EXHIBIT HOURS
MONDAY, 11:00 A.M. – 5:00 P.M.
TUESDAY, 9:00 A.M. – 5:00 P.M.
WEDNESDAY, 9:00 A.M. – 5:00 P.M.
THURSDAY, 9:00 A.M. – 12:00 P.M.

CONFERENCE SCHEDULE
*CONFERENCE SCHEDULE IS SUBJECT TO CHANGE

SATURDAY AUGUST 8
8:00 A.M. – 8:45 A.M.  Registration/Continental Breakfast
8:45 A.M. – 9:00 A.M.  Workshop Welcome
9:00 A.M. – 10:20 A.M.  Presentations
10:20 A.M. – 10:50 A.M.  Break
10:50 A.M. – 12:10 P.M.  Presentations
12:10 P.M. – 1:30 P.M.  Lunch
1:30 P.M. – 3:10 P.M.  Presentations
3:10 P.M. – 3:40 P.M.  Break
3:40 P.M. – 5:20 P.M.  Presentations

SUNDAY AUGUST 9
8:00 A.M. – 8:45 A.M.  Registration/Continental Breakfast
8:45 A.M. – 9:00 A.M.  Opening Comments
9:00 A.M. – 10:20 A.M.  Presentations
10:20 A.M. – 10:50 A.M.  Break
10:50 A.M. – 12:10 P.M.  Presentations
12:10 P.M. – 1:30 P.M.  Lunch
1:30 P.M. – 3:10 P.M.  Presentations
3:10 P.M. – 3:40 P.M.  Break
3:40 P.M. – 5:20 P.M.  Presentations
5:20 P.M. – 5:30 P.M.  Closing Remarks
MONDAY, AUGUST 10

8:00 A.M.–12:00 P.M. Side Meetings
9:00 A.M.–1:00 P.M. Registration/Check-in
11:00 A.M.–12:30 P.M. Brunch on the Launch Pad
1:00 P.M.–1:15 P.M. Conference Welcome
1:15 P.M.–2:15 P.M. Keynote Address
2:15 P.M.–2:45 P.M. Ice Cream Social—Exhibit Viewing
2:45 P.M.–3:00 P.M. Conference Announcements
3:00 P.M.–4:15 P.M. Technical Session I: All Systems Go!
4:15 P.M.–4:45 P.M. Break—Exhibit and Poster Viewing
4:45 P.M.–6:00 P.M. Technical Session II: Launch Opening Social at Space Dynamics Laboratory
6:30 P.M.–9:30 P.M.

TUESDAY, AUGUST 11

7:15 A.M.–9:00 A.M. Continental Breakfast
8:00 A.M.–9:45 A.M. Technical Session III: Next on the Pad Break—Exhibit and Poster Viewing
9:45 A.M.–10:30 A.M. Conference Announcements
10:45 A.M.–12:15 P.M.
12:15 P.M.–1:15 P.M. Munch & Mingle Luncheon
1:15 P.M.–1:45 P.M. Exhibit and Poster Viewing
1:45 P.M.–3:15 P.M. Technical Session V: Year in Review Break—Exhibit and Poster Viewing
3:15 P.M.–4:00 P.M. Technical Session VI: Ground Systems and Communications
4:00 P.M.–6:00 P.M. Free Evening/Industry Sponsored Events
**OPENING SOCIAL**
*MONDAY, AUGUST 10, 6:30-9:30 P.M.*

The Space Dynamics Laboratory invites you to attend the Opening Social.

USU Research Foundation/Innovation Campus Fountain
1695 North Research Park Way, North Logan, Utah

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**WEDNESDAY, AUGUST 12**

7:15 A.M.–9:00 A.M.  Continental Breakfast
8:00 A.M.–9:45 A.M.  Technical Session VII: Opportunities, Trends and Initiatives
9:45 A.M.–10:30 A.M.  Break—Exhibit and Poster Viewing
10:30 A.M.–12:15 P.M.  Technical Session VIII: FJR Student Competition
12:15 P.M.–1:15 P.M.  Munch & Mingle Luncheon
1:15 P.M.–2:15 P.M.  Technical Session IX: Education
2:15 P.M.–2:20 P.M.  Conference Announcements
2:20 P.M.–2:45 P.M.  Student Competition Awards
2:45 P.M.–3:30 P.M.  Ice Cream Social—Exhibit and Poster Viewing
3:30 P.M.–5:15 P.M.  Technical Session X: Advanced Technologies II
                      Free Evening/Wednesday Activities

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**THURSDAY, AUGUST 13**

7:15 A.M.–9:00 A.M.  Continental Breakfast
8:00 A.M.–9:30 A.M.  Technical Session XI: Advanced Technologies III
9:30 A.M.–9:45 A.M.  Extravaganza Drawing
9:45 A.M.–10:15 A.M.  Break—Exhibit Viewing
12:15 P.M.–12:30 P.M.  Closing Remarks
12:30 P.M.–1:30 P.M.  Munch & Mingle Luncheon
1:30 P.M.  Conference Concludes
2:00 P.M.–6:00 P.M.  Side Meetings
9:00 A.M. Open-Sourcing CubeSat Design
Artur Scholz—NCKU

9:20 A.M. How a Lightweight RTOS can Drive CubeSat Flight Software Functionality
Andrew Kalman—PUMPKIN, Inc.

9:40 A.M. Robust Star Detection for Cubic-Centimeter Star Imager
Samir Rawashdeh—University of Michigan–Dearborn

10:00 A.M. New Small Satellite Capabilities for Microwave Atmospheric Remote Sensing: The Earth Observing Nanosatellite
Bill Blackwell—MIT Lincoln Lab

10:50 A.M. NanosatC-Br1 The First Brazilian CubeSat, and Beyond
Otavio Durão—INPE–The Brazilian Institute for Space Research

11:10 A.M. D-Sat Mission: an In-Orbit Demonstration of Solid-Propelled Satellite Decommissioning Device Capabilities
Elena Toson—D-Orbit Srl
<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Presenter/Institution</th>
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<tbody>
<tr>
<td>11:30 A.M.</td>
<td>Methods to Predict Fatigue in CubeSat Structures and Mechanisms</td>
<td>Walter Holemans—Planetary Systems Corporation</td>
</tr>
<tr>
<td>1:30 P.M.</td>
<td>Methods to Predict Fatigue in CubeSat Structures and Mechanisms</td>
<td>Walter Holemans—Planetary Systems Corporation</td>
</tr>
<tr>
<td>1:50 P.M.</td>
<td>An Affordable Launch Vehicle Concept for CubeSat-Class Missions</td>
<td>Jason Budinoff—NASA Goddard Space Flight Center</td>
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<tr>
<td>2:10 P.M.</td>
<td>Increasing International Space Station Utilization for Small Satellite Deployments</td>
<td>Conor Brown—NanoRacks LLC</td>
</tr>
<tr>
<td>2:30 P.M.</td>
<td>Let’s Status ELaNa and What’s Ahead</td>
<td>Garrett Skrobot—NASA LSP</td>
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</tbody>
</table>
3:40 P.M.  Benefits for Deployable Quadrifilar Helical Antenna Modules for Small Satellites
Greg O’Neill—Helical Communication Technologies

4:00 P.M.  Big Software for SmallSats: Adapting cFS to CubeSat Missions
James Marshall—George Washington University

4:20 P.M.  LANL Compact Attitude Determination and Control System for Small Satellites
Nicholas Dallmann—Los Alamos National Laboratory

4:40 P.M.  NanoSatellite Avionics Optimization in a Space-Constrained Environment
James Byrne—MIT Space Systems Lab

5:00 P.M.  Developing a CubeSat Mission to Support Earth Science
William Mast—NASA/GSFC/WFF

CHECK OUT INDUSTRY SIDE MEETING LISTINGS ON THE BACK COVER
9:00 A.M.  
G.A.U.S.S. MicroSatellites: Experience and Proposals  
Vladislav Solovey—G.A.U.S.S. Srl

9:20 A.M.  
PolySat Mission and Operations Engineering Lessons  
Nik Powell—Cal Poly, SLO

9:40 A.M.  
Gossamer Orbit Lowering Device (GOLD) for Safe and Efficient CubeSat Deorbit  
Nicola Sarzi-Amade—Global Aerospace Corporation

10:00 A.M.  
Flight Testing of a Low Cost De-Orbiting Device for Small Satellites  
Dana Turse—Composite Technology Development, Inc.

10:50 A.M.  
Design and Test of the Payload Electronics and In Flight Sequence Development for the CSUNSAT1 Low Temperature Battery Experiment  
Gary Bolotin—Jet Propulsion Labrotory, California Institute of Technology

11:10 A.M.  
Conformal Circularity Polarized UHF Up- and Downlink Solar Panel Antennas for CubeSats  
Reyhan Baktur—Utah State University

11:30 A.M.  
JPL’s Advanced CubeSat Concepts for Deep Space Exploration  
Sara Spangelo—Jet Propulsion Lab

11:50 A.M.  
Globalstar Communication Link for CubeSats  
Jeff Dailey—NearSpace Launch Inc.
1:30 P.M.  Developing the Miniature Tether Electrodynamics Experiment: Completion of Key Milestones and Future Work
Brett Bronner—University of Michigan

1:50 P.M.  Integrating Advanced Payload Data Processing in a Demanding CubeSat Mission
Peter Mendham—Bright Ascension Ltd

2:10 P.M.  Stay on the Path—Sticking to your Selected CubeSat Mission to Achieve Project Success
Jeroen Rotteveel—Innovative Solutions In Space BV

2:30 P.M.  E-Field Instruments for CubeSats
Marcin Pilinski—ASTRA LLC

2:50 P.M.  Time Capsule to Mars: A Platform for Advanced Technological Testing in Interplanetary Space
Emily Briere—Duke University

3:40 P.M.  Lights Out: Evolution of an Automated Ground Segment for Operation of the Aerospace CubeSat Constellation
Darren Rowen—The Aerospace Corporation

4:00 P.M.  SPARC-1: In Pursuit of Mission-Capable Modular, Nanosatellites
James Lyke—AFRL
A CubeSat Programme for the Demonstration of a Miniaturized Entangled Photon Source for Quantum Key Distribution
Robert Bedington—Centre for Quantum Technologies, National University of Singapore

A LEO CubeSat Mission for Mapping Spot Beams of GEO Comm-Satellites
Jacob LaSarge—Air Force Institute of Technology

PSAT—An APRS Satellite with PSK31 and North American Alert Beacon
Robert Bruninga—US Naval Academy

ALTERNATES

Conceptual Design of Ground Test-bed for CubeSat’s Manipulator
Dong-Hyun Cho—Korea Aerospace Research Institute (KARI)

Applications of EyasSat3 to Curriculum Development and Attitude Determination and Control System Research
Brian Crouse—US Air Force Academy

Deployment System for CubeSat Electric Field Instrument
Dana Turse—Composite Technology Development, Inc.

The Scanning Ionospheric Photometer for CubeSats
Chad Fish—ASTRA LLC.

Open Design—A New Approach for CubeSats
Brian Cooper—Aquila Space Inc

The New Normal: Experiments in CubeSat-Based C4ISR
Matt Bille—Booz Allen Hamilton
Truly effective small satellite missions require success across multiple systems. These systems include: launch, satellite, payload, ground network, mission operations and data analysis. Over the past few decades, satellite mission and systems developers have made critical advancements in each of these areas. These advancements have proven the utility of small satellite missions in military, civilian, and commercial endeavors.

The 29TH AIAA/USU Conference on Small Satellites will explore the current state and future possibilities within the critical systems that support mission success.
Gen. John E. Hyten is Commander, Air Force Space Command, Peterson Air Force Base, CO. General Hyten is responsible for organizing, equipping, training and maintaining mission-ready space and cyberspace forces and capabilities for North American Aerospace Defense Command, U.S. Strategic Command and other combatant commands around the world. General Hyten also oversees Air Force network operations; manages a global network of satellite command and control, communications, missile warning and space launch facilities; and is responsible for space system development and acquisition. General Hyten earned a BS in Engineering and Applied Sciences from Harvard University and an MBA from Auburn University. He is also a distinguished graduate of Squadron Officer School and Air Command and Staff College, both at Maxwell AFB, AL.
A look at some advancements, opportunities and approaches that are bringing critical pieces together for mission success

3:00 P.M. Creativity: The Critical Element for Mission Success
Luca Maresi, Alessandro Marchi—European Space Agency

3:15 P.M. Rosetta-Philae RF Link, from Separation to Hibernation
Clement Dudal, Miguel Angel Fernandez—SYRLINKS; Celine Loisel, Emmanuel Robert—CNES; Yves Richard, Gwenael Guillois—SYRLINKS

3:30 P.M. Implementing a Small Satellite Information Enterprise Using a Modular Open Architecture Approach Based on International Standards
Thomas Schwab—Lockheed Martin

3:45 P.M. CanX-4 and CanX-5 Precision Formation Flight: Mission Accomplished!
Grant Bonin, Scott Armitage, Niels Roth, Ben Risi, Robert Zee—UTIAS Space Flight Laboratory

4:00 P.M. Small Payload Launch Opportunities and Challenges
Tom Maultsby—Small Payload Rideshare Association; Aaron Rogers—The Johns Hopkins University Applied Physics Laboratory; Jason Mello—United States Air Force
CONTINENTAL BREAKFASTS & A.M. BREAKS
Start the day off with an assortment of pastries, fresh fruit, juice, coffee, and herbal tea. Each morning, continental breakfast will be available until 9:00 A.M. in the Marketplace (room 211). All A.M. breaks will be available in multiple locations in the exhibit areas.

ICE CREAM SOCIALS & P.M. BREAKS
By popular demand we are now offering two Ice Cream Social events. One on Monday afternoon, one on Wednesday afternoon. Sorbet and several flavors of famous Aggie Ice Cream are available. Tuesday will also have a P.M. break with a variety of snacks. All P.M. breaks will be available in multiple locations in the exhibit areas.
Launch systems, multi-manifest, or rideshare opportunities specifically designed to provide access to space for small satellites

4:45 P.M.  Rideshare and the Orbital Maneuvering Vehicle: the Key to Low-Cost Lagrange-point missions
Chris Pearson, Marissa Stender—Moog; Mina Cappuccio, Darin Foreman—NASA Ames Research Center; William Wilkie—NASA Langley Research Center

5:00 P.M.  DARPA Phoenix Payload Orbital Delivery System: Progress towards Small Satellite Access to GEO
Larry Gunn, Jeremy Palmer—DARPA; Joanne Leung—MDA Robotics and Automation; Al Tadros—SSL; Ken Weldy—Naval Research Laboratory; Erin Fowler—ManTech; Brook Sullivan—Sullivan Analytics and Technical Services LLC, James Eagen—KSH Systems Engineering

5:15 P.M.  Deploying 87 Satellites in One Launch: Design Trades Completed for the 2015 SHERPA Flight Hardware
Kaitlyn Kelley, Mitch Elson, Jason Andrews—Spaceflight Industries
5:30 P.M.  The Atlas V Aft Bulkhead Carrier Update—Past Missions, Upcoming Launches and Future Improvements  
Montgomery Kirk, David Callen—National Reconnaissance Office; George Budris—United Launch Alliance

5:45 P.M.  Herding Cats: Key Takeaways from Wrangling 28 Payloads on One Mission  
Jason Armstrong, Daniel Lim—TriSept Corporation

ALTERNATES

Paving the Way for Small Satellite Access to Orbit: Cyclops’ Deployment of SpinSat, the Largest Satellite Ever Deployed from the International Space Station  
Matthew Hershey, Daniel Newswander, James Smith—NASA Johnson Space Center; Craig Lamb, Perry Ballard—Department of Defense Space Test Program

Carlos Niederstrasser, Warren Frick—Orbital ATK, Inc.

Rainbow—A Launch Capability for Small Satellites from Esrange, Sweden  
Anne Ytterskog, Anna Rathsman—Swedish Space Corporation
A preview of missions scheduled to fly within the next 18 months with an emphasis on the scientific or technological purpose of the mission

8:00 AM  The NASA Optical Communication and Sensor Demonstration Program: Preflight Update
Siegfried Janson, Richard Welle, Todd Rose, Darren Rowen, David Hinkley, Brian Hardy, Stephan La Lumondiere, Geoffrey Maul—The Aerospace Corporation

8:15 AM  PICASSO: A State of the Art CubeSat
Bena Mero, Kevin Quillien, Malcom McRobb, Simone Chesi, Ross Marshall, Alasdair Gow, Craig Clark—Clyde Space; M. Anciaux—Belgian Institute for Space Aeronomy

8:30 AM  MarCO: CubeSats to Mars in 2016
Andrew Klesh, Joel Krajewski—NASA Jet Propulsion Laboratory
8:45 A.M.  The Rapid Response Radiation Survey (R3S) Mission Using the HiSat Conformal Satellite Architecture
Nathanael Miller, Ryan Norman, Hector Soto, Victor Stewart, Mark Jones, Matthew Kowalski, Adam Ben Shabat, Kerry Gough—NASA Langley Research Center

9:00 A.M.  CubeSat Based Rendezvous, Proximity Operations, and Docking in the CPOD Mission
John Bowen, Marco Villa, Austin Williams—Tyvak Nano-Satellite Systems

9:15 A.M.  Miniature X-Ray Solar Spectrometer (MinXSS)—A Science-Oriented, University 3U CubeSat
James Mason, Thomas Woods, Gregg Allison, Matthew Cirbo, Seth Folley, Andrew Jones, Rick Kohnert, Xinlin Li—Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder

9:30 A.M.  Integrated Communication Extension Capability (ICE-Cap)
Peter Yoo, Dmitriy Obukhov, Austin Mroczek—SPAWAR Systems Center Pacific

ALTERNATE

CSP Hybrid Space Computing for STP-H5/ISEM on ISS
Christopher Wilson, Jacob Stewart, Patrick Gauvin, James MacKinnon, James Coole, Jonathan Urriste, Alan George—National Science Foundation; Gary Crum—NASA Goddard Space Flight Center

WWW.SMALLSAT.ORG
10:45 A.M. Moth-Eye Anti-Reflection for Small Satellites
Hugh Podmore, Regina Lee—York University

11:00 A.M. Radiation Hardened Very Low Power ASICs for Satellite Command Control and Data Handling (C&DH) and Sensor Integration
Sasan Ardalan, Don Elkins—Micro-RDC

Benjamin Klamm—NASA Ames Research Center

11:30 A.M. Multi-spacecraft Autonomous Positioning System—LEO Demo Development
Evan Anzalone, Christopher Becker, Danielle Crump, Daniel Heater—NASA Marshall Space Flight Center

11:45 A.M. Cubesat Micropropulsion Characterization in Low Earth Orbit
Giulio Manzoni, Yesie Brama—Microspace Rapid Pte Ltd
12:00 P.M. Integrated Vehicle and Trajectory Design of Small Spacecraft with Electric Propulsion for Earth and Interplanetary Missions
Sara Spangelo—NASA Jet Propulsion Laboratory; Derek Dalle—NASA Ames Research Center; Benjamin Longmier—University of Michigan

ALTERNATE

An Ultra-Low Vibration Cryocooling Kit Based on a Miniature Rotary Compressor
Olly Dmitriev, Eugene Tabota, Ian Eurling—Vert Rotors UK; Giulio Santori—The University of Edinburgh

SMALL SAT CONFERENCE APP
Enhance your Small Sat experience by downloading our mobile guide through Guidebook! (See instructions on back cover)
A review of missions launched in the past 18 months with an emphasis on lessons learned and/or the technological advancements that significantly enhanced mission utility.

1:45 p.m. SENSE: Lessons Learned through Acquisition and On-Orbit Operations  
Lyle Abramowitz—The Aerospace Corporation; John Avrett—Space and Missile Systems Center

2:00 p.m. Smart Communication Satellite (SCS) Project Overview  
Jin Jin, Linling Kuang, Jian Yan, Xi Chen, Zuyao Ni, Xiaochuan You, Diqing Sun, Jianhua Lu—Tsinghua University

2:15 p.m. LightSail Program Status: One Down, One to Go  
Rex Ridenoure—Ecliptic Enterprises Corporation; Barbara Plante—Boreal Space; Doug Stetson—Space Science and Exploration Consulting Group; David Spencer—Georgia Institute of Technology; Justin Foley—California Polytechnic State University

2:30 p.m. An Agile Paradigm and the Prometheus CubeSat System  
Nicholas Dallmann, Jerry Delapp, Donald Enemark, Thomas Fairbanks, Clifford Fortgang, David Guenther, Stephen Judd, Gayle Kestell—Los Alamos National Lab
2:45 P.M. Initial Operation Results of a 50kg-class Deep Space Exploration Micro-Spacecraft PROCYON Ryu Funase, Takaya Inamori, Satoshi Ikari, Naoya Ozaki, Hiroyuki Koizumi—University of Tokyo; Atsushi Tomiki, Yuta Kobayashi, Yasuhiro Kawakatsu—Japanese Aerospace Agency (JAXA)

3:00 P.M. Flight System Technologies Enabling the Twin-CubeSat FIREBIRD-II Scientific Mission David Klumpar, Larry Springer, Ehson Mosleh, Keith Mashburn, Seth Berardinelli, Adam Gunderson, Matthew Handley, Nicholas Ryhajlo—Montana State University

ALTERNATE

Manfred Memorial Moon Mission (4M): Development, Operations and Results of a Privately Funded Low Cost Lunar Flyby Hubert Moser, Ghislain Ruy, Klaus Schwarzenbarth, Jean-Baptiste Frappé, Kai Baessler, Bart van Schie—LuxSpace

WE VALUE YOUR OPINION!

Help us make 2016 even better! Complete the post-conference evaluation form located in the back of this booklet and hand it in at conference headquarters for a free gift. COMPLETE IT ONLINE AND GET AN EXTRA GIFT!
Innovative technologies or full-up systems (hardware/software) for ground networks, mission operations centers, or science/data analysis centers that significantly advance mission utility

Emerging technologies or techniques for the timeless challenge of communicating with small satellites

4:00 P.M.  Automated Resource-Constrained Science Planning for the MiRaTA Mission
Andrew Kennedy, Anne Marinan, Kerri Cahoy, James Byrne, Timothy Cordeiro, Zachary Decker, Weston Marlow, Stephen Shea—Massachusetts Institute of Technology

4:15 P.M.  Software Defined Radio (SDR) for Parallel Satellite Reception in Mobile/Deployable Ground Segments
Mamatha Maheshwarappa—University of Surrey; Mark Bowyer—Airbus Defense and Space Ltd; Christopher Bridges—University of Surrey

4:30 P.M.  A Portable Autonomous Ground Station to Support a Constellation of CubeSats
John Michel, Nicholas Dallmann, Jerry Delapp, Stephen Judd, Michael Proicou, Daniel Seitz, Robert Wheat—Los Alamos National Laboratory
4:45 P.M. Creating an IP Router for Space to Ground Communications
David Rolenc—Real Time Logic

5:00 P.M. Large, Deployable S-Band Antenna for a 6U CubeSat
Peter Warren, John Steinbeck, Robert Minelli—Physical Sciences; Carl Mueller—Vencore Inc.

5:15 P.M. Rapid Slew and Settle of a Small Satellite in LEO Laser Communication
Daniel Dionne, Sungyung Lim, Laurent Duchesne, Louis Breger, Seamus Tuohy—Draper Laboratory

5:30 P.M. Ultra-Compact Ka-Band Parabolic Deployable Antenna for RADAR and Interplanetary CubeSats
Sauder Jonathan, Nacer Chahat, Mark Thomson, Richard Hodges—NASA Jet Propulsion Laboratory; Yahya Rahmat-Samii—University of California Los Angeles

5:45 P.M. Ka-Band for CubeSats
Jan King—Aquila Space, Inc.

ALTERNATES

Modular Architectures for Small Satellite Ground Systems
Gerry Simon—Kratos Defense; Matt Prechtel—Real Time Logic

A Novel, Low Power Optical Communication Instrument for Small Satellites
Paul Serra, Nathan Barnwell, John Conklin—University of Florida

Low-Cost, High-Speed Modems for Small LEO-to-Ground and LEO-to-LEO Data Links
Richard Gedney—ViaSat Inc.
Contemporary research and intellectual analysis that characterizes the growing business of small space systems with emphasis on the opportunities, trends and initiatives for the coming decade and beyond.

8:00 A.M. Smaller Satellites, Smarter Forecasts: GPS-RO Goes Mainstream
Peter Platzer, Christopher Wake, Lauren Gould—Spire Global, Inc.

8:15 A.M. Custom Optics vs Modified COTS for Small Spacecraft: The Build vs Rebuild Decision
Doug Sinclair—Sinclair Interplanetary; John Enright, Tom Dzamba—Ryerson University; Thomas Sears—Sinclair Interplanetary

8:30 A.M. Small Satellites Trending 2009–2013
Greg Richardson, Kara Schmitt, Mary Covert, Christa Rogers—The Aerospace Corporation

8:45 A.M. Operationally Responsive Space—The Way Forward
Thom Davis—Operationally Responsive Space Office
9:00 A.M.  RILDOS: A Beaconing Standard for Small Satellite Identification and Situational Awareness
Thomas Rivers—Kratos Technology and Training Solutions; John Heskett—Real Time Logic; Marco Villa—Tyvak Nano-Satellite Systems

9:15 A.M.  Rideshare Mission Assurance on Multi-Payload Missions
Andrew Read, Peter Chang—The Aerospace Corporation

Elizabeth Buchen—SpaceWorks Enterprises, Inc.

GO LOCAL!
On Wednesday evening explore Logan and beautiful Cache Valley. Register today for an organized activity at Conference Headquarters.
10:45 a.m. Drift Recovery and Station Keeping Results for the Historic CanX-4/CanX-5 Formation Flying Mission
Josh Newman—UTIAS Space Flight Laboratory

11:00 a.m. Laser Beacon Tracking for High-Accuracy Attitude Determination
Tam Nguyen—Massachusetts Institute of Technology

11:15 a.m. Design and Optimization of a Disaggregated Constellation for Space Situational Awareness
Adam Snow, Angela Den Boer, Luke Alexander—Georgia Institute of Technology

11:30 a.m. An Inverse Dynamics Satellite Attitude Determination and Control System with Autonomous Calibration
Sanny Omar—Auburn University
11:45 A.M. Orbit Determination from Two Line Element Sets of ISS-Deployed CubeSats
Kathleen Riesing—Massachusetts Institute of Technology

12:00 P.M. Enabling Dependable Data Storage for Miniaturized Satellites
Christian Fuchs—Technical University Munich

COMPETITION JUDGES

- **DoD**
  David Voss, Air Force Research Laboratory

- **NASA**
  Charles Norton, NASA Jet Propulsion Laboratory

- **Industry**
  Will Pomerantz, A.C. Charania, Virgin Galactic

- **International**
  Tom Segert, Berlin Space Technologies

- **Academia**
  Eric Swenson, Air Force Institute of Technology

- **At Large**
  Helen Lurie, BitBeam Technologies

AWARDS WILL BE PRESENTED AT 2:20 P.M. TODAY
Programs that develop engineers and/or scientists through the use of small satellite technology

1:15 P.M.  The Skybox Flight Operator Intern Program—Benefits and Lessons Learned  
Emma Lehman, Mark Longanbach—Skybox/Google

1:30 P.M.  Early Results of a Wildfire Monitoring Microsatellite UNIFORM-1  
Takashi Hiramatsu, Miki Ito, Yuta Araki—Japan Association for Satellite Technology Cooperation; Shusaku Yamaura—Keio University; Tetsuya Fukuhara—Hokkaido University; Toru Kouyama, Soushi Kato—The National Institute of Advanced Industrial Science and Technology; Yoshihiro Tsuruda—The University of Tokyo

1:45 P.M.  Initial Results of the First NSF-Funded Research Experience for Undergraduates on Small Satellite Software  
Jeremy Straub, Ronald Marsh, David Whalen—University of North Dakota

2:00 P.M.  Prox-1: Automated Proximity Operations on an ESPA Class Platform  
Kevin Okseniuk, Sean Chait, Peter Schulte, David Spencer—Georgia Institute of Technology
ALTERNATE

Alpha Centauri Exoplanet Satellite (ACESat): Orbital Design
Sasha Weston—Stinger Ghaffarian Technologies; Ruslan
Belikov—NASA; Eduardo Bendek—Bay Area Environmental
Research Institute

MARK YOUR CALENDARS!

Plan to join us for future Conferences on Small Satellites

August 5–10, 2017
August 4–9, 2018

August 6-11, 2016
Exhibit/Sponsor Registration February 2–4, 2016
Abstract deadline February 9, 2016
Innovative technologies (hardware/software) that provide significant advancements in small satellite missions

3:30 P.M. MicroSD Operational Experience and Fault-Mitigation Techniques
Joshua Lamorie, Francesco Ricci—Xiphos Systems Corporation

3:45 P.M. The Development of a Low Mass Extendible Composite Boom for Small Satellite Applications
Juan Reveles, Mike Lawton, Vincent Fraux, Vinoth Gurusamy—Oxford Space Systems LTD

4:00 P.M. Global Navigation Satellite System Based Coarse Attitude Determination on Small Satellites
Paris Ang, Niels Roth, Grant Bonin, Robert Zee—UTIAS Space Flight Laboratory

4:15 P.M. X-band CubeSat Communication System Demonstration
Serhat Altunc, Obadiah Kegege—NASA Goddard Space Flight Center; Scott Palo, Darren O’Conor—University of Colorado Boulder; Steven Bundick, Harry Shaw, Scott Schaibre, George Bussey—NASA Goddard Space Flight Center
4:30 P.M.  RadSat—Radiation Tolerant SmallSat Computer System  
Brock LaMeres, Samuel Harkness, Mathew Handley, Patrick Moholt, Connor Julien, Todd Kaiser, David Klumpar—Montana State University; Gary Crum—NASA Goddard Space Flight Center

4:45 P.M.  Progress in Reducing Vibration Levels on Naval Postgraduate School CubeSat Launcher  
Wenschel Lan, Vidur Kaushish, James Newman—Naval Postgraduate School

5:00 P.M.  Small Photon Entangling Quantum System for Space Based Quantum Experiments  
Rakhitha Chandrasekara, Zhongkan Tan, Yue Chuan Tan, Cliff Cheng, Alexander Ling—National University of Singapore
Innovative technologies (hardware/software) that provide significant advancements in small satellite missions

8:00 A.M.  LunarCube: A Deep Space 6U CubeSat with Mission Enabling Ion Propulsion Technology
            Michael Tsay, John Frongillo, Kurt Hohman—Busek Co. Inc.; Benjamin Malphrus—Morehead State University

8:15 A.M.  Impacts of Control Moment Gyroscope Gear Slack on Spacecraft Pointing Performance
            Dylan Penn—Air Force Research Laboratory; Eric Swenson—Air Force Institute of Technology

8:30 A.M.  Multiplying Mars Lander Opportunities with MarsDrop Microlanders
            Robert L. Staehle, Sara Spangelo—NASA Jet Propulsion Laboratory; Matthew Eby—The Aerospace Corporation;
            Rebecca M. E.—Williams Planetary Science Institute; Marc Lane, Kim Aaron, Rohit Bhartia, Justin Boland—NASA Jet
            Propulsion Laboratory

8:45 A.M.  The Next Generation of Space Manufacturing: Model Based and Digitally Assured
            Greg Toy—Raytheon Company
THURSDAY IS LOGO DAY
Participate by wearing your company’s logo. Enjoy the last day of the Conference by dressing casually in your company attire.

9:00 A.M.  Performance Characterization of the HYDROS™ Water Electrolysis Thruster
Karsten James, Todd Moser, Andrew Conley, Jeffrey Slostad, Robert Hoyt—Tethers Unlimited, Inc.

9:15 A.M.  Enabling High Performance Green Propulsion for SmallSats
Robert Masse, Ronald Spores, May Allen, Scott Kimbrel—Aerojet Rocketdyne; Chris McLean—Ball Aerospace and Technologies Corporation
Innovative technologies or full-up systems that allow cutting-edge missions to be formulated

10:15 A.M. Small Satellite Mission Concept to Image Earth-Like Planets Around Alpha Centauri
Eduardo Bendek, Rusl Belikov—NASA Ames Research Center; Julien Lozi—National Astronomical Observatory of Japan; Sandrine Thomas—LSST Corporation; Jared Males—Steward Observatory; Sasha Weston—NASA Ames Research Center

10:30 A.M. BNG Driver for a Miniaturized Time-of-Flight Reflectron Mass Spectrometer for Upper Atmosphere Composition Measurements
Michelle Pyle, Ryan Davidson, Charles Swenson—Utah State University Center for Space Engineering, Erik Syrstad—Space Dynamics Laboratory

10:45 A.M. Solar Occultation Constellation for Retrieving Aerosols and Trace Element Species (SOCRATES) Mission Concept
Richard Bevilacqua, Mike Fromm—Naval Research Laboratory; Scott Bailey—Virginia Tech; Chad Fish—ASTRA LLC; Larry Gordley; GATS Inc.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Authors</th>
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<tr>
<td>11:00 A.M.</td>
<td>A Constellation of Fourier Transform Spectrometer (FTS) CubeSats for Global Measurements of Three-Dimensional Winds</td>
<td>Ronald Glumb, Christopher Lietzke, Scott Luce, Peter Mantica, Anna Glumb—Harris Corporation; Martin Chamberland, Jean-Philippe Déry—Telops Inc.</td>
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<tr>
<td>11:30 A.M.</td>
<td>MiniCOR: A Miniature Coronagraph for Interplanetary CubeSat</td>
<td>Clarence Korendyke, Damien Chua—Naval Research Laboratory; Paulett Liewer—NASA Jet Propulsion Laboratory; James Cutler, James Forbes—University of Michigan; Angelos Vourlidas—The Johns Hopkins University Applied Physics Laboratory; Russell Howard, Simon Plunkett—Naval Research Laboratory</td>
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<tr>
<td>11:45 A.M.</td>
<td>Nanosats for Radar Altimetry</td>
<td>Austin Mroczek—SPAWAR Systems Center Pacific; Gregg Jacobs—Naval Research Laboratory</td>
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<td>12:00 P.M.</td>
<td>Shields-1, A SmallSat Radiation Shielding Technology Demonstration</td>
<td>Donald Thomsen—NASA Langley Research Center; Wousik Kim—NASA Jet Propulsion Laboratory; James Cutler—University of Michigan</td>
</tr>
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**ALTERNATE**

MISTiC Winds, a Micro-Satellite Constellation Approach to High Resolution Observations of the Atmosphere Using Infrared Sounding and 3D Winds Measurements

Kevin Maschhoff, John Polizotti, Jeanne Hartley—BAE Systems
Thermally Insensitive Silicon Carbide Optical Telescope Payload for High Performance Small Satellite Relevant Space Environments
Trent Newswander, Matt Felt, Jim Peterson—Space Dynamics Laboratory; Hugo Vargas—Entegris

BioSentinel: Mission Development of a Radiation Biosensor to Gauge DNA Damage and Repair Beyond Low Earth Orbit on a 6U Nanosatellite
Robert Hanel, Brian Lewis, Sharmila Bhattacharya, Antonio Ricco, Elwood Agasid, Debra Reiss-Bubenheim, Tore Straume, Macarena Parra, Vanessa Kuroda—NASA Ames Research Center

A Compact Ion Neutral Mass Spectrometer for CubeSat/SmallSat Platforms
Marcello Rodriguez, Nikolaos Paschalidis, Sarah Jones, Paulo Uribe—NASA Goddard Space Flight Center; Timothy Cameron—Adnet Systems Inc.; Giriraj Nanan—NASA Goddard Space Flight Center

Radiation Effects CubeSat Mission
Harry Shaw—NASA Goddard Space Flight Center; Michele Manuel—University of Florida; Raymond Ladbury—NASA Goddard Space Flight Center; Norman Fitz-Coy, Kelly Jordan—University of Florida; Clara Wright—NASA Kennedy Space Center; Jonathon Pellish—NASA Goddard Space Flight Center
FPGA-based GPS Receiver for Nanosatellite Applications
Thong Thai, Surabhi Guruprasad, Regina Lee, Sunil Bisnath—York University

Thinking Inside the Cube
Marco Esposito—Cosine Measurement Systems; Alessandro Marchi—European Space Agency

Development of a 2-phase Thermal Strap for Small Satellite Applications
Bruce Davis—Roccor LLC; Mike Hulse—i2cSolutions

Environmental Flight Acceptance Tests of the Small Earth Observation Satellite Flying Laptop
Michael Lengowski, Fabian Steinmetz, Nico Bucher, Kai Klemich, Mark Lutzner, Sabine Klinkner—Institute of Space Systems; Eugen Mikulz, Steffen Babben—DLR Berlin

Development of a CubeSat Centrifuge for Understanding the Origins of Asteroids and Comets
Jack Lightholder, Elizabeth Dye, Viranga Perera, Andrew Klesh—Arizona State University/NASA Jet Propulsion Laboratory, Jekan Thangavelautham, Erik Asphaug—Arizona State University

Design and Qualification of DSSP’s CubeSat Delta-V Motor
Jason Thrasher, Michael McPherson—Digital Solid State Propulsion, Inc.

HaWK (High Watts per Kilogram) Series of Solar Arrays
Ryan VanHalle—MMA Design LLC

JAMSS Small Satellite Launch Services Overview
Yoshihiko Uemura, Takuma Terada, Shigeru Imai, Nobuhiko Fukuda, Shigehiro Suzuki—Japan Manned Space Systems Corporation
The UWE-Roadmap to Pico–Satellite Formation Flying: In-Orbit Experiences
Klaus Schilling Informatik VII—University Wuerzburg

CubeSat Model-Based Systems Engineering (MBSE) Reference Model—Model Distribution and Application in the Concept Lifecycle Phase—Interim Status
David Kaslow—S.E.L.F

The Puerto Rico CubeSat a Project to Attract STEAM Students into the Area of Aerospace Engineering.
Amilcar Rincon-Charris, Rafael Salgado—Inter American University of Puerto Rico; Edwar Romero—Universidad del Turabo; Rachid Darbali, Eduardo Ortiz—University of Puerto Rico

ALSET—Japanese Air Launch System Ground Tests and Applications

The TechEdSat Series—A Platform for Rapidly Advancing Nano-Satellite Technologies and Capabilities
Marcus Murbach—NASA Ames Research Center; Periklis Papadopoulos—San Jose State University; Ali Guarneros Luna—NASA Ames Research Center
Design and Testing of a CubeSat-Sized Retroreflector Payload
David Wayne, Dmitriy Obukhov, Michael Lovern, Alex Phipps, Kevin Book, Michael Tran, Richard Bell—SPAWAR Systems Center Pacific

A Low Power Cylindrical Hall Thruster for Next Generation Microsatellites
Carl Pigeon, Nathan Orr, Benoit Larouche, Vincent Tarantini, Grant Bonin, Robert Zee—UTIAS Space Flight Laboratory

NanoSat With Magnetometer Payload to Compliment the Europa Clipper Mission: A Concept Study
Casey Steuer, Bret Bronner, Gregory Carbott, Lara Hue, Huy-Duc Trung, Erinn van Wynsberghe, James Cutler, Xianzhe Jia—University of Michigan

In-Orbit Robotic Assembly of n-U CubeSat Systems
Daniel Cellucci—Cornell University; Greenfield Trinh—NASA Ames Research Center; Benjamin Jenett—Massachusetts Institute of Technology; Kenneth Cheung—NASA Ames Research Center

Utilizing Wireless Sensor Network Technology for Intersatellite Communication
Ken Oyadomari—Stinger Ghaffarian Technologies

A Game-Changing Radio Communication Architecture for Cube/Nano-Satellites
Miguel Fernandez, Gwenael Guillois, Yves Richard—SYRLINKS; David Evans, Roger Walker—European Space Agency; Otto Koudelka, Patrick Romano—TU-Graz; K. Hansen—GomSpace ApS
CHOMPTT—the Pulsed Laser Precision Time Transfer CubeSat Mission
Nathan Barnwell, Lucas Bassett-Audain, Paul Buchman, Maria Carrasquilla, Leopoldo Caro, David Keister, Olivia Formoso, Seth Nydam—University of Florida

The Arkyd Spacecraft Development Platform
Hannah Goldberg, Chris Voorhees—Planetary Resources

A Flexible and Autonomous Communication Subsystem for Constellations of Small-Satellites
Juan Fraire, Esteban Kocian—STI

Sensor Suite and Algorithms for the CubeSat Proximity Operations Demonstration Mission (CPOD)
Nicholas Ryhajlo, Ehson Mosleh, Nathan Pust, John Bowen, Marco Villa—Tyvak-Nano-Satellite Systems

RAMS: A Miniature Ram Angle and Magnetic Field Sensor for Picosat Attitude Estimation
Andrew Nicholas, Glenn Creamer, Ted Finne, Ivan Galysh, James Armstrong—Naval Research Laboratory; Fred Herrero—Space Systems Research Corp.
Educational CubeSat Missions Using Scientific Ballooning
Brenda Dingwall—NASA; Christopher Goyne—University of Virginia; Debora Fairbrother—NASA

Brian Weeden—Secure World Foundation

AMODS: Autonomous Mobile On-orbit Diagnostic System
Edward Hanlon, Benjamin Keegan, Benjamin Bailin, Jin Kang—United States Naval Academy

Design and Validation of an Articulated Solar Panel for CubeSats
Patrick Höhn—Dwarf Planet Project

On-orbit Performance of a Miniature Propulsion System on a 70 kg Space Probe to Explore Near-Earth Asteroids
Hiroki Kawahara, Kazuya Yaginuma, Jun Asakawa, Yuichi Nakagawa—The University of Tokyo; Junichiro Nakatsuka—Japan Aerospace Exploration Agency; Satoshi Ikari, Ryu Funase, Kimiya Komurasaki—The University of Tokyo

Cryogenic Thermal Management for CryoCube-1
Phillip Putman, Alex Walker—Sierra Lobo, Inc.; Michael Harris, Geoffrey Husk—Kennedy Space Center; Mark Haberbusch—Sierra Lobo, Inc.
Open Standard IP Centric Communications Protocol for Small Satellites
Kevin Lynaugh—Vulcan Wireless Inc.

Multi-Band RF Front End for Software Defined Radio Applications
Steven Schenk, Joe Luna, Don Crockett—ViaSat Advanced Microwave Products

The Evolution of the CubeSat Program MOVE
Martin Langer, Nicolas Appel, Patrick Günzel, Johannes Gutsiedl, Florian Janke, Jonis Kiesbye, Martin Losekamm, Nikolas Perakis—Technische Universität München

CubeSat 6U to 27U OMSR Bus for Advanced NASA, DoD and Commercial Missions
Edmund Burke—Space Information Labs

Small Satellite Verification and Assessment Test Facility with Space Environments Effects Ground-Testing Capabilities
JR Dennison—Utah State University; Crystal Frazier, Erik Stomberg—Space Dynamics Laboratory; Lisa Phillipps, Alex Souvall—Utah State University; James Dyer—Space Dynamics Laboratory
Alexander Crew—Stanford University; Harlan Spence—University of New Hampshire; David Klumpar—Montana State University; Brian Larsen—Los Alamos National Laboratory; J Bernard Blake—The Aerospace Corporation; Ehson Mosleh—Montana State University; Jason Legere—University of New Hampshire; Larry Springer—Montana State University

Motor Algebra Based Small Satellites Formation Navigation
Zhiming Chen Nanjing—University of Aeronautics and Astronautics

Development of Total Orbital Real-time Attitude Control Simulator for Small Satellites
Motoki Hoshika, Takanori Toraya, Yuta Suzaki, Takayuki Hosoka, Masato Sambe, Shinji Nishikori, Ogawa, Masayuki Katayama—Mitsubishi Precision Co., Ltd.

Development of a Power Efficient, Restartable, “Green” Propellant Thruster for Small Spacecraft and Satellites
Stephen Whitmore, Stephen Merkley, Zachary Spurrier, Sean Walker—Utah State University

Radiation Hardened ARM Microcontroller Module
Wesley Morris—Silicon Space Technology; Craig Kief, Brian Zufelt—COSMIAC Research Center; Scott Peterson, Donald Amundson, Rex Lowther—Silicon Space Technology

Low-Cost Reliable Onboard Computer for Small Satellites
Stanislav Podshivalov, Timofey Kondranin, Sergey Negodyaev—Moscow Institute of Physics and Technology