



ISSR&D
CONFERENCE 2017

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6th Annual International Space Station Research and Development Conference

Organized by the American Astronautical Society with the support of the
Center for the Advancement of Science in Space (CASIS) and NASA

ABSTRACT DEADLINE: April 10, 2017

CONFERENCE: July 17-20, 2017



Conference Overview

The International Space Station (ISS) Research and Development (R&D) Conference unites the global ISS user community to push the boundaries of innovation. As the demand for space research continues to grow, companies and organizations of all shapes and sizes are leveraging the ISS as the ultimate platform for microgravity research, technology development, and remote sensing. In addition to its cutting-edge capabilities, the ISS is a stepping stone for further exploration, new business models, and new platforms for space research.



Washington, DC
July 17-20, 2017

OMNI SHOREHAM HOTEL

The 6th annual ISS R&D Conference will be held July 17-20, 2017, at the Omni Shoreham Hotel in Washington, D.C. The conference brings together a diverse community of existing and future users of the ISS as well as the investment community. These users are those involved in basic scientific research, engineering development of low Earth orbit and deep space systems, and space operations and logistics research and development. Just as important, we seek commercial users who can build a business case utilizing the ISS— commercial developers, enabling partners, entrepreneurs, and investors.

Both the conference and abstract submittal are open to domestic and international entrepreneurial, commercial, academic, and government agency attendees. This includes professionals, young professionals, students, citizen scientists and all interested parties. The working language for the conference is English. The conference will include plenaries centered around topics of general interest to the community and focused technical sessions.

Important Deadlines and Dates	
April 10, 2017 (2400 hours US Eastern Time)	Abstract Submission Deadline
May 10, 2017	Notifications to Authors
July 10, 2017	Final Presentation/Poster Submission Deadline

Instructions

Abstract submission is open to all nationalities. We encourage submissions from any past, present, or future ISS user, supporter, or operator with an entrepreneurial, commercial, academic, or government background. Submissions are especially encouraged from young professionals and students.

The American Astronautical Society (AAS) ISS Research Technical Committee will evaluate abstracts based on the quality of the abstract, relevance, innovation, substance merit, future practical application, and balance and variety in the sessions. Accepted abstracts will be selected for plenary sessions, parallel technical sessions or poster displays. The Technical Committee reserves the right to place the presentation/poster in the most appropriate session. Authors may indicate preferences for presentation, poster, or either in the submittal process. Scientific papers are not required.

See page five for abstract topics.

INFORMATION FOR PRESENTERS

With the large number of expected submissions, authors/presenters are encouraged to submit abstracts early; the deadline is **April 10, 2017**. Authors/Presenters may access the web-based abstract submittal system using the link found in the conference website (www.issconference.org) or directly at <https://www.xcdsystem.com/ISS>.

Using the online submission process, the primary author is expected to provide the following.

- Presentation title and appropriate category from this call for papers.
- Name, affiliation, postal address, telephone number, and email address of the corresponding author.
- Name, affiliation, postal address, telephone number, and email address of the presenter
- Other descriptive and demographic data.
- Short abstract of no more than 50 words.
- Expanded abstract sent in the Portable Document File (PDF) format of no more than 2 pages that includes the title and authors. Write the abstract to allow evaluation against the acceptance criteria of quality of the abstract, relevance, innovation, substance merit, and future practical application.

Authors accepted for posters or presentations will receive an invitation to present via email. Authors will have one week to accept or decline the invitation via return e-mail. Detailed presentation instructions will be sent by email following acceptance.

Presentations/posters must be submitted by July 10, 2017, through the online submission process. Failure to do so will invoke the “No Presentation/No Podium” rule and the item will be stricken from the schedule. By submission of an abstract, presentation or poster, the author agrees to the inclusion of such in the program and/or conference proceedings. PDFs of the abstracts, bios, and presentations/posters may be made available to all conference attendees in hardcopy or electronically.

Concerning “Pre-decisional”, “Pre-publication”, or “Proprietary” information in presentations - This type information should not be included in the submitted presentation. The author should submit a sanitized version to the database and coordinate with their session chairs to provide a unique set of charts for the day of presentation with such information. This coordination must include a complete trial run of the

presentation on the AV equipment in the presentation room. (No cold or first time runs will be permitted in the conference room.) The presentation submitted to the database should be otherwise significantly complete.

Technical sessions consist of several 15-to-20 minute presentations with each followed by 5-to-10 minutes of Q&A. Some sessions may include a round-table discussion with all presenters at one time.

Poster displays run the length of the conference and are completely interactive around the presenter's hardcopy display. There will be designated periods for authors to be present at their posters.

All authors are required to register for the conference in the same fashion as all other attendees.

Technology Transfer Notice – This is an international conference. If your organization, agency, or nation requires export approval of your material for this conference, you must follow that process, and you must do it on a schedule that allows you to meet the conference deadlines. This is the author's responsibility, not the conference organizers.

Authors may contact ISSTechChair@atdl-inc.com for additional information or if submittal difficulties are encountered.

Presentation and Poster Topics

Biology and Medicine

Microgravity effects on physical and biological phenomena are far ranging and poised to benefit pharmaceutical research from target identification to drug discovery, testing, and delivery. Moreover, molecular and physiological changes in space provide accelerated models of human disease and aging on Earth.

Responsive abstracts should describe the use of ISS to improve pharmaceuticals or delivery systems and study biology in the context of animal/cell modeling of disease or mechanistic studies in cell culture.

Specific examples include but are not limited to cell function; microbial function and other microbiological processes; pharmaceutical development and delivery/diagnostics systems, including antibiotic effectiveness, pharmacokinetics/dynamics, macromolecular crystal growth, microfluidic devices, etc.; physiologic impacts of microgravity such as protein synthesis, musculoskeletal effects, immune response, etc.—including animal modeling—and cancer research.

Commercialization and Nongovernment Utilization

The ISS platform is available today as a test bed and a pathfinder for industry to advance the commercialization of low-Earth orbit (LEO). NASA, CASIS, and international partners are encouraging and facilitating commercialization opportunities as agencies continue to develop strategic policy on stimulation of a sustainable commercialized LEO marketplace. The ISS is already supporting commercial ventures including small satellite deployment, vaccine development, Earth monitoring, and a range of other focused research projects.

Responsive abstracts may address any efforts related to use of the ISS for commercial endeavors.

Specific examples include but are not limited to economic opportunity of ISS/LEO, funding of privatized research, public/private partnerships, business models involving ISS, barriers to commercial use of the ISS, industry strategic outlook and cooperation, promising near-term market opportunities in LEO, and any early lessons learned.

Earth Science and Remote Sensing

The location of ISS in low Earth orbit affords a unique vantage point for imaging of Earth and space. Utilizing this platform for Earth science and remote sensing allows a broad range of studies with equally broad implications for basic and applied science for application across many fields.

Responsive abstracts may discuss use of the ISS for remote sensing or technology advancement to improve such studies.

Specific examples include but are not limited to, disaster response, advances in active and passive remote sensing systems (multispectral, hyperspectral, Lidar, microwave, etc.), development of optical sensor suites, planetary science investigations, stratospheric aerosol and gas monitoring, right-of-way

inspections, urban planning, humanitarian response, energy sustainability, forestry, agriculture and other resource management remote sensing applications.

Finances

Managing financing for programs, projects, and investigations is a topic of interest to new and existing users. Financing may be internal or external. It is a concern of large businesses, small businesses, entrepreneurs, researchers, academia, and financiers. We are looking for inputs from those needing financing, those who have developed financing, and those who provide financing.

Responsive abstracts will describe the challenges of developing and implementing a financing plan and how to manage these challenges.

Specific examples include, but are not limited to how to look for financing, attract financing, soliciting financing, financing models, financing rounds and tranches, managing intake of funds, commitments required, effect upon the company, etc.

Human Health in Space

Long duration human presence in space is necessary for many applications in commerce, research, and exploration. The ISS provides the operations base to understand the effect of spaceflight on the human body and human performance.

Responsive abstracts will describe studies on ISS with these objectives.

Specific examples include, but are not limited to, biomedical research in space, health risks due to radiation and weightlessness, (e.g., musculoskeletal effects and sensorimotor adaptation), cardiovascular alterations, intracranial pressure and visual impairment, medical monitoring and investigation capabilities, immune function, physiology, cognition, psychological adaptation, human factors, and onboard countermeasures and plans (including exercise and pharmacology, astronaut participation, and perception, etc.).

Physical Sciences and Materials Development

The lack of convection and sedimentation in microgravity allows for more uniform crystallization and synthesis of some materials (e.g., metals, semiconductors, biomaterials, ceramics, and composites), benefitting studies of material properties and performance, including complex fluids, in various phases. Moreover, the external environment of space is an ideal test bed for materials degradation, providing exposure to extreme conditions (e.g., vacuum, atomic oxygen, UV radiation, and space debris). The limitation of natural convection in microgravity also provides a unique opportunity for combustion studies, experiments in fluid dynamics, and energy transport studies involving heat and mass transfer.

Responsive abstracts should describe the evaluation of physical sciences phenomena or the development of new/improved materials using the above-referenced benefits of the ISS.

Specific examples include, but are not limited to, engineered materials, components, and structures; fluid behavior (including complex fluids), transport processes and/or advanced structures and materials;

energy capture, generation, storage, efficiency, and sustainability; and materials development/in-orbit production processes.

Plant Science

Analyzing the broad range of spaceflight-specific adaptive processes in plants may advance fundamental understanding of plant biology, improve space agriculture capabilities, and inform terrestrial agricultural and commercial applications involving plant growth, behavior, and interactions with other organisms.

Responsive abstracts should seek to exploit the ISS for one or more of the above-referenced purposes.

Specific examples include, but are not limited to, studies of gene expression and plant morphology, biofuel production and protein production related to industrial processes, and symbiotic interactions.

Technology Development and Demonstration

The ISS supports technology application, development, and demonstration both for improving human spaceflight capabilities and for improving quality of life on Earth.

Responsive abstracts should describe use of ISS as a test bed to demonstrate operational techniques and capabilities for space exploration or to develop and demonstrate technologies and advanced systems that benefit either space-based initiatives or terrestrial commercial applications.

Specific examples include, but are not limited to, autonomy, communications needs and solutions, energy storage and power management and production, external and internal accommodations, hardware capabilities and limitations, inflatable structures, in-space manufacturing (additive technologies, demonstrations, and unique processes), ISS utilization for satellite launches and CubeSat deployments, on-board requirements to sustain life (including closed-loop life support, radiation shielding and monitoring, and environmental control and life support systems), advanced communication and navigation strategies, robotics, and advanced exploration capabilities.

STEM Education

Space science has repeatedly demonstrated its ability to inspire interest and excitement among children and adults in the areas of science, technology, engineering, and mathematics (STEM), making it an ideal platform for promoting and advancing education initiatives. The engineering and scientific accomplishments and capabilities of the ISS provide an opportunity to excite students, perhaps encouraging their career interests toward these areas. Moreover, the broad spectrum of inspiring topics available for educational use may allow initiatives to reach a wider student population, engaging groups not commonly targeted by STEM education programs.

Responsive abstracts will discuss education programs that capitalize on the ISS research platform.

Specific examples include but are not limited to education outreach, ISS utilization for student experiments and activities, innovation educational outreach programs regarding the ISS, ground-based simulations and demonstrations, and curriculums utilizing or focusing on ISS.

Questions?

Call for Papers Inquiries

ISSTechChair@atdl-inc.com

For the latest news and information on the ISS R&D
Conference 2017, visit www.issconference.org