

# SpaceOps 2016

The 14th International Conference  
on Space Operations

“Expanding the Space Community”

May 16-20, 2016  
Daejeon Convention Center,  
Daejeon, Republic of Korea

[www.spaceops2016.org](http://www.spaceops2016.org)

Abstract Submission Deadline  
**August 13, 2015**



*SpaceOps 2016*

The 14th International Conference on Space Operations  
May 16-20, 2016 / Daejeon, Korea

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# Welcome to SpaceOps 2016

In the current era of space exploration, each space mission builds to a pivotal moment near its completion in which the entirety of a project's efforts and endeavors are put to the test. In the operations phase, the successes and failures, the achievements and oversights of all prior mission phases become manifest. This is a point where we know whether or not it is on the way to success.

However, due to risks presented by a hostile and unknown space environment, increasingly complex technologies required, and growing costs compounded by shrinking budgets, the effort required to even reach this phase is monumental. As these challenges will not diminish moving forward, the cultivation of an increasingly coordinated and globally synergistic SpaceOps community is desirable as a foundation from which we can overcome these difficulties together. With the inclusion of a truly global community, we can make possible greater ambitions in the future by working together and fostering greater technical interchange.

If your organization is new to the Space Operations domain, we encourage you to come to SpaceOps conference to share your ideas, plans, techniques and technologies with others. If your organization is already familiar with the Space Operations domain, you will find a great opportunity to gather necessary feedback for your projects and missions at SpaceOps conference, as well as a chance to develop ties with colleagues devoted to the space sector, which may one day be your partners.

As a truly global community, we can make great progress in the future by working together and fostering technical interchange. In this spirit, SpaceOps is pleased to welcome all of the "startup" teams and space experts who are interested in the field of Space Operations to the SpaceOps 2016 conference. What makes this conference so exceptional is that a special topic, "Emerging Space Operations in Asia and Developing Countries" has been added under the theme of "Expanding the Space Community."

We, the SpaceOps Community, firmly believe that with an enthusiastically communicating and networking Space Operations community, we all become stronger – and mankind's dream to utilize and explore space becomes a reality.



## About SpaceOps

The International Committee on Technical Interchange for Space Mission Operations and Ground Data Systems (also known as the SpaceOps) is a spacecraft operations oriented international association consisting of representatives from the major space-faring institutions of the world. It was founded to foster continuous technical interchange on all aspects of space mission operations and ground data systems, and to promote and maintain an international community of space operations experts.

In 1990, the SpaceOps Organization started the SpaceOps Conference series as a technical forum for the space operations community that addresses state-of-the-art operations principles, methods, and tools. These biennial events attracts engineers, technologists, scientists, managers, and experts from space agencies, industry, and academia. The scope is intended to cover all spaceflight missions, including human and robotic, near Earth and deep space.

## Welcome to SpaceOps 2016

### What

**We** need the best ideas, the brightest teams, the most creative innovations, and the most insightful experiences to be presented to the broadest community of space operations professionals.

### Who

**Space** operations professionals and innovators from around the globe will be bringing their accomplishments, future plans, and innovations to share with their colleagues.

### Why

**You** will advance your mission, your organization, and your own expertise only if you stay connected with the space operations community.

### Where

**Daejeon** Convention Center (DCC) in Daejeon, Republic of Korea. Home to your host, Korea Aerospace Research Institute (KARI).

### How

**Visit [www.spaceops2016.org](http://www.spaceops2016.org)** for logistical details on how to submit abstracts. The basic information is set forth in this Call for Papers, but much more detail is available on the website

# Conference Overview

## The SpaceOps 2016 Theme: "Expanding the Space Community"

Hosted by KARI(Korea Aerospace Research Institute) and sponsored by the AIAA(American Institute of Aeronautics and Astronautics), SpaceOps 2016 is a technical forum of the space operations community that addresses state-of-the-art operations principles, methods, and tools. SpaceOps 2016 (Theme: "Expanding the Space Community") provides the opportunity for you to share experience, challenges, and innovation solutions with colleagues from around the globe.

The conference theme encapsulates the main focus of worldwide Space Program activities in the coming years, with the emphasis on:

- Enabling new participants by promoting and implementing low-cost mission development opportunities, thereby allowing more countries and institutions to take part in space development and space operations.
- Inspiring the participation from developing countries, especially for Asian, African and any other nations that are emerging players in space development. This will also facilitate discussions and global partnership opportunities between new and mature space organizations.
- Making a professional and technical network with leading-edge space operations experts in academia, government, and industry
- Attracting experts, young professionals, and students' interest to space and state-of-the-art technologies

**For more information regarding SpaceOps 2016, please visit [www.spaceops2016.org](http://www.spaceops2016.org)**

- Key Statistics from SpaceOps 2014
  - ▷ 620 attendees
  - ▷ 29 countries represented
  - ▷ 333 technical paper published

## Important Dates

Abstract submission opens	April 1, 2015
Abstract submission closes	August 13, 2015
Notification to authors	Nov 16, 2015
Registration opens	Feb 1, 2016
Final paper submission deadline	March 31, 2016
Presentation material submission	April 15, 2016
Conference dates	May 16-20, 2016



# Topic Descriptions

## **Operations Concepts and Flight Execution (OCFE)**

- Mission Operations Concepts
- Flight Operations
- Flight Execution Processes
- Operations Automation and Optimization
- Operational Validation
- Operations Concepts for Constellation & In Situ Operations
- Payload Operations Concepts
- End of Life Operations
- Fault Management and Recovery
- Knowledge Management & Transfer
- Lessons Learned Assessment & Management
- Operations Training Methodologies
- Simulation Methods & Tools for Operation Training
- Human Factor & Behaviour in Operations

## **Ground Systems, Communications and Data Processing (GSCDP)**

- Ground System Engineering
- Ground Data Systems Development, Validation and Maintenance
- Advanced Technologies for Space Operations
- Flight Control Systems and EGSE
- Ground Segment Architectures and Design
- Payload Monitor and Control
- On-board/ground Interfaces
- Data Management
- Space Cyber Security
- Network Operations and Management
- Ground Network Implementation
- Ground Communications
- Ground Network and Antenna Concepts
- Communications Architectures for Complex Constellations
- Archive Systems and Data Mining
- Information Architectures and Information Models
- Software Development and Maintenance
- Control Centre Architecture

## **Mission Design and Management (MDM)**

- Mission Architectures
- Challenges in Trajectory Design and Analysis
- Mission Engineering and Planning
- Mission Simulation and Modelling
- Cost-Effective Operations
- International Cooperation for Mission Management
- Managing Mission Risks and Opportunities
- Public Engagement
- Regulations and Laws

## **Planning and Scheduling (PS)**

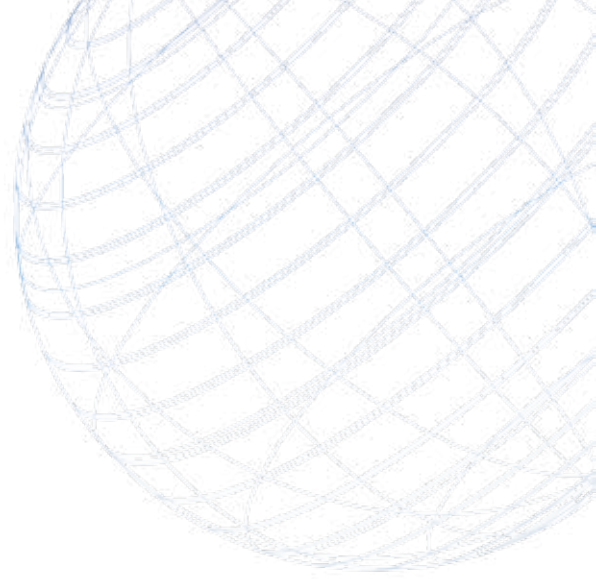
- Mission Planning and Scheduling Methods
- Mission Planning Systems
- Planning and Scheduling Systems
- Asset Scheduling
- Resource Management
- Real-time Re-planning Techniques
- Science Observation Planning

## **Small Satellite and Commercial Space Operations (SSCSO)**

- Cubesat and Nanosat Operations
- Cubesat Networks/Swarms; Constellation Operations
- TT&C Systems & Flight Operations for Small Satellites
- Challenges with Small Satellite Operations
- End of Life Operations
- Nano-Technologies
- Air and Space Traffic Management with Satellites
- Commercial Manned Spaceflight
- Commercial Orbital Transportation Services
- Commercial Spaceports
- Lean and Lights-out Commercial Control Centers
- Managing a Constellation of Satellites
- Operations with Space Tourists On-board
- Training Spaceflight Participants

▶▶▶ *Continued*





### ***Guidance, Navigation and Control (GNC)***

- Flight Dynamics and Navigation
- Attitude Determination and Control
- Interplanetary Missions
- Formation/Constellation Management
- Global Navigation Systems and Applications
- GNC and Astrodynamics Software
- Space Debris and Collision Avoidance

### ***Cross Support, Interoperability and Standards (CSIS)***

- Communications Standards (Link Layer, Network Layer, Application Layer etc.)
- Communications Standards - Network
- Communications Standards - Application Layer
- Software Standards
- Interoperability and Cross Support Standards
- Telerobotics Standards
- Advanced Standards for Future Missions
- Secure Interoperability and Cross Support
- Space Internetworking Standards
- Other relevant Standards

### ***Human Systems and Operations (HSO)***

- Human Spaceflight
- ISS Operations
- Training for Human Operations
- Mission Architectures for Human Spaceflight
- Flight Crew Operations Techniques
- Long Duration Human Mission Concepts
- International Factors for Crew Operations
- Human Lunar/Mars missions

### ***Launcher, Rockets and Balloon Operations (LRBO)***

- Launchers and Facilities
- Balloons and Sounding Rockets
- Launch Vehicle Propulsion Systems and Test Facilities
- Pre-Launch Integration and Test
- Launch Vehicle Availability, Reliability, and Risk Management
- Launcher Integrated Health Monitoring
- Test Operations
- Ground Processing for vehicles and payloads
- Real-time Launch Operations

### ***Emerging Space Operations in Asia and Developing Countries (ESO, Special Topic in 2016)***

- Introduction to Newly Developed Space Program
- Newly Operating Space Center and Ground System
- Any other themes related to Emerging Space Program in Asia and Developing Countries

# Abstract Requirements

The SpaceOps 2016 conference organizing committee's highest priority is to accept abstracts and papers that emphasize unique and innovative practices, technologies, and experiences from which others in the space operations community will benefit. When all abstracts are received, the Technical Program Committee (TPC) – staffed by volunteers from the agencies and industry partners of the SpaceOps Organization – will evaluate the submitted abstracts based upon (but not limited to) these five evaluation criteria:

- Relevance to space operations
- Substantive merit (content and realism)
- Balance and variety in the sessions
- Innovation
- Applicability and benefit to future missions

**Note:** For the purpose of Daejeon conference and to encourage the participation of new comers, some special evaluation criteria and deadline dates are applicable only for the special topic of "Emerging Space Operations in Asia and Developing Countries" in the SpaceOps 2016 conference.

# Oral/Poster/e-Poster Sessions

When you submit your abstract, you will be able to choose your preferred presentation approach: Oral Session, Traditional (Paper) Poster Session, or Electronic Poster Session. The characteristics of these sessions are:

- Oral Sessions are 20 minute lectures followed by 5 minutes of Q&A.
- Poster Session presentations are run for several days and are also interactive, centered on the presenter's hardcopy display. The recommended size is A0 (841x1189 mm, 33.1x46.8 inch, same with 16 sheets of A4 size) and it can't be allowed exceed A0 size.
- Electronic Poster sessions will have a unique ability to display software demonstrations and the opportunity to interact with attendees supported by a conference-provided active electronic display. The recommend file types for e-Poster are **MS Power Point, Adobe PDF and Prezi**.

# Procedures for Abstract Submission

SpaceOps 2016 Technical Program Committee (TPC) requests that you to submit your 300~500 (No more than 600) words abstract electronically through the conference website at [www.spaceops2016.org](http://www.spaceops2016.org) or ScholarOne in AIAA website. This website will be open for the submission of abstracts until August 13, 2015. We request that you limit your abstract to text only, no graphics. You will have the opportunity to indicate your preference of presentation style (oral/poster/e-Poster) and the most appropriate topic area. The TPC will then make the best effort at placing your submission in the program in a way that best connects you with your audience. Please consider that due to the overall scheduling constraints, the allocation of the topic area could be changed by the decision of the TPC. Please feel free to contact us with any questions. The TPC has a plan to award a "**Best Student Paper**" for the conference. So, we are asking that student primary authors identify themselves when submitting an abstract. To qualify, the abstract and manuscript must be the primary work of a student, as indicated by being the lead author, and the presentation must be made by the student. Note that some of the national space agencies may provide monetary support for student participants. Consult the SpaceOps2016 web site [www.spaceops2016.org](http://www.spaceops2016.org) for information relating to student assistance programs offered by your country's agency. Authors having issues submitting abstracts electronically should contact ScholarOne Technical Support at [AnnA@aiaa.org](mailto:AnnA@aiaa.org). Questions about the abstract or technical topics, or about the program format or policies of the conference, should be directed to the Technical Program Committee Chairs: Chair, Bangyeop Kim (KARI, [kby@kari.re.kr](mailto:kby@kari.re.kr)) Deputy Chair, Adrew Z. Downen (JPL NASA, [andrew.z.downen@jpl.nasa.gov](mailto:andrew.z.downen@jpl.nasa.gov))

## Special Reminder for Conference Participation

### Generals

- To be allowed to present at any session, you have to submit an abstract in advance.
- All conference presenters in both oral and poster sessions are required to submit manuscripts that comply with the standard requirements for professional conferences, as documented in the AIAA "Author's Kit" that is supplied to accepted authors.
- If the presenter does not appear in person to present at the scheduled session, the paper will not be published in the (electronic) proceedings. Videotaped presentations will not be allowed.
- If the author's organization/agency/nation requires export approval of the material for this international conference, the author must follow that process, and must do it on a schedule that allows to meet the conference deadlines.
- All authors are required to register for the conference in the same fashion as all other attendees.

For all manuscripts submitted, and for all presentations in the oral/poster/e-poster sessions, we will not accept overt marketing material or "sales pitches." These forums and products are for the exchange of technical information, not for marketing. The information must impart some benefit to the space operations community independent of any product or service that may be incidentally mentioned in the presentation materials. For the marketing or commercial purpose, please look at the Exhibition Opportunities.

### Exhibition Opportunities

Marketing and commercial promotion is welcome and encouraged in the exhibition venue. The conference venue at the Daejeon Conference Center provides ample space for exhibitors. We encourage industry members to bring their best and most innovative products, systems, and services to the SpaceOps 2016 Exhibition for broad exposure to the space operations professionals in attendance. The Exhibition forum excels at connecting industry providers with space operations customers, bringing maximum benefit to both. Exhibition space is currently available for SpaceOps 2016. For more information about the exhibition or to request an exhibitor prospectus, contact SpaceOps 2016 Secretariat at [secretariat@spaceops2016.org](mailto:secretariat@spaceops2016.org) or (+) 82.42.472.7464.

### Sponsorship Opportunities

Various sponsorship opportunities are available for SpaceOps 2016. Sign on as a sponsor and demonstrate your support for the space operations community. For more information on sponsorship opportunities, contact SpaceOps 2016 Secretariat at [secretariat@spaceops2016.org](mailto:secretariat@spaceops2016.org) or (+) 82.42.472.7464.

### Poster Conference Book

The TPC has chosen to support the development of a Post Conference Book (PCB) for SpaceOps 2016. The TPC will review final papers just prior to the conference and select approximately 10% of final papers.

### Registration Fee Support for Student Presenters

Some of student participants who are both the first author and the presenter can have a chance to being exemption from the registration fee. For the detail, refer the information on the SpaceOps 2016 website [www.spaceops2016.org](http://www.spaceops2016.org).