74th INTERNATIONAL ASTRONAUTICAL CONGRESS

2-6 October 2023, Baku, Azerbaijan

Global Challenges & Opportunities: Give Space a Chance

Call for Papers & Registration of Interest
Connecting @ll Space People

www.iafastro.org
1. Message from the International Astronautical Federation (IAF)

Dear Colleagues,

The 74th International Astronautical Congress will take place in Baku, Azerbaijan between 2nd and 6th October 2023.

It is an honour for the International Astronautical Federation to invite world experts specialists in the field of space and to offer all space enthusiasts an opportunity to support and promote the general theme of the Congress “Global Challenges and Opportunities: Give Space a Chance.”

There is a rich history behind holding the IAC in Azerbaijan. The 24th International Astronautical Congress was held in Baku in 1973 for the first time in the Soviet Union upon the Initiative of Azerbaijan’s National Leader Heydar Aliyev.

This IAC 2023 aims to gather researchers and professionals to discuss new developments in space science and exploration, space applications and operations, space technology, space infrastructure, space and society, and much more.

We have the great pleasure to invite you to propose one or more papers (oral or interactive) in any of the categories scheduled for the different symposia of the Congress. Please visit the instructions in this document.

I would like to thank you in advance for your scientific contribution to the IAC 2023 and I and the incoming IAF President Clay Mowry look forward to seeing you in Baku, Azerbaijan.

Sincerely,

Pascale Ehrenfreund
President, International Astronautical Federation (IAF), France

2. Message from the Local Organizing Committee

The space gives us extensive opportunities to dare, to create, to innovate, and to work in synergy towards a thriving, advanced future of the mankind. And the International Astronautical Congress is an excellent platform that brings us all together, united in the face of global challenges and ready to explore the untapped potential of the space for the benefit of the humanity.

In 2023, the global space community will convene in Baku at the International Astronautical Congress once again, exactly 50 years after Baku hosted the 24th edition of the IAC and became the first and the only city in the region to do so. This, certainly, is a major occasion in the history of the space industry development in Azerbaijan, as it is one of the core priorities of our vision as a country aspiring to foster the formation of regional space ecosystem and strengthen its position as an emerging space nation. What’s more, the 74th edition of IAC will give you a chance to get a first-hand experience of the unmatched Azerbaijani hospitality, expose yourself to genuine cultural immersion, and enjoy the diverse charms of our beautiful country.

On behalf of the Space Agency of the Republic of Azerbaijan, it is a great pleasure to host the 74th International Astronautical Congress (IAC) in Baku in 1973 has left us with. The 24th IAC was one of the most memorable congresses in the history, leaving a lasting impression on guests. We are happy to mention that, in his letter, Stark Draper, the former President of the IAC in 1973, thanked the Azerbaijani community for their warm welcome, as well as congress organizers for arranging such an outstanding event. These words have inspired us and Azercosmos, as a host organization, to put forward the candidacy of Baku city in a bid to host the 74th IAC in Baku in 2023!

Now that the IAC returns to our region after such a long time, it will bring a breath of fresh air not only to Azerbaijan, but to the neighboring countries. It will contribute to the regional space platform with many new ideas, discussions and debates, while also creating opportunities for guests to immerse in Azerbaijan’s rich culture. As the transportation, business and space hub of the region, Azerbaijan will ensure the greatest benefits to all the participants of the upcoming IACs.

In terms of the organizational standard, the IAC in Baku will be approached with special attention and dedication. Our Institutions and people have mobilized their powers in order to organize and deliver an exceptional congress experience to all participants. And we are working strenuously with our partners to make IAC 2023 Baku event that could reach everyone, everywhere!

We sincerely hope you grab the chance to demonstrate your research papers publicly by being a contributor in one or more of the 180 technical sessions, and share knowledge and experience with collaborators working inside your sphere. And a certain number of papers will have the privilege of moving on to the next stage as vibrant presentations or oral performances.

We would like to encourage our international partners, individuals from governmental, scientific, academic, and commercial entities; heads of space agencies and space industries; scientists, engineers, enthusiasts, young professionals, and students, in one word: the entire space community, to become parts of the innovative, immersive, and fascinating space event in Baku, Azerbaijan, in 2023.

Sincerely,

Samaddin Azadov
Chair, Azercosmos, Azerbaijan

3. Message from the International Programme Committee (IPC) Co-Chairs

It is a real privilege and a great pleasure to host the 74th International Astronautical Congress IAC 2023 in Baku, Azerbaijan. Azerbaijan will welcome the global space community to Baku and offer an exceptional congress experience united by the theme of the past and the future under the theme Global Challenges and Opportunities: Give Space a Chance.

On behalf of Azercosmos, Space Agency of the Republic of Azerbaijan, we invite you to be part of this unique event and join us in Baku. We are looking forward to seeing you in Baku at the 74th IAC 2023.

In addition, we would like to extend our cordial invitation to the professional space community to participate in the IAC 2023. We encourage you to submit your abstracts and join us for this remarkable event.

We hope to see you in Baku and look forward to your participation at the 74th IAC 2023.

Sincerely,

Dunay Badirkhanov
IPC Co-Chair, Vice-chairman/CTO, Azercosmos, Azerbaijan

Giorgio Sacoccia
IPC Co-Chair, President, Italian Space Agency (ASI), Italy
4. Messages from the Supporting Organizations

Message from the International Academy of Astronautics (IAA)

For well over the past sixty years the International Academy of Astronautics, created at the outset of a new Space Age, has provided answers and solutions to the immense challenges that have faced the world community. This has made it a foremost center of excellence in Astronautics, thanks to the concerted efforts of its dedicated members who developed its vision for the role of humankind in Space.

Aiming to mobilize the best talents from many fields of science and technology, the Academy has been most successful in developing a wide array of new activities to explore the unlimited possibilities of Space to improve the quality of life for people all over the world. Decades of continuous progress have been achieved through important international events such as the highly successful Summits in Washington DC and Mexico attended by 25 to 35 Heads of Space Agencies, as well as nearly 25 standalone IAA conferences in the world and 13 symposia each year at the International Astronautical Congress.

The International Academy of Astronautics (IAA) is pleased to invite you to attend the IAA Academy Day open meeting on Sunday and the various IAA symposia throughout the week. The Academy is organizing 13 symposia at next year’s IAC in Baku, representing about one third of the IAC technical programme, and will co-host some interesting sessions with the IAF and the IISL. On the occasion of the Academy Day, newly elected Academicians will be introduced and the major IAA Awards will be given.

Please join us in advancing humankind’s reach into the Space frontier!

John Schumacher
President, International Academy of Astronautics (IAA)

Message from the International Institute of Space Law (IISL)

On behalf of the International Institute of Space Law, I am pleased to invite you to attend our 66th Colloquium on the Law of Outer Space in Baku, Azerbaijan. This year’s Colloquium consists of seven exciting sessions and explores a range of highly relevant issues. Legal questions raised by current public and private space activities will be addressed and debated by the world’s finest space lawyers as well as students and young professionals. IISL will also co-host some interesting sessions with the IAF and the IISL. On the occasion of the Academy Day, newly elected Academicians will be introduced and the major IAA Awards will be given.

Please join us in advancing humankind’s reach into the Space frontier!

Kai-Uwe Schrogl
President, International Institute of Space Law (IISL)

Message from the Space Generation Advisory Council (SGAC)

On behalf of SGAC, we are pleased to invite you to the 21st Space Generation Congress (SGC) to be held in Baku, Azerbaijan on 28-30 September 2023, prior to the 74th International Astronautical Congress (IAC).

In 2023, SGC will focus on emerging space actors, with a view towards involving students and young professionals in the space sector from as many parts of the world as possible. Being the only event of its kind, SGC offers the next generation of space leaders the opportunity to network and examine critical questions that are facing the space and international community at large.

It is with great pleasure that we would like to invite our global youth community to submit an abstract for the 74th IAC that will be held in Baku. The IAC brings together scientists, practitioners, engineers, and leaders of the space industry and of agencies together at a single forum to discuss recent research breakthroughs, technical advances and existing opportunities, as well as to grow their space careers.

We are looking forward to welcoming you to Baku!

Hamza Hameed
Chair, Space Generation Advisory Council (SGAC)

Anthony Yuen
Co-Chair, Space Generation Advisory Council (SGAC)
5. International Astronautical Federation (IAF)

Founded in 1951, the International Astronautical Federation is the world’s leading space advocacy body. The IAF has 468 members from 75 countries, including all leading space agencies, companies, societies, associations and institutes worldwide.

Following its theme - “A space-faring world cooperating for the benefit of humanity” and its motto “Connecting GI Space People” - the Federation advances knowledge about space and fosters the development and application of space assets by advancing global cooperation.

As organizer of the annual International Astronautical Congress (IAC), and other meetings on specific subjects, the IAF actively encourages the development of space for peaceful purposes and supports the dissemination of scientific and technical information related to space.

International Astronautical Federation
100 Avenue de Suffren
75015 Paris, France
Tel: +33 1 45 67 42 60
Website: www.iafastro.org

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IAF EXECUTE

The International Academy of Astronautics is a community of leading experts committed to expanding the frontiers of space, the newest realm of human activity. To foster the development of astronautics, the Academy undertakes a number of activities, including the recognition of outstanding contributors through elections and awards. It also facilitates professional communication, develops and promotes new ideas and initiatives, engages the public and fosters a sense of community among the members. The IAA is a unique international non-governmental organization established in 1960 and recognized by the United Nations in 1996. It is an honorary society with an action agenda. With about 1200 elected members and corresponding members from 91 nations, the International Academy of Astronautics works closely with space agencies, industry, the academic community and the national science and engineering academies to determine needs and objectives and to help shape policy and forge cooperation by means of studies, position papers, conferences and publications. The IAA has published more than 70 studies to date and is engaged in the preparation of about 40 others. The Academy also publishes four book series and five journals and organizes about 25 conferences and regional meetings per year focused on the development and promotion of all space activities and covering all continents including space developing countries. In addition, the Academy activity also includes, in cooperation with the International Astronautical Federation and the International Institute of Space Law, the traditional contribution to the International Astronautical Congress (IAC), where the Academy organizes 13 symposia. The Academy also continues to enjoy its participation in the COSPAR Assemblies and the International Society for Photogrammetry and Remote Sensing (ISPRS) congress. Although the IAA has many connections to these and other similar organizations, it is distinctive as the only International Academy of elected members in the broad area of astronautics and space.

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7. International Institute of Space Law (IISL)

Founded in 1960, the International Institute of Space Law (IISL) is an independent non-governmental organization dedicated to fostering the development of space law. The membership of the IISL is composed of individuals and institutions from more than forty countries, elected on the basis of their contributions to the field of space law or other social sciences related to space activities. Additionally, prospective membership is open to students and young professionals with a demonstrated interest in space law.

Since 1992, the IISL has organized the annual Manfred Lachs Space Law Moot Court Competition. The competition is based on a hypothetical space law case, and is written by IISL members. Approximately sixty student teams from universities in Africa, the Asia Pacific, Europe, and North America participate. The competition is an important part of the organization ’s outreach programme, and is its principal mechanism for engaging future generations of space law professionals. The regional champions compete in the World Finals, which take place at the IAC and are judged each year by judges of the International Court of Justice. This unique feature makes the Manfred Lachs Moot Court one of the most prestigious moot court competitions in the world.

The IISL is an officially recognized observer at sessions of the United Nations Committee on the Peaceful Uses of Outer Space, and its Scientific & Technical and Legal Subcommittees. In cooperation with the European Centre for Space Law (ECSL), the IISL organizes an annual space law symposium for the delegates and staff attending the sessions of the UNCOPUOS Legal Subcommittee. In addition the Institute organizes a variety of conferences on space law throughout the year in locations all over the world. It publishes an annual volume of IISL Proceedings with papers and reports of all these activities during the year.

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8. Space Generation Advisory Council (SGAC)

The Space Generation Advisory Council in Support of the United Nations Programme on Space Applications is a global non-governmental, non-profit (US 501(c)(3)) organization and network which aims to represent university students and young space professionals aged 18-35 to the United Nations, space agencies, industry, and academia. Headquartered in Vienna, Austria, the SGAC network of members, volunteers, and alumni has grown to more than 21,000 members representing more than 165 countries. SGAC was conceived at UNISPACE III in 1999, as part of the Vienna Declaration, "To create a council to support the United Nations Committee on the Peaceful Uses of Outer Space, through raising awareness and exchange of fresh ideas by youth. The vision is to employ the creativity in advancing humanity through peaceful uses of space". SGAC holds Permanent Observer status at the United Nations Committee on the Peaceful Uses of Outer Space, contributing to discussions on the role of space in achieving the UN Sustainable Development Goals. As a volunteer-run organization, SGAC believes in empowering its members and providing them with opportunities for professional development through roles in the SGAC teams.

Further information regarding SGAC can be found at: www.spacegeneration.org

Space Generation Advisory Council (SGAC)
European Space Policy Institute
Schwarzenbergplatz 6
A-1030 Vienna, Austria
E: info@spacegeneration.org
W: www.spacegeneration.org
Facebook: @spacegeneration
Twitter: @SGAC

9. Message from the IAF Vice President for Technical Activities

The International Programme Committee is pleased to invite you to submit an abstract for consideration for the 74th International Astronautical Congress to be held in Baku, Azerbaijan from 2 to 6 October 2023. The Congress is organized by the International Astronautical Federation (IAF), hosted by the Space Agency of the Republic of Azerbaijan (Azercosmos), and will be supported by the International Academy of Astronautics (IAA), the International Institute of Space Law (IISL) and the Space Generation Advisory Council (SGAC) who contribute to the IAC through their particular events and symposia. The Space domain is experiencing quick modifications; one could say a revolution, both for users and developers of Space solutions. Coming years will be for sure a game changer for all space actors. It is the right time to join the global space community at this exciting international gathering – and play an active role in the Technical Programme by presenting your recent work. Holding the Congress under the theme “Global Challenges and Opportunities: Give Space a Chance” in Azerbaijan’s capital will make a significant contributions to the establishment of closer ties with foreign space agencies, companies and organizations, to the development of human capital.

This “Call for Abstracts” is a precursor to a subsequent submission of a final paper, which may be presented at the 74th IAC. Authors are invited to submit an abstract regarding an original, unpublished paper that has not been submitted in any other forum. Abstracts must fit into one of the following IAC categories: A. Science and Exploration; B. Applications and Operations; C. Technology; D. Infrastructure; E. Space and Society. Abstracts must be written in English and the length shall not exceed 400 words. Tables or drawings are not allowed in the abstract. Submitted abstracts can be considered for oral presentations (as ‘Short Talks’ in the Symposia) and for interactive presentations.

Submit your abstract through the online IAF portal at https://iafastro.directory/iac/account/login/ by 28 February 2023. Submitted abstracts will be evaluated by the Session Chairs on the basis of technical quality and relevance to the session topics. Abstracts will be considered for an oral or interactive presentation. All selected papers will be treated as equally important in the presentation sessions and Congress Proceedings, differing only in the format of the presentation sessions (in other words, Oral Presentation papers will NOT be considered more important than Interactive Presentation papers).

Their evaluation will be submitted to the International Programme Committee, which will make the final decision during the IAF Spring Meetings to be held in March 2023 in Paris, France. Please note that any relevance to the Congress main theme will be considered as an advantage. Accepted abstracts will be displayed on the Congress website and published in the IAC Congress Proceedings. We look forward to receiving your abstracts for IAC 2023 and please check the IAF website regularly to get the latest updates on the Technical Programme!

Lionel SUCHET
Vice President, Technical Activities
International Astronautical Federation (IAF)
A1.6 Astrobiology and Exploration

Space exploration planning now includes ambitious goals like human missions to the Moon and Mars, and exploited robotics exploration of bodies relevant for astrobiology such as the Mars surface and the primary ocean world Europa. Enceladus, and Titan. Astrobiology, therefore, becoming a space flight science, ready for direct measurements of habitability and the presence of life off Earth in many places. The session aims to present studies on astrobiology, astrochemistry, life detection, and planetary protection.

Co-Chairs

- Patricia Navarro
  Deutsche Aerospace (DFVLR) — GERMANY
- Stephan Gross
  Deutsche Aerospace (DFVLR) — GERMANY

Rapporteur

- Tetyana Milojevic
  Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

A1.7 Life Support, Habitats and EVA Systems

This session will address strategies, solutions and technologies in providing for human requirements during future deep space and planetary/lunar surface exploration.

Co-Chairs

- Ulrich Kamber
  Airbus Defence and Space (Ariane Space) — FRANCE
- Turhan Bozkurt
  Maxar Technologies (MRP) — UNITED STATES

Rapporteur

- Giorgi Dvadze
  Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

A1.8 Biology in Space

This session focuses on aspects of biology and biological systems related to gravity-based and space flight experiments as well as topics not covered by other sessions of this symposium.

Co-Chairs

- Didier Chaput
  Centre National d’Études Spatiales (CNES) — FRANCE
- Fengyuan Zhang
  Beijing University — CHINA
- Jonny McCleary
  The Aerospace Corporation — UNITED STATES

A1.9 Microgravity Sciences and Processes Symposium

The objective of the Microgravity Science and Processes Symposium, organized by the International Astronautical Federation (IAF), is to highlight and discuss the state of the art in Microgravity Science and Processes and promote and work for the future of this field as part of human exploration. The session shows cover all microgravity science disciplines (material science, fluid physics, combustion science, fundamental physics), recent results and research perspectives, together with relevant technology developments.

Co-Chairs

- Valentina M Ниена
  Université Libre de Bruxelles — BELGIUM
- Angelika Diefenbach
  Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

A2.1 Gravity and Fundamental Physics

This session is devoted to the search for new fields of research in condensed matter physics and gravitational physics including cosmic fluids, critical fluids, equivalence principle, atomic clock and plasma physics.

Co-Chairs

- Horia Serghie
  Ghent University — GERMANY
- Antonio Viviani
  University degli Studi della Campania “Luigi Vanvitelli” — ITALY

Rapporteur

- Jancy McPhee
  The Aerospace Corporation — UNITED STATES

A2.2 Fluid and Materials Sciences

The core topic of the session is to present research findings in fluid and materials sciences, multi-phase and chemically reacting flows including theoretical modeling, numerical simulations, and results of ground-based laboratory and space experiments.

Co-Chairs

- Nikola R. Tsvetkov
  Université Paris-Saclay — FRANCE
- Satoshi Matsukawa
  Japan Aerospace Exploration Agency (JAXA) — JAPAN

Rapporteur

- Thomas Driebe
  Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

A2.3 Radiation Fields, Effects and Risks in Human Space Missions

This session focuses on the results of ground-based preparatory experiments from all disciplines.

Co-Chairs

- Valentina M Ниена
  Université Libre de Bruxelles — BELGIUM
- Antonio Viviani
  University degli Studi della Campania “Luigi Vanvitelli” — ITALY

Rapporteur

- Malcolm S. Innis
  Université Paris-Saclay — FRANCE

A1.5 Radiation Fields, Effects and Risks in Human Space Missions

The major topic of this session is the characterization of the radiation environment by theoretical modeling and experimental data, radiation effects on physical and biological systems, countermeasures to address and radiation risk assessment.

Co-Chairs

- Lawrence Pinsky
  University of Houston — UNITED STATES
- Gerhard Reiter
  Deutsche Aerospace (DFVLR) — GERMANY

Rapporteur

- Perumal Senthil
  Prairie View A&M University — UNITED STATES
A2.5 Facilities and Operations of Microgravity Experiments
This session is devoted to the development and operation of new and existing facilities and concepts for the future, ground and flight operation (minimization, robotics, hardware & software).
Chair:
Norbert Frischauf
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY
Rapporteur:
Stephan Ulamec
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY

A2.6 Microgravity Sciences on board ISS and beyond
This session focuses on the presentation of scientific and operational results obtained from microgravity sciences research conducted on large orbital platforms, in particular the ISS. Papers on planned or newly developed research topics and experimental scenarios are also invited. The session is not limited to the usage of the ISS but comprises the preparation scenarios for further long term flight opportunities beyond the low Earth orbit such as Deep Space Gateway.
Chair:
Angelina Steinbach
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY
Rapporteur:
Peter Graf
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY

A2.7 Life and Physical Sciences under reduced Gravity
This session focuses on the presentation of scientific and operational results obtained from life and physical sciences research conducted on large orbital platforms, in particular the ISS. Papers on planned or newly developed research topics and experimental scenarios are also invited. The session is not limited to the usage of the ISS but comprises the preparation scenarios for further long term flight opportunities beyond the low Earth orbit such as Deep Space Gateway.
Chair:
Angelina Steinbach
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY
Co-Chair:
Coco Thiel
University of Zurich — SWITZERLAND
Co-Chair:
Peter Graf
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY

A2.1P Interactive Presentations - IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM
This session offers a unique opportunity to deliver your messages in an interactive presentation on any of the subjects of Microgravity Sciences and Processes addressed in the classic sessions. The presentation will be displayed on a digital screen in a dedicated location and available for every of Congress attendees for the entire Congress week. An audience present at this location will be invited to participate actively in the discussion of the presentation. The session will be followed by a dedicated discussion forum where interested attendees can present their questions and exchange with the presenters. Authors are encouraged to prepare a short video clip (max 2 minutes), which specifically presents the topic and interacts with the audience. The Interactive Presentation may take advantage of all electronic display capabilities, such as PowerPoint charts, embedded hot links, slides, audio-visual clips, etc. Audience will also be invited to present the author of the first Interactive Presentation in the A Category at a special ceremony. An Abstract that follows the standard format must be submitted by the deadline for standard IC abstracts.
Chair:
Norbert Frischauf
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY
Rapporteur:
David Korsmeyer
NASA Jet Propulsion Laboratory — UNITED STATES

A3.2 Moon Exploration – Part 3
This session will address current and future lunar missions. The sessions will address orbital missions, robotic surface missions, as well as life sciences on the Moon, microwave utilization and preparatory activities for future solar-system exploration.
Chair:
Bernard Foing
ESA - European Space Agency — THE NETHERLANDS
Rapporteur:
David Korsmeyer
NASA Jet Propulsion Laboratory — UNITED STATES

A3.3 Mars Exploration – Missions Current and Future
The planet Mars is being explored now and in the coming years with multiple robotic missions from a variety of nations. This session will cover current results from ongoing Mars missions and the designs for proposed Mars missions.
Chair:
Vincenzo Sgouros
Thales Alenia Space Italia — ITALY
Rapporteur:
Marina F. Fedi
University of Milano — ITALY

A3.4 Small Bodies Missions and Technologies (Part 1)
This session will cover the missions and technological aspects related to the exploration of small bodies including a search for pre-biotic signatures.
Chair:
Sue teen Mccartney-Leeder
Space Technology (Qld) Ltd. — AUSTRALIA
Rapporteur:
David Korsmeyer
NASA Jet Propulsion Laboratory — UNITED STATES

A3.5 Solar System Exploration including Ocean Worlds
This session covers robotic missions for solar system exploration (inner, outer and planets and their satellites, and space plasma physics) except the Earth, Moon, Mars, and small bodies missions. Papers dealing with missions of the upcoming class. Special emphasis on papers addressing missions to so-called Ocean Worlds (Europa, Enceladus, Titan) is sought. Papers covering both new mission concepts as well as the associated specific technologies are invited.
Chair:
Stephen Ulamec
Deutsches Zentrum für Luft- und Raumfahrt (DLR) — GERMANY
Rapporteur:
Marco D. Boyaran
NASA Jet Propulsion Laboratory — UNITED STATES

A3.6 Interactive Presentations - IAF SPACE EXPLORATION SYMPOSIUM
This session offers a unique opportunity to deliver your messages in an interactive presentation on any of the subjects of Space Exploration addressed in the classic sessions. The presentation will be displayed on a digital screen in a dedicated location and available for every of Congress attendees for the entire Congress week. An audience present at this location will be invited to participate actively in the discussion of the presentation. The session will be followed by a dedicated discussion forum where interested attendees can present their questions and exchange with the presenters. Authors are encouraged to prepare a short video clip (max 2 minutes), which specifically presents the topic and interacts with the audience. The Interactive Presentation may take advantage of all electronic display capabilities, such as PowerPoint charts, embedded hot links, slides, audio-visual clips, etc. Audience will also be invited to present the author of the first Interactive Presentation in the A Category at a special ceremony. An Abstract that follows the standard format must be submitted by the deadline for standard IC abstracts.
Chair:
Christian Goldfinger
Canadensys Aerospace Corporation — CANADA
Rapporteur:
Bernard Foing
ESA - European Space Agency — THE NETHERLANDS
A4

**52nd IAA SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – THE NEXT STEPS**

This symposium, organized by the International Academy of Astronomers (IAA), covers the strategic plans, architectural concepts and technology development for future human exploration of the Moon, Mars, Lagrange Points and NEOs.

**Co-Chairs**

Maria Antonietta Perino

Thales Alenia Space Italia — ITALY

Kathryn Denning

York University — UNITED STATES

**A5.1** Human Exploration of the Moon and Lunar Space

This session will examine the scenarios and infrastructure required to support human exploration of the Moon and Lunar Space. Papers are invited to discuss technology roadmaps as well as to discuss how to achieve international cooperation.

**Co-Chairs**

Neville Clifford

Avalon Space — CANADA

Michael Boly

Avalon Space — UNITED STATES

**A5.2** Human Exploration of Mars

This session will examine the scenarios and infrastructure required to support human exploration of Mars and the moons of Mars. Papers are invited to discuss technology roadmaps as well as to discuss how to achieve international cooperation.

**Co-Chairs**

Marcia Finnelli

University of Rome "Tor Vergata" — ITALY

Kathy Lockard

ICF Incorporated — UNITED STATES

**A5.3** Human and Robust Partnerships in Exploration - Joint session of the IAA Human Spaceflight and IAF Exploration Symposia

This session will examine the scenarios and infrastructure required to support human exploration of Mars and the moons of Mars. Papers are invited to discuss technology roadmaps as well as to discuss how to achieve international cooperation.

**Co-Chairs**

Marcia Finnelli

University of Rome "Tor Vergata" — ITALY

Kathy Lockard

ICF Incorporated — UNITED STATES

**A5.4** Deep Space Habitats and Resources

This session will examine the scenarios and infrastructure required to support human exploration of Mars and the moons of Mars. Papers are invited to discuss technology roadmaps as well as to discuss how to achieve international cooperation.

**Co-Chairs**

Maria Antonietta Perino

Thales Alenia Space Italia — ITALY

Rick Krebs

University of Wisconsin - Madison — UNITED STATES

**A5.5** Interactive Presentations - 29th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM

This symposium is organized by the International Academy of Astronomers (IAA), covers the strategic plans, architectural concepts and technology development for future human exploration of the Moon, Mars, Lagrange Points and NEOs.

**Co-Chairs**

Mark A. Skinner

The Aerospace Corporation — UNITED STATES

Thomas Koblet

SwissAerospace Association — SWITZERLAND

**A6.1** Space Debris Detection, Tracking and Characterization - SST

This session will address the current state of space debris tracking and characterization, and results of space debris characterization.

**Co-Chairs**

Mark A. Skinner

The Aerospace Corporation — UNITED STATES

Christian Sallaberger

University of Manchester — UNITED STATES

**A6.2** Modelling and Risk Analysis

This session will address the characterization of the current and future debris populations and methods for risk assessment. Risk analysis is essential in evaluating the risk of collision for robotic and human missions.

**Co-Chairs**

Mark A. Skinner

The Aerospace Corporation — UNITED STATES

Christian Sallaberger

University of Manchester — UNITED STATES

**A6.3** Impact-Induced Mission Effects and Risk Assessments

This session will address the follow-up of space debris by impact with spacecraft. Space debris populations and mission risk assessments, such as: Space debris monitoring and detection, Space debris mitigation, Space debris risk analysis, Space debris risk assessment, Space debris protection and shielding studies, laboratory impact experiments, numerical simulations, and on-board diagnostics to characterize impacts such as material erosion, acceleration, etc.

**Co-Chairs**

Zihong Song

Beijing Institute of Spaceflight Environment Engineering, China Academy of Space Technology (CASST) — CHINA

Yellin Falkowska

Joint Space Operations Center (JSOC) — UNITED STATES

Jean-Claude Traon

CNES — FRANCE

**A6.4** Mitigation - Tools, Techniques and Challenges - SEM

This session will address the follow-up of space debris by impact with spacecraft. Space debris populations and mission risk assessments, such as: Space debris monitoring and detection, Space debris mitigation, Space debris risk analysis, Space debris risk assessment, Space debris protection and shielding studies, laboratory impact experiments, numerical simulations, and on-board diagnostics to characterize impacts such as material erosion, acceleration, etc.

**Co-Chairs**

Piero Onofri

Italian Aeronautics Agency (ASI) — ITALY

Holger Kuhrt

European Space Agency (ESA) — GERMANY

**A6.5** Post Mission Disposal and Space Debris Removal - 1 SEM

This session will address post mission disposal and active removal techniques such as: Space debris monitoring and detection, Space debris protection and shielding studies, laboratory impact experiments, numerical simulations, and on-board diagnostics to characterize impacts such as material erosion, acceleration, etc.

**Co-Chairs**

Bianca Stufler

Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY

Dominic Soan

ESA — ITALY

**A6.6** Operations in Space Debris Environment, Situational Awareness - SSA

This session will address the follow-up of space debris by impact with spacecraft. Space debris populations and mission risk assessments, such as: Space debris monitoring and detection, Space debris protection and shielding studies, laboratory impact experiments, numerical simulations, and on-board diagnostics to characterize impacts such as material erosion, acceleration, etc.

**Co-Chairs**

Vincent Martinot

Thales Alenia Space France — FRANCE

T. Koza

COMSAT Corporation — UNITED STATES

**20**
**A6.8** Political, Legal, Institutional and Economic Aspects of Space Debris Mitigation and Removal - STM Security

The session aims to inform on the non-technical aspects of space debris mitigation, debris remediation and STM efforts that form a basis for the most possible, liability and registration, on the role of bodies such as UN/ISAS or IADC, as well as on insurance, financial incentives and funding. In addition, security-related aspects and the role of international cooperation in order to secure these issues may be considered.

**Co-Chairs**

- Elena Wille (ESA — THE NETHERLANDS)
- Anatomie de l’International Space University (ISU) — FRANCE
- DFKE GmbH, Aktive Innovationszentrum — GERMANY
- Delft University of Technology (DUT) — NETHERLANDS
- University of the West Indies — TRINIDAD

**A7.1** IAF SYMPOSIUM ON ON-GOING AND FUTURE SPACE ASSEMBLY AND SOLAR-SYSTEM SCIENCE MISSIONS

The symposium, organized by the International Astronautical Federation (IAF), will bring together leaders from the science, industry, and space community to share information, insights, and planning for on-going and future space missions in exoplanets, astronomy, space physics, fundamental physics, and solar system planetary science. The symposium will cover both the latest results and open questions in these areas of scientific endeavor. The session will be held during the 74th IAC International Astronautical Congress (IAC) 2023, in Baku, Azerbaijan.

**Co-Chairs**

- Andrew Court (TNO — THE NETHERLANDS)
- Fengshan Chen (Chinese Academy of Sciences — CHINA)
- Cristiano Conti (Di Toscana, Università di Firenze — ITALY)

**A7.3** Technology Needs for Future Missions, Systems, and Instruments

The session will focus on presenting technology demonstrations, challenges, and opportunities that are essential for future space missions and systems. The presentations will cover various aspects of space science and technology, including new missions, technologies, and instrumentation.

**Co-Chairs**

- Eric Wille (TNO — THE NETHERLANDS)
- Andrew Court (TNO — THE NETHERLANDS)
- Mariangela Cucchiarella (Agenzia Spaziale Italiana — ITALY)

**A7.4** Earth Observation Data Systems and Technology

The session will focus on advancements in Earth observation data systems and technology. This includes developments in data processing, analysis, and dissemination as well as advancements in data science. The session will also discuss the future of Earth observation data systems and technology.

**Co-Chairs**

- Jürgen Schäfer (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY)
- Andrew Court (TNO — THE NETHERLANDS)

**A7.5** Earth Observation Societal and Economic Applications, Challenges and Benefits

The session will focus on the societal and economic applications of Earth observation data and services. This includes advancements in data science, processing, applications, and services that enable the development of new markets and applications.

**Co-Chairs**

- Jürgen Schäfer (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) — GERMANY)
- Andrew Court (TNO — THE NETHERLANDS)
B.1 Assessing and Mitigating the Global Freshwater Crisis

The session is focused on climate change, water availability, quality and security, and water-sector system engineering and scientific challenges. It is designed to bring together climate and water experts to share insights and solutions for addressing the global freshwater crisis. The session will also include networking opportunities for presenting new freshwater measurements and addressing problems for societal benefit.

Co-Chairs

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<td>Jorn Nymark</td>
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<td>Miriam Molina</td>
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<tr>
<td>Satish Kumar</td>
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B.1.1 Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM

This session offers a unique opportunity to deliver your key message in an interactive presentation on one of the subjects of Earth Observation addressed in the classical sessions. The presentation will be displayed on a digital screen in a dedicated location and available for view by all Congress attendees for the entire Congress week.

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B.1.2 IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM

This session is focused on all aspects of communications, services, architecture and infrastructure, fixed and mobile broadband, including the high-throughput satellite (HTS) and low-earth orbit (LEO) systems; infrastructure in satellite networks, for and for LEOs; G/I standards and higher frequencies and laser communication (including quantum communications); VAS/TMS and satellite-internet and internet services, including vehicle-to-vehicle, inter-earth and intersatellite systems. It also includes spectrum issues for new opportunities, and systems modeling.

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B.2 Advances in Space-based Communication Systems and Services, Part 3

This session is focused on all aspects of new space communications, services, architecture and infrastructure, fixed and mobile broadband services, including the high-throughput satellite (HTS) and low-earth orbit (LEO) systems; infrastructure in satellite networks, for and for LEOs; G/I standards and higher frequencies and laser communication (including quantum communications); VAS/TMS and satellite-internet and internet services, including vehicle-to-vehicle, inter-earth and intersatellite systems. It also includes spectrum issues for new opportunities, and systems modeling.

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B.2.4 Advances in Space-based Communication Systems and Services, Part 3

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B.3.1 Advances in Space-based Communication Systems and Services, Part 3

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B.3.2 Advances in Space-based Communication Systems and Services, Part 3

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B.3.3 Advances in Space-based Communication Systems and Services, Part 3

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B3.1 Governmental Human Spaceflight Programmes (Overview) The session will cover the key features and trends in government human spaceflight programmes. The speakers will discuss the key goals of various governmental human spaceflight programmes, the role of government in funding and supporting research and development, and the impact of government programmes on the overall direction of the human spaceflight industry.

Chair: Susan Kramsch — Danish Aerospace Company A/S — DENMARK

Rapporteur: Michael E. Lopez-Alegria — Northrop Grumman Space Systems — UNITED STATES

B3.2 Commercial Human Spaceflight Programmes This session will focus on the key features and trends in commercial human spaceflight programmes. The speakers will discuss the role of private companies in funding and supporting research and development, and the impact of commercial programmes on the overall direction of the human spaceflight industry.

Chair: Michael H. Kuehne — JAXA Space Systems — JAPAN

Rapporteur: Michael P. Allen — Arianespace — FRANCE

B3.3 Flight & Ground Operations aspects of Human Spaceflight - Joint Session of the IAF Human Spaceflight and IAF Space Operations Symposium This session will focus on the key features and trends in flight and ground operations aspects of human spaceflight. The speakers will discuss the role of flight and ground operations in supporting human spaceflight programmes, and the impact of flight and ground operations on the overall direction of the human spaceflight industry.

Chair: Michael P. Allen — Arianespace — FRANCE

Rapporteur: Michael P. Allen — Arianespace — FRANCE

B3.4 Human and Robotic Partnerships in Exploration - Joint session of the IAF Human Spaceflight and IAF Exploration Symposium This session will focus on the key features and trends in human and robotic partnerships in exploration. The speakers will discuss the role of human and robotic partnerships in supporting exploration programmes, and the impact of human and robotic partnerships on the overall direction of the human spaceflight industry.

Chair: Mark Gero — JAXA Space Systems — JAPAN

Rapporteur: Michael P. Allen — Arianespace — FRANCE

B3.5 Advanced Systems, Technologies, and Innovations for Human Spaceflight This session will focus on the key features and trends in advanced systems, technologies, and innovations for human spaceflight. The speakers will discuss the role of advanced systems, technologies, and innovations in supporting human spaceflight programmes, and the impact of advanced systems, technologies, and innovations on the overall direction of the human spaceflight industry.

Chair: Christian Kalmbach — German Aerospace Center — GERMANY

Rapporteur: Michael E. Lopez-Alegria — Northrop Grumman Space Systems — UNITED STATES
B4.4 Small Earth Observation Missions

This session addresses the technologies, applications, and missions achieved through the use of small, cost-effective satellites and sensor systems for Earth observation. In particular, it covers the development and launch of Earth observation missions that are built from small satellites, and the impacts on the emerging sector of space-based Earth observation. The session welcomes a broad range of topics, including but not limited to:

- Innovative small satellite mission concepts and their implementation
- Ground-based and on-board data processing techniques
- Data sharing and networking solutions
- Business models and market opportunities for small satellite earth observation missions
- Legal and policy aspects of small satellite earth observation missions

Co-Chairs
- Mircea Cretu
  University of Refugees 
- Giorgio F. Poesio
  University of Refugees

B4.5 Access to Space for Small Satellite Missions

This session focuses on the development of new launch vehicles and launch services tailored specifically for small satellite missions. The session aims to explore the opportunities and challenges associated with accessing space for small satellites, including:

- Launch services and launch vehicles specifically designed for small satellites
- Cost-effective launch options for small satellite missions
- Rocket propulsion systems and technologies for small satellite launch
- Integration of small satellites into existing launch services
- Market opportunities for small satellite launch services

Co-Chairs
- Yves Gourbet
  University of Refugees
- Philip Davies
  University of Refugees

B4.6A Generic Technologies for Small/Micro Platforms

This session focuses on the development and utilization of generic technologies for small-micro platforms. The session aims to explore the opportunities and challenges associated with the development of technologies that can be applied across different domains, including:

- Micropropulsion systems
- Power electronics
- Data transmission and networking
- Deployment mechanisms
- Lifetime and reliability

Co-Chairs
- Jeff Foreman
  The Aerospace Corporation
- Anne Marie Lavoie
  Space Generation Advisory Council

B4.6B Generic Technologies for Nano/Photon Platforms

This session focuses on the development and utilization of generic technologies for nano/photon platforms. The session aims to explore the opportunities and challenges associated with the development of technologies that can be applied across different domains, including:

- Nano/micropropulsion systems
- Power electronics
- Data transmission and networking
- Deployment mechanisms
- Lifetime and reliability

Chairman
- Silvano Alatalo
  Italian Space Agency

B4.7 Constellations and Distributed Systems

This session focuses on the development and utilization of constellations and distributed systems for satellites. The session aims to explore the opportunities and challenges associated with the development of technologies and systems that can be applied across different domains, including:

- Constellation mission concepts and their implementation
- On-board and ground-based data processing techniques
- Data sharing and networking solutions
- Business models and market opportunities for small satellite constellations
- Legal and policy aspects of small satellite constellations

Co-Chairs
- Thijs van der Hagen
  Netherlands Space Agency
- Eugene B. Don
  NASA

B4.8 Small Spacecraft for Deep-Space Exploration

This session focuses on small satellites and spacecraft for deep-space exploration. The session aims to explore the opportunities and challenges associated with the development of technologies and systems that can be applied across different domains, including:

- Small satellites and spacecraft for deep-space exploration
- Deep-space propulsion systems and technologies
- Communication and data transmission solutions
- Integration of small satellites and spacecraft into deep-space missions
- Mission planning and mission design

Co-Chairs
- Leon Abbas
  Mobile Space Institute
- Henk van Loey
  University of Refugees

B5.1 Tools and Technology in Support of Integrated Applications

This session focuses on the development and utilization of tools and technologies in support of integrated applications. The session aims to explore the opportunities and challenges associated with the development of technologies and systems that can be applied across different domains, including:

- Tool development and utilization for integrated applications
- On-board and ground-based data processing techniques
- Data sharing and networking solutions
- Business models and market opportunities for integrated applications
- Legal and policy aspects of integrated applications

Co-Chairs
- Jobst Hoeksema
  AirSat

B5.2 IAF SYMPOSIUM ON SMALL SATELLITE MISSIONS

This session focuses on small satellites and spacecraft for deep-space exploration. The session aims to explore the opportunities and challenges associated with the development of technologies and systems that can be applied across different domains, including:

- Small satellites and spacecraft for deep-space exploration
- Deep-space propulsion systems and technologies
- Communication and data transmission solutions
- Integration of small satellites and spacecraft into deep-space missions
- Mission planning and mission design

Co-Chairs
- Jobst Hoeksema
  AirSat

This session offers a unique opportunity to deliver your key messages in an interactive presentation on any of the subjects on small satellite missions addressed in the classic session. This interactive presentation will be displayed in a digital slide and be distributed to all participants for review. This will allow attendees to develop and integrate new ideas and concepts related to the topic of small satellite missions.

Chairman
- Jobst Hoeksema
  AirSat

The interactive presentation will allow attendees to discuss potential applications, challenges, and future directions with the presenters. The interactive presentation will be a valuable resource for attendees to learn about the latest developments and trends in the field of small satellite missions.
Innovative Space Operations Concepts and Advanced Systems

Attitude Dynamics (2)

Interactive Presentations - IAF SPACE OPERATIONS SYMPOSIUM
IAF ASTRODYNAMICS SYMPOSIUM
th
IAF SPACE OPERATIONS SYMPOSIUM
—

Attitude Dynamics (1)

Ground Operations - Systems and Solutions

Rapporteur

Satellite Commercial Applications

The emergence of "new space" and "satellite (based)" solutions has contributed to the rise of commercial satellite applications. There is an increasing demand for connectivity in several verticals such as agriculture, energy, and transport and space IoT plays a key role in increasing productivity. Meanwhile, the downstream market is evolving towards innovation-driven markets. New enabling technologies such as nanosatellites and CubeSats are changing the traditional satellite services with satellite IoT as the key application. This session invites papers on several areas such as the commercial space and space culture; a commercial space model for public users; atmosphere, ecosystems, resource monitoring; new application: virtual optics and space IoT; new application: systems (ландscape, automotive, cultural); general analytics, global communications; commercializing data about the Earth; and case studies of commercial satellite applications.

Co-Chairs

John M. Heacock
The Ohio State University College of Engineering — UNITED STATES

Dering Ye
China Aerospace Science and Technology Corporation (CASC) — CHINA

Repporteur

Samuel Meloy
The Ohio State University — UNITED STATES

This session offers a unique opportunity to deliver your key messages in an innovative presentation on any of the subjects of integrated applications addressed in the classic sessions and in several areas that have not yet been covered in previous presentations. Any format of visual, audiovisual, and computer-based presentations is allowed. The presentation will be displayed on a screen in a dedicated location and available for viewing by all Congress attendees. The session is open to all Congress attendees, including those who have not submitted an abstract but wish to contribute to the symposium. The session will be dedicated exclusively to the attendees to view the innovative presentations. The author(s) and the invited guests are to provide a short introduction to the applied general topics and interact with the attendees present. The interactive presentation may take advantage of all electronic display capabilities, such as: PowerPoint charts, embedded hot links, pictures, audio, and video clips. An abstract will be prepared to the author of the best interactive presentation in this category at a specially convened meeting. The session is open only to those presentations that follow the standard format and are submitted by the deadline for declared abstracts.

Co-Chairs

Robert M. Treichler
Europe Space Agency (ESA) — UNITED STATES

Janne Halin
City of Los Angeles — UNITED STATES

B6.1P

IAF SPACE OPERATIONS SYMPOSIUM

The Space Operations Symposium, organized by the International Astronautical Federation (IAF), addresses all aspects of spaceflight operations. The sessions address space operations including human spaceflight and robotic space missions, from low Earth orbit and geosynchronous orbit to lunar, planetary, cometary, and asteroid missions. The symposium covers both flight and ground operations, includes mission planning, training, and real-time operations. Particular focus is provided for commercial space operations, advanced systems, new operation concepts, and small-satellite operations.

Co-Chairs

Andreas Rudolph
Europe Space Agency (ESA) — GERMANY

Official Organizer

National Aeronautics and Space Administration (NASA), AIAA
Propulsion Laboratory — UNITED STATES

Zhina Meurer
ThyssenKrupp Space Technology GmbH — GERMANY

B6.1

Ground Operations - Systems and Solutions

This session focuses on all aspects of ground systems and solutions for all mission types, for both preparation and execution phases.

Co-Chairs

Ivan Baru
EUMETSAT — GERMANY

Claude Aubry
Centre National d’Etudes Spatiales (CNES) — FRANCE

Repporteur

Karin Weidinger
Airbus Defence & Space — GERMANY

This session focuses on innovative space operations and addresses advanced concepts, systems, approaches, and tools for operating existing and new types of missions, improving mission output in quality and quantity, and reducing cost.

Co-Chairs

Marco Cardando
Thames Valley Space Park — ITALY

Thomas Kueh
Airbus Defence & Space — GERMANY

Repporteur

Yukio Nogawa
Japan Aerospace Exploration Agency (JAXA) — JAPAN

This session addresses the broad topic of operations, from preparation through validation, simulation and training, including operations concepts, exercises, and lessons learned. This includes both flight and surface operations.

Co-Chairs

Andreas Rudolph
Europe Space Agency (ESA) — GERMANY

Zhina Meurer
ThyssenKrupp Space Technology GmbH — GERMANY

Repporteur

Karen Pedersen
Kingston Satellite Services AS — NORWAY

Matthew Duggan
The Boeing Company — UNITED STATES

Flight & Ground Operations of HSF Systems - A Joint Session of the IAF Human Spaceflight and IAF Space Operations Symposia

This session addresses advanced concepts, approaches, and tools for operating existing and new types of missions, improving mission output in quality and quantity, and reducing cost. The session focuses on innovative space operations and addresses advanced concepts, systems, approaches, and tools for operating existing and new types of missions, improving mission output in quality and quantity, and reducing cost.

Co-Chairs

Dermot Daly
AeroMobil Ltd

Annamaria Piras
ThyssenKrupp space Technology GmbH — GERMANY

Repporteur

Thomas A. Andersen
Deutsche Aerospace Company AG — GERMANY

Marla Grubich
Airbus Defence & Space — USA

B6.5

Large Constellations & Fleet Operations

This session discusses large constellations, fleet operations, and business models. The fusion of satellite constellations and fleet operations is changing the way satellites are utilized and the way we think about satellite services. The session is open only to those presentations that follow the standard format and are submitted by the deadline for declared abstracts.

Co-Chairs

John Andrews
Arianespace SA — UNITED KINGDOM

Zhina Meurer
ThyssenKrupp Space Technology GmbH — GERMANY

Repporteur

Andreas Rudolph
Europe Space Agency (ESA) — GERMANY

Shinya Ishimori
Olinic, Inc. — UNITED STATES

B6.5P

Interactive Presentations - IAF SPACE OPERATIONS SYMPOSIUM

This session offers a unique opportunity to deliver your key messages in an innovative presentation on any of the subjects of Space Operations addressed in the classic Sessions. The presentation will be displayed on a digital screen in a dedicated location and available for viewing by all on-screen Congress attendees. The afternoon is dedicated exclusively for the attendees to view the Interactive Presentations, and the author will be assigned a specific ten minute slot to personally present the topic and interact with the attendees present. The interactive presentation may take advantage of all electronic display capabilities, such as: PowerPoint charts, embedded hot links, pictures, audio, and video clips. An abstract will be presented to the author of the best interactive presentation in this category at a specially convened meeting. The abstract format must be submitted by the deadline for declared abstracts.

Co-Chairs

John Andrews
Arianespace SA — UNITED KINGDOM

Official Organizer

National Aeronautics and Space Administration (NASA), AIAA
Propulsion Laboratory — UNITED STATES

Category

TECHNOLOGY

Common technologies to space systems, including astrodynamics, structures, power and propulsion

C1
IAF ASTRODYNAMICS SYMPOSIUM
C2
IAF MATERIALS AND STRUCTURES SYMPOSIUM
C3
IAF SPACE POWER SYMPOSIUM
C4
IAF SPACE PROPULSION SYMPOSIUM

Category coordinated by John C. Mansin, ARTEMIS Innovation Management Solutions, LLC, UNITED STATES

C1
IAF ASTRODYNAMICS SYMPOSIUM

This symposium addresses advances in orbital mechanics, attitude dynamics, guidance, navigation and control of space systems.

Co-Chairs

David Schaubert
Colorado Center for Astrodynamics Research, University of Colorado — UNITED STATES

Wael Attia
Thales Alenia Space France — ISRAEL

C1.1
Attitude Dynamics (1)

This theme focuses on advances in spacecraft attitude dynamics and control, as well as design, testing and performance of novel attitude sensors and actuators. This theme also covers dynamics and control of multiple interconnected rigid and flexible bodies, including benefited systems, and in orbit assembly.

Co-Chairs

Zhihong Ning
China Academy of Space Technology (CASC) — CHINA

Mikhail Golubev
Aerodynamic Institute of Moscow — RUSSIAN

Repporteur

Japan Aerospace Exploration Agency (JAXA) — JAPAN

C1.2
Attitude Dynamics (2)

This theme focuses on advances in spacecraft attitude dynamics and control, as well as design, testing and performance of novel attitude sensors and actuators. This theme also covers dynamics and control of multiple interconnected rigid and flexible bodies, including benefited systems, and in orbit assembly.

Co-Chairs

Gernot Kuster
— SINGAPORE, REPUBLIC OF

Wolfgang Schartner
Aerodynamics Institute of Applied Mechanics, IAI — AUSTRIA

Repporteur

Korea Advanced Institute of Science and Technology (KAIST) — KOREA, REPUBLIC OF

C1.3
Guidance, Navigation and Control (1)

The emphasis of this theme is on advanced studies and applications related to the guidance, navigation and control of Earth orbiting and interplanetary space objects, including orbiting, flying, maneuvering and docking.

Co-Chairs

Tetsu Nagata
Institute of Intelligent System Engineering, China Academy of Space Technology (CASC) — CHINA

Ryohei Kaneko
Aoyama University — JAPAN

Repporteur

Julia Carli Bulemio
CNS System SA/Bremen — GERMANY
The topics to be addressed include novel technical concepts for mechanical/robotic/thermal/fluidic systems and subsystems of launchers, manned and unmanned spacecraft, re-entry vehicles and small satellites. Advanced subsystems and design of future exploration missions will be covered, considering issues arising from material selection, cost efficiency, manufacturing and production. The topics to be addressed include advanced materials and structures for high temperature applications in space related domains. This includes carbon-carbon and ceramic matrix composites, ultra high temperature ceramics, ablative materials, ceramic tiles and insulations, together with innovative structural concepts making use of the above, for propulsion systems, launchers, hypersonic vehicles, entry vehicles, entry capture, power generation. The session covers the full spectrum of materials, design, manufacturing and testing aspects.

**Advanced Materials Applications and Rapid Prototyping**

The topics to be addressed include advanced materials applications and novel technical concepts in the rapid prototyping of space systems. Continuous improvements in materials and structural concepts are always needed to achieve extremely demanding goals in performance, reliability, and affordability of space components, especially in terms of greater accuracy/dimensional stability, larger size, greater survivability to both natural and threat environments, and producibility capability for high volume production. Different rapid prototyping processes are currently used for different applications in the fabrication of metal, ceramic, and plastic parts. However, as very new technique, Additive Manufacturing is strongly emerging due to the capability of optimization of structural parts for space applications as it concerns weight reduction, improvement of mechanical properties and reduction of development and lead times as well as the reduction of costs. Furthermore AM processes make three-dimensional parts directly from CAD models by adding materials layer by layer.

**Space Environmental Effects and Spacecraft Protection**

The topics to be addressed will be space environment effects and spacecraft protection. The effects of vacuum, irradiation, atomic oxygen, space plasma, thermal cycling, disorientation, meteoroids and space debris impact on space systems, materials and structures, and microelectronics will be addressed. Protection and shielding technologies, as well as advanced simulation technology and models addressing impact, and survivability of Commercial Off-the-Shelf (COTS) microelectronics to space radiation will be covered.

**Space Vehicles – Mechanical/Robotic/Thermal/Fluidic Systems**

The topics to be addressed include novel technical concepts for mechanical/robotic/thermal/fluidic systems and subsystems of launchers, manned and unmanned spacecraft, re-entry vehicles and small satellites. Advanced subsystems and design of future exploration missions will be covered, considering issues arising from material selection, cost efficiency, manufacturing and production. It is planned to discuss the issue of experimental and computational simulation of functioning and full-scale tests of space vehicles and their systems/subsystems. Attention will be paid to the problem of verifications and validations of mathematical models for the design and experimental development of different objects at various phases of their life cycle.
C3.8 Specialized Technologies, Including Nanotechnology

Specialized material and system technologies are essential to a large variety of space applications both to enable advanced exploration, and science/observation mission scenarios to perform tests verifications aiming on extremal manoeuvrability of Inmarsat and highest capabilities in structural, thermal, electrical and electromechanical structural performance offered by state-of-the-art technologies. Examples are the recently developed carbon nanotubes which are experiencing first applications at micro scale such as in new Composite structures, high-efficiency energy storage devices, MEMS and MIMOS devices. Molecular nanotechnology and advanced nanomaterials at nanoscale offer the race to micro-machining, ultralightweight sensor systems, and new generations of specialized technologies, in particular nanomaterial-related topics and their application in devices offering unparalleled performance for space applications.

C3.9 Smart Materials and Adaptive Structures

The focus of the session will be on applications of smart materials to spacecraft and launch vehicle systems, novel sensor and actuator concepts and new concepts for multi-functional and intelligent structures in space systems. Also included in this session will be the new control methods for vibrational suppression and shape control using adaptive structures as well as the integration of performance predictions with data from ground and in-flight testing.

C3.10 Space Power Symposium

These range from joint technology development up to visionary concepts such as space solar power plants. The Space Power Symposium, organized by the International Astronautical Federation (IAF) and the Space Power Association (SPA), aims to bring together scientists, engineers, and policymakers to discuss the latest developments in space power technology and their potential applications. The symposium covers topics such as advanced solar and nuclear power sources, space-based power generation and transmission, and the integration of space power systems with terrestrial networks. The symposium also includes workshops and panel discussions on key issues such as the economic viability and environmental impacts of space power systems.

C3.11 Joint Session on Advanced and Nuclear Power and Propulsion Systems

This session, organized by the Space Propulsion Symposium, addresses all aspects related to nuclear power and propulsion systems for space applications. The session addresses all topics related to propulsion systems, including nuclear and non-nuclear systems, and their potential applications in space exploration and planetary missions.

C3.12 Interactive Presentations - IAF MATERIALS AND STRUCTURES SYMPOSIUM

This session offers a unique opportunity to deliver your message in an interactive presentation on any of the subjects of Materials and Structures addressed in the classical Sessions. The session follows the standard format must be submitted by the deadline for standard IAC abstracts. It will also include, but not be restricted, to topics such as advanced materials and structures for space applications and space storage technologies. The presentation will be displayed on a digital screen in a dedicated location and available for view by all Congress attendees for the entire Congress week. In addition, one afternoon is dedicated exclusively for the attendees to view the Interactive Presentations, and the author will be assigned a specific ten minute slot to personally present the topic and interact with the audience present. This presentation format offers a unique opportunity to engage with the attendees and to promote your topic and interact with the audience present. The Interactive Presentations may include all types of electronic displays, such as PowerPoint slides, animations, videos, and other forms of multimedia content. The format followed is the standard format must be submitted by the deadline for standard IAC abstracts.

C4.10 Advanced Space Power Technologies

This session is devoted to emerging concepts ranging from very small power (micro and milli-watt power) to very large power systems toward future ambitious space missions and space utilizations such as future moon village. This includes concepts and technology development of space power system for the increasing spacepower market by the same, mini- and micro-satellite. This session is dedicated to space power systems for such applications as well as for long-distant exploration probes and sensors.

C4.11 IAF SPACE PROPULSION SYMPOSIUM

The Space Propulsion Symposium addresses all aspects related to propulsion systems for space applications, including chemical and non-chemical propulsion technologies, ramjet, scramjet, and various combinations of air-breathing and rocket propulsion. The symposium also includes workshops and panel discussions on key issues such as the economic viability and environmental impacts of propulsion systems.
C4.2 Liquid Propulsion (2)
The session on Liquid Propulsion (2) is dedicated to Liquid Rocket Engines (mono-propellant or bi-propellant), with particular emphasis on sub-systems and specific components (including propellants). The session welcomes manuscripts on all research and development areas: design, testing (including diagnostics and test facilities), analysis and calculations, modelling, applications, science and fundamentals.

Rapporteurs

Tibor S. Balint
Jet Propulsion Laboratory

Jill Prince
British Interplanetary Society

Co-Chairs

Martin Velander
GKN Aerospace Engine Systems — THE NETHERLANDS

Universität Dresden — GERMANY

Christoph Bordone
Centre National d’Études Spatiales — FRANCE

C4.3 Solid and Hybrid Propulsion (1)
The session on Solid and Hybrid Propulsion (1) is dedicated to Solid and Hybrid Rocket motors, with particular emphasis on sub-systems and specific components (including propellants). The session welcomes manuscripts on all research and development areas: design, testing (including diagnostics and test facilities), analysis and calculations, modelling, applications, science and fundamentals.

Rapporteurs

Toru Shimada
Japan Aerospace Exploration Agency

CIRA Italian Aerospace Research Center, Capua — ITALY

Rapporteurs

Didier Boury
ArianeGroup SAS

International Astronautical Congress

2 - 6 October 2023, Baku, Azerbaijan

C4.4 Solid and Hybrid Propulsion (2)
The session on Solid and Hybrid Propulsion (2) is dedicated to Solid and Hybrid Rocket motors, with particular emphasis on sub-systems and specific components (including propellants). The session welcomes manuscripts on all research and development areas: design, testing (including diagnostics and test facilities), analysis and calculations, modelling, applications, science and fundamentals.

Rapporteurs

Garri A. Popov
CIRA Italian Aerospace Research Centre — ITALY

Mariano Andrenucci
Politecnico di Torino

Rapporteurs

C4.5 Electric Propulsion (1)
The sessions Electric Propulsion (1) and Electric Propulsion (2) are dedicated to all aspects of Electric Propulsion, including full systems, sub-systems and specific components. The session welcomes manuscripts on all research and development areas: design, testing (including diagnostics and test facility), analysis and calculations, modelling, applications, science and fundamentals.

Rapporteurs

Vito Salvatore
CIRA Italian Aerospace Research Centre — ITALY

Elena Toson
ESA - European Space Agency

Co-Chairs

C4.6 Electric Propulsion (2)
The sessions Electric Propulsion (1) and Electric Propulsion (2) are dedicated to all aspects of Electric Propulsion, including full systems, sub-systems and specific components. The session welcomes manuscripts on all research and development areas: design, testing (including diagnostics and test facility), analysis and calculations, modelling, applications, science and fundamentals.

Rapporteurs

Alexandru Constantinescu
ISC Aalborg Research Centre — AUSTRIA / FINLAND

Brian Lindsey
US Air Force Academy — UNITED STATES

C4.7 Hypersonic Air-breathing and Combined Cycle Propulsion, and Hypersonic Vehicle The session on Hypersonic Air-breathing and Combined Cycle Propulsion, and Hypersonic Vehicle covers all categories of hypersonic air-breathing and combined cycle propulsion with space applications. The typical types of engines considered in this session include: turbojet, scramjet, Scramjet, air-breathing rocket, Turbo-Band Combined Cycle (TBCC), Rocket Band Combined Cycle (RCCC), Hypersonic Pre-cooled Propulsion, Air Turbine Rocket (ATR) and other types of hypersonic combined cycle propulsion, together with the associated vehicle.

Rapporteurs

Tore Shimada
Institute of Space and Astronautical Science (ISAS)

Delft University of Technology (TU Delft)

D4.6 AIAA SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D4.7 AIAA SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D5 21st IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT

D6 56th IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE ACTIVITIES

D6 IAF SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES

Category coordinated by Roberta Mugellesi-Dow, European Space Agency (ESA), UNITED KINGDOM

D1 IAF SPACE SYSTEMS SYMPOSIUM


Co-Chairs

Michael Bartsch
European Space Agency (ESA) — GERMANY

Martin Tass
National Aeronautics and Space Administration (NASA) — UNITED STATES

Coordinators

Jeff Emdee
AIAA Propulsion Conference Advisory Board — UNITED KINGDOM

Rapporteur

C4.8 Joint Session between IAA and IAF for Small Satellite Propulsion Systems

The session on Joint Session between IAA and IAF for Small Satellite Propulsion Systems explores the potential of small satellites and their role in space missions and technology developments.

Rapporteurs

Peter Dieleman
The Aerospace Corporation — UNITED STATES

Giulio Saccoccia
Space Generation Advisory Council (SGAC) — ITALY

Co-Chairs

Toru Shimada
Japan Aerospace Exploration Agency

C4.9 Propulsion Systems for launchers and re-entry vehicles

The session on Propulsion Systems for launchers and re-entry vehicles focuses on propulsion systems for launchers and re-entry vehicles, including issues related to propulsion system optimization and performance.

Rapporteurs

Brian Lindsey
US Air Force Academy — UNITED STATES

Christopher Lee
Baseline Research and Technology Information Systems Agency (BRITIS) — THE NETHERLANDS

C4.10 Joint Session on Nuclear Power and Propulsion Systems, and Propellantless Propulsion

The session on Joint Session on Nuclear Power and Propulsion Systems, and Propellantless Propulsion brings together experts from the fields of nuclear power and propulsion systems, and propellantless propulsion.

Rapporteurs

Leopold Summerer
AIAA - European Space Agency — THE NETHERLANDS

Christian Bach
European Space Agency (ESA) — GERMANY

Co-Chairs

Elizabeth Jones
AIAA Propulsion Conference Advisory Board — UNITED KINGDOM

Coordinators

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D1.2 Space Systems Architectures
This session addresses current and future space systems architectures designed to realize mission concepts for Earth orbiting or exploration missions, both robotic and crewed. These architectures and their elements and building blocks should aim at an increase in functionality, performance, efficiency, reliability and robustness of operations, while building on existing architectures, innovative or disruptive technologies. The scope of the session includes multiple space systems or multiple satellite systems, such as constellations, networks, formations, distributed systems, and systems of systems (including integration with terrestrial systems). Transboundary space allocation of functionality and autonomy, both on-board and ground-based, may be addressed.

Co-Chairs
- David E. Glass
- Jon Holladay

D1.3 Technologies to Enable Space Systems
This session will focus on innovative technologies that are usually high risk, but which have the potential to significantly enhance the performance of existing and new space systems. Enabling innovative technologies for space applications often result from spin-offs, which will be discussed during the session, together with potential spin-offs, examples include instrumentation, biotechnology, components, micro- and nano-technologies, advanced new materials, among others.

Co-Chairs
- Steven Arnold
- Andreas Schlesinger

D1.4A Space Systems Engineering - Methods, Processes and Tools [1]
This session will focus on state-of-the-art systems engineering methodologies that reduce the time and cost, and improve the quality of space system design. Of special interest are multi-disciplinary methods, processes, and tools used for system design, Front-end Education, Technical Management, Operations, and inheritance of space systems to advance the state-of-the-art, best practices, techniques, tools, training benefits space system design, development and operations. Of the art are the system engineering methodologies for space systems, including space systems (SoS) engineering, system modeling and simulation tools applied to space system and design optimization, methodologies and processes for technical planning, preparation, assessment and decision analysis of space system designs, advancement in space system development environments, such as constrained engineering design facilities; and novel methods to improve risk management, earned value management, configuration management, data management, availability, reliability, maintainability and quality of life cycle cost estimates.

Co-Chairs
- Qingyong Wang
- Peter Eldredge

This session will focus on state-of-the-art systems engineering methodologies that reduce the time and cost, and improve the quality of space system design. Of special interest are multi-disciplinary methods, processes, and tools used for system design, Front-end Education, Technical Management, Operations, and inheritance of space systems to advance the state-of-the-art, best practices, techniques, tools, training benefits space system design, development and operations. Of the art are the system engineering methodologies for space systems, including space systems (SoS) engineering, system modeling and simulation tools applied to space system and design optimization, methodologies and processes for technical planning, preparation, assessment and decision analysis of space system designs, advancement in space system development environments, such as constrained engineering design facilities; and novel methods to improve risk management, earned value management, configuration management, data management, availability, reliability, maintainability and quality of life cycle cost estimates.

Co-Chairs
- Giuliano Lorusso
- Norbert Frischau

D1.5 Lessons Learned in Space Systems: Achievements, Challenges, Best Practices, Standards
This session will focus on lessons learned in space systems at all aspects of the life cycle. The sharing becomes more important every year necessary to ensure success of future missions. This interactive workshop will also include the discussion of mission accomplishments, the challenges and the best practices that led to mission success, incorporating documentation of lessons learned. The scope of the session also includes the standardization of design and operational elements, lessons learned in design, development, operation, and performance from management and engineering, lessons learned in project management and engineering, achievement from mission success and the best practices in excellent mission performance.

Co-Chairs
- Yubin Li
- Matthias Saile

D1.6 Cooperative and Robotic Space Systems
This session will focus on cooperative and robotic systems as they apply to the space domain. This emerging topic includes concepts such as constellations, multi-satellite architectures, and multi-orbit systems and technologies. Novel platforms, where the objectives may not be realized in the traditional sense, may also be addressed. The session will include collaborative robotic systems, such as space robotic systems and manipulators, combined interface and distributed multi-agent technologies. Papers in this session will look at current research and future opportunities, while addressing both challenges and strengths at the worldwide community emerging from these exciting times.

Co-Chairs
- Klaus Schilling
- Martin Knudsen

D1.7 Interactive Presentations - IAF SPACE SYSTEMS SYMPOSIUM
The session offers a unique opportunity to deliver key messages in an interactive presentation on any of the subjects of space systems addressed in the classical sessions. The presentation will be displayed on a digital screen in a dedicated location and available for view by all Congress attendees for the entire Congress week. In addition, after dinner, the attendees will be assigned to the appropriate presentation for this session. The interactive presenters will be invited to present their topic in an interactive and friendly manner and will be expected to be present at the time of the interactive presentation to answer questions from the audience.

Co-Chairs
- Elke M. Scharnweber

D2 Space Transportation Solutions and Innovations Symposium
This session will focus on advances in space transportation, both existing and new, which include improvements to existing vehicle technologies and new technology concepts for future vehicles. The topics covered in this session will range from conceptual design and development to case studies of existing systems. The focus will be on the application of innovative technologies for future space transportation systems.

Co-Chairs
- David S. Coleman
- Hadi Zare

D3 Launch Vehicles in Service or in Development
Review of current and planned launch services and support, including economics of space transportation, costing, cost, insurance, loading, Advanced In-Ground infrastructure, ground operations, production methods, mission planning and mission control for both repeatable and reusable launch services.

Co-Chairs
- Dennis Slocy
- Vladimir Zhurbenko

D4 Upper Stages, Space Transfer, Entry and Landing Systems
Discussion of new advancements in propulsion and launch vehicle systems. Includes current and new transfer systems, entry and landing systems, sub-systems and technologies for accommodating new and larger cargo transfer.

Co-Chairs
- Lorenzo Calvetti
- Christian Bernet

D5 Future Space Transportation Systems
Discussion of advanced systems engineering and conceptual concepts for both expendable and reusable systems for both earth to orbit and exploration missions.

Co-Chairs
- Eberhard Gill
- Thierry Floriant

D6 Future Space Transportation Systems Verification and In-Flight Experimentation
Discussion of advanced systems engineering and conceptual concepts for both expendable and reusable systems for both earth to orbit and exploration missions.

Co-Chairs
- Roland Huber
- Thierry Floriant

D7 Small Launchers: Concepts and Operations
Discussion of new, more affordable launchers for small payloads ranging from small satellites as low as 1 kg to Earth and GEO orbits. Includes innovations such as alternative mission evaluation methods, evolutions from sub-orbit concepts, combinations of existing/nearing elements and new elements, modular, partially reusable and expendable concepts, and flexible, on-demand, flight-as-a-service concepts. Includes mission operations, design, development, and specific standards.

Co-Chairs
- Harry J. Elderkin

Co-chairs: Jutta Schramm, Cristina Bernet, and Stefano Baccarini.
D2.8 Space Transportation Solutions for Deep Space Missions
The session is focused on innovative space transportation capabilities and mission architectures, either in the form of human space exploration missions, or even in the form of robotic missions, to support the development of a human spaceflight program. It will bring together new solutions in the field of space transportation, including innovative propulsion technologies, new mission architectures, and new systems for human exploration. The focus will be on short-term missions and on the development of technologies that can be used for long-term missions.

Co-Chairs
Kenyon Bruce Morris
Innovative Concepts and Technologies
Interactive Presentations - IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D2.9 Emerging Space Ventures, including Space Logistics and Space Safety for Sustainability
This session will address the key challenges and opportunities of emerging space ventures, including space logistics and space safety for sustainability. It will cover topics such as the development of new business models, the integration of space logistics into supply chains, and the development of new space safety practices. The focus will be on the emerging space economy and how it can contribute to sustainability.

Co-Chairs
Aline Decadi
Interactive Presentations - IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D3.2B Systems and Infrastructures to Implement Sustainable Space Development and Settlement - Systems
The session is focused on the design and implementation of sustainable space development and settlement systems. The focus will be on the development of new solutions in the field of systems and infrastructures, including new propulsion technologies, new mission architectures, and new systems for human exploration. The session will bring together new solutions in the field of space transportation, including innovative propulsion technologies, new mission architectures, and new systems for human exploration. The focus will be on short-term missions and on the development of technologies that can be used for long-term missions.

Co-Chairs
Ayman Ahmed
Interactive Presentations - IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D3.3 Space Technology and System Management Practices and Tools
The session is focused on the development and implementation of new space technologies and system management practices and tools. The focus will be on the development of new solutions in the field of systems and infrastructures, including new propulsion technologies, new mission architectures, and new systems for human exploration. The session will bring together new solutions in the field of space transportation, including innovative propulsion technologies, new mission architectures, and new systems for human exploration. The focus will be on short-term missions and on the development of technologies that can be used for long-term missions.

Co-Chairs
Charles E. Gadok Jr.
Interactive Presentations - IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D3.1 Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and Development
The session is focused on the development of new strategies and architectures for future space exploration and development. The focus will be on the development of new solutions in the field of systems and infrastructures, including new propulsion technologies, new mission architectures, and new systems for human exploration. The session will bring together new solutions in the field of space transportation, including innovative propulsion technologies, new mission architectures, and new systems for human exploration. The focus will be on short-term missions and on the development of technologies that can be used for long-term missions.

Co-Chairs
ArianeGroup
Interactive Presentations - IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D3.2A Systems and Infrastructures to Implement Sustainable Space Development and Settlement - Systems
The session is focused on the design and implementation of sustainable space development and settlement systems. The focus will be on the development of new solutions in the field of systems and infrastructures, including new propulsion technologies, new mission architectures, and new systems for human exploration. The session will bring together new solutions in the field of space transportation, including innovative propulsion technologies, new mission architectures, and new systems for human exploration. The focus will be on short-term missions and on the development of technologies that can be used for long-term missions.

Co-Chairs
ArianeGroup
Interactive Presentations - IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

D3.2B Systems and Infrastructures to Implement Sustainable Space Development and Settlement - Systems
The session is focused on the design and implementation of sustainable space development and settlement systems. The focus will be on the development of new solutions in the field of systems and infrastructures, including new propulsion technologies, new mission architectures, and new systems for human exploration. The session will bring together new solutions in the field of space transportation, including innovative propulsion technologies, new mission architectures, and new systems for human exploration. The focus will be on short-term missions and on the development of technologies that can be used for long-term missions.
Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES

D6.2 Emerging Space Ventures, Including Space Logistics and Space Safety for Sustainability

Topics of this session are derived from the knowledge base of the Space Safety and Security Session and will cover a variety of topics including logistics, safety, and security, and the associated risk management approach. It covers all topics of space transportation systems, spaceports, space operators, and space-transportation systems. The goal is to identify best practices to operate and manage the space-transportation systems, spaceports, and space operators, and to develop the necessary policies and procedures to ensure the safe and secure operation of the space-transportation systems, spaceports, and space operators.

Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES

D6.3 Predicting, Testing, and Measuring the Effects of the Space Environment on Space Missions

This session offers a unique opportunity to explore new ideas in an interactive presentation on the subjects of safety, quality and knowledge management in Space. The session offers a unique opportunity to discuss the latest developments in Space technologies, space dynamics, and risk management. paper will be presented to the author of the best Interactive Presentation in the D Category at a special ceremony. An Abstract that follows the standard format must be submitted by the deadline for standard IAC abstracts.

Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES

D5.1 For a Successful Space Program: Quality and Safety

This session offers a unique opportunity to explore new ideas in an interactive presentation on the subjects of safety, quality and knowledge management in Space. The session offers a unique opportunity to discuss the latest developments in Space technologies, space dynamics, and risk management. paper will be presented to the author of the best Interactive Presentation in the D Category at a special ceremony. An Abstract that follows the standard format must be submitted by the deadline for standard IAC abstracts.

Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES

D5.6 IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE ACTIVITIES

The space environment can strongly impact the performance and reliability of space missions. It has several natural and induced components, including high-energy radiation, plasmas, atmospheric effects, planetary dust, extreme temperature, vacuum, microgravity, environmental disasters, and molecular and extraterrestrial contamination. Environmental conditions present challenges to the design, planning, and operation of space missions. The evaluation of the nominal and worst-case scenarios is critical for mission success. The development of risk management strategies to predict, mitigate, and prepare for these scenarios is essential for achieving mission success.

Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES

D4.4 Strategies for Real-time Implementation of Interstellar Missions: Preparations and Beyond

Knowledge about space beyond our solar system is essential to understanding the dynamics of the universe. However, this knowledge is limited due to the distance and complexity of the study. The International Astronautical Symposium (IAS) on Space Activities and Space Safety is organized by the International Astronautical Federation (IAF) and aims to foster discussions on the latest developments in space technologies, space dynamics, and risk management. The goal is to identify best practices to operate and manage the space-transportation systems, spaceports, and space operators, and to develop the necessary policies and procedures to ensure the safe and secure operation of the space-transportation systems, spaceports, and space operators.

Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES

D6.1 For a Successful Space Program: Quality and Safety

This session offers a unique opportunity to explore new ideas in an interactive presentation on the subjects of safety, quality and knowledge management in Space. The session offers a unique opportunity to discuss the latest developments in Space technologies, space dynamics, and risk management. paper will be presented to the author of the best Interactive Presentation in the D Category at a special ceremony. An Abstract that follows the standard format must be submitted by the deadline for standard IAC abstracts.

Co-Chairs
Jeanne Holm
European Space Agency (ESA) — UNITED STATES
This session will explore innovative programs focusing on space education and outreach to students aged 11 to 18. It will place emphasis on programs that effectively engage primary school students in Science, Technology, Engineering, Arts and Mathematics (STEAM), help them develop key skills, and foster a long-term passion for space. This session will explore how programs and activities that focus on the professional development of primary school teachers, or on educational methodologies of relevance to primary education. When submitting abstracts for this session, please: Clearly define the connection to primary education/outreach and to space. Provide a short but clear description of the activity or the program. Include context information about the scope, methods, outcomes, and any support for your activity. Make sure that the abstract provides a coherent idea or narrative. Include reference to data gathered through evaluations, surveys or other means, if applicable.

Co-Chairs
Jessica Culler
Nelly Box Haynes
NASA Ames Research Center — UNITED STATES
JPL — UNITED STATES

Rapporteurs
Christian Vogel
JAXA — JAPAN
Michelle Banks
Lockheed Martin Space Systems Company — UNITED STATES

E1.7 New Worlds - Non-Traditional Space Education and Outreach

This session will focus on novel and non-standard methods of space education and outreach in non-traditional areas and to use tactical targets. When submitting abstracts for this symposium, please: Provide context describing the research and/or analysis you conducted when choosing the purpose of the activity, targeting an audience, and designing the activity. Clearly state the goal of the activity, the intended audience, the measurable objectives that were set, and the activity is in planning or has already occurred. Provide a short but clear description of the activity or the program. Include context information about the scope, methods, outcomes, and any support for your activity. Make sure that the abstract provides a coherent idea or narrative. Include reference to data gathered through evaluations, surveys or other means, if applicable.

Co-Chairs
Jessica Culler
Nelly Box Haynes
NASA Ames Research Center — UNITED STATES
JPL — UNITED STATES

Rapporteurs
Christian Vogel
JAXA — JAPAN
Michelle Banks
Lockheed Martin Space Systems Company — UNITED STATES

E1.8 Hands-on Space Education and Outreach

This session will explore space education and outreach for both a way to introduce and teach Science, Technology, Engineering, Arts and Math (STEAM) concepts, especially with diverse learners. This session will focus on new and innovative ideas to introduce and teach space-related concepts. During this session, presentations will not only present the ideas behind the activity, but also demonstrate hands-on activities to the audience. When submitting abstracts for this session, please: Clearly define the connection to space education and outreach. Provide a short but clear description of the activity or the program. Include context information about the scope, methods, outcomes, and any support for your activity. Make sure that the abstract provides a coherent idea or narrative. Include reference to data gathered through evaluations, surveys or other means, if applicable.

Co-Chairs
Lyndsay Wilgus
NASA Goddard Space Flight Center — UNITED STATES
Valerie Anne Ciesielski
NASA Goddard Space Flight Center — UNITED STATES

Rapporteurs
Christian Vogel
JAXA — JAPAN
Michelle Banks
Lockheed Martin Space Systems Company — UNITED STATES

E1.9 Space Culture — Public Engagement in Space through Culture
The focus of this session is on public space culture in general. This means to bring together all those interested in the space culture and science communication, space agencies and spin-off organisations, which link space education with culture. When submitting abstracts for this session, please clearly identify both the educational and cultural aspects of the work presented, and its connection to space activities. All abstracts should contain information about the role of the activity in the project, include some information about the audience the activity is targeted at and present the methodology of the intervention. Make sure that the abstract provides a coherent and concise outline. Include references to key theatres within museums, venues or other means, if applicable.

Le-Chairs
Nelly Ben Hayoun
University of New South Wales — AUSTRALIA

Miloš Gvozdić
University of Kragujevac — SERBIA

Rapporteurs
Carol Olliver
University of New South Wales — AUSTRALIA

Nelson Romero
Avelino Carlos — SPAIN


E1.1P Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM
This session offers a unique opportunity to share your education and outreach activities through an interactive presentation on any of the subjects of the symposium. The presentation will be displayed on a digital screen in a dedicated location and available for viewing by all Congress attendees during the entire Congress week. This allows for an active discussion during the session, and for the audience to provide feedback on your presentation. The selection of the oral presentations is solely based on the submitted abstracts. We strongly recommend that you submit an abstract with an extensive description of your topic, including a detailed description of your work and the methodology you used to develop it.

Le-Chairs
Kevin Russo
The Academy of Sciences — UNITED STATES

Jessica Cutter
AIAA Aerospace Research Center — UNITED STATES

Rapporteurs
Franco Bernelli-Zazzera
SETI Institute — ITALY

Nelly Ben Hayoun
University of New South Wales — AUSTRALIA

The Planetary Society
— UNITED STATES

E2.1 STUDENT CONFERENCE
Presentation of space-related papers by undergraduate and graduate students who participate in an international student competition.

Student Conference — Part 1
Undergraduate and graduate level students (no more than 38 years of age) present technical papers on any project in space science, industry or technology. These papers will represent the work of the students. Students presenting in this session are younger than 38 years. All students presenting in this session are invited to participate in the IAA/IISL Student Competition. The purpose of this competition is to foster the development of young minds and to provide educational and career opportunities for bright young students. In addition, this competition is a way to promote space-related activities and to encourage the development of new technologies and solutions for space-related problems. This competition is open to undergraduate and graduate students who are national students of the five countries that host the symposium. Each team of students must submit an abstract of the paper they wish to present to the symposium. The abstracts will be evaluated by a panel of judges who will determine the winners of the competition. The winners of the competition will be awarded certificates and prizes. The presentation will be displayed on a digital screen in a dedicated location and available for viewing by all Congress attendees during the entire Congress week. This allows for an active discussion during the session, and for the audience to provide feedback on your presentation.

Le-Chairs
Francesco Benedetta Zassa
Politecnico di Milano — ITALY

Mona Schaefer
University of Applied Sciences Würzburg-Schweinfurt — GERMANY

Rapporteurs
Emmanuel Zenou
Institut Supérieur de l’Aéronautique et de l’Espace (ISAE) — FRANCE

Emmanuel Zenou
University of Manchester — UNITED KINGDOM

The Prague Security Studies Institute
— CZECH REPUBLIC

E2.2 Student Conference — Part 2
Undergraduate and graduate level students (no more than 38 years of age) present technical papers on any project in space science, industry or technology. These papers will represent the work of the students. Students presenting in this session are younger than 38 years. Each team of students must submit an abstract of the paper they wish to present to the symposium. The abstracts will be evaluated by a panel of judges who will determine the winners of the competition. The winners of the competition will be awarded certificates and prizes. The presentation will be displayed on a digital screen in a dedicated location and available for viewing by all Congress attendees during the entire Congress week. This allows for an active discussion during the session, and for the audience to provide feedback on your presentation.

Le-Chairs
Marco Schiattarella
University of Applied Sciences Würzburg-Schweinfurt — GERMANY

Jon Fredriksen
University of Applied Sciences Nordland — NORWAY

Rapporteurs
Emmanuel Zenou
Institut Supérieur de l’Aéronautique et de l’Espace (ISAE) — FRANCE

Emmanuel Zenou
University of Manchester — UNITED KINGDOM

The Prague Security Studies Institute
— CZECH REPUBLIC

E2.3 Student Team Competition
Undergraduate and graduate level student teams (students no more than 38 years of age present papers on subjects related to space science, industry or technology. These papers will represent the work of the authors (three or more students). Students presenting in this session are younger than 38 years. Each team of students must submit an abstract of the paper they wish to present to the symposium. The abstracts will be evaluated by a panel of judges who will determine the winners of the competition. The winners of the competition will be awarded certificates and prizes. The presentation will be displayed on a digital screen in a dedicated location and available for viewing by all Congress attendees during the entire Congress week. This allows for an active discussion during the session, and for the audience to provide feedback on your presentation.

Le-Chairs
Franco Bernelli-Zassa
Politecnico di Milano — ITALY

Jana Robinson
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur
Pieter Van Beekhuizen
Commission d’Astronautique de l’Academie Roumaine — ROMANIA

E2.4 Educational Pico and Nano Satellites
The session is mainly for students. The session covers all aspects related to educational satellites.

Le-Chairs
Xoxosade Y.M.
University of Technology (JAD) — CHINA

Graham Hinton
University of Queensland — AUSTRALIA

Rapporteur
Carol Olliver
University of New South Wales — AUSTRALIA


E3 36TH IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS
The symposium, organized by the International Academy of Astronautics (IAA), will provide a venue for the current trends in space policy, regulations, and economics, by covering satellite activities as well as multidomain space policies and plans. The symposium also integrates the IAA/IISL Social Responsibility Working Group.

Co-Chairs
Emmanuel Zenou
European Space Agency (ESA) — THE NETHERLANDS

Bernard Schmidt-Tedd
European Space Agency (ESA) — GERMANY

Peter Van Beekhuizen
Commission d’Astronautique de l’Academie Roumaine — ROMANIA

E3.1 International Cooperation in using Space for Sustainable Development: Towards a “Space2030” Agenda
This session will focus on the benefits of using space technologies and applications in the context of sustainable development. It will explore the role of space as a tool to support the implementation of the Sustainable Development Goals (SDGs) and the New Development Agenda. The session will discuss the potential of space technologies and applications to support the achievement of the SDGs and the New Development Agenda, and will explore the role of new and emerging space policies and initiatives in this context.

Le-Chairs
Isabelle Douence-Bellon
Groupe d’Etudes d’Astronautique de l’Academie Royale Belge — BELGIUM

Simona Dotti Ponzi
Commission d’Astronautique de l’Academie Royale Belge — BELGIUM

Rapporteur
Emmanuel Zenou
Institut Supérieur de l’Aéronautique et de l’Espace (ISAE) — FRANCE

E3.2 The Future of the Space Exploration and Innovation
This session will focus on the current trends and future developments in space exploration and innovation. It will explore the role of space exploration in addressing global challenges, such as climate change, resource depletion, and the exploration of new planets. The session will also discuss the role of innovation in the space sector, including new technologies and business models that are transforming the space industry.

Le-Chairs
Marc Harena
German Aerospace Center — GERMANY

Nicolas Peter
International Space University (ISU) — FRANCE

Rapporteur
Emmanuel Zenou
Institut Supérieur de l’Aéronautique et de l’Espace (ISAE) — FRANCE

E3.3 Space Economy Session — A Focus on In-space Operations and their Potential to Stimulate Economic Development
This session will focus on the potential of in-space operations to stimulate economic development. It will explore the role of in-space operations in creating new economic opportunities, fostering innovation, and stimulating economic growth. The session will also discuss the potential of new in-space activities to create new markets and drive economic development.

Le-Chairs
Peter van Beekhuizen
German Aerospace Center — GERMANY

Jana Robinson
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur
Pieter Van Beekhuizen
Commission d’Astronautique de l’Academie Roumaine — ROMANIA

E4 Assuring a Safe, Secure and Sustainable Environment for Space Activities
Space activities contribute to the well-being of people on Earth. However, space activities have a number of inherent risks that need to be addressed. The session will focus on the potential risks associated with space activities, such as space debris, and how to mitigate these risks. It will also explore the role of international cooperation in ensuring a safe, secure, and sustainable environment for space activities.

Le-Chairs
Peter Manzoni
German Aerospace Center — GERMANY

Jana Robinson
National Aeronautics and Space Administration (NASA) — UNITED STATES

Rapporteur
Sloane Peterson
German Aerospace Center (DLR) — Germany

74th IAC
International Astronautical Congress
2 - 6 October 2023, Baku, Azerbaijan
E3.5 37th IAA/ISDL Scientific Legal Roundtable: “Space Launch from Celestial Bodies, Technology, Law and Policy”

E3.6 Space launches from Earth have long been the defining technical, legal and political footprint for the states and other entities that operate in the exploration and utilization of the outer space region. Recognizing a broad array of scientific and technological advancements, space launches are also the basis for setting legal, jurisdictional, supervision, and liability to the history of the outer space regime. For this reason, the 37th IAA/ISDL will hold a scientific roundtable to discuss the history of space launches and the legal and political implications of such activities. The roundtable will focus on the development of international space law and the role of international legal frameworks in promoting the peaceful exploration and use of outer space.

Panelists:
- Olga Bannova, University of Houston — United States
- Anna Barbara Imhof, University of Applied Sciences and Arts (HfG) — Germany
- Matthew R. Bunch, University of Texas — United States
- Matthias Konig, University of Bremen — Germany

E4.1 Memoires & Organisational Histories

The symposium will cover the entire spectrum of space history, at least 25 years old. History of space science, technology & development, rocketry, human spaceflight and personal experiences are included. This year a special focus is laid on the history of Western Asian space activities & programs.

Panelists:
- Olga Bannova, University of Houston — United States
- Anna Barbara Imhof, University of Applied Sciences and Arts (HfG) — Germany
- Matthew R. Bunch, University of Texas — United States
- Matthias Konig, University of Bremen — Germany

E4.2 Technical and Scientific Histories

The symposium will cover the entire spectrum of space history, at least 25 years old. History of space science, technology & development, rocketry, human spaceflight and personal experiences are included. This year a special focus is laid on the history of Western Asian space activities & programs.

Panelists:
- Olga Bannova, University of Houston — United States
- Anna Barbara Imhof, University of Applied Sciences and Arts (HfG) — Germany
- Matthew R. Bunch, University of Texas — United States
- Matthias Konig, University of Bremen — Germany

E4.3 Interactive Presentations - 36th IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS

This session solicits papers for a panel discussion focusing on the history of Western Asian space activities & programs. This symposium offers a unique opportunity to deliver your key messages in an interactive presentation on any of the subjects addressed in the classic paper. A range of topics may be covered including ideas and insights, space architecture, and space regulations.

Panelists:
- Olga Bannova, University of Houston — United States
- Anna Barbara Imhof, University of Applied Sciences and Arts (HfG) — Germany
- Matthew R. Bunch, University of Texas — United States
- Matthias Konig, University of Bremen — Germany

E4.4 History of Western Asia Contribution to Astromonics

The symposium will cover the entire spectrum of space history, at least 25 years old. History of space science, technology & development, rocketry, human spaceflight and personal experiences are included. This year a special focus is laid on the history of Western Asian space activities & programs.

Panelists:
- Olga Bannova, University of Houston — United States
- Anna Barbara Imhof, University of Applied Sciences and Arts (HfG) — Germany
- Matthew R. Bunch, University of Texas — United States
- Matthias Konig, University of Bremen — Germany
E7.4 Key Governance Issues in the New Space Age

The New Space Age is defined by a number of technical, economic and political developments, and the use of space for new space age activities, in both public and private sectors. To consistently secure safe, sustainable and secure use of outer space for peaceful purposes we will always need to consider governance aspects.

Thereby, the potentiality is a natural consequence of the ever-expanding use of space for commercial and non-commercial purposes. The New Space Age presents us with the challenge of ensuring that outer space continues to be a resource that is not only peaceful, but also benefits the whole of humankind.

Rapporteur

Co-Chairs

Rapporteur

Multilingual Astronautical Terminology

Rapporteur

Recent Developments in Space Law with Particular Focus on Space Debris Remediation

Key Governance Issues in the New Space Age

The New Space Age is defined by a number of technical, economic and political developments, and the use of space for new space age activities, in both public and private sectors. To consistently secure safe, sustainable and secure use of outer space for peaceful purposes we will always need to consider governance aspects.

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Multilingual Astronautical Terminology

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Rapporteur

Co-Chairs

Rapporteur

Multilingual Astronautical Terminology

Rapporteur

Recent Developments in Space Law with Particular Focus on Space Debris Remediation

Key Governance Issues in the New Space Age

The New Space Age is defined by a number of technical, economic and political developments, and the use of space for new space age activities, in both public and private sectors. To consistently secure safe, sustainable and secure use of outer space for peaceful purposes we will always need to consider governance aspects.

Thereby, the potentiality is a natural consequence of the ever-expanding use of space for commercial and non-commercial purposes. The New Space Age presents us with the challenge of ensuring that outer space continues to be a resource that is not only peaceful, but also benefits the whole of humankind.
**GTS. GLOBAL TECHNICAL SYMPOSIUM (GTS)**

The Global Technical Symposium (GTS) is designed to offer a modern and agile platform at the IAC for sharing technical content to an open-minded audience on-site but also online. Jointly organized by associated technical committees and the Workforce Development-Young Professionals Programme Committee, these sessions are similar to the conventional technical sessions in terms of abstract submission and paper submissions. However, in addition to the on-site presentation of the technical presentations, these sessions are also broadcast online. Authors are allowed to present remotely or on-site, and participants are also allowed to listen to the session from the comfort of their homes or at their workplaces in addition to the IAC venue. The IAC hopes that this approach will enable more students and young professionals without the ability to join IAC on-site to contribute to discussion at the IAC.

**GTS.1 ENTREPRENEURSHIP AROUND THE WORLD**

Entrepreneurship has different characteristics that differ from country to country around the world. Some of the challenges that entrepreneurs face transcend cultural and national borders, but others do not. This session will examine how international companies or organizations have overcome these challenges.

**GTS.2 HUMAN SPACEFLIGHT GLOBAL TECHNICAL SESSION**

This session will cover the latest in human spaceflight research and developments, focusing on human factors, crew health, and the impact of long-duration missions on human capabilities.

**GTS.3 SPACE COMMUNICATIONS AND NAVIGATION GLOBAL TECHNICAL SESSION**

This session will explore the latest advancements in space communications and navigation technologies, including satellite constellations, space situational awareness, and data relay systems.

**GTS.4 STUDENT TEAM COMPETITION**

This session will present student team competition projects from around the world, showcasing innovative ideas and technologies developed by young professionals.

**GTS.5 SMALL SATELLITE MISSIONS GLOBAL TECHNICAL SESSION**

This session will focus on small satellite missions, including their role in space exploration, Earth observation, and science communication.

**Categories**

- **GTS.1 ENTREPRENEURSHIP AROUND THE WORLD**
- **GTS.2 HUMAN SPACEFLIGHT GLOBAL TECHNICAL SESSION**
- **GTS.3 SPACE COMMUNICATIONS AND NAVIGATION GLOBAL TECHNICAL SESSION**
- **GTS.4 STUDENT TEAM COMPETITION**
- **GTS.5 SMALL SATELLITE MISSIONS GLOBAL TECHNICAL SESSION**
13. Instructions for Authors

Abstract Preparation

Format
- Abstracts must be written in English.
- Abstract length should not exceed 400 words.

Content
- Tables or drawings are not allowed in the abstract.
- Formulas can be included using the LaTeX box provided on the abstract submission page.
- Abstracts should specify purpose, methodology, results and conclusions.
- Abstracts should indicate that substantive technical and/or programmatic content is included.

Co-authors
- All your co-authors should be added at the time you submit your abstract using the tool provided online. You should register all of them online indicating their name, affiliation, full postal address, phone and email address.

Abstract Submission

Signing in
- The submission of abstracts must be done exclusively on the IAF website restricted area https://iafastro.directory/iac/account/login.
- If you are submitting an abstract on our website for the first time, you will need to register.
- In case you have forgotten your password, please use the password recovery utility.

Submission
- Go to the new abstract submission page.
- Browse the technical programme and choose the symposium and technical session for which you want to submit your abstract.
- Type the title and content of your abstract into the related abstract.
- Confirm that your attendance at IAC 2023 to deliver and present your paper.
- Confirm that the material is new and original and that it has not been presented at a previous meeting.
- Confirm that your attendance at IAC 2023 to deliver and present your paper.
- Please contact the IISL secretary for the regulations at secretary@iislweb.org.

Additional Information

Preliminary versions of the IAC proceedings will be available to participants at the Congress electronically. More information about the IAF Digital Library is available on the IAF website: https://ii.iacastro.directory/

Authors should follow the above general procedure. An additional suitability requirement is that the proposed topic must be related to a potential or on-going IAA Study Group activity.

Authors should follow the above instructions for the submission of their abstracts. In addition to the IAC Proceedings, the papers of the Colloquium, along with other materials, will be published in the Proceedings of IISL. Authors who qualify may ask to be considered for the Dr. I.H. Ph. Diederiks-Verschoor Award for Best Paper. Please contact the IISL secretary for the regulations at secretary@iislweb.org.

DEADLINES

Abstract Submission 28 February 2023
Interactive Presentation Submission 11 September 2023
Paper Submission 15 September 2023
Oral Presentation Submission 22 September 2023

Please make sure to check the IAF website (www.iafastro.org) and the IAF App regularly to get the latest updates on the Technical Programme!

QUESTIONS

Abstract submission and/or oral presentations: papersupport@iafastro.org
Interactive presentations: iapsupport@iafastro.org

Paper and Presentation Submission

- Details on how to prepare and submit your final paper as well as your presentation material will be available on www.iafastro.org by mid-April.
- Authors with an abstract accepted for oral presentation will be offered a presentation slot of 10 to 20 minutes.
- Authors with an abstract accepted for interactive presentation will be offered a presentation slot of 10 minutes.
- Authors with an abstract accepted for an interactive presentation will be asked to prepare slides and display them for the duration of the congress on screens. Authors will be assigned a specific screen number and will have a dedicated slot during which they will have the opportunity to engage in interactive discussion with other Congress attendees.

14. Space in Azerbaijan: Upholding the Legacy, Shaping the Future

Innovation and aspiration to explore and harness the power of knowledge for the benefit of the world have always been a cross-cutting theme throughout Azerbaijan’s space history spanning centuries. The foundation of space exploration in Azerbaijan was laid centuries ago, with people looking up into the sky in pursuit of discovering what the universe has stored away. Let us take a journey down the memory lane and reflect on the main milestones of the emergence and establishment of space industry in Azerbaijan.

The Maragha Observatory, a widely recognized regional scientific hub of the time, was established by Nasraddin Tusi, a prominent Azerbaijani astronomer, scientist, and thinker. He was at the origins of space activities in Azerbaijan by making an immense contribution to the scientific exploration of space through his prolific research in the fields of astronomy and physics.

A milestone year for Azerbaijan’s space industry as the 24th International Astronautical Congress under the theme “Space Research: Influence on Science and Technology” was held in Baku, the only city in the region that hosted this prominent event. The event left fundamental legacy for the space industry of Azerbaijan as over succeeding years, space research was highly prioritized, and Azerbaijani scientists and engineers were actively involved in the space program of the USSR.

Musa Manarov, an Azerbaijani astronaut and space engineer, flew into space aboard Soyuz TM-4 crewed spaceship as a flight engineer. Later, in 1990, he participated in his second space mission on Soyuz TM-11.

Azercom, the Space Agency of the Republic of Azerbaijan, was founded as the first and only satellite operator in the Caucasus region, becoming the main leading force behind the development of innovative space ecosystem in Azerbaijan.

Azerospace-1 telecommunication satellite – the first-ever satellite of Azerbaijan – was successfully launched into the orbit. Azerphotospace-2 telecommunication satellite was successfully launched into the orbit. The global space community will get together in Baku for the IAC once again half a century later, showcasing the world the latest developments and insights within the space sector.

Azerbaijan is taking gradual steps towards becoming one of the leading players on the global space arena, expressing its commitment to creating a better connected, developed, and secure world for future generations. The IAC 2023 is a perfect example of demonstrated allegiance and dedication of Azerbaijan to the common cause of exploring the space together and tackling the global challenges with the help of the space and the boundless knowledge it equips us with.
Join the IAF, the world leading space advocacy body!

Become an IAF Member

- Download the Application Form on [www.iafastro.org](http://www.iafastro.org)
- Participate in the IAF Committees in charge of defining the Technical Programme
- Propose to host a Plenary Event during the IAC
- Propose a Global Networking Forum (GNF) Event to showcase your organization’s latest achievements or to discuss the most interesting topics about Space
- Participate and vote in the General Assembly and nominate IAF Officers
- Host one of our events!

**JOIN US**

1. Download the Application Form on our website ([www.iafastro.org](http://www.iafastro.org)) or request it to the Secretariat.
2. Complete the Application Form and attach the requested documents.
3. Send everything to our Secretariat ([info@iafastro.org](mailto:info@iafastro.org)).
4. We will review your application and ask in case of missing information.
5. Once reviewed, your application will be recommended by the IAF General Counsel.
6. Final approval by the General Assembly during the IAC.

Connecting all Space People
ORGANIZED BY:

International Astronautical Federation
100 Avenue de Suffren
75015 Paris, France
Phone: +33 1 45 67 42 60
E-mail: info@iafastro.org
www.iafastro.org

HOSTED BY:

Azercosmos, Space Agency
of the Republic of Azerbaijan
72 Uzeyir Hajibayli str.
Baku, Azerbaijan, AZ1000
Phone: +99412 310 0055
E-mail: info@azercosmos.az
www.azercosmos.az

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