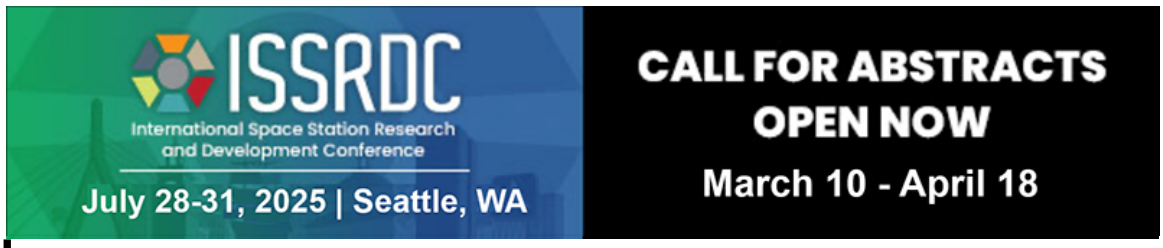

2025
CALL FOR ABSTRACTS

14th Annual International Space Station Research and Development Conference

In-Person Technical Sessions

Organized by the American Astronautical Society (AAS),
the International Space Station National Laboratory, and NASA

ABSTRACT DEADLINE: April 18, 2025

Technical Sessions: July 29-31, 2025

ISS NATIONAL LABORATORY

NASA

American Astronautical Society

Conference Overview

The 2025 International Research and Development Conference (ISSRDC) is being held Monday, July 28 through Thursday, July 31 at the Hyatt Regency Hotel in Seattle, Washington.

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 steppingstone for further exploration, new business models, and new platforms for space research.

Now in its 14th year, the conference brings together a diverse community of existing and future ISS users as well as the investment community. These users are involved in fundamental scientific research, in-space production, engineering development of low Earth orbit and deep space systems, as well as space operations and logistics research and development. Additionally, we seek commercial users who can build a business case utilizing the ISS, including commercial developers, enabling partners, entrepreneurs, and investors.

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

This document is specific to the technical sessions. Please check the ISSRDC website (www.issconference.org) for updates and the latest information on full conference planning.

Presenters and attendees of ISSRDC are required to register for the conference. There is not a separate registration for technical sessions, and technical sessions will not have a virtual option.

Deadlines and Dates

Friday, April 18, 2025 (11:59 p.m. U.S. Eastern Time)	Abstract submission deadline
Monday, May 19, 2025	Invitation notification sent to authors, authors must respond to invitation by May 22
Wednesday, July 16, 2025	Deadline for load of final presentations and posters into conference management system
Tuesday, July 29 through Thursday, July 31, 2025	Technical sessions

Instructions

Abstract submission is open to all nationalities, but the presenter must attend the conference in person. We encourage submissions from any past, present, or future ISS user, supporter, or operator with an entrepreneurial, commercial, academic, or government background.

The American Astronautical Society (AAS) ISS Research Technical Committee will evaluate abstracts based on their quality, relevance, innovation, substance merit, and future practical application. Accepted abstracts will be selected for 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. Please note that if an author selects "presentation only" or "poster only" and they are not selected for that category, they are not evaluated for the other.

See page six for abstract topics. Please note, ***abstract topics are not necessarily the session topics/titles***. Sessions will be structured around the accepted abstracts. Scientific papers are not required.

INFORMATION FOR SPEAKERS/AUTHORS OF TECHNICAL SESSION PRESENTATIONS

To view the technical session program and copies of presentations from the last year's ISSRDC, please click here.

Authors are encouraged to submit abstracts early to allow enough time for any submission difficulties. Since 2018, we have received twice as many submissions for technical session presentations as there are available spaces.

Authors may access the web-based abstract submission system directly at the Abstract Submission Site or by using the link found on the conference website at www.issconference.org.

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/primary author
- Name, affiliation, postal address, telephone number, and email address of the presenter
- Other descriptive and demographic data
- A short abstract of no more than 50 words
- An expanded abstract in Portable Document File (PDF) format of no more than two pages that includes the title and authors

Authors should write the abstract to allow evaluation against the acceptance criteria of relevance, quality, innovation, substance merit, and future practical application.

Authors accepted for presentations will receive an email invitation to present. Primary authors will have limited time to accept or decline the invitation via email. Those not responding to the invitation will be noted as declining participation. Detailed presentation instructions will be sent by email following acceptance.

Complete electronic copies of presentations and posters for the proceedings and sessions must be submitted by the date shown in Important Deadlines and Dates 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. "Walk on" charts (or presentations brought to the event venue) and updates to previously submitted presentations are not allowed.

By submitting an abstract, presentation, or poster, the author agrees to its inclusion in the program and/or conference proceedings. Copies of the abstracts, bios, contact information, posters, and presentations may be made available to all conference registrants in hard copy or electronically.

“Pre-decisional,” “pre-publication,” or “proprietary” information should not be included in abstracts or submitted presentations/posters. Addendum charts containing such material will not be possible.

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 the author’s organization, agency, or government requires export approval of their material for this conference, the author must follow that process on a schedule that allows the author to meet the conference deadlines. Completing export approval is the responsibility of the author, not of the conference organizers.

Submit your abstract at the Abstract Submission Site.
(https://www.xcdsystem.com/aas/abstract/index.cfm?ID=1bnbd4L)

Authors may email ISSRDC@astronautical.org for additional information, submission difficulties, or abstract inquiries.

For the latest news and information on ISSRDC 2025, visit www.issconference.org.

Please send conference attendance inquiries to events@ISSNationalLab.org.

Presentation Topics

The following presentation topics are not intended to be an exhaustive list of all possible subject areas but are intended to provide a forum for the presentation of related subject matter.

Biotechnology and Medicine

Microgravity's effects on physical and biological phenomena are far-ranging and include use-inspired research areas in macromolecular crystal growth, pharmaceutical development, and delivery/diagnostics systems including antibiotic effectiveness, pharmacokinetics/dynamics, microfluidic devices and nanoparticles for improved drug delivery, among others. These investigations are poised to benefit health outcomes and 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. Space-based discoveries in biology benefit humans on Earth but also help keep astronauts healthy on long-duration space journeys.

Responsive abstracts should describe the use of the ISS to improve human health using model systems of aging and disease or technologies seeking to improve drug discovery, delivery, and targeting systems that provide benefits to humans on Earth and human exploration.

Specific examples include, but are not limited to, pharmaceutical development and delivery/diagnostics systems for the improvement of human health, including antibiotic effectiveness, biomanufacturing, macromolecular crystal growth, microfluidic devices, microphysiological systems, pharmacokinetics/dynamics, tissue engineering, and stem cell research.

Fundamental Biology

Microgravity's effects on physical and biological phenomena enable fundamental research focused on animal physiology and behavior, cell biology, ecology, microbiology, and plant biology. Space-based discoveries in biology benefit humans on Earth but also help keep astronauts healthy on long-duration space journeys.

Responsive abstracts should describe the use of the ISS to study the biology and/or ecology of a living organism in the space environment to expand the frontiers of scientific knowledge.

Specific examples include, but are not limited to studies designed to understand the effects of microgravity and spaceflight on the behavior, biology, ecology, and/or physiology of an organism or community of organisms.

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. NASA, the ISS National Lab, and international partners are encouraging and facilitating commercialization opportunities as agencies continue to develop strategic policy on stimulation of a sustainable commercialized low Earth orbit 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 to utilize the ISS for commercial endeavors and may address business or hardware items.

Specific examples include, but are not limited to, economic opportunity for value creation leveraging the ISS/low Earth orbit, funding of privatized research, public-private partnerships, business models involving the ISS, barriers to commercial use of the ISS, industry strategic outlook and cooperation, promising near-term market opportunities in low Earth orbit, applications for the sustainability of Earth's resources, and any early lessons learned. Also included is the use of existing, new, or proposed low Earth orbit systems or hardware such as airlocks, docking adapters, observation platforms, and research or manufacturing facilities and capabilities.

Human Health and Performance

As we look to establish a robust economy in low Earth orbit and further human space exploration, it is imperative to mitigate the risks that long-duration spaceflight poses for humans across all physiological systems. The ISS provides the operations base to understand the effects of spaceflight on the human body and human performance as exploration missions extend to longer time in space and beyond low Earth orbit.

Responsive abstracts will describe studies on the ISS that meet the above objectives.

Specific examples include, but are not limited to, biomedical research in space, health risks due to radiation and weightlessness (e.g., musculoskeletal, sensorimotor, cardiovascular, vision adaptation), and onboard countermeasures to physiological adaptations to space (nutrition, sleep, exercise).

In-Space Production Applications

Decades of research in microgravity and the space environment have led to fundamental discoveries in new materials, processes, and cellular behavior. In many cases, these discoveries have led to the early- stage demonstration of novel materials, morphologies, and complex 3D cellular structures with improved mechanical and functional properties for use in diverse application environments. These discoveries and early-stage research demonstrations are now being targeted for commercial products by leveraging the microgravity and space environments to produce novel or superior products compared to terrestrial manufacturing and bioproduction.

Responsive abstracts should describe low Earth orbit-based applied R&D microgravity applications seeking to demonstrate space-based manufacturing and production activities that enable new business growth and capital investment, represent scalable and sustainable market opportunities, and produce reoccurring value with the potential to generate demand for and revenue from access to space.

Specific examples include, but are not limited to, optical fibers, exotic glasses, additive manufacturing, thin film deposition, organic crystals, pharmaceutical development, industrial crystals, stem cell expansion, organoids, tissue chips, and 3D biofabrication.

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), benefiting 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 or 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; applications for the sustainability of Earth's resources; and materials development/in-orbit production processes.

Remote Sensing from the ISS for Earth and Space Science

The location of the 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 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, astrophysics, heliophysics, 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, and applications for the sustainability of Earth's resources using remote sensing.

Technology Demonstration

The ISS is a test bed for technology development and demonstration that will enable commerce in low Earth orbit, improve human spaceflight capabilities, and benefit the quality of life on Earth.

Responsive abstracts should describe use of the 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, autonomous operations, 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), applications for the sustainability of Earth's resources, ISS utilization for satellite launches, onboard 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.

Workforce Development and STEM Education

A new generation of scientists and explorers need a strong foundation in the areas of science, technology, engineering, and mathematics (STEM) to compete in the global economy and to support the goals of NASA and commercial spaceflight. The ISS is a proven focal point and platform for promoting and advancing education initiatives. The engineering and scientific capabilities of the ISS and the science and technology advances made onboard the orbiting laboratory provide an opportunity to excite students to pursue careers in STEM fields. Moreover, the broad spectrum of inspiring topics available for educational use allows initiatives to reach a wide student population and engage groups not commonly targeted by STEM education programs.

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

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

Innovative Solutions

This topic area addresses innovative solutions appropriate for commercialization. Abstracts in this category should clearly demonstrate a strong potential to address a critical need within ISS in-orbit activity or a project that should be developed on the ISS to address Earth-based problems. Understanding that innovation can be unpredictable, topics that fall in this subject area could include any of the other nine abstract areas.

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

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

Depending upon the number and level of accepted responses, those selected may be presented in a forum separate from the usual technical sessions. This may be through an Expo format, lightning presentations, a dedicated plenary round, or some other mechanism.