CALL FOR PAPERS

7th 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 27, 2018

CONFERENCE: July 23-26, 2018

American Astronautical Society

NASA

CASIS

Conference Overview

The International Space Station Research and Development Conference (ISSRDC) 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.

San Francisco, CA
July 23-26, 2018

Marriott Marquis Hotel

The 7th annual ISSR&D Conference will be held July 23-26, 2018, at the Marriott Marquis Hotel, San Francisco, CA. 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 27, 2018 (2400 hours US Eastern Time)	Abstract Submission Deadline
June 4, 2018	Notifications to Authors
July 20, 2018	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. Please note, abstract topics are not necessarily the Session Topics/Titles. Sessions will be structured around the accepted abstracts.

INFORMATION FOR PRESENTERS

With the large number of expected submissions, authors/presenters are encouraged to submit abstracts early; the deadline is **April 27, 2018**. Do not expect an extension. In 2017 we had twice as many submissions as we had space.

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/abstract/index.cfm?ID=Wn3jUkt .

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

- Presentation title and appropriate category/topic from this call for abstracts.
- 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.

Electronic copies of presentations/posters for the proceedings and sessions must be submitted by July 20, 2018, 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. Instructions regarding hardcopies of posters will be provided later to those invited.

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. It may be possible to coordinate with the session chairs to provide a unique set of charts for the day of presentation with such information. If permitted, 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 generally 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 government 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.

Questions?

Call for Papers Inquiries
ISSTechChair@atdl-inc.com

For the latest news and information on the ISSR&D Conference 2018, visit www.issconference.org

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. These discoveries benefit humans on Earth and can be used to keep astronauts healthy on long duration space journeys.

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.

Commercial and Nongovernment Use

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 will address efforts exploit the use of the ISS for commercial endeavors. These may address business or hardware items.

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. Also included is the use of existing, new, or proposed LEO systems or hardware such as airlocks, docking adapters, observation platforms, and research or manufacturing facilities and capabilities.

Earth Science and Remote Sensing

The location of ISS in low Earth orbit affords a unique vantage point for imaging of Earth and space. Many legacy Earth observation satellites face obsolescence as the private sector begins investing in global observing systems. The ISS offers a stable earth observation platform for use in direct commercial and public use application. It can also be used as a man tended development platform for new sensors and systems.

Responsive abstracts should address the challenges and various solutions for publicly and privately funded use of the ISS for remote sensing or technology advancement to improve Earth Science and Remote Sensing.

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

Commercial companies are finding what may be economical ways of reaching and operating businesses in Lower Earth Orbit. Those on the cusp of entering these uncharted areas need to learn from those who currently obtain or manage financing for programs, projects, and investigations to new and existing ISS users. Financing, whether internal or external, is a concern of large businesses, small businesses, entrepreneurs, researchers, academia, and financers. 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 for establishing businesses in space, attracting tourists and customers 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

As we look to creating a lower earth orbit economy and furthering human space exploration, it is imperative that the risks to long duration human presence in space be mitigated. The ISS provides the operations base to understand the effect of spaceflight on the human body and human performance. It is ideal for research that will clear the path for commerce and exploration.

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.).

Innovative Solutions

This topic area addresses Innovative Solutions appropriate for commercialization. Entries in this category should be able to clearly demonstrate a strong potential to solve a critical need within ISS on orbit activity or be ISS developed and applicable to on-earth problem solving. Understanding that innovation can be unpredictable, subject topics include all the other nine abstract areas.

Responsive abstracts will describe the innovation, its level of development, and the commercialization potential as seen by the author. You do not need have commercialization funding to submit but you must identify your funding requirements. You do not need customers at this point, but you must describe your innovation such that an unrecognizing customer will realize their need for this “product” or service.

It is fully acceptable that submissions be solutions in search of a problem. That said, we are not looking for bare ideas, we expect adequate development to have been already accomplished to demonstrate the concept and paths to implementation.

Depending upon the number and level of acceptable responses, those selected may be presented in a forum separate from the usual Technical Sessions. This may be an Expo format, lightning presentations, dedicated poster round, or some other mechanism.

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 that could be used to sustain industry in space and extended space exploration flights 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. They may apply to Earth based activity, industry in LEO and human spaceflight exploration.

STEM Education

In the future, humankind may take tours of the ISS, Moon and even Mars. A new generation of scientists and explores - children and adults - needs to emerge in the areas of science, technology, engineering, and mathematics (STEM) to make this happen. The ISS is a proven focal point and platform for promoting and advancing education initiatives. The engineering and scientific capabilities and accomplishments of the ISS provide an opportunity to excite students to pursue careers these fields. Moreover, the broad spectrum of inspiring topics available for educational use allows 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.

Technology Development and Demonstration

The ISS is a testbed for technology development, and demonstration that will enable commerce in LEO, improve human spaceflight capabilities, and benefit the 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.