18th AMOS

Advanced Maui Optical and Space Surveillance Technologies Conference

2017 PROGRAM

September 19-22 | Maui, Hawai'i

Presented by

maui economic DEVELOPMENT BOARD

1305 N. Holopono Street, Suite 1 | Kihei, Hawai'i 96753
www.medb.org | Tel: 808.875.2300

Welina Mai Kakou | Welcome

Aloha!

We are pleased that you are participating in the 18th 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 leis worn at the welcome reception, our traditional Native Hawaiian invocation opening the conference, and a private luau buffet and show on Wailea Beach.

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 Team

Mahalo to our Sponsors

Po'okela | striving for the best

BOEING

Laulima | working together

SAIC

Lokahi | collaboration and unity

Secure World Foundation

County of Maui, State of Hawaii

AGI

HARRIS

Raytheon

LOCKHEED MARTIN

University of Hawai'i System

Kupa'a | loyal and committed

APPLIED DEFENSE SOLUTIONS

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Malama | to care for

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HNU PHOTONICS

JSF Japan Space Forum

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ExoAnalytic Solutions

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SB Software Bisque

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Software Bisque | www.bisque.com
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Tyvak | www.tyvak.com
University of Hawai'i | www.hawaii.edu/research/

Exhibit Hours

Load-in | Tue, 8:00 AM - 5:00 PM
Wednesday | 9:30 AM - 6:30 PM
Thursday | 9:00 AM - 5:30 PM
Friday | 9:00 AM - 3:10 PM
Load-out | Fri, 3:10 PM - 5:00 PM

SEP 19 Tuesday | Po'alua

TECHNICAL SHORT COURSES (Separate registration fee required)

8:00 AM - 12:00 PM

Rapid Integration of Novel Algorithms with Modern Data Management Systems
Presented by **Carl Fischer**, Chief Technologist, Ball Aerospace; and **Matthew Fisher**, Senior Engineer, Ball Aerospace
(Breakout Room 4617)

Collision Avoidance Risk Assessment
Presented by **Francois Laporte** and **Monique Moury**, CNES; **Matt Hejduk** and **Lauri Newman**, NASA/GSFC
(Mauna Loa Ballroom)

Earth and Planetary Atmospheric Physics Primer
Presented by **Capt Michael Nayak**, AFRL
(Ilima Ballroom)

1:00 PM - 5:00 PM

Space Debris Risk Assessment and Mitigation Analysis – Requirements and their verification Using ESA's DRAMA software
Presented by **Vitali Braun**, Space Debris Engineer, IMS Space Consultancy at ESA/ESOC Space Debris Office; and **Tim Flohrer**, Space Debris Analyst, SST Segment Co-Manager, ESA/ESOC Space Debris Office
(Mauna Loa Ballroom)

Implementing Operational Analytics Using Predictive Analysis and Big Data Techniques
Presented by **Rohit Mital**, Chief Technology Officer, Stinger Ghaffarian Technologies; and **Joseph Coughlin**, Senior Aerospace Engineer, Applied Defense Solutions
(Ilima Ballroom)

6:00 PM - 7:30 PM WELCOME RECEPTION | Luau Gardens

APPLES FOR EDUCATION

On your behalf and in lieu of a floral lei at the Welcome Reception,

BOEING

made a donation to the MEDB Ke Alahele Education Fund, a STEM grantmaking vehicle created to stimulate community investment in broadening career pathways for Maui County residents.

Co-hosted by The Boeing Company, the conference kicks off with a welcome reception providing participants with a unique networking opportunity. Surrounded by tropical breezes participants and their guests will be greeted with a shell lei, a beverage and appetizers, all while listening to music by the U.S. Air Force Band of the Pacific. Conference badge required at entry.

SEP 20 Wednesday | Po'akolu

6:00 AM - 7:15 AM BREAKFAST AT LEISURE | Luau Gardens

7:30 AM CONFERENCE OPENING | Aulani Ballroom

Welcome | **Leslie Wilkins**, President & CEO, Maui Economic Development Board, Inc.
Invocation | **Reverend Kealahou Alika**, Keawala'i Congregational Church

KEYNOTE ADDRESS

Douglas L. Loverro, Former Deputy Assistant Secretary of Defense for Space Policy, U.S. Department of Defense

*Introduction by **L. Kirk Lewis** (Col, Ret.), Senior Analyst, Institute for Defense Analyses*

ASK A QUESTION

Use the Conference App, or go to http://sift.ly (Enter code: AMOS17)

8:30 AM SSA POLICY FORUM

Evolution of the Commercial SSA Industry

Moderated by **Brian Weeden**, Technical Advisor, Secure World Foundation

Stewart Bain, CEO, Northstar
Doug Hendrix, CEO, ExoAnalytic Solutions
Tom Kubancik, Vice President, Advanced Programs, Applied Defense Solutions
Edward Lu, Vice President, Strategic Projects, Leolabs
Helen Reed, Co-Founder and Chief Technology Officer, Chandah Space Technologies
Paul Welsh, Vice President Business Development, Analytical Graphics Inc.

9:30 AM EXHIBITS | Exhibit Room

COFFEE BREAK Sponsored by HARRIS

10:00 AM ORBITAL DEBRIS (20-min presentations) | Aulani Ballroom

Co-chaired by **Carolin Frueh**, Purdue University and **Tim Flohrer**, ESA/ESOC Space Debris Office

Debris Albedo from Laser Ablation in Low and High Vacuum: Comparisons to Hypervelocity Impact | **Gouri Radhakrishnan**, The Aerospace Corporation

A Search for Debris from Two Titan 3C Transtage Breakups at GEO with a 6.5-m Magellan Telescope | **Patrick Seitzer**, University of Michigan Astronomy

Characterizing the Survey Strategy and Initial Orbit Determination Abilities of the NASA MCAT Telescope for Geosynchronous Orbital Debris Environmental Studies | **James Frith**, University of Texas El Paso

Precision Tracking of Decimeter Targets at GEO Distances Using the Magdalena Ridge Observatory 2.4-meter Telescope | **William Ryan**, New Mexico Tech/MRO

Characterizing GEO Titan IIIC Transtage Fragmentations Using Ground-based and Telescopic Measurements | **Heather Cowardin**, UTEP/JACOBS-JETS

Exploiting Orbital Data and Observation Campaigns to Improve Space Debris Models | **Vitali Braun**, European Space Agency

12:00 PM - 1:00 PM LUNCH | Lokelani Ballroom

1:00 PM ASTRODYNAMICS (20-min presentations) | Aulani Ballroom

Co-chaired by **Marcus Holzinger**, Georgia Institute of Technology and **Paul Schumacher**, Air Force Research Laboratory

Determining Type I and Type II Errors when Applying Information Theoretic Change Detection Metrics for Data Association and Space Situational Awareness | **Matthew Wilkins**, Applied Defense Solutions

Sensitivity to Phase Angle for Reconciling Space Object Observed and Solar Pressure Albedo-Areas Via Astrometric and Photometric Data Fusion | **Vishnuu Mallik,** University of Texas at Austin

Optical Initial Orbit Determination Using Polynomial Chaos Surrogate Functions | **Daniel Lubey**, The Aerospace Corporation

Relative Orbit Determination of Multiple Satellites Using Double Differenced Measurements | **Jeroen Geeraert**, CU Boulder / CCAR

Boundaries on Range-Range Admissible Regions for Optical Space Surveillance | **John Gaebler**, University of Colorado Boulder

Uninformative Prior Multiple Target Tracking Using Evidential Particle Filters | **Johnny Worthy**, Georgia Institute of Technology

3:00 PM BREAK AND EXHIBITS

3:20 PM ASTRODYNAMICS (continued)

Optical Data Association in a Multi-Hypothesis Framework with Maneuvers | **Islam Hussein**, Applied Defense Solutions

Limitations on Improving Orbit Prediction Accuracy through Machine Learning | **Xiaoli Bai**, Rutgers, The State University of New Jersey

Strengthening the Bridge between Academia and Operations for Orbital Debris Risk Mitigation | **Mark Vincent**, Raytheon

Prediction Accuracy Analysis from Orbital Elements Generated for a New Space Object Catalogue | **James Bennett**, Space Environment Research Centre

Conjunction Assessment for Commercial Satellite Constellations Using Commercial Radar Data Sources | **Michael Nicolls**, LeoLabs, Inc.

5:00 PM - 6:30 PM
POSTER AND EXHIBIT SESSION | Sponsored by SAIC®

SEP 21 Thursday | Po'aha

6:00 AM - 7:15 AM BREAKFAST AT LEISURE | Luau Gardens

7:30 AM | Aulani Ballroom

KEYNOTE ADDRESS

Colonel Shinichiro Tsui, Councellor, National Space Policy Secretariat, Cabinet Office, Government of Japan

ASK A QUESTION

Use the Conference App, or go to http://sift.ly (Enter code: AMOS17)

8:00 AM SSA POLICY FORUM

Challenges and Opportunities From Large Commercial Constellations

Moderated by **Andrew D'Uva**, President, Providence Access Co.

Tim Flohrer, Space Debris Analyst and Co-Lead Space Surveillance and Tracking, European Space Agency
Cyrus Foster, Flight Dynamics Lead, Planet
Gary Henry, Director of Space Defense & Intelligence, Boeing
Diana McKissock, SSA Sharing Cell Lead, 18th Space Control Squadron

9:00 AM EXHIBITS AND COFFEE BREAK | Exhibit Room

9:30 AM OPTICAL SYSTEMS (20-min presentations) | Aulani Ballroom

Co-chaired by **Mike Dearborn**, MITRE Corporation and **Jim Shell**, Novarum Tech

Event Based Sensing for Space Situational Awareness | **Gregory Cohen**, Western Sydney University

Image Reconstruction from Data Collected with an Imaging Interferometer | **Zachary DeSantis**, Lockheed Martin SSC

Stereo–SCIDAR System for Improvement of Adaptive Optics Space Debris-tracking Activities | **Elliott Thorn**, Research School of Astronomy and Astrophysics

10:30 AM OPTICAL SYSTEMS (15-min presentations)

Plasma Spectroscopy CubeSat: A Demonstration of On-Orbit Electric Propulsion System Diagnostics | **Jennifer Hudson**, Western Michigan University

QuadCam - A Quadruple Polarimetric Camera for Space Situational Awareness | **Jovan Skuljan**, Defence Technology Agency

Towards Routine Uncued Surveillance of Small Objects at and near GEO with Small Telescopes | **Peter Zimmer**, J.T. McGraw and Associates, LLC

Deep Space Wide Area Search Strategies | **Michael Capps**, Colorado State University

11:30 AM - 12:30 PM LUNCH | Lokelani Ballroom

12:30 PM NON-RESOLVED OBJECT CHARACTERIZATION (20-min presentations) | Aulani Ballroom

Co-chaired by **Heather Cowardin,** University of Texas El Paso, Jacobs-JETS and **Matthew Hejduk**, Astrorum Consulting

Debris Attitude Motion Measurements and Modeling - Observation vs. Simulation | **Tobias Lips**, Hypersonic Technology Goettingen GmbH

Acoustic Imaging of Geosynchronous Satellites | **Zachary Watson**, University of Arizona, HartSci

Space Weathering Experiments on Spacecraft Materials | **Russell Cooper**, Air Force Research Laboratory

Probabilistic Analysis of Light Curves | **Islam Hussein**, Applied Defense Solutions

Rapid Characterization of Geosynchronous Space Debris with 5-color Near-IR Photometry | **Eric Pearce**, University of Arizona Steward Observatory

Development and Evaluation of New Methods for Estimating Albedo-Area for Stable GEOs | **Tamara Payne**, Applied Optimization Inc.

2:30 PM BREAK AND EXHIBITS

2:50 PM TASKING (20-min presentations) | Aulani Ballroom

Co-chaired by **Ryan Coder**, AFRL, Air Force Maui Optical and Supercomputing Site and **Tamara Payne**, Applied Optimization

Sensor Tasking for Detection and Custody of HAMR Objects | **Carolin Frueh**, Purdue University

Performance of Optimized Scheduled Follow-up Observations for Geosynchronous Space Object Using Different Genetic Algorithms | **Andreas Hinze**, DLR

Autonomous Space Object Catalogue Construction and Upkeep Using Sensor Control Theory | **Travis Bessell**, Defence Science Technology Group

Time Optimal Search or Follow-up Tasking on Orbit Region for SSA | **Timothy Murphy**, Georgia Tech

An Autonomous Sensor Tasking Approach for Large Scale Space Object Cataloging | **Richard Linares**, University of Minnesota

4:30 PM - 5:30 PM POSTER AND EXHIBIT SESSION | Co-sponsored by

SN SpaceNav

AMOS

8:00 PM - 10:00 PM | Pacific Terrace Rooftop

Satellite Watching and Star Party

Join us for desserts under the stars

Sponsored by AGI

SEP 22 Friday | Po'alima

6:00 AM - 7:15 AM BREAKFAST AT LEISURE | Luau Gardens

7:30 AM | Aulani Ballroom

KEYNOTE ADDRESS

Stuart Eves PhD, FRAS, FBIS
Lead Mission Concepts Engineer, Surrey Satellite Technology Limited

ASK A QUESTION

Use the Conference App, or go to http://sift.ly (Enter code: AMOS17)

8:00 AM SSA POLICY FORUM

International Perspectives on the Future of Space Traffic Management

Moderated by **Victoria Samson**, Washington Office Director, Secure World Foundation

LTC Pawel Chodosiewicz, Acting Director of Defense Projects Department, Polish Space Agency
Stephen Earle, Space Traffic Program Manager, Federal Aviation Administration
WGCDR Steven Henry, Australian Exchange Officer, Principal Department of Defense Space Advisor Staff
Bhavya Lal, Research Staff Member, Science and Technology Policy Institute, Institute for Defense Analyses
Uwe Wirt, Director of Operations, German Aerospace Center (DLR) / German Space Situational Awareness Center (GSSAC)

9:00 AM EXHIBITS AND COFFEE BREAK | Exhibit Room

9:30 AM ADAPTIVE OPTICS AND IMAGING (20-min presentations) | Aulani Ballroom

Co-chaired by **Eric Pearce**, University of Arizona Steward Observatory and **Stacie Williams**, Air Force Office of Scientific Research

High Resolution SSA Imaging Using Carbon Fiber Telescopes | **Ryan Swindle**, Air Force Research Lab

Developments in High Spatial Resolution Imaging of Faint, Complex Objects at Lowell Observatory | **Gerard van Belle**, Lowell Observatory

Using Asteroids and their Moons for Closely Spaced Object Studies | **Jack Drummond**, Leidos - Starfire Optical Range

Quantum Theory of Three-Dimensional Superresolution Using Rotating-PSF Imagery | **Sudhakar Prasad**, University of New Mexico

High-Fidelity Imaging Using Compact Multi-Frame Blind Deconvolution | **Stuart Jefferies**, Georgia State University

Imaging Through Turbulence: A Light-Field Approach | **Jeremy Bos**, Michigan Technological University

High-Altitude Airborne Platform Characterisation of Adaptive Optic Corrected Ground Based Laser | **Francis Bennet**, The Australian National University

11:50 AM - 12:50 PM LUNCH | Lokelani Ballroom

12:45 PM - 2:30 PM SPACE EXPLORATION STUDENT SESSION

Maui middle school students to participate in hands-on STEM activities.

Guest Speaker:
Dr. Janet Kavandi, Director, NASA Glenn Research Center; and NASA Astronaut

12:50 PM SPACE SITUATIONAL AWARENESS | Aulani Ballroom

Co-chaired by **James "Chris" Higgins**, SMC/SYGO and **Robert "Lauchie" Scott**, Defence R&D Canada

Invited Talk:
Introduction to the current Space Joint Warfighting Construct Prototyping opportunities, concepts and ideas being explored by AFRL/RV and SMC/AD with government partners and industry in the realm of Space Situational Awareness

Co-presented by **Col Russ Teehan**, Director, Space Vehicles Directorate, Air Force Research Laboratory and **Col John Anttonen**, Director, Advanced Systems & Development Directorate, Air Force Space & Missile Center

1:20 PM SPACE SITUATIONAL AWARENESS (15-min presentations)

ESA's SSA Programme: Activities in Space Surveillance and Tracking | **Tim Flohrer**, European Space Agency

AN/FSY-3 Space Fence System – Sensor Site One/Operations Center Integration Status and Sensor Site Two Planned Capability | **Matthew Hughes**, Lockheed Martin

Detection of Faint Companions in the Vicinity of Geostationary Satellites | **Henrique Schmitt**, Naval Research Laboratory

Empirical Real-time Dynamic Data Driven Detection & Tracking Using Detectionless and Traditional FiSSt Methods | **Shahzad Virani**, Georgia Institute of Technology

An Autonomous Data Reduction Pipeline for Wide Angle EO Systems | **Grant Privett**, Defence Science and Technology Laboratory

Small and Medium Aperture Speckle Interferometry for Geostationary On-Orbit-Servicing Space Situational Awareness | **Robert "Lauchie" Scott**, Defence R&D Canada

SEP 22 Friday | Po'alima

2:50 PM BREAK AND EXHIBITS

3:10 PM SPACE SITUATIONAL AWARENESS (15-min presentations) (continued)

The Ultimate Big Data Enterprise Initiative: Defining Functional Capabilities for an International Information System (IIS) for Orbital Space Data (OSD) | **Robert Raygan**, Integrity Applications Incorporated

The Role of Impacts and Momentum Transfer for the Evolution of Envisat's Attitude State | **Thomas Schildknecht**, Astronomical Institute University of Bern

Space Objects Maneuvering Detection and Prediction via Inverse Reinforcement Learning | **Roberto Furfaro**, Unversity of Arizona

Attaining Situational Understanding in the Space Domain | **Barry Schiff**, Lockheed Martin

A Cloud-Based, Open-Source, Command-and-Control Software Paradigm for Space Situational Awareness | **Jason Thomas**, Ball Aerospace

Evaluating Options for Civil Space Situational Awareness | **Bhavya Lal**, IDA Science and Technology Policy Institute

An Imagineering Approach to the Future of Space Situational Awareness | **Rick Luce**, Stellar Solutions, Inc.

4:55 PM CLOSING AND PRIZE DRAWING

Your input is invaluable as we begin to plan next year's Conference. Complete the Feedback Form to be in the running to win an Apple Mini-iPad (must be present to win).

5:30 PM - 8:30 PM CLOSING DINNER LUAU & SHOW | Luau Gardens

Dine, Dance and Discover
Te Au Moana: The Ocean Tide
A spectacular luau experience.
Luau ticket required.

SAVE THE DATE 2018

SEP 11-14

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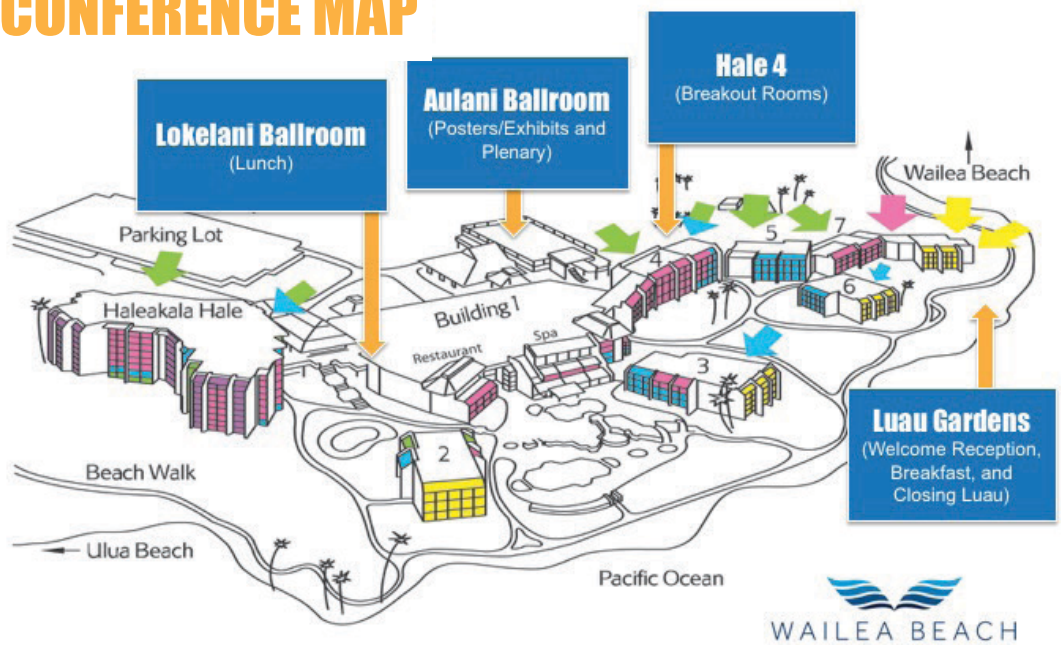
CONFERENCE MAP



POSTER PRESENTERS

Characterization of Hypervelocity Impact Debris from the DebriSat Tests | **Paul Adams**, Aerospace Corporation

A Deep Machine Learning Algorithm to Optimize the Forecast of Atmospherics | **Randall Alliss**, Northrop Grumman

SPIDER: First Extended Scene Images | **Katherine Badham**, Lockheed Martin Space Systems Company

A Space Object Detection Algorithm Using Fourier Domain Likelihood Ratio Test | **David Becker**, Air Force Institute of Technology

Simultaneous Hyperspectral Measurements of Space Objects with a Small Format System | **Elizabeth Beecher**, Air Force Research Laboratory

Rotation State Evolution of Retired Geosynchronous Satellites | **Conor Benson**, University of Colorado Boulder

Australian Space Situational Awareness Capability Demonstrations | **Travis Bessell**, Defence Science and Technology Group

Larger Optics and Improved Calibration Techniques for Small Satellite Observations with the ERAU OSCOM System | **Sergei Bilardi**, Embry-Riddle Aeronautical University, Space and Atmospheric Instrumentation Lab

Satellite Characterization Data Collection and Analysis | **Jeff Brennan**, Lockheed Martin

Optical Ground Based Space Surveillance Obscured Sky Mitigation | **Robert Bruck**, BAE Systems

Looking Down Through Clouds | **Jarred Burley**, AFIT

Can LEO Conjunction Warnings Become a Viable Business? | J**oseph Carroll**, Tether Applications, Inc.

Combined SSA Sensor Tasking for Space-to-Space and Ground-to-Space | **Kenneth Center**, Orbit Logic

Non-traditional Sensor Tasking for SSA: A Case Study | **Kenneth Center**, Orbit Logic

Design and Efficiency Analysis of Operational Scenarios for Space Situational Awareness Radar System | **Eun Jung Choi**, Korea Astronomy and Space Science Institute

Orbit Determination Results and Space Debris Test Observation of the OWL-Net | **Jin Choi**, University of Science and Technology

Determining Relative Power Capacities of Geosynchronous Satellites | **Francis Chun**, USAF Academy

Training the Next Generation in Space Situational Awareness Research | **Damon Calpo**, University of Arizona

Satellite and Debris Characterisation in LEO and GEO Using Adaptive Optics | **Michael Copeland**, Australian National University & Space Environment Research Centre

Photometric Analysis of Small Momentum Impulse Transfer Events | **Phillip Cunio**, ExoAnalytic Solutions

Satellite Articulation Characterization from an Image Trajectory Matrix Using Optimization | **David Curtis**, US Air Force

Improved Orbit Determination of LEO CubeSats: Project LEDsat | **James Cutler**, University of Michigan

GEO Optical Data Association with Concurrent Metric and Photometric Information | **Phan Dao**, AFRL Space Vehicles

Autonomous Orbit Propagation for GPS Equipped Cubesats | **Gim Der**, derastrodynamics

Recent Developments in Shadow Imaging | **Dennis Douglas**, Integrity Applications Incorporated

Spectroscopic Characterization of GEO Satellites with Gunma LOW Resolution Spectrograph | **Takao Endo**, Mitsubishi Electric Corporation

Implementation of High Power, High Resolution Radar System | **Barry Geldzahler**, NASA

Debris Manoeuver with Ground-Based Laser | **Ben Greene**, Space Environment Research Centre

Aperture Partitioning Element Results | **Steven Griffin**, Boeing

Laser Propogation through Deep Turbulence Characterization | **V.S. Rao Gudimetla**, AFRL/RDSM, AMOS Site

Simulations for Improved Imaging of Dim Objects at Maui Space Surveillance Site | **Richard Holmes**, Boeing

Image Restoration from Limited Data | **Douglas Hope**, Hart Scientific Consulting International

A Validation Method of ESA's MASTER 1 cm Population in Low Earth Orbit | **Andre Horstmann**, TU Braunschweig

Design and Commissioning of the Transportable Laser Ranging Station STAR-C | **Leif Humbert**, DLR

Application of Multi-Hypothesis Sequential Monte Carlo for Breakup Analysis | **Islam Hussein**, Applied Defense Solutions

Shape and Orbit Estimation Technique for Space Debris Observation Using MU Radar | **Naruomi Ikeda**, Research Institute for Sustainable Humanosphere, Kyoto University

Applying Cognitive Fusion to Space Situational Awareness | **Steven Ingram**, Lockheed Martin

Dynamic Aperture Diversity | **Stuart Jefferies**, Georgia State University

Space Object Classification Using Fused Features of Time Series Data | **Bin Jia**, Intelligent Fusion Technology, Inc.

Research to Operations Transition of an Auroral Specification and Forecast Model | **James Jones**, Northrop Grumman

A Simulation Environment to Determine the Performance of SSA Systems | **Christopher Kebschull**, TU Braunschweig/Institute of Space Systems

Geosynchronous Patrol Orbit for Space Situational Awareness | **Tom Kelecy**, Applied Defense Solutions

Integrating Machine Learning into Space Operations | **Kevin Kelly**, US Air Force

DVD-COOP: Innovative Conjunction Prediction Using Voronoi-filter based on the Dynamic Voronoi Diagram of 3D Spheres | **Deok-Soo Kim**, Hanyang University

Publicly Available Geosynchronous (GEO) Space Object Catalog for Future Space Situational Awareness (SSA) Studies | **Darin Koblick**, California State University Long Beach

Utilizing Cubesatellites for Characterization of the AN/FSY-3 Space Fence System and Other Sensors | **Michael Koltiska**, US Air Force

The Solaris-Panoptes Global Network of Robotic Telescopes and the Borowiec Satellite Laser Ranging System for SST: A Progress Report | **Maciej Konacki**, Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences

Technical Description of a Novel Sensor Network Architecture and Results of Radar and Optical Sensors Contributing to a UK Cueing Experiment | **Darcy Ladd**, Science and Technology Facilities Council (STFC)

Automated Cloud Observation for Ground Telescope Optimization | **Ben Lane**, ExoAnalytic Solutions

Cloud Services for Space Situational Awareness | **Sarah Law**, Raytheon

NASA's Optical Program on Ascension Island: Bringing MCAT to Life as the Eugene Stansbery-Meter Class Autonomous Telescope (ES-MCAT) | **Susan Lederer**, NASA JSC

Distinguishing Active Box-Wing and Cylindrical Geostationary Satellites Using IR Photometry with NASA's WISE Spacecraft | **Chris Lee**, University of Michigan

WENESSA, Wide Eye-Narrow Eye Space Situational Awareness | **Paul LeVan**, Air Force Research Laboratory – Directed Energy Directorate

Applications of Photometric Stereopsis for Shape Estimation of RSOs | **Manoranjan Majji**, Texas A&M University

Ever Wonder What's in Molniya? We do. | **John McGraw**, J.T. McGraw and Associates, LLC

Modular Mount Control System for Telescopes | **John Mooney**, The Boeing Company

Harnessing Orbital Debris to Sense the Space Environment | **Shaylah Mutschler**, University of Colorado Boulder

Fuel Optimal, Finite Thrust Guidance Methods to Circumnavigate with Lighting Constraints | **Eric Prince**, Air Force Institute of Technology

TC4 Observing Campaign: An Operational Test of NASA Planetary Defense Network | **Vishnu Reddy**, University of Arizona

Space Surveillance Using TAROT Telescopes Network | **Pascal Richard**, Centre National d'Etudes Spatiales (C.N.E.S)

Single Photon Counting Large Format Imaging Sensors with High Spatial and Temporal Resolution | **Oswald Siegmund**, Space Sciences Laboratory

Preliminary CubeSat Design for Laser Remote Maneuver of Space Debris at the Space Environment Research Centre | **Liam Smith**, Lockheed Martin

Advanced Capabilities in Space Radar | **Robert Sparr**, SRI International

Automated Terrestrial EMI Emitter Detection, Classification, and Localization | **Richard Stottler**, Stottler Henke Associates Inc.

Automatic Satellite Telemetry Analysis for SSA Using Artificial Intelligence Techniques | **Richard Stottler,** Stottler Henke Associates, Inc.

Sohbrit: Autonomous COTS System for Satellite Characterization | **Samuel Tarin**, Sandia National Laboratories

Network Enabled Unresolved Residual Analysis Learning | **Dwight Temple**, Exoanalytic Solutions

Daytime Sky Brightness Characterization for Persistent GEO SSA | **Grant Thomas**, Air Force Institute of Technology

Optical In-Situ Monitor – A Step Towards European Space-Based Debris Observations | **Jens Utzmann**, Airbus DS GmbH

LauncherOne: Virgin Orbit's Dedicated Launch Vehicle for Small Satellites & Impact on the Space Enterprise Vision | **Mandy Vaughn**, VOX Space

Passive Optical Link Budget for LEO Space Surveillance | **Paul Wagner**, DLR

Dynamics Observation of Space Objects Using Adaptive Optics Simulation and Light Curve Analysis | **Kazufumi Watanabe**, Graduate school of Kyushu University

Automation of a Wave-Optics Simulation and Image Post-Processing Package on Riptide | **Michael Werth**, Boeing

Improved Anomaly Detection Using Integrated Supervised and Unsupervised Processing | **Charles Wetterer**, Pacific Defense Solutions

Debris Object Orbit Initialization Using the Probabilistic Admissible Region with Asynchronous Heterogeneous Observations | **Matthew Wilkins**, Applied Defense Solutions

Event-Driven Site Controller for Distributed Optical SSA | **Andrew Zizzi**, Lockheed Martin

Orbital Resonances in the Vinti Solution | **Laura Zurita**, US Air Force

Poster presenters will be available to discuss their presentation during the poster sessions.

ALOHA AND MAHALO

University of Hawai'i and US Air Force telescopes atop Haleakala, Maui