IEEE

AESS

2017 IEEE Aerospace Conference

Yellowstone Conference Center
Big Sky, Montana
March 4– 11, 2017

CALL for PAPERS

Technical Cosponsors

AIAA   phmsociety

THE CONFERENCE

The international IEEE Aerospace Conference, with AIAA and PHM Society as technical cosponsors, is organized to promote interdisciplinary understanding of aerospace systems, their underlying science and technology, and their application to government and commercial endeavors. The annual, week-long conference, set in a stimulating and thought-provoking environment, is designed for aerospace experts, academics, military personnel, and industry leaders. The 2017 conference is the 38th in the conference series.

WHO SHOULD ATTEND?

This is a conference for **Participants.** Consider attending if you have a professional interest in aerospace engineering or science and wish to:
- Present results and insights from your own work
- Interact with colleagues who present papers in your field
- Engage with people and ideas across a broad spectrum of aerospace technologies
- Understand how your organization might participate in next year's conference.

WHAT SETS THIS CONFERENCE APART

High-Quality Papers and Presentations. Each year, a large number of presentations are given by professionals distinguished in their fields and by high-ranking members of the government.

Science and Aerospace Frontiers. The plenary sessions feature internationally prominent researchers working on frontiers of science and engineering that may significantly impact the world. Registrants are briefed on cutting-edge technologies emerging from and intersecting with their disciplines.

Multidisciplinary Focus. This is the only general IEEE conference designed to facilitate cross-fertilization of aerospace disciplines and dialogue among members of government, industry, and the academic community.

Exceptional Networking Opportunities. The conference provides extraordinary opportunities for discussions and collaborative dialogue with aerospace pacesetters. Professional exchanges benefit the participants, their organizational sponsors, industry, and the engineering and scientific professions.

Author Development. The conference provides unusually thorough and supportive paper reviews, relying on expert guidance from senior engineers and scientists and an opportunity for instructive interaction between author and reviewers.

Conference Proceedings. An electronic copy of the 4,000+ page Conference Proceedings is included in the registration package.

International Participation. Representatives of 30 countries participated in the 2016 conference.

Sequestered Venue. The Yellowstone Conference Center and lodging nestle closely together in the small village of Big Sky, fostering communications and ensuring easy access to all events.

What Attendees Say: Simply the Best!

- No conference packs so much into one week.

- Never have I encountered such a concentrated and collaborative environment at a conference. Really great organization and lovely environment.

- A wonderful interdisciplinary experience!

- The technical stature of this conference makes it one of the best places to present your ideas and receive competent comments.

- Allows me to interact with people in ways that are simply not possible otherwise. The benefit to my work has been tremendous.

- For my company, the networking and high profile of the conference are second to none!

- A fantastic conference that fosters collaboration at the same time it encourages participants to strengthen their personal and family relations. Amazing achievement!

- I've made invaluable connections every year.

- The best conference I have ever taken a part in.

- I really enjoyed the collaborative and supportive atmosphere. The exchange of ideas that resulted was something that I have not seen in any other conference that I have attended.

- The Plenary talks and networking options at this conference are superior to all other conferences I attend.

TECHNICAL PROGRAM

This Call invites papers reporting original work or state-of-the-art reviews that will enhance knowledge of:
- Aerospace systems, science and technology
- Applications of aerospace systems and technology to military, civilian or commercial endeavors
- Systems engineering and management science in the aerospace industry
- Government policy that directs or drives aerospace programs, systems and technologies.

Specific topics planned for the 2017 Conference are listed in the **Tracks, Sessions and Organizers** section, pages 7–30.

NETWORKING PROGRAM

The Networking Program provides opportunities for engaging with other conference professionals beyond the technical sessions. Networking events include:
- Saturday arrival icebreaker reception
- Buffet dinners at four evening meetings
- Pre-dinner receptions
- Midweek mountainside lunch
- Networking "Java Jams" prior to afternoon sessions
- Post-session fireside ice cream socials
- Friday evening farewell dinner

The costs for these are covered in the registration and guest activity fees.

An extensive activity program is available for guests. Recreation options can be found on the conference website.

Front Cover – *The Juno mission is the second spacecraft designed under NASA's New Frontiers Program. Juno will improve our understanding of the solar system's beginnings by revealing the origin and evolution of Jupiter. As of May 6, 2016, Juno is approximately 450 million miles (724 million kilometers) from Earth. The one-way radio signal travel time between Earth and Juno is currently about 40 minutes. Juno will arrive at Jupiter on July 4, 2016, at 8:35 p.m. PDT (Earth Received Time). Juno's onboard color camera, called JunoCam, invites the public to serve as a virtual imaging team. The public can vote and comment on where to point JunoCam and which features to image on Jupiter. NASA Image.*

ABSTRACT SUBMISSION

A 500-word abstract is due by **July 1, 2016** at the conference website www.aeroconf.org.

Abstracts will be accepted ONLY through the conference website. Accept/reject notices will be emailed promptly. Author instructions are on the website.

Note: The IEEE Aerospace Conference is designed as a venue for engineers and scientists to present and discuss their work. **Please submit only if you expect to attend the conference yourself to personally present your paper. (See IEEE Policies on Presentation and Reuse below.)**

PAPER SUBMISSION

Properly formatted papers of 6-20 pages must be submitted for review no later than **Friday, October 21, 2016**, a **firm** deadline! Each paper must be in final publishable format and submitted via the conference website as a PDF file. Use our format template to type your paper and see useful links: http://www.aeroconf.org/paper-submission. **Revised** papers responsive to reviewer comments must be submitted to the website by **Monday, January 9, 2017**. This is a **firm** deadline!

Questions regarding the review process may be directed to:

James Hoffman, Paper Review Chair
PaperReviewChair@aeroconf.org
818-354-4384

IEEE Copyright forms (see link on your "My Submissions" page) must be signed and submitted by **Tuesday, January 24, 2017.**

Submitted papers are considered for the conference **Best Paper Award**, which is selected prior to the conference on the basis of technical innovation and quality of the written paper.

(See www.aeroconf.org for criteria.)

IEEE POLICIES
ON PRESENTATION AND REUSE

Publication of Conference Papers in the *IEEE Xplore* Digital Library

IEEE policy on publication of papers accepted for IEEE conferences states that "IEEE reserves the right to exclude a paper from distribution after the conference (e.g., removal from *IEEE Xplore*), if the paper is not presented at the conference."

IEEE Xplore is the association's digital library of nearly 3 million full-text documents. IEEE journals and conference proceedings are among the world's most highly cited technical publications.

Reuse of Conference Papers in Journal Publications

IEEE policy recognizes and encourages the evolutionary publication process from conference presentation to scholarly publication. Guidelines for author reuse of their presented papers and other intellectual property rights can be found at:

http://www.ieee.org/publications_standards/publications/rights/index.html

A list of IEEE journals can be found at:

ieee.org/publications_standards/publications/periodicals/journals_magazines.html

REGISTRATION

The conference registration fee includes:
- Access to all technical sessions
- Electronic copy of Conference Proceedings
- Electronic copy of Conference Digest and Schedule
- Recreation activities discount
- Networking/Social Program
  - Saturday night icebreaker reception
  - Five catered dinner buffets
  - Mid-week mountainside lunch
  - Four pre-dinner socials
  - Four post-session ice cream socials
  - Hot beverages before morning and afternoon sessions

REGISTRATION FEES (US$) Including Activities & Meals Package	Received by Dec 1, 2016	Received after Dec 1, 2016	Received after Jan 25, 2017
IEEE & AIAA Members	800	960	1,170
Non-Members	1,025	1,250	1,440
Guests* and Jr. Engineers (Activities & Meals)	240	260	280

*Spouse/partner/child of primary registrant

For Travel and Lodging, see page 4.

FOR MORE INFORMATION

VISIT OUR WEB SITE: aeroconf.org for updates, paper submittal instructions, and the latest information on the 2017 Conference.

CONFERENCE-RELATED QUESTIONS

Chair
Erik Nilsen   818-354-4441   Chair@aeroconf.org

TECHNICAL PROGRAM QUESTIONS

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REGISTRATION QUESTIONS

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PAPER REVIEW QUESTIONS

Paper Review Chair
James Hoffman   818-354-4384 PaperReviewChair@aeroconf.org

GENERAL HELP
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TRAVEL AND LODGING

Special travel rates are available from major cities through the conference travel agent.

Special lodging rates near the Yellowstone Conference Center are also available through the conference travel agent. Book early for best choice.

LODGING RATES (US$)**

Per person for 7 nights, 2 persons/bedroom

Unit and Occupancy				Rate
Huntley Lodge*	First Class	2 queen beds	2	**896**
Huntley Lodge*	Deluxe/View	2 queen beds	2	**931**
Huntley Lodge*	Loft	2 queen beds + loft queen	2	**1067**
Summit Hotel*	Hotel Room	2 queen beds	2	**1082**
Summit Hotel*	Studio	Murphy, kitchen, fireplace	2	**945**
Summit Hotel*	One Bedroom	1 queen, sleeper sofa, kitchen, 2 baths	4	**1084**
Shoshone Condominiums*	One Bedroom Suite	1 queen, 1 murphy, sleeper sofa, kitchen, fireplace, 2 baths	2	**1418**
Village Center*	Studio	1 queen murphy, sleeper sofa, kitchen, fireplace, 1 bath	2	**945**
Village Center*	One Bedroom	1 queen, sleeper sofa, kitchen, fireplace, 2 baths	4	**1084**
Stillwater Condominiums	One Bedroom	1 bedroom, 1 bath	2	**966**
Stillwater Condominiums	One Bedroom	1 bedroom, loft, 2 baths	4	**728**
Stillwater Condominiums	Two Bedrooms	2 bedrooms, 2 baths	4	**749**
Big Horn Condominiums	Three Bedrooms	3 bedrooms, 3 baths	6	**730**
Powder Ridge Condominiums	Three Bedrooms	3 bedrooms, 2 baths, kitchen, fireplace	8	**623**
Powder Ridge Condominiums	Four Bedrooms	4 bedrooms, 3 baths, kitchen, fireplace	8	**718**
Powder Ridge Condominiums	Five Bedrooms	5 bedrooms, 4 baths, kitchen, fireplace	8	**884**

*Includes full breakfast buffet (Huntley Lodge, Summit Hotel, Village Center and Shoshone Condominiums only).
**Does NOT include taxes and service fees (17% total) or $8 baggage handling gratuity.

ARRANGE REGISTRATION, TRAVEL AND LODGING AT www.aeroconf.org AFTER OCTOBER 1, 2016

One person for 7 nights, private lodging

Unit and Occupancy				Rate
Huntley Lodge*	First Class	2 queen beds	1	**1547**
Huntley Lodge*	Deluxe/View	2 queen beds	1	**1617**
Huntley Lodge*	Loft	2 queens + loft queen	1	**1890**
Village Center*	Studio	1 queen murphy, sleeper sofa, kitchen, fireplace 1 bath,	1	**1645**
Summit Hotel*	Hotel Room	2 queen beds	1	**1918**
Summit Hotel*	Studio	Murphy, kitchen, fireplace	1	**1645**

*Includes full breakfast buffet (Huntley Lodge, Summit Hotel, Village Center and Shoshone Condominiums only).
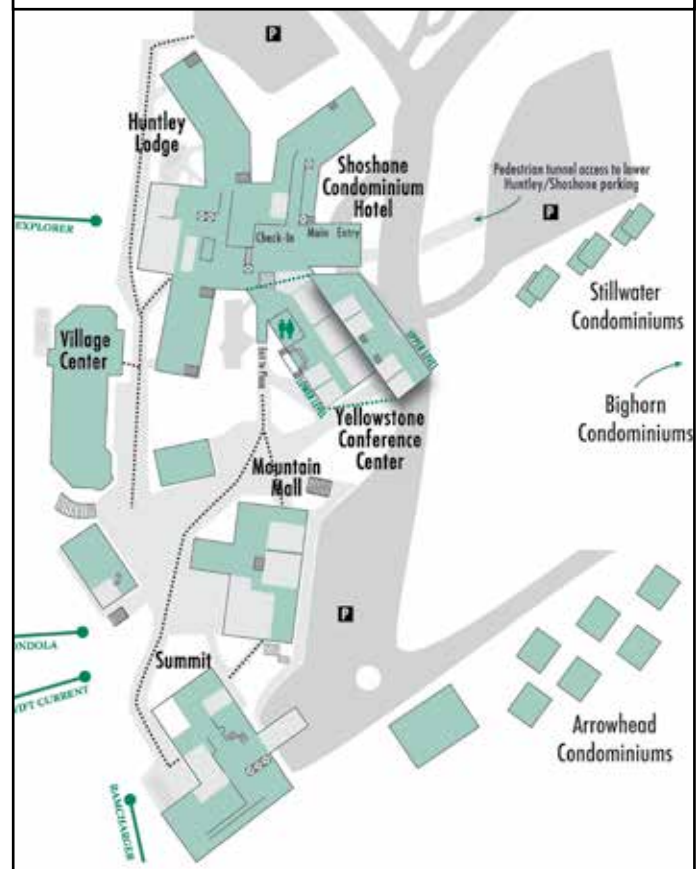**Does NOT include taxes and service fees (17% total) or $8 baggage handling gratuity.

YELLOWSTONE CONFERENCE CENTER AND LODGING

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SCHEDULE OVERVIEW

6 Days of Presentations, Over 175 Hours of Technical Sessions, and 20 Hours of Conference-Sponsored Technical Networking Events

Registration and Icebreaker Wine & Cheese Reception Saturday March 4, 6:30–9:00 PM					
Sunday March 5	**Monday March 6**	**Tuesday March 7**	**Wednesday March 8**	**Thursday March 9**	**Friday March 10**
Continued Registration 8:45–11:30 AM	Technical Sessions 8:30 AM–Noon	Technical Sessions 8:30 AM–Noon	Technical Sessions 8:30 AM–Noon	Technical Sessions 8:30 AM–Noon	Technical Sessions 8:30 AM–Noon
Continued Registration 3:30–6:45 PM	Lunch Break Noon–1:00 PM	Catered Lunch Noon–1:30 PM	Lunch Break Noon–1:00 PM	Lunch Break Noon–1:00 PM	Lunch Break Noon–1:00 PM
	Panels 1:00–4:00 PM	Jr Engineering & Science Conference 1–4:00 PM	Panels 1:00–4:00 PM	Panels 1:00–4:00 PM	Ad Hoc Individual Track Planning Meetings
Java Jam 4:00–4:30 PM	Java Jam 4:00–4:30 PM	Ad Hoc Session Workshops (see announcement board for time and location)	Java Jam 4:00–4:30 PM	Java Jam 4:00–4:30 PM	Track/Session Organizers Planning Session for 2016 Conference 4:00–5:30 PM
Technical Sessions 4:30–5:45 PM	Technical Sessions 4:30–5:45 PM		Technical Sessions 4:30–5:45 PM	Technical Sessions 4:30–5:45 PM	
Plenary Session 5:50–6:35 PM	Plenary Session 5:50–6:35 PM		Plenary Session 5:50–6:35 PM	Plenary Session 5:50–6:35 PM	
Hosted Reception 6:35–7:05 PM	Hosted Reception 6:35–7:05 PM	Free Evening in Big Sky Village	Hosted Reception 6:35–7:05 PM	Hosted Reception 6:35–7:05 PM	Farewell Networking Catered Reception & Dinner 6:30–11:00 PM (Buffet open 6:30–8:30 PM)
Catered Dinner 7:05–8:05 PM	Catered Dinner 7:05–8:05 PM		Catered Dinner 7:05–8:05 PM	Catered Dinner 7:05–8:05 PM	
Plenary Session 8:05–8.50 PM	Plenary Session 8:05–8.50 PM		Plenary Session 8:05–8.50 PM	Plenary Session 8:05–8.50 PM	
Technical Sessions 9:00–10:15 PM	Technical Sessions 9:00–10:15 PM		Technical Sessions 9:00–10:15 PM	Technical Sessions 9.00–10:15 PM	
Après Session Fireside Cheer and Chat 10:15–11:00 PM	Après Session Fireside Cheer and Chat 10:15–11:00 PM		Après Session Fireside Cheer and Chat 10:15–11:00 PM	Après Session Fireside Cheer and Chat 10:15–11:00 PM	
All dinners and networking activities are intended to promote, enhance, and facilitate technical discussions and long-term professional and personal relationships.					

Tracks, Sessions & Organizers

Track 1 — Science and Aerospace Frontiers (Plenary Sessions)

David Woerner 818-393-2000 david.f.woerner@jpl.nasa.gov

Currently a manager for the Radioisotope Power System Program at NASA and the Nuclear Space Power Office at JPL. Previously manager of Launch Services and Multi-Mission Radioisotope Thermoelectric Generator for the Mars Science Laboratory mission. Was Chief Engineer of avionics, Mars Pathfinder mission. Worked on many deep space missions including Galileo, Cassini, and Magellan. Recipient of NASA's Exceptional Service and Exceptional Achievement Medals. Chair of the Board of Directors, of the IEEE Aerospace Conferences (IAC). IAC Conference Chair 1997, 2002-04, & 2006-13.

Track 2 — Space Missions, Systems and Architectures

Marina Ruggieri +39-067-259-7451 ruggieri@uniroma2.it

Full Professor of Telecommunications Engineering at the University of Roma "Tor Vergata" and therein member of the Board of Directors. IEEE 2016 Vice President-Elect, Technical Activities. Past Director of IEEE Division IX (2014-2015). IEEE Fellow. Author/co-author of 330 papers, 1 patent and 12 books.

Peter Kahn 818-354-3314 peter.b.kahn@jpl.nasa.gov

Manager of the Project Systems Engineering and Formulation Section at the Jet Propulsion Laboratory. Over 25 years systems engineering experience in space flight projects.

Steven Scott 301-286-2529 steven.s.scott@nasa.gov

NASA Goddard Space Flight Center Chief Engineer. 25 years experience in Systems Engineering, including management of Flight Systems, Software Systems, Flight and Ground Software, Fault Management, Avionics, Spacecraft Engineering, Flight Instruments, Operations, Integration and Testing, Mission Assurance. AIAA Associate Fellow and IEEE Senior Members.

Session 2.01 — Deep Space, Earth and Discovery Missions

Addresses status and results of missions in formulation, implementation, and operation. Session objective is to provide a full mission prospective and discuss the system level tradeoffs, challenges and lessons learned. From operational missions, results are discussed along with the in-flight challenges. Session addresses all types of missions from Earth orbiting to planetary to heliophysics to astrophysics missions.

James Graf 818-354-4765 818-625-7804 james.e.graf@jpl.nasa.gov
Deputy Director, Earth Science and Technology Directorate, Jet Propulsion Laboratory

Nick Chrissotimos 301-286-8212 301-775-4353 nicholas.g.chrissotimos@nasa.gov
Associate Director of Flight Projects Code 460, NASA - Goddard Space Flight Center

Session 2.02 — Future Space and Earth Science Missions

Concepts for future space or Earth science programs or missions, from early formulation through Phase B.

Robert Gershman 818-354-5113 714-488-3164 robert.gershman@jpl.nasa.gov
Principal Engineer, Jet Propulsion Laboratory

Patricia Beauchamp 818-354-0529 818-645-2479 patricia.m.beauchamp@jpl.nasa.gov
Program Technical Manager, Strategic Missions and Advanced Concepts, Jet Propulsion Laboratory

Michael Amato 301-286-3914 michael.amato@nasa.gov
Systems Engineer, NASA GSFC

Session 2.03 — System and Technologies for Landing on Planets, the Moon, Earth and Small Bodies

This session includes landing spacecraft, including precision and safe landing, atmospheric entry, descent, and landing/rendezvousing with small bodies.

Ian Clark 818-359-4965 818-359-4965 ian.g.clark@jpl.nasa.gov
Systems Engineer, Jet Propulsion Laboratory

| Session 2.04 | **Access to Space and Emerging Mission Capabilities** |

The high cost of launch continues to be a roadblock to space missions large and small. The development of adapters (ESPA, PPOD, e.g.), the acceptance of risk for accommodating secondary or auxiliary payloads, and the explosion of cubesat and smallsat capability have led to some creative approaches to space missions. This session is meant to showcase how our space colleagues are leveraging these emerging capabilities.

Eleni Sims   505-846-8147 505-440-1132   sam.sims@aero.org

Project Engineer, Aerospace Corporation

David Callen   571-594-3331 571-594-3331   dcallen@scitor.com

Launch Integration Manager, Scitor Corp

| Session 2.05 | **Robotic Mobility and Sample Acquisition Systems** |

Use of robotic systems for in situ space exploration involving robotic mobility, manipulation, and sampling. All aspects of these robotic systems, including design, development, implementation, and operation are valued topics of presentation. Research prototypes as well as fielded or flown systems are of interest.

Richard Volpe   818-354-6328   volpe@jpl.nasa.gov

Section Manager, Jet Propulsion Laboratory

| Session 2.06 | **Future Missions & Enabling Technologies for In Situ Exploration, Sample Returns** |

Future mission concepts, planetary protection technologies, sample handling techniques, novel technologies for in situ exploration, technologies not covered under robotic mobility and sample acquisition, human precursor mission concepts, and technologies that enable precursor missions.

Patricia Beauchamp   818-354-0529 818-645-2479   patricia.m.beauchamp@jpl.nasa.gov

Program Technical Manager, Strategic Missions and Advanced Concepts, Jet Propulsion Laboratory

Ying Lin   818-393-6381   ying.lin@jpl.nasa.gov

Manager, Planetary Instrument Concept Program Office, Jet Propulsion Laboratory

| Session 2.07 | **In Situ Instruments for Landed Surface Exploration, Orbiters and Flybys** |

Instruments for surface and subsurface chemistry and geology (elemental, isotopic, molecular, mineralogical composition), geophysics (tectonics, internal structure, heat flow, geochronology), atmospheric chemistry and dynamics, dust and particles, charged particle/plasma, and magnetometers.

Stephanie Getty   301-614-5442   stephanie.a.getty@nasa.gov

Research Planetary Scientist, NASA - Goddard Space Flight Center

Ricardo Arevalo   301-614-6914   ricardo.d.arevalo@nasa.gov

Research Space Scientist, NASA - Goddard Space Flight Center

Xiang Li   301-614-6016   xiang.li@nasa.gov

Assistant Research Scientist, University of Maryland, Baltimore County

| Session 2.08 | **Q/V band connectivity and Alphasat experience** |

Future High Throughput Satellite (HTS) systems, able to support terabit/s connectivity, will require a very large bandwidth availability; this pushes towards the exploitation of the so-called "beyond Ka-band" systems. This session focuses on the proposed and on-going Q/V band and beyond satellite missions, both of scientific and commercial nature. Enabling system architecture and technologies are included as well, i.e. smart gateway architectures, propagation impairment mitigation techniques, high power generation systems, etc.

Giuseppe Codispoti   +39-339-135-9676 +39-339-135-9676   giuseppe.codispoti@asi.it

QV Band Telecommunications Program Manager, ASI, Italian Space Agency

Giorgia Parca   +39-06-856-7620   giorgia.parca@est.asi.it

Research Fellow, Italian Space Agency

| Session 2.09 | **Mission Design for Spacecraft Formations** |

Topics include all aspects (like configuration analysis, orbital dynamics and control, operational issues) of the missions exploited by two or more spacecraft flying in formation, either about the Earth or other celestial bodies.

Giovanni Palmerini   +39-064-991-9760 +39-366-675-0164   giovanni.palmerini@uniroma1.it

Professor, Guidance and Navigation, Sapienza Universita' di Roma

| Session 2.10 | **Radiation and Plasma Environments and Their Interaction with Space Systems** |

The mitigation of adverse effects from radiation on humans and electronics in space is a critical step in mission success. This session focuses on research in understanding the nature of the radiation field in space and how that field is changed as it passes through shielding materials, electronics, and the human body. Topics include radiation measurements made in space, fragment measurements and materials studies conducted at accelerator facilities on ground, radiation transport modeling, improvements of nuclear reaction models and radiation transport codes, shielding of electronics and humans, and benchmarking of measurements performed both in space and on ground for the verification and validation of the transport codes.

Lembit Sihver   +43-66-460-588-3345 +46-66-460-588-3345   lembit.sihver@tuwien.ac.at

Professor Dr, Technische Universität Wien

| Session 2.11 | **Space Debris and Dust: The Environment, Risks, and Mitigation Concepts and Practices** |

Operational satellites are at risk from collisions with the more than 20,000 trackable debris objects that remain in orbit today, as well as hundreds of thousands of objects, including micrometeoroids, that are too small to be cataloged. Beyond the realm of Earth-oriented orbits, unique and immensely valuable science-gathering spacecraft can also be exposed to similar hypervelocity collisional risks, but from cometary and asteroidal micro-milliscale particles (dust). Papers are invited that address the space debris population and growth projections; debris and dust characteristics; impact modeling and materials testing; modeling and simulation and/or test results that can lead to quantification of the risks to spacecraft in various orbits and exploration missions; and mitigation strategies including debris removal or repositioning, spacecraft shielding, orbit selection, and spacecraft operations. Papers documenting past mission anomalies traced to space debris, and mitigation strategies employed today, are also of critical interest.

Kaushik Iyer   240-228-8936   iyerka1@jhuapl.edu

Materials Physicist, Johns Hopkins University/Applied Physics Laboratory

Douglas Mehoke   443-778-5104 240-475-8289   doug.mehoke@jhuapl.edu

SEM Group Supervisor of the Mechanical Systems Group, Johns Hopkins University Applied Physics Laboratory (JHU/APL)

| Session 2.12 | **Asteroid Detection, Characterization, Sample-Return, and Deflection** |

This Session invites papers on flight and ground system concepts, mission concepts, and technologies that address the need to detect and mitigate asteroids posing impact hazards for Earth and for asteroid retrieval missions. Papers on instrument technologies and technologies for proximity operations near, and landing on, asteroids are also sought.

Mark Boslough   505-845-8851   mbeb@unm.edu

Technical Staff, Sandia National Laboratories

Jeffery Webster   818-653-8360 818-653-8360   jeff.webster@aeroconf.org

Project Support Specialist, Jet Propulsion Laboratory

Paul Chodas   818-354-7795   paul.chodas@jpl.nasa.gov

Senior scientist, Jet Propulsion Laboratory

| Session 2.13 | **Orbital Robotics: On-Orbit Servicing and Active Debris Removal** |

On-going and future missions involving orbital robotic systems. Orbital robotic systems operations, to include On-Orbit Servicing, Active Debris Removal, Assembly, and Astronaut Assistance. All designs and methods to accomplish robotic tasks in orbit, as for example mobility, manipulation, assembly or maintenance, are of interest. Specific aspects may be addressed, such as hardware design, open-loop or closed-loop control, computer vision, autonomy, tele-operation, experimental facilities on ground, or others of relevance.

Roberto Lampariello   +49-815-328-2441 +49-173-592-7833   roberto.lampariello@dlr.de

Research scientist, German Aerospace Center - DLR

David Sternberg   610-420-6425 610-420-6425   davister@mit.edu

Doctoral Candidate, Massachusetts Institute of Technology

Track 3 — Antennas, RF/Microwave Systems, and Propagation

Farzin Manshadi   818-354-0068
farzin.manshadi@jpl.nasa.gov

Leads spacecraft frequency selection, radio frequency interference analysis, frequency coordination, and long term spectrum planning activities. Previously, JPL supervisor of design & development of the microwave antennas at the NASA Deep Space Network. PhD, EE UCLA.

James Hoffman   818-354-4384
james.p.hoffman@jpl.nasa.gov

Senior Engineer in JPL's Radar Science and Engineering Section and has worked in microwave instrument design for remote sensing applications for more than 10 years. Currently the RF System Lead for the NI-SAR radar mission (NASA-ISRO) and the InSight Landing Radar.

| Session 3.01 | **Phased Array Antenna Systems and Beamforming Technologies** |

Included are active power combining, thermal management, phasing networks, integration, power, test and evaluation and beamsteering, algorithm development and associated hardware implementations, and modeling and simulation for all levels of phased array development and beamsteering.

Janice Booth   256-876-1426 256-337-8838   janice.c.booth2.civ@mail.mil

Electronics Engineer, AMRDEC Weapons Development and Integration Directorate

Glenn Hopkins   404-395-7371   glenn.hopkins@gtri.gatech.edu

Senior Research Engineer, Georgia Tech Research Institute

Session 3.02	**Ground and Space Antenna Technologies and Systems**

Papers on all aspects of antenna systems for ground, ground to/from space and space communications, including reflector antennas and feeds, arrays, and transmit/receive subsytems.

Vahraz Jamnejad   818-354-2674 818-468-9422   **vahraz.jamnejad@jpl.nasa.gov**
Principal Technologist, Jet Propulsion Laboratory

Farzin Manshadi   818-354-0068 818-486-4312   **farzin.manshadi@jpl.nasa.gov**
JPL Spectrum Manager, Jet Propulsion Laboratory

Session 3.03	**RF/Microwave Systems**

Papers about RF and microwave systems or components, passive and active, including radar systems.

James Hoffman   818-354-4384 626-298-0783   **james.p.hoffman@jpl.nasa.gov**
Senior Research Engineer, Jet Propulsion Laboratory

Session 3.04	**Radio Astronomy and Radio Science**

Papers on the techniques, hardware and systems, and results in the fields of Radio Astronomy and Radio Science.

Mark Bentum   +31-53-489-2108 +31-68-193-2260   **m.j.bentum@utwente.nl**
Associated professor, University of Twente

Melissa Soriano   818-393-7632   **webguru@aeroconf.org**
Senior Engineer, Jet Propulsion Laboratory

Session 3.05	**Miniaturized RF/Microwave Technologies Enabling Small Satellite and UAV Systems**

Papers in all fields that advance the state-of-art in the miniaturization of RF and microwave technologies. These include device technologies such as RF ASICs, MMICs, and system-on-chip; packaging technologies such as flexible electronics, 3D microwave integration, and hybrid techniques; instruments and systems for small satellites, and UAVs.

Dimitris Anagnostou   605-394-2913   **danagn@ieee.org**
Professor, South Dakota School of Mines and Technology

Track 4	**Communication & Navigation Systems & Technologies**

Phil Dafesh   310-336-8733
philip.a.dafesh@aero.org

Directs development and application of GPS, wireless, and software-defined-radio technology at Aerospace Corporation. 48 publications, 5 patents and 2 patents pending MS & PhD, EE, UCLA. BS, Physics & EE, Cal Poly Pomona.

Shirley Tseng   714-832-5373
shirleytseng@earthlink.net

Consults on design and implementation of large-scale, high-performance satellite and terrestrial high performance networks. Previously: satellite design, development, test; satellite operations & ground station design, GE.

Session 4.01	**Evolving Space Communication Architectures**

A forum in which to trace, examine and predict trends in the architectures of space communications and navigation. Innovative concepts and game changing approaches with a system view are especially sought.

Shervin Shambayati   650-852-7322   **shervin.shambayati@sslmda.com**
Senior Systems Engineering Specialist, SSL

Session 4.02	**Communication Protocols and Services for Space Networks**

The focus is communication protocols and services supporting space systems, including ground- and space-based methods to increase efficiency, enable new exploration/applications, provide more secure systems, and improve Quality of Service. Techniques include relay communications, routing, delay/disruption tolerant networking, retransmission approaches, adaptive link/network/transport methods, demand access, and advanced scheduling. Novel space network architectures are of key interest, including microspacecraft swarms, sensor webs, and surface networks. Implementation and evolution of communications networking into space systems, as well as application to specific missions, are sought.

Loren Clare   818-354-1650 818-237-0621   **loren.p.clare@jpl.nasa.gov**
Supervisor, Communications Networks Group, Jet Propulsion Laboratory

Steven Berson   310-336-3474   **steven.berson@aero.org**
Engineering Specialist, Aerospace Corporation

Session 4.03	**Navigation and Communication Systems for Exploration**

Systems, technology, and operations for navigation and/or communication among elements involved in civil, commercial, or national security missions in any orbital domain (Earth and interplanetary). The session is focused on new operational concepts, science discoveries or performance improvements to accomplish space missions.

Patrick Stadter   240-228-4658   patrick.stadter@jhuapl.edu

Principal Professional Staff, Johns Hopkins University/Applied Physics Laboratory

David Copeland   240-228-8390   david.copeland@jhuapl.edu

Senior Professional Staff II, Johns Hopkins University/Applied Physics Laboratory

Session 4.04	**Relay Communications for Space Exploration**

For a wide range of space exploration scenarios, multi-hop relay communications can provide significant benefits in terms of increased data return and reduced user burden (mass, power, cost) over conventional space-to-ground links. In this session we examine relay communications for both Earth-orbiting missions and missions throughout the solar system. Topics of interest include relay system architecture, relay spacecraft design (for both dedicated relay orbiters and for hybrid science/telecom spacecraft), relay telecommunications payload design, relay communication protocols, mission applications and operational experiences/lessons-learned.

Charles Edwards   818-354-4408 818-687-8623   chad.edwards@jpl.nasa.gov

Mgr, Mars Relay Network/Chief Technologist, Mars Exploration Directorate , Jet Propulsion Laboratory

David Israel   301-286-5294   dave.israel@nasa.gov

Exploration and Space Communications Projects Division Architect , NASA - Goddard Space Flight Center

Session 4.05	**Space Communication Systems Roundtable : Networking the Solar System**

The roundtable will provide a forward-looking view of the development of a Solar System Internetwork - a layered architecture aimed at offering ubiquitous, high-bandwidth communication throughout the solar system in support of robotic and, ultimately, human exploration in deep space. Panelists will assess trends in physical layer capabilities, including migration to higher RF frequencies (Ka-band) and/or to optical wavelengths, as well as higher layers in the protocol stack, including networking protocols such as DTN, suited for use in long light-time applications. Based on assessment of forecasted commercial satcom trends, and building on the multi-hop relay capabilities operating today at Earth and at Mars, the roundtable will describe the evolution towards a true Solar System Internetwork in the coming decades.

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Mgr, Mars Relay Network/Chief Technologist, Mars Exploration Directorate , Jet Propulsion Laboratory

Session 4.06	**Innovative Space Communications and Tracking Techniques**

This session solicits innovative contributions to improve flight and ground communication and tracking systems such as antenna arrays, software-defined radios, advance receivers, deployable antennas, relay satellites, Ka and Optical communications, novel signal formats, new coding methods, and CubeSat communications and tracking techniques.

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Technical Group Supervisor, Jet Propulsion Laboratory

Alessandra Babuscia   617-800-5219 617-800-5219   alessandra.babuscia@jpl.nasa.gov

Telecommunication Engineer, NASA Jet Propulsion Laboratory

Session 4.07	**Navigation technology in wearables**

Papers in this session are sought on topics related to different aspects of navigation technology used by wearables including, but not limited to,   Indoor positioning, GNSS based positioning, Hybrid positioning, Inertial sensors, and Navigation for Sports, Healthcare, or Safety.

Amir Emadzadeh   310-845-6016 310-845-6016   amire@ucla.edu

Senior Staff Engineer, QuickLogic

Session 4.08	**Communication System Analysis & Simulation**

This session solicits innovative contributions on modeling, analysis, and/or simulation of satellite, aerospace, or terrestrial communication systems. Topics include modeling and design of network services and systems, communication waveforms and modulation, integration of terrestrial and satellite networks, deep space communication systems, terrestrial and deep space relay communication networks, communication protocols for satellite communication, traffic modeling, traffic engineering and analysis, network measurements, network optimization and resource provisioning, next generation internet, overlay and virtual networks, autonomic communication systems, cross-layer & cross-system protocol design, and communication network monitoring.

Yogi Krikorian   310-336-1793 818-795-5923   yogi.y.krikorian@aero.org

Senior Engineering Specialist, Aerospace Corporation

James Hant   310-336-1388   james.j.hant@aero.org

Director, Modeling and Simulation Department, Aerospace Corporation

| Session 4.09 | **Wideband Communications Systems** |

This session solicits innovative contributions about wideband communication systems in terrestrial, satellite, and hybrid Space-terrestrial communications systems transmitting information at high data rates. Papers dealing with modeling and simulations of communications systems, evaluating performance, or describing hardware/software implementation of communication system components are welcome. Detailed topics include, but are not limited to: Broadband satellite and aerospace transmission; Broadband terrestrial wireless transmission; Millimeter wave communications; Spread-spectrum and CDMA communications; TV and HDTV broadcasting over satellite; Modulation and channel coding techniques; MIMO techniques; Antenna design; Multi-carrier communications; Multi-user transmission; Channel equalization; Carrier and timing synchronization; Radio resource management and scheduling; Emerging technologies for safety-critical and emergency communications; Emerging standards for terrestrial and satellite communications (LTE, LTE-A, WiMax, DVB-S2, IEEE 802.11x); Energy-efficient terrestrial and satellite communications; and networking.

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Engineer, Self

Claudio Sacchi +39-046-128-3907 +39-335-600-6431 +39-349-574-9500 sacchi@disi.unitn.it
Assistant professor, University of Trento

| Session 4.10 | **Communications and/or Related Systems: Theory, Simulation, and Signal Processing** |

This session solicits innovative contributions on theory, modeling and simulation, and signal processing foundations of satellite, aerospace and terrestrial wireless communications.

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Engineer, Self

Rajendra Kumar 562-985-1556 714-670-7453 rajendra.kumar@csulb.edu
Professor, California State University

| Session 4.11 | **Global Navigation Satellite Systems** |

This session focuses on recent advances in satellite navigation. Current and future envisioned applications of GPS, GLONASS, Galileo, and Compass global navigation satellite systems are addressed, as well as global, regional and local augmentation systems. Topics covered include receiver technology, interoperability, orbit computation, multi-sensor fusion, and navigation model, methods and algorithms.

Gabriele Giorgi +49-892-892-3473 gabriele.giorgi@tum.de
Lecturer, Technische Universität München

| Session 4.12 | **Software Defined Radio and Cognitive Radio Systems and Technology** |

This section presents papers on software and cognitive radio in general, and their application to space communications in particular. Both original and space-centric tutorial papers are welcome.

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Engineering Specialist, Aerospace Corporation

Genshe Chen 301-515-7261 240-481-5397 gchen@intfusiontech.com
CTO, Intelligent Fusion Technology, Inc

| Session 4.13 | **CNS Systems and Airborne Networks for Manned and Unmanned Aircraft** |

This session focuses on communications, navigation and surveillance systems, including on-board or ground-based systems for the complete range of vehicles operating in the National Airspace System (NAS): manned and unmanned vehicles, fixed wing and rotorcraft, general aviation, civil transport and military that may carry passengers, cargo or are performing surveillance-type missions. Topics range from concept development, simulation and modeling, technology development and verification, through flight testing and certification. Emerging fields include surface wireless networks, ADS-B, Datacomm, airborne network security, UAS integration, satellite-based CNS, and international activities.

Denise Ponchak 216-433-3465 denise.s.ponchak@nasa.gov
Branch Chief, NASA Glenn Research Center

| Session 4.14 | **Aviation Cyber Security and Cyber-Physical Systems** |

Wireless communications, data networks, information systems, and cyber security are significant emerging topics in aerospace, including aviation. Systems that integrate with the cyberspace and enable safe, efficient and/or profitable operation and performance, with minimal or no human intervention, are of growing interest to the community. This session focuses on related timely topics including, but not limited to, security, privacy, and safety issues/developments in the following areas: aerospace software, data and multimedia distribution; next-generation air traffic control systems; IVHM; aeronautical networks; commercial wireless networks; information flows; UAVs and commercial space vehicles; airport and airline information systems; cloud computing; RFID systems; large-scale enterprise systems; aircraft certification; incident response strategies; and risk assessment and management.

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Professor, University of Washington

Krishna Sampigethaya 206-890-8516 sampiger@erau.edu
Assistant Professor, Embry-Riddle Aeronautical University

| Session 4.15 | **Space Information Systems Security** |

This session welcomes novel concepts and technologies on information and communications security tailored to space systems. Its scope includes efficient hardware and software implementations of symmetric and asymmetric cryptographic primitives (e.g., encryption, authentication, integrity checking, key agreement and distribution), post-quantum cryptographic primitives and schemes, key management mechanisms tailored for the space segment, communications physical layer security, spread spectrum and anti-jamming techniques, secure spacecraft recovery, protocols for delay-tolerant networks, security evaluation and assurance, standardization efforts, space environment effects on cryptographic processing, attacks against space systems and associated countermeasures, and security and reliability issues in communications.

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Senior Security Researcher, Intel Corporation

Ignacio Aguilar Sanchez   +31-71-565-5695   **ignacio.aguilar.sanchez@esa.int**

Communications System Engineer, ESTEC/ESA

| Session 4.16 | **Civil and National Security Space Panel: Joint NASA/DoD Technology Initiatives** |

This panel will focus on the intersection of technology between NASA and the DoD. In the current constrained budgetary climate, there is increased emphasis on sharing technology between governmental agencies, including communications, navigation, launch services, hosted payloads, small sats, etc. Come join us to hear the latest technology areas where this collaboration is currently being demonstrated.

Steven Arnold   240-463-4351 240-463-4351   **steven.arnold@jhuapl.edu**

Deputy Business Area Executive, Johns Hopkins University/Applied Physics Laboratory

| Track 5 | **Observation Systems and Technologies** |

Gene Serabyn   818-393-5243
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Senior Research Scientist at JPL developing high-contrast coronagraphic and interferometric techniques for direct exoplanet imaging.

Ifan Payne   575-835-6808
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Dr. Ifan Payne is currently the Program Director of the Magdalena Ridge Observatory (MRO) which is located at the New Mexico Institute of Mining and Technology (NMT) at Socorro, New Mexico. He obtained his Ph.D. in Architectural Science from the University of London.

| Session 5.01 | **Space Based Optical Systems and Instruments** |

This session covers all aspects of design, assembly, alignment and testing of optical systems and instruments for applications including astronomy, energy, defense and remote observation. Topics range through design and engineering to integration, alignment, test and control of space-based large optical systems.

Ryan Mc Clelland   240-366-7776 240-366-7776   **rmccle@gmail.com**

Senior Mechanical Systems Engineer, SGT, Inc.

| Session 5.02 | **Ground Based Telescopes, Instruments and Technologies** |

This session covers the design, build, assembly, integration, test, and operation of ground based optical telescopes and telescope arrays. Papers discussing new and proposed telescopes, optical instruments and systems and techniques such as adaptive optics are welcome, together with results and future plans.

Stefan Martin   818-354-5861 818-726-4103   **stefan.r.martin@jpl.nasa.gov**

Optical Engineer, Jet Propulsion Laboratory

Mark Sirota   626-236-7256 626-236-7256   **msirota@tmt.org**

TMT Controls Group Lead, Thirty Meter Telescope Project

| Session 5.03 | **Exoplanet Instruments, Missions and Observations** |

Future missions such as TESS, JWST and WFIRST, as well as potential missions such as Exo-C, HabEx and LUVOIR promise to revolutionize exoplanet science, and astrophysics in general. All such missions involve new technological approaches that provide access to new regions of observational parameter space. This session focuses on the new technologies, and the missions and observations thereby enabled.

Gene Serabyn   818-393-5243 818-640-7485   **gene.serabyn@jpl.nasa.gov**

Senior Research Scientist, Jet Propulsion Laboratory

Session 5.04 — Atmospheric Turbulence: Propagation, Phenomenology, Measurement, Mitigation

This session deals with all aspects of wave propagation through atmospheric turbulence. Topics of interest to this session are adaptive optics systems, deformable/fast-steering mirror modeling and control algorithms, wave front sensing, laser beacon systems and modeling, scintillation, anisoplanatism, atmospheric turbulence characterization and modeling, deconvolution/imaging algorithms, partially-coherent light, and scattering.

Milo Hyde   937-255-3636 575-442-1358   **milo.hyde@afit.edu**
Assistant Professor, Air Force Institute of Technology

Session 5.05 — Image Processing

A forum on the theory and practice of image restoration and analysis. Potential topics include image registration, feature detection and estimation, image denoising, multimodal image fusion, and hardware/software architectures for image storage and processing.

Martha Bancroft   503-537-9155 503-703-4056   **marti@dragonsden.com**
Owner, MBC

Matthew Sambora   937-469-8135   **samboraimageprocessing@gmail.com**
Principal System Engineer, Integrity Applications Incorporated

Session 5.06 — Optical Detection and Analysis for Space Situational Awareness (SSA)

This session focuses on systems, data products, and processes related to the optical detection, characterization, and tracking of near-Earth man-made space objects. Possible topical areas include: small automated optical systems for the tracking of man-made objects and space debris, methods for characterizing and analyzing unresolved objects, multi-site and multi-operator cooperative data fusion and analysis, and operational image processing capabilities that contribute to SSA. The aim of this session is to provide a forum for discussion and collaboration between satellite owners/operators and providers of SSA data.

Jeremy Bos   906-370-4180 906-370-4180   **jpbos@mtu.edu**
Assistant Professor, Michigan Technological University

Michael Werth   949-232-4113   **mikewerth1@gmail.com**
Physicist/System Engineer, Boeing Company

Session 5.07 — Photonics and Lasers

Papers on active (including LEDs, lasers, and photodetectors) and passive (such as optical waveguides and fiber) optical components, integration of photonic components with Si electronics and optoelectronic subsystems that have applications in aerospace are solicited.

David Peters   505-845-9244 505-379-5730   **dwpeter@sandia.gov**
Principal Member of Technical Staff, Sandia National Laboratories

Aleksandr Sergeyev   906-487-2258   **avsergue@mtu.edu**
Associate Professor, Michigan Technological University

Track 6 — Remote Sensing

Jordan Evans   818-354-1358
jordan.p.evans@jpl.nasa.gov

Manager of the Mechanical Systems Division of JPL. Previously the Mars Science Laboratory - Deputy Flight System Manager. Development experience with space projects at both NASA Goddard and JPL, including FUSE, WFC3, GLAST, LISA, and MSL along with numerous architecture studies.

Darin Dunham   804-519-5480
darin@vectraxx.com

Darin Dunham is a Systems Engineer Principal with Lockheed Martin. Served almost 10 years in the Marine Corps ending career at the Marine Corps Systems Command. He received his Master of Science in Electrical Engineering from the Naval Postgraduate School and his Bachelors of Science in Electrical Engineering from Carnegie Mellon.

Session 6.01 — End to End Remote Sensing: Approaches and Challenges

This session encompasses engineering approaches and challenges of remote sensing investigations, emphasizing end-to-end aspects including onboard instrument, host platform, telecom link, ground algorithms and analysis. End-to-End can also mean the synthesis of multiple investigations that contribute to answering a specific scientific question or measuring a specific value. These can be investigations in an intentionally designed campaign or a posteriori syntheses of existing data sets, for deep-space, earth-orbiting, or airborne missions.

Todd Bayer   818-354-5810 818-470-7078   **todd.j.bayer@jpl.nasa.gov**
Principal Systems Engineer, NASA Jet Propulsion Lab

Karen Kirby   240-228-1833   **karen.kirby@jhuapl.edu**
Spacecraft System Engineer, JHU-APL

Session 6.02	**Instrument and Sensor Architecture and Design**

This session covers topics related to the physical or functional architecture and design of instruments/sensors. Topics include hardware/software trade studies, fault protection approaches, unique or innovative system interfaces, accommodation of payloads within a system, and approaches to the processes involved in engineering an instrument or sensor.

Matthew Horner   626-502-8741 626-502-8741   **mhorner@jpl.nasa.gov**

Engineer, JPL

Keith Rosette   818-354-0660 626-898-1742   **keith.a.rosette@jpl.nasa.gov**

Product Delivery Manager, Jet Propulsion Laboratory

Session 6.03	**Imaging Spectrometer Systems, Science, and Science Applications**

This session covers subject matter related to the design, build, assembly, integration, test, and operation, of imaging spectrometer instruments and also the processing and interpretation of data acquired with them. Proposed instruments, science, science applications, contextual information, and lessons learned for all phases are included.

Michael Mercury   818-354-4217   **michael.b.mercury@jpl.nasa.gov**

Systems Engineer, Jet Propulsion Laboratory

Session 6.04	**Advances in Radar Signal Processing**

This session covers the theory, algorithms, and hardware implementation of radar signal processing. Topics of interest include target and interference models, filtering, waveform design, Doppler processing, threshold detection and CFAR, synthetic aperture imaging, space-time adaptive array processing, multiple-input multiple-output systems, and compressive sensing.

Larry Smith   912-536-7283 912-536-7283   **donnie.smith@gatech.edu**

Engineer, Google

Thomas Backes   404-483-5236 404-483-5236   **tdbackes@gmail.com**

Engineer, Thomas D. Backes

Session 6.05	**Information Fusion**

This session focuses on exploitation of all sources of information, including physical sensor data, context information, and human inputs. Methodologies for effective multi-sensor multi-target tracking of highly disparate sources are of interest, as are algorithms and advances in downstream analysis of track data for situational awareness.

Stefano Coraluppi   412-432-8931   **stefano.coraluppi@ieee.org**

Senior Member of Technical Staff, Systems & Technology Research

Craig Agate   805-869-1076 805-908-2094   **cagate@toyon.com**

Senior Staff Analyst, Toyon Research Corporation

Session 6.06	**Multisensor Fusion**

Papers that address all aspects of information fusion for the integration of multiple sensors are sought. Of particular interest are the theoretical aspects of some popular questions like, When is sensor fusion better than a single sensor? or, How does one ensure that sensor fusion produces better results? Algorithms that address one of the many challenges in multisensor/multitarget tracking or multisensor resource management are also sought.

William Blair   404-407-7934 770-316-1291   **dale.blair@gtri.gatech.edu**

Principal Research Engineer, Georgia Tech Research Institute

Laura Bateman   240-228-6849   **laura.bateman@jhuapl.edu**

System Engineer, Johns Hopkins University/Applied Physics Laboratory

Session 6.07	**Applications of Target Tracking**

Tracking of targets, both cooperative and uncooperative, moving under water, on water, on land, in air or in space, with sonar, radar or electro-optical sensors. Fusion of data from multiple sensors. Algorithms for handling target maneuvers and data association. Estimation of sensor properties (biases, noise variances).

Yaakov Bar Shalom   860-486-4823   **ybs@engr.uconn.edu**

Board of Trustees Distinguished Prof. and Marianne Klewin Endowed Prof., University of Connecticut

John Glass   731-445-0471 731-445-0471   **john.glass@gtri.gatech.edu**

Research Engineer I, Georgia Tech Research Institute

Session 6.08	**Guidance, Navigation and Control**

The target of this section is collecting the most recent works of research and development regarding guidance, navigation and control (GNC) in order to provide an exhaustive (as much as possible) picture of the state of art and a likely key to the reading of today's new challenges. With this section we intended to give emphasis both to the more interesting theoretical aspects of the matter and to engineering problems of great practical importance, so a wide spectrum of arguments is welcomed.

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Terry Ogle   404-407-6942   **terry.ogle@gtri.gatech.edu**

Sr. Research Engineer, Georgia Tech Research Institute

Track 7 — Spacecraft Avionics Systems, Subsystems, & Technologies

John Samson   727-539-2449
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45+ years experience in onboard processing for space and airborne applications. More than 50 publications in the area of onboard processing systems and architectures. Senior Member IEEE, Associate Fellow AIAA.

Harald Schone   818-393-1736
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JPL EEE Parts Program Office Manager. 30 years experience in Radiation Effects and Collisional Atomic Physics R & D. At AF Research Labs directed and executed 60M/yr Space Electronics Program. PhD, atomic physics, University of Heidelberg.

John Dickinson   210-522-5826   john.dickinson@swri.edu

Principal Engineer, Southwest Research Institute. Experience in spacecraft and payload systems engineering and avionics design and test on Kepler, WISE, JUNO, IBEX, RBSP, MMS, SPP, Solar Orbiter, CYGNSS, and several DOD projects. BSEE, Johns Hopkins University; MSEE, Georgia Institute of Technology.

Session 7.01 — High Performance Space Processing and Spacecraft High-Speed Interconnect Architectures and Standards

Innovations and new developments in onboard processing hardware architectures including combinations of single and multi-core processssors, bridge, network and data handling ASICs, companion processing ASICs and FPGAs, attached memories, power distribution, system on a chip implementations, network connections and network architectures for spacecraft. Also interested in processing and network performance, size, weight and power comparisons of different components and architectures and standardized form factors and interfaces utilized. Appropriate descriptions of radiation hardness by design, process or technology and mitigation of other spacecraft environmental factors should be addressed for any elements described as well as software support and integration and test of elements as applicable. Standards being developed for spacecraft procssing and/or high speed interconnects for next generation usage are especially sought. Description of actual development, test, flight or mission usage adds perspective, needs and accomplishments.

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Principal System Engineer, Honeywell

Joseph Marshall   571-364-7799 571-762-3815   joe.marshall@baesystems.com
Senior Principal Systems Engineer 2, BAE Systems

Session 7.02 — Onboard Signal, Data, Command Processing and Data Handling Technologies

This session welcomes novel concepts and technologies tailored to onboard signal, data and command processing. Its scope includes software and hardware implementations (e.g. special purpose processors, FPGAs, ASICs), as well as hardware/software approaches for telecommand reception, decoding and distribution, payload data pre-processing (e.g. feature extraction, filters, pattern recognition, Gbit on copper data handling), dedicated accelerators for data processing, transmission and storage (e.g. compression, encoding, parallel processing for payloads(GIPs, GFLOPs), etc). Fault-tolerance mechanisms, autonomous operations, reconfigurable approaches and failsafe strategies that can be applied to the aforementioned topics are also welcome.

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Patrick Phelan   210-522-6330   pphelan@swri.org
Senior Research Engineer, Southwest Research Institute

Session 7.03 — Multi- and Many-Core Computing in Space: Hardware and Software

This session will explore topics unique to using multi and many core computing in space, including emerging hardware, software tools and techniques, legacy application migration, use cases and lessons learned from early adopters. Papers covering both homogeneous and heterogeneous multi/many core architectures and heterogeneous systems containing multi/many core components are welcome.

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Owner, MBC

Stephen Crago   703-812-3729   crago@isi.edu
Director, Computational Systems and Technology; Research Assistant Professor, EE, University of Southern California

Session 7.04	**Memory and Data Storage Technologies for Space and Missile Applications**

This session's charter is to advance, discuss and present both the latest and emerging device technologies, packaging techniques, error handling, architectures and reliability enhancement for memory and data storage technologies for space and misslie applications.

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Assurance Technology Program Manager, Jet Propulsion Laboratory

Matthew Marinella   505-844-7848   **mmarine@sandia.gov**
Principal Member of the Technical Staff, Sandia National Laboratories

Session 7.05	**High Performance Reconfigurable and Evolutionary Computing Platforms**

This session focuses on emerging and novel designs and tests for high performance embedded computing platforms that have the ability to perform on-orbit reconfiguration in response to dynamic and/or emergent mission requirements. Examples of focus areas include, but not limited to, on-orbit reconfiguration, temporal and spatial reuse of systems' resources, reconfiguration to support fault tolerance, applying machine learning techniques for predicting and evaluating system performances, embedded cluster computing, architectures to support on-board big data analytics, power aware optimal reconfiguration algorithms, Reconfigurable Software Implemented Hardware Fault Tolerance (RSIHFT) algorithms and designs, evolutionary platforms and autonomous computing designs.

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Mark Post   +44-141-574-5274   **mark.post@strath.ac.uk**
Lecturer, University of Strathclyde

Session 7.06	**Mixed Signal and System-on-a-Chip Technologies**

Innovative mixed signal and systems-on-a-chip (SOC) technologies are sought. Specifically, miniaturized mixed signal circuits and systems for space applications with radiation hardened, low power implementations; sensor, detector and imager readout circuits, high resolution/ high speed ADCs and DACs; high throughput digital processing architectures (ASIC, FPGA or SOC); and embeddable systems that can serve as the C&DH system for traditional or very small spacecraft; novel SOC designs for mass limited aerospace / space applications, including ASIC, FPGA, 3D, stacked die, and multi-chip stacked package implementations; resource efficient (mass/ volume) miniaturized multi-channel/ parallel systems; circuit designs for analog and digital processing functions; and designs for integrated communications systems applications on a chip.

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Mark Post   +44-141-574-5274   **mark.post@strath.ac.uk**
Lecturer, University of Strathclyde

Session 7.07	**Avionics for Small Satellites, Nano-Satellites, and CubeSats**

A survey of newly designed and heritage avionics subsystems for application in smaller spacecraft. Relevant topics include attitude determination and control, telemetry systems, command and data handling, power systems, thermal systems, and guidance and navigation systems, all scoped for small satellites (<50kg). Participants include fundamental research organizations, such as universities and national laboratories, as well as system providers, such as defense departments, and industry partners.

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Principal System Engineer, Honeywell

James Lumpp   859-257-3895   **jel@uky.edu**
Professor, University of Kentucky

Session 7.08	**Power Electronics for Space Applications**

Advanced power electronics devices, circuits and systems for space applications, including power devices, electronics, electro-magnetic devices and components such as photo-voltaic modules and power systems. Particular technical aspects include extreme thermal and power requirements, efficiency and power management, and reliability.

Peter Wilson   +44-122-538-6828   **prw30@bath.ac.uk**
Professor, University of Bath

Christopher Iannello   321-861-3276 407-252-8448   **chris.iannello@nasa.gov**
NASA Technical Fellow for Electrical Power, NASA - NESC

| Session 7.09 | **Electronics for Extreme Environments** |

This session is interested in innovations in electronics technologies (semiconductor devices, circuit concepts, packaging, reliability, and performance characterization) that can enable operation of electronics in the extreme environments of the planets in our solar systems, such as operating temperatures as low as -240C in permanently shadowed regions of the moon, -180C on Icy bodies and Titan's surface, and -125C on Mars. Technologies capable of supporting operation at combination of low temperature and high radiation can facilitate missions to Europa. The session also covers low temperature electronics packaging technologies capable of withstanding large thermal cycles (e.g., Martian surface night/day temperature cycles between -125C and 20C). For Venus surface missions (480C) the session is interested in high temperature electronics and electronics packaging technologies.

Mohammad Mojarradi   818-354-0997 818-642-9176   **mohammad.m.mojarradi@jpl.nasa.gov**
Supervisor, Advanced Instrument Electronics, Jet Propulsion Laboratory

Christopher Iannello   321-861-3276 407-252-8448   **chris.iannello@nasa.gov**
NASA Technical Fellow for Electrical Power, NASA - NESC

| Session 7.10 | **Advanced Packaging for Space** |

Materials and techniques for assembling and testing microelectronics for spacecraft applications including component packaging, attachment, connectors, thermal/mechanical/electrical/radiation performance comparisons and failure analysis. Papers may address a specific sub-assembly such as solar cell arrays, sensors, instrumentation, power, communications, or navigation; adaptation of manufacturing methods for space applications; or integration of diverse modules such as MEMS, power electronics, sensors, optics, RF and microprocessors. Of particular interest this year is the state-of-the-art in 3D electronics packaging and its readiness to be used in space, i.e., can today's 3D technology withstand the launch vibration environment, the potential extremes of temperature cycling, etc. for space applications; What, if anything, is being done to ensure that 3D packaging can be used in space?

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Chief Systems Engineer, Sierra Nevada Corp.

Sung Lim   404-894-0373   **limsk@ece.gatech.edu**
Dan Fielder Professor, Georgia Institute of Technology

| Session 7.11 | **Fault Tolerance, Autonomy, and Evolvability in Spacecraft and Instrument Avionics** |

Adaptation, including Fault Tolerance, Autonomy, and Evolvability, reflects the capability of a system to maintain or improve its performance in the presence of internal or external changes, such as faults and degradations, uncertainties and variations during fabrication, modifications in the operational environment, or incidental interference. This session addresses all aspects of adaptivity for spacecraft and instrument avionics with the scope of papers encompassing theoretical considerations, design solutions, and actual techniques applied to space flight operations.

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Principal, Member Technical Staff, Jet Propulsion Laboratory

Tom Hoffman   818-354-6521 818-648-7204   **thoffman@jpl.nasa.gov**
Project Manager, Jet Propulsion Laboratory

| Session 7.12 | **Spacecraft Guidance, Navigation, and Control Technologies** |

Topics of the session include both theory and implementation issues related to the guidance, navigation and control of satellites, probes and launchers.

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Professor, Guidance and Navigation, Sapienza Universita' di Roma

John Enright   416-979-5000 x 4174   **jenright@ryerson.ca**
Associate Professor, Ryerson University

| Session 7.13 | **Emerging Technologies for Space Applications** |

This session is a forum for presenting a wide range of advanced avionics and electronic device technologies for space, including topics such as advanced MEMS devices, 3D circuit printing, innovative embedded electronics applications (including multi-functional components), as well as the leveraging of advanced commercial electronics for space application. This session also serves as a catch-all for advanced electronic technology topics that do not fit cleanly into other sessions, or are multi-disciplinary in nature.

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Chief Systems Engineer, Sierra Nevada Corp.

Jennifer Alvarez   210-522-6091   **jennifer.alvarez@swri.org**
Senior Program Manager, Southwest Research Institute

| Session 7.14 | **COTS for Reliable Space Systems** |

Using commercial electronics not intended for an application in a space environment is becoming increasingly common. This Panel will discuss various ongoing risk reduction efforts at various centers around the world.

Harald Schone   818-393-1736 818-653-9738   **harald.schone@jpl.nasa.gov**
Chief Technologist, Jet Propulsion Laboratory

| **Session 7.15** | **Innovative Solutions for Tough EMC Problems on Spacecraft** |

All too commonly in aerospace EMC is misunderstood or misaddressed. More often than not late in the process EMC problems arise that must be corrected before the system can be released by engineering. Unfortunately, this happens all too frequently when little schedule remains, most of the budget has been spent on overruns, and the mass budget is still over limit. Many EMC engineers find themselves faced with this sort of situation, who then need to quickly examine the systems and the problems and come up with a solid "fix" that preserves what little resources remain. This session will look at some examples of this sort of quandary and the solutions that were ultimately incorporated into successful designs.

Robert Scully   281-483-1499   bob.scully@ieee.org

Lead EMC Engineer, NASA - Johnson Space Center

| **Track 8** | **Spacecraft & Launch Vehicle Systems & Technologies** |

Robert Gershman   818-354-5113
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Principal Engineer, JPL Systems Engineering and Formulation Division. Previously at JPL: Assistant Program Manager, Exploration Systems Engineering Office; Planetary Advanced Missions Manager; Deputy Manager, Galileo Science and Mission Design Office; Supervisor, Mission Engineering Group.

Bret Drake   281-283-6440
bret.g.drake@aero.org

30+ years of systems engineering and spaceflight architecture mission design experience, both within NASA and industry. In his 26 years with NASA, Mr. Drake helped lead the Agency in the design and analysis of human exploration mission approaches beyond low-Earth Orbit including missions to the Moon, Near-Earth Objects, and Mars.

| **Session 8.01** | **Human Exploration Beyond Low Earth Orbit** |

This session seeks papers addressing the broader aspects of human exploration including planning, development, system concepts, and execution of missions beyond low Earth orbit. Sample topics include systems architecture studies of human missions to the Moon, Asteroids, and Mars, design reference mission analyses, strategic concepts, and broader trade study and systems engineering analyses for any aspect of human space exploration systems beyond low-Earth orbit. New approaches and unique applications of systems concepts are sought.

Bret Drake   281-283-6440   bret.g.drake@aero.org

Space Systems Architecture Engineer, The Aerospace Corporation

Kevin Post   832-738-7275   kevin.e.post@boeing.com

Engineer, The Boeing Company

John Guidi   202-358-1644   john.guidi@nasa.gov

Deputy Director, Advanced Exploration Systems, HEOMD, NASA

| **Session 8.02** | **Human Exploration Systems Technology Development** |

This session seeks papers dealing with technology development for human exploration of space. This can include development efforts with technology readiness levels anywhere from laboratory to full-scale flight demos. It can also include assessments of technology needs of programs, program elements, or individual mission concepts.

Robert Gershman   818-354-5113 714-488-3164   robert.gershman@jpl.nasa.gov

Principal Engineer, Jet Propulsion Laboratory

Stephen Gaddis   757-864-4196 256-655-2564   stephen.w.gaddis@nasa.gov

Program Director, NASA - Langley Research Center

| **Session 8.03** | **Advanced Launch Vehicle Systems and Technologies** |

This session seeks papers covering on-going development and future advances in space transportation from Earth to orbit and distant destinations. Topics including transportation architectures, launch vehicles, infrastructure, transportation business and enabling technologies are of interest.

Bernard Kutter   303-269-5538 720-352-1372   bernard.f.kutter@ulalaunch.com

Manager Advanced Programs, United Launch Alliance

Jon Holladay   256-544-7250   jon.holladay@nasa.gov

Engineering Project Manager, NASA

| **Session 8.04** | **Hosted Payloads** |

This session seeks papers regarding commercial companies working with the government to share spacecraft resources for independent hosted payloads. Topics range from spacecraft interfaces, thermal, power, telemetry, communications to mission assurance, program management, costing models and lessons learned for hosted payload programs.

Doug Holker   310-336-2232 310-336-2232   douglas.holker.ctr@us.af.mil

Associate Principal Director, Developmental and Project Planning, Aerospace Corporation

Session 8.05	## Human Factors & Performance

This session seeks papers on human performance, integration, and operations within complex spacecraft systems. Suggested human factors topics may include cockpit and flight deck displays and controls, handling qualities and flight performance, human-robotic interaction and performance, team performance and dynamics, training, countermeasures technologies/systems, and behavioral health and performance during short- and long-duration spaceflight. Papers including operations to experimental and modeling approaches, both in the laboratory and in spaceflight analog locations are of interest.

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Group Lead, Human Systems Integration, The Charles Stark Draper Laboratory, Inc.

Jessica Marquez   650-604-6364   jessica.j.marquez@nasa.gov
Human System Engineer, NASA Ames Research Center

Session 8.06	## Space Human Physiology and Countermeasures

This session focuses on the physiological aspects of humans in space and current or future countermeasures to maximize human health and performance in the space environment. Suggested topics include (but are not limited to) bone loss, muscle atrophy, psychological effects, sensory-motor deconditioning, extravehicular activity, cardiovascular adaptation, VIIP syndrome, decompression sickness, radiation, exercise, or artificial gravity. Physiological and psychological aspects of missions at Space Analogue sites are also of interest. Both experimental and modeling approaches are welcome.

Ana Diaz Artiles   617-909-0644 617-909-0644   ad877@cornell.edu
Lecturer & Research Associate, Cornell University

Laurence Young   617-253-7759 617-803-3107   lry@mit.edu
Apollo Program Professor of Astronautics, Professo, Massachusetts Institute of Technology

Andrew Abercromby   281-770-0046   andrew.abercromby-1@nasa.gov
Lead, EVA Physiology Laboratory, NASA Johnson Space Center

Session 8.07	## Mechanical Systems, Design and Technologies

This session seeks papers on spacecraft configurations, structures, mechanical and thermal systems, devices, and technologies for space flight systems and in situ exploration. Papers addressing mechanical systems design, ground testing, and flight validation are also encouraged.

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President, Murphian Consulting LLC

Alexander Eremenko   818-354-1070   alexander.e.eremenko@jpl.nasa.gov
Engineer, Jet Propulsion Laboratory

Session 8.08	## Spacecraft Propulsion and Power Systems

This session seeks papers on the development and infusion of in-space propulsion and power technologies for future NASA science missions and other Earth orbiting applications. The session's primary focus is on robotic satellite applications and is not intended for human spaceflight topics.

John Brophy   818-354-0446 818-731-4346   john.r.brophy@jpl.nasa.gov
Principal Engineer, Jet Propulsion Laboratory

Carolyn Mercer   216-433-3411   cmercer@nasa.gov
Project Manager, NASA Glenn Research Center

Session 8.09	## Nuclear Space Power Generation

The Nuclear Space Power Generation session invites papers on all things nuclear and related to space power: concepts for dynamic power systems and static generators at all scales, fuel processing, reactors for manned and unmanned space missions, lessons learned, plans for future devices, models and simulations, test results, government policies, nuclear launch safety, infrastructure, and technologies on any scale that address the future success of space missions.

David Woerner   818-393-2000 626-497-8451   david.f.woerner@jpl.nasa.gov
Project Manager, Jet Propulsion Laboratory

June Zakrajsek   216-977-7470   june.f.zakrajsek@nasa.gov
NASA RPS Program Planning and Assessment Manager, NASA - Glenn Research Center

Session 8.10	## Autonomy and Perception for Aerospace Applications

This session covers theoretical developments and applications of autonomy and perception technologies across a wide range of aerospace systems. Topics include autonomous guidance, navigation, and control (GNC) solutions for spacecraft proximity operations and docking, planetary landing and mobility, and orbital search and scan operations, and incorporation of autonomy into vehicle avionics and planning systems. Also of interest are papers addressing real-time perception using data-rich sensors, such as cameras or lidar, including aerospace applications of computer vision. System level concepts and results from demonstrations and field tests are also encouraged.

Steve Paschall   857-928-6611   spaschall@alum.mit.edu
Technical Director, Autonomous Systems, Charles Stark Draper Laboratory

Ted Steiner   617-258-4165 651-212-0178   tsteiner@draper.com
Senior Member of the Technical Staff, Charles Stark Draper Laboratory

Session 8.11	**Systems and Technologies for CubeSat/Smallsats**

This session seeks papers covering technologies and systems for very small spacecraft (secondary platforms such as CubeSat, ESPA and ASAP-class) that enable "big" science and demonstration missions on a small budget. Papers that evaluate flight or testing results are strongly encouraged.

Michael Swartwout　　　　314-977-8214　　　　　　　　　　mswartwo@slu.edu

Assistant Professor, Saint Louis University

Kyle Kemble　　　　505-853-2545　　　　　　　　　　kyle.kemble.2@us.af.mil

Small Satellite Portfolio Mission Manager, Air Force Research Laboratory

Session 8.12	**Technologies for Exploration of the Outer Planets Using Small Spacecraft**

This session will explore technologies, designs, and concepts that provide low mass and small-sized solutions for issues inherent to deep space destinations including: power generation in low insolation environments, thermal management in cold environments, long-distance communications, and ways to improve spacecraft longevity given long transit times.

Young Lee　　　　818-354-1326 818-625-5080　　　　　　young.h.lee@jpl.nasa.gov

Project Support Lead, Jet Propulsion Laboratory

Session 8.13	**Systems and Technologies for Ascent from Planetary Bodies, a Multidisciplinary Problem**

This session covers both the individual technologies, the system level interactions and trades, and the issues that influence the design of ascent systems leaving the surface of planetary bodies, such as the Moon, Mars, Phobos or other bodies within our solar system. It addresses issues like the impacts of thermal constraints, propulsion design and performance, GN&C, aerodynamic impacts, and packaging constraints on ascent vehicle design.

Robert Shotwell　　　　818-354-6969　　　　　　　　robert.shotwell@jpl.nasa.gov

Chief Engineer, Mars Program, Jet Propulsion Laboratory

Tara Polsgrove　　　　256-544-1274　　　　　　　　tara.polsgrove@nasa.gov

Lead, MSFC Human Architectures Team, NASA Marshall Space Flight Center

Session 8.14	**New Technologies and Instruments for Scientific Balloon Missions**

Scientific balloons are capable of testing new technologies and performing groundbreaking science for low cost. Topics include mission concepts (astrophysical, planetary, and terrestrial), instrument, sensor and infrastructure technologies (e.g., gondola mechanical structures, pointing/aspect systems, payload networking, data streaming techniques, power management schemes, and ground station operation enhancements and architectures) and cross-over technologies relevant for future orbital and deep space payloads. Also of interest are specific electronic developments related to long duration and ultra-long duration balloon flights, as well as related technologies applicable to balloon systems, testing, and performance.

Robert Gershman　　　　818-354-5113 714-488-3164　　　robert.gershman@jpl.nasa.gov

Principal Engineer, Jet Propulsion Laboratory

Track 9	**Air Vehicle Systems and Technologies**

Christian Rice　　　　301-342-1380
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Chief Test Engineer, Rotary Wing. BS, Aerospace and Ocean Engineering; MS, Aviation Systems.

Tom McAteer　　　　301-757-4697
thomas.mcateer@navy.mil

Propulsion & Mechanical Systems Rotary Wing Branch Head, Naval Air Warfare Center Aircraft Division, MD.

Kendra Cook　　　　617-699-2469　　　　　　　　kendra.l.cook@gmail.com

Kendra is a Systems Engineer at NASA's Jet Propulsion Laboratory and also the Owner/Principal of C2 International. She has a technical background with expertise in various engineering disciplines, program management, and compliance. She has a B.S. in Aerospace Engineering from Boston University and M.S. degrees in both Astronautical Engineering and Computer Engineering from the Air Force Institute of Technology. Prior to her current position, she was NOAA's Lead Systems Engineer on the COSMIC-2 Program.

Session 9.01	**Air Vehicle Flight Testing**

Session focuses on the technology, techniques, and procedures of fixed and rotary wing aircraft flying qualities, performance, and mission systems testing at the installed full-system system level.

Andrew Lynch　　　　301-995-4447　　　　　　　　andrew.lynch@navy.mil

H-60 International Programs, PEO (A), PMA-299

Session 9.02	**UAV Systems & Autonomy**

This session includes papers on all aspects of Unmanned Aerial Vehicle (UAV) systems and autonomy. All aspects of UAVs — from design to execution, from experimental to operational — are included. Autonomy related to UAVs and policy discussions related to UAVs are also represented.

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Owner, C2 International, LLC

Luis Gonzalez   +61-41-171-8012   felipe.gonzalez@qut.edu.au
Senior Lecturer, Queensland University of Technology

Session 9.03	**Aircraft Systems & Avionics**

The focus of this session is to introduce innovative concepts in the areas of aircraft systems and avionics development, integration and testing for improving aircraft performance, airframe systems performance, survivability, situational awareness, energy state awareness, and airspace awareness.

Tyler Fean   301-757-0776 301-367-5962   tyler.fean.ctr@navy.mil
Aerospace Engineer, American Systems

Session 9.04	**Air Vehicle Flight Controls**

This session focuses on the development, testing, and technolgies of air vehicle flight controls, including fixed wing, rotary wing, and unmanned aerial vehicles.

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Propulsion & Mechanical Systems Rotary Wing Branch Head, NAVAIR

Session 9.05	**Guidance Strategies in Presence of Wind**

This sessions aims to bring together researchers from all around the world whose work concentrate on wind utilization in (real-time) guidance and control strategies. In this session, we invite researchers who are interested in methodologies that will enable utilization of wind energy during the flight to achieve specific performance objectives in hand.

Kamran Turkoglu   408-924-4329 408-924-4329   kamran.turkoglu@sjsu.edu
Assistant Professor, San Jose State University

Track 10	**Software and Computing**

Sanda Mandutianu   626-318-1566
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Senior technical staff at Jet Propulsion Laboratory. Has been task lead and PI on systems and software architectures, autonomy and control, information architecture, artificial intelligence, agent-based and semantic technologies. Published peer reviewed papers and book chapters.

Jeff Norris   818-354-5472
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Dr. Jeff Norris is the Mission Operations Innovation Lead at the NASA Jet Propulsion Laboratory. He is also the founder and lead of the Operations Laboratory and Principal Investigator for a variety of projects focused on the control of spacecraft and robots.

Session 10.01	**Computational Modeling**

The focus of this session is Computational Modeling in any discipline, with emphasis on the mathematical model of the phenomenology and on the numerical algorithms used for solution. Disciplines include fluid dynamics and fluid/thermal sciences, earth and planetary physics, systems engineering studies, sensor management and sensor modeling, and radar and signal processing.

Darrell Terry   803-256-6332   darrell.terry@att.net
Sensors Systems Engineer, Principal, The Mitre Corporation

Virgil Adumitroaie   818-393-7038 626-318-3467   virgila@jpl.nasa.gov
Data Scientist, Jet Propulsion Laboratory

Session 10.02	**Software Engineering**

The focus of this session is software engineering practices, techniques, research and lessons learned addressing development challenges of aerospace domain software.

Kristin Wortman   240-228-9634   kristin.wortman@jhuapl.edu
Senior Professional Staff - Embedded Applications , Johns Hopkins University/Applied Physics Laboratory

Ronnie Killough   210-522-3616   rkillough@swri.org
Director - R&D, Southwest Research Institute

Session 10.03 | Software Architecture and Design

Appropriate software architecture is critical to the design, development and evolution of all software systems, and its role in the engineering of software-intensive applications in the aerospace domain has become increasingly important. This session solicits novel ideas on the foundations, languages, models, techniques, tools, and applications of software architecture technology. Topics include software architecture for space mission systems; architecture across software, system and enterprise boundaries; architectural patterns, styles and viewpoints; architecture frameworks; architecture description languages and model driven architecture ontology-based approaches for architecture description; design reasoning, capturing and sharing design decisions; and open architectures, product-line architectures, and systems of systems software architects' roles and responsibilities.

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Steffen Jaekel   +49-815-328-3496 +49-163-825-3609   steffen.jaekel@dlr.de
Research Scientist (Dipl.-Ing./M.Sc.), German Aerospace Center - DLR

Session 10.04 | PANEL: Software Architecture

Gathering of practitioners and researchers interested in learnng about and improving the state of practice of software architecture in the context of the aerospace domain. Discussions will be moderated by the organizers and will debate the main topics addressed by the papers presented at the conference.

Kristin Wortman   240-228-9634   kristin.wortman@jhuapl.edu
Senior Professional Staff - Embedded Applications , Johns Hopkins University/Applied Physics Laboratory

Session 10.05 | Model-based Systems and Software Engineering

This session is concerned with the application, or potential application, of model-based approaches, techniques, languages, and tools to the aerospace domain. Topics ranging from theoretical and conceptual work in these areas to specific, concrete applications, in scope from small software systems to large systems of systems, are welcome.   A driving current theme is the coordination and usage of multiple types of models, e.g. descriptive versus behavioral models. This is a diverse session, with areas of interest including model-based architecture and analysis, design, control systems, verification and testing, simulation, domain specific languages and transformations, aircraft systems, flight systems, ground systems, planning and execution, guidance and navigation, and fault management.

Alexander Murray   818-354-0111 818-267-7576   alex.murray@jpl.nasa.gov
Senior Systems Engineer, Jet Propulsion Laboratory

Session 10.06 | Implementing Artificial Intelligence for Aerospace

This session considers how to create state-of-the-art single and multi-agent technologies for creating 'intelligent' systems in both hardware and software. It will include papers related to all areas of single-craft aerospace mission autonomous control (ground station, spacecraft/satellite, unmanned aircraft and ground rovers) and papers related to partially and fully autonomous aerospace systems. Techniques considered will include, but are not limited to genetic algorithms, swarm intelligence, probabilistic AI, training & learning tools, and intelligent multi-agent systems. This session invites papers on best practices towards implementing new state-of-the-art autonomy and intelligence systems for aerospace. Papers on clustering, distributed, or formation flying missions and control techniques for low-cost, small-size craft are particularly welcomed.

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Lecturer in On-Board Data Handling, Surrey Space Centre

Jeremy Straub   701-777-4107   jeremy.straub@my.und.edu
Researcher, University of North Dakota

Session 10.07 | Human-Systems Interaction

Technologies and techniques for creating more effective interfaces between humans and spacecraft, robots, and other aerospace systems. Specific topics of interest include visualization, haptics, situational awareness, immersive virtual environments, and natural user interfaces as applied to design, production, operations, and analysis.

Dr. Janki Dodiya   +49 531-295 2987   janki.dodiya@dlr.de
Senior Research Scientist, German Aerospace Center - DLR

Jeff Norris   818-354-5472 818-640-8490   jeffrey.s.norris@jpl.nasa.gov
Mission Operations Innovation Lead, NASA Jet Propulsion Laboratory

Session 10.08 | Human Modeling

Cognitive, musculoskeletal, and/or physiological modeling of humans, identifying thresholds of fatigue, stress, and injury in astronauts, both in the planning stages of a mission, and real-time maximum likelihood matches deducing state based on biometric sensors on the astronaut.

Howard Neely   310-770-5789   neely@threebirdssystems.com
CEO, Three Birds Systems

Session 10.09 — Cloud Computing, Big Data Analytics, and Enterprise Software Related Systems

Cloud computing is becoming increasingly prevalent in the aerospace community. This session consists of papers regarding the latest advances in cloud computing and techniques to effectively utilize cloud computing capabilities.

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Distinguished Engineer, Cisco Systems Inc

Akshat Vig 20-6245-8488 206-245-8488 akshatvig19@gmail.com
Senior Software Engineer, Amazon Web Services

Track 11 — Diagnostics, Prognostics and Health Management (PHM)

Andrew Hess 301-605-7625
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Consultant to government and industry on advanced diagnostics, prognostics, predictive analytics, health and asset management of machines and engineering systems. Previously program office lead for the JSF PHM effort. Current President of the PHM Society.

Wolfgang Fink 818-395-7769
wfink@email.arizona.edu

Associate Professor and Edward & Maria Keonjian Endowed Chair, University of Arizona. Visiting Associate in Physics, California Institute of Technology. Visiting Research Associate Professor of Ophthalmology and Neurological Surgery, University of Southern California. Ph.D., Theoretical Physics, University of Tübingen, Germany.

Session 11.01 — PHM for Aerospace Subsystems, Components and Structures

Advanced Diagnostics and PHM can be and is applied separately or concurrently at the device, component, subsystem, structure, and/or total platform levels. This session will give PHM developers, practitioners, integrators, and users a chance to discuss their capabilities and experiences at any or all of these application levels. Discussion of the integration of PHM capabilities across these various levels of application is welcome and encouraged. Applications involving propulsion systems, fuel management, flight control, EHAS, drive systems, and structures are particularly solicited.

Andrew Hess 301-605-7625 240-355-8915 andrew_hess@comcast.net
President, The Hess PHM Group, Inc.

Session 11.02 — PHM for Control Systems Applications

This session focuses on diagnostics and prognostics for electronic controls, control systems, and electronic systems for both the item under control and the controlling system. Methods for fault detection, rate of progression, and consequence or mission risk are encouraged. The session also is looking for novel technical approaches to use diagnostic and prognostic information to provide control input adjustments that can slow or reverse fault progression.

Derek De Vries 435-863-6693 derek.devries@orbitalatk.com
Senior Fellow, Orbital ATK, Inc.

Session 11.03 — Algorithms and Advanced Concepts for Diagnostics and PHM

Diagnostics and PHM is a rapidly evolving research area. This session focuses on novel algorithms for solving PHM problems and advanced concepts applied to these problems.

Matthew Daigle 650-604-4583 matthew.j.daigle@nasa.gov
Research Computer Scientist, NASA Ames Research Center

Chetan Kulkarni 615-715-6938 chetan.s.kulkarni@nasa.gov
Research Engineer III, SGT. Inc NASA Ames Research Center

Session 11.04 — Design Attributes for Diagnostics and Prognostics

Design of complex systems, such as aircraft and space vehicles, requires complex trade-offs among requirements related to performance, safety, reliability, and life cycle cost. This session will focus on the application of methods such as testability, diagnosability, embedded sensors, prognostics, and remaining useful life estimation to the design of complex aerospace systems. We invite papers discussing new methodologies, lessons learned in application of health management methods in system design, and operational experience with health management capabilities embedded into systems early in the design process.

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President, The Hess PHM Group, Inc.

Session 11.05 — Systems Health Management for Space Systems and Operations

This session focuses on advances pertinent to space operations. The needs for semi-autonomous or autonomous operations, communication delay, short contact periods survival in harsh environments pose unique challenges to systems health management. Additional challenges come from the application areas that include cryogenic operations, fuel reloading, ground operations, deep space habitats, etc.

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Post Doctoral Research Scholar, SGT, Inc., NASA Ames Research Center

Indranil Roychoudhury   650-604-0448   **indranil.roychoudhury@nasa.gov**
Computer Scientist, SGT, Inc.

Session 11.06 — MEMS and Sensor Technologies for PHM Applications

This session is designed to bring together researchers and engineers developing sensors applicable to SHM and IVHM. Papers are invited on MEMS, MOEMS, nanotechnology, BIOS, quantum dots, chemical sensors, optical sensors, and imaging sensors that can be integrated with nondestructive testing applications for structural health monitoring and diagnostics.

Morteza Safai   206 304-4618 206-304-4618   **morteza.safai@boeing.com**
Sensors Engineer / Technical Fellow, Boeing Company

Session 11.07 — PHM for Helicopters, UAVs, and Autonomous Systems

This session focuses on prognostics and health management for helicopters, UAVs, and other autonomous mobile platforms.

Wolfgang Fink   818-395-7769 818-395-7769   **wfink@email.arizona.edu**
Associate Professor, University of Arizona

Session 11.08 — PHM for Electronics

This session invites contributions in the areas of advanced diagnostics and PHM for electronics, electronic systems, and their components. This would include, but is not limited to: real time, onboard, in-flight and during mission, as well as off-board, off-line, repair center and depot applications with a specific focus on remediation of No Fault Found (NFF) test results in electronic systems.

Ken Anderson   801-731-8508   **ken.anderson@usynaptics.com**
Vice President , Universal Synaptics

Session 11.09 — PHM for Military Applications

This session focuses on the use of PHM in the field of military applications including space, aviation, ground vehicles, ships, and undersea platforms.

Karl Reichard   814-863-7681   **kmr5@psu.edu**
Research Associate, Applied Research Laboratory

Session 11.10 — PHM /CBM+ for Propulsion Systems

Advanced Diagnostics and PHM can be and is applied to propulsion systems. This session will give PHM developers, practitioners, and users a chance to discuss their capabilities and experiences with PHM applied to propulsion systems. Discussion of the integration of PHM capabilities in the field of propulsion systems is welcome and encouraged. Applications involving propulsion systems, fuel management, flight control, and structures are particularly solicited.

Andrew Hess   301-605-7625 240-355-8915   **andrew_hess@comcast.net**
President, The Hess PHM Group, Inc.

Michael Houck   301-995-2945 301-643-9951   **michael.houck@navy.mil**
Division Director, Mechanical Sys, Controls and Diagnostics, NAVAIR 4.4.2, Propulsion & Power

Session 11.11 — PHM for Human Assets in Support of Individual Health, Performance, and Mission Success

This session explores the bridge between system PHM capabilities and Space Medicine and other related healthcare domains as applied to High Value Human Asset health support. PHM for Human Assets is focused on tracking the continuing health status of very healthy individuals, as well as ensuring sustained peak required Performance and Mission success for manned exploration-class missions, elite warfighter performance, and safe aircraft operation.

Alexandre Popov   256-348-3928 **256-348-3928 popov.alexandre@gmail.com**
AIAA Systems Engineering Technical Committee (SETC) member and Associate Graduate Faculty member in the Master of Science program in Computer Science, University of Ontario Institute of Technology

Wolfgang Fink   818-395-7769 818-395-7769   **wfink@email.arizona.edu**
Associate Professor, University of Arizona

Session 11.12 — PHM for Commercial Space Applications

This session seeks papers on diagnostics, prognostics, health management (PHM) and autonomous fault management for Satellites and other commercial space ventures. Papers are sought in the areas of satellites, launch vehicles, and outer space ventures. Papers may address research, actual flight experience, and future planning related to satellite and launch vehicle PHM and fault management.

Richard Milford   310-227-6956   **richard.milford@att.net**
Department Manager, Boeing Company

Session 11.13 — PHM for System Structure and Implementation

This session seeks papers on diagnostic, prognostic, and health management (PHM) for System Structure and Implementation. Papers are desired on topics which describe the process of defining the systems architectural concept, development of the systems PHM requirements, design and implementation, results from PHM implementation on a system for both success stories and challenges, or lessons learned from implementation of the PHM in a defined system structure on the system's platform and components. Papers are encouraged, which provide both the system's predicted implementation structure and benefits vs. achieved implementations and benefits for the systems operation. These benefits may include enabling condition based maintenance (CBM), improved service life, and early detection of issues and their resolution.

Derek De Vries   435-863-6693   derek.devries@orbitalatk.com
Senior Fellow, Orbital ATK, Inc.

Andrew Hess   301-605-7625 240-355-8915   andrew_hess@comcast.net
President, The Hess PHM Group, Inc.

Session 11.14 — Panel: PHM / CBM+ from a User-Perspective

Distinguished practitioners in the PHM field are solicited to share their experiences and observations across a broad range of research, lessons-learned experiences, and application topics covering the challenges and innovative engineering and/or business approaches associated with the development and implementation of PHM capabilities and CBM+ architectures. Interested parties should contact the session organizers.

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Track 12 — Ground and Space Operations

Jonathan Gal Edd   301-286-2378
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Works for NASA/GSFC. serving as Ground Segment manager(GSM) for OSIRIS-REx, an asteroid sample return mission. Previously, Ground system chief engineer for Landsat 8 (LDCM), Ground Systems manager for TDRS-K and Mission Systems Engineering manager for the James Webb Space Telescope (JWST).

Carlos Gomez Rosa   301-614-5228
carlos.gomez@nasa.gov

Carlos Gomez is a graduate from the University of Puerto Rico where he received a BS in Electrical Engineering. He later completed a MS in Engineering from the Johns Hopkins University. Mr. Gomez was the Mission Operations Manager for the GOES-O mission and in 2015 completed MAVEN's Primary Science Period as its Mission Director.

Session 12.01 — Spacecraft Development and Flight Operations: Challenges, Successes, Failures and Lessons Learned

Designing, developing and flying spacecraft is a challenging endeavor; it IS "Rocket Science." These challenges, when experienced during development, pose risks to cost and schedule. When anomalies occur in flight, the challenges are even greater, imparting risks to mission success. This session solicits outstanding papers describing some of the difficult challenges mission teams have faced and how they've resolved them. Spacecraft development and operations challenges, inflight anomaly resolution, process improvement, automation and lessons learned for future missions are highlighted.

Mona Witkowski   818-354-4203 818-983-4727 818-983-4727   mona.m.witkowski@jpl.nasa.gov
Flight Director / Operations Mission Manager, Jet Propulsion Laboratory

Session 12.02 — Flight/Ground Systems, Mission Planning and Operations

This session entertains papers with topics related to ground systems design and architectures, flight/ground interfaces and software tools, as well as current and emerging methods and technologies to support all aspects of mission design, planning and operations. We would like to hear about ideas and approaches for "doing more with less", such as efficient ground systems integration and automation.

Judith Furman   210-522-6040 210-382-0732   jfurman@swri.org
Principal Analyst, Southwest Research Institute

Carlos Gomez Rosa   301-614-5228 240-595-2168   carlos.gomez@nasa.gov
Mission Director, NASA - Goddard Space Flight Center

Session 12.03 — Operations Management

Papers are sought to highlight innovative approaches and lessons learned towards reducing operations cost and risk. Topics such as managing single or multi-mission operations, team development and staffing, logistics and infrastructure may cover any phase of the system life cycle from concept design to mission termination, including previous, existing, and emerging programs.

Carlos Gomez Rosa   301-614-5228 240-595-2168   carlos.gomez@nasa.gov
Mission Director, NASA - Goddard Space Flight Center

Mark Woodard   301-286-9611   mark.woodard@nasa.gov
MMS Mission Director, NASA - Goddard Space Flight Center

Session 12.04 — Human Space Flight Development, Operations and Processing

This session focuses on all aspects of Human Spaceflight processing and operations across all mission regimes. Research topics including the design, and development of manned spacecraft hardware and support systems, as well as operations research focused on pre-flight, in-flight and post-flight activities is encouraged. Additionally, research dedicated to specific areas such as flight operations including IVA and EVA, landing and recovery of crewed spacecraft, and the physiological and psychological effects on human beings during all of these mission types and phases is also encouraged.

Michael Lee   321-861-2568 321-431-4766   michael.r.lee@nasa.gov
Partner Manager/Deputy Mission Manager/Alternate Contracting Officer's Representative, NASA - Kennedy Space Center

Matthew Miller   912-674-6722   mmiller@gatech.edu
Graduate Research Assistant, Georgia Institute of Technology

Session 12.05 — Payload and Instrument Operations and Processing

This session incorporates all aspects of payload operations, including techniques and tools for planning, scheduling, commanding, processing, analyzing, and optimizing, as well as payload delivery systems engineering.

Radu Popescu   303-492-5689 303-589-5143   radu.popescu@lasp.colorado.edu
Data Analysis and Information Management, Laboratory for Atmospheric and Space Physics

David La Vallee   240-228-4546   david.lavallee@jhuapl.edu
Project Leader, Johns Hopkins University APL

Session 12.06 — Cyber Security in Aerospace Operations

Defending against cyber attacks is necessary for the protection of space system assets and mission execution capabilities. This session welcomes approaches for cyber security tailored for the aerospace domain. Security engineering to prevent intrusions and situational awareness tools to detect attacks, are evolving technologies enabling increased protection for the mission. In addition, mission resilience to cyber attack is an emerging field critical for protecting the mission. Other topics include: unique cyber vulnerabilities for space systems; the implementation of network security and information security techniques; CONOPS for cyber security; implications for NIST's Risk Management Framework for Space; analytics applied to space systems; and lessons learned from previous attacks or defensive techniques.

David La Vallee   240-228-4546   david.lavallee@jhuapl.edu
Project Leader, Johns Hopkins University APL

Jon Handiboe   240-228-3302   jon.handiboe@jhuapl.edu
Group Supervisor, JHU/APL

Track 13 — Management, Systems Engineering and Cost

Jeffery Webster   818-653-8360
jeff.webster@aeroconf.org

Project Support Specialist--Project Support Office at JPL; Senior Systems Engineer--Mission Systems Concepts Section; Mars Trace Gas Orbiter-- Project Planner & Systems Engineering; Associate Engineer--Mission & Systems Concepts Section

Torrey Radcliffe   310-336-0013
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Associate Director, Space Architecture Department, The Aerospace Corporation. Background in preliminary spacecraft design, space architecture development and portfolio analysis of manned and unmanned systems. S.B, S.M. and PhD in Aeronautics and Astronautics from MIT.

Session 13.01 — System Simulation and Verification

This session addresses the design, implementation, and use of system-level simulations to measure or verify the performance and utility of space, ground, and related systems.

Virgil Adumitroaie   818-393-7038 626-318-3467   virgila@jpl.nasa.gov
Data Scientist, Jet Propulsion Laboratory

James Hant   310-336-1388   james.j.hant@aero.org
Director, Modeling and Simulation Department, Aerospace Corporation

Session 13.02 Cost and Schedule Tools, Methods and Processes

This Session addresses cost and schedule analysis tools, methods, processes, and results including design trades for design concepts and technologies throughout a project's life cycle. Topics addressed include cost or schedule model development, regression analysis and other tools, historical studies addressing trends, databases, government policies, industry training, mission cost analysis, operations and supporting/infrastructure cost, mission portfolio analysis, case histories, lessons learned, process control, and economic and affordability analysis that assesses program/project viability.

Robert Bitten   310-336-1917   robert.e.bitten@aero.org
Principal Engineer, Aerospace Corporation

Stephen Shinn   301-286-5894   stephen.a.shinn@nasa.gov
Deputy Director for Business Management, Flight Projects Directorate, NASA - Goddard Space Flight Center

Session 13.03 Management and Risk Tools, Methods and Processes

This session addresses tools, methods, and processes for managing aerospace system development programs/projects, mission operations, technology development programs, and systems engineering organizations. Topics include analyzing risks; managing all life cycle phases of programs/projects; using project-level management disciplines including project management, systems engineering, scheduling, safety and mission assurance, and configuration management; and improving training and capability retention (passing expertise between generations of systems engineers); and managing aerospace technology development programs. Applications include commercial, military and civil space systems, and commercial and military aircraft systems. This session also covers the topic of risk management in aerospace endeavors, including new insights from the successful application of risk management, and lessons learned when risk management did not prevent realization of consequences.

Jeremiah Finnigan   240-228-5725 240-478-1737   jeremiah.finnigan@jhuapl.edu
Senior Professional Staff, Johns Hopkins University/Applied Physics Laboratory

Robin Dillon Merrill   202-687-5398   rld9@georgetown.edu
Professor, Georgetown University

Session 13.04 Mission Modeling, Concept Optimization and Concurrent Design

This session is dedicated to the discussion of the topics related to the current state of practice and future advances in conceptual design across the aerospace domain including design tools, optimization techniques, design study results, results visualization, trade space exploration and lessons learned.

Robert Oberto   310-336-1203 310-923-5779   bob@boboberto.com
Senior Engineering Specialist , The Aerospace Corporation

Eric Mahr   310-336-5329   eric.m.mahr@aero.org
Senior Engineering Specialist, Aerospace Corporation

Session 13.05 Systems Architecture, Engineering and System of Systems

This session is dedicated to papers dealing with the fundamental challenges associated with architecting and high level systems engineering of large scale systems and systems of systems, including development and application of tools and techniques that support both architecting and system engineering processes (e.g., Architecture Descriptions, Model Based Systems Engineering), maintaining the integrity of "the architecture" across the project lifecycle, and discussions of successful (and not so successful) architecting and systems engineering endeavors with an emphasis on the lessons learned.

Lisa May   202-285-5352 202-285-5352   lisa.may@murphian.com
President, Murphian Consulting LLC

Inki Min   310-336-2452   inki.min@aero.org
Principal Engineering Specialist, Aerospace Corporation

Daniel Selva   617-682-6521 617-682-6521   ds925@cornell.edu
Assistant Professor, Cornell University

Session 13.06 Technology Transfer and Infusion

This session provides information on infusing aerospace technologies into both government agencies as well as the broader marketplace. We discuss technology transfer into NASA and DoD, as well as federally funded technology transfer into commercial markets. This session includes review of the legal and operational issues in effective technology transfer, challenges to efficient commercialization, and private and public funding challenges to accelerated technology development.

Andrea Belz   626-429-4301 626-429-4301   abelz@usc.edu
Director, Innovation Node-Los Angeles, University of Southern California

Howard Neely   310-770-5789   neely@threebirdssystems.com
CEO, Three Birds Systems

Thomas Cwik   818-354-4386 818-653-8222   cwik@jpl.nasa.gov
Manager of Space Technology and Ocean Worlds Technology, Jet Propulsion Laboratory

Session 13.07	**Promoting (and Provoking) Cultural Change**

Culture is a byproduct of habits. This session explores how to create environments and add nutrients that help great things grow.

David Scott   256-544-3226 256-227-0339   scotty@nasa.gov

Computer Engineer, NASA - Marshall Space Flight Center

Sreeja Nag   617-710-1845   sreeja.nag@nasa.gov

Research Engineer, NASA Goddard Space Flight Center / Ames Research Center (BAERI)

Session 13.08	**Operationally Driven Design, Development, and Testing of Space Systems**

This Session addresses lean, operationally driven design, development, and testing methods for space systems. Examples include human space vehicles, EVA methods, EVA tools, NASA's Evolvable Mars Campaign, and NEEMO.

Steven Chappell   303-903-6528   steven.p.chappell@nasa.gov

Research Specialist, Wyle

Session 13.09	**Probabilistic Risk Modelling for Space Missions, including Humans-in-the-Loop**

This session addresses probabilistic risk modeling of aerospace mission success and safety, for both robotic and human space systems and missions.

Ephraim Suhir   408-410-0886   suhire@aol.com

Professor, ERS Co.

Andrew Hsu   310-336-2547   andrew.hsu@aero.org

Senior Engineering Specialist, The Aerospace Corporation

Track 14	**Government Plans, Policies and Education**

Dave Lavery   202-358-4684   dave.lavery@nasa.gov

Program Executive for Mars Exploration in the Science Mission Directorate of NASA Headquarters. Instrumental in the development and application of robotics and rover technology, and director of NASA participation in robotics competition for education/outreach.

Session 14.01	**PANEL: Competition Robotics for Education and Workforce Development**

The use of robotics as a focusing technology topic for K-12 and college-level education, and how extracurricular robotics competition programs can be used to focus and integrate in-class activities.

Dave Lavery   202-358-4684 202-329-0144   dave.lavery@nasa.gov

Program Executive for Solar System Exploration, NASA Headquarters

Session 14.02	**PANEL: Technology Development for Science-Driven Missions**

The Panel will discuss the technology needs for the next generation of NASA science missions, and technology developments and mission implementation options currently being pursued by NASA technology programs. The panel will discuss assessing technology readiness levels of new technologies, challenges of infusing new technology into future NASA missions or commercial space applications, and ways that technology infusion can be improved.

Patricia Beauchamp   818-354-0529 818-645-2479   patricia.m.beauchamp@jpl.nasa.gov

Program Technical Manager, Strategic Missions and Advanced Concepts, Jet Propulsion Laboratory

Session 14.03	**PANEL: Emerging Technologies for Mars Exploration**

This panel will discuss the unique technology needs for future Mars exploration, including those for robotics explorers as well as groundbreaking technologies for future human missions. Panelists will highlight a variety of emerging technologies that can enable these future pathways for Mars exploration.

Charles Edwards   818-354-4408 818-687-8623   chad.edwards@jpl.nasa.gov

Mgr, Mars Relay Network/Chief Technologist, Mars Exploration Directorate , Jet Propulsion Laboratory

| Session 14.04 | **PANEL: Mission Options and Technologies for Human Exploration** |

NASA is pursuing "Human-Robotics" technologies that can assist humans in missions with: robots as crew precursors, robots that work during crewed mission phases, or robots that work following a crewed mission. In each of these three cases, the robots must work effectively with humans on earth, typically with people supervising the robots across time delay. This panel will examine these technologies, and discuss them in the context of recently-announced human exploration missions.

Lyndon Bridgwater   281-483-6625   **l.bridgwater@nasa.gov**
Aerospace Engineer, NASA

Robert Ambrose   281-244-5561   **robert.o.ambrose@nasa.gov**
Branch Chief, NASA - Johnson Space Center

| Session 14.05 | **PANEL: Access To Space and Emerging Mission Capabilities** |

The high cost of launch continues to be a roadblock to space missions large and small. The development of adapters (ESPA, PPOD, e.g.), the acceptance of risk for accommodating secondary or auxiliary payloads, and the explosion of cubesat and smallsat capability have led to some creative approaches to space missions. This panel is meant to explore how our space colleagues are leveraging these emerging capabilities.

Eleni Sims   505-846-8147 505-440-1132   **sam.sims@aero.org**
Project Engineer, Aerospace Corporation

| Session 14.06 | **PANEL: Operational Uses of Consumer-Class Unmanned Aerial Vehicles** |

This panel will discuss the use of consumer-class UAVs for various "non-hobby" tasks, and how these vehicles fit within the rapidly changing regulatory environment.

Dave Lavery   202-358-4684 202-329-0144   **dave.lavery@nasa.gov**
Program Executive for Solar System Exploration, NASA Headquarters

Jeff Norris   818-354-5472 818-640-8490   **jeffrey.s.norris@jpl.nasa.gov**
Mission Operations Innovation Lead, NASA Jet Propulsion Laboratory

| Session 14.07 | **PANEL: Model-based Engineering – Paradigm Shift or Business as Usual?** |

The panel will discuss directions and implications of model-based engineering initiatives across large government organizations: policies, processes, technologies, and application domains.

Sanda Mandutianu   626-318-1566 626-318-1566   **sanda.mandutianu@jpl.nasa.gov**
Sr. Systems Software Engineer, Jet Propulsion Laboratory

| Session 14.08 | **PANEL: From Earth Reliant To The Proving Ground** |

The journey to Mars crosses three thresholds, each with increasing challenges as humans move farther from Earth into deep space. NASA is addressing these challenges by developing and demonstrating capabilities in incremental steps through three thresholds: Earth Reliant, Proving Ground, and Earth Independent. This panel will focus on work we are doing now in the Earth Reliant Phase and the work we are planning in the Proving Ground, which is split into two phases.

Greg Williams   202-358-2015   **greg.williams@nasa.gov**
Deputy Associate Administrator, NASA - Headquarters

| Session 14.09 | **PANEL: NASA Innovative Advanced Concepts Program** |

NIAC invests in NASA's most visionary aerospace studies that could one day transform future missions and are often at the razor thin edge of science fiction. The panel will provide an introduction to the NIAC program and highlight the visionary efforts of several NIAC Fellows.

Alvin Yew   301-286-3734   **alvin.g.yew@nasa.gov**
Program Manager, NASA

| Session 14.10 | **PANEL: Astronaut - Robot Cooperation** |

Robotics is a technology that aims to extend man's manipulation skills to hazardous and distant places. Extra-vehicular activities in orbit or on a planet belong to these places. This panel will discuss cooperation of astronauts and robots during EVAs, in orbit, or possibly also on the Moon or on Mars, addressing issues such as technology, operations and safety. Key questions to be addressed include: What are typical astronaut tasks during EVAs? What functionality do orbital and planetary robots nowadays offer and where are they heading? What are the fundamental limitations in having robots support or even substitute for astronauts? What could astronauts do with support from robots?

Roberto Lampariello   +49-815-328-2441 +49-173-592-7833   **roberto.lampariello@dlr.de**
Research scientist, German Aerospace Center - DLR

BACK COVER – *Recurring Slope Lineae (RSL) at Horowitz Crater. These changing streaks on Mars start on the slopes of hills and craters but don't usually extend to the bottom. They appear to change with the season, appearing fresh and growing during warm weather and disappearing during the winter. After much study, including a recent chemical analysis, a leading hypothesis has emerged that these streaks are likely created by new occurrences of liquid salty water that evaporates as it flows. NASA image from the Mars Reconnaissance Orbiter.*

Junior Engineering & Science Conference

Yellowstone Conference Center
Big Sky, Montana   March 7, 2017

Junior Conference Submission Deadlines
Junior Abstract Deadline : January 10, 2017
Junior Presentation Deadline : February 14, 2017

WHO MAY PARTICIPATE

Any student, kindergarten through high school, who is registered at the conference as an official guest of a primary registrant, is eligible to present a paper as a Junior Engineering & Science Speaker.

NUMBER OF PARTICIPANTS

To provide sufficient time for each presentation, the number of participants will be limited to 30. Preference will be given to the earliest submissions.

TOPICS

Topics with direct or tangential relationship to science, engineering, or mathematics are encouraged.

STUDENT'S RESEARCH

The presentation should describe one of the following:

1. An original idea accompanied by supportive reasoning and data
2. An experiment, invention or field work
3. A review summarizing a topic of interest.

HOW TO SUBMIT YOUR PRESENTATION

1. Write a short **abstract** describing your topic.

2. Have your parent or guardian who is registered for the conference register you as a junior engineer, complete a release form, and submit your abstract to Session 15.01 (Junior Conference) on the conference website, www.aeroconf.org (select Session 15.01 Junior Engineering Conference). **The abstract cut-off date is Tuesday, January 10, 2017**. You will receive an email confirmation of acceptance.

3. Prepare a 5–10 slide PowerPoint presentation of your work. The title slide should include your name, age, grade, special interests, and (if you choose) a photo of yourself. You may have help from an adult, but the presentation should be primarily your own work.

4. Once your abstract is confirmed, submit your PowerPoint presentation to the conference website as soon as possible. **The presentation deadline is Tuesday, February 14, 2017**. No late presentations will be included in the conference.

5. Prior to the conference all Junior Engineering & Science presentations will be loaded onto a single laptop. You will have an opportunity to practice before giving your presentation.

6. After the last presentation, all participants will receive an electronic copy of the Junior Engineering & Science Conference Proceedings.

2017 Junior Engineering & Science Conference Contacts

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