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**73<sup>rd</sup>**

**INTERNATIONAL ASTRONAUTICAL CONGRESS**

**18 - 22 SEPTEMBER 2022, PARIS, FRANCE**

*Space for @ll*

**PUBLIC, PLENARY  
& IAF GNF  
PROGRAMME**

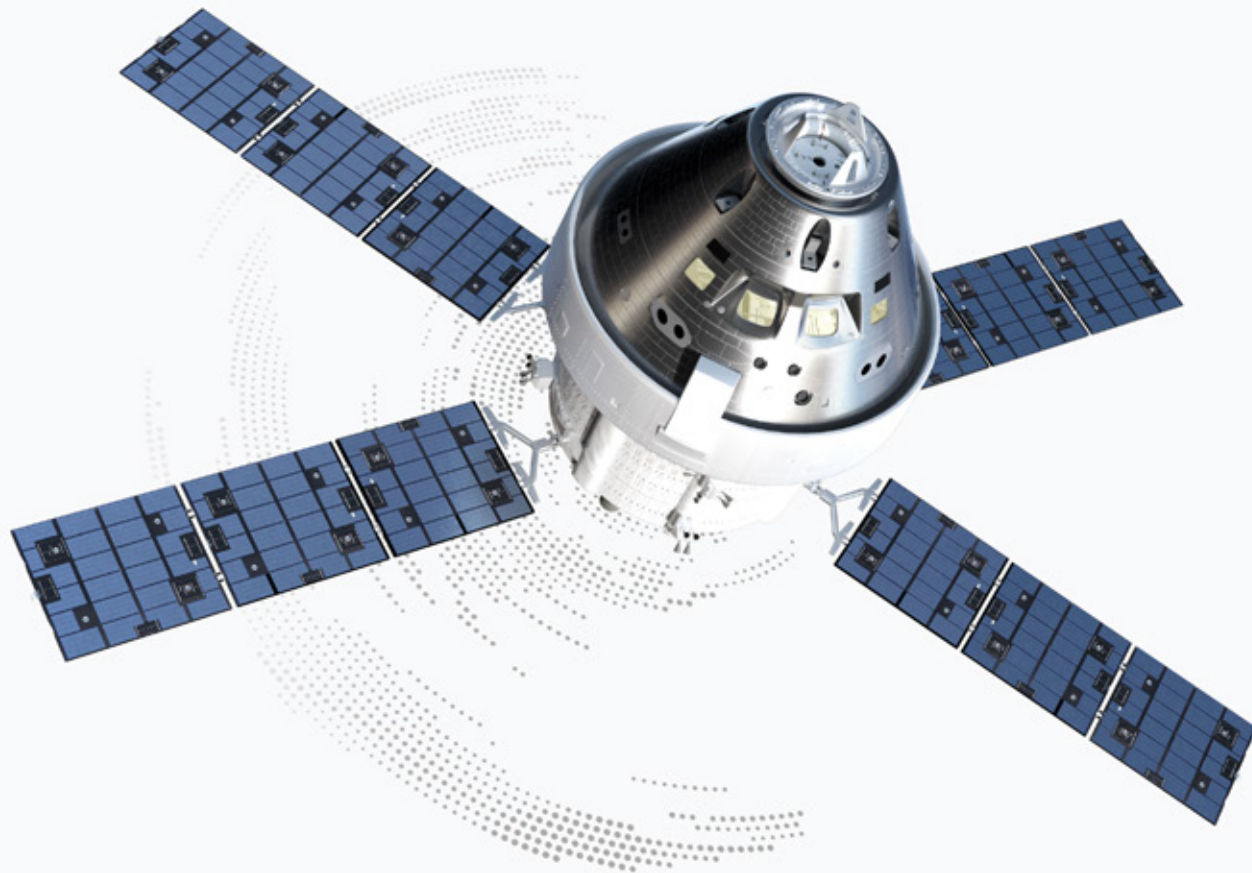
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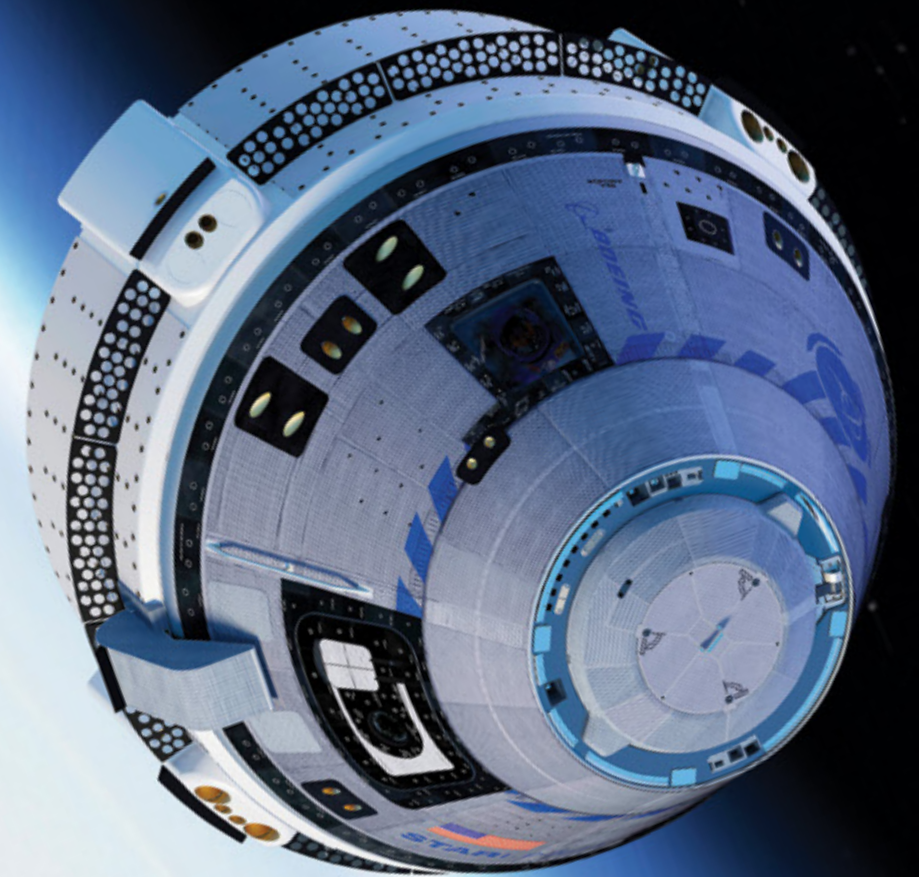
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## DISCOVERING THE NEXT ADVENTURE.



The human spirit is limitless. When we strive beyond the unknowns of today, we meet tomorrow with courage. Boeing is honored to salute those who look to the future and face it fiercely.





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Norsk Romsenter  
Norwegian Space Agency



# GLOC 2023

IAF GLOBAL SPACE  
CONFERENCE ON  
CLIMATE CHANGE

Fire and Ice - Planetary Extremes in a Changing Climate

23 - 25 MAY 2023 | OSLO, NORWAY

[www.gloc2023.org](http://www.gloc2023.org)



GLOC 2023 will address various topics of interest in relation to space and climate change with a specific focus on:

- Climate change impacts on the environment
- Applications and services driven by climate change
- Impacts of a changing climate on policy and law
- Commercial opportunities created by a changing climate
- Present and future international collaboration on space missions related to climate change
- Social, communications, economic and cultural dimensions of environmental change



Join us for the **GLOC 2023 RECEPTION!**  
IAC 2022, Monday 19 September 17:00 - 17:45  
Norwegian Pavillion (Booth D10)

For more info:



Indian Space Research Organisation  
Department of Space, Government of India



## Space Technologies Towards a New Paradigm



NEWSPACE INDIA LIMITED (NSIL)

A Government of India Company under Department of Space  
For carrying out commercial space activities

[contact-nsil@isro.gov.in](mailto:contact-nsil@isro.gov.in) | [www.nsilindia.co.in](http://www.nsilindia.co.in)



INDIAN NATIONAL SPACE PROMOTION AND AUTHORIZATION CENTRE

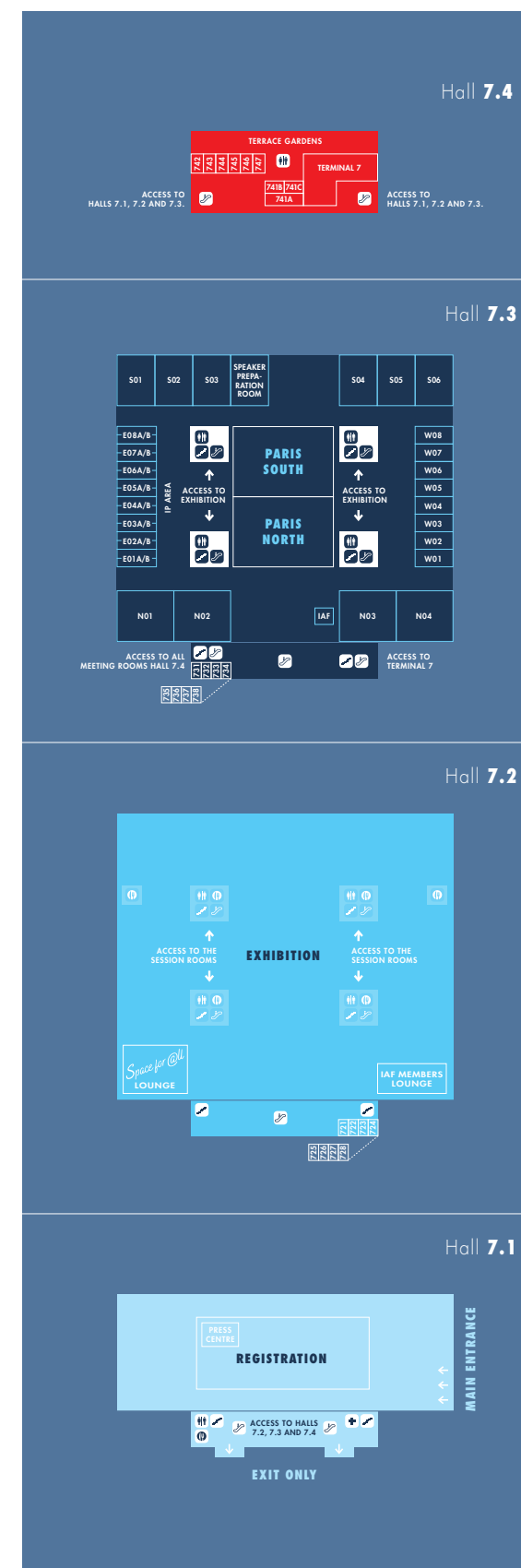
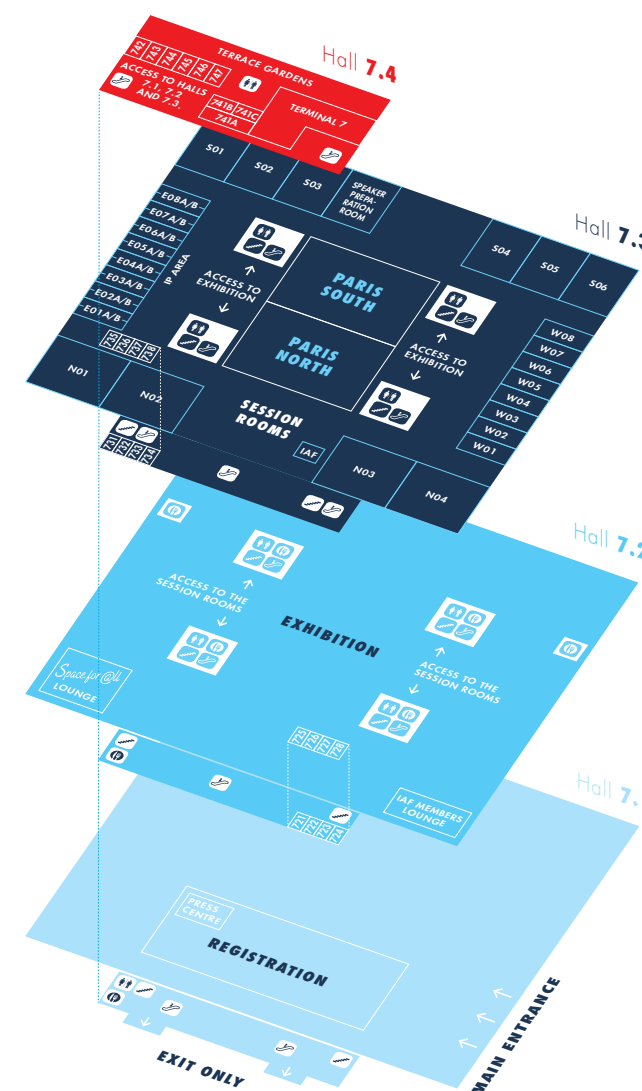
An autonomous body "to permit, regulate, promote, hand-hold, monitor and supervise Space Activities of Non-Governmental Private Entities (NGPEs) in India."

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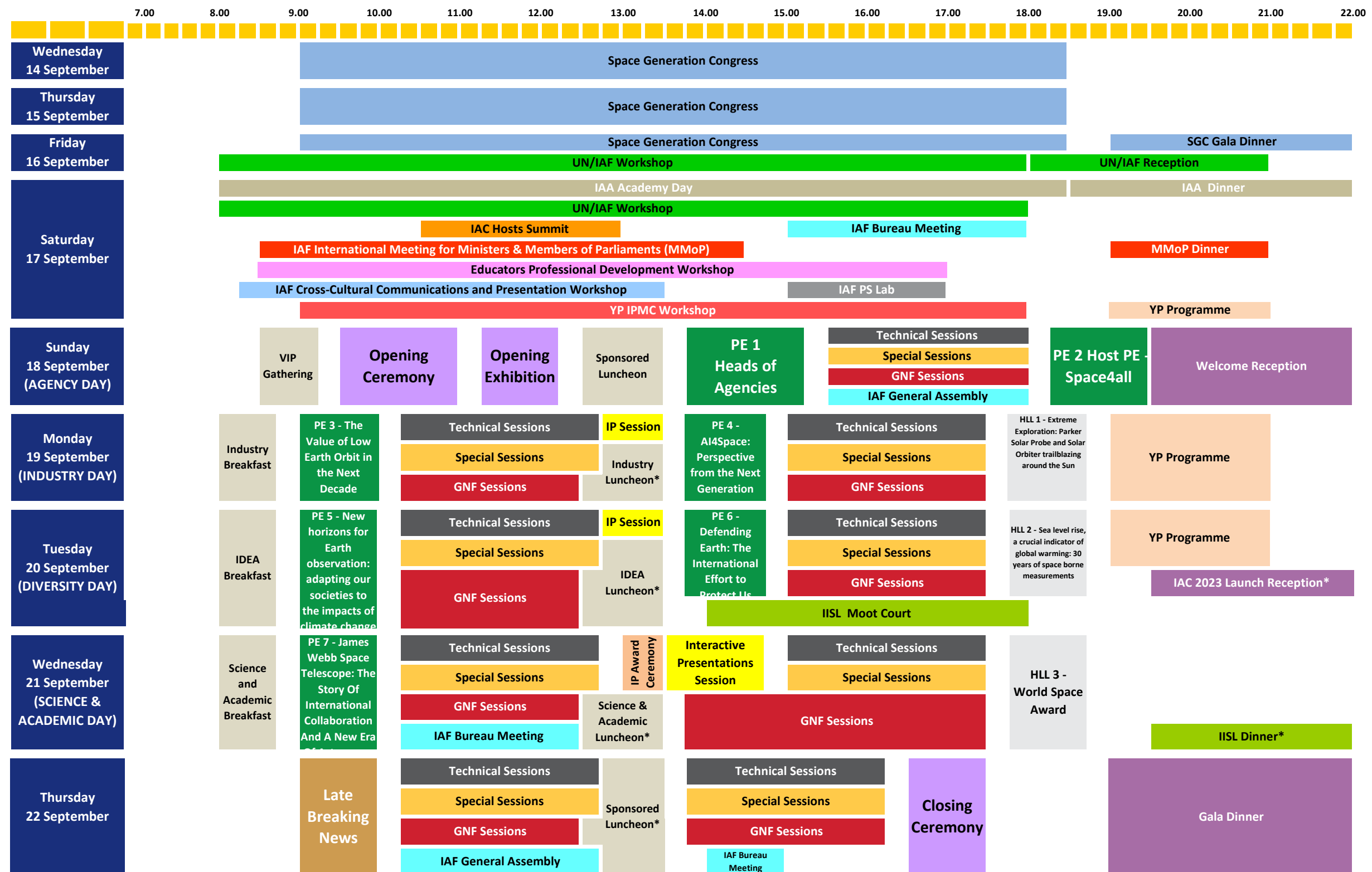
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## 1 Congress at a Glance



Please Note: \*By invitation only; Pre-Congress events as well as the IISL Moot Court are dedicated to the respective participants



## 2 Plenary and IAF GNF Programme at a Glance

	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	STREAM TOPIC
<b>Sunday 18 Sept</b>				Opening Ceremony	Opening Exhibition and VIP Tour		* VIP Luncheon sponsored by ESA	PE 1- Heads of Space Agencies		Meet SUSIE (Arianegroup)	A new innovative satellite platform for exiting missions like the Arctic	Roundtable on ESA Ministerial (ESA)	PE 2 - Host Plenary: Space for @II		
<b>Monday 19 Sept</b>		Industry Breakfast sponsored by Nanoracks	PE 3 - The Value of Low Earth Orbit in the Next Decade	Space 2050: Boldly Going Into the Future (Lockheed Martin)	Extreme Makeover: Space Edition (to be held in Paris South)		* Industry Lunch and Award Ceremony	PE 4 - AI4Space: Perspective from the Next Generation	A Sustainable Lunar Surface Infrastructure (TAS)	Commercial LEO Destinations (Blue Origin)	#NEXTSPACE: Teamwork, Human Expansion and Boomerang from Space (Airbus)	HLL 1 - Extreme Exploration: Parker Solar Probe and Solar Orbiter trailblazing around the Sun			
<b>Tuesday 20 Sept</b>		IDEA "3G" Breakfast sponsored by JPL	PE 5 - New horizons for Earth observation: adapting our societies to the impacts of climate change	Solving Sustainability Issues on Earth, in Space and Beyond (Saudi Space Commission)	Future of Space outreach - International Rocketry Competition (PSA)	Rise of "Exciting and Emotional Space Businesses" (JAXA)	* IDEA "3G" Diversity Luncheon sponsored by EUTELSAT	PE 6 - Defending Earth: The International Effort to Protect Us from Asteroids and Comets	Helga and Zohar Travel to the Moon: an International Collaboration aboard Artemis I (Lockheed Martin)	Moon to Mars Objectives (NASA)	Diversity at ArianeGroup and Market Perspectives by Arianespace (Arianegroup)	HLL 2 - Sea level rise, a crucial indicator of global warming: 30 years of space borne measurements			
<b>Wednesday 21 Sept</b>		Science and Academic Breakfast	PE 7 - James Webb Space Telescope: The Story of International Collaboration and a New Era of Astronomy for All	Re-imagining Scientific Discovery with SLS Unique Launch Capability (Boeing)	From Cygnus to CDFF: Building the Foundation of a New Economy in Low Earth Orbit (NG)	Sustainability Actions for Emerging Countries using satellite data (CLIODN/UNOOSA/NSA)	* Science and Academic Luncheon sponsored by RAKIA	IP Award Ceremony	IP Session	Opening Up of Indian Space Sector- Global Perspective (ISRO)	From LEO to Deep Space - What Every Space Actor Needs for Mission Success (ITU/Amazon)	The Skills Gap: Keeping up with the growing space sector (UK SA)	HLL 3 - World Space Award - Achievements of the Tianwen-1 Mission		
<b>Thursday 22 Sept</b>			Late Breaking News	Space inspiration: how space and Ariane are inspiring artistic creation (Arianegroup)	Mumm Stellar Project - The first Champagne for Space - A technical and cultural endeavour (GH Mumm)		* VIP Luncheon sponsored by Astroscale + WSWA Award	Fostering disruptive innovation through open collaboration in the space industry (CNES)	The benefits of space opportunities in addressing socio-economic challenges and developing of space ecosystem in			Closing Ceremony			

\*Upon Invitation Only



## 3 Daily Congress Programme

### Sunday 18 September

#### 09:30 - 11:00 Opening Ceremony

**Location:** Paris South, Level 3, Hall 7, Paris Convention Centre

##### Master of Ceremonies



**Barbara BELVISI**  
CEO,  
Interstellar Lab,  
France

##### Speakers:



**Philippe BAPTISTE**  
President,  
Centre National d'Etudes  
Spatiales (CNES),  
France



**Thierry BRETON**  
Internal Market  
Commissioner,  
European Commission,  
France



**Élisabeth BORNE**  
Prime Minister,  
Council of Ministers of  
France,  
France



**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France

##### Anchor Sponsors Speakers:



**Robert LIGHTFOOT**  
Executive Vice President,  
Lockheed Martin  
Corporation,  
United States



**André-Hubert ROUSSEL**  
CEO,  
ArianeGroup SAS,  
France

#### 11:15 - 12:15 Opening Exhibition/Ribbon cutting/VIP Tour

**Location:** Exhibition Hall, Level 2, Hall 7, Paris Convention Centre

#### 12:30 - 13:30 ESA VIP Luncheon (upon invitation only)

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

Sponsored by:



Speaker:



**Josef ASCHBACHER**  
Director General,  
European Space Agency (ESA),  
France



**WELCOME**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France

#### 13:45 - 15:15 Plenary 1 – Heads of Agencies



**Location:** Room Paris South+North, Level 3, Hall 7, Paris Convention Centre

This year's Heads of Agencies plenary will focus on the overall theme of the Congress "Space for @ll".

During the first part, the participating Heads of Agencies will present and discuss their projects and explain what their priorities are for the coming years. In the second part, the Heads of Agencies will focus more on their past achievements and explain the projects that will involve a community beyond space, in line with this year's IAC motto.

The plenary will conclude with an interactive Q&A session with the audience.

Speakers:



**Lisa CAMPBELL**  
President,  
Canadian Space Agency  
(CSA),  
Canada



**Josef ASCHBACHER**  
Director General,  
European Space Agency  
(ESA),  
France



**S. SOMANATH**  
Special Advisor to  
President (IAC Evolution)  
IAF Bureau,  
Chairman,  
Indian Space Research  
Organisation (ISRO),  
India



**Hiroshi YAMAKAWA**  
President,  
Japan Aerospace  
Exploration Agency (JAXA),  
Japan



**Bill NELSON**  
Administrator,  
National Aeronautics and  
Space Administration (NASA),  
United States



**MODERATOR**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France



**MODERATOR**  
**Christian FEICHTINGER**  
Executive Director,  
International Astronautical  
Federation (IAF),  
France



**WELCOME KEYNOTE**  
**Philippe BAPTISTE**  
President,  
Centre National d'Etudes  
Spatiales (CNES),  
France



## 15:30 - 16:15 Press Conference – Heads of Agencies

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

The Heads of Agencies Press conference will give the audience (mainly press representatives) the opportunity to directly address the Heads of Agencies asking relevant and challenging questions.

### Speakers:



**Josef ASCHBACHER**  
Director General,  
European Space Agency (ESA),  
France



**Philippe BAPTISTE**  
President,  
Centre National d'Etudes  
Spatiales (CNES),  
France



**Lisa CAMPBELL**  
President,  
Canadian Space Agency  
(CSA),  
Canada



**Bill NELSON**  
Administrator,  
National Aeronautics and  
Space Administration (NASA),  
United States



**S. SOMANATH**  
Special Advisor to  
IAF Bureau,  
Chairman,  
Indian Space Research  
Organisation (ISRO),  
India



**Hiroshi YAMAKAWA**  
President,  
Japan Aerospace  
Exploration Agency (JAXA),  
Japan



**MODERATOR**  
**Michael SHEETZ**  
Space Reporter,  
CNBC,  
United States

## 15:30 - 16:25 IAF GNF – Meet SUSIE



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

Meet SUSIE: ArianeGroup's vision for moving cargo and human to, in and from space. SUSIE is an innovative concept launched on Ariane 6 that ArianeGroup will unveil for the first time. Designed on a proven European flight heritage, this innovative concept will thrust European capabilities for sovereign human and cargo launch/recovery.

De-facto, it will also allow Europe to keep up with upcoming key future challenges like the establishment of space logistics networks, deep space exploration, international cooperation and full reusability needs.

### Organized by:



### Speakers:



**Morena BERNARDINI**  
Head of Strategy &  
Innovation,  
ArianeGroup SAS,  
France



**Marco PRAMPOLINI**  
System Architect for  
Advanced Concepts,  
ArianeGroup SAS,  
France



**Joost VAN TOOREN**  
Human Space Flight  
Programme Manager,  
ArianeGroup SAS,  
France

## 16:30 - 17:00 IAF GNF – A New Innovative Satellite Platform For Existing Missions Like The Arctic Weather Satellite And Mats



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The experience of 30 years of proven success from a wide range of space missions in low and geostationary orbit has gone into the development of a new and already flight proven satellite platform. The platform named InnoSat is built around a set of core elements that can be re-used (both hardware and software) whilst offering high performance in terms of pointing, stability, power, data downlink and autonomy.

Among the early utilisers of the new satellite platform are:

- ESA, Arctic Weather Satellite (launch planned for 2024)
- European Union, EU Horizon 2020 IOD/IOV 8 (launch planned for 2024)
- Swedish National Space Agency, MATS is a scientific mission, created by the Department of Meteorology (MISU) at Stockholm University (launch planned late for 2022)

### Organized by:



### Speaker:



**Benoit MATHIEU**  
Managing Director,  
OHB Sweden AB,  
Sweden

## 17:15 - 18:10 IAF GNF – Roundtable ESA Ministerial 2022



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

We are at D-2 Months of a major milestone: the ESA Council meeting at ministerial level (CM22).

What does it mean? What is at stake? Why is ESA Director General proposing to his Member States a major step up for the European space Programmes? After a very successful ministerial meeting back in 2019 (Sevilla, Space19+), CM22 represents a package that is a proposed increase of 25% of the budget over three years. Why is this so important, now?

The panel composed of representatives of ESA Member States will exchange on the spirit that is animating this new ambition. How space benefits the European citizens, day after day and how space provides essential instruments in current global crisis such as the Climate Change or the war in Ukraine. Key questions, key players to set the stage on how the preparation for CM22 will lead to essential decisions in Paris on 23 November 2022.

### Organized by:



## Speakers:



**Josef ASCHBACHER**  
Director General,  
European Space Agency (ESA),  
France



**Philippe BAPTISTE**  
President,  
Centre National d'Etudes  
Spatiales (CNES),  
France



**Walther PELZER**  
Director General, German  
Space Agency, Member of  
the Executive Board,  
Deutsches Zentrum für Luft-  
und Raumfahrt e.V. (DLR),  
Germany



**Anna RATHSMAN**  
Director General,  
Swedish National Space  
Agency (SNSA),  
Sweden



**Giorgio SACCOCCIA**  
President,  
Italian Space Agency (ASI),  
Italy

## 18:15 - 19:30 Plenary 2 – Space4all : Space For All The Inhabitants Of Planet Earth



**Location:** Room Paris South+North, Level 3, Hall 7, Paris Convention Centre

Space has long been synonymous with adventure, exploration and discovery. Today we even talk about space tourism and the exploitation of mining resources. All these ambitions if they meet today a reality, are to be compared to what space brings to the everyday life of the earthlings but also to the progress of science.

Without observation satellites, there would be no global warming measurements and therefore no sustainable development policies. Without Galileo, there would be no positioning of vehicles, but also of hikers, trains, and ships entering ports. Without microgravity experiments, there will be no bio-production for gene therapies in the future, nor experiments for a new agriculture. Without a lunar base, there will be no fundamental research on food, energy and oxygen in autonomy.

Space teaches us to live better on planet earth. Our daily life and our future will depend more and more on this scientific and human adventure.

## Speakers:



**Nicolas GAUME**  
Co-Founder & CEO,  
Space Cargo Unlimited,  
France



**Conny HANSELI**  
PhD Student in Urban  
Design,  
Karlsruhe Institute of  
Technology (KIT) and  
Toulouse School of  
Architecture (ENSA),  
France



**François HOUILLER**  
President and CEO,  
French Research Institute  
for Exploitation of the Sea  
(IFREMER),  
France



**Rafaela KRAUS**  
Vice President  
Entrepreneurship,  
University of the Bundeswehr  
Munich,  
Germany



**Stefan MAY**  
Country Head,  
Continental,  
France



**Frédéric REVAH**  
CEO,  
Genethon,  
France



**MODERATOR**  
**Gilles RABIN**  
Advisor to the President,  
Centre National d'Etudes  
Spatiales (CNES),  
France

## 19:30 - 22:00 Welcome Reception

**Location:** Level 3, Hall 7, Paris Convention Centre

To celebrate the IAC 2022, we will have a Welcome Reception with food and beverages.

Sponsored by:





## Monday 19 September

### 08:00 - 08:45 Industry Breakfast

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

**Sponsored by:** **Nanoracks**  
SPACE OUTPOST EUROPE

**Speakers:**



**Chirag PARIKH**  
Executive Secretary,  
National Space Council,  
United States



**Amela WILSON**  
CEO,  
Nanoracks,  
United States



**WELCOME**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France

### 09:00 - 10:00 Plenary 3 – The Value Of Low Earth Orbit In The Next Decade



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

2022 is a really powerful year for low Earth orbit (LEO)! The US announced its intent to operate the International Space Station (ISS) to 2030 and other ISS partners are also planning extensions. Use of the ISS until 2030 brings more than a third additional on-orbit lifetime. Europe is defining their roadmap for the future and planning to develop their own capabilities. India is developing a cargo option. China's Aerospace and Technology Corporation (CASC) announced it would add two 22-ton modules to complete the Tiangong space station this year. New commercial players also have plans!

This plenary will discuss how LEO will be used differently in the next 8 years - given the more recent international capabilities and new objectives - and what a human presence in LEO across multiple international and commercial efforts will look like. We will highlight potential business markets and the business cases for commercial companies and key benefits provided by these efforts. Discussions will also include why these investments are being made now.

A key focus for this plenary is on diversity and the "G's of the IAF": Gender, Geography and Generation. We will hear from a diversity of voices including research, tourism, manufacturing, and space development, and from government agency and company perspectives.

**Speakers:**



**Mary Lynne DITTMAR**  
Chief Government and  
External Relations Officer,  
Axiom Space, LLC,  
United States



**Olivia GAMEZ HOLZHAUS**  
CEO,  
Rhodium Scientific,  
United States



**Robyn GATENS**  
Director of the International  
Space Station,  
National Aeronautics and  
Space Administration (NASA),  
United States



**Iwao IGARASHI**  
Vice President & General  
Manager, Business  
Development, Space Systems,  
Integrated Defense & Space  
Systems,  
Mitsubishi Heavy Industries  
(MHI),  
Japan



**Shawna PANDYA**  
Physician, Aquanaut, Scientist-  
Astronaut Candidate Program  
Graduate,  
International Institute for  
Astronautical Sciences (IIAS),  
Canada



**MODERATOR**  
**Dan DUMBACHER**  
Executive Director,  
American Institute of  
Aeronautics and Astronautics  
(AIAA),  
United States

### 10:15 - 11:05 IAF GNF – Space 2050: Boldly Going Into The Future



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

What will space exploration and activities look like in the future? The fourth industrial revolution is currently underway, with machine learning and artificial-intelligence (AI) technologies making significant advancements and changing industries. The next thirty years will revolutionize our efforts in space and on Earth. We envision fully autonomous deep space exploration, where spacecraft, rovers, and landers decide what to do based on commander's intent. Cooperative robotics will enable life-saving operations on Earth, such as autonomous robotic surgery and fire-fighting assistance, and enable lunar surface activities, such as autonomous mining and outpost construction with raw materials. There will be cognitive AI assistants to help crew with situational awareness, troubleshooting, and decision making. Advances in propulsion will provide faster travel. Furthermore, smart cities will become a reality. Advances in power and infrastructure management will enable better living conditions on Earth, the Moon, and Mars. We will discuss the current developments at Lockheed Martin, the major challenges, and what this innovation path looks like towards making these science fiction scenarios a reality in Space 2050.

**Organized by:**



**Speakers:**



**Timothy CICHAN**  
Space Exploration Architect,  
Lockheed Martin  
Corporation,  
United States



**Sapna RAO**  
Systems Engineer, Commercial  
Civil Space,  
Lockheed Martin  
Corporation,  
United States



**Eric SMITH**  
Director of Artificial  
Intelligence and Data  
Analytics,  
Lockheed Martin  
Corporation,  
United States

### 11:20 - 12:20 IAF GNF – Extreme Makeover: Space Edition



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

Last time you moved, you had to get used to the local food, paint, find a gym, build a social circle, and make a house a new home. Humanity's next big move will take us a bit further away, but the challenges will remain the same. Everything we once knew about living and working in space is about to change..

Hear from lifestyle brands, earth-bound innovators, and space experts to find out how we will eat, exercise, and take care of ourselves in the next era of space exploration..

Space gray is officially out of style. It's time for an extreme makeover.

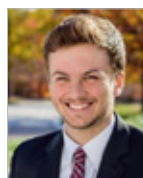
**Organized by:**



## Speakers:



**Hubert ANTOINE**  
President and CEO,  
Ynsect,  
France



**Ben GREAVES**  
Closed Environment  
Agricultural Engineer,  
Starlab Oasis,  
United Arab Emirates



**Helene HUBY**  
Co-Founder and CEO,  
The Exploration Company,  
Germany



**Amicie MONCLAR**  
CEO,  
Zephalto,  
France



**Lembit SIHVER**  
Chief Technology Officer,  
Cosmic Shielding,  
United States



**Adam SIREK**  
Co-founder,  
Leap Biosystems,  
Canada



**Marshall SMITH**  
Senior Vice President of Space  
Sytems,  
Nanoracks,  
United States



**John ZOLDAK**  
Director of Space Sciences,  
Zin Technologies,  
United States



**MODERATOR**  
**Clémentine DECOOPMAN**  
Associate Director Space  
Stream,  
Creative Destruction Lab,  
France



**MODERATOR**  
**Akihiko HOSHIDE**  
Astronaut, Director Houston  
Office,  
Japan Aerospace Exploration  
Agency (JAXA),  
United States

## 12:30 – 13:30 Industry Luncheon (Upon Invitation Only)

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

## Speakers:



**WELCOME REMARKS:**  
**Andreas LINDENTHAL**  
IAF VP: Financial Matters and  
Industry Relations,  
International Astronautical  
Federation (IAF),  
Germany



**WELCOME REMARKS:**  
**Carlo MIRRA**  
Chair, IAF Industry Relations  
Committee  
Sales Director in the  
Institutional Business Growth,  
Airbus Defence and Space  
Netherlands B.V.,  
Netherlands



**AWARDS PRESENTATION:**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France

## Speakers:



**Mike LEWIS**  
Chief Innovation Officer,  
Nanoracks,  
United States



**André-Hubert ROUSSEL**  
CEO,  
ArianeGroup SAS,  
France

## 13:45 - 14:45 Plenary 4 – AI4SPACE: Perspective From The Next Generation



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

From astronomy to mission design, from advanced satellite operations to autonomous remote space exploration, Artificial Intelligence (AI) has the potential to disrupt how space is being done today.

The AI4Space plenary will be a deep dive into how AI is transforming the sector, showcasing the work and research of the talented group of the NextGen panelists selected for this session.

Leveraging the panelist's diverse expertise, the plenary will cover topics as robotics, AI-enabled science, mission design, lunar rovers, human-robots interactions, and overall anything related to what the future might hold for space activities.

You can expect a dynamic and interactive session, so make sure to come equipped with curiosity and your best questions, and get ready to be inspired by the passion driving the NextGen!

## Speakers:



**Audrey BERQUAND**  
Research Fellow,  
European Space Agency  
(ESA),  
Netherlands



**Kelsey DOERKSEN**  
PhD Student,  
University of Oxford,  
United Kingdom



**Luke HEFFERNAN**  
Business Development Lead,  
Australian Institute for  
Machine Learning,  
Australia



**Sorina LUPU**  
PhD Student,  
Caltech,  
United States



**Antonio STARK**  
Chief Operating Officer,  
Unmanned Exploration  
Laboratory,  
Republic of Korea



**MODERATOR**  
**Danielle WOOD**  
Assistant professor,  
Massachusetts Institute of  
Technology,  
United States

## 15:00 - 15:45 IAF GNF – A Sustainable Lunar Surface Infrastructure



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The major spacefaring nations are embarked in a coordinated international effort to sustain space exploration beginning at the International Space Station and moving to lunar orbit and lunar surface and then Mars.

The international Lunar Gateway, a human-tended facility in orbit around the Moon, is the next step beyond LEO in the global journey to Mars.

A Moon surface infrastructure will complement the opportunities that the Lunar Gateway offers to develop a sustainable human space exploration. It will allow to validate capabilities and enabling technologies for Mars (landers, rovers, protections from the cosmic radiations...) and will offer in-situ resources.

The panelists will discuss the main elements required to initiate the Moon surface infrastructure and will present the current plans at international level to contribute to its open architecture.



Organized by:



Speakers:



**Lisa CALLAHAN**  
Vice President and General Manager of Commercial Civil Space, Lockheed Martin Corporation, United States



**Massimo COMPARINI**  
CEO, Thales Alenia Space Italia, Italy



**James FREE**  
Associate Administrator for Exploration Systems Development, National Aeronautics and Space Administration (NASA), United States



**David PARKER**  
Director of Human and Robotic Exploration, European Space Agency (ESA), Netherlands



**MODERATOR**  
**Maria Antonietta PERINO**  
Director for Space Economy Exploration and International Network, Thales Alenia Space Italia, Italy

## 16:00 - 16:30 IAF GNF – Commercial LEO Destinations



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

As we approach the end of life for the International Space Station (ISS) later this decade, commercial destinations in Low Earth Orbit (LEO) will support the activities of governments, industry, academia, and consumers. Blue Origin and Sierra Space are developing Orbital Reef - a mixed use LEO space station for commerce, research, and tourism that welcomes all - by the end of this decade. This fireside chat will explore the opportunity for global user communities to use commercial stations to support exploration, develop space technology, promote commercial enterprise, and fly people in space routinely.

Organized by:



Speakers:



**Janet KAVANDI**  
President, Sierra Space, United States



**Brent SHERWOOD**  
Senior Vice President Advanced Development Programs, Blue Origin, United States

## 16:45 - 17:30 IAF GNF – #Nextspace: Teamwork, Human Expansion And Boomerangs From Space



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The Space industry is changing. But that's nothing new. Space has been pushing back the realms of the possible for decades and that's what makes it so exciting.

The industry today takes many forms. Original pioneers who have innovation coursing through their veins. Newer players taking centre stage with impressive technology and far-flung ambitions. Start-ups developing niche technologies. Media and influencers that helped create and foster an increased public awareness and fascination with Space endeavours. Last but not least, players from areas that would once have been considered entirely unrelated are now ready to benefit from space exploration in new ways, and these non-space players will become key for some future endeavours.

A distinguished panel of representatives of the above groups will discuss what the future holds for Humanity's presence in Space, the envisioned expansion of the Human experience in Space in the years and decades to come, and how humans will live in different destinations... from LEO to Moon and Mars and maybe one day beyond.

Participants will elaborate how the developments that are necessary for this expansion of the human presence can be a 'technological boomerang' that will be pivotal to building a better tomorrow by improving life on Earth.

Organized by:



Speakers:



**Soyoung CHUNG**  
Senior Researcher, Korea Aerospace Research Institute, Republic of Korea



**Raphael RÖTTGEN**  
Managing Partner, E2MC Ventures, Switzerland



**Antonino SALMERI**  
Policy Analyst, Open Lunar Foundation, Luxembourg



**Peter WEISS**  
President & Founder, Spartan Space, France



**MODERATOR**  
**Laura TODD**  
Vice President Space Exploration Future Programmes, Airbus Defence and Space SAS, France

## 17:45 - 18:45 Highlight Lecture – Extreme Exploration: Parker Solar Probe And Solar Orbiter Trailblazing Around The Sun

HLL

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

Though billions of stars exist in the universe, only the one at the center of our solar system plays a unique role for us here on Earth. The Sun provides light and heat, controls the seasons and ocean currents, stirs up the atmosphere, and gives energy to most life.

But the Sun also affects us in less obvious ways. The energetic particles it emits can disrupt radio communications. Its coronal mass ejections can interact with the Earth's magnetic field to trigger power outages by inducing high voltage fluctuations in the power grid. Knowing how to combat these potentially damaging disruptions and understanding the solar events that cause them is crucial for scientific, social, and economic reasons.

Two bold flagship space missions are on their way to better understand how our Sun works: NASA's Parker Solar Probe (Parker), launched in 2018, and Solar Orbiter, a mission of international collaboration between ESA and NASA, launched in 2020. Parker is venturing closer to the Sun than any other spacecraft to answer long-standing questions, e.g., how the solar wind and energetic particles are accelerated and transported throughout our solar system. In April 2021, Parker crossed over into the solar atmosphere for the first time in history, breaking one of the last frontiers of solar system exploration. Solar Orbiter performed its first close solar flyby at 0.32 au in March 2022, taking the closest-ever images of the Sun while measuring the composition of the solar wind to establish the causal connection between the Sun and the bubble of the heliosphere.

The two engaging speakers lead the Solar Orbiter and Parker missions. They will describe the firsts of each mission and draw connections between the new observations from each mission and how what we are learning from them impacts our daily lives here on Earth.

#### Speakers:



**Daniel MÜLLER**  
Project Scientist ESA-NASA  
Solar Orbiter Mission,  
European Space Agency  
(ESA),  
Netherlands



**Nour RAOUAFI**  
Parker Solar Probe Project  
Scientist,  
The Johns Hopkins  
University Applied Physics  
Laboratory,  
United States



**MODERATOR**  
**Jason KALIRAI**  
Mission Area Executive for  
Civil Space,  
The Johns Hopkins University  
Applied Physics Laboratory,  
United States

#### 19:30 - 21:30 Young Professionals Networking Event (restricted to Young Professionals)

**Location:** Room N02, Level 3, Hall 7, Paris Convention Centre

Join us for the opportunity for speed mentoring with industry leaders about how to navigate your career. Networking and reception will follow.

#### Sponsored by:



## Tuesday 20 September

#### 08:00 - 08:45 IAF IDEA "3G" Diversity Breakfast

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

#### Sponsored by:



**WELCOME**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France



**MODERATION**  
**Deganit PAIKOWSKY**  
IAF VP for Diversity Initiatives  
and Science & Academic  
Relations,  
International Astronautical  
Federation (IAF),  
Israel

#### Speaker:



**Larry D. JAMES**  
Deputy Director,  
NASA Jet Propulsion  
Laboratory,  
United States

#### 09:00 - 10:00 Plenary 5 – New Horizons For Earth Observation: Adapting Our Societies To The Impacts Of Climate Change



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The urgency of tackling climate change has become one of the greatest challenges for mankind. The contributions of Earth Observation satellites have proved to be a formidable stepping stone, allowing to accurately understand and monitor our planet, assess climate variables and depict change. However, despite the accessibility of satellite data and the interest raised by these prospects, a bridge has yet to be built to allow local decision-makers and the wider audience to make the most of these approaches for adaptation to climate change.

The Space for Climate Observatory (SCO) is a unique initiative to support the emergence of projects enabling climate adaptation at a local level. As an international network of space agencies and public and private entities, the SCO develops projects built upon existing cloud computing infrastructures and satellite data for adaptation – from extreme events management to biodiversity monitoring –, using new methodologies and providing operational tools directly to the users. These tools are co-designed to answer specific needs and to allow the wide audience to leverage satellite data. The projects can besides be readily modified to suit other geographic areas facing similar environmental stakes.

The objective of this plenary is to discuss the best way to enable collaboration between research institutions, public entities and the private sector to work towards wider adaptation thanks to Earth observation, and to find the most promising solutions for local, satellite-based adaptation by exploring SCO's concrete activities and achievements.



Panellists will bring their own perspective on the topic and on international data and coordination issues, coming from widely different geographic area and sectors. In addition to space agencies that each face specific challenges depending on the national infrastructures and environmental situations, the panel will include presentations from actual projects.

## Speakers:



**Simonetta CHELI**  
Director of Earth Observation Programmes and Head of ESRIN, European Space Agency (ESA), Italy



**Amal LAYACHI**  
Head of Capacity Building Department, Centre Royal de Télédétection Spatiale (CRTS), Morocco



**Stéphane MERMOZ**  
Researcher (CESBIO), Founder, GlobEO, France



**Nancy OLIVETO**  
Founder, Societe Generale D'Evaluation Des Territoires (SGEVT), France



**Rosa Maria RAMIREZ DE ARELLANO Y HARO**  
Head of International Affairs, Mexican Space Agency (AEM), Mexico



**Shereen ZORBA**  
Head of Secretariat, UN Science-Policy-Business Forum on the Environment, Kenya



**MODERATOR**  
**Laurence MONNOYER-SMITH**  
Head of Sustainable Development, Centre National d'Etudes Spatiales (CNES), France

## Organized by:



## Speakers:



**Mohammad ALGASSIM**  
General Manager of Strategy, Saudi Space Commission (SSC), Saudi Arabia



**Candace JOHNSON**  
Co-Initiator, SES, France



**Valanathan MUNSAMI**  
Advisor to the CEO, Saudi Space Commission, Saudi Arabia



**Soichi NOGUCHI**  
Former Astronaut, Japan Aerospace Exploration Agency (JAXA), Japan



**Frank M. SALZGEBER**  
Managing Director, Space Sector, Saudi Space Commission (SSC), Saudi Arabia



**Frans VON DER DUNK**  
Harvey and Susan Perlman Alumni, Othmer Chair of Space Law, College of Law, University of Nebraska-Lincoln, United States



**MODERATOR**  
**Mishaal ASHEMIMRY**  
Aerospace Consultant & Special Advisor to CEO, Saudi Space Commission (SSC), Saudi Arabia

**10:15 - 11:05 IAF GNF – Solving Sustainability Issues On Earth, In Space And Beyond**



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

Water scarcity, power shortages and global warming are some of the many sustainability issues facing us on Earth. Saudi Arabia, located in a dry desert, has managed to, for example, solve its water scarcity issues through mass-scale desalination and has recently made a commitment to spending over USD\$ 187 B towards the growth of a green economy through its Saudi Green Initiative (SGI), with the ambitious goals of achieving the following by 2030:

- Reducing emissions by as much as 278 million tons per annum (Mtpa),
- Cutting global methane emissions by 30%,
- Planting 450 million trees, and
- Rehabilitating 8 million hectares of degraded lands.

Ultimately, this will allow Saudi Arabia to achieve net zero emissions by 2060 through a Carbon Circular Economy approach.

Saudi Arabia recognizes the enormous responsibility we as humans have towards the preservation and use of outer space, the Moon, and Mars. While we attempt to solve sustainability issues facing us here on earth, we must also be proactive in identifying similar solutions applicable for use in outer space and within future settlements on the Moon and Mars. In this session, we will engage experts from around the world to share their unique knowledge and experience on how we can translate our sustainability efforts on Earth, to space and beyond.

**11:10 - 11:40 IAF GNF – Future Of Space Outreach - International Rocketry Competition**



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The future of Space activities can only be ensured if we are able to attract the best minds and ensure the extraordinary capabilities of the next generation of space professionals. This is one of the goals of the Portuguese Space Agency through the several outreach and educational programs it promotes. One of these programs is the European Rocketry Challenge – EuRoC, a competition dedicated to university students to design and build their rockets, with solid or hybrid propulsion, and launch them up to 10km high. EuRoC had its first edition in 2020 and, since then, the skies of Ponte de Sor have seen more and more rocket launches every October: in 2022, EuRoC will receive 25 teams and more than 500 students.

But EuRoC is not the only competition worldwide: there are similar competitions throughout the planet. For this reason, the Portuguese Space Agency wants to foster these rocket launch activities and invite other countries to share their experience and create a World Rocketry Collaboration & Competition.

This panel will address space outreach activities in general and rocketry activities, bringing organizers of such events from all around the world.

## Organized by:



## Speakers:



**Brennan DEW**  
Australian Space Discovery  
Centre,  
Australian Space Agency,  
Australia



**Melissa K. FORCE**  
General Counsel,  
Spaceport America,  
United States



**Marta GONÇALVES**  
Science and Education Officer,  
Portugal Space Agency,  
Portugal



**Andiswa MLISA**  
Interim CEO,  
South African Space Agency,  
South Africa



**MODERATOR**  
**Ricardo CONDE**  
President,  
Portugal Space Agency,  
Portugal

## 11:45 - 12:30 IAF GNF – Rise Of Exciting And Emotional Space Businesses



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

For decades, people have pursued the functional value of space and have inspired the world with the scientific and technological advancement, yet it has remained a special field with only a limited number of people involved. As the space business expands, and as more people become directly involved in space development, we are expecting to see the emergence of what we want to call “Space Emo-biz” which is a business area that builds on the inspirational value of space when the technology allows to appeal to the emotions of a mass of people so they can feel and experience the excitement derived from space science and technology.

Specific business cases are already in progress that are based on inspirational value of space. For example, Sony has been working on “STAR SPHERE” which allows users to capture real-time images using a satellite optical camera, Bascule has established the “KIBO STUDIO,” the one and only interactive broadcasting studio on the ISS. Both of these projects are the product of JAXA’s business co-creation program (J-SPARC). Moreover, ALE aims to deliver artificial shooting stars service “Sky Canvas” by injecting meteor source from their satellite, while Avatarin has an avatar robot, “newme,” enabling real-time remote access to desired destinations.

Not only in Japan, but these space entertainment businesses have been spreading out globally with different and fascinating ideas, along with the rapid space development.

**Organized by:**



## Speakers:



**Yusuke MURAKI**  
Strategic Space Producer,  
Space Entertainment  
Promotion Office,  
Sony Group Corporation,  
Japan



**Rumiko NANGO**  
Project Director, Producer and  
Executive Officer,  
Bascule Inc.,  
Japan



**Lena OKAJIMA**  
Founder and CEO,  
ALE Co., Ltd.,  
Japan



**Ke WANG**  
Co-Founder,  
Karman Project Foundation,  
Japan



**MODERATOR**  
**Kyoko DATEKI**  
Director, Business  
Development and Industrial  
Relations Department,  
Japan Aerospace Exploration  
Agency (JAXA),  
Japan

## 12:30 - 13:30 IAF IDEA “Excellence in 3G Diversity Award Ceremony” Luncheon (Upon Invitation Only)

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

**Sponsored by:**



**WELCOME**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France



**MODERATOR**  
**Anthony TSOUGRANIS**  
IAF VP for Honours and  
Awards,  
International Astronautical  
Federation (IAF),  
United States

## Speakers:



**MOHAMED AL-ASEERI**  
Chief Executive Office,  
National Space Science  
Agency (NSSA),  
Bahrain



**KEYNOTE SPEAKER**  
**David PARKER**  
Director of Human and Robotic  
Exploration,  
European Space Agency (ESA),  
Netherlands



**SPONSOR KEYNOTE**  
**Anne CARRON**  
Chief Human Resources  
Officer,  
Eutelsat,  
France

## 12:30 - 13:30 IAF-CGTN TV Broadcast Session: Space Exploration For A Shared Future

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The IAF is partnering with China Global Television Network (CGTN), China’s new international media organization. This Broadcast session will focus on: Space Exploration for a Shared Future

The programme will feature brief keynotes from:



**Josef ASCHBACHER**  
Director General,  
European Space Agency  
(ESA),  
France



**Clay MOWRY**  
Incoming IAF President,  
IAF Bureau,  
Chief Revenue Officer,  
Voyager Space Holdings,  
United States



**Xiaojun WANG**  
VP: Societies and Museums,  
IAF Bureau,  
President,  
China Academy of Launch  
Vehicle Technology (CALT),  
China



Followed by a panel with:



**Dunay BADIRKHANOV**  
Vice-Chairman,  
Azercosmos Space Agency of  
the Republic of Azerbaijan,  
Azerbaijan



**Pascale EHRENFREUND**  
IAF President,  
International Astronautical  
Federation (IAF),  
President,  
International Space University  
(ISU),  
France



**Steve EISENHART**  
VP: IAF Global Networking  
Forum,  
IAF Bureau,  
Senior Vice President,  
Space Foundation,  
United States



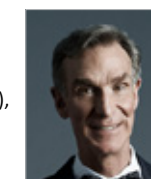
**Xu YANSONG**  
Director for International  
Cooperation,  
China National Space  
Administration,  
China



**Fan ZHANG**  
Professor of Astronomy,  
China



**Richard MOISSE**  
Head of Planetary Defence  
Office,  
European Space Agency (ESA),  
Spain



**Bill NYE**  
CEO,  
The Planetary Society,  
United States



**MODERATOR**  
**Dipak SRINIVASAN**  
Civil Space Strategic  
Engagements Lead,  
The Johns Hopkins University  
Applied Physics Laboratory,  
United States

## 15:00 - 15:50 IAF GNF – Helga And Zohar Travel To The Moon: An International Collaboration Aboard Artemis I



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The Matroshka AstroRad Radiation Experiment (MARE) will measure for the first time in history the radiation dose deposition into the human body in deep space. To achieve this, two anthropomorphic female human phantoms, Helga and Zohar, are being sent around the Moon on Artemis I. Zohar will be adorned with the AstroRad vest, a possible radiation countermeasure for future human exploration. The findings of this study will serve to improve the safety of crew members as we near the first entry of a human being into deep space and outside of Earth's protective bubble since 1972.

MARE is an international collaboration between NASA, DLR and ESA and is supported by two key industry partners: Lockheed Martin and StemRad. This panel will discuss how this collaboration was initiated at the 2015 IAC in Jerusalem, the importance of the study, and what each of the partners "brought to the table"; briefly, a well-established heritage of sending human phantoms into space, a nascent idea for a radiation countermeasure derived from an on-Earth nuclear application, a company building an exploration spacecraft, a strong expertise in radiation dosimetry and analysis for crew protection and, critically, key stakeholders who believed in taking advantage of the rare opportunity to fly a large scientific payload to deep space and were able to harness their respective agencies to support this both monetarily and politically.

The panel is comprised of MARE principle investigators for NASA and DLR and ESA, alongside Lockheed Martin's program manager for AstroRad. Our moderator is a longtime member of IAF who is very familiar with the panelists and the MARE study. We wish that our experience serve as an example and an inspiration for researchers, industry professionals and agency stakeholders aiming to work together for the advancement of space exploration.

**Organized by:**



**Speakers:**



**Kat CODERRE**  
Deputy Manager for Deep  
Space Exploration Advanced  
Programs,  
Lockheed Martin Corporation,  
United States



**Ramona GAZA**  
Lead, MARE - HHPC Science  
Team, Space Radiation  
Analysis Group,  
National Aeronautics and  
Space Administration  
(NASA),  
United States



**Karel MARSALEK**  
Research Fellow,  
Institute of Aerospace  
Medicine,  
Deutsches Zentrum für Luft-  
und Raumfahrt e.V. (DLR),  
Germany



**Oren MILSTEIN**  
CEO, Stemrad, Principle  
Investigator,  
Israel Space Agency,  
Israel



**MODERATOR**  
**Deganit PAIKOWSKY**  
Lecturer, Department of  
International Relations,  
Hebrew University of  
Jerusalem,  
Israel

## 13:45 - 14:45 Plenary 6 – Defending Earth: The International Effort To Protect Us From Asteroids And Comets



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

For billions of years, asteroids have pummeled Earth. The 2013 Chelyabinsk Meteor was only 20-m across, but its high-altitude explosion unleashed the equivalent energy of 30 Hiroshima bombs and resulted in greater than 1,000 injuries. Even larger asteroids would have more catastrophic consequences.

What are we doing to detect and prevent a potential disaster caused by an asteroid impact? To date, only about 0.4% of the ~5 million asteroids larger than the 20-m Chelyabinsk asteroid have been detected. NASA's upcoming Near-Earth Object Surveyor Mission will accelerate the search for potentially hazardous asteroids, thus allowing us to identify the threats.

But detection is only part of the equation. What happens when we identify an Earth-bound asteroid, and how do we protect ourselves? For the first time, humanity is testing a planetary defense mitigation method: a kinetic impactor. NASA's Double Asteroid Redirection Test (DART) is the world's first demonstration in a series of planetary defense missions. Launched in November 2021, DART will intentionally slam into an asteroid just one week after the IAC, on September 26, 2022. Later in the decade, ESA's Hera mission will visit the DART impact target to further characterize the effects of the DART experiment. Together, these two missions will provide the necessary data to design an operational planetary defense spacecraft should the need ever arise.

Our panel assembles a diverse, international group including NASA and ESA leadership, technical experts, and a science communicator to discuss the science behind the asteroid threat, the engineering behind the spacecraft designed to understand these dangers, and our roadmap for safeguarding our planet and way of life. This very timely Plenary Event will feature stunning visuals and gripping storytelling within an engaging and informative atmosphere, and culminating in one of the most memorable experiences of the entire Congress.

Join us!

**Speakers:**



**Betsy CONGDON**  
DART Mechanical Lead  
Engineer,  
The Johns Hopkins University  
Applied Physics Laboratory,  
United States



**Bhavya LAL**  
Associate Administrator  
for Technology, Policy, and  
Strategy,  
National Aeronautics and  
Space Administration (NASA),  
United States



**Patrick MICHEL**  
Hera Mission Principal  
Investigator,  
Centre National de la  
Recherche Scientifique  
(CNRS),  
France

## 15:30 - 16:00 Press Conference – Sustainability as the Game Changer ... Aiming high! Launching the 4<sup>th</sup> edition of the New Space Economy European Expoforum at IAC 2022!

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

Jointly organised by E. Amaldi Foundation and Fiera Roma, the New Space Economy European Expoforum (NSE) offers a yearly outlook on the most interesting trends of the evolution of the Space sector and gathers participants, private stakeholders, students, young innovators representatives of international organizations and general public in a dynamic format which brings Space down to Earth as an enabling tool for everyday life. In particular, NSE 2022 will tackle Sustainability with a rich programme of plenaries, workshops, interactive exhibitions, challenges and awards. NSE 2022 focus on Sustainability with 4 main topics: The Changing Earth, Space Pollution, Human Health and Innovative Space Ventures.

NSE networks big industrial players, small and medium innovative companies, investors, ventures, startups, research centres, academia, space agencies, institutions and international organizations. The event will benefit of a multidisciplinary approach to provide space solutions for non-space users in building a sustainable society and inspire next generations.

The press conference during the IAC in Paris will allow us to present:

- The highlights of the programme 2022
- Smart opportunities for the youngest generation: as startups competition and students challenge

Join us in Rome on 1-3 December and grab the opportunity to be part of the evolution New Space, the biggest cultural change of our century!

NSE 2022 is organised under the patronage of ASI, CNEL, ICE/ITA and IAF, and the support of ESA, SGAG and other relevant organizations.

### Speakers:



**Simonetta CHELI**  
Director of Earth Observation Programmes and Head of ESRIN, European Space Agency (ESA), Italy



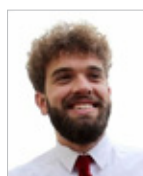
**Jean-François CLERVOY**  
ESA astronaut, Honorary Chairman, Novespace, France



**Maria Cristina FALVELLA**  
General Inspector, Italian Space Agency (ASI), President, Fondazione E. Amaldi, Italy



**Christian FEICHTINGER**  
Executive Director, International Astronautical Federation (IAF), France



**Davide PETRILLO**  
Executive Director, Space Generation Advisory Council (SGAC), Austria



**Giorgio SACCOCCIA**  
President, Italian Space Agency (ASI), Italy



**MODERATOR**  
**Fiorella COLIOLO**

## 15:55 - 16:25 IAF GNF – Moon To Mars Objectives

**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

NASA Deputy Administrator Melroy will preview the release of NASA's revised top-level Moon to Mars Objectives and discuss next steps in architecture planning towards creating a blueprint for sustained human presence and exploration throughout the Solar System.

### Organized by:



### Speakers:



**Pam MELROY**  
Deputy Administrator, National Aeronautics and Space Administration (NASA), United States



**INTRODUCTION**  
**Pascale EHRENFREUND**  
President, International Astronautical Federation (IAF), France

## 16:35 - 16:55 IAF GNF – Diversity In Space

**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

"Space is hard" and mastering access to space requires two essential features: Thrust & Trust. "Thrust" is about mastering the technologies (propulsion, software, mechanical design...) when "Trust" is about having teams mastering these technologies. ArianeGroup is convinced that in a fast-evolving space ecosystem, it will be more and more essential to have innovative and creative teams and this requires ensuring that they are as diverse as possible. Florence GALLOIS - Chief Human Resources Officer at ArianeGroup - will introduce all the initiatives run by ArianeGroup to encourage diversity.

### Organized by:



### Speakers:



**Florence GALLOIS**  
Chief Human Resources Officer, ArianeGroup SAS, France



## 16:55 - 17:35 IAF GNF – Arianespace: Market Challenges & Perspectives



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

Arianespace's Chief Commercial Officer will provide the latest insights about the launch service market and in particular the challenges & perspectives for the coming years. Indeed, Ariane 6 & VEGA-C launchers are about to replace Ariane 5 & VEGA launchers and will feature more competitiveness and versatility to adapt to the ever evolving needs of Arianespace's customers.

Organized by:



### FIRESIDE CHAT

Speaker:



**Chirag PARIKH**  
Executive Secretary,  
National Space Council,  
United States



**MODERATOR**  
**Michael SHEETZ**  
Space Reporter,  
CNBC,  
United States

### FIRESIDE CHAT

Speakers:



**Emmanuel FRANC**  
Senior Vice President, Chief  
Commercial Officer,  
Arianespace,  
France



**Julie ZOLLER**  
Head of Global Regulatory  
Affairs,  
Amazon's Project Kuiper,  
United States



**MODERATOR**  
**Michael SHEETZ**  
Space Reporter,  
CNBC,  
United States

## 17:45 - 18:45 Highlight Lecture – Sea Level Rise, A Crucial Indicator Of Global Warming: 30 Years Of Space Borne Measurements

HLL

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

Satellite altimetry measures the topography of the sea surface, with high-resolution, global coverage and short revisit time. Since the very first missions in the late-1970s, the accuracy of a single sea surface height measurement has increased by a factor of 100, approaching the 1-cm level nowadays. The data collected by the constellation of high precision altimetry missions have provided invaluable information in many domains of Earth sciences. Satellite altimetry has revolutionized our knowledge of the marine gravity field, of the dynamics of the oceans and ocean circulation, of the climate-related sea level rise, of land hydrology and ice mass changes of the ice sheets. In this presentation, we summarize the most recent scientific advances made in these different domains, with particular focus on the ocean circulation and its applications, as well as on sea level rise, routinely measured since the early 1990s from global to local scales by high precision altimeter satellites. We will also address the status of the next-generation altimetry missions with much improved spatial resolution.

Speakers:



**Anny CAZENAVE**  
Emeritus Scientist,  
Laboratoire d'Etudes  
en Géophysique et  
Océanographie Spatiale,  
Centre National d'Etudes  
Spatiales (CNES),  
France



**Lee Lueng FU**  
Senior Research Scientist,  
NASA Jet Propulsion  
Laboratory,  
United States



**MODERATOR**  
**Selma CHERCHALI**  
Head of the Earth Observation  
Department,  
Centre National d'Etudes  
Spatiales (CNES),  
France

## 19:00 - 21:00 Young Professionals Networking Event (restricted to Young Professionals)

**Location:** Room N02, Level 3, Hall 7, Paris Convention Centre

Join us for a night focusing on space educational offerings and how you can get involved with our organizations. Networking and reception to follow.

Sponsored by:



## Wednesday 21 September

### 08:00 - 08:45 IAF Science & Academic Breakfast

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

#### Speakers:



**Emmanuelle DAVID**  
Executive manager,  
Ecole Polytechnique Fédérale  
de Lausanne (EPFL),  
Switzerland



**Ken DAVIDIAN**  
AST Director,  
Research and Program  
Manager for the FAA Center  
of Excellence for Commercial  
Space Transportation,  
United States



**Yoav LANDSMAN**  
CEO,  
Moonscape,  
Luxembourg



**Jenna TIWANA**  
European Business  
Development & Partnerships  
Officer,  
ispace, inc.,  
Luxembourg



**WELCOME**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France



**MODERATOR**  
**Deganit PAIKOWSKY**  
Lecturer, Department of  
International Relations,  
Hebrew University of  
Jerusalem,  
Israel

### 09:00 - 10:00 Plenary 7 – James Webb Space Telescope: The Story Of International Collaboration And A New Era Of Astronomy For All



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

#### PART 1: The challenges of the James Webb mission

Launched on Dec. 25, 2021, the James Webb Space Telescope is led by NASA in partnership with the European and Canadian space agencies. Webb is an international collaboration involving hundreds of scientists and thousands of engineers. Webb embodies NASA's values of teamwork, diversity, and excellence. In a follow-on panel to IAC 2021 in Dubai, the panelists will present some of the challenges encountered in making this amazing facility operational. They will discuss the issues encountered during the program life, arising from the international nature of the mission, the development of a segmented, cryogenic telescope, and the process of bringing the mission online after launch.

#### Speakers:



**Josef ASCHBACHER**  
Director General,  
European Space Agency  
(ESA),  
France



**Lisa CAMPBELL**  
President,  
Canadian Space Agency  
(CSA),  
Canada



**Hervé GILIBERT**  
CTO,  
ArianeGroup SAS,  
France



**Stéphane ISRAËL**  
CEO,  
Arianespace,  
France



**Thomas ZURBUCHEN**  
Associate Administrator  
for the Science Mission  
Directorate,  
National Aeronautics and  
Space Administration  
(NASA),  
United States



**MODERATOR**  
**Natalia LARREA BRITO**  
Director,  
USA Office,  
Euroconsult,  
United States

#### PART 2: Unfolding the Universe: Early Science Results from the James Webb Space Telescope

The James Webb Space Telescope is NASA's newest great observatory, developed in partnership with the European and Canadian space agencies. Webb will explore all phases of the universe's history and greatly expand our understanding of everything from the first galaxies to form after the big bang, the evolution of galaxies across cosmic time, the formation of stars and planets in our galaxy, and phenomena in our solar system. What science advancements have we seen and what awaits us? The IAC will be the first major conference to hear about the significance of the first images, unveiled on 12 July 2022, and discoveries for all of humanity. We will demonstrate the capabilities of Webb, showing preliminary results from the Early Release Science Program and Early Release Observations. The presentations will span the area that Webb will explore in its initial few months: distant galaxies, active galaxies, stars forming in our own galaxies, and transiting exoplanet studies.

#### Speakers:



**Vassilis CHARMANDARIS**  
Director & Researcher of  
the Institute of Astrophysics,  
Professor of Department of  
Physics,  
University of Crete,  
Greece



**Guido ROBERTS-BORSANI**  
Postdoctoral Researcher,  
University of California, Los  
Angeles (UCLA),  
United States



**Eric P. SMITH**  
Program Scientist for  
the James Webb Space  
Telescope Program &  
Astrophysics Division Chief  
Scientist,  
National Aeronautics and  
Space Administration (NASA),  
France



**Pascal TREMBLIN**  
Researcher,  
CEA Paris-Saclay,  
France



**MODERATOR**  
**Natalia LARREA BRITO**  
Director,  
USA Office,  
Euroconsult,  
United States

### 10:15 - 10:45 IAF GNF – Re-Imagining Scientific Discovery With SLS Unique Launch Capability



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The scientific community updates their respective decadal surveys every ten years, reflecting on the community's consensus opinion of the most compelling scientific enigmas and associated missions. These missions face challenges of constrained unique and challenging designs, costs, and long development times - unfortunately limited to the traditional probe, orbiter, or lander launched on a single rocket. This model, until now, has necessarily limited the number of important scientific investigations.

As investigations become increasingly more complex, to achieve increased levels of scientific return, Discovery, Flagship and New Frontier missions will depend on a new paradigm for the mission/launch model to increase the opportunities for mission content and mission deployments while optimizing common trajectories and final destinations within celestial neighborhoods.

Space Launch System's (SLS) new capabilities enable near and deep space utilization and discovery as an alternative to the traditional LEO commercial rocket operational paradigm. SLS is designed for high energy exploration and discovery as this super heavy lift vehicle enables co-manifested and ride sharing missions, a multi-payload Carrier Concept, Ultra High Departure Energy (C3), and super heavy lift direct injection capabilities with in-space propulsion not previously possible.

SLS's mission flexibility, consisting of reduced transit times, larger launch windows, and multiple science missions in a single launch, will reduce the cost of scientific exploration and accelerate the pace of discovery with these missions. A potential opportunity exhibiting these benefits will be presented describing the trade study for Icy Giant missions - where a two planet, two spacecraft mission on a single launch would not only reduce flight times to either giant but increase delivered mass.



By offering these previously unconventional options for operations, SLS will empower unprecedented opportunities for scientific discovery, mission success and increased value to the science and astronomy communities, and ultimately humankind.

Organized by:

Speaker:

**James GREEN**  
Scientist, Senior Advisor,  
National Aeronautics and  
Space Administration (NASA),  
United States

## IAC 2022 PUBLIC DAY

Please note that the IAC 2022 Public Day Programme will be in French. Simultaneous translation will be provided through an App for your phone, so please make sure to bring your headset should you wish to listen to the sessions in English.

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

TIMES	SUBJECTS	SPEAKERS	FACILITATORS
<b>10:00 - 11:30</b>	<b>40 years of French crewed flights</b>		Sylvain Charrier (CNES)
10:00	Welcome		
10:05 - 10:10	Jean-Loup Chrétien video		
10:10 - 10:30	The 1990s-2000s, a historic period	Astronauts : Claudie Haigneré, Jean-Pierre Haigneré, Jean-François Clervoy	
10:30 - 10:50	Human spaceflight today	Jean Blouvac (CNES), Rémi Canton (CNES)	
10:50 - 11:10	En route to the future (manufacturers)	Peter Weiss, Barbara Belvisi, ArianeGroup, Hélène Huby	
<b>11:30 - 12:45</b>	<b>Meeting with Thomas Pesquet</b>	Thomas Pesquet (ESA)	Philippe Willekens (ESA)
<b>13:00 - 14:15</b>	<b>Space and Imagination</b>		Alain Cirou (Ciel et Espace)
		Clémence Dargent (Scriptwriter for the "Ovni(s)" TV series), Jean-François Clervoy (Astronaut), Emilie Cauquy (Responsible for access to and promotion of the film collections at the Cinémathèque Française), Thierry Lefebvre (space and cinema), Marion Montaigne (author of "Dans la combi de Thomas Pesquet" [In Thomas Pesquet's Suit])	

<b>14:30 - 15:30</b>		<b>Space and Society</b>		Raphaël Sart (CNES)
		What is the "overview effect"? Watching over our planet from space, biodiversity seen from space, guardian angel satellites, etc.	Claudie Haigneré (Astronaut) Pascale Ultré-Guérard (CNES)  Laurence Monnoyer-Smith (CNES) Stéphanie Limouzin (CLS) Jean Maréchal (CNES)	
<b>15:45 - 17:00</b>		<b>The routes of the cosmos</b>		Jacques Arnould
	15:45 - 15:50	Introduction	Jacques Arnould (CNES)	
	15:50 - 16:10	"The grand tour of the Solar System"	Francis Rocard (CNES)	
	16:10 - 16:30	"Rovers on Mars"	Sylvestre Maurice (IRAP)	
	16:50 - 17:05	"We're going to deflect an asteroid"	Patrick Michel (Observatoire de la Côte d'Azur)	
	17:05pm	Q&A		

**10:55 - 11:25 IAF GNF – From Cygnus To CDFF: Building The Foundation Of A New Economy In Low Earth Orbit**



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

Today Northrop Grumman is providing commercial cargo resupply and logistics services to the International Space Station with its Cygnus spacecraft. Building on this proven technology, we are building the Habitation and Logistics Outpost (HALO) for NASA's Gateway that will serve as a staging point for lunar surface exploration and has extensibility towards destinations beyond the moon. Northrop Grumman is employing the experience gained from Cygnus and HALO to design a safe, reliable and cost-effective commercial free-flying space station in low Earth orbit under a NASA Space Act Agreement for the Commercial Low-Earth Orbit Development program.

Northrop Grumman's vision for its space station will continue the work of the International Space Station (ISS), while expanding across multiple markets to provide optimized and tailored support for a new commercial economy. Northrop Grumman envisions an accessible marketplace in space that includes the potential for scientific activities, tourism and more.

This session will explore how Northrop Grumman's concept for a safe, reliable and cost-effective commercial space station employs trusted, adaptable technology from its ongoing human spaceflight and space operations program to enable more affordable, future civil and commercial missions that can aid in the creation and sustainment of a vibrant LEO economy.

Organized by:

Speakers:

**Rick MASTRACCHIO**  
Director, Business Development,  
Northrop Grumman Corporation,  
United States

**Andrei MITRAN**  
Director, Strategy and Business Development,  
Northrop Grumman Corporation,  
United States

## 11:35 - 12:25 IAF GNF – Sustainability Actions For Emerging Countries Using Satellite Data



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The availability of space applications for emerging countries and developing nations is of key importance for their economic growth potential. Furthermore, it is essential for these countries to be able to understand and react to current threats, such as the impact of climate change, pollution, deforestation, biodiversity, environmental monitoring, urban development and many other related topics.

During the very successful GLEC22 meeting held in Quito during May 2022 these points have been discussed in different panels and by various keynote speakers. Putting these sustainability ambitions into context it is important to make efficient use of funds and relevant satellite data. Various national, bilateral and international initiatives and/or programmes focusing on tropical deforestation, handling illegal fisheries, environmental related data, as well as EU's Global Action on Space for international collaboration using space-based data and services, may be relevant examples for emerging countries in particular.

This GNF session will focus on the topics above, and a panel consisting of senior executives will present their findings and ideas leading up to GLOC23 which will be hosted by the Norwegian Space Agency in Oslo in May 2023 and will specifically cover the global efforts to better understand and battle climate change by use of space-based services and applications.

**Organized by:** Norsk Romsenter  
Norwegian Space Agency

### Speakers:



**Rodrigo DA COSTA**  
Executive Director,  
European Union Agency  
for the Space Programme  
(EUSPA),  
Czech Republic



**Christian HAUGLIE-HANSSEN**  
Director General,  
Norwegian Space Agency  
(NOSA),  
Norway



**Valanathan MUNSAMI**  
Advisor to the CEO,  
Saudi Space Commission,  
Chancellor,  
International Space  
University (ISU),  
Saudi Arabia



**Masami ONODA**  
Director, Washington D.C.  
Office,  
Japan Aerospace Exploration  
Agency (JAXA),  
United States



**Jolanda VAN EIJNDTHOVEN**  
Head of Unit International  
Relations & Communication,  
DG/DEFIS, European  
Commission,  
Belgium



**PILAR ZAMORA ACEVEDO**  
Executive Director,  
Colombian Space Agency  
(AEC),  
Colombia



**KEYNOTE SPEAKER**  
**Josef ASCHBACHER**  
Director General,  
European Space Agency  
(ESA),  
France



**MODERATOR**  
**Pieter VAN BEEKHUIZEN**  
Vice Chair IAF CLIODN,  
Board Member,  
Stichting Space Professionals  
Foundation (SSPF),  
Netherlands

## 12:30 - 13:30 IAF Science & Academic Luncheon (Upon Invitation Only)

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

**Sponsored by:**



**Speaker:**



**Eytan STIBBE**  
Mission Specialist,  
RAKIA,  
Israel



**WELCOME**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France

## 12:30 - 13:30 IAF-CGTN TV Broadcast Session: Space Exploration For A Shared Future (Recorded video)

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The IAF is partnering with China Global Television Network (CGTN), China's new international media organization. This Broadcast session will focus on: Space Exploration for a Shared Future

The programme will feature brief keynotes from:



**Josef ASCHBACHER**  
Director General,  
European Space Agency  
(ESA),  
France



**Clay MOWRY**  
Incoming IAF President,  
IAF Bureau,  
Chief Revenue Officer,  
Voyager Space Holdings,  
United States



**Xiaojun WANG**  
VP: Societies and Museums,  
IAF Bureau,  
President,  
China Academy of Launch  
Vehicle Technology (CALT),  
China

Followed by a panel with:



**Dunay BADIRKHANOV**  
Vice-Chairman,  
Azercosmos Space Agency of  
the Republic of Azerbaijan,  
Azerbaijan



**PASCALE EHRENFREUND**  
IAF President,  
International Astronautical  
Federation (IAF),  
President,  
International Space University  
(ISU),  
France



**Steve EISENHART**  
VP: IAF Global Networking  
Forum,  
IAF Bureau,  
Senior Vice President,  
Space Foundation,  
United States



**Xu YANSONG**  
Director for International  
Cooperation,  
China National Space  
Administration,  
China



**Fan ZHANG**  
Professor of Astronomy,  
China



## 13:45 - 14:40 IAF GNF – International Cooperation Prospects On China Lunar & Deep Space Exploration Program



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

“Where is the Sun, the Moon and those stars?” - the question is from the poem “Tian Wen” by Qu Yuan, one of Chinese most distinguished and famous poets born 2,300 years ago.

The Chinese nation has never stopped the exploration of the universe for thousands of years. China’s Lunar Exploration Program, officially started in 2004, till in 2020 with 1731g lunar samples returned, has successfully accomplished the Three-Step Plan of ‘Orbiting, Landing and Sample Return’.

In May 2021, the first mission of China’s Planetary Exploration Program, Tianwen-1, achieved orbiting, landing and roving on Mars by one mission, making China a great leap being able to explore from Earth-Moon system to interplanetary space. In the future, China will take the International Lunar Research Station as the long-term goal of following-up lunar exploration, and will continue carrying out planetary exploration programs, including asteroid sampling, main belt comet exploration, Mars sample return, Jupiter system exploration and etc.

Openness, Cooperation and Win-Win are always the most important principles in the international cooperation of China’s deep space exploration. China National Space Administration (CNSA) will introduce China’s future plans and cooperation opportunities in Lunar and Deep Space Exploration in this GNF event, and will together with mission designer, chief scientist and international experts discuss the prospects of international cooperation.

**Organized by:**



**Speakers:**



**James CARPENTER**  
Lead for Moon and Mars Science and Moon Utilisation Manager, Human and Robotic Exploration Directorate, European Space Agency (ESA), Netherlands



**Ferhat Fikri ÖZEREN**  
Deputy Secretary General, Asia-Pacific Space Cooperation Organization (APSCO), Turkey



**Zhaoyu PEI**  
Deputy Director of CNSA Lunar Exploration and Space Engineering Center, China National Space Administration (CNSA), China



**Chi WANG**  
General Director, National Space Science Center, Chinese Academy of Sciences, China



**MODERATOR**  
**Yiran WANG**  
Vice President and Secretary General, Chinese Society of Astronautics, China

## 14:00 - 14:45 Press Conference – The James Webb Space Telescope Media Event

**Location:** Room N02, Level 3, Hall 7, Paris Convention Centre

The James Webb Space Telescope is NASA’s newest great observatory, developed in partnership with the European and Canadian space agencies. Webb will explore all phases of the universe’s history and greatly expand our understanding of everything from the first galaxies to form after the big bang, the evolution of galaxies across cosmic time, the formation of stars and planets in our galaxy, and phenomena in our solar system. What science advancements have we seen and what awaits us?

The IAC will be the first major conference to hear about the significance of the first images, unveiled on 12 July 2022, and discoveries for all of humanity. We will discuss the capabilities of Webb, as well as preliminary results the world has seen from the Early Release Science Program and Early Release Observations. The presentations will span the area that Webb will explore in its initial few months: distant galaxies, active galaxies, stars forming in our own galaxies, and transiting exoplanet studies.

Please join us for a media event on **Wednesday 21 September 2022** from **14:00 to 14:45** in **room N02, Paris Convention Centre**.

**Speakers include:**

- Eric Smith, James Webb Space Telescope Program Scientist at NASA Headquarters
- Pascal Tremblin, Astrophysicist at the University of Paris-Saclay
- Vassilis Charmandaris, Director & Researcher of the Institute of Astrophysics, Professor at the University of Crete in Greece
- Guido Roberts-Borsani, Postdoctoral Fellow at UCLA

## 14:50 - 15:40 IAF GNF – Opening Up Of Indian Space Sector- Global Perspective



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

Led by Indian Space Research Organisation (ISRO) India’s space program has impressively evolved for the past 50 years. In terms of technological capabilities India ranks among the top 5 space faring nations of the world. India is globally recognised for building low-cost satellites and launch vehicles. The global space economy is estimated at ~US \$440 billion. Despite having world’s most accomplished space program, India’s space sector accounts for a 2-3% of the global space economy. To increase the share in the global business, Government of India has initiated the space sector reforms, to promote, handhold, regulate and authorise private enterprises and start-ups to undertake space activities.

An independent nodal agency under Department of Space - the Indian National Space Promotion and Authorization Centre (IN-SPACe) has been created on June 24, 2020. This will enhance the diffusion of space technology and boost space economy within the country, for a resurgent, AatmaNirbhar Bharat. These far-reaching space reforms initiative, promulgated by the Government of India in June 2020 are expected to give a major fillip to private sector space industry, including the start-ups. Additionally, it will enable commercialisation of space technology, boost private investments, preparing the youth as space leaders, innovations in the sector for the progress of humanity.

Earlier during March 2019, Cabinet approved creation of new company “New Space India Limited (NSIL)” to; enhance ISRO- Industry interface & Carry out Commercialization of ISRO’s space products & services. NSIL is a wholly owned Government of India Undertaking / Central Public Sector Enterprise, under the administrative control of Department of Space.

Presently, FDI in space is allowed under government route only for satellite establishment and operations. FDI in space is approved by the Government on a case-by-case basis and often this approval takes time. However, witnessing the change in approach of the Indian Government towards private players involvement, Indian companies will be allowed to invest up to 100% and 70% through FDI with approval of centre in all the streams viz. Upstream, mid-stream and downstream segment.

To ensure effective collaboration between Indian and foreign players, IN-SPACe would be the agency in charge for facilitating foreign investment in space sector and will provide a one-stop interface for foreign players to enter Indian space market. In this context, the panel involving the representatives from Government of India, Indian industry and global space industries will share their perspectives from both the national and global point of view.

**Organized by:**



## Speakers:



**Scott PACE**  
Director,  
Space Policy Institute, George  
Washington University,  
United States



**Enrico PALERMO**  
Head,  
Australian Space Agency,  
Australia



**Stephane VESVAL**  
SVP Sales & Marketing Space  
Systems,  
Airbus Defence and Space  
SAS,  
France



**S. SOMANATH**  
Chairman,  
Indian Space Research  
Organisation (ISRO),  
India



**MODERATOR**  
**Pawan GOENKA**  
Chairman,  
Indian National Space  
Promotion Authorization  
Centre (IN-SPACE),  
India

## 15:00 - 16:00 Press Conference – IAF-CSA Space Universities CubeSat Challenge Announcement

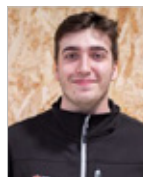
**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

The International Astronautical Federation (IAF) in cooperation with the Chinese Society of Astronautics (CSA) will recap the results of the exclusive IAF-CSA Space Universities CubeSat Challenge for a free launch of a CubeSat operated by the China Academy of Launch Vehicle Technology. The competition highlighted the importance of fostering the innovative thinking of students as well as contributing to the popularization of space knowledge and supporting the innovative talents.

## Speakers:



**Fernando AGUADO-AGELET**  
Full Professor,  
University of Vigo,  
Spain



**Guillermo CALVO-HERMO**  
Electronics Lead,  
UVigo SpaceLab; Student,  
University of Vigo



**Christian FEICHTINGER**  
Executive Director,  
International Astronautical  
Federation (IAF),  
France



**Xiaojun WANG**  
President,  
China Academy of Launch  
Vehicle Technology (CALT),  
China



**YIRAN WANG**  
Vice President and Secretary  
General,  
Chinese Society of  
Astronautics,  
China



**Yao ZHANG**  
Deputy Director General,  
Chinese Society of  
Astronautics,  
China



**MODERATOR**  
**Deganit PAIKOWSKY**  
Lecturer, Department of  
International Relations,  
Hebrew University of  
Jerusalem,  
Israel

## 15:50 - 16:35 IAF GNF – From LEO To Deep Space - What Every Space Actor Needs For Mission Success

**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

Since the dawn of the space age, all space actors have required assured access to radiofrequency spectrum from their location in space to monitor and control their operations and perform their missions. The International Telecommunication Union (ITU), a specialized agency of the United Nations, is the central authority for the world's cooperative use of these critical space resources of spectrum and orbits for all space actors – from traditional comsats, to “mega-constellations;” to small satellites performing important scientific functions, to explorers bound for cislunar space, Mars and beyond, and to new space actors, including newly space-faring nations and inventors of emerging space services such as in-orbit servicing. This session will bring together a diverse range of key space actors from International and National Regulators, Space Agencies, NGSO Satellite Systems and Geostationary Satellite Operators to highlight the successful regulatory mechanisms that allow us to continue to benefit from the space ecosystem while exploring and building knowledge on the next steps to continue assuring spectrum availability and reliability for future space systems -- like those to be considered at the ITU's 2023 World Radiocommunication Conference (WRC-23).

The lessons learned from this 60-year journey in making spectrum free of interference for All may also be of interest to space stakeholders when dealing with other emerging challenges concerning space sustainability.

Organized by:



## Speakers:



**Jorge CICCROSSI**  
Senior Engineer, Space Systems  
Coordination Division,  
International  
Telecommunications Union  
(ITU),  
Switzerland



**Aarti HOLLA-MAINI**  
Secretary General,  
Global Satellite Operators  
Association (GSOA),  
Belgium



**Amar SAIDANI**  
Regulatory Affairs and  
Spectrum, Orbit Resources  
Department,  
Agence Nationale des  
Fréquences,  
France



**Badri YOUNES**  
Deputy Associate  
Administrator for Space  
Communications and  
Navigation (SCaN), Human  
Exploration and Operations  
Mission Directorate,  
National Aeronautics and  
Space Administration (NASA),  
United States



**Julie ZOLLER**  
Head of Global Regulatory  
Affairs,  
Amazon's Project Kuiper,  
United States



**MODERATOR**  
**Audrey L. ALLISON**  
Senior Policy Analyst, Center  
for Space Policy and Strategy,  
The Aerospace Corporation,  
United States

## 16:00 - 17:00 Press Conference – The First International Moon Day: 20 July 2022

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre



The Moon Village Association considers that the peaceful exploration and utilisation of the Moon is the next step for humanity in opening new perspectives related to economic, cultural, and inspirational goals. The Moon has huge benefits to offer to humanity, but



these must be shared between all countries and involve space and non-space industries. Humanity needs to work together to reach this goal with all stakeholders, including governments, industry, academia, international organisations, and the public.

MVA proposed at the United Nations Committee on the Use of Outer Space the celebration of the International Moon Day on 20 July. This was approved by the United Nations General Assembly in December 2021.

Because MVA has been an early advocate of the concept of the International Moon Day (IMD) celebration, MVA is taking the initiative to organize its implementation. The goals of the IMD are fully in line with the MVA mission and objectives to promote the development of lunar exploration in addressing the largest public, scientific, educational, and industrial communities. The theme of the IMD for 2022 is "Lunar Exploration Coordination and Sustainability".

The celebration has involved either "bottom up" events organized at national level as well as a "top down" event organized on a global scale.

The Press Conference shall discuss the achievements of the first year celebration held on 20 July 2022 and the preliminary plan for 2023.

#### Speakers:



**Nasr AL-SAHHAF**  
Chair,  
International Moon Day  
Group,  
Saudi Arabia



**Dumitru-Dorin PRUNARIU**  
Astronaut and Expert,  
Romanian Association for  
Space Technology and  
Industry,  
Member,  
Board of the Romanian Space  
Agency, ROMSPACE,  
Romania



**Giuseppe REIBALDI**  
President,  
Moon Village Association  
(MVA),  
Italy



**MODERATOR**  
**John C. MANKINS**  
Vice President,  
Moon Village Association  
(MVA),  
Vice President,  
ARTEMIS Innovation  
Management Solutions,  
United States

#### 16:45 - 17:30 IAF GNF – The Skills Gap: Keeping Up With The Growing Space Sector



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

What can we do to mitigate the risks of an aging workforce and growing requirement for specialist roles, whilst making space an attractive sector to work in?

The UK Space Agency (UKSA) will present some of the issues facing the sector on skills retention and career development and chair a discussion on how we can keep attracting, whilst also retaining, the very best space talent.

Organized by:



#### Speakers:



**Kate KITAGAWA**  
Director of Space Education  
Office,  
Japan Aerospace Exploration  
Agency (JAXA),  
Japan



**Enrico PALERMO**  
Head,  
Australian Space Agency,  
Australia



**Mary PREVILLE**  
Vice President Space Program  
Policy,  
Canadian Space Agency  
(CSA),  
Canada



**MODERATOR**  
**Kathie BOWDEN**  
Skills Lead,  
UK Space Agency,  
United Kingdom

#### 17:45 - 18:45 Highlight Lecture – IAF World Space Award: Achievements Of The Tianwen-1 Mission

HLL

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The session introduces the background and the latest progress of Tianwen-1 mission, summarizes its important technological and scientific achievements and its significance to both China and the world's space exploration. The session also introduces the development goals and road map of China's planetary exploration program and proposes the initiative of "strengthening international exchanges and cooperation, jointly exploring the unknown".

#### Speaker:



**Jilian WANG**  
Vice President,  
China Academy of Space  
Technology (CAST),  
China



**MODERATOR**  
**Pascale EHRENFREUND**  
President,  
International Astronautical  
Federation (IAF),  
France

## Thursday 22 September

### 09:00 - 09:25 Late Breaking News – T-4 Days To Humanity's First Attempt To Deflect An Asteroid In Space



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

Humanity's first planetary defense mission, NASA's Double Asteroid Redirection Test (DART), is now just over 100 hours from impacting a 160-meter asteroid in space and deflecting its orbit. The spacecraft is hurtling towards its target binary asteroid system at 22,000 km/hr, on a one-way trip collision course trajectory. The target, Dimorphos, is a small 160-meter moon of the larger asteroid Didymos. DART is now just 2.4 million kilometers from the target, about 10x the distance of our Moon from Earth. Although the primary Didymos asteroid came into view of the DRACO imager on DART about a month ago, the small binary moon is about to be resolved for the first time as the spacecraft enters its terminal phase. Major ground-based telescopes have now locked on to the target for continuous coverage, and space-based observatories, including the James Webb Space Telescope, are preparing their observational sequences to witness DART's pending impact. And, the Italian Space Agency's LICIACube cubesat has just been deployed from DART and is preparing to image the encounter.

NASA's DART mission is designed to test a technology that could one day save our planet. Asteroids are swarming around the inner solar system and frequently impact Earth. If a large asteroid were to impact a populated area of the planet, the result could be devastating. The kinetic impact technique that DART will perform is the world's first planetary defense demonstration. Later in the decade, the European Space Agency's Hera mission will visit the Didymos system and characterize the DART impact.

The timing of the Late Breaking News session at the 73<sup>rd</sup> International Astronautical Congress is ideally situated to share with the community the latest information on NASA's DART mission. One of the lead mission engineers, Dr. Betsy Congdon, will present the current health and status of the DART mission and the preparation plans for the upcoming encounter in just 4 days. Dr. Congdon will share the activities happening in the DART Mission Operations Center at the Johns Hopkins Applied Physics Lab, including the team's latest efforts to ensure mission success. With this session, the IAC community will have a head start in joining the rest of the world for this international endeavor.

**Speaker:**



**Betsy CONGDON**  
DART Mechanical Lead Engineer,  
The Johns Hopkins University  
Applied Physics Laboratory,  
United States

### 09:35 - 10:00 Late Breaking News – First Results With The James Webb Space Telescope (JWST) MIRI Instrument



**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The James Webb space telescope has been successfully launched on the 25<sup>th</sup> of December 2021 by an Ariane rocket. With a primary mirror of 6.5m in size, it is the largest telescope in space. The telescope is equipped with four scientific instruments: 3 instruments providing observation in the 0.6 – 5 microns wavelength range: NIRCAM, NIRSPEC and NIRISS and one instrument dedicated to the 5 – 28 microns wavelength range : MIRI. Webb is a NASA flagship mission with participation of Europe through the European Space Agency (ESA) and Canada through the Canadian Space Agency (CSA).

France has been strongly involved in the MIRI instrument. MIRI is an instrument provided by a consortium of laboratories under the leadership of Gillian Wright from the Royal Observatory of Eddinburg. The French contribution has been focused on the imager part of MIRI: MIRIm. Three modes of observations are possible with MIRIm: - imaging with a pixel field of view of 0.11 arcsecond, a field of view of 74x113 arcsecond<sup>2</sup> and a choice between 9 filters, - slit or slitless spectroscopy at low spectral resolution ( $R \approx 100$  at 7 microns) over the 5-11 microns wavelength range, and - coronagraphy with a set of 4 quadrant phase masks (first time in space) and a classical Lyot mask.

At the time of the writing of this abstract, the commissioning of the instrument is still going on, but we can already say that an exquisite image quality has been achieved. The first scientific observations have been made to public in July. During our talk at the IAC we will present the French contribution, describe MIRIm, present the performance of the various modes of MIRIm, as well as first scientific observations.

**Speaker:**



**Anthony BOCCALETTI**  
Director of Research,  
Laboratoire d'Etudes Spatiales  
et d'Instrumentation en  
Astrophysique,  
Paris Observatory,  
France



**Pierre-Olivier LAGAGE**  
Senior Astrophysicist,  
Commissariat à l'Energie  
Atomique et aux Energies  
Alternatives (CEA),  
France



**Desi RAULIN**  
Project Manager for French  
contributions to MIRI (JWST),  
Centre National d'Etudes  
Spatiales (CNES),  
France

### 10:15 - 11:15 IAF GNF – Space Inspiration: How Space And Ariane Are Inspiring Artistic Creation



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

This session will gather artists coming from different backgrounds - musicians, visual artists, photographers, clothes designers - who are big fans of space and especially Ariane rockets, in order to discuss the link between space and their art. They will explain how space has always had an influence on their art, what they felt when they discovered the industrial reality behind the dream and how they transformed it into art creations.

**Organized by:**



**Speakers:**



**Myriam AÏLO**  
General Manager,  
Avnir,  
France



**Mathieu CESAR**  
World-renowned French  
Photographer,  
France



**PYRAMID**  
Music Producer,  
France



## 11:25 - 12:20 IAF GNF – Mumm Stellar Project - The First Champagne For Space - A Technical And Cultural Endeavour



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

For the past six years, Maison Mumm has collaborated with Spade design agency and CNES to imagine a Champagne tasting ritual in the most challenging context of a spaceflight. The experience they created will allow the next generation of Space travellers to embark with a piece of human culture, a product of the Earth's soil, and experience an iconic ritual of celebration that has brought people together for centuries.

The Stellar project takes form from the ground up - from the caring of the vineyards, the elaboration of the wines and ageing in Mumm's cellars, to the rituals and emotions that build the tasting experience. The collaborative approach and the wine-making expertise behind Mumm Cordon Stellar allowed to express a wine's character, aromas and structure in the context of space, where our perception is often challenged and our senses confused or inhibited.

Encapsulated in a unique bottle that meets the safety constraints of a spaceflight with the cultural heritage of Champagne, Mumm Cordon Stellar offers to reinterpret a millenary ritual of mankind at the outposts of humanity.

As we reveal Mumm Cordon Stellar bottle during IAC 2022, we invite the GNF attendees to discover the wide range of expertises that were brought together to elaborate this space cultural ritual.

### Speakers:



**Sébastien BARDE**  
Associate Director for Exploration and Human Spaceflight,  
Centre National d'Etudes Spatiales (CNES),  
France



**Octave DE GAULLE**  
Director,  
Spade Agency,  
France



**Laurent FRESNET**  
Cellar Master,  
Maison Mumm,  
France



**INTRODUCTION**  
**César GIRON**  
Chairman and CEO,  
Martell Mumm Perrier-Jouët,  
France



**INTRODUCTION**  
**Lionel SUCHET**  
Chief Operating Officer,  
Centre National d'Etudes Spatiales (CNES),  
France



**MODERATOR**  
**Sam BURBANK**  
Filmmaker, Founder,  
Inverse Square Films,  
United States

## 12:30 - 13:30 World Space Week Association VIP Luncheon (Upon Invitation Only)

**Location:** Terminal 7, Level 4, Hall 7, Paris Convention Centre

**Organized and Sponsores by:**



### Speakers:



**Nobu OKADA**  
Founder & CEO,  
Astroscale,  
Japan



**WELCOME SPEECH**  
**Dennis STONE**  
President,  
World Space Week Association,  
United States



**INTRODUCTION**  
**Maruška STRAH**  
Executive Director,  
World Space Week Association,  
Austria

## 12:30 - 13:30 IAF-CGTN TV Broadcast Session: Space Exploration For A Shared Future (Recorded video)

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The IAF is partnering with China Global Television Network (CGTN), China's new international media organization. This Broadcast session will focus on: Space Exploration for a Shared Future

The programme will feature brief keynotes from:



**Josef ASCHBACHER**  
Director General,  
European Space Agency (ESA),  
France



**Clay MOWRY**  
Incoming IAF President,  
IAF Bureau,  
Chief Revenue Officer,  
Voyager Space Holdings,  
United States



**Xiaojun WANG**  
VP: Societies and Museums,  
IAF Bureau,  
President,  
China Academy of Launch Vehicle Technology (CALT),  
China

Followed by a panel with:



**Dunay BADIRKHANOV**  
Vice-Chairman,  
Azercosmos Space Agency of the Republic of Azerbaijan,  
Azerbaijan



**PASCALE EHRENFREUND**  
IAF President,  
International Astronautical Federation (IAF),  
President,  
International Space University (ISU),  
France



**Steve EISENHART**  
VP: IAF Global Networking Forum,  
IAF Bureau,  
Senior Vice President,  
Space Foundation,  
United States



**Xu YANSONG**  
Director for International Cooperation,  
China National Space Administration,  
China



**Fan ZHANG**  
Professor of Astronomy,  
China

## 13:45 - 14:45 IAF GNF – Fostering Disruptive Innovation Through Open Collaboration In The Space Industry



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

The objective of this roundtable is to show the beneficial effects of open source hardware and software as a new basis for open collaboration in space. This panel will illustrate a wide range of space-related fields to which open source can be applied, from telecommunications to ISRU and satellite propulsion. Open source will allow a broader inclusion of talent and ideas from a wide range of backgrounds.

With speakers from a wide range of industries (core research, information technology, non governmental organisations, higher education), the panel will bring the argument that open collaboration is becoming the standard in other sectors, as well as a guide for possible implementation in the space industry.

The panel will start from the impact of open source on business and innovation acceleration in the IT industry, with examples such as the Linux operating system or the OpenStack cloud orchestration suite.

It will also explain how open source requires a new vision of intellectual property, and of where value creation lies, as well as discuss the possible limitations related to export control policies.

Open source will also be demonstrated a key way to accelerate the creation of standards in the space industry. The panel speakers would highlight the need for a clear and open framework for collaboration, as well as well-defined, shared values.

The impact of online collaboration tools will be demonstrated, as well as the opportunities provided by distributed collaborative prototyping facilities around the world, on the FabLabs model.

In the end, this panel discussion will not only show the benefits of open collaboration, but also show it to be the only way to keep up with and accelerate the pace of innovation in the industry.

## Speakers:



**Myriam AYASS**  
Section Leader of the IP management and KT policies section & Legal Advisor, European Organization for Nuclear Research (CERN), Switzerland



**Louis David BENYAYER**  
Strategy Consultant, Affiliate Professor, ESCP Business School, France



**Anne Lise COUDRY**  
Vice President, Open Space Makers, France



**Philippe KRIEF**  
Director Research Relations, The Eclipse Foundation, France



**MODERATOR**  
**Benjamin JEAN**  
CEO, Inno3, France

14:55 - 15:25

**IAF GNF – The Benefits Of Space Solutions In Addressing Socio-Economic Challenges And Developing Of Space Ecosystem In Emerging Space Countries**



**Location:** Room N01, Level 3, Hall 7, Paris Convention Centre

At Azercosmos, Space Agency of the Republic of Azerbaijan, we are striving to transfer Azerbaijan into one of the driving forces of the global space industry by delivering cutting edge satellite solutions for a better connected, developed, and secure world. We are proud partners of many companies both in public and private sectors across the Globe for more than decade now, providing our customers with advanced Telecommunication Services over Azerspace-1 and Azerspace-2 satellites, and Earth Observation services by Azersky satellite.

Apart from delivering a broad spectrum of services and solutions via its satellite fleet, Azercosmos engages in a wide range of R&D activities that aim to foster the technological advancement. The Agency cooperates with international stakeholders and partners to be fully integrated in the global space ecosystem, participate in major global projects, build the local know-how, and ensure the establishment and strengthening of collaborative ties in the space industry.

With the purpose of increasing interest in the younger generation into research and development within the space field, Azercosmos has been holding world-class competitions, such as Cansat Azerbaijan, ActInSpace Hackathon and NASA Space Apps Hackathon and involving participants from all over Azerbaijan.

Azercosmos is a proud host of world's prestigious global space event – the International Astronautical Congress (IAC). Held in Baku in 1973 for the first time, the IAC will return to Azerbaijan in 2023, after a half-century. With utmost confidence and strong determination, Azerbaijan will welcome the global space community to Baku in 2023 and offer an exceptional congress experience, immersing participants into the elegant fusion of the past and the future.

Organized by:



## Speakers:



**Dunay BADIRKHANOV**  
Vice-Chairman, Azercosmos Space Agency of the Republic of Azerbaijan, Azerbaijan



**Natavan HASANOVA**  
Strategic Development and Planning Director, Azercosmos Space Agency of the Republic of Azerbaijan, Azerbaijan



**Lala HASANZADA**  
Leading Business Analyst, Azercosmos Space Agency of the Republic of Azerbaijan, Azerbaijan

16:30 - 17:30

**Closing Ceremony**

**Location:** Room Paris South, Level 3, Hall 7, Paris Convention Centre

The Closing Ceremony provides a formal end to the activities of the IAC. There will be a video summary of the week's highlights, presentation of awards, and at the end of the ceremony, the Congress flag will be handed over to the next host country – Azerbaijan.

## Master of Ceremony:



**Christian FEICHTINGER**  
Executive Director, International Astronautical Federation (IAF), France

## Speakers:



**Anthony TSOUGRANIS**  
IAF VP for Honours and Awards, International Astronautical Federation (IAF), National Aeronautics and Space Administration (NASA), United States



**Clay MOWRY**  
President, IAF Bureau, Chief Revenue Officer, Voyager Space Holdings, United States

19:30 - 23:00

**Gala Dinner**

**Location:** Musée des Arts Forains

As you pass through the gates, we will change of era. You will be in 1900, the golden age of the carnival.

Built at the end of the 19<sup>th</sup> century by a student of Gustave Eiffel in the center of Paris, the Gala Dinner venue, made of millstone, houses the reconstitution of a fair from yesteryear with its rides and attractions.

You will have the possibility of using the century-old rides at your leisure for an unforgettable time traveling experience.

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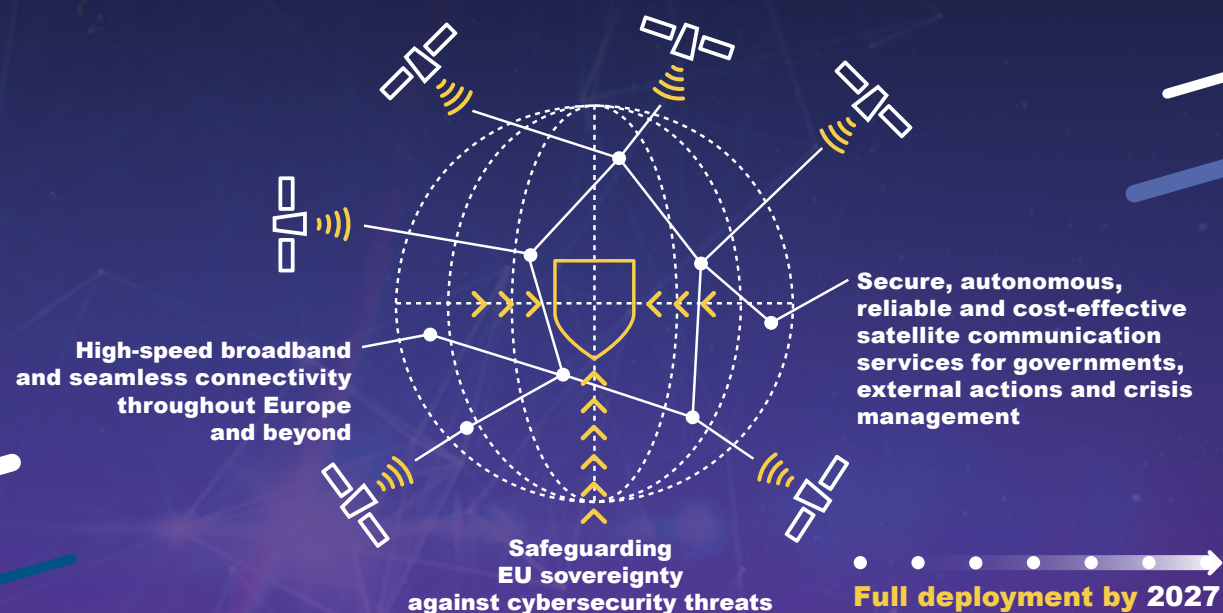






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- ✓ Participate in the IAF Committees in charge of defining the Technical Programme
- ✓ Propose to host a Plenary Event during the IAC
- ✓ Propose a Global Networking Forum (GNF) Event to showcase your organization's latest achievements or to discuss the most interesting topics about Space
- ✓ Participate and vote in the General Assembly and nominate IAF Officers
- ✓ Host one of our events!

### JOIN US

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**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.

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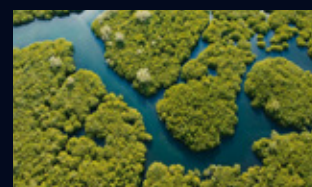
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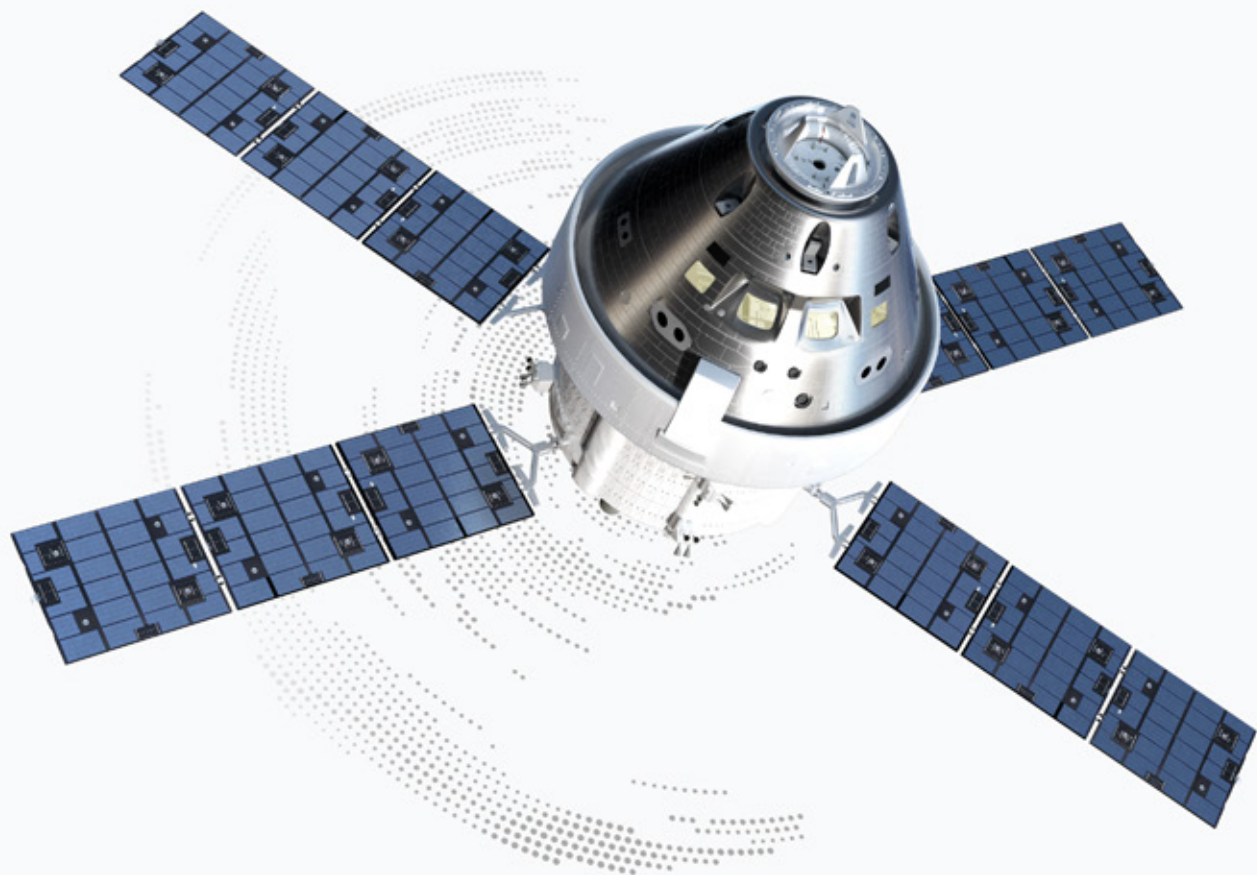


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