

AMOS

Advanced Maui Optical
and Space Surveillance
Technologies Conference

Conference Program | September 1-4, 2009

In Our



10th year...

Welina maí kākou (welcome all)



We are pleased that you are participating in the 10th annual AMOS Conference! Although we will be sitting in a darkened ballroom, intently listening to technical briefings throughout the week, we are, indeed, in a culturally rich and beautiful setting...

It is our pleasure to share with you a few of the things that make Maui unique. We have sprinkled elements throughout the week to remind us of our Hawaiian “Sense of Place.”

Among them are the lei kukui worn to designate our conference session chairs, our traditional Native Hawaiian invocation opening the conference, a special screening of Ho‘omana‘o I Nā Wā I Huliau on Thursday evening, and a featured presentation of Hawaiian Starlight to celebrate the international year of astronomy.

If there is anything our Conference Team can do to make your week more productive and enjoyable, please let us know.

Warmest Aloha,
The AMOS Conference Organizing Committee

traveling with a companion?

Guests not attending the conference are invited to join participants at the welcome reception and closing dinner. In addition, we have arranged two exclusive activities especially for our conference guests:

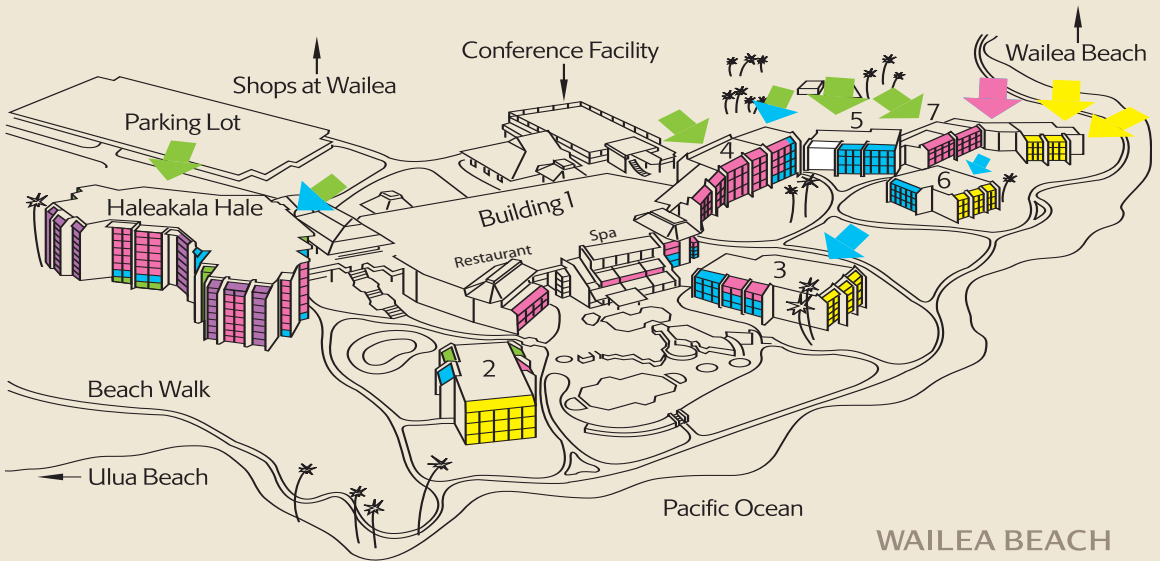


Welcome Coffee Hour, Wed, Sep 2 | Mala Lounge
Join us on the opening morning of the conference starting at 9:00am for an informal presentation about optional island activities. This is a nice opportunity to mingle and map out plans for the week.



Lavender Farm and Paia Town, Thu, Sep 3 | \$145
Guests are invited to enjoy the beauty of our island on a specially arranged visit to Ali'i Kula Lavender and Paia, a historical plantation town. Bus departs hotel at 9 a.m. for a six hour tour.

Wailea Beach Marriott Resort | conference hotel map



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WALEA BEACH
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3700 Wailea Alanui
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Hō'ike (highlights)

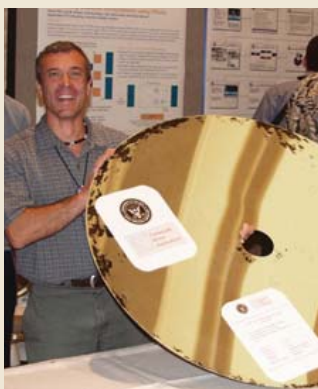
welcome reception | tue, sep 1

co-sponsored by General Dynamics

Set against the backdrop of the Pacific Ocean on Wailea Beach, the conference kicks off with the welcome reception providing participants with a unique networking opportunity. Participants and their guests will be greeted with a fresh flower lei, a beverage, appetizers, all while listening to the music of Hawaii, surrounded by tropical breezes. One guest per registered participant.

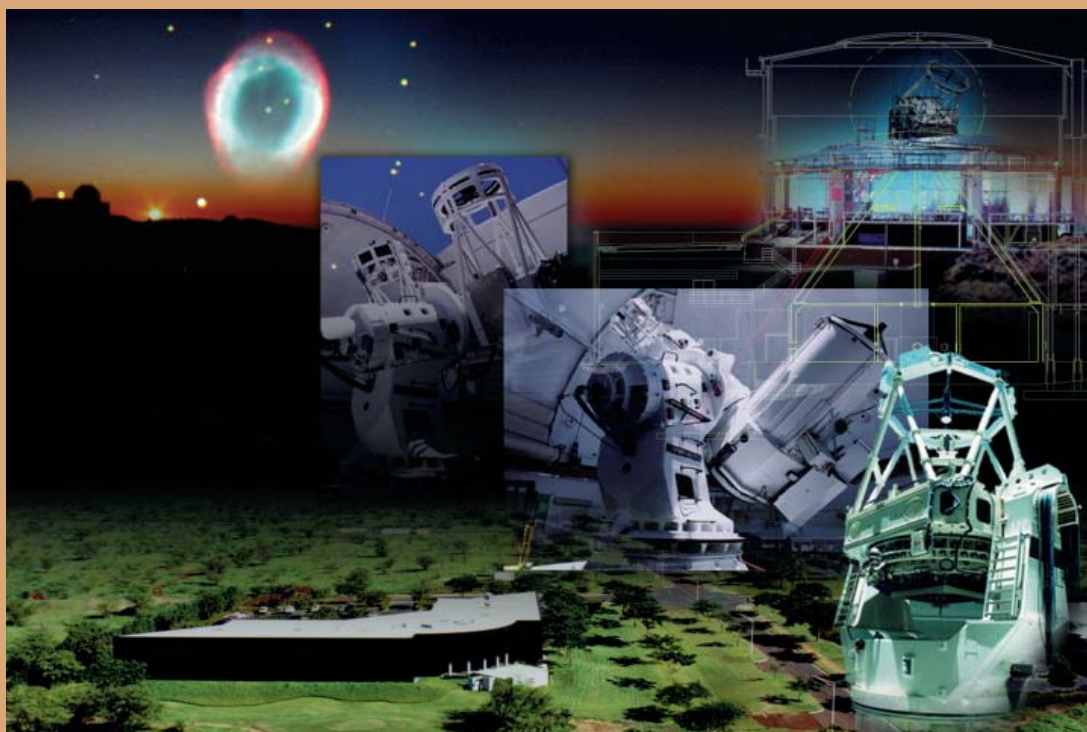


exhibition & poster session | wed, sep 2



The poster session is an opportunity for authors to present their work and have in-depth discussions with conference participants during a dedicated two-hour session on the conference opening day. Poster display boards are arranged throughout a portion of the ballroom together with industry exhibits in a convivial setting with seating and light refreshments to encourage interaction with the poster authors. The exhibit venue is open throughout the week serving as a locus for side discussions and pop-up meetings.

tutorial: AMOS site capabilities | wed, sep 2



cultural evening | thu, sep 3



Please join us for a screening of

HO‘OMANA‘O
I NĀ WĀ I HULIAU
(Recall the Past Before the Turning)

A photographic portrayal of pre-contact Hawaii through “Histography,” the historical Hawaiian past and photography weaved together, forming a gateway from past to present. Join us on this journey as we guide you on a walk through time.

celebrating the international year of astronomy | fri, sep 4

featured presentation



Hawaiian Starlight
Sharing the Beauty of the Hawaiian Skies

closing dinner & willie k show | fri, sep 4

Overlooking Wailea beach, the golf fairways and Mount Haleakala, the conference wraps up with a sunset dinner on the Pacific Terrace. Say “Aloha” to friends as you experience the local flavors of Hawaii and entertainment by Maui’s own, Willie K as he rocks the night with music from all genres.



He’s an amazing guitar virtuoso, a Hawaiian Jimi Hendrix; he’s Gabby Pahinui, Andres Segovia and Eddie Van Halen rolled into one. Willie can mimic seemingly any style, moving easily between screaming Stratocaster, sweet slack key and jazzy almost baroque, acoustic 12-string.”

- The Honolulu Weekly

optional technical tour | sat, sep 5

Optional technical tour of the Maikalani, The Advanced Technology Research Center at the Institute for Astronomy, University of Hawaii and the Maui Space Surveillance Complex atop Haleakala. Participants registered for the tour, bus will depart conference hotel at 7:30 a.m.

po‘akolu | wed, sep 2

Tuesday 1 September

6-7:30 pm Welcome Reception | **Cosponsored by General Dynamics** | Luau Gardens

Wednesday 2 September

6:00 am BREAKFAST | Luau Gardens at leisure from 6am - 7:15am

EXHIBITION AND POSTER ROOM | Jade-Plumeria Ballroom

7:30 **CONFERENCE OPENING** | Aulani Ballroom

Jeanne Unemori Skog, President & CEO, Maui Economic Development Board

INVOCATION | *Reverend Kealahou Alike, Keawala'i Congregational Church*

WELCOME REMARKS (via video) | *Daniel K. Inouye, United States Senator*

KEYNOTE ADDRESSES

Introductions | *Colonel L. Kirk Lewis, Ret., Senior Analyst, Institute for Defense Analyses*

Lieutenant General Larry D. James, Commander, 14th Air Force (Air Forces Strategic), Air Force Space Command, and Commander, Joint Functional Component Command for Space, U.S. Strategic Command, Vandenberg Air Force Base, California

Lieutenant General John T. "Tom" Sheridan, Commander, Space and Missile Systems Center, Air Force Space Command, Los Angeles Air Force Base, California

9:00 BREAK

9:20 **IRIDIUM/COSMOS COLLISION** | *Session Chair, Doyle Hall, AMOS - Boeing LTS Maui*

Analysis of the Prediction Characteristics for the Collision

Vladimir Agapov, Vympel Corp., Russia

The Spectrum of Satellite Breakup and Fragmentation

David Finkleman, Center for Space Standards and Innovation

Analysis and Implications of the Iridium 33/Cosmos 2251 Collision

T.S. Kelso, Center for Space Standards and Innovation

High Power Large Aperture Radar Observations of the Iridium-Kosmos Collision

Juha Vierinen, Sodankyla Geophysical Observatory, Finland

10:40 **ASTRODYNAMICS** | *Session Chair, T.S. Kelso, Center for Space Standards & Innovation*

Localized Density/Drag Prediction for Improved Onboard Orbit Propagation

Nathan Stastny, Air Force Research Laboratory

Comparison of Different Algorithms of Orbit Determination Using Radar Measurements Acquired

Kyle Alfriend, Texas A&M University

Investigation of the Characteristics of the Algorithm of Primary Orbit Determination for LEO

Sergey Kamensky, Vympel Corporation, Russia

11:40 LUNCHEON | Lokelani Ballroom

12:40 **IMAGING** | *Session Chair, Charles Matson, Air Force Research Laboratory*

A Real Time Superresolution Image Enhancement Processor

David Gerwe, The Boeing Company

Support-Based Digital and Optical Super-resolution in One and Two Dimensions

Sudhakar Prasad, University of New Mexico

Preconditioning MFB and the Local Minimum Trap

James Nagy, Emory University

A Statistical Information based analysis of a Compressive Imaging System

Douglas Hope, University of New Mexico

Speckle Imaging with a Partitioned Aperture: Laboratory Results

Brandoch Calef, Boeing LTS Maui

Enhancing Image Processing Performance for PCID in a Heterogeneous Network of Multi-code Processors

Richard Linderman, Air Force Research Laboratory

2:40 BREAK | **Cosponsored by a.i. solutions**

3:00 **IMAGING** (continued)

First Polarimetric Images of Boosting Rocket Exhaust Plumes

David Tyler, Lockheed Martin Space Systems, ATC

Beyond Diffraction Limited Seeing Through Polarization Diversity

Steven James, Air Force Research Laboratory

Improving the Detection of Near Earth Objects for Ground Based Telescopes

Anthony O'Dell, U.S. Air Force

4:00 **EXHIBITION AND POSTER PRESENTATIONS** | Jade-Plumeria Ballroom

6:00 **AMOS SITE CAPABILITIES TUTORIAL** | Aulani Ballroom

poster presentations

JSpOC Cognitive Task Analysis, *Denise Aleva, Air Force Research Laboratory*

Simulations of Optical Interferometric Imaging of Geostationary Satellites, *Eric Bakker, New Mexico Tech*

Application of MODTRAN® for Planetary Atmospheres to Jupiter and Titan, *Alexander Berk, Spectral Sciences, Inc.*

AFRL Advanced Electric Lasers Branch - Construction and Upgrade of a 50-watt Facility-class Sodium Guidestar Pump Laser, *Timothy Bronder, Air Force Research Laboratory*

Experimental investigation of image de-aliasing algorithm performance, *Peter Crabtree, Air Force Research Laboratory*

A Lunar Laser Ranging Retroreflector for the 21st Century, *Douglas Currie, University of Maryland*

Analytical Modeling of Space-Based Thermal Imaging Systems, *James Dawson, Dynetics, Inc.*

Comparing Speckle Imaging Methods, *Gregory Dente, GCD Associates*

Militarily Critical Technology Program, *James Doherty, Institute for Defense Analyses*

The AO PSF from Keck and Gemini, *Jack Drummond, Air Force Research Laboratory*

Performance Constraints on the MCS Superresolution Algorithm, *Michael Egan, National Geospatial-Intelligence Agency*

Comparison of Different Methods of Ephemeris Retrieval for Correlation of Observations, *Carolin Fruh, Astronomical Institute, University of Bern, Switzerland*

Optimizing Site Locations for Determining Shape from Photometric Light Curves, *Dan Fulcoly, U.S. Air Force Academy*

ALL-ON-ALL CONJUNCTION ASSESSMENT: Methods for Automating and Minimizing the Computation Time, *Robert Hall, Analytical Graphics Inc.*

Accurate Radiometric Calibration using Mechanically-Shuttered CCD Systems, *Doyle Hall, Boeing LTS Maui*

Scaling up of the Iris AO Segmented DM Technology for Atmospheric Correction, *Michael Helmbrecht, Iris AO, Inc.*

Price-Based Information Routing in Complex Satellite Networks for Space-Based Situational Awareness, *Islam Hussein, Worcester Polytechnic Institute*

Advanced Sciences and Technology Research for Astrodynamics, *Moriba Jah, Air Force Research Laboratory*

Simulations of Non-resolved, Infrared Imaging of Satellites, *Kevin Jim, Oceanit*

A New Undergraduate Course on the Physics of SSA, *Thomas Jost, U.S. Air Force Academy*

LEO Satellite Tracking with Raven-Class Systems, *Paul Kervin, Air Force Research Laboratory*

Development of a New Type Sensor for In-Situ Space Debris Measurement, *Yukihito Kitazawa, IHI Corporation, Japan*

Space Object Radiometric Modeling for Hardbody Optical Signature Database Generation, *Bernie Klem, Arnold Engineering Development Center*

Observation of Light Curves of Space Objects, *Hirohisa Kurosaki, Japan Aerospace Exploration Agency, Japan*

Automatic Reacquisition of Satellite Positions by Detecting their Expected Streaks in Astronomical Images, *Martin Levesque, DRDC, Canada*

Compressive Coherence Sensing, *Daniel Marks, Duke University*

The Race toward Becoming Operationally Responsive in Space, *Jeff Nagy, U.S. Air Force*

When Satellites Collide: High-Performance Computer Modeling of the Cosmos-Iridium Collision, *Scot Olivier, Lawrence Livermore National Laboratory*

Astronomy as a Tool for Training the Next Generation Technical Workforce, *Van Romero, New Mexico Institute of Mining and Technology*

High Performance Computing Software Applications Institute for Space Situational Awareness (HSAI-SSA), *Chris Sabol, Air Force Research Laboratory*

Comparison of Neural Networks and Tabular Nearest Neighbor Encoding for Hyperspectral Signature Classification in Unresolved Object Detection, *Mark Schmalz, Department of CISE*

Small Aperture Telescope Observations of Co-located Geostationary Satellites, *Robert Scott, DRDC, Canada*

Expanding Lookout Capabilities for Architectural Analysis, *BethAnn Shick, U.S. Air Force*

High Speed Optical Imaging Photon Counting Microchannel Plate Detectors for Astronomical and Space Sensing Applications, *Oswald Siegmund, University of California, Berkeley*

Simulation of Satellite Light Curves for a Combination of Simple Shapes for Ground and Space-based Sensors, *Cody Singletary, U.S. Air Force Academy*

Cancelled
Conjunction Risk Assessment with Spherical-Quadrature, *Chris Thornton, The Boeing Company*

Polarization Pulse Ranging for Space Situational Awareness, *David Tyler, University of Arizona*

Advanced Speckle Imaging Reconstruction Environment (ASPIRE), *Ron Vilorio, Maui High Performance Computing Center*

Activities of JAXA's Innovative Technology Center on Space Debris Observation, *Toshifumi Yanagisawa, Japan Aerospace Exploration Agency, Japan*

Comparison of Optical Sparse Aperture Image Restoration with Experimental PSF and Designed PSF, *Zhiwei Zhou, Beijing University of Technology, China*

po‘ahā | thu, sep 3

6:00 am BREAKFAST | Luau Gardens at leisure from 6:00 am to 7:15 am

EXHIBITION AND POSTER ROOM | Jade-Plumeria Ballroom

7:30 CONFERENCE KEYNOTE | Aulani Ballroom
Introduction | Colonel L. Kirk Lewis, Ret., Senior Analyst, Institute for Defense Analyses

State of the Global Space Industry
Elliot Holokauahi Pulham, President and CEO, The Space Foundation

8:00 SPACE SITUATIONAL AWARENESS | Session Chair, Michael Egan, National Geospatial-Intelligence Agency

Enhanced Algorithms for EO/IR Electronic Stabilization, Clutter Suppression, and Track-Before-Detect for Multiple Low Observable Targets
Alexander Tartakovsky, Argo Science Corp. and University of Southern California

Commercial and Foreign Entities (CFE) Pilot Program status update and way-ahead
Charles Spillar, U.S. Air Force Space Command

Space Surveillance Network Sensor Development, Modification, and Sustainment Programs
Richard Colarco, L-3 Communications

Cancelled

Probabilistic Evidential Reasoning with Symbolic Argumentation for Space Situation Awareness
Glenn Takata, Charles River Analytics

9:20 BREAK

9:40 ORBITAL DEBRIS | Session Chair, Thomas Schildknecht, University of Bern, Switzerland

Analysis of Situation in GEO Protected Region
Vladimir Agapov, Keldysh Institute of Applied Mathematics, Russia

Faint deep space debris observations with ISON optical network
Igor Molotov, Keldysh Institute of Applied Mathematics, Russia

Analysis of Orbit Prediction Sensitivity to Thermal Emissions Acceleration Modeling for High Area-to-mass Ratio Objects
Thomas Kelecy, Boeing LTS Maui

Photometric Studies of GEO Debris
Patrick Seitzer, University of Michigan

Reflectance Spectra of Space Debris in GEO
Thomas Schildknecht, Astronomical Institute, University of Bern, Switzerland

An Assessment of GEO Orbital Debris Photometric Properties Derived from Laboratory-Based Measurements
Heather Cowardin, ESCG/JACOBS

11:40 LUNCHEON | Lokelani Ballroom

12:40 NON-RESOLVED OBJECT CHARACTERIZATION | Session Chair, Matt Hejduk, SRA International (AFSPC/A3C)

Photometry of Rotating Regular N-sided Prisms for Arbitrary Solar Phase Angles
Keith Knox, Boeing LTS Maui

Signature Intensity Derivative and its Application to Resident Space Object Typing
Tamara Payne, Applied Optimization Inc.

Cancelled

Catalog of Brightness Curves for GEO Space Debris
Vadim Vygon, Institute for Precision Instrument Engineering, Russia

A Survey of Geosynchronous Satellite Glints
Frederick Vrba, U.S. Naval Observatory

Space Object Characterization Using Time-Frequency Analysis of Multispectral Measurements from the Magdalena Ridge Observatory
Christian Alcalá, Atmospheric and Environmental Research, Inc.

Micro-facet Scattering Model for Pulse Polarization Ranging
John Stryjewski, CSC

2:40 BREAK

3:00 ADAPTIVE OPTICS | Session Chair, Mike Roggemann, PDS

Advanced Photosensors for Laser Beacon Adaptive Optics on the Starfire Optical Range 3.5 m Telescope
Robert Johnson, Air Force Research Laboratory

Wide-field Image Compensation with Multiple Laser Guide Stars
Michael Hart, University of Arizona

Predicting Photon Returns of Sodium Guide Stars for Different Laser Technologies
Edward Kibblewhite, University of Chicago

Holographic Adaptive Optics
Geoff Andersen, U.S. Air Force Academy

4:20 BOEING OPEN RECEPTION | Mauna Loa & Ilima Ballroom

7:00 CULTURAL EVENING - HO‘OMANA‘O I NA WA I HULIAU (show begins at 7:30 pm) | Lokelani Ballroom

po‘alima | fri, sep 4

6:00 am BREAKFAST | Luau Gardens at leisure from 6:00 am to 7:15 am

EXHIBITION AND POSTER ROOM | Jade-Plumeria Ballroom

7:30 **ASTRONOMY** | Aulani Ballroom
Session Chair, Eileen Ryan, Magdalena Ridge Observatory, New Mexico Tech

Hawaiian Starlight: Sharing the Beauty of the Hawaiian Skies (*IYA featured presentation*)
Jean-Charles Cuillandre, Canada-France-Hawaii Telescope Corp.

8:00 Planning Ahead for Asteroid Hazard Mitigation, Phase 1: Parameter Space Exploration and Scenario Modeling
Catherine Plesko, Los Alamos National Laboratory

Impact Hazard Mitigation: Understanding the Effects of Nuclear Explosive Outputs on Comets and Asteroids
Ryan Clement, Los Alamos National Laboratory Presented by Catherine Plesko

Rotation Rates of Recently Discovered Small Near-Earth Asteroids
William Ryan, New Mexico Institute of Mining and Technology

The Pan-STARRS Project: The Next Generation of Survey Astronomy Has Arrived
William Burgett, Institute for Astronomy, University of Hawaii

9:20 BREAK

9:40 **ASTRONOMY** (continued)

The Pan-STARRS Gigapixel Camera
John Tonry, Institute for Astronomy, University of Hawaii

A New Method for Collimating and Aligning a Very Wide Field Telescope
Nick Kaiser, Institute for Astronomy, University of Hawaii

Proper Motions from the Pan-STARRS PS1 Survey
David Monet, U.S. Naval Observatory

Asteroid Detection with the Pan-STARRS Moving Object Processing System
Larry Denneau, Institute for Astronomy, University of Hawaii

11:00 **SPACE-BASED ASSETS** | *Session Chair, Thomas Cooley, Air Force Research Laboratory*

Applied Reachability for Space Situational Awareness and Safety in Spacecraft Proximity Operations
Marcus Holzinger, University of Colorado at Boulder

Telescope Spectrophotometric and Absolute Flux Calibration, and National Security Applications, Using CALIPSO Satellite LIDAR, and Future Wavelength-Tunable Systems
Justin Albert, University of Victoria, Canada

11:40 LUNCHEON | Lokelani Ballroom

12:40 **SPACE-BASED ASSETS** (continued)

Operationally Responsive Space Launch for Space Situational Awareness Missions
Thomas Freeman, SMC/SDTW

AFRL's Demonstration and Science Experiments (DSX) Mission
Mark Scherbarth, Air Force Research Laboratory

Leveraging the Space Plug-and-Play Avionics Standard to Enable Constellation-Level Collaborative Autonomy
Louis Marketos, Design_Net Engineering

1:40 **INSTRUMENTATION, SENSORS AND SYSTEMS** | *Session Chair, John Lambert, The Boeing Company*

Stratospheric Observatory for Infrared Astronomy: Infrared Sensor Development and Science Capabilities
Joel Nelson, Agilix

Geo Satellite Imaging at the Naval Prototype Optical Interferometer (NPOI)
Sergio Restaino, Naval Research Laboratory

SAM, The Starfire Optical Range Atmospheric Monitor
Marjorie Shoemaker, AFRL/RDSA, Boeing LTS

2:40 BREAK

3:00 **INSTRUMENTATION, SENSORS AND SYSTEMS** (continued)

Novel All Digital Ring Cavity Locking Servo for FASOR-X
Jeffrey Baker, Boeing LTS Maui

Science Objectives and Commissioning of the Magdalena Ridge Observatory Interferometer
Charles Cormier, New Mexico Tech

3:40 **ATMOSPHERICS/SPACE WEATHER** | *Session Chair, Bill Bradford, PDS*

Validation of Optical Turbulence Simulations from a Numerical Weather Prediction Model in Support of Adaptive Optics Design
Randall Alliss, Northrop Grumman - TASC

Preliminary Results to Support Evidence of Thermospheric Contraction
Arrun Saunders, University of Southampton, United Kingdom

Improving Laser-Guide Star AO Observations via Mesospheric Sodium Enhancement
Robert Whiteley, Innovative Technology Systems

4:40 ADJOURN / EXHIBITORS LOAD-OUT

6:00 **CLOSING DINNER AND SHOW** | Pacific Terrace

exhibitors

Air Force Research Laboratory, RDSM

The Maui Space Surveillance System, also known as the Air Force Maui Optical & Supercomputing Site (AMOS), is operated by the Air Force Research Laboratory's Directed Energy Directorate. AMOS is a center of excellence in electro-optical space surveillance and high performance computing.

Air Force Research Laboratory, Small Business Office

The Mission of the Air Force Research Laboratory Small Business Office is to create and deliver small business developed technology solutions and mission-ready capabilities to the warfighter. The Small Business Office assists companies interested in doing business with the Air Force Research Laboratory and promotes small business opportunities for inclusion in our prime contract and subcontract awards.

Analytical Graphics, Inc.

Analytical Graphics, Inc. develops commercial off-the-shelf analysis software used in more than 32,000 worldwide installations. Military space, missile defense, space exploration, and space situational awareness professionals can utilize AGI's software as desktop applications; embeddable engines; or lightweight components, all with a range of licensing and pricing options.

Applied Optimization, Inc.

Applied Optimization, Inc., is an Engineering Research and Development firm whose core expertise is the technology development and expertise to solve problems of estimation, process modeling, and operational methodology. We use complex mathematical algorithms and scientific principles to produce simulated effects and to project results for conditions that cannot be readily tested in a physical laboratory.

The Boeing Company

Boeing is the world's leading aerospace company and the largest manufacturer of commercial jetliners and military aircraft combined. Additionally, Boeing designs and manufactures rotorcraft, electronic and defense systems, missiles, satellites, launch vehicles and advanced information and communication systems. In Hawaii, Boeing is the prime contractor for the U.S. Air Force's state-of-the-art Maui Space Surveillance System.

FLIR Infrared Camera

Come see the latest from FLIR Systems, the global leader in infrared cameras. FLIR will feature its SC Series infrared cameras which boast high speed, high resolution, and high sensitivity. Showcased will be FLIR's Silver SC2200 0.8um – 2.5um MCT SWIR, Titanium SC7900 VLWIR MCT, Orion LWIR and MWIR, SC8000 – BBInSb, Silver SC2500 NIR, RS6702, and more. Bring your application questions and learn about FLIR infrared camera solutions.

Hnu-Photonics

HNU Photonics is a science and technology company creating cutting-edge technologies and transforming innovative ideas into state-of-the-art products with commercial, scientific and military applications. The focus of the company is renewable energy, defense photonics, specialized optics, medical imaging technologies, and HNU has already introduced revolutionary advances in each of these areas.

Lockheed Martin Santa Barbara Focalplane

Santa Barbara Focalplane, a Missiles and Fire Control Business is a merchant vendor of the very latest in thermal infrared components, imaging systems, cameras and technology. SBF specializes in designing and manufacturing the highest quality indium antimonide (InSb) focal plane arrays (FPAs) in many configurations from linear through large staring formats.

Oceanit

These business units act as incubators where engineers and scientists are brought together in cross-collaborating teams to produce a range of dual-use technologies which are spun off into new ventures. Recently, Oceanit's incubator approach, which employs government research funding, has produced two venture funded life science companies, Hoana Medical and Nanopoint, which have raised over \$40 million of venture capital, and one internally funded group called Mosaic.

Pacific Disaster Center

PDC is an applied science, information and technology center, working to reduce disaster risks and impacts to peoples' lives and property.

Precision Asphere, Inc.

Precision Asphere, Inc. specializes in fabrication of ultra high precision custom aspheres. From prototype to medium volume production, we offer fast (f/1 or faster) on- and off-axis aspheric optics with super smooth surface and very low irregularity in the mid-frequencies range.

RC Optical Systems, Inc.

RC Optical Systems is the World's leading manufacturer of Ritchey-Chrétien Telescopes up to one meter aperture. RCOS designs, engineers and manufactures Imaging Instruments, Tracking Systems, Beam Directors, Lidar Systems and more using primarily Ritchey-Chrétien reflective optics.

Software Bisque

Located in Golden Colorado, Software Bisque develops software and hardware solutions for astronomy and sky survey applications. Their flagship product, "TheSky Astronomy Software" is the world's leading observatory control software. A new, technology rich, cross-platform version of TheSky (for Mac/Linux/Windows) scheduled for release by the end of 2009.

Trex Hawaii

Trex Enterprises Corporation (Trex) is a diversified high-technology company specializing in cutting-edge technical solutions and products to improve performance across the electromagnetic spectrum. We have developed a strong base of proprietary technologies in microwave sensing, high resolution imaging, digital signal processing, applied optics and materials.

mahalo to our sponsors

po'okela *(striving for the best)*



lokahi *(collaboration and unity)*



laulima *(working together)*



kupa'a *(loyal and committed)*



malama *(to care for)*



a.i. solutions



Presented by



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