

AMOS 2003

TUESDAY *September* 9

6:00 AM **BREAKFAST** | LUAU GARDENS *at leisure from 6:00 am to 7:30 am*

8:00 **CONFERENCE OPENING** | AULANI BALLROOM

OPENING REMARKS

Paul Kervin, *Air Force Research Laboratory*

Lieutenant Colonel Jeffrey McCann, *Air Force Research Laboratory*

WELCOME REMARKS

Alan M. Arakawa, *Mayor, County of Maui*

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

KEYNOTE ADDRESS

Major General Donald L. Lamberson, *United States Air Force (Ret)*

9:00 **LASER APPLICATIONS**

**WHAT IS BEST: OPTICAL IMAGE, HOLOGRAM OR INTENSITY HOLOGRAM?
BUT POSSIBLY OPTIMAL PROCESSING OF LASER RADAR SIGNAL IS NECESSARY?**
Igor Troitski

**LONG-RANGE ADAPTIVE LASER TRACKING SYSTEM (ALTS): OPERATIONAL
PRINCIPLES, CONCEPT DESIGN AND POTENTIAL APPLICATIONS**

Vladimir Markov, *MetroLaser Incorporated*

THE INTERNATIONAL LASER RANGING SERVICE

Michael Pearlman, *Harvard-Smithsonian Center for Astrophysics*

10:00 **BREAK** | PAVILION LANAI

10:30 **NASA'S PHOTON-COUNTING SLR2000 SATELLITE LASER RANGING SYSTEM:
PROGRESS AND APPLICATIONS**

John Degnan, *Sigma Space Corporation*

**PRECISION ORBIT AND LASER POINTING/ATTITUDE DETERMINATION AND
VALIDATION FOR ICESAT**

Bob Schutz, *Center for Space Research*

**AN INEXPENSIVE 3D IMAGING LIDAR FOR CONTIGUOUS, DECIMETER
RESOLUTION TOPOGRAPHIC MAPPING FROM A HIGH ALTITUDE AIRCRAFT**

John Degnan, *Sigma Space Corporation*

**DEVELOPMENT OF SAFE GROUND TO SPACE LASER PROPAGATION SYSTEM FOR
THE OPTICAL COMMUNICATIONS TELESCOPE LABORATORY**

Janet Wu, *Jet Propulsion Laboratory*

**OPTICAL GROUND STATION SITE DIVERSITY FOR DEEP SPACE OPTICAL
COMMUNICATIONS: THE MARS TELECOMM OPTICAL LINK**

Ben Parvin, *Jet Propulsion Laboratory*

THE MAGIC OF RELAY MIRRORS

Donald Washburn, *Air Force Research Laboratory*

12:30 PM **LUNCHEON** | SOUTH PACIFIC BALLROOM

1:30 **PHOTOMETRY OF A LASER-PUMPED SODIUM GUIDESTAR AT THE STARFIRE
OPTICAL RANGE**

Jack Drummond, *Air Force Research Laboratory*

1:50 **ADAPTIVE OPTICS**

**BROADENING PARTICIPATION IN THE TECHNICAL WORKFORCE THROUGH
MAUI EDUCATIONAL PARTNERSHIPS**

Lisa Hunter, *Center for Adaptive Optics*

**WIDE-FIELD COMPENSATION FOR THE AEOS TELESCOPE: ENABLING A BROAD
NEW RANGE OF APPLICATIONS**

Michael Lloyd-Hart, *Steward Observatory*

ADAPTIVE OPTICS: TRANSITION TO HIGH-RESOLUTION WAVEFRONT CONTROL

Mikhail Vorontsov, *Army Research Laboratory*

**DEFORMABLE MIRRORS IN THE 21ST CENTURY: NEXT GENERATION
INTEGRATED ADAPTIVE OPTICS**

Mark Ealey, *Xinetics Inc.*

INITIAL RESULTS FROM A PORTABLE, FLEXIBLE ADAPTIVE OPTICS SYSTEM

Sergio Restaino, *Naval Research Laboratory*

3:30 **ADJOURN**

WEDNESDAY *September* 10

6:00 AM **BREAKFAST** | LUAAU GARDENS *at leisure from 6:00 am to 7:30 am*

8:00 **HIGH PERFORMANCE COMPUTING**

MULTIDISCIPLINARY APPLICATIONS OF DETACHED-EDDY SIMULATION TO SEPARATED FLOWS AT HIGH REYNOLDS NUMBERS
Scott Morton, *U.S. Air Force Academy*

HIGH RESOLUTION NUMERICAL WEATHER FORECASTING TO AID AMOS
Kevin Roe, *AMOS (Maui High Performance Computing Center)*

WIDE FIELD-OF-VIEW IMAGE CORRECTION WITH TURBULENCE TIP-TILT VISUALIZATION
Donald Fraser, *University of New South Wales*

PANSTARRS: THE DATA PROCESSING PIPELINE
Mark Skinner, *AMOS (Maui High Performance Computing Center)*

AN APPROACH FOR MINIATURE, REAL-TIME EMBEDDED SUPERCOMPUTING FOR AEROSPACE APPLICATIONS
Don Fronterhouse, *Scientific Simulation, Inc.*

PROGRESS ON PARALLELIZING A GENERAL PURPOSE DIRECT SIMULATION MONTE CARLO (DSMC) CODE FOR HIGH PERFORMANCE COMPUTING APPLICATIONS
Matthew Braunstein, *Spectral Sciences, Inc.*

10:00 **BREAK** | PAVILION LANAI

10:30 **HIGH PERFORMANCE COMPUTING FOR SPACE USING COMMERCIAL-OFF-THE-SHELF (COTS)-BASED TECHNOLOGY**
Kenneth Mighell, *National Optical Astronomy Observatory*

10:50 **ASTRONOMY**

RECENT DISCOVERIES AND ADVANCES FOR THE NEAR-EARTH ASTEROID TRACKING PROGRAM WITH THE MSSS 1.2-METER TELESCOPE
Ray Bamberg, *Jet Propulsion Laboratory*

REDUCING THE RISK OF CATASTROPHIC ASTEROID IMPACTS WITH PANSTARRS
Robert Jedicke, *University of Hawaii, Institute for Astronomy*

MULTI-SENSOR OBSERVATIONS OF THE NEAR-EARTH ASTEROID 2002 NY40
Lewis Roberts, *AMOS (The Boeing Company)*

MARS IN A PRE- AND POST-DUST STORM ERA
James Murphy, *New Mexico State University*

THE HIGH RESOLUTION VISIBLE AND INFRARED SPECTRAGRAPH (HiVIS) AT AEOS
Jeff Kuhn, *University of Hawaii, Institute for Astronomy*

12:30 PM **LUNCHEON** | SOUTH PACIFIC BALLROOM

1:30 **OBSERVING GAMMA-RAY BURST OPTICAL COUNTERPARTS WITH THE AEOS BURST CAMERA (ABC)**
Mark Skinner, *AMOS (The Boeing Company)*

THE RICE UNIVERSITY CCD IMAGER FOR GAMMA-RAY BURST STUDIES
Ian Smith, *Rice University*

LASER RELATIVITY SATELLITE: A SEARCH FOR THE DRAGGING OF INERTIAL FRAMES (THE LENSE-THIRRING EFFECT)
Lieutenant Colonel Billy Smith, *U.S. Naval Academy*

2:30 **SPACE WEATHER**

OPTICAL TURBULENCE FORECASTING
Edmond Dewan, *Air Force Research Laboratory*

MAUI-MALT: FURTHER STUDIES OF MESOSPHERIC BORES
Pam Loughmiller, *Cornell University*

MAUI-MALT OBSERVATIONS OF THE EVOLUTION OF A SECONDARY INSTABILITY IN KELVIN-HELMHOLTZ BILLOWS FORMED NEAR 86KM ALTITUDE
Jim Hecht, *Space Science Applications Laboratory*

SPACE WEATHER MURI EFFORTS: SIMULATING SOLAR ERUPTIONS AND THEIR EFFECTS ON GEOSPACE
Paul Bellaire, *Air Force Office of Scientific Research*

3:50 **BREAK** | PAVILION LANAI

4:00 **3D PRESENTATION** | PIKAKE BALLROOM

EXPLORE THE VIRTUAL UNIVERSE FROM AMOS TO ATLO, © SEPTEMBER 11TH, 2003
Eric De Jong, *Jet Propulsion Laboratory, California Institute of Technology*
There will be four seatings of the 3D film presentation which will accommodate 50 participants each.

4:00 **POSTER PRESENTATIONS** | JADE / PLUMERIA

Presenters will be available to discuss their papers. A listing of presentations may be found at the back of this program.

5:30 – 6:30 **DOD CRITICAL TECHNOLOGIES OVERVIEW — OPTIONAL SIDE PRESENTATION**
Ray Wick, *Institute for Defense Analyses*

6:30 **TELESCOPES: HISTORICAL PERSPECTIVES FOR SCIENTISTS AND ENGINEERS**
Jim Mayo, *Northrop Grumman*

THURSDAY *September* 11

6:00 AM **BREAKFAST** | LUAAU GARDENS at leisure from 6:00 am to 7:30 am

8:00 **KEYNOTE ADDRESS**

Lieutenant General Bruce K. Brown, *United States Air Force (Ret)*

SATELLITE METRICS

COMMISSIONING RESULTS FROM AN ARRAY OF REMOTELY CONTROLLED, AUTONOMOUS SMALL TELESCOPES FOR SURVEILLANCE OF SPACE

Brad Wallace, *Defence R&D Canada*

DEEP STARE TECHNICAL ADVANCEMENTS AND STATUS

Dave Brisnehan, *Northrop Grumman*

DISCOS – A SPACE OBJECT CATALOGUE

Cristina Hernandez, *ESA/ESOC Germany*

HIGH ACCURACY ORBIT ANALYSIS TEST RESULTS USING THE HIGH ACCURACY NETWORK DETERMINATION SYSTEM (HANDS)

Thomas Kelecyc, *General Dynamics*

10:00 **BREAK** | PAVILION LANAI

10:30 **RELATIVE ORBIT TRAJECTORIES OF GEOSYNCHRONOUS SATELLITES USING THE COWPOKE EQUATIONS**

Chris Sabol, *AMOS (Air Force Research Laboratory)*

THE GRACE MISSION: ITS STATUS AND COMPUTATIONAL REQUIREMENTS

Byron Tapley, *University of Texas Center for Space Research*

11:10 **ORBITAL DEBRIS**

GERMANY SPACE-BASED OBSERVATION OF ORBITAL DEBRIS IN GEO

Michael Oswald, *Aerospace Systems, Germany*

RECENT RESULTS FROM NASA'S GEO DEBRIS OPTICAL SURVEYS

Mark Matney, *Lockheed Martin Space Operations*

AN OPTICAL SEARCH FOR SMALL-SIZED DEBRIS IN GEO AND GTO

Thomas Schildknecht, *University of Bern, Switzerland*

METER-CLASS AUTONOMOUS TELESCOPE FOR SPACE DEBRIS

Gene Stansbery, *NASA/Johnson Space Center*

12:30 PM **LUNCHEON** | SOUTH PACIFIC BALLROOM

1:30 **BLIND SEARCH FOR MICRO SATELLITES IN LEO: OPTICAL SIGNATURES AND SEARCH STRATEGIES**

Mark Ackermann, *Sandia National Laboratories*

ORBITAL DEBRIS PREDICTION AND HAZARD ASSESSMENT

Christian Tournes, *Davidson Technologies*

ACTIVITIES ON SPACE DEBRIS IN EUROPE

Walter Flury, *European Space Agency, Germany*

2:30 **SPACE OBJECT IDENTIFICATION**

MULTISPECTRAL IMAGING OF THE ARCHIMEDES PALIMPSEST

Keith Knox, *AMOS (The Boeing Company)*

SPACE SITUATIONAL AWARENESS (SSA) ARCHITECTURE FINAL REPORT

Paul Popejoy, *The Aerospace Corporation*

AN OVERVIEW OF THE ANDE RISK REDUCTION FLIGHT

Andy Nicholas, *Naval Research Laboratory*

DECONVOLUTION OF COLUMBIA IMAGES FROM THE STARFIRE OPTICAL RANGE

Julian Christou, *Center for Adaptive Optics*

3:50 **ADJOURN**

5:30 **LUAAU AND ENTERTAINMENT** | LUAAU GARDENS – DOORS OPEN AT 4:30



FRIDAY *September* 12

6:00 AM **BREAKFAST** | LUAAU GARDENS *at leisure from 6:00 am to 7:30 am*

8:00 **SPACE OBJECT IDENTIFICATION (CONT.)**

THE AIR FORCE SPACE SURVEILLANCE TELESCOPE
John McGraw, *University of New Mexico*

AN INTEGRATED OPTICAL/DIGITAL APPROACH FOR IMPROVED IMAGE RESTORATION

Victor Pauca, *Wake Forest University*

A FISHER INFORMATION APPROACH TO ENGINEERING PUPIL PHASE DIVERSITY

Todd Torgersen, *Wake Forest University*

PARALLEL MULTIFRAME BLIND DECONVOLUTION USING WAVELENGTH DIVERSITY
Harry Ingleby, *Royal Military College of Canada*

FORWARD ERROR PROPAGATION IN IMAGE ENHANCEMENT VIA A MULTIFRAME BLIND DECONVOLUTION ALGORITHM

Mark Schmalz, *University of Florida*

USING THE TEMPORAL INFORMATION IN PHASE-DIVERSE IMAGERY

Stuart Jefferies, *Maui Scientific Research Center*

10:00 **BREAK** | PAVILION LANAI

10:30 **THEORETIC ANALYSIS FOR HIGH-RESOLUTION IMAGING THERMOMETRY**

Bruce Stribling, *AMOS (The Boeing Company)*

AEOS I-BAND PHOTOMETRY OF MOVING TARGETS

Doyle Hall, *AMOS (The Boeing Company)*

OBSERVATIONS OF RETIRED BOEING 376 SPACECRAFT

John Lambert, *AMOS (Boeing LTS)*

LONG-TERM ANALYSIS OF GEO PHOTOMETRIC SIGNATURES

Tamara Payne, *AMOS (Boeing LTS)*

OPTICAL BRIGHTNESS MEASUREMENTS OF GPS BLOCK II, IIA, AND IIR SATELLITES ON ORBIT

Fred Vrba, *U.S. Naval Observatory, Flagstaff Station*

OBJECT CHARACTERIZATION FROM SPECTRAL DATA

Kim Luu, *AMOS (Air Force Research Laboratory)*

12:30 PM **LUNCHEON** | SOUTH PACIFIC BALLROOM

1:30 **CHARACTERIZATION OF SATELLITE MATERIALS BASED ON THEIR SPECTRA**

Dave Talent, *AMOS (Oceanit)*

OBTAINING MATERIAL TYPE OF ORBITING OBJECTS THROUGH REFLECTANCE SPECTROSCOPY MEASUREMENTS

Kira Jorgensen, *NASA/Johnson Space Center*

THE CHEMICAL DYNAMICS AND SPECTROSCOPY ASSOCIATED WITH LEO SPACECRAFT EFFLUENTS

Rainer Dressler, *Air Force Research Laboratory*

METHODOLOGY TO DETERMINE SPACECRAFT ATTITUDE FROM INVERSE ANALYSIS OF POINT OPTICAL SOURCE TRACKING DATA

Anil Chaudhary, *Applied Optimization Inc.*

A RULES BASED EXPERT SYSTEM APPLIED TO REAL-TIME SATELLITE ABNORMALITY ASSESSMENT

Christopher Beam, *General Dynamics*

NON-IMAGING APPROACHES FOR SATELLITE IDENTIFICATION: ARTIFICIAL NEURAL NETWORK CLASSIFIER VERSUS DISTANCE CLASSIFIER

Mike Roggemann, *Michigan Technological University*

3:30 **CONFERENCE WRAP UP**



POSTER PAPERS

TOWARDS A FULLY RELATIVISTIC THEORY OF QUANTUM INFORMATION

Chris Adami, *Jet Propulsion Laboratory*

THE ROTSE-III TELESCOPE SYSTEM

Carl Akerlof, *University of Michigan*

MOLECULAR BEAMS IN SPACE: SOURCES OF OH(A→X) EMISSION IN THE SPACE SHUTTLE ENVIRONMENT

Larry Bernstein, *Spectral Sciences, Inc.*

SSA APPLICATIONS FOR THE RULLI SENSOR

Jeffrey Bloch, *Los Alamos National Laboratory*

ADAPTIVE PHASE DISTORTION CORRECTION IN STRONG SPECKLE-MODULATION CONDITIONS WITH TWO DEFORMABLE MIRRORS

Gary Carhart, *Army Research Laboratory*

ATMOSPHERIC OPACITY FROM A SUBMILLIMETER FTS AT THE GEOGRAPHIC SOUTH POLE

Richard Chamberlin, *California Institute of Technology*

VERTICAL SOUNDING IN JUPITER'S ATMOSPHERE

Nancy Chanover, *New Mexico State University*

DETAILS OF THE RICE UNIVERSITY CCD IMAGER FOR THE AEOS TELESCOPE

Reginald Defour, *Rice University*

AUTONOMOUS CONTROL OF A MOBILE 20-INCH OUTREACH TELESCOPE USING A STAR-TRACKER

Troelz Denver, *University of Hawaii Institute for Astronomy*

RECENT ACCOMPLISHMENTS IN LASER-

PHOTOVOLTAIC WIRELESS POWER TRANSMISSION

John Fikes, *NASA Marshall Space Flight Center*

LIGHTWEIGHT ATHERMAL SLMS™ INNOVATIVE TELESCOPE (LASIT™) FOR SPACE IMAGING, SPACE SURVEILLANCE AND LASER COMMUNICATIONS

William Goodman, *Schafer Corporation*

IDENTIFICATION AT THE AFRL MAUI OPTICAL AND SUPERCOMPUTING (AMOS) SITE

Kris Hamada, *AMOS (The Boeing Company)*

IMPROVED SATELLITE BRIGHTNESS MODELING

Matt Hejduk, *Titan Corporation*

20 WATT CW 589-NM SODIUM BEACON EXCITATION SOURCE FOR ADAPTIVE OPTICAL TELESCOPE APPLICATIONS

Paul Hillman, *Air Force Research Laboratory*

ENABLING PRECISION CONTROL AND SUPERIOR SYSTEM/SATELLITE STABILITY WITH THE DEVELOPMENT OF A HYBRID ELECTRIC-LASER PROPULSION (HELP) SYSTEM

Rachel Leach, *Design_Net Engineering*

DISH SURFACE OPTIMIZATION SYSTEM: SURFACE CORRECTION ON A LEIGHTON 10.4-METER PRIMARY MIRROR

Melanie Leong, *California Institute of Technology*

PRODUCTIVITY ENHANCEMENT IN ASTROMETRIC VISUAL SATELLITE OBSERVING

George Lewis

PROMPT OPTICAL STUDIES OF GAMMA-RAY BURSTS IN THE SWIFT ERA

Edison Liang, *Rice University*

PRECISION IMAGING WITH ADAPTIVE OPTICS APERTURE MASKING INTERFEROMETRY

James Lloyd, *California Institute of Technology*

ULTRA-HIGH-SENSITIVITY HDTV COLOR CAMERA CONSIST OF IMAGE INTENSIFIER

Miyazaki Masayuki, *Japan Broadcasting Corporation*

THE DATABASE JOIN OF THE USNO-B AND 2MASS CATALOGS

Dave Monet, *U.S. Naval Observatory*

THE NSF CENTER FOR ADAPTIVE OPTICS – RELEVANCE TO DOD MISSIONS

Scot Olivier, *Center for Adaptive Optics*

THE LYOT PROJECT: STATUS AND DEPLOYMENT PLANS

Ben Oppenheimer, *The American Museum of Natural History*

FIRST LIGHT FOR KERMIT

Marshall Perrin, *University of California Berkeley*

PASSIVE MILLIMETER-WAVE IMAGING OF SPACE OBJECTS AT MAUI: INITIAL S/N STUDY RESULTS

Mark Pesses, *SAIC*

MINING SCIENTIFIC DATA FOR NON-IMAGING IDENTIFICATION AND CLASSIFICATION OF SPACE OBJECTS

Bob Plemmons, *Wake Forest University*

INFRARED CLOUD IMAGER

Lewis Putnam, *ESC - SENSOR*

A MULTI-WAVELENGTH STUDY OF ATMOSPHERIC TURBULENCE

Lewis Roberts, *AMOS (The Boeing Company)*

RELIABILITY OF FIBER OPTIC SYSTEMS

Garry Rodrigue, *University of California*

SYNTHESIZING REFERENCE STAR DATA FOR OBJECT AMPLITUDE CORRECTION

Kathy Schulze, *KJS Consulting*

LASER RANGING AT McDONALD OBSERVATORY: ALMOST 35 YEARS AND STILL GOING

Peter Shelus, *McDonald Observatory*

LIDAR RISK REDUCTION AND TECHNOLOGY DEVELOPMENT STRATEGY FOR SPACE-BASED REMOTE SENSING

Uendra Singh, *NASA Langley Research Center*

SENSITIVITY ANALYSIS OF THE BISPECTRUM MEASURED-PHASE SEED TECHNIQUE

David Tyler, *University of Arizona*

ANALYSIS OF IMAGES TAKEN WITH ORTHOGONAL TRANSFER CCDs AND IMPLICATIONS FOR LARGE FOCAL-PLANE DETECTOR ARRAYS

Mark Waterson, *University of Hawaii Institute for Astronomy*

DOD CRITICAL TECHNOLOGIES OVERVIEW

Ray Wick, *Institute for Defense Analyses*

CUBESAT: THE UNIVERSITY OF HAWAII SMALL SATELLITE PROJECT

Byron Wolfe, *University of Hawaii*

DETECTING PROTOSTELLAR JETS WITH THE GODDARD FABRY-PEROT CORONAGRAPH, AND MODIFICATION FOR ADAPTIVE OPTICS

Bruce Woodgate, *NASA/Goddard Space Flight Center*

SURFACE LAYER TURBULENCE MEASUREMENT

Peter Zimmer, *University of New Mexico*