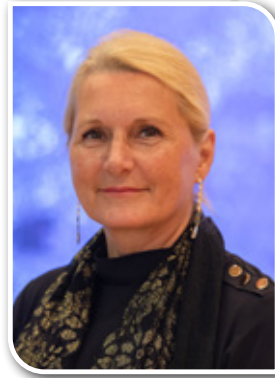




## IAF President's Welcome

Dear friends,

After the postponement of the International Astronautical Congress 2020 in Dubai due to the pandemic, we are now only days away from the most important space event of the year: the International Astronautical Congress 2021! IAC 2021 is held in Dubai, United Arab Emirates, from 25 – 29 October. This IAC is remarkable because we could bring the IAC for the very first time to an Arab country.



The UAE is not anymore an emerging space actor but a country with a dynamic and ambitious space sector. I am confident that the legacy of the IAC 2021 will be an inspiration to the region, and serve as a catalyst for many other Arabic nations to establish space centers and agencies.

This congress would not be possible without the hard work of all the parties involved. I would like to extend my deep gratitude to our host, the Mohammed Bin Rashid Space Centre (MBRSC), the members of the IAF committees and the IAF Secretariat led by its Executive Director, Dr. Christian Feichtinger for their excellent management as well as all the volunteers who dedicate their time to ensure the success of this congress.

Finally, the global space community will gather again, and I am sure that you are all as excited. An exciting IAC programme awaits you with a week full of interesting technical sessions, breaking news, highlight lectures, global networking forums, and numerous special events. I hope you will enjoy the IAC and leave enriched with new knowledge and great experiences.

Warmest Regards,

Pascale EHRENFREUND  
IAF President

### IN THIS ISSUE

#### IAF PRESIDENT'S WELCOME

#### IAF EVENTS & NEWS

- IAC 2021
- IAF Awards 2021
- IAF Grant and Recognition Programmes for Students and YPs
- GLEC 2022
- IAC 2022

#### IAF MEMBERS' CORNER

#### OUR LATEST PUBLICATIONS

- [GLEX 2021 Highlights](#)
- [IAC 2021 - General Overview Programme](#)
- [IAC 2021 - Public, Plenary & GNF Programme](#)
- [IAC 2021 - Technical Programme](#)
- [IAC 2021 - Other Events Programme](#)
- [IAC 2021 Exhibition Programme](#)
- [IAC 2022 - Call for Papers](#)

#### IMPORTANT DATES:

- IAC 2021: 25 - 29 October 2021
- IAF Spring Meetings 2022: 22 - 24 March 2022
- GLEC 2022: 16 - 20 May 2021
- IAC 2022: 18 - 22 September 2022
- IAC 2023: 25 - 29 September 2023

## Connecting @ll Space People





IAC 2021

For the very first time, the IAC will open its doors to the global space community in the United Arab Emirates, the first Arab country to host the IAC since its establishment in 1950. The United Arab Emirates' interest in astronomy and space sciences dates back to the 1970's, when His Highness Sheikh Zayed bin Sultan Al Nahyan met with the NASA team responsible for the Apollo moon landing. This encounter sparked a national focus on space that began almost three decades ago, eventually leading to the birth of a national space sector. The IAC 2021 Host Organization – the Mohammed Bin Rashid Space Centre (MBRSC) – member of the IAF since 2012, was established by the Dubai Government to serve as one of the main pillars to drive the establishment of the knowledge economy and sustainable development in the UAE.

With the theme “Inspire, Innovate & Discover for the Benefit of Humankind”, the IAC 2021 looks forward to making a contribution to humanity and to science by strengthening and enhancing cooperation between all countries in the space sector.

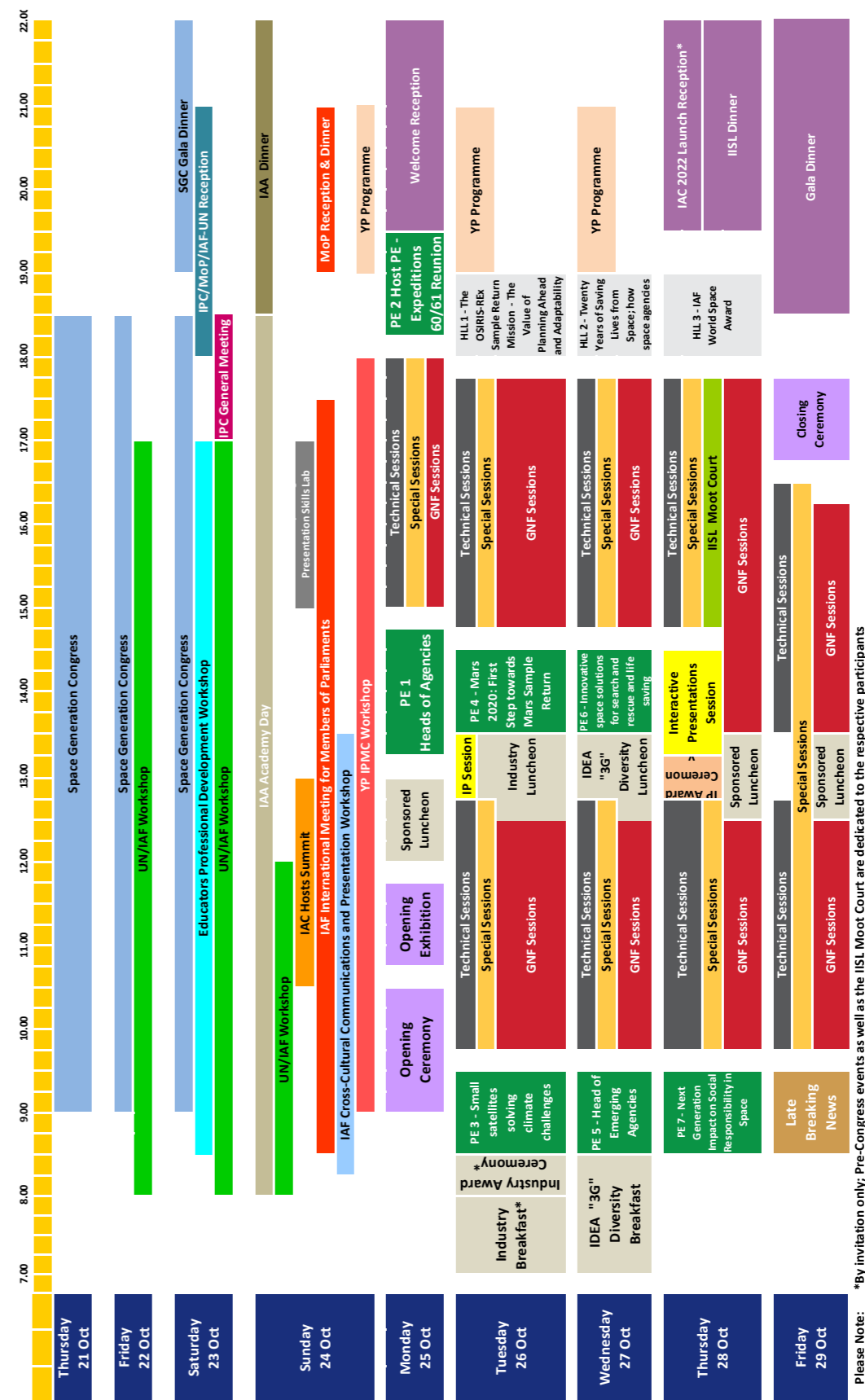
The full IAC Programme is now available on the IAF App!

Download it now and personalize your own IAC schedule

Available on Google Play and the App Store.



CONGRESS AT A GLANCE



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



Plenary Events 

**Plenary 1: Heads of Agencies**

[Day: Monday 25 October](#) | [Time: 13:15-14:45 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

**Plenary 2: Expeditions 60/61 Reunion**

[Day: Monday 25 October](#) | [Time: 18:15-19:30 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

**Plenary 3: Small Satellites Solving Climate Challenges**

[Day: Tuesday 26 October](#) | [Time: 08:30-09:30 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

**Plenary 4: Mars 2020: First Step Towards Mars Sample Return**

[Day: Tuesday 26 October](#) | [Time: 13:30-14:30 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

**Plenary 5: Heads of Emerging Agencies**

[Day: Wednesday 27 October](#) | [Time: 08:30-09:30 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

**Plenary 6: Innovative Space Solutions for Search And Rescue and Life Saving Applications**

[Day: Wednesday 27 October](#) | [Time: 13:30-14:30 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

**Plenary 7: Next Generation Impact on Social Responsibility in Space**

[Day: Thursday 28 October](#) | [Time: 08:30-09:30 GST](#)  
Location: Sheikh Rashid Hall E, Dubai World Trade Centre

Highlight Lectures 

**Highlight Lecture 1: The Osiris-Rex Sample Return Mission – The Value Of Planning Ahead and Adaptability**

[Day: Tuesday 26 October](#) | [Time: 18:00-19:00 GST](#)  
Location: Sheikh Rashid Hall, Dubai World Trade Centre



**Highlight Lecture 2: Twenty Years of Saving Lives From Space; How Space Agencies are Contributing to Relief Efforts through The "International Charter Space and Major Disasters"**

[Day: Wednesday 27 October](#) | [Time: 18:00-19:00 GST](#)  
Location: Sheikh Rashid Hall, Dubai World Trade Centre

**Highlight Lecture 3: IAF World Space Award - Accomplishments of The Hayabusa2 Mission: Sample Return From C-Type Asteroid Ryugu**

[Day: Thursday 28 October](#) | [Time: 18:00-19:00 GST](#)  
Location: Sheikh Rashid Hall, Dubai World Trade Centre

Late Breaking News 

To be announced separately.  
[Day: Friday 29 October](#) | [Time: 08:30-09:30 GST](#)  
Location: Sheikh Rashid Hall, Dubai World Trade Centre

IAF GNF Sessions 

**Space Law for New Space Actors - Fostering Responsible National Space Activities**

[Day: Monday 25 October](#) | [Time: 14:55 -15:45 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

**Challenges Ahead for a Responsible Space Sector**

[Day: Monday 25 October](#) | [Time: 14:55 -15:45 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

**Earth System Science: Open Data and Open Science in Support of our Planet**

[Day: Monday 25 October](#) | [Time: 17:05 -18:05 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

**Powering The Next Giant Leap**

[Day: Tuesday 26 October](#) | [Time: 09:40 -10:40 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

**Building The Commercial Future of Low Earth Orbit**

[Day: Tuesday 26 October](#) | [Time: 10:50 -11:50 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

**'Access To Space For All': UNOOSA And Airbus To Announce Winner Of Free Payload Flight On Iss/Bartolomeo**

[Day: Tuesday 26 October](#) | [Time: 12:00 -12:30 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

**The Mega-Constellation Ecosystem: What Industrial and Regulatory Elements are Necessary for a Thriving Market?**

[Day: Tuesday 26 October](#) | [Time: 14:35 -15:35 GST](#)  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre



## On-Orbit Servicing: Enabling A Sustainable Infrastructure To Grow The Space Economy

Day: [Tuesday 26 October](#) | Time: 15:40 -16:40 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Defining Possible In Human Space Exploration

Day: [Tuesday 26 October](#) | Time: 16:45 -17:15 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## The Need For Laser Communication As The Backbone Of Future Leo, Meo And Geo Satellite Constellations

Day: [Tuesday 26 October](#) | Time: 17:25 -17:55 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## French Fireside Chat: Surveillance, Habitat, Optronics

Day: [Wednesday 27 October](#) | Time: 09:40 -10:40 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## 2020'S - The Decade of The Start-Up Companies

Day: [Wednesday 27 October](#) | Time: 10:50 -12:20 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Space Startups Pitch Competition by UAE Space Agency

Day: [Wednesday 27 October](#) | Time: 14:40 -15:25 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Is Europe Ready For Human Spaceflight?

Day: [Wednesday 27 October](#) | Time: 15:45 -16:15 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Going Far Together

Day: [Wednesday 27 October](#) | Time: 16:30 -17:00 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## The Cloud: Bridging The Gap Between Earth and Space

Day: [Wednesday 27 October](#) | Time: 14:55 -15:45 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Building The Lunar Ecosystem Today - Actions From Industrial And Agencies

Day: [Thursday 28 October](#) | Time: 09:40 -10:35 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Evolution of Space Industry and New Business Opportunities in Emerging Space Countries

Day: [Thursday 28 October](#) | Time: 10:45 -11:15 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## How To Develop a Sustainable Lunar Surface Infrastructure

Day: [Thursday 28 October](#) | Time: 11:25 -12:25 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Investing In Space Start-Ups: Their Evolution During 2020

Day: [Thursday 28 October](#) | Time: 14:55 -15:45 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Moonlight: Connecting Earth With The Moon

Day: [Thursday 28 October](#) | Time: 14:35 -15:35 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre



## Horizon 2061 Planetary Exploration Foresight: Science, Missions, Technology, Infrastructures & International Stakeholders

Day: [Thursday 28 October](#) | Time: 15:45 -16:45 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## Towards Sustainable Lunar Activities

Day: [Thursday 28 October](#) | Time: 16:55 -17:45 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## The Deep Space Food Movement

Day: [Friday 29 October](#) | Time: 09:40 -10:40 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## IAF / ASE Astronauts Panel

Day: [Friday 29 October](#) | Time: 11:00 -12:00 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre

## IAC 2021 GNF Media Panel – A Roundtable on The Role of Media in Promoting Space Activities

Day: [Friday 29 October](#) | Time: 13:40 -14:40 GST  
Location: Sheikh Rashid Hall F, Dubai World Trade Centre



This year, the IAC 2021 Call for Abstracts has attracted an overwhelming number with over 3,370 submissions to 182 regular Technical Sessions. Interestingly, the abstracts were submitted by 86 countries, manifesting the growing international reputation of the flagship space congress IAC. The International Programme Committee has introduced several innovative and exciting changes to this year's IAC:

First, the number of Technical Sessions has welcomed new symposia in order to bring "hot" research topics within the IAC scope. The new IAF symposium on Space Security, appears explicitly in the Technical Programme. We envisage that such tracks will flourish in the forthcoming IACs.

Second, a new mentoring initiative for less-experienced authors or submitters from resource-limited countries – “the IAF Abstract Mentor Programme” was launched for the third time and saw phenomenal interest, mainly from the young generation. This resulted in more than 100 applications which were reviewed by a pool of passionate volunteer mentors.

Third, the IAC Technical Programme is supplemented with the very successful Special Sessions (SpS). The Call for SpS resulted in a record number of 87 proposals with multidisciplinary topics and interactive formats reflecting the Congress theme “Inspire, Innovate & Discover for the Benefit of Humankind”. We take this again as an exciting signal of the demand to contribute to the IAC Technical Programme.

IAC 2021 will also feature a new dynamic and engaging Interactive Presentations Session called “Lightning Talks”. This new session format is an excellent way to rapidly and compellingly share the latest information about diverse topics from presenters in an engaging and snappy style.



## Technical Sessions

Date	25/10/2021	26/10/2021	26/10/2021	27/10/2021	27/10/2021	28/10/2021	28/10/2021	29/10/2021	29/10/2021
Time / Room Number	15:15-18:15	09:45-12:45	14:45-17:45	09:45-12:45	14:45-17:45	09:45-12:45	14:45-17:45	09:45-12:45	13:30-16:30
Sheikh Maktoum A	A3.1	A3.2A	A3.2B	A3.3A	A3.3B	A3.4A	A3.5	A3.2C	A3.4B
Sheikh Maktoum D	D2.1	D2.2	D2.3	D2.4	D2.5	D2.6	D2.7	D2.8/A5.4	D2.9/D6.2
Sheikh Maktoum C	C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7	C1.8	C1.9
Sheikh Rachid C	A6.1	A6.9	A6.4	A6.3	A6.2	A6.5	A6.6	A6.8/E9.1	A6.7
Sheikh Maktoum B	B3.1	B3.2	B3.3	B3.4/B6.4	B3.5	B3.6/A5.3	B3.7	B3.8	A6.10/B6.5
Sheikh Rachid D	B4.2	B4.1	B4.3	B4.4	B4.5	B4.6A	B4.7	B4.8	B4.6B
Abu Dhabi B	B5.1	E7.1	E7.2	E7.3	E7.4	E7.6/E3.5	E6.3	E7.5	E7.7
Ajman D	C4.1	C4.3	C4.5	C4.2	C4.6	C4.7	C4.8/B4.5A	C4.9	C4.10/C3.5
Rais Al Khaimah	C2.1	C2.2	C2.3	C2.4	C2.5	C2.6	C2.7	C2.8	C2.9
Umm Al kwain	A1.1	A1.2	A1.3	C4.4	A1.4	A1.5	A1.6	A1.7	A1.8
Sheikh Rachid A	A2.1	A4.1	A4.2	A2.2	A2.3	A2.4	A2.5	A2.6	A2.7
Al Ain J	D1.1	D1.2	D1.3	A5.1	A5.2	D1.4A	D1.4B	D1.5	D1.6
Abu Dhabi A	B1.1	C3.1	C3.2	B1.2	B1.3	B1.4	B1.5	C3.4	E8.1
Al Ain A	A7.1	E3.1	E3.2	A7.2	A7.3	E3.3	E3.6	E3.4	D5.4
Al Ain B	E5.1	D5.1	E5.2	D5.2	E5.3	D5.3	E9.2	E5.4	E5.5
Al Ain F	D6.1	B2.1	B2.2	B2.3	B2.4	B2.5	B2.6	D6.3	B2.7
Sharja A	E1.1	E1.2	E1.3	E1.4	E1.5	E1.6	E1.7		E1.9
Sharja D	D4.1	D4.2	D4.3	D3.1	D3.2A	D4.4	D4.5	D3.2B	D3.3
Dubai C	E2.1	E6.4	B6.1	E6.2	B5.2	B5.3	B6.2	B6.3	E6.1
Dubai D GTS	B2.8/GTS.3	E2.2	E2.3/GTS.4	E2.4	E6.5/GTS.1	C3.3	B4.9/GTS.5	B1.6	B3.9/GTS.2
Ajman A						E4.1	E4.2	E4.3	
ISZ								E1.8	

**Category A: Science & Exploration** A1--> A7  
**Category B: Applications & Operations** B1--> B6  
**Category C: Technology** C1--> C4  
**Category D: Infrastructure** D1--> D6  
**Category E: Space & Society** E1--> E9

## Interactive Presentations & Lightning Talks

As part of the Technical Programme, the Lightning Talks will get a strong visibility and are a great opportunity to get to know the IP presenters at the IAC.

Lightning talks have a specific format and recommended structure, that make them stand out from other short talks. These talks are succinct, very dynamic and innovative, and must be delivered in under 60 seconds! Join us on Tuesday 26 October from 12:50 to 13:20, in Pavilion B (Ground Floor).

The Interactive Presentations Session is a **dynamic forum** among presenters and the audience and **highly interactive**, and allow authors and participants to engage in **in-depth discussions** about the presented work from which **new collaborations**, ideas, and solutions can emerge.

Interactive Presentations include **multimedia**, such as audio and video, as well as images and animations. Their flexibility helps foster presenters **creativity** and skills, and provides a platform for building **engaging, collaborative**, and **visually powerful** presentations.

The **five best** Interactive Presentations of the IAC 2021 will be **awarded** during a dedicated ceremony to be held just before the IP Session on Thursday 28 October, from 12:45 to 13:15.

More information about the IP Awards is available here:  
<https://www.iafastro.org/activities/honours-and-awards/iaf-interactive-presentation-award/>



## Special Sessions

### Space Infrastructure Games

[Day: Monday 25 October | Time: 15:00 - 16:30](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### The Grand Planetary Defense Dart/Hera Missions Interactive Q&A

[Day: Monday 25 October | Time: 16:45-18:15](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Nanosatellite T-101 Launch Mission Design Workshop - From A Customer's Need To Space Operations

[Day: Tuesday 26 October | Time: 09:45-11:15](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Impact Of Satellite Constellations On Astronomy And Society: A Multi-Disciplinary Approach

[Day: Tuesday 26 October | Time: 11:30-13:00](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Rethinking The Sustainability And Inclusiveness of Space Exploration Through The Design Of Space Habitats

[Day: Tuesday 26 October | Time: 14:45-16:15](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Gaming Out Conflict And Cooperation Scenarios in Lunar Surface Development

[Day: Tuesday 26 October | Time: 16:30-18:00](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Space Traffic Management: The IAF Initiative

[Day: Wednesday 27 October | Time: 09:45-11:15](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Viewing The Health Of Earth's Oceans From Space – Agency Leaders Confer With Each Other On The Difficult Challenges, Emerging Success, And Plans For The Future

[Day: Wednesday 27 October | Time: 11:30-13:00](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Designing A Geostationary Space Station For 22<sup>nd</sup> Century

[Day: Wednesday 27 October | Time: 14:45-16:15](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### In-Space Servicing, Manufacturing, Assembly, Robotics, And Transportation (Smart)

[Day: Wednesday 27 October | Time: 16:30-18:00](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Colliding Laws In Outer Space: Mapping Potential Clashes Between Space Law, Commerce, Antitrust And Ethics And Their Solutions Through Design Sprint

[Day: Thursday 28 October | Time: 09:45-11:15](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre

### Emirates Mars Mission Science Data Workshop

[Day: Thursday 28 October | Time: 11:30-13:00](#)  
 Location: Sheikh Rashid B, Dubai World Trade Centre



## Democratizing Earth Analytics With AWS Cloud

Day: [Thursday 28 October](#) | Time: 14:45-16:15

Location: Sheikh Rashid B, Dubai World Trade Centre

## Interstellar Probe: Humanity's First Deliberate Step Into The Galaxy By 2030

Day: [Thursday 28 October](#) | Time: 16:30-18:00

Location: Sheikh Rashid B, Dubai World Trade Centre

## Live Demonstration Of Data Processing Using Artificial Intelligence And Satellite Data For Ocean Farming Applications

Day: [Friday 29 October](#) | Time: 11:30-12:30

Location: Sheikh Rashid B, Dubai World Trade Centre

## Making Space For All: Advancing Disability Inclusion In Space For The Benefit Of Science And All Humankind

Day: [Friday 29 October](#) | Time: 12:45-13:45

Location: Sheikh Rashid B, Dubai World Trade Centre

## Use Cases For Intelligent Virtual Assistants In The Space Field

Day: [Friday 29 October](#) | Time: 14:00-15:00

Location: Sheikh Rashid B, Dubai World Trade Centre

## Regional Cooperation and National Space Legislation

Day: [Friday 29 October](#) | Time: 15:15-16:15

Location: Sheikh Rashid B, Dubai World Trade Centre

## Symposium Keynotes

# Keynotes

## A3.3B EMIRATES MARS MISSION: SCIENCE INSTRUMENT OVERVIEW

Symposium: A3. IAF SPACE EXPLORATION SYMPOSIUM

Session: Mars Exploration – Science, Instruments and Technologies

Day: [Wednesday 27 October](#) | Time: 14:45 - 15:05

Location: Sheikh Maktoum A, Dubai World Trade Centre

## B1.1 COMMITTEE ON EARTH OBSERVATION SATELLITES (CEOS): 2021 REPORT OF ACTIVITIES TO THE INTERNATIONAL ASTRONAUTICAL CONGRESS

Symposium: B1. IAF EARTH OBSERVATION SYMPOSIUM

Session: International Cooperation in Earth Observation Missions

Day: [Monday 25 October](#) | Time: 15:15 - 15:45

Location: Abu Dhabi A, Dubai World Trade Centre

## B1.6 CANADA'S EMERGENCY GEOMATICS FOR DISASTER RESPONSE: USE CASE OF THE 2019 FLOODS

Symposium: B1. IAF EARTH OBSERVATION SYMPOSIUM

Session: 21<sup>st</sup> Anniversary of the Disaster Charter: History, Status and Future of this Powerful and Productive International Cooperation

Day: [Friday 29 October](#) | Time: 09:45 - 10:05

Location: Dubai D GTS, Dubai World Trade Centre

## B3.1.1 NASA'S PLANS FOR HUMAN SPACE EXPLORATION

Symposium: B3. IAF HUMAN SPACEFLIGHT SYMPOSIUM

Session: Governmental Human Spaceflight Programmes (Overview)

Day: [Monday 25 October](#) | Time: 15:15- 15:45

Location: Sheikh Maktoum B, Dubai World Trade Centre



## B3.1.2 HUMAN SPACEFLIGHT WITHIN ESA'S SPACE EXPLORATION PROGRAMME FOR THE NEXT DECADE

Symposium: B3. IAF HUMAN SPACEFLIGHT SYMPOSIUM

Session: Governmental Human Spaceflight Programmes (Overview)

Day: [Monday 25 October](#) | Time: 15:45- 16:15

Location: Sheikh Maktoum B, Dubai World Trade Centre

## B4.3 CAPSTONE: PATHFINDER FOR THE LUNAR GATEWAY

Symposium: B4. 28<sup>th</sup> IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS

Session: Small Satellite Operations

Day: [Tuesday 26 October](#) | Time: 14:45 - 15:10

Location: Sheikh Rachid D, Dubai World Trade Centre

## B4.5 SPEED TO SPACE: DEDICATED LAUNCH FOR SMALL SATELLITES ON ELECTRON

Symposium: B4. 28<sup>th</sup> IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS

Session: Access to Space for Small Satellite Missions

Day: [Wednesday 27 October](#) | Time: 14:45 - 15:25

Location: Sheikh Rachid D, Dubai World Trade Centre

## C1.6 ON PERTURBATION SOLUTIONS IN THE RESTRICTED THREE-BODY PROBLEM DYNAMICS

Symposium: C1. IAF ASTRODYNAMICS SYMPOSIUM

Session: Orbital Dynamics (1)

Day: [Thursday 28 October](#) | Time: 09:45 - 10:15

Location: Sheikh Maktoum C, Dubai World Trade Centre

## C4.8-B4.5A ELECRIE PROPULSION FOR CUBESATS: A REVIEW

Symposium: C4. IAF SPACE PROPULSION SYMPOSIUM

Session: Joint Session between IAA and IAF for Small Satellite Propulsion Systems

Day: [Thursday 28 October](#) | Time: 14:45 - 15:15

Location: Ajman D, Dubai World Trade Centre

## D2.7 BUILDING THE INFRASTRUCTURE OF SPACE: SMALL LAUNCH TO CONNECTIVITY

Symposium: D2. IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

Session: Small Launchers: Concepts and Operations

Day: [Thursday 28 October](#) | Time: 14:45 - 15:15

Location: Sheikh Maktoum D, Dubai World Trade Centre

## E1.4 UNISAT PLATFORM AND LUNAR-MARS MISSION IN GAUSS

Symposium: E1. IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM

Session: In Orbit - Postgraduate Space Education

Day: [Wednesday 27 October](#) | Time 09:45 - 10:05

Location: Sharja A, Dubai World Trade Centre

## E6.3 THE NEED FOR NASCENT INDUSTRY AND ECOSYSTEM INFRASTRUCTURE

Symposium: E6. IAF BUSINESS INNOVATION SYMPOSIUM

Session: Innovation: The Academics' Perspectives

Day: [Thursday 28 October](#) | Time 14:45 - 15:05

Location: Abu Dhabi B, Dubai World Trade Centre

## Global Technical Sessions

If you cannot make it to Dubai for IAC 2021, there is still a chance for you to get involved! You can take part in the IAC 2021 Global Technical Symposium (GTS) remotely!

These sessions showcase recent advances in several technical topics discussed at IAC, with speakers sharing their work on-site at IAC and remotely.



This year, the GTS will include 5 sessions:

- Space Communications and Navigation (25 October 2021 at 15:15 Dubai Time): <https://attendee.gotowebinar.com/register/7458815721528783886>
- Student Team Competition (26 October 2021 at 14:45 Dubai Time): <https://attendee.gotowebinar.com/register/4515911277135261198>
- Entrepreneurship Around the World (27 October 2021 at 14:45 Dubai Time): <https://attendee.gotowebinar.com/register/8214410007741241102>
- Small Satellite Missions (28 October 2021 at 14:45 Dubai Time): <https://attendee.gotowebinar.com/register/5746283480314469390>
- Human Spaceflight (29 October 2021 at 13:30 Dubai Time): <https://attendee.gotowebinar.com/register/2447383559126206220>

The full program (including abstracts of the papers being presented) are accessible here: <https://iafastro.directory/iac/list/IAC-21/GTS/>

Sessions will be held on-site at IAC 2021 and broadcast online using GotoWebinar. Links to register for the webinars have been included above.



## IAF IDEA “3G” DIVERSITY PROGRAMME

With the aim of promoting and advancing the principles of “3-G” (Geography, Generation, and Gender) Diversity amongst a global space community the IAF has established an International Platform for Diversity and Equality in Astronautics (IDEA). The IAF welcomes delegates to participate in the IAC Diversity Activities and benefit from an intensive and open exchange on diversity and equality aspects within the IAF, amongst IAF member organizations as well as other organizations promoting diversity.

### 1. IAF IDEA “3G” Diversity Breakfast

**Date:** Wednesday 27 October 2021  
**Time:** 07:00 - 08:30  
**Venue:** Pavilion A, Exhibition Area

As an important element of the IAF “3G” Diversity Day the IAF welcomes all delegates to the IAF IDEA “3G” Diversity Breakfast sponsored by Jet Propulsion Laboratory (JPL). The event will be opened with a welcome by the IAF President, Pascale Ehrenfreund, followed by an introduction from Moderator Deganit Paikowsky, IAF VP for Diversity Initiatives and Science & Academic Relations.

Larry D. James, Interim Director of JPL, will present on behalf of JPL on the topic “*Inclusion Drives Innovation*” and will present an exciting video to the audience. To further deepen the topic questions from the public are welcomed.

**Sponsored by:**  
Jet Propulsion Laboratory



## Programme:

- 07:00 - 07:05 **Welcome**  
**Pascale Ehrenfreund**, , *President, International Astronautical Federation (IAF), France*
- 07:05 - 07:10 **Moderation and Introduction to IAF “3G” Diversity Breakfast**  
**Deganit Paikowsky**, *IAF VP for Diversity Initiatives and Science & Academic Relations, International Astronautical Federation (IAF), Israel*
- 07:10 - 07:30 **Presentation by Sponsor**  
**Larry D. James**, *Interim Director, Jet Propulsion Laboratory (JPL), United States*  
- JPL Video  
- Question time
- 07:30 - 07:35 **Concluding Remarks**  
**Deganit Paikowsky**, *IAF VP for Diversity Initiatives and Science & Academic Relations, International Astronautical Federation (IAF), Israel*
- 07:35 - 08:30 **Networking**



## 2. IAF IDEA Excellence in “3G” Diversity Award Luncheon (Upon invitation only)

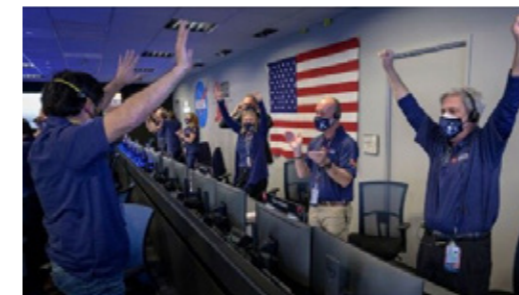
**Date:** Wednesday 27 October 2021  
**Time:** 12:30 - 13:30  
**Venue:** Pavilion A, Exhibition Area

The IAF Excellence in “3G” Diversity Awards recognize IAF member organizations (industry, government, academia) worldwide for outstanding contributions to the fostering of “3G” (Geography, Generation, Gender) Diversity within the space sector.

The highest standards in “3G” Diversity can be achieved both by organizations and within teams’ activities. To correctly represent this the IAF Honours and Awards Committee (HAC) decided to divide the IAF Excellence in “3G” Diversity Awards in two corresponding categories.

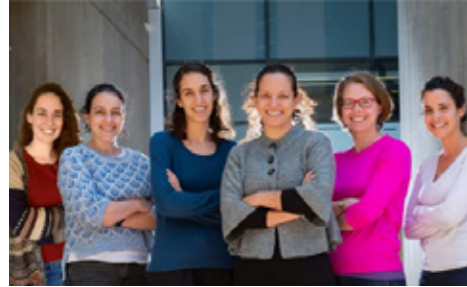
This Luncheon is dedicated to the award ceremony for the 2021 IAF Excellence in “3G” Diversity Awards, bestowed to **Jet Propulsion Laboratory (JPL)** and the **Earth and Planetary Image Facility (EPIC)** Academic Team.

### Jet Propulsion Laboratory (JPL)



"JPL has been on a focused journey over the last five years to build and execute on strategies to support diversity, equity and inclusion at the Laboratory and in the communities, we engage with. These strategies focus on evolving our culture, ensuring leadership understanding and accountability to the concepts of diversity, equity, and inclusion, and building our future through a diverse and inclusive workforce."






Earth and Planetary Image Facility (EPIF) Academic Team



"The Earth and Planetary Image Facility (EPIF) academic team from Ben-Gurion University of the Negev has been awarded the IAF IDEA "3G" Diversity Award for their work on the She-Space initiative; a hands-on science outreach program to encourage high school-age girls to pursue science research and careers in fields related to space and space science"

Sponsored by: **Jacobs**

**Programme:**

12:30 - 12:35	<b>Welcome</b> Pascale Ehrenfreund, , President, International Astronautical Federation (IAF), France	
12:35 - 12:40	<b>Presentation by Sponsor</b> Jayne Dale, Space Campaign Lead for the EMEA Region, Jacobs, United Kingdom	
12:40 - 12:45	<b>Introduction of the IAF Excellence in "3G" Diversity Award</b> Anthony Tsougranis, IAF VP for Honours and Awards, International Astronautical Federation (IAF), United States	
12:45 - 12:50	<b>Award Ceremony and Photo</b>	
12:45 - 13:10	<b>Presentation by the Award winner</b> Jet Propulsion Laboratory (JPL) represented by: Larry D. James, Interim Director, Jet Propulsion Laboratory (JPL), United States	
	<b>Earth and Planetary Image Facility (EPIF) Team</b> represented by: Shimrit Maman - Tirosh, Research Associate and Laboratory Director, Earth and Planetary Image Facility (EPIF), Israel	
13:10 - 13:30	<b>Networking</b>	

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## IAF Awards 2021

### 1. IAF World Space Award

The IAF World Space Award is presented for an outstanding contribution or contributions in space science, space technology, space medicine, space law or space management of exceptional impact to the world's progress in astronautics.

The recipient of this year's award is the **Hayabusa2 Team**.

Hayabusa2 is a landmark asteroid sample return mission developed and implemented by the Japan Aerospace Exploration Agency (JAXA). It was launched on December 3, 2014 and arrived at a C-type near-Earth asteroid 162173 Ryugu in June 2018 after 3.5 years of the ion engine powered cruise. During the ensuing 1.5 years of its challenging asteroid proximity operation, Hayabusa2 successfully deployed four mobile rovers on the surface of the asteroid, achieved two high precision landings for sample collection from two different sites, and successfully conducted a kinetic impact operation to create a large artificial crater for subsurface material and structural investigations. Hayabusa2 successfully returned to Earth on December 6, 2020 after completing a round-trip journey of around 5.2 billion km in six years. The mission successfully brought as much as 5.4 grams of sample of Ryugu to Earth.



The Hayabusa2 has greatly contributed to the advancement of robotic interplanetary sample return missions through a series of flawless operational accomplishments made possible by its sophisticated technologies concerning solar-electric-propulsion cruising, landing, roving, impacting, and returning to Earth. Hayabusa2 has achieved the world's second-ever successful round-trip flight to a celestial body beyond the Moon, following the former Hayabusa mission. It has also accomplished the world's first in collecting samples from a C-type asteroid, which is expected to greatly contribute to the progress of planetary science.

The Hayabusa2 team consists of hundreds of experts including engineering staff from JAXA, international scientists from around the world, and young professionals ranging from graduate students to post-doctoral researchers.



The team has been led by Dr. TSUDA Yuichi. He received his Ph.D. degree in aeronautics and astronautics from the University of Tokyo in 2003 and joined JAXA in the same year as a research associate. He was a visiting scholar at the Dept. of Aerospace Engineering, the University of Michigan as well as the Dept. of Aerospace Engineering Sciences, the University of Colorado Boulder in 2008-2009. After serving as a deputy lead for the IKAROS project, the world's first interplanetary solar sail mission, Tsuda became the Hayabusa2 project manager in 2015, being the youngest project manager in JAXA's history. His research interests are astrodynamics, spacecraft system, and deep space exploration.

[IAF World Space Award \(iafastro.org\)](http://iafastro.org)

### 2. IAF Excellence in International Cooperation Award

The IAF Excellence in International Cooperation Award is presented annually to an individual who has demonstrated excellence in their efforts to promote and facilitate global engagement and cooperation in the space sector.

In its first year, the award has been bestowed to:



**Jean Yves LE GALL**  
Former President,  
Centre National  
d'Etudes Spatiales  
(CNES)

*"As an advocate for international cooperation, Dr. Le Gall has established fruitful networks and collaborations with numerous stakeholders at political, institutional, industrial and academic levels encouraging them to work together to create a coherent space strategy."*

*Recognizing early on that the space landscape thrives on diversity and international collaboration, Dr. Le Gall has always found ways to convince political leaders that a strong space policy could only rely on strong cooperation within Europe and space leaders around the world. To this day, Dr. Le Gall is one of the most influential French leaders on space policy and his support to European and international space programs and achievements is well documented throughout his different positions within the French national scientific research agency CNRS, several French ministries, at Novespace, Starsem, Arianespace, where he was Chairman & CEO, as President of the French space agency (CNES) and President of the International Astronautical Federation (IAF)"*

Jean-Yves LE GALL is IAF Former President and Honorary Ambassador.

Jean-Yves Le Gall has been President of the Centre National d'Etudes Spatiales (CNES), the French space agency, from 2013 to 2021. In this capacity, he was Interministerial Coordinator for satellite navigation programmes and Chair of the Administrative Board of GSA, the European GNSS Agency. He was also Co-Chair of the Council of the European Space Agency (ESA) and Former President of the International Astronautical Federation (IAF).

CNES is responsible for proposing and implementing space policy in France. It is involved in all aspects of space (Ariane, Sciences, Observation, Telecommunications, Defence) through its four centres of excellence in Paris, Toulouse and French Guiana, with 2,450 employees and a budget of more than €2.3m (2017). CNES also represents France on the ESA Council and at many other international organizations, and is a partner in various commercial enterprises.

Born in 1959, Jean-Yves Le Gall is a qualified engineer and scientist who has devoted his entire career to the European space programme, holding positions within the French national scientific research agency CNRS, several French ministries, at Novespace and a first stint with CNES before joining Starsem and Arianespace for 12 years, where he was CEO then Chairman & CEO.

Jean-Yves Le Gall is a member of the International Academy of Astronautics (IAA) and Vice-President of the "Space Circle" at French think-tank CEPS (Centre d'Etude et de Prospective Stratégique). He also chairs the France-Japan business council of Medef International, and is a member of the French-Mexican Strategic Council.

He received the Astronautics Prize from the French Association of Aeronautics and Astronautics (AAAF) in 2001. He was named Via Satellite magazine's 2005 Satellite Executive of the Year and received the Lifetime Achievement Award in 2007 from the Asia-Pacific Satellite Communications Council (APSCC). In 2011 he was inducted into the Hall of Fame of the Society of Satellite Professionals International (SPPI) and received the Icarus Prize from the French association of professional aerospace journalists (AJPAE). In 2014 he received a Laureate Award from Aviation Week & Space Technology magazine.

Jean-Yves Le Gall holds the rank of Officer in both the Legion of Honour and the National Order of Merit in France. He has also been awarded the Order of Friendship by the Russian Federation and the Order of the Rising Sun, Gold and Silver Star, by the government of Japan.

### 3. IAF Hall of Fame

The IAF Hall of Fame is intended to create a standing forum of personalities that have contributed substantially to the progress of space science, technology, and space benefits to mankind. It will consist of a permanent gallery of these personalities, including a citation, biographical information, and a picture, in a special part of the IAF web presence. The recipient of this year's award are:



**Dr. Alexander V. DEGTYAREV**  
General Director - General  
Designer,  
Yuzhnoye State Design Office,  
Ukraine  
(in memoriam)

*"For outstanding contribution to development of space science and expansion of international cooperation in space exploration"*

Dr. Alexander Degtyarev served as General Director - General Designer of Yuzhnoye State Design Office in 2010-2020; his main interest



was in aerospace engineering he had succeeded in. Due to his extensive, more than 40 years' experience in engineering, designing and development testing of launch vehicle systems, he managed to resolve a number of topical challenges in aerospace industry. Dr. Degtyarev designed and justified the rocket systems modification method which takes into account economic restrictions, defined space vehicle system main competitive characteristics, developed a new method which allows determining launch vehicle and spacecraft main design and ballistic characteristics during satellites delivery to orbit.



**Prof. Guirong MIN**  
Chief Scientist and former President,  
China Academy of Space Technology  
(CAST),  
China  
(in memoriam)

*"An expert with distinguished contribution for China space development from first satellite to space station for more than 50 years"*

Prof. Guirong Min has been engaged in space technology research and planning and made outstanding contributions to satellite system engineering and spacecraft thermal control. He was in charge of studying satellite thermal control systems in the early time of China's space history, including the Chinese first satellite—DFH-1. He also proposed systematic and innovative ideas in spacecraft thermal control theory, method and technology. In the aspect of satellite system engineering, as one of the technical directors, he took charge of research and launch mission of China's recoverable satellites. He was the pioneer of Chinese space station program and lunar exploration program. Prof. MIN was elected the member of IAA, academician of the Chinese Academy of Sciences and academician of the Chinese Academy of Engineering in 1990s.



**Dr. Hiroki MATSUO**  
President,  
Society for Promotion of Space Sciences,  
Japan

*"MATSUO Hiroki has been dedicated to the research and development in space engineering from its dawn of history in Japan, including his notable contribution of strong leadership in space science and exploration."*

Dr. Matsuo played an instrumental role in the advancement of astronautics both in Japan and globally.

One of his early accomplishments were the development of Japanese satellite launcher. This led to the successful launch of Japan's first satellite OHSUMI by the L-4S-5 rocket. Dr. Matsuo was engaged in nearly every process in the development of the launch vehicles of ISAS such as the M-series rockets, and scientific satellites, including Japan's first scientific satellite SHINSEI and two successful Halley's Comet probes, SAKIGAKE and SUISEI, which laid the foundation for the miraculous story of the recent Hayabusa2 mission. Without Dr. Matsuo's achievements, Japan's planetary exploration, represented by the asteroid explorer HAYABUSA, the Lunar surface observer KAGUYA and the Venus climate orbiter AKATSUKI, would not have been the success that it is today.

In 2000, Dr. Matsuo became Director General of ISAS, and took strong initiative in the development of the inter-university research system. Dr. Matsuo had himself been heavily involved in human resource development, educating and providing research guidance to graduate students at the University of Tokyo since 1974. In 2003, Dr. Matsuo was appointed Commissioner and eventually Chairman of the Space Activities Commission, which oversaw JAXA's space programmes. Dr. Matsuo also devoted himself to the enhancement of the involvement of developing countries of South-East Asia in space development and utilization, by regularly chairing the Asia-Pacific Regional Space Agency Forum (APRSAP) until his retirement in 2010.

Dr. Matsuo held key international positions, including Vice President of the IAF in 1996-1998, in addition to being a long-standing member of the Federation's Honours and Awards Committee. Dr. Matsuo played a leading role in the success of the International Astronautical Congress (IAC) 2005 in Fukuoka, as General Chairperson of Local Organizing Committee. He was also Vice-President of IAA in 2001-2019, and Advisor to the International Space University in 2000-2003.

[IAF Hall of Fame \(iafastro.org\)](http://iafastro.org)



## 4. IAF Excellence in "3G" Diversity Award

### IAF EXCELLENCE IN 3G DIVERSITY AWARD 2021 RECIPIENTS

This "IAF Excellence in 3G Diversity Award" is intended to recognize IAF member organisations (industry, government, academia) worldwide for outstanding contributions to the fostering of "3G" (Geography, Generation, Gender) Diversity within the space sector. It is an annual award presented at the IAC, but is given only when nominations of exceptional merit are received.

#### Jet Propulsion Laboratory (JPL)



*"The Jet Propulsion Lab strives for excellence in all we do. As one of the premiere research and space exploration organizations in the world, we value the full contributions of all employees and we are stronger because of our diversity. We value diversity and inclusion in all we do, and we have made it a priority to demonstrate this commitment through our leadership and actions at the Lab. We have taken actions on many fronts to broaden our diversity and deepen our inclusion -- from internships through retirement -- while creating opportunities for everyone to reach their highest potential along the way. This journey never ends. We will continue to evolve and push for excellence in Diversity, Equity and Inclusion".*

#### Earth and Planetary Image Facility (EPiF) Academic Team



Through their ongoing She Space and She Space International programs, the EPiF team demonstrated remarkable commitment to increasing diversity in space science along all 3 "G's". With their focus on the mentorship of high school-aged girls by active female researchers and academics, the She Space programs simultaneously address the gender and generational equality aspects of "3G" diversity. The all-female project staff act as role models for the next generation of female space scientists; providing She Space students with a concrete overview of careers in space science, encouraging them to dream and to follow these role models ("If you can see it, you can be it.").

The She Space program was originally founded in 2017 as a local program targeted to Be'er Sheva and surrounding Negev regions. To this day, it is a collaboration between EPiF at Ben-Gurion University and the Beit Yatziv Educational Community Center in Be'er Sheva. Although the program continues to ensure that there are local participants every year, the program has also expanded its reach



by inviting students from all over Israel and, more remarkably, by developing even further, from 2018 to the present, into the fully international She Space International Program.

The 2021 iteration of She Space International includes research teams from 8 countries (Brazil, Germany, Israel, Peru, S. Korea, Spain, Togo, and the United States). In each country, teams of high school-age students use relevant space-based technology to actively research a question related to climate change in their home country. The students select the research question, design the research methods, and present and share results with one another. A member of this year's She Space and She Space International staff, Dr. Lonia Friedlander, commented, "This is how you build an international research team that can compare local results with one another. By combining their individual projects and sharing results, the larger team will be able to tie local effects to the global climate change processes, which will soon affect us all."

After receiving word of the team's selection for the 2021 Award, the EPIF team leader for the She Space programs, Dr. Shimrit Maman, expressed her gratitude for the Award and her hope that the attention it engenders will encourage others to take responsibility for increasing diversity in the space sciences. "It is all of our collective responsibility, irrespective of age, gender, or geographic location, to work together and make use of every available space-based technology to tackle global climate change to the best of our abilities." Describing the project's hoped-for and long-term outcomes, Dr. Maman continued, "This flagship project allows young women to participate in cutting-edge research, to utilize advanced space-based technologies with real-world research applications, and to build research collaborations and social connections that transcend international boundaries and borders." And fully recognizing that this a team effort and a team award, she added further, "I am proud of every member of the She Space and She Space International staff that participated or currently participates in the project and I am proud of all of our student participants; both in Israel and globally. I am also deeply grateful for our selection. My hope is that that the attention paid to this Award will help others to also begin working to address some of the same issues of diversity and climate change readiness that She Space and She Space International were designed to tackle."

The 2021 Award will be presented to Dr. Shimrit Maman – on behalf of the whole team – at this year's IAF Excellence in 3G Diversity Luncheon at the 2021 International Astronautical Congress (IAC) in Dubai.

## 5. IAF Excellence in Industry Award

### IAF EXCELLENCE IN INDUSTRY AWARD 2021

The IAF Excellence in Industry Award is intended to distinguish an industry organization, member or non-member of the IAF, worldwide for introducing innovative space technologies to the global marketplace and is recognized throughout space industry for successfully executing a landmark space mission.

#### Lockheed Martin Space

"For the continued outstanding contributions of Lockheed Martin to the growth of the world's space exploration industry, exemplified by success in milestone achievements in space telescopes, robotic missions, human missions, and international partnerships. The Lockheed Martin team has successfully tested and delivered the Orion spacecraft for the first crew-capable test flight to the moon in 2021 and has executed development and operations activities for missions to Jupiter, Mars, and several asteroid destinations. Lockheed Martin has continued its commitment to working with internal partners across its portfolio, including the European Space Agency and Airbus Defense & Space on the Orion program, and multiple other companies who provide instruments through NASA for the deep space robotics missions such as the lunar thermal mapper from the University of Oxford in the United Kingdom. The wide range of targets and mission capabilities deployed to learn about the worlds around us is exceptional and sets Lockheed Martin apart in the exploration community."



"Going to space is just the beginning. It's what you do when you get there that matters. We build satellites and spacecraft that do amazing things in space for government and commercial customers. Lockheed Martin-built satellites give earlier warning of severe



weather, connect troops on the battlefield, and deliver GPS directions to a billion people worldwide. As we look to the future, we're driving innovations to help our customers do even more in orbit. That's why we're designing smarter satellites that operate like smartphones in the sky, with apps that can be updated in orbit so they can adapt as mission needs on the ground change. Your mission is ours. And as that mission evolves, we'll be ready."

[IAF Excellence in Industry Award \(iafastro.org\)](http://iafastro.org)

## 6. Frank J. Malina Astronautics Medal

Since 1986, the Frank J. Malina Astronautics Medal is presented annually to an educator who has demonstrated excellence in taking the fullest advantage of the resources available to them to promote the study of astronautics and related space sciences.



**Frank J. Malina**  
(1912 – 1981)

The recipient of this year's award is Prof. Filippo Graziani.



**Prof. Filippo GRAZIANI**  
*Senior Professor of Astrodynamics,*  
University of Roma "La Sapienza", Scuola di  
Ingegneria Aerospaziale,  
*President,*  
Italian company Group of Astrodynamics for  
the Use of Space Systems (G.A.U.S.S. srl)  
Italy

Filippo Graziani has been professor of Astrodynamics at Aerospace Engineering School of Sapienza University of Roma for 35 years till 2012 when he retired and has been dean of the School from 2004 to 2010. He is Member of the International Academy of Astronautics (IAA) and Member of IAA Trustees Board. His didactical and research activity has been mainly directed towards the "hands-on" space educational programs.

He participated to the main Italian space programs starting with the San Marco satellites in 1970 and he was the team leader of the Italian University Satellites Program (UNISAT) with the aim of designing, manufacturing, launching microsatellites with his students. Ten microsatellites have been launched since 2000.

In 2012 he founded the company GAUSS (Group of Astrodynamics for the Use of Space Systems) as a spin-off of the Aerospace Engineering School, active in the space technology field and he is President and CEO. He is author of more than 200 technical papers on Astrodynamics and Space Systems. He is Co-Editor of Acta Astronautica since 2009. He received the "Utkin Golden Medal" for international relationship between Russia and Italy for University Satellites Launches and the "M.K.Yangel -100 years Golden Medal" for the contribution to the development of space science in the world. Since 1975, every year, he participates to the IAF Conferences.

[Frank J. Malina Astronautics Medal \(iafastro.org\)](http://iafastro.org)



## IAF GRANT AND RECOGNITION PROGRAMMES FOR STUDENTS AND YPS

### 1. IAF Young Space Leaders (YSL) Recognition Programme

These awards are issued to students and young professionals who are in the course of their academic or professional activities, and have helped promote astronautics by enhancing outreach opportunities, expanding knowledge of space among the general public or fostering deeper engagement within the international space community. The six winners will be awarded their prizes during the Closing Ceremony of the 72<sup>nd</sup> IAC on 29 October. They will also be invited to the gala dinner as guests of honor of the IAF President, Pascale Ehrenfreund.



**Elizabeth BARRIOS**



**Danil IVANOV**



**Marco GÓMEZ-JENKINS**



**Pierre-Alexis JOURMEL**



**Kathryn ROBISON HASANI**



**Ayami KOJIMA**

### 2. IAF Emerging Space Leaders (ESL) Grant Programme

These 25 students and young professionals were chosen by the IAF Emerging Space Leaders Sub-Committee composed of nine highly experienced space stakeholders. They will travel to Dubai in October 2021 to participate in the IAC and have the opportunity to extend their network, gain knowledge and meet space experts!



**Ahmed BARAKA**



**Fahd MOUMNI**



**Shankar BHATTARAI**



**Mariam NASEEM**



**Fiorella Arias BONILLA**



**Gladys NGETICH**



**Edward BURGER**



**Nishanth PUSHPARAJ**



**Isidora (Isi) CASAS DEL VALLE PACHECO**



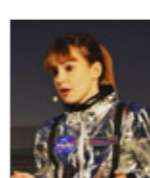
**Tania ROBLES**



**Matias CAMPOS**



**Carlos RODRIGUEZ**



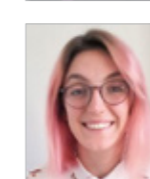
**Chloé CARRIÈRE**



**Marco ROJAS**



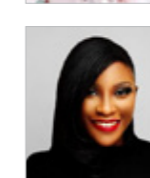
**Kawsihen ELANKUMARAN**



**Giuliana ROTOLA**



**Sepideh FAGHIHI**



**Ruvimbo SAMANGA**



**Angel Arcia GIL**



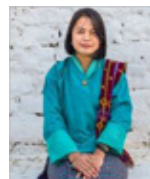
**Hari Ram SHRESTHA**



**Katherine HERRERA-JORDAN**



**Jiten THAPA**



**Pooja LEPCHA**



**Atipat WATTANUNTACHAI**



**Alan MATTOS**

### 3. Future Space Leaders (FSL) Grant Programme

The Future Space Leaders Foundation (FSLF) is pleased to announce the 2021 Future Space Leaders Grant Program. Intended for U.S. graduate students and young professionals who are pursuing space- and satellite-related careers, the program will provide grants for participation in the 71<sup>st</sup> International Astronautical Congress (IAC) to be held in Dubai, United Arab Emirates, USA, October 25 – October 29, 2021. In addition to attending the IAC, Grant Recipients will also be involved in supplementary career development activities in Dubai. These IAC-associated events include the Cross-Cultural Presentation Workshop, the United Nations/International Astronautical Federation (IAF) Workshop, the Space Generation Congress hosted by the Space Generation Advisory Council (SGAC) and the Young Professionals Workshop. These additional activities will necessitate Grantees' presence in Dubai, United Arab Emirates, beginning on October 20, 2021.



**Shayna HUME**



**Simon SHUHAM**



**Josh INGERSOLL**



**Andrew SWACKHAMER**



**Molly MACEACHEN**



**Anna VOELKER**



**Ufuoma OVIENMHADA**

## GLEC 2022

ORGANIZED BY:  HOSTED BY:  

**16-20 MAY 2022**  
**QUITO, ECUADOR**

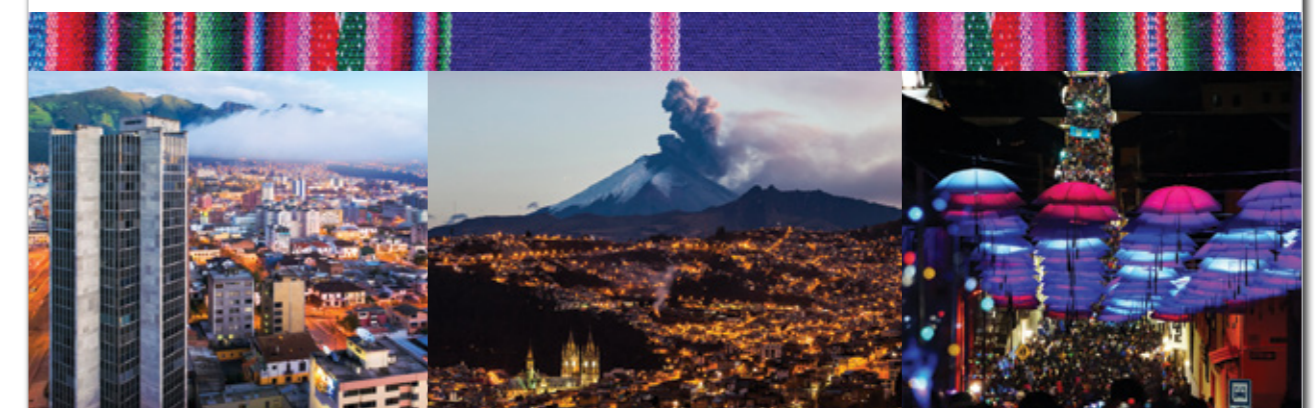
 **GLEC2022**  
GLOBAL CONFERENCE  
ON SPACE FOR  
EMERGING COUNTRIES

[www.glec2022.org](http://www.glec2022.org)



#### GLEC 2022 will focus on:

- Creating awareness on the essential legislative and policy elements that must be considered in establishing a firm foundation for national or regional space ecosystems.
- Promoting the creation and development of a local/regional space ecosystem that is innovative, responsive, robust, and commercially viable.
- Highlighting the socio-economic benefits of space applications so that high-level citizen support can be secured for advancing national or regional space ecosystems.





## IAC 2022

The IAF General Assembly selected Paris, France as Host City for IAC 2021 on Friday 5 October. The Hosting Organization is the Centre National d'Études Spatiales (CNES), a member of IAF since 1981. Paris hosted the first IAC ever in 1950, then in 1963 and lastly in 1982 and now will be holding the record of the city with most IACs hosted. Following the growing escalation of the Covid-19 outbreak around the world, the IAF has been forced to re-assess the overall schedule of IACs. On Wednesday 3 June 2020, an extraordinary session of the Bureau of the International Astronautical Federation (IAF) was chaired by Pascale Ehrenfreund, IAF President. The Bureau reviewed the calendar of the forthcoming editions of the International Astronautical Congress (IAC) in light of the consequences of the COVID-19 pandemic and the resulting lockdown. Paris, France will now host the IAC on 18 – 22 September 2022.

The IAC 2022 theme will be **Space for @ll** to reach beyond the space community and bringing together all communities to offer great opportunities for networking and forging new contacts and potential partnerships. Exceptionally, the IAC 2022 will be from Sunday till Thursday.

ORGANIZED BY: HOSTED BY:

**IAC PARIS 2022**

**73<sup>RD</sup> INTERNATIONAL ASTRONAUTICAL CONGRESS**  
**18 - 22 SEPTEMBER 2022, PARIS, FRANCE**

*Space for @ll* Call for Papers & Registration of Interest

[www.iac2022.org](http://www.iac2022.org)

SUPPORTED BY:



## NEWS!



### Astronautical Society of India Azadi Ka Amrit Mahotsav Inaugural Function 03<sup>rd</sup> September 2021

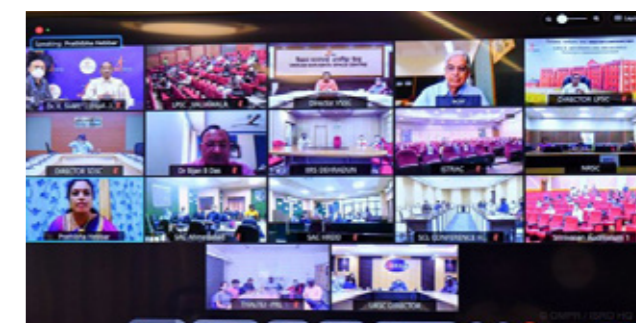
India (Bharatvarsha), our great nation is celebrating the 75<sup>th</sup> anniversary of Indian Independence. Prime Minister of India has inaugurated the Nationwide celebrations, to celebrate this great occasion as "Azadi Ka Amrit Mahotsav" on 12<sup>th</sup> March 2021. To commemorate this monumental occasion, Astronautical Society of India (ASI) is participating in this Mahotsav, by organizing a set of web series activities, to disseminate technical, constitutional and ancient Indic knowledge to the astronautics fraternity of the nation, for a resurgent, Aatma Nirbhar Bharat.

Chairman, ISRO/President, ASI/Secretary- Department of Space, has kindly inaugurated the Amrit Mahotsav on 03 September 2021. Inaugural function is followed by a thought-provoking talk on "Development of Astronautics in India" by Dr. B. N. Suresh, Chancellor, Indian Institute of Space Science and Technology/ Hon. Distinguished Professor, ISRO. The brief abstract of the talk is:

"India in the last few decades has been witnessing stupendous growth in aeronautics and astronautics, in several advanced technology sectors like space, aeronautics and in defence. Started with a humble beginning in the early 60's the Indian space programme has attained total self-sufficiency in rockets, spacecraft and applications to meet the national needs. The Indian launch vehicles like PSLV, GSLV and GSLV Mk3 have been made operational and presently PSLV is indeed a work-horse with multi-mission capabilities. Similarly, the spacecraft technologies have made a leap- frogging and today, India has one of the largest space assets in the south east Asia, providing a wide variety of services in remote sensing, communications, navigation, scientific, etc., to the Country. In the arena of interplanetary missions too India has achieved the successes in its first attempts. In the aeronautics arena, the light combat aircraft developed and inducted into the Indian air force is one of the world class aircraft and further developments in navy version and medium version are underway. In missile technologies a range of missiles with wide varying capabilities for the defence of the Country have been successfully developed and deployed. Brahmos, a supersonic missile developed in collaboration with Russia is an advanced missile with very accurate striking capabilities and it is even being exported. The

education sector also has expanded in the Country to prepare the bright young scientists and engineers in the aerospace areas and well equipped to undertake the development of complex technologies and systems in the aerospace sector. The progress made in all these aerospace sectors and their contributions for National development was discussed in the talk"

For the complete video of the talk please visit our website: <https://www.asindia.org>



### Astronautical Society of India Azadi Ka Amrit Mahotsav Inaugural Function 03<sup>rd</sup> September 2021

The BDLI (German Aerospace Industries Association, [www.bdl.de](http://www.bdl.de)) is looking forward to the 72<sup>nd</sup> IAC 2021 in Dubai! With more than 250 member companies, we are proud that the German space industry is one of the world's leaders and that in 2020, the

German space industry, with its 9,600 employees, generated a turnover of 2.3 billion Euros. We appreciate that the variety of German space companies – from start-ups and SMEs to system integrators – will be represented at the German Pavilion at the IAC.

Visit us at the German Pavilion in Hall 8 where we are happy to introduce you to the high-tech developments and products from Germany. Visit [www.iac.german-pavilion.com/en/home/](http://www.iac.german-pavilion.com/en/home/) to find more information on our companies and selected products as well as the [BDLI Trade Show Guide](#). We are looking forward to meeting you at the IAC in Dubai!



HEAD Aerospace (HEAD) is a Global Space Company for the Future, supplying Space Products and Components as well as unsurpassed Earth Observation and Monitoring capabilities and Solutions through Satellite Imagery and HEAD's own growing IOT constellation.

Founded in 2007 as a private space company, with Headquarters in Beijing, China, HEAD provides upstream space products and services from international aerospace companies into China while developing diversified activities such as our Internet-of-Things (IoT) constellation, Skywalker. The HEAD France office manages a network of 100+ global partners in both Satellite Imagery commercialisation and Integrated IoT solution. Attached to the HEAD France office, our International Team of experienced, industry professionals are locally based across the globe in 10+ countries to support customers as well as our extensive network of local resellers.

In 2018, HEAD entered into a Strategic partnership with the Chinese satellite operator for the commercialization of Earth Observation data, enabling HEAD to supply Satellite Imagery collected from more than 45 industry leading Satellites at a global scale. These satellites provide enormous capacity and monitoring capabilities due to frequent revisit times from the ever-growing number of very high resolutions Satellite Imagery sensors as well as SAR, Stereo and Medium resolution sensors, uniquely positioning HEAD as a key player in the geospatial market providing reliable Earth Observation data and turnkey integrated geospatial solutions.

HEAD has long been an IAC member since 2012, one of the earliest partners from the China space industry, actively participated in nearly all the past IAF events, including IAC, GLEX, GLEC.

We look forward to meeting you at the IAC conference where

our Team will be presenting a number of papers on our Earth observation technologies. We invite you to visit us at booth H7-23 in Dubai!



Dubai International Airport. Jilin KF01, 50cm Satellite Imagery – 18 January 2020



## Space Camp, Space Forum, and the IAC 2024 bid

The Hungarian Astronautical Society (MANT) has been organizing its annual Summer Space Camps for students since 1994. In 2020, because of the COVID-19 pandemic, we had to move the Camp to the virtual space for the first time in its history. Because of its success and the continuing uncertainties in Summer 2021, we decided to repeat the "virtual edition" of the Space Camp. The 3-days long event started on 6 July and offered presentations covering a wide range of space-related activities – about becoming an astronaut, Mars exploration, a virtual balloon flight, and a lot more.

Every second year, we organize the Hungarian Space Forum. This is the largest national space conference, with a long tradition dating back to the early 1970's. Our host was the Centre for Energy Research in Budapest. There were nearly 40 scientific talks and several poster presentations, as well as two round-table discussions – one about the Hungarian national research astronaut program to be launched soon, and another about space industry trends – during the 3-days conference starting on 29 September. The hybrid event was well attended by about an equal number of participants on-site and on-line.



IAC 2024 Budapest  
Candidate City

As the readers of this Newsletter may well be aware of it, Budapest is among the candidate cities for hosting the 75<sup>th</sup> International Astronautical Congress (IAC) in 2024. This Summer we were busy with preparing for the re-submission of our bid to IAF, taking into account the comments and suggestions made by its delegation led by Executive Director Christian Feichtinger who visited Hungary in August. They obtained first-hand information about the preparations, the prospective venues, the Hungarian space sector, and found that the proposed Budapest sites meet the complex requirements for hosting the IAC. Last time it was 1983 when Budapest organized an IAF Congress. So it is the right time to return in 2024!

## Eugen-Sänger-Medal Awarded to Klaus Schilling

The German Aerospace Society DGLR awarded the prestigious Eugen-Sänger-Medal to Professor Klaus Schilling (Würzburg) for his outstanding achievements in the development of small satellites.

Advances in miniaturization technology continuously decrease satellite mass and volume. The shorter construction periods of nano-satellites accelerate technology innovations and enable new applications. Building on his experience in space industry at Airbus (in projects like Cassini/Huygens and Rosetta), Schilling developed since 2003 together with international students the University Würzburg's Experimental (UWE) CubeSat program, and realized step-by-step the technology basis for 4 self-organizing CubeSats of the formation NetSat (<https://www.telematik-zentrum.de/en/projects/netsat/>), launched 2020.

"From the very beginning, Professor Schilling had recognised and promoted the importance of interdisciplinary technological cross-fertilization between computer science, automation, software development and robotics. His satellites impressively reflect this interaction of different components," said DGLR President Professor Rolf Henke.

Schilling acknowledges: "This recognition is a great encouragement for my team. The medal recognizes contributions, that were only possible by the interdisciplinary teams, I had the privilege to coordinate. It is crucial that the disadvantages of miniaturization, such as increased sensitivity to harsh space radiation, are to be compensated by intelligent software. Thus the microprocessors on board our satellites host algorithms for rapid fault detection, identification and recovery to ensure reliable operation."

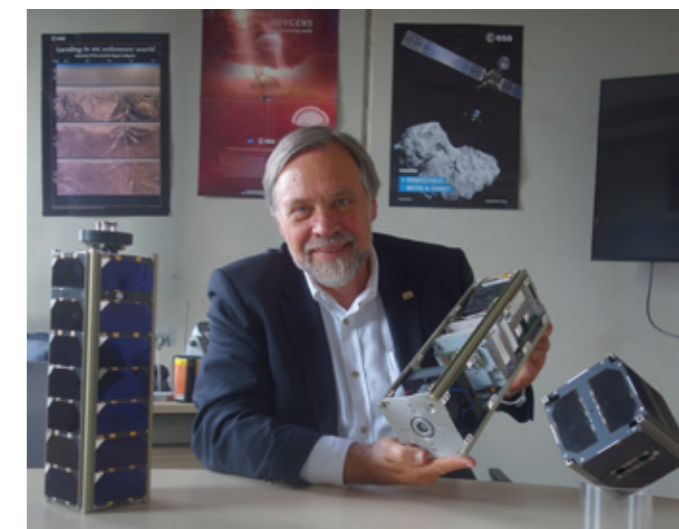
He was founder of the independent research institute "Zentrum für Telematik" ([www.telematik-zentrum.de/en](http://www.telematik-zentrum.de/en)), as well as the start-up company "S4- Smart Small Satellite Systems GmbH" ([www.s4-space.com](http://www.s4-space.com)). Both transfer the technology knowhow to advanced small satellite products for "New Space", in particular small and efficient attitude control systems.

### Weblinks

Press release: <https://go.uni-wue.de/kschiprize>

Video on professional achievements and acknowledgements: <https://video.uni-wuerzburg.de/iframe/index.php?securecode=650130822bdc58f0296adc45>

Previous winners of the Eugen-Sänger-Medal <https://www.dglr.de/?id=2644>



Klaus Schilling with the satellites, that have accompanied his professional life. UWE and NetSat in the foreground; on the posters in the background HUYGENS and ROSETTA, which were realized during his work in industry. (Photo: Zentrum für Telematik)



## KSAT – Connecting Space to Earth

Kongsberg Satellite Services (KSAT) is the leading provider of Ground Network Services and Earth Observation Services. KSAT owns and operates a ground station network of both polar and mid-latitude stations. The three polar ground stations are uniquely located in Tromsø at 69°N, Svalbard Satellite Station (SvalSat) at 78°N, Inuvik Station at 68°N and the Antarctic station (TrollSat) at 72°S. The company handles 75 000+ passes per month.

At the 72<sup>nd</sup> International Astronautical Congress 2021 KSAT will present its services. You are welcome to come and see us at our booth in Hall 6, the number is 33 A+F.

We will present one paper at the congress. Our Director Optical Solutions Hennes Henniger will talk about design, installation and commissioning testing of our first optical ground station, also the first commercially available one in the world - situated in Nemea, Greece.

At KSAT we are constantly expanding our ground network, also planning to support lunar and cislunar missions. Through a single point of integration, mission customers will be provided with unparalleled communications coverage extending all mission phases. KSAT has expanded its existing ground network of over 250 antennas across 25 geographically distributed sites to include large-diameter (15+ meter) antennas.

For pollution-, ice movements- and vessel detection, KSAT uses an extensive combination of commercial satellites in a virtual constellation. In combination with our perfectly positioned global ground station network, KSAT offers a unique end-to-end solution on coverage, resolution, price and monitoring frequency, delivered in just minutes after acquisition.

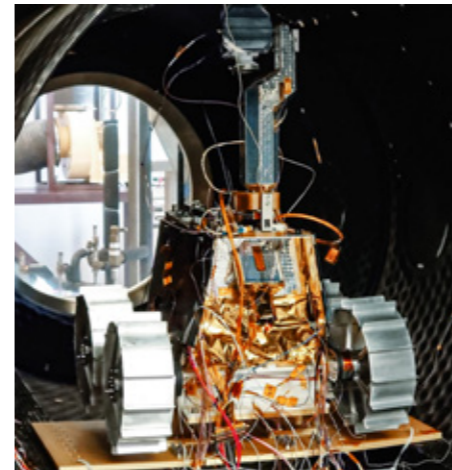


## Emirates Lunar Mission

The Emirates Lunar Mission (ELM) is the first Emirati and Arab mission to explore the Moon. The mission is an ambitious national project of the UAE and part of the Mars 2117 Strategy aiming to establish the first inhabitable human settlement in Mars by 2117. ELM includes the development and launch of the first Emirati lunar rover named "Rashid", after the late Sheikh Rashid bin Saeed Al Maktoum, builder of modern Dubai. The mission supports the UAE's efforts to enhance the region's space industry and contribute to its future built by innovative Emirati minds.

The Emirates Lunar Mission aims to conduct tests to study various aspects of the lunar surface, including the lunar soil and its formation and components, thermal properties of the surface including thermal amplitude and conduction characteristics. It will carry out a series of measurements and tests that will expand human understanding of the Moon-plasma, photoelectrons and dust particles located over the illuminated part of the lunar surface. A range of materials will also be tested and their interaction with the Moon will be studied.

The Rashid rover will be equipped with state-of-the-art technologies including a 3D camera, advanced motion system, sensors, communication system and be powered using solar panels. During its mission period, the Rashid rover will capture multiple images and relay it back to the control room in Dubai. The Emirates Lunar Mission will also test new technologies in material science, robotics, mobility, navigation, and communications, specially designed to survive and function in the harsh lunar environment.







## Planet Introduces New High Resolution Pelican Satellites

Planet, a leading provider of daily data and insights about Earth, recently announced their next-generation fleet of satellites for very high resolution imagery, called Pelican. The constellation will begin launching next year and be operational in 2023. When fully operational, the Pelican constellation will replenish and upgrade Planet's existing high resolution SkySat fleet, which consists of 21 satellites imaging at 50cm resolution. Pelican will provide Planet's customers in government, sustainability, finance, insurance, and more with better resolution, more frequent image revisit times, and reduced reaction time and latency.

Planet operates history's largest fleet of Earth observation satellites with 200 currently in orbit. The company takes an agile aerospace approach towards designing and building spacecraft, enabling them to quickly innovate and enhance their products; and all of the Pelican fleet will be designed and built in-house at Planet. This approach ensures that the company meets customer needs through rapid product iteration, providing timely, detailed, and unique datasets to customers every year.

The Pelican constellation will offer enhanced image resolution, enabling customers to see fine details like road markings. When fully operational, the Pelican fleet will exceed SkySat's market-leading global intraday revisit frequency of up to 10 times. And when paired with Planet's full suite of daily, global monitoring data and analytics solutions, Pelican will enable powerful new insights that drive unparalleled awareness and decision making for users working in government, sustainability, finance, insurance, and more.

"Pelican significantly advances Planet's product suite with the highest temporal resolution and revisit times that we have ever offered, while dramatically reducing the time between tasking and receipt of an image. In a world that is increasingly fast-changing and unpredictable, this kind of detailed information on demand will be a game changer for our customers who every day need to make quick, consequential decisions," said Planet's Senior Vice President of Space Systems James Mason.



## International Summer Space School

The 16<sup>th</sup> International Summer Space School "Future Space Technologies and Experiments in Space" was held at the Samara National Research University (Russia) from August 30 to September 10.

The School was attended by 37 people from Mexico, Egypt, India and Ethiopia. For two weeks in Samara the School participants listened to lectures by leading scientists from Samara University, as well as foreign professors from France, Spain and Egypt, took part in practical classes that was held on the basis of the nanosatellite flight control center, nanosatellite testing center and the center of nanosatellite technologies of the Inter-University Space Research Department.

In the second week, the work was focused on the team project work. The participants of the School were divided into teams and took part in the preliminary design analysis of four scientific missions of nanosatellites designed to study space debris, photographing the Sun, study the Earth's ionosphere, and study the radio navigation field between the Earth and the Moon. On the final day, the teams defended their projects in front of a commission of experts.

The International Summer Space School of Samara University is held with the aim of developing international cooperation and creating an educational space in the field of promising space technologies. It has been held since 2003 and allows talented young people from different parts of the world to obtain new competencies in the field of space technologies and take part in project work as part of international teams. The Summer Space School is supported by IAF Space University Administrative Committee.



## Satellogic Uses AWS Ground Station to Scale Services and Deliver Insights to Customers Faster

Satellogic recently announced an expanded collaboration with Amazon Web Services, Inc. (AWS), including use of AWS Ground Station to scale its live Earth catalog, enhance customer experiences, decrease data processing times, and optimize costs. Satellogic has 17 commercial Earth Observation (EO) satellites in low Earth orbit and plans to grow its constellation to more than 300 satellites by 2025. The company is leveraging AWS Ground Station to quickly and cost-efficiently scale their satellite data acquisition processes and then deliver data directly to AWS for processing and analysis so that customers can make decisions faster.

Founded in 2010, Satellogic is making EO data more accessible and more affordable. Its vertically integrated business model, owning the design, manufacturing, and operation of its satellites, is what makes that mission possible. Satellogic's lightweight, small EO satellites can be produced at scale with unrivaled unit economics. The company delivers daily updates to create a complete picture of our planet for decision makers so that they can tackle some of the biggest challenges of our time.

AWS Ground Station allows customers to cost-effectively control satellite operations, ingest satellite data, and integrate the data with applications and other cloud services running in AWS. The AWS Ground Station global network of satellite ground station systems help customers manage their satellite communications without having to build or manage their own ground-station infrastructure. For example, AWS Ground Station makes it easy for Satellogic to scale their operations at the same time that it delivers the obtained data directly into their cloud environment.

For more information visit [www.satellogic.com](http://www.satellogic.com)



## TWO CLIMATOLOGICAL INSTRUMENTS TO MAKE CITIES AND THE INDUSTRY MORE RESILIENT TO CLIMATE CHANGES.

### The heat/cold wave tracker, and the thermal ocean tracker

Each of our innovations are in relation with scientific research we made. Typically, Gov. Organizations and Scientists are using satellites, drifting buoys, radars to monitor the climate. However, those instruments are not sufficiently accurate and often fraught with errors. That is in a context of extreme climate changes uncertainties SIMEON Technologies (France) and Deywoss One LLC (USA) joined together for developing two instruments: the Heat/Cold Wave Tracker "HCWT" (photo 1) and the Thermal Sea/Ocean Tracker "TOT" (photo 2) to refine satellite measurements. The HCWT is a climatological instrument which is measuring greenhouse's gas (CO<sub>2</sub>, CH<sub>4</sub>, and others) levels in the ground and the atmosphere as well as, solar irradiation levels. The TOT has a similar function, but for the seas and oceans.

### THE HEAT/COLD WAVE TRACKER

Place at 110cm depth in any kind of soil, in the city, a land, forest, in a land or in wetland, every 10 cm, 23 sensors will measure the temperature, moisture, CO<sub>2</sub>, CH<sub>4</sub> level underground, while 7 sensors will record the same kind of information's under surface. A pyranometer is measuring the Solar irradiance and a rain gauge the rainfall. Each 12 hours the HCWT (photo.1) will run and collect data. Each sensor is consulted, from depth to the surface.

HEAT & COLED WAVE TRACKER



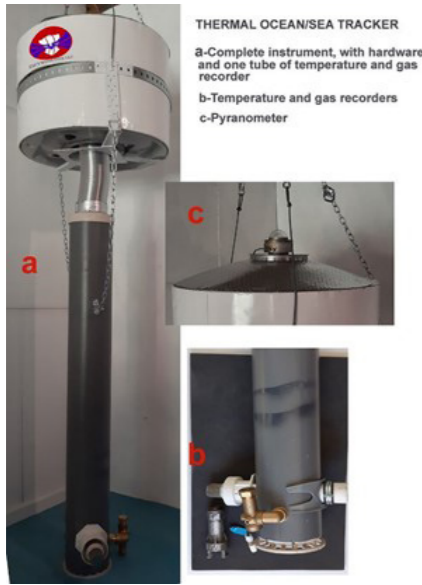


The data are automatically record and send by satellite to the control center to be treat. The instrument measures the thermal situation of the soil, the level of Gas emitted until surface and the level of gas store by the ground. Heat waves are responsible for Billion\$ damage each year around the world, in ecosystems loss and sanitary problems.

### THERMAL OCEAN TRACKER

We recently made research (Siméon, 2013) in a climatological ocean anomaly called "Thermal HotSpot". These researches made with the laboratory of Paleoenvironment and Paleobiosphere of Lyon 1 (France). These studies consisted in the study of the stable isotope of oxygen and carbon store in a sample of coral to measure the temperature of the sea during several years. Because of a disagreement between satellites recorded (+1.5°C) and isotopic fractionations (+5°C) sea surface temperature anomaly "SST"; which are more precise, we developed the Thermal Sea/Ocean Tracker.

Our instrument is deploying 10 segments of 100cm (1 meter) until 11 meters depth and each segment records the temperature, the carbon level and the salinity concentration of the water, every 1m.



For both instruments, data will be treated with an algorithm which compensates the gap with the satellite's measurements, and a bulletin issued. Then, a bulletin or an alert will be proposed to decision makers, industrials on the probability of an imminent risk for their activities, the populations and the ecosystems.

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Our researches on Researchgate: <https://www.researchgate.net/profile/Jean-Luc-Simeon>  
**Anne-Marie Hitipeuw-Gribnau**, chief resilience officer of the Dutch city of The Hague, told the United Nations, (Tabary, 2020) heat wave is "Heat is a silent killer".

**Kristofer Covey** (University of Yale) explained that the 300 billion trees actually plants are already an important source of methane (CH4):

**Jean-Pierre Wigneron**; satellite-based vegetation analysis. Siberia is losing a lot of CO2 due to wild fire.

**Liu and Al.** (Liu, et al., 2020) is showing a relation between abnormal warm winter and the influenza epidemic season.

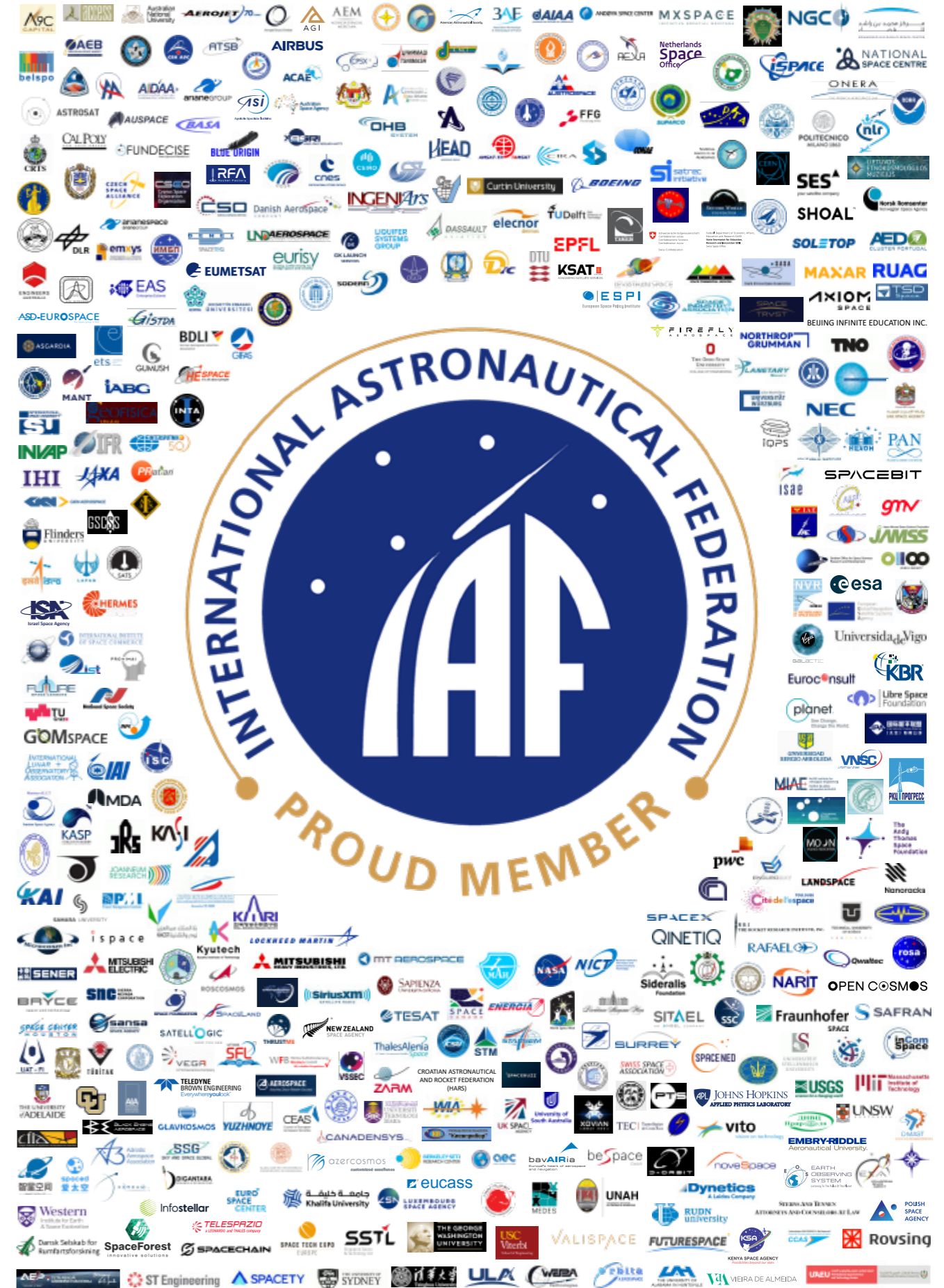


Yuzhnoye State Design Office (<https://yuzhnoye.com/en/>) concluded a launch services contract with Dutch ISILAUNCH to orbit the Ukrainian spacecraft Sich-2-1.

Ukrainian Earth remote sensing satellite Sich-2-1 is scheduled for launch onboard Falcon-9 rocket in the SpaceX Trasporter-3 Mission.

Contract stipulates provision of full range of Sich-2-1/Falcon-9 integration activities, including provision of the required hardware, mission management and launch.

Sich-2-1 spacecraft of Yuzhnoye SDO design is at the final testing phase according to the approved Master space system development schedule. Satellite ground segment is being developed jointly with the National Space Facilities Control and Test Center.





## International Astronautical Federation

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International Astronautical Federation

The next IAF newsletter will be issued in December 2021