



IAF President's Welcome

Dear IAF Friends,

Welcome to the October 2023 IAF Newsletter! I invite you to immerse yourself in the latest updates and insights from the International Astronautical Federation (IAF). Let's pause for a moment to revisit some of the key milestones and events that have guided our voyage through space exploration over the past month.



In May 2023, the Global Space Conference on Climate Change (GLOC) unfolded in Oslo, Norway. This event gathered space experts and enthusiasts from across the globe to explore the critical issues surrounding climate change, leveraging space-based services and applications. The "Fire and Ice – Space for Climate Action" sessions ignited discussions on the important role of space in addressing climate change.

As we look forward, we are on the verge of the commencement of the world's premier global space event, the International Astronautical Congress (IAC) 2023 in Baku! Scheduled from October 2nd to 6th, IAC 2023 stands as the year's highlight for the entire space community. With a captivating programme featuring high-level speakers and thought-provoking discussions, IAC 2023 promises to be an exceptional experience. We eagerly anticipate welcoming thousands of participants from over 100 countries, including a significant representation from the future leaders of space. Furthermore, we are honored to have an impressive exhibition featuring 150 companies and organizations present in Baku.

At IAC 2023, our focus will revolve around the theme of "GLOBAL CHALLENGES AND OPPORTUNITIES: GIVE SPACE A CHANCE". We will continue to explore the three critical themes that guide our journey in space exploration: Preservation of Space for Future Generations: Our commitment to preserving space for future generations and practicing responsible space resource utilization remains paramount.

Additionally, it is with great honor and pleasure that we extend a warm welcome to 19 Astronauts at the IAC 2023! Join them on a remarkable Space Odyssey, as they come together for the International Astronauts Chapter.

I invite you to join us at IAC 2023, where we will delve into these themes and together chart a course for the future of space exploration.

Thank you for being an integral part of our mission. Stay tuned for more exciting updates in the next edition of the IAF Newsletter.

Warm regards,

Clay MOWRY
IAF President

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IAF MEMBERS' CORNER

OUR LATEST PUBLICATIONS

- [IAC 2023 Final Programmes](#)
- [IAC 2024 Call For Papers](#)
- [GLOC 2023 Highlights](#)

IMPORTANT DATES:

- IAC 2023: 2 – 6 October 2023
- 2024 Spring Meetings: 26 – 28 March
- GLOSS 2024: 3 – 6 June 2024
- IAC 2024: 14 – 18 October 2024

Connecting @ll Space People



The IAC 2023 APP

Through the IAF App you will be able to connect and collaborate with the entire IAF Community and check on the full IAC 2023 programme. Please download the IAF App now and let us know what you think about it, what could be improved and of course what you love the most.



Late Breaking News

09:00- 10:00 Late Breaking News – Chandrayaan-3: Initial Results In Exploring Lunar South Pole



Location: Heydar Aliyev Center (HAC) Auditorium

India, a pioneer in lunar exploration, achieved a historic milestone by becoming the fourth nation to softly land on the Moon's surface, marking the first human endeavor into the lunar south high latitude region. Chandrayaan-3's Lander has successfully deployed the Rover on the lunar surface, fulfilling its initial objectives of demonstrating safe and soft landing in the Moon's southern high latitudes and showcasing rover mobility on the lunar terrain.

The instruments housed within the Lander and Rover have commenced in-situ observations in this region, furthering scientific exploration. The successful soft landing validated numerous advanced technologies, including sensors, actuators, simulation, navigation, guidance, and control systems, which hold great promise for future lunar missions. Additionally, the landing site at approximately 69 degrees south latitude presents an opportunity for unique scientific investigations, such as studying seismic activity, thermophysical properties, plasma environment, and elemental composition.

ISRO is eager to present the preliminary scientific findings from this groundbreaking mission at IAC 2023, as part of our Late Breaking News session.

Speakers:



M. S. ANURUP
 Director, Space Transportation Programme Office (STPO),
 Indian Space Research Organisation (ISRO),
 India



D. GOWRISANKAR
 Director, Office of International & Interagency Cooperation,
 Indian Space Research Organisation (ISRO),
 India



Anil KUMAR
 Associate Director, ISTRAC and Chief General Manager, Safe & Sustainable Space Operations Management,
 Indian Space Research Organisation (ISRO),
 India



Victor JOSEPH
 Associate Scientific Secretary & Director, Technology Development & Innovation,
 Indian Space Research Organisation (ISRO),
 India

The Astronauts of IAC 2023 - Embark on a Space Odyssey!

We are immensely honored and thrilled to introduce you to the distinguished lineup of 19 Astronauts gracing the 74th International Astronautical Congress (IAC 2023) in Baku!

not only showcase their diverse experiences but also exemplify the spirit of global cooperation and outreach.

Join us on a celestial Space Odyssey, as we come together to celebrate the congress theme, "GIVE SPACE A CHANCE" – the most anticipated space event of the year!

In a world where space travel is becoming increasingly accessible, one question lingers – is Space losing its mystique, its exclusivity? Find out more at the IAF GNF session, "Popularizing Space - meet the Space people," scheduled for Friday, 6 October, from 10:15 to 11:15, at the Heydar Aliyev Centre Auditorium (HAC). Our space travelers will delve into their personal motivations for venturing into the cosmos.

The International Astronautical Federation (IAF), in collaboration with esteemed partners, the Association of Space Explorers (ASE) and the IAC 2023 Host - Azercosmos, presents the IAC 2023 International Astronauts Chapter. This chapter promises an array of captivating opportunities, during which these astronauts will

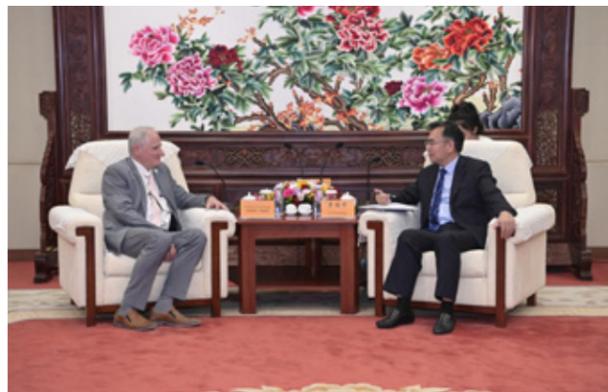
Get ready to embark on an extraordinary IAC that promises to be out of this world!



IAF Delegation China Visit

August 22-30, the IAF delegation led by Dr. Christian Feichtinger visited China. It was invited by Chinese Society of Astronautics (CSA) which is one of IAF's seven Alliance partners. The government department, industries and universities of China's space community met with the delegation to promote the international space cooperation.

Mr. Li Guoping, the Engineer in Chief of China National Space Administration (CNSA), held talks with Dr. Christian Feichtinger. Mr. Li Guoping reviewed the fruitful cooperation between China and IAF over the years, introduced the recent development of China's space program, looked forward to the future prospects of cooperation, and pointed out the key areas of concern for China. Dr. Christian Feichtinger highly praised China's remarkable achievements in space, fully recognized China's contribution to the development of the IAF, and actively supported China continue to play a greater and better role in the IAF.



Mr. Li Guoping held talks with Dr. Christian Feichtinger



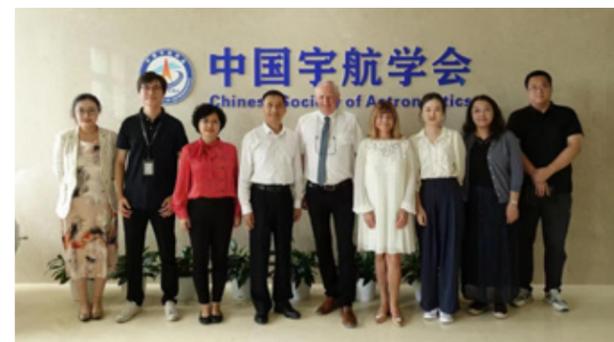
President Li Daming presented a model to Dr. Christian Feichtinger

The IAF delegation visited the China Academy of Space Technology (CAST). Mr. Li Daming, the president of CAST introduced the academy's engagement in China's major national space program and its involvement in the international space cooperation and arranged the delegation's visit to the exhibition hall of CAST and its Tianjin Production Base. Dr. Christian Feichtinger congratulated CAST on its world-class R&D and production capabilities after years of development.



President Li Daming presented a model to Dr. Christian Feichtinger

Mr. Yu Miao, director of International Cooperation Center of China Aerospace (ICCCA) held a meeting with Dr. Christian Feichtinger. Mr. Yu Miao introduced the work of ICCCA as a space soft science organization in academic exchanges, news reporting, book publishing and talents fostering. He expressed that ICCCA is willing to cooperate with IAF in multi-level and multi-fields to promote international space cooperation. Dr. Christian Feichtinger said that ICCCA is dynamic with featured businesses and hopes that IAF can cooperate comprehensively with ICCCA in the future.



Mr. Wang Yiran and his team had a group photo with Dr. Christian Feichtinger and his team

Mr. Wang Yiran, the vice president and secretary general of Chinese Society of Astronautics (CSA), held talks with Dr. Christian Feichtinger. Mr. Wang Yiran reviewed the long term and friendly cooperation between CSA and IAF and proposed opening new areas of cooperation in the future. Dr. Christian Feichtinger thanked the CSA team for their efforts over the years in promoting communication and cooperation between IAF and China and is confident in the future cooperation.



Dr. Christian Feichtinger talked with the participating team

IAF delegation participated in the IAF-CSA Space Universities CubeSat Challenge (SUAC) 2.0 held at Beihang University. Mr. Cheng Bo, deputy president of Beihang University, had a brief meeting with Dr. Christian Feichtinger. The IAF and the CSA jointly initiated SUAC in 2021. SUAC 2.0 is co-hosted by Beihang University and CAST. This year, 32 Chinese universities submitted 78 competition works with over 400 teachers and students involved, and 36 teams from 14 universities entered the China Final. After one day's presentation, the China Final selected the gold, silver, and bronze awards for the production category, and the first, second, and third prizes for the paper and creative category. The gold award winners of the production category are Beihang University and Chinese Academy of Sciences University. Their works and the works of the International Winner selected by the IAF Space Universities Administrative Committee (SUAC) Working Group will have the opportunity to be launched by Chinese rockets for free.

IAF delegation visited Dalian University of Technology (DUT). Mr. Luo Zhongxuan, the vice president of DUT and Mr. Zhao Hongzhi, the deputy director of Dalian Science and Technology Bureau met with Dr. Christian Feichtinger. The China Micro Nano Satellite Education and Research Alliance had technical exchange meeting with Dr. Christian Feichtinger.



Dr. Christian Feichtinger and his delegation visited Dalian University of Technology

Chinese Society of Astronautics (CSA) joined IAF in 1980. Since then, CSA and IAF have had long term and friendly cooperation represented by the joint organization of the 47th IAC in 1996, the 64th IAC in 2013, the GLUC 2010 and the GLEX 2017 in Beijing, China.

IAF Committee Briefs - Summer 2023

The Summer 2023 IAF Committee Briefs can be found here:

IAF Astrodynamics Committee Brief: https://www.iafastro.org/assets/files/publications/committeebrief/2023/Astrodynamics-Committee_Brief_Summer%202023_2023-09-01_FINAL.pdf

IAF Earth Observations Committee Brief: https://www.iafastro.org/assets/files/publications/committeebrief/2023/Earth-Observations_Summer%202023-Brief_2023-09-01_FINAL.pdf

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Chief, Space Services Department
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NAOKO YAMAZAKI
Former JAXA astronaut,
Representative Director,
Space Port Japan Association

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NEWS!



Meteosat Third Generation – already delivering on its promise

The year 2023 has been characterised so far with extreme weather phenomena in many parts of the globe. Communities in Europe have been subjected to extreme heat, drought and fires along with fierce storms and flooding of large areas.

The Meteosat Third Generation (MTG) system will help mitigate the damage and destruction wrought by fast developing and highly dangerous weather events such as severe storms, by enabling forecasters to track their development in near-real time. The first imaging satellite in the MTG series, MTG-I1, launched

in December 2022, is currently undergoing commissioning and tests by EUMETSAT before becoming operational later in the year.

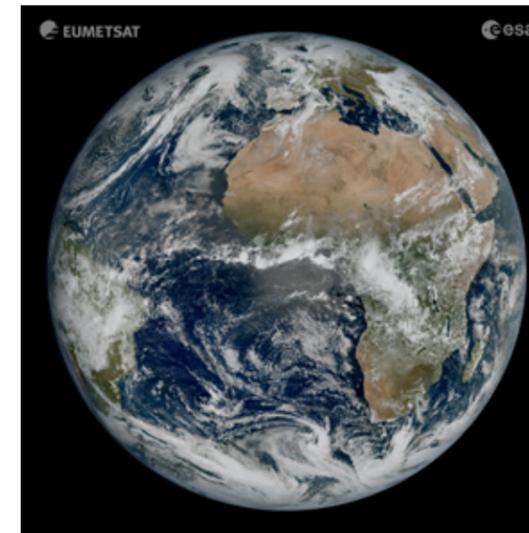
Even in this test phase, the first MTG-I1 image, produced by the Flexible Combined Imager in March, showed conditions over Europe, Africa and the Atlantic in extraordinary detail currently not as clearly visible, or not visible at all, in imagery from the instruments on the Meteosat Second Generation satellites. The image also revealed a greater level of detail of cloud structures at high latitudes, crucial for monitoring rapidly developing severe weather in Nordic countries.

In July, the first ever satellite instrument continuously detecting lightning over Europe and Africa was activated and is delivering on its promise of a breakthrough for the detection and prediction of severe storms.

The Lightning Imager has four cameras covering Europe, Africa, the Middle East and parts of South America, observing cloud-to-ground, cloud-to-cloud and intracloud lightning activity. Such observations are important because severe storms are often preceded by abrupt changes in lightning activity. The Lightning

Imager data will therefore give weather forecasters additional confidence in their forecasts of severe storms.

Once the satellite becomes operational at the end of the year, EUMETSAT will disseminate the data it provides to weather services in its member states and beyond.



First image of the full Earth disc from Meteosat Third Generation – Imager 1. The image was captured at 11:50 UTC on 18 March 2023 by the Flexible Combined Imager on MTG-I1.



Equatorial Launch Australia (ELA) the developer, owner and operator of the Arnhem Space Centre (ASC) on the Gove Peninsula in Australia's Northern Territory, has today signed a multi-year, multi-launch contract with Korean aerospace company, INNOSPACE, for a series of orbital launches from the Australian spaceport.

This agreement covers several INNOSPACE rocket variants carrying payloads ranging from 50kg to 500kg into low earth orbit over a five-year period until December 2028.

ELA, known for its advanced multi-user commercial spaceport, will host INNOSPACE as the first commercial company to become a 'resident launcher' at ASC, with the first launches expected in early 2025. ELA has been working with the Australian Space Agency to expand its launch facilities and support INNOSPACE in obtaining its first Australian Launch Permit (ALP), a process expected to take 6 to 14 months. INNOSPACE will have access

to a Space Launch Complex and Horizontal Integration Facility at ASC. ELA's Executive Chairman, Michael Jones, emphasized the potential of ASC to be a global commercial launch site. INNOSPACE's CEO, Soojong Kim, praised the equatorial spaceport's launch efficiencies and flexibility in orbit access.

INNOSPACE is a Korean launch services provider with hybrid rocket technology, aiming to transport small satellites to space orbit quickly and reliably. ELA operates the Arnhem Space Centre, offering launch and rocket development services for space vehicles and payloads.

For more information, visit INNOSPACE at www.innospc.com and Equatorial Launch Australia at www.ela.space.



Beginning of a new era for HE Space!

HE Space is now part of a bigger consortium

After celebrating its 40-year jubilee last year, HE Space has entered a new era. Last year our founder Scott Millican retired and sold the company to CS GROUP. As a result, HE Space is now part of a much bigger consortium - SpaceForce.



SpaceForce is the exciting new name for all the professionals working in the space sector at Sopra Steria, CS Group and HE Space.

Although the 3 companies are different in size and focus, they all share the same values inspiring our corporate social responsibility: employee care, diversity, sustainability and a commitment to quality.

SpaceForce is addressing civil and military European Space markets for a wide range of space missions (EO, GNSS, SATCOM, Science/Exploration and Safety), and all along their life cycle,

providing systems and services for ground and on-board software systems, engineering, consultancy, operation services and end user applications.

The objective of SpaceForce is to lead the engineering and digital Space market in Europe and to provide highly skilled consulting. To succeed in this evolution, SpaceForce is proposing to key European space agencies, European space manufacturers and operators, to prime the development and integration of new systems or to externalize their development, operation and exploitation as services.

It also addresses the growing New Space market with new business models for space, by providing off-the-shelf services and products from Upstream to Downstream.

Towards a smarter future in space and on Earth!



The 30th Summer Space Camp

The Hungarian Astronautical Society (MANT) has been organizing its annual Summer Space Camps since 1994. As this year's camp, hosted by the town of Dabas (near Budapest), was the 30th of its kind, we prepared with a truly special program to celebrate this occasion. As usual, there were interesting presentations by Hungarian space engineers, scientists and entrepreneurs, covering a wide range of topics, from building satellites to modeling planetary atmospheres in the laboratory. Lecturers and participants of former Space Camps were also invited, and a balloon was launched towards the stratosphere. Beyond doubt, the greatest anticipation surrounded the visit of the four selected astronaut candidates of the HUNOR (*Hungarian to Orbit*) governmental program who are in the middle of their training program. One of those candidates will soon become the next Hungarian research astronaut who will spend a long-duration flight on board the International Space Station in 2024 or 2025. The participants of the week-long (July 2– 8) Space Camp were 13–18 years old students, already space enthusiasts and most likely engineers and researchers in the near future.

The summer for MANT was also busy with preparing for projects like the new issue of the comprehensive directory of domestic space actors (*Hungarian Space Kaleidoscope*), the third national space contest for high-school students (*The Way to Space!*),

and the Hungarian selection round for the ESA 2024 CanSat competition.



LMO Space partners with In-Space Missions on AUREA SDA programme

Luxembourg and UK-based LMO Space has teamed up with In-Space Missions Ltd, a subsidiary of BAE Systems, to explore the use of small satellite platforms for Space Domain Awareness (SDA) within LMO's AUREA (Autonomous Recognition of Foreign Assets) program. In-Space Missions will study the mission scope of a space-based SDA demonstrator small satellite with a ground-based software stack to demonstrate end-user compatibility.

Michel Poucet, CEO of LMO, noted that this partnership with In-Space Missions will expedite the validation process for LMO's Protect and Defend architecture, showcasing core SDA capabilities to NATO and Five Eyes end users.

Doug Liddle, CEO of In-Space Missions, emphasized the importance of monitoring Earth's orbital environment and synthesizing an accurate picture of the increasingly contested space domain. This collaboration enables In-Space Missions to work on a project with LMO, a recognized leader in space domain awareness.

The partnership will define mission requirements, assess satellite platform constraints, identify development gaps, and determine the number of satellites needed for LMO's AUREA SDA service. The AUREA program will focus on multi-sensor and multi-modal technologies, including optical, LiDAR, and radar instruments. It will also involve the delivery of an on-board computer simulator to LMO for comprehensive software testing, paving the way for the launch of an AUREA SDA demonstration mission.

AUREA is a dual-use development program funded by Luxembourg's Directorate of Defence, aiming to enhance SDA capabilities for Luxembourg and its European and NATO Allies.

Colonel Guy Hoffman, Luxembourg National Armaments Director, stressed the importance of Space Domain Awareness and the need for innovative dual-use solutions to benefit both military and societal needs.

About In-Space Missions:

In-Space Missions, a subsidiary of BAE Systems, designs, builds, and operates space missions for global customers, offering small satellite manufacturing, integration, testing, on-orbit operations, and secure data delivery services. They also provide "Space as a Service" through InSpace Digital and rideshare opportunities for payloads.

About LMO:

LMO is a dual-use space company specializing in hardware and software solutions for Space Domain Awareness, In-Orbit Servicing, and Propulsion. Their subsystems aim to protect, defend, and repair critical space infrastructure, facilitating sustainable space use.



New green hypergolic propellant – potential gamechanger for in-space propulsion

While green storable high-performance hypergolic propellants have been the Holy Grail of space propulsion for decades, engineers and scientists from Łukasiewicz – Institute of Aviation (Łukasiewicz – ILOT) have successfully completed the key development step required to solve the challenge.

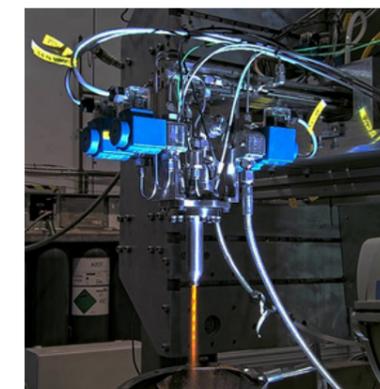
The developed propellant combination uses 98% hydrogen peroxide as oxidizer with a novel fuel. Its hypergolic properties make it perfect for steady-state and impulse operations. Being an alternative to heritage solutions and having a vacuum-specific impulse of 310 seconds, it is gaining wide commercial interest. Its use in bipropellant thrusters proved no issues, unlike in many previous international developments of this kind. The next efforts will be focused on introducing this innovative technology to new systems under development by key space system integrators.

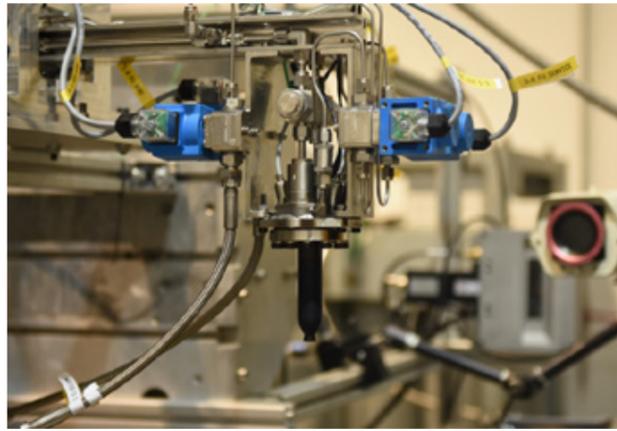


The propellant developed at Łukasiewicz – ILOT is a safer alternative for personnel and the environment to the toxic materials currently in use – hydrazine derivatives and nitrogen oxides. The developed combination uses hydrogen peroxide (with a concentration of 98%) as oxidizer with a novel fuel.

It is characterized by high performance – a specific impulse in a vacuum of 310 seconds, as well as hypergolicity, i.e. the ability to spontaneously ignite when the components get into contact in the combustion chamber. It is an ideal candidate for use in rocket engines for future satellite platforms, landers and upper stages of launch vehicles, which are also under development at Łukasiewicz – ILOT.

Future work will focus on implementing this innovative technology into new systems and subsystems being developed by key satellite integrators operating in the European and global markets.





IPSA (Institut Polytechnique des Sciences Avancées) is a Graduate School of Engineering specialized in Air, Space and Sustainable Mobility, offering a 5-year syllabus 100% dedicated to Aeronautics and Space. The interest in 'everything Aerospace' is a particular source of motivation for the School and the passion is shared by both students and lecturers.

Since its creation in 1961, IPSA has been driven by the constant concern to match the training provided to students with the needs of companies. Thus, IPSA's Master in Aeronautical Engineering is composed of majors and specializations which constitute the basics of acquiring and deepening essential and solid knowledge in this field. This program is continuously evolving and is updated under the guidance and work of the School's Development Department.

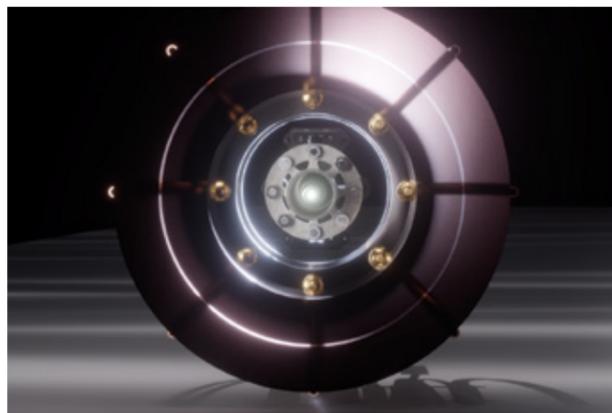
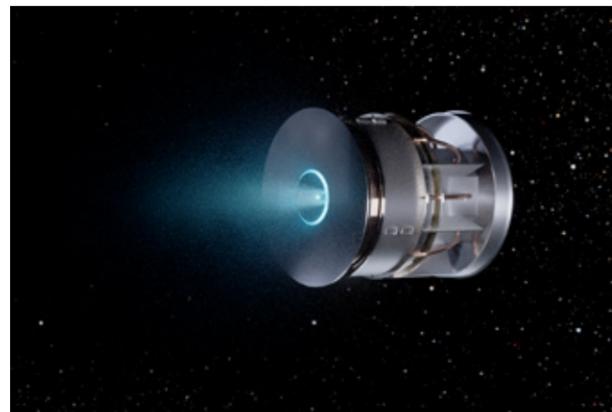
The diplôme d'ingénieur, equivalent to a master's degree in Aeronautical Engineering awarded by IPSA certifies graduates' ability to tackle any problem related to aeronautics and space. IPSA training also allows graduates to work in related advanced fields of aeronautics and space, particularly in land transport, which uses techniques and technologies similar to those used in aeronautics.

Key figures :

- 2 courses (Master & Bachelor)
- 2.500 students
- 2 campuses (Paris & Toulouse)
- 110 partner universities
- 800 partnerships with leading companies
- 80 student associations
- 5.000 graduates



Munich, Germany: In January 2023, NeutronStarSystems has been awarded a 2.5 Million EUR grant from the European Innovation Council's Transition Challenge for the project - Superconductor-Based Readiness Enhanced Magnetoplasmadynamic Electric Propulsion (SUPREME), an in-space electric propulsion system that is propellant agnostic, manoeuvrable and scalable in a range from 1 to 1000 kW. SUPREME has the potential to save up Billions of Euro for cargo missions to the Moon and Mars. The project will have a duration of 30 months and it will be executed with the support of the University of Stuttgart (Institute of Space Systems), the University of Twente, Airbus CRISA and Peak Technology. A prototype of 5 kW SUPREME engine will be built and tested in relevant environment aiming to pave the way to a flight demonstration in 2026. This power class is meant to target payloads between 400 and 1800 kg, covering missions from small satellite constellations, secure communications, space situational awareness, orbit servicing assembly and manufacturing (OSAM). The project is funded under grant agreement SUPREME No. 101113107.



The National Space Science Agency (NSSA) has announced the name and logo of its 3U CubeSat that is currently under development, **AlMunther**, which contains an Earth observation payload and a secondary payload that utilizes cybersecurity and artificial intelligence (AI) and is anticipated to be launched in 2024.



The NSSA continues its collaboration with UAE's space centers, i.e., MBRSC and NSSTC, through joint initiatives and projects.



NSSA will host the 2nd Middle East Space Generation Workshop (ME-SGW) for the Space Generation Advisory Council (SGAC) on 6-7 September 2023. The five workshops will discuss the topics of space economic infrastructure, women in space, space and education, space and entrepreneurship, and generation engagement in space in the region.



Additionally, and for the fifth time, NSSA will host the annual NASA Space Apps Hackathon. This year the event will be hosted in two locations in the Kingdom. The agency has also conducted more than 45 workshops and sessions for various age groups and levels on numerous space-related topics throughout the year to raise awareness in the community.



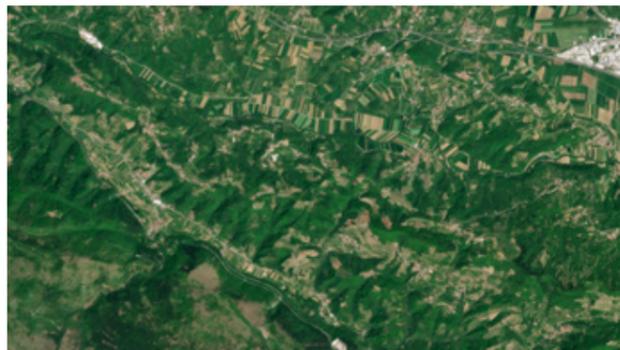
The NSSA is also participating in the IAC conference held this year in Baku with 6 research papers on numerous topics such as utilizing AI in onboard processing and validating new material usage for spacecraft's structure for mass optimization. The agency will also participate in the Space for Climate Action Symposium organized by UNOOSA in Austria on 12-14 September 2023 with 2 research papers utilizing Earth observation data for food security and agriculture.





In August '23, Planet Labs PBC closed their acquisition of the business of Sinergise, the operator of Sentinel Hub, marking a significant step forward in Planet's mission to make Earth observation (EO) data more accessible. This business step accelerates the company's vision to build an Earth Data Platform that powers action in support of a more sustainable and secure planet. Over the past 10 years, Planet has built an unprecedented set of EO data products to capture physical change as it happens while Sinergise built an incredibly powerful platform to process and analyze EO data at scale. By combining these technologies, Planet will have the ability to efficiently deliver EO data to customers to unlock transformational insights. As the world faces increasingly complex challenges, the need for accessible and actionable EO data has never been more critical.

Planet is eager to continue their investment in Europe. Thanks to programs like Copernicus, Horizon, and Earthnet, Europe has developed a world class EO ecosystem. In Europe, Planet operates offices in Germany and The Netherlands, and now with the Sinergise acquisition, they also host offices in Austria and Slovenia. Planet holds business relationships with a myriad of European companies and startups, such as BASF, EOMap, and LiveEO, and they have supported ambitious government programs and agencies, including NICFI Satellite Data Program, the Welsh Government, and Germany's BKG. Planet remains committed to fostering a thriving ecosystem of partners building successful businesses on EO data and services.



Satellogic Expands Global Reach with Key Announcements

Satellogic (NASDAQ: SATL), a leader in sub-meter resolution Earth Observation ("EO") data collection, is building momentum with several recent announcements: an [agreement](#) with Saudi Arabia-based Quant Data & Analytics; a new [partnership](#) with

Canadian-based SkyWatch, making its high-resolution satellite imagery available on SkyWatch's EarthCache platform; and recently signed [collaboration](#) with U.S.-based Skyloom to test multiple pathways to enhance optical data transmissions.



[Quant Data & Analytics](#) is leveraging Satellogic high-resolution, high-frequency satellite imagery to power its development of derivative data products, transforming and broadening the adoption of data science, AI, and SaaS products for real estate and retail across the Gulf Region.

[EarthCache](#) offers an intuitive interface and robust API to enable expert and novice geospatial data users access to archive imagery as well as tasking. Satellogic continues to expand its reseller network, enabling more access to its affordable, submeter satellite imagery.

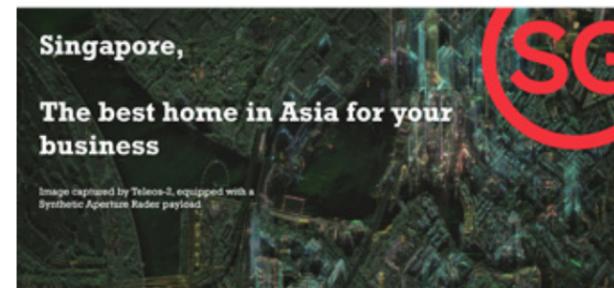
[Skyloom](#) is a leader in space-based telecommunications. Together with Satellogic, Skyloom plans to conduct different optical data transmission tests—a collaboration that aims to pave the way for faster delivery of high-resolution satellite imagery.

Satellogic remains committed to increasing access to affordable Earth Observation capabilities. Customers can leverage Satellogic's constellation, or their own NewSat satellite through Space Systems, a direct satellite sales offering. Find out more about how you can deploy your own state-of-the-art Earth imaging satellite for less than \$10M at www.satellogic.com/space-systems/



Singapore: Home to a thriving space sector & location of choice for Space businesses

Singapore's thriving space sector is home to more than 2,000 professionals and researchers across more than 60 local and international companies across the space value chain.



Singapore's national space office, the **Office for Space Technology & Industry (OSTIn)**, manages the **\$150M flagship Space Technology Development Programme** that supports the development of space technologies for terrestrial applications, and disruptive small sat technologies for innovative and sustainable applications.

Our pursuit in the abovementioned niche space technology areas is supported by Singapore's strengths in **Innovation, Advanced Manufacturing, and Artificial Intelligence.**

- 1. Innovation** – Singapore has a vibrant ecosystem featuring global R&D labs for leading Fortune 500 companies, as well as over 400 venture capital firms, and over 200 incubators and accelerators. We work with companies to develop solutions to solve the world's most pressing problems.
- 2. Advanced Manufacturing** – With deep engineering and innovation capabilities, Singapore is recognised as the global leader in high-value manufacturing, and the world's 5th largest exporter of high-tech products. The Singapore Government is investing more than S\$3 billion over 5 years to boost our advanced manufacturing capabilities.
- 3. Artificial Intelligence (AI)** – Singapore is known globally as a competitive hub for AI talent, having invested around S\$70M in AI talent and opened 3 new centres of innovation to help small and medium size enterprises create and adopt new AI products and solutions.



Situated at the heart of Southeast Asia (SEA), businesses can tap into a US\$3.2 trillion economy, which is fast-growing and forecasted to be the 4th largest economy by 2030. **Singapore is an excellent gateway to SEA**, with its extensive connectivity, network of Free Trade Agreements and digital cooperation initiatives.

Learn more about Singapore's space sector via www.space.gov.sg, and connect with us on [LinkedIn](#) for news and regular updates. Consider also joining the annual **Global Space and Technology Convention** hosted in Singapore annually in February.



On the 30th of May, the fourth edition of Emerging Space, the leading European space industry conference focused on emerging space ecosystems, took place in Bratislava, Slovakia. Its main objective, as in previous editions, was to help emerging space ecosystems grow and be valuable members of the global space community. Slovakia, as one of such newer and relatively smaller space ecosystems, considers this to be a topic of great importance bringing added value to both new and well-established space players. In total the event drew the attention of more than 400 in-person and online participants. It also attracted a stellar speaker lineup from international organizations, space agencies, major European space industry, as well as leading global and European associations and NGOs.

The second day of the event continued with Emerging Space European Industry Summit (ESEIS), an inaugural edition of a closed-door meeting organised together with ASD Eurospace. It brought together twenty top representatives of leading European space companies and emerging space ecosystems of Europe, as well as ESA representation in order to create new connections between the well-established and emerging space ecosystems of Europe.



Viterbi School of Engineering, USC Liquid Propulsion Laboratory

The Viterbi School of Engineering's Liquid Propulsion Laboratory (LPL) at the University of Southern California (USC) designs, builds, and tests industry-grade liquid rocket engines and feed systems. Recently, this student group successfully fired their



IAF Members' Corner

new 3-kN regeneratively-cooled kerosene/LOX engine named "Mike's Fury" at the Mojave Desert in California (shown in the photograph).



This was the LPL's first successful test fire of a regeneratively-cooled engine and one of the few successful ones to date in collegiate rocketry. The student group additively manufactured this engine by laser powder bed fusion with the help of its industrial partner i3DMFG. LPL will test-fire this engine again later this year, introducing adding important thrust vectoring capability.



Yuzhnoye Design Office

On August 2, 2023 the medium class Antares rocket was launched from the Wallops Flight Facility (Virginia, the United States). It orbited the Cygnus cargo ship with 3785 kg payload for the International Space Station (ISS). The Cygnus NG-19 mission was named after the astronaut Laurel Clark.



The two-stage Antares rocket was developed by the US corporation Northrop Grumman (then Orbital ATK) in close collaboration with the international team of engineers, including the Ukrainian specialists. The stage 1 Core Structure and part of the ground instrumentation was developed at Yuzhnoye Design Office and manufactured at Yuzhmash plant.

The maiden launch of Antares was implemented on April 21, 2013. It should be noted that within the shortest term a reliable, efficient and affordable commercial launch vehicle was developed to perform resupply missions to the ISS as ordered by NASA. It enabled the astronauts to receive the materials and instrumentation sustaining the life activity and scientific research at the station.



The proven engineering solutions and the system architecture of the Antares rocket ensured the adaptivity of its design to rapid upgrade aimed to enhance its performance in order to meet the growing need in increase of mass of the payload to be delivered to the ISS.

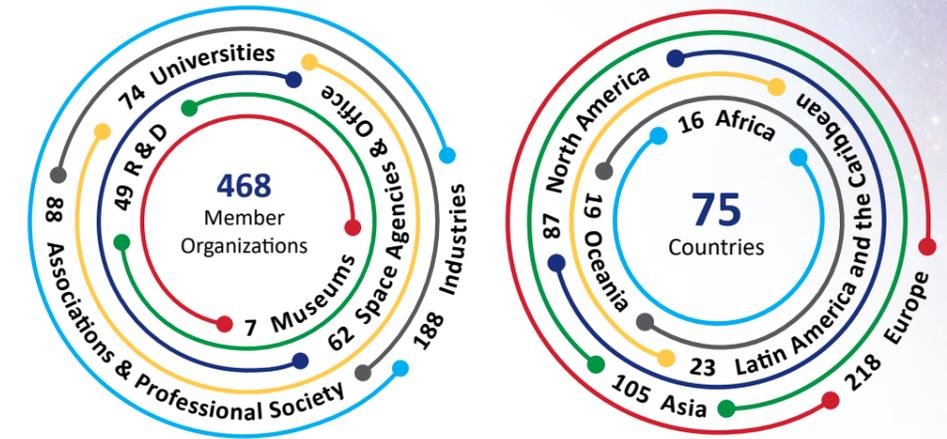
It is worth mentioning that in 2020 the Antares Program was chosen by the International Academy of Astronautics for the prestigious team award, The Laurels for Team Achievement.

It was the last launch of the Antares as modification 230+. Over the 10 years in service the rocket was launched 18 times, 17 of them successfully.



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