6266-144]S16g
Tsuiki, Atsuo [6265-143]S27a
Tsujimoto, Masahiro [6266-104]S14, [6272-167]S26l
Tsujimoto, Takuji [6265-142]S27a, [6265-143]S27a, [6265-144]S27a, [6265-145]S27a
Tsumura, Kohji [6265-64]S17
Tsunemi, Hiroshi [6266-91]S13, [6266-93]S13, [6266-96]S13, [6266-100]S13, [6266-101]S13, [6266-142]S16g, [6266-144]S16g, [6266-145]S16g, [6266-151]S16g, [6266-152]S16g, [6266-155]S16f, 6276 ProgComm, [6276-40]S7, [6276-67]S8, [6276-73]S8
Tsunoda, Naoko [6266-146]S16g, [6266-147]S16g
Tsuru, Takeshi G. [6266-91]S13, [6266-93]S13, [6266-96]S13, [6266-100]S13, [6266-145]S16g, [6266-151]S16g, [6266-152]S16g, [6276-38]S6, [6276-40]S7, [6276-73]S8
Tsuruta, Seiitsu [6265-144]S27a
Tsutumi, Junpei [6274-52]S10
Tubb, Alan [6273-45]S10
Tubbs, Robert N. [6268-14]S11, [6268-32]S7, [6272-10]S3, [6272-105]S22, [6272-121]S25
Tucker, Carole E. [6275-29]S5, [6275-30]S5, [6275-48]S9, [6275-58]S11
Tucker, Dean [6274-72]S10
Tucker, Dennis S. [6265-104]S25
Tucker, Douglas [6270-77]S7c
Tucker, Gregory S. [6275-33]S6
Tucker, James [6265-24]S9
Tucker, Robert [6275-58]S11
Tuell, Michael T. [6273-105]S3
Tueller, Jack [6276-68]S8
Tulloch, Simon M. [6272-88]S18, [6272-129]S26a
Tuparev, Georg [6270-18]S4, [6270-22]S4, [6270-64]S7b, [6274-32]S8
Turatto, Massimo [6269-108]S10a
Turner, Martin J. L. 6266 Chr, [6266-60]S8, [6266-64]S8
Turner, Nils H. [6268-17]S4, [6268-34]S7, [6272-132]S26b, [6272-199]S23
Turner-Valle, Jennifer A. [6266-20]S4
Tuthill, Peter G. [6268-04]S2, [6268-34]S7, [6272-132]S26b, [6272-199]S23
Tuttle, Carl E. [6265-44]S13
Tuttle, James G. [6275-14]S2
Tuttle, Sarah [6266-32]S5
Twarog, Bruce [6267-105]S29a
Tycner, Christopher [6268-33]S7, [6268-125]S19e, [6268-155]S19j
Tyler, Glenn A. [6272-13]S3, [6272-35]S8, [6272-45]S10, [6272-110]S23
Tyson, J. Anthony [6267-151]S29d, [6269-117]S10a, [6276-75]S8
Tyson, Robert K. SC135 Inst

U

Ubertini, Pietro [6266-22]S4, [6266-79]S10, [6266-83]S11
Uchiyama, Hideki [6276-38]S6
Udry, Stephane [6269-25]S4
Uebelhart, Scott A. [6265-100]S24, [6271-28]S5
Uematsu, Yasuhiro [6274-83]S10
Ueno, Masaru [6276-38]S6
Ueno, Shiro [6266-144]S16g
Uesugi, Kentaro [6266-142]S16g
Uitenbroek, Han [6269-225]S10c
Ukita, Nobuharu [6267-90]S24, [6269-32]S5
Ullom, Joel N. [6275-52]S10, [6276-49]S7
Unger, Blair L. [6265-36]S11
Upton, Robert S. [6271-30]S5, [6271-48]S7, [6272-36]S8, [6273-23]S5
Uraguchi, Fumihiro [6267-116]S29b, [6267-124]S29d
Usuda, Tomonori [6267-95]S27, [6267-116]S29b, [6267-146]S29h, [6267-147]S29h, [6272-81]S16, [6274-83]S10
Utashima, Masayoshi [6265-143]S27a
Uthas, Helena [6269-74]S9
Uttenthaler, Stefan [6269-39]S6
U-Yen, Kongpop [6275-56]S11, [6275-67]S12b

V

Vaccarella, Annino [6269-78]S10a
Vadher, N. M. [6266-143]S16g, [6269-501]S
Vaillancourt, John E. [6275-54]S11
Vaitheeswaran, Vidhya [6272-30]S7
Vakili, Farrokh [6268-13]S3, [6268-37]S7, [6268-76]S15, [6268-158]S19k, [6269-187]S10b, [6269-196]S10c
Valat, Bruno [6268-31]S7, [6268-158]S19k
Vale, Leila R. [6276-49]S7
Valentin, Herve [6274-70]S10
Valentine, Daniel P. [6273-39]S8
Valentini, Angelo [6267-30]S9
Valentini, Gaetano [6267-29]S9, [6267-30]S9, [6267-121]S29d
Valenzuela, Jose J. [6269-188]S10b
Valiante, Elisabetta [6266-114]S15b
Vallbé, Marc [6269-45]S6
Vallerga, John V. [6272-154]S26g, [6276-44]S7
Van Arsdall, Morgan M. [6270-58]S7b
van Baren, Coen [6266-131]S6
Van Bertouch, Michael J. [6273-121]S21d
van Boekel, Roy [6268-23]S3
Van Buren, David [6273-48]S10
van Cleve, Jeffery [6265-87]S22
van Dam, Marcos A. [6270-12]S2, [6272-01]S1, [6272-106]S22, [6272-159]S26i
van den Brink, Raymond [6273-116]S21c
van den Dool, Teun C. [6268-101]S19a, [6273-58]S12
Van der Kuur, Jan [6266-72]S9
van der Laan, Thijs [6266-45]S15d, [6266-65]S8
van der Wal, Peter [6275-20]S3
van Dordrecht, Axel [6269-24]S4
van Eyken, Julian C. [6269-87]S10a
van Haendel, Rob P. A. [6273-58]S12
Van Harmelen, Jan [6273-92]S19, [6276-25]S4
van Hoof, Chris A. [6265-09]S3, [6275-43]S8
van Langevelde, Huib J. [6267-98]S27
van Leeuwen, Floor [6270-27]S5
van Moorsel, Gustaaf [6274-03]S1
van Rooyen, Ruby [6267-35]S11
van Venrooij, Bart [6273-96]S20
Van Winckel, Hans [6269-96]S10a
VanBrocklin, Randy R. [6273-01]S1, [6273-02]S1, [6273-18]S4, [6273-103]S21a
Vandame, Benoit [6267-87]S29h
Vandenbussche, Bart K. P. [6265-09]S3
Vanderbei, Robert J. [6265-48]S13, [6265-51]S13, [6265-130]S26c, [6265-162]S26c, [6272-46]S10
Vandervelde, Thomas E. [6273-75]S15
Vandormael, Denis P. G. [6268-94]S18
Vanegas, Carlos [6268-96]S19a
VanHoudt, Paul [6272-50]S11
Vannier, Martin [6268-60]S12
Vannier, Martin [6268-158]S19k
Varela, Antonia M. [6267-45]S12, [6267-46]S13
Varisco, Salvatore [6266-126]S15d, [6266-127]S15d
Varsik, John R. [6267-10]S3, [6274-71]S10, [6274-76]S10
Vasiljevic, Alex [6267-70]S19
Vasisht, Gautam [6268-92]S18, [6268-110]S19c, [6272-92]S19, [6272-180]S26o
Vassilev, Vessen [6275-15]S3, [6275-17]S12b, [6275-19]S3
Vasudevan, Gopal [6265-127]S26c
Vaughn, Jeffrey L. [6272-45]S10, [6272-110]S23
Vayonakis, Anastasios [6275-59]S11, [6275-64]S12a
Veillet, Christian [6272-89]S18
Velazquez, Miguel V. [6275-80]S12d
Velebir, James R. [6265-105]S26a

W

Participants List

Bold = SPIE Member

X

Y

Z

SPIE Astronomical Telescopes and Instrumentation

24–31 May 2006
Orlando World Center Marriott Resort & Convention Center
8701 World Center Drive
Orlando, Florida USA 32821
Hotel Telephone: 407 239 4200
Hotel Fax: 407 238 8777

Onsite Registration and Information Hours

Orlando World Center Marriott

Convention Center Atrium

Wednesday 24 May	7:15 am to 5:00 pm
Thursday 25 May	7:15 am to 5:00 pm
Friday 26 May	7:30 am to 4:00 pm
Saturday 27 May	7:30 am to 4:00 pm
Sunday 28 May	Registration Closed
Monday 29 May	7:15 am to 4:00 pm
Tuesday 30 May	7:30 am to 4:00 pm
Wednesday 31 May	7:30 am to 11:30 am

For Safety and Security reasons, please be prepared to show a picture ID at registration to receive your event badge!

Exhibition Hours

Orlando World Center Marriott

Palms Ballroom

Thursday 25 May	5:30 to 8:00 pm
Friday 26 May	10:00 am to 12:30 pm; 1:30 to 4:00 pm
Saturday 27 May	10:00 am to 12:30 pm; 1:30 to 4:00 pm
Sunday 28 May	Closed
Monday 29 May	10:00 am to 12:30 pm; 1:30 to 4:00 pm
Tuesday 30 May	10:00 am to 12:30 pm; 1:30 to 4:00 pm

Speakers Audiovisual Desk

Atlanta Room

Wednesday 24 May through Wednesday 31 May . 7:30 am to 5:00 pm

All conference rooms will have a computer, LCD projector, screen, lapel microphone, and laser pointer. All speakers are requested to come to the Speaker Check-in at the Atlanta Room 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

Located in the SPIE Registration Area

Open during registration hours

If you have registered to attend a short course, please stop by the Course Materials Desk to pick up your course notes and to find out where the class will be located. You may also get a copy of the latest Education Services catalog to see the many courses SPIE has available at symposia, on video and CD-Rom, and to discover the opportunities of customized In-Company courses.

Audio/Video/Digital Recording Policy

Due to copyright restrictions, no recordings of any kind are permitted without prior written consent of the presenter in any and all conference sessions, short courses or posters. Consent forms are available at the SPIE Audiovisual Desk and anyone wishing to record must have a written consent form signed and filed for each presenter being recorded. Individuals not complying with this policy will be asked to leave a given session and asked to surrender their film or recording media.

In the Exhibition Hall: For security and courtesy reasons, photographing or videotaping individual booths and displays in the exhibit hall is allowed ONLY with explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their film and to leave the exhibition hall.

SPIE Message Center

To leave messages for attendees call the Orlando World Center Marriott at (407) 238-4010. Messages will be taken during registration hours Wednesday through Wednesday.

Internet Access

Royal and Canary Salons, Palms Ballroom

An Internet Pavilion will be provided for attendee convenience on:

Wednesday 24 May	7:00 am to 6:30 pm
Thursday 25 May	7:00 am to 8:00 pm
Friday 26 May	7:00 am to 7:00 pm
Saturday 27 May	7:00 am to 6:30 pm
Sunday 28 May	Closed
Monday 29 May	7:00 am to 7:00 pm
Tuesday 30 May	7:00 am to 8:00 pm
Wednesday 31 May	7:00 am to 3:30 pm

At no charge attendees can browse the web and check and send e-mail. There will be a 10-minute time limit per each person's internet session.

Business Center

Located on Convention level, near Food Court

Hours of operation with on-site attendant

Monday through Friday	7:00 am to 6:30 pm
Saturday and Sunday	8:00 am to 4:00 pm

Business center is open 24 hours but not always staffed. Attendees can use the copier, computer (hi speed) and printer, and charge it to their room, pay cash, or pay by credit card (after hours by credit card only). Cost for the computer usage is $.69 per minute, $1 for black print, and $1.50 for color print. Copies (1-100) are 20 cents each.

Lunch Breaks

The Marriott has ten restaurants and lounges, serving everything from pizza and burgers to sashimi and prime beef. Many of these will be open during lunch time to facilitate attendee lunches each day. Attendees may find the Mangrove Emporium the hotel's upscale Food Court with outdoor seating serving sandwiches, salads, and pizza, to be a good option to obtain lunch quickly.

Coffee Breaks

Coffee will be available each day of the event except Sunday. On Wednesday and Thursday coffee will be served in the Crystal Ballroom Foyer. On exhibition days Friday-Tuesday, coffee will be available in the exhibition hall. Coffee will be served at approximately 10:00 am and 3:00 pm each day.

Check individual conference schedules for coffee break.

Desserts

Dessert snacks will be served in the exhibition hall, Palms Ballroom on Friday, Saturday, Monday and Tuesday from 3:00 to 3:30 pm. Complimentary tickets for the dessert snacks will be included in attendee registration packets.

Paid Guest Registration

Extra Tickets for Networking Receptions

Cost is $50 per guest *(including children 12 years or older).*

Tickets for the networking receptions on Wednesday and/or Monday may be purchased for an attendee's guests (including children 12 years or older). Cost is $50 per guest. Guests without a paid guest badge will not be admitted to the receptions. **This price does not include All-Conference Dinner on Friday, 26 May 2006 or the Interactive Poster Sessions.**

Visitor Information Desk

Guests can visit the Concierge desk in the main lobby for guest services, restaurant reservations, theme park transportation, etc.

Interactive Poster Sessions

Orlando World Center Marriott – Royal Salon, Palms Ballroom

Thursday 25 May . . . . . 6:00 to 8:00 pm
Tuesday 30 May . . . . . 6:00 to 7:30 pm

Posters Display Hours

Posters will be on display for each session as follows:

First session (25 May) viewing hours:

Thursday . . . . . 10:00 am to 8:00 pm
(includes interactive session from 6:00 to 8:00 pm)
Friday . . . . . 7:30 am to 7:00 pm
Saturday . . . . . 7:30 am to 2:00 pm

Second session (30 May) viewing hours:

Monday . . . . . 10:00 am to 7:00 pm
Tuesday . . . . . 7:30 am to 8:00 pm
(includes interactive session from 6:00 to 7:30 pm)
Wednesday . . . . . 7:30 am to 1:00 pm

Poster Set-Up

For the Thursday 25 May Poster Session, poster presenters may set up starting at 10:00 am on Thursday morning. Poster authors for this session should be at their papers from 6:00 to 8:00 pm on Thursday to answer questions from attendees.

For the Tuesday 30 May Poster Session, poster presenters may set up starting at 10:00 am on Monday 29 May. Poster authors for the second session should be at their papers from 6:00 to 7:30 pm on Tuesday to answer questions from attendees.

Poster numbers will be pre-posted on the poster boards and presenters who have not placed their papers on their assigned board by 5:30 pm on the day of their presentation will be considered a "no show" and their manuscript will not be published. Presenters must remove their posters by 2:00 pm on the last day of display of their assigned session (Saturday for the first session and Wednesday for the second session.) Posters not removed will be considered unwanted and will be discarded.

SPIE Marketplace

In the SPIE registration area

Open during registration hours, Wednesday through Wednesday

The SPIE Marketplace is your source for the latest SPIE Press books, Proceedings, and Educational and Professional Development materials. You can become a member of SPIE, explore the Digital Library, and take home a souvenir.

Membership

SPIE Members, through their collective talents, influence the future of optical, technical and scientific discovery.

Membership in SPIE equals resources for you, anytime, anywhere:
- Peer-reviewed journals
- Discounted subscription for the SPIE Digital Library
- Publications
- Education
- International technical conferences and exhibitions
- SPIE Professional (The new quarterly membership magazine from SPIE)
- Significant discounts on most SPIE products and services

Join now: spie.org/membership

Child Care

All About Kids Professional Child Care, (407) 812-9300, www.All-About-Kids.com, or email AAboutKids@aol.com

SPIE does not imply an endorsement nor recommendation of these services. They are provided on an "information only" basis for your further analysis and decision. Other services may be available.

Hertz®

Hertz Car Rental is the official car rental agency for this Symposium. To reserve a car, identify yourself as an **Astronomical Telescopes attendee** using the **Hertz Meeting Code CV# 029B0009.**

In the United States call 1-800-654-2240.

Parking

Self parking at the Marriott is $7.00. Valet parking is $17. Both include in/out privileges. Tax is extra @ 6.5%. Parking can be billed to the guest's room.

Mears Motor Shuttle

Mears Motor Shuttle provides transportation between the airport and the hotel. One day prior to your return to the airport at the end of your stay at the symposium, make a return reservation by calling Mears Transportation at 407-423-5566 or book on-line www.spie.org/events/as under Travel/General. Please plan to allow three hours prior to your flight time for your transfer to the airport.

Taxi

Taxi service between Orlando International Airport and the Orlando World Center Marriott is approximately $42 on way. For more information requesting Taxi Service while in Orlando, call (407) 422-2222 or email taxiquote@mearstransportation.com

Chauffeur Driven Luxury Sedans

American Executive Town Car offers chauffeur driven luxury sedans which accommodate **up to four passengers comfortably for one flat rate**. The flat rate from the airport to the Orlando World Center Marriott is $50 one-way, $95 round trip. **Reservations are required.** All credit cards (except Diner's), traveler's checks or cash are accepted (no personal checks). Call toll free 1-877-248-9965, local phone (407) 854-3999 or www.goamericantowncar.com.

Theme Park Attraction Tickets

Visit the concierge desk for information on the Theme Parks.

Walt Disney World

Disney-MGM Studios

Everyone is talking about the hair-raising "Twilight Zone Tower of Terror". It takes you from the suggestion of horror to the terror of reality as your elevator car drops 13 floors faster than the force of gravity! Nowhere else can you experience the glamour and excitement of all-time favorite movies and TV shows, plus see real production as it happens!

Magic Kingdom

Begin your day with the fantastic intergalactic adventures of the Third Millennium at the "New Tomorrowland" in Magic Kingdom. Then head for "Frontierland" and a 52-foot plunge down Splash Mountain! Take a perilous Jungle Cruise. Face off with fierce "Pirates of the Caribbean". You won't want to miss any of the fabulous attractions in these seven lands of fantasy, adventure and fun.

EPCOT

Take a giant step into Future World and "Innovations", where you'll get your hands on thousands of the latest gadgets and inventions before the rest of the world does. You won't believe your size at the "Honey, I Shrunk the Audience" attraction. You'll travel eleven nations, each magnificently framed in its own landscape, where you can taste different cultures, through architecture, entertainment and cuisine. And cap it all off with IllumiNations, an extravaganza of lasers, lights and fireworks!

Animal Kingdom

Disney's Animal Kingdom, a theme park about animals … wild animals, dinosaurs and animal characters from the imagination of Disney. Keep in mind that the animals freely roam throughout naturalistic habitats to be patient, observant and alert and you'll discover a new appreciation for the animals with which we share this world. It's an experience you won't forget.

Universal Studios Florida

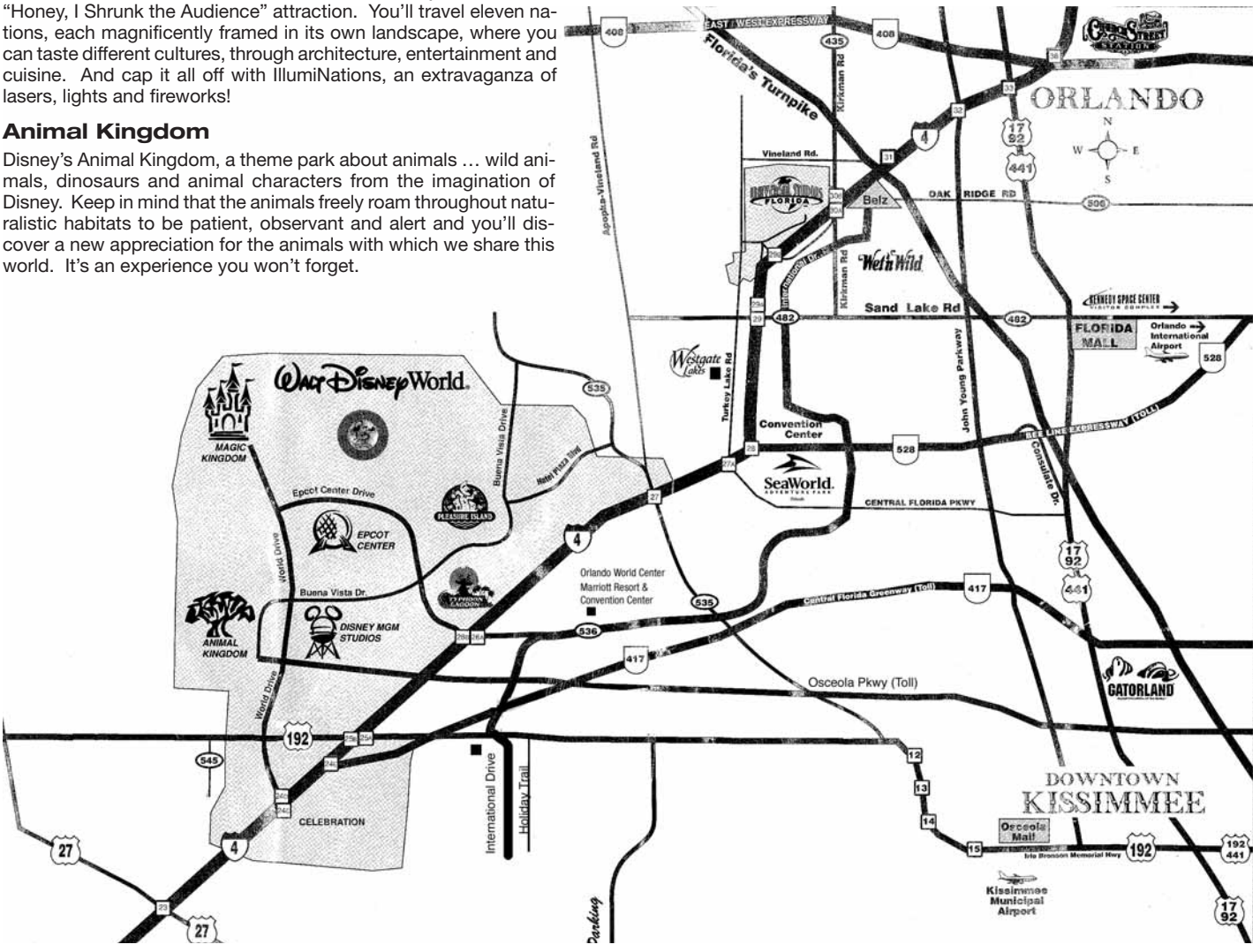
Is where Hollywood, movies and television come alive and create exhilarating and exciting experiences for everyone! Only here is it possible to go beyond the screen and be fully immersed in the action. So instead of just watching movies, you actually get to live them. Universal Studios offers a variety of heart-pounding, thrill seeking rides.

Islands of Adventure

The future of technology and the power of imagination bring to life the timeless stories and characters you've come to love. Your group will live the adventure on all five exciting islands including Seuss Landing, The Lost Continent, Jurassic Park, Toon Lagoon, and Marvel Super Hero Island. Create the event you didn't think possible at Universal Studios Islands of Adventure!

SeaWorld

SeaWorld Orlando is the world's most popular marine life adventure park with more than 200 acres of shows, attractions and exhibits that combine entertainment and education to create incredible once-in-a-lifetime adventures. Hands-on, up-close encounters with hundreds of marine animals have opened a window to the mystery of the sea to more than 756 million visitors. From the moment your guests enter SeaWorld, new sensations surround them. There's something for everyone!



Visit the

SPIE Marketplace

Palms Ballroom
Open during registration hours

The SPIE Marketplace is your source for the latest SPIE Press books, Proceedings, and Educational and Professional Development materials.

Become a member of SPIE, explore the Digital Library, and take home a souvenir.

The International Society for Optical Engineering

Get the latest editor-reviewed research . . . *much faster!*

Printed Proceedings of SPIE

You can get the Yellow book faster than ever before: within six weeks of the meeting.

6265 **Space Telescopes and Instrumentation I: Optical, Infrared, and Millimeter** *(J. C. Mather/ H. A. MacEwen/M. W. de Graauw)* $165

6266 **Space Telescopes and Instrumentation II: Ultraviolet to Gamma Ray** *(M. J. Turner/G. Hasinger)* . $160

6267 **Ground-based and Airborne Telescopes** *(L. M. Stepp)* $155

6268 **Advances in Stellar Interferometry** *(J. D. Monnier/M. Schöller/W. C. Danchi)* $165

6269 **Ground-based and Airborne Instrumentation for Astronomy** *(I. S. McLean/M. Iye)* $225

6270 **Observatory Operations: Strategies, Processes, and Systems** *(D. R. Silva/R. E. Doxsey)* $105

6271 **Modeling, Systems Engineering, and Project Management for Astronomy II** *(M. J. Cullum/ G. Z. Angeli)* $80

6272 **Advances in Adaptive Optics II** *(B. L. Ellerbroek/D. Bonaccini Calia)* $200

6273 **Optomechanical Technologies for Astronomy** *(E. Atad-Ettedgui/J. Antebi/D. Lemke)* $155

6274 **Advanced Software and Control for Astronomy** *(H. Lewis/A. Bridger)* $105

6275 **Millimeter and Submillimeter Detectors and Instrumentation for Astronomy III** *(J. Zmuidzinas/ W. S. Holland/S. Withington/W. D. Duncan)* $100

6276 **High Energy, Optical, and Infrared Detectors for Astronomy II** *(D. A. Dorn/A. D. Holland)* $100

SPIE Digital Library Subscription

For fastest access: editor-reviewed papers are available within 2 to 4 weeks of meeting.

The SPIE Digital Library is the world's largest resource available on optics and photonics. Researchers get unprecedented access to SPIE Proceedings and Journals from 1990 to the present-approximately 215,000 articles.

Researchers will save time because we make every aspect of locating the right information easier.

- 24/7 access, 365 days a year
- Browse proceedings tables of contents and abstracts by year, volume number, title, symposium, and technology area
- Email alerts for just published articles in your area of interest
- New content added frequently
- Powerful searching tools
- Citation meta data (BibTek, Endnote, Plaintext) available for easy download
- Create article collections for sharing and group collaboration
- Full-text papers in PDF and HTML (journals only)
- Reference linking via CrossRef
- Desktop access from work or home

A personal subscription includes 50 full-text papers from the Digital Library for a period of one year.

SPIE Digital Library

Technology content like no other.

spiedl.org

Searchable CD-ROM with Multiple Conferences

CD-ROMs are now available *within 8 weeks of the meeting!*

Full-text papers from all 12 Proceedings volumes. PC, Macintosh, and Unix compatible.

Astronomical Telescopes and Instrumentation 2006:
Space Telescopes and Instrumentation and Stellar Interferometry
(Includes Vols. 6265, 6266, 6268)

Order No. CDS217 · Est. pub. July 2006

Meeting attendee: $135
Nonattendee member price: $345
Nonattendee nonmember price: $450

Astronomical Telescopes and Instrumentation 2006:
Ground-based and Airborne Telescopes and Instrumentation and Systems
(Includes Vols. 6267, 6269-6271)

Order No. CDS218 · Est. pub. July 2006

Meeting attendee: $135
Nonattendee member price: $400
Nonattendee nonmember price: $510

Astronomical Telescopes and Instrumentation 2006:
Technology Advancements
(Includes Vols. 6272–6276)

Order No. CDS219 • Est. pub. July 2006

Meeting attendee: $135
Nonattendee member price: $465
Nonattendee nonmember price: $600

SPIE Membership and Publications Order Form

For Office Use Only

Date _____

Amt. Recd. _____

CC Cash Check TC

Check # _____

P.O. # _____

IDN # _____

ORD # _____

5687

☐ SPIE Member SPIE ID #

First Name M.I. Last Name

Title

Company

Address (include Mail Stop)

City State/Province Zip/Postal Code

Country other than USA

Phone Fax

E-Mail Address (SPIE does not sell e-mail addresses) Date of Birth *(Optional)*

☐ Check this box if you do not wish to receive information from organizations other than SPIE.

SPIE Membership

To receive the member discount, check appropriate box(es) below and fax or mail this form.

☐ Annual SPIE Membership: $95 (choose format): ☐ print journal

☐ Annual Student Membership: $20

Journal Option (choose one): ☐ Optical Engineering ☐ Electronic Imaging ☐ Biomedical Optics
☐ Microlithography, Microfabrication, and Microsystems

MEMBERSHIP TOTAL

$_____

Digital Library Subscription

Includes 50 paper downloads and 1-year access. ☐ SPIE Member $135 ☐ Non-Member $195 ☐ SPIE Student Member $85

You will need to provide an e-mail address and, if you are an SPIE member, your membership number in the Name and Address section above. Once the form is submitted and validated, you will receive e-mail confirmation with instructions for setting up your account.
At that point you may begin using all features of the SPIE Digital Library.

DIGITAL LIBRARY TOTAL

$_____

Publications

Fill in the volume or order number(s) and price(s) of the publications you wish to order below.

QTY.	VOL NO.	TITLE	PRICE (U.S.)

PUBLICATIONS TOTAL

$_____

CA, FL, WA residents add sales tax; Canadian residents must add GST ..... $_____

Shipping/Handling (Books & CD-ROMs) ..... $_____

U.S. 5% of order total [2-3 weeks delivery] Elsewhere 10% of order total [3-5 weeks delivery]

Express Shipping: U.S. $15 USD for 1st item; $10 USD each addl item [2-3 days delivery]
Elsewhere $30 USD for 1st item; $15 USD each addl item [1 week delivery]

SUBTOTAL

$_____

Method of Payment

☐ **Check enclosed.**
Payment in U.S. dollars (by draft on a U.S. bank or international money order) is required.
Do not send currency. Wire transfers from banks must include a copy of the transfer order.

TOTAL

$_____

☐ **Charge to my:** ☐ VISA ☐ MasterCard ☐ Discover ☐ American Express ☐ Diners Club

Card Number _____

Expiration date _____

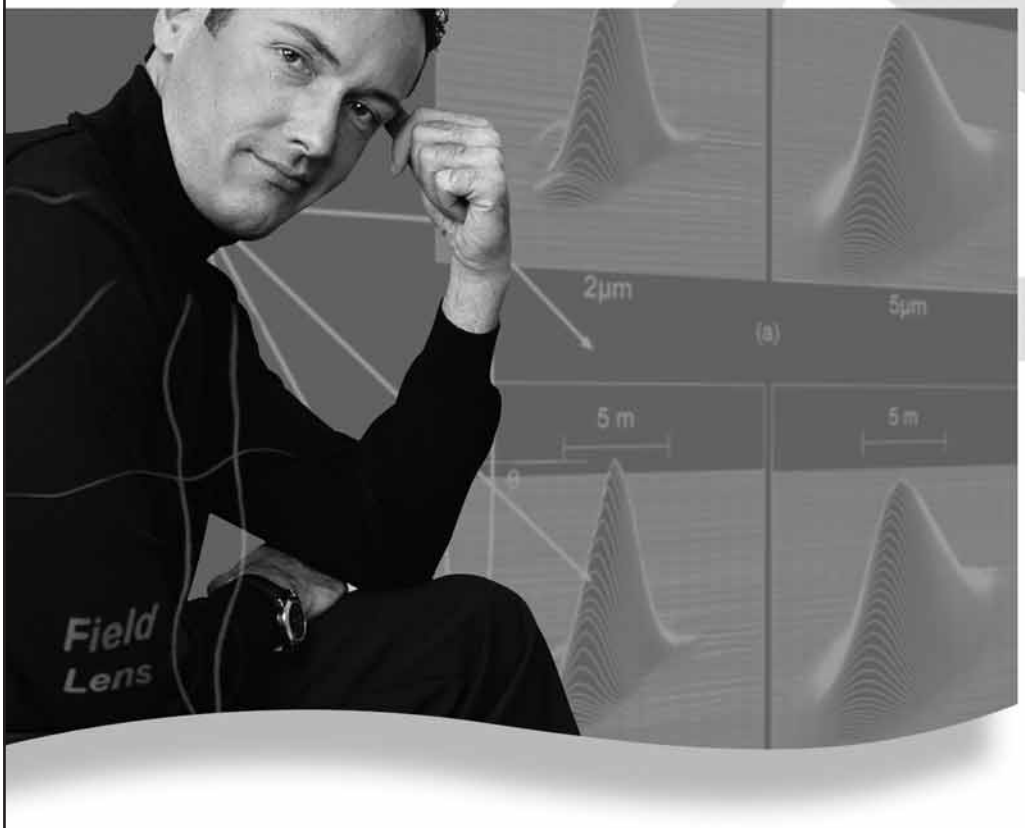
Signature _____

☐ **Purchase order enclosed** *(Purchase orders must be preapproved).*

All orders must be PREPAID in U.S. dollars. Prices subject to change without notice. No returns without written authorization of SPIE. **ITEMS WILL NOT BE SHIPPED UNLESS PAYMENT IS RECEIVED.**

Notes

Don't Miss Astronomical Telescopes and Instrumentation at Optics and Photonics 2007!



Optics & Photonics covers the latest developments in optics, nanotechnology, illumination engineering, and astronomy. When it comes to offering the technical information you need to make informed research and purchasing decisions, this is the ideal event.

SPIE
OPTICS & **Photonics**

26–31 August 2007
San Diego, California USA

Conferences • Courses • Exhibition

spie.org/events/op

SPIE—The International Society for Optical Engineering • +1 360 676 3290 • spie@spie.org

Technical figures from Optical Engineering Journal, October 04 — Wide Angle Decentered Lens Beam Steering courtesy of Gibson, Duncan, Watson and Loomis

High Performance

Cooled CCD Cameras

The revolution in affordable large format CCDs continues! And with all of these very high resolution sensors, the need for true high speed readout has never been greater.

The U16M will be partly new product and partly dramatic change in Kodak's pricing of an old standby for huge field-of-view. Kodak has added anti-blooming and microlenses to the 16M, due in mid summer. The U16 is a more traditional full frame device for those concerned about the 90% fill factor of the U16M.

Alta U16

Grade 1: $23995
Conference special: $21595

Alta U16M

Grade 1: $14250
Conference special: $12825

4096 x 4096
9 micron pixels
36.9 x 36.9 mm
1359 mm2
Full Well: 100K/85K e⁻
Peak QE: 65/59%

This new large format CCD will be ideal for medium focal length telescopes. The U9000 has a much higher full well capacity than the interline KAI-11000, with much higher quantum efficiency and much lower dark current. The KAF-09000 has >350X anti-blooming as standard.

Alta U9000

(CCD due to be available in June 2006)

Grade 1: $12495
Conference special: $11250

NEW!

3056 x 3056
12 micron pixels
36.7 x 36.7 mm
1346 mm2
Full Well: 120K
Peak QE: 76%

Apogee recently halved the read noise of this long popular workhorse, increasing further the dynamic range of the low noise output. For those needing the highest dynamic range, there is an alternative output with a pixel well of 500K.

Alta U6

Grade 2: $8995
Conference special: $8095

1024 x 1024
24 micron pixels
24.5 x 24.5 mm
604 mm2
Full Well: 200K*
Peak QE: 65%

Back-illuminated CCDs

Since SITe's demise, E2V (formerly Marconi) has taken over as the primary as well as premier supplier of back-illuminated CCDs. This one provides large field-of-view with exceptionally high QE across the visible.

Alta U42

Grade 1: $38500
Conference special: $34650

2048 x 2048
13.5 micron pixels
27.6 x 27.6 mm
764 mm2
Full Well: 100K
Peak QE: >90%

Our most popular camera for several years--high QE without worries of microlens artifacts or sub-pixel QE non-uniformity. Ideal pixel size for medium scopes.

Alta U47

Grade 1: $14995
Conference special: $13495
1024^2, 13u, 177 mm2
Full Well: 100K
Peak QE: >90%

13.3 x 13.3 mm

Standard on all Alta U Series cameras: dual 16 & 12 bit digitization; TDI; automated sequencing; binning up to 10 by total vertical; stable cooling; external triggering, and more.

Boxes are actual size of CCD imaging area

Apogee Instruments Inc.
1020 Sundown Way Ste 150 Roseville CA 95661 USA
tel 916 218 7450 fax 916 218 7451
www.ccd.com

See complete specifications at www.ccd.com/alta_specs.html