



IAF President's Welcome

Dear friends,

This edition of our newsletter arrives just as we are gathering for the first time since the beginning of the pandemic in St. Petersburg, Russia, for the **IAF Global Space Exploration Conference – GLEX 2021**. After the United States in 2012, and China in 2017, the IAF is proud to offer the space community and the greater public, the unique opportunity to meet again in Russia, another leading nation in space exploration, for the third edition of the Global Space Exploration Conference.



GLEX 2021 is hosted by the Russian State Space Corporation, **ROSCOSMOS**, a member of the IAF since 1993. We are particularly pleased with the programme of this event. The plenary programme, including the celebration of the **60th anniversary of Yuri Gagarin** first space flight; the IAF Global Networking Forum with many interesting updates from **IAF members**; the **Next Generation Day** profiting from so many astronauts' wisdom and experience; the very rich technical programme with over **570 received abstracts** from 57 countries which made it challenging for the GLEX 2021 International Programme Committee to choose among all these excellent abstracts; the rich social and cultural programme to enjoy to the fullest the **beautiful city of St. Petersburg** and its impressive **cultural life**; the great engagement from the online community thanks to the free streaming kindly offered by the IAF; and so much more, including the expectations for the first ever roundtable panel on the role of digital, social and analog media on space exploration!

Meanwhile, preparations continue to advance for the IAC 2021 in Dubai, U.A.E., the details of which you will find in this issue. We are also delighted to have received 5 full proposals for hosting IAC 2024, showing that the interest on the world's premier global space event keeps on thriving. Stay tuned to see which proposal will be selected!

Best wishes for the summer and let's keep the conversation online alive @iafastro.

Warmest Regards,

Pascale EHRENFREUND
IAF President

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INTERVIEW WITH:

HE Sarah bint Yousef Al Amiri, Minister of State for Advanced Technology, Chairwoman of the UAE Space Agency

and

Salem Al Marri, Chair, IAC 2021 Local Organizing Committee

Adnan Al Rais, Co-Chair, IAC 2021 Local Organizing Committee

IMPORTANT DATES:

- Early Registration Rate deadline for IAC 2021 – 30 July 2021
- IAC 2021: 25 - 29 October 2021
- IAF Spring Meetings 2022 – 22-24 March 2022
- IAC 2022: 18 – 22 September 2022
- IAC 2023: 25 – 29 September 2023

Connecting @ll Space People





GLEX 2021

It has been an incredible path the route to this third IAF Global Space Exploration Conference - GLEX 2021 but here we are, next week we will all meet in Saint Petersburg to celebrate the 60th Anniversary of Yuri Gagarin's Spaceflight and to take a look on how far the global space community has come. Also of course to look at the future of space exploration, what is ahead of us?

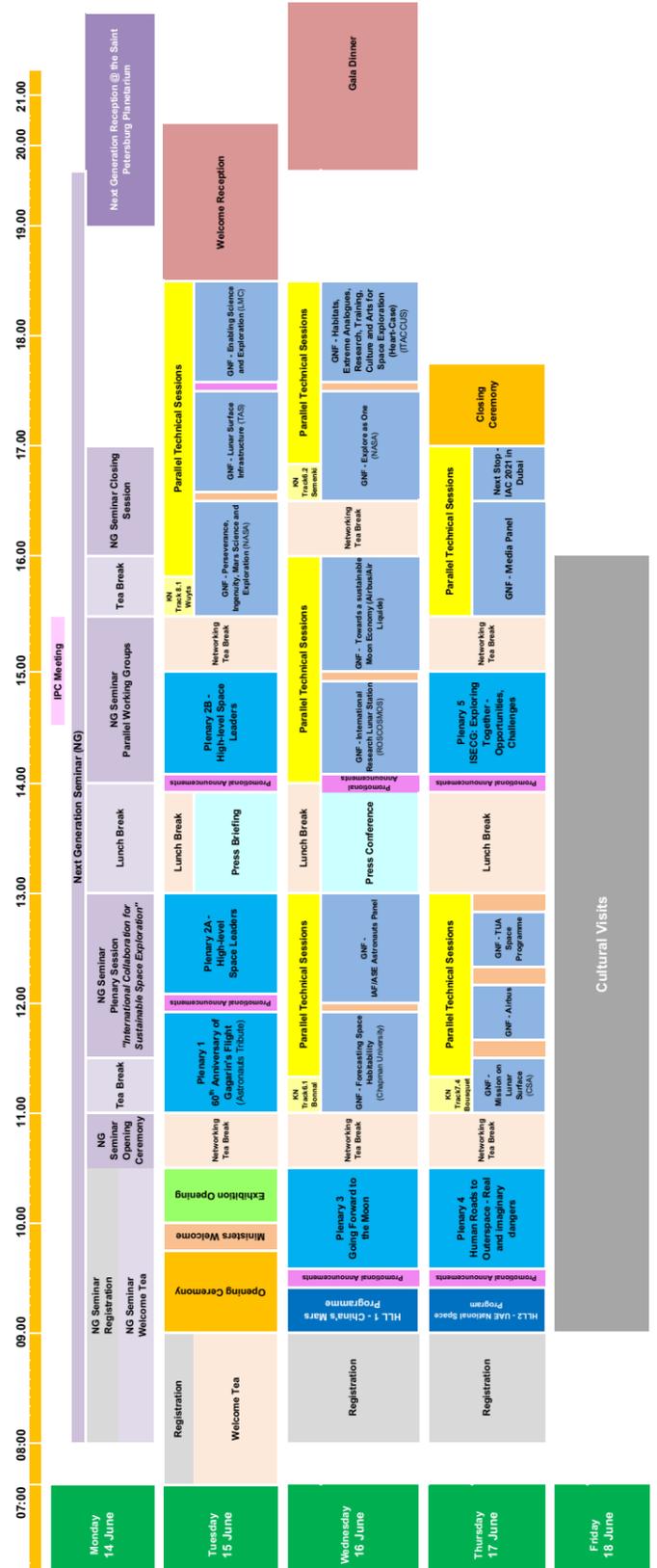
The community coming together will truly be global as the IAF has decided to offer the livestreaming of the conference FOR FREE to all the space exploration lovers.

Enjoy the conversations and be part of it on social media through the official #GLEX2021!

Check the Final programme of the conference on the [iafastro website](http://iafastro.org).



GLEX 2021 AT A GLANCE



TECHNICAL PROGRAMME AT A GLANCE

Date/schedule	15.06.2021 PM	16.06.2021 AM	16.06.2021 PM (1st)	16.06.2021 PM (2nd)	17.06.2021 AM	17.06.2021 PM
Timing	15:30 - 18:30	11:00 - 13:00	14:00 - 16:00	16:30 - 18:30	11:00 - 13:00	15:30 - 17:00
Hall #1	TS 2 PART 1 Lunar Exploration	TS 3 PART 1 Mars Exploration	TS 3 PART 2 Mars Exploration	TS 2 PART 3 Lunar Exploration	TS 2 PART 4 Lunar Exploration	TS 2 PART 5 Lunar Exploration
Hall of Library	TS 1 PART 1 International Cooperation for Space Exploration	TS 1 PART 2 International Cooperation for Space Exploration	TS 1 PART 3 International Cooperation for Space Exploration	TS 10 PART 1 Space Resources	TS 10 PART 2 Space Resources	TS 3 PART 4 Mars Exploration
Hall #9	TS 8 PART 1 Challenges of Life Support/Medical Support	TS 6 PART 1 Space Transportation	TS 8 PART 2 Challenges of Life Support/Medical Support	TS 6 PART 2 Space Transportation	TS 8 PART 3 Challenges of Life Support/Medical Support	TS 11 PART 3 Ground-Based Preparatory Activities
Hall #16	TS 12 PART 1 Transcending Societal Issues for Space Exploration	TS 4 PART 2 Exploration of Near- Earth Asteroids	TS 12 PART 2 Transcending Societal Issues for Space Exploration	TS 4 PART 1 Exploration of Near- Earth Asteroids	TS 12 PART 3 Transcending Societal Issues for Space Exploration	TS 7 PART 5 Key Technologies
Hall #20	TS 7 PART 1 Key Technologies	TS 7 PART 2 Key Technologies	TS 2 PART 2 Lunar Exploration	TS 7 PART 3 Key Technologies	TS 7 PART 4 Key Technologies	TS 5 PART 2 Exploration of Other Destinations
Hall #14	TS 11 PART 1 Ground-Based Preparatory Activities	TS 9 Space Stations	TS 11 PART 2 Ground-Based Preparatory Activities	TS 3 PART 3 Mars Exploration	TS 5 PART 1 Exploration of Other Destinations	TS 1 PART 4 International Cooperation for Space Exploration

GLEX 2021 will be marked by the launch of «The Virtual Technical Gallery», the most innovative IAF tool. The Virtual Technical Gallery is a user-friendly digital platform and will host a vibrant mix of more than 250 brilliant video lectures, engaging lightning talks and full manuscripts.

All registered participants will receive a custom Access Key ID on 11 June and will be able to display the content of the respective Technical Sessions just after 08:00 (MSK) on each day following the onsite presentations.

Registered participants can scan the QR code or click on <https://dl.iafastro.directory/gallery/GLEX-2021/> to access the VTG with their Access Key. In case you have not received your Access Key ID on 11 June, please check your spam folder or contact digital.library@iafastro.org.



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72nd INTERNATIONAL ASTRONAUTICAL CONGRESS

25-29 October 2021 | Dubai

Inspire, Innovate & Discover
for the Benefit of Humankind

WWW.IAC2021.ORG



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IAC 2021 READY TO WELCOME THE GLOBAL SPACE COMMUNITY IN DUBAI

The **72nd International Astronautical Congress** will take place as an in-person congress in the beautiful and dynamic city of **Dubai from the 25th to the 29th October 2021**. During the first official press conference held in Dubai on 18 May 2021, IAF President, Prof. **Pascale EHRENFREUND** stated: "with the theme **"Inspire, Innovate & Discover for the Benefit of Mankind"**, the IAC 2021 will make a contribution to humanity and to science by strengthening and enhancing cooperation between all countries in the space sector."

IAF President, Prof. **Pascale EHRENFREUND** presented the exciting programme: a rich plenary programme with the usual **Heads of Agencies** roundtable, and various sessions focusing on **Future Mars Sample Return Missions, the role of Emerging Space Agencies, Small Satellites**, and the views of the **Next Generation**. The comprehensive technical programme also promises to be exciting and will offer a large number of presentations thoroughly selected by the IAC International Programme Committee. The Global Networking Forum will bring together stakeholders, policy-makers, experts and young professionals in the global conversation about present and future of space activities.

H.E. Yousuf Hamad ALSHAIBANI, Director General, MBRSC, said: "On the back of the UAE's achievements in the space field and a futuristic vision for the sector, we look forward to hosting this year's International Astronautical Congress. The event will act as a catalyst for more nations from the region to engage with international partners and **empower a new generation of space experts** that will work for humanity."

Salem ALMARRI, Deputy Director General, MBRSC and IAC 2021 LOC Chair, declared: "The UAE hosting this year's edition reaffirms our commitment to support the growth and development of the global space sector. We have been working closely with all relevant government authorities in Dubai to **ensure the safety of everyone**, setting up all required protocols that will help us pursue a successful event in October."



Hurry up early registration rates are valid only until 30 JULY 2021



IAF ABSTRACT MENTORING PROGRAMME



The **IAF Abstract Mentoring Programme** was introduced in 2018 with the objective of helping young or less experienced researchers improve their abstracts ahead of submission, to increase the chance of their work being accepted for presentation at the International Astronautical Congress (IAC). Over the years, the AMP has proven to increase the motivation of early career researchers, as well as the number of abstract submissions received from resource-limited countries.

The IAF Abstract Mentoring Programme is a **wonderful opportunity** for Mentees to obtain critical input from space experts on their draft abstracts. The feedback ensures that the abstracts are scientifically sound, thus giving proposals a higher chance of being accepted for oral or interactive presentation. Every mentor has the potential to instigate surprising change; mentors can support mentees figure out the best path forward, gaining new perspectives and fresh ideas. Mentoring relationship also offers a unique insight into generational differences.

We would like to thank our dedicated mentors who generously gave of their time and shared their expertise, by providing feedback on more than 350 abstracts since the launch of the programme.

IAF MENTORING SUCCESS STORIES

I am very grateful to Tim for his careful guidance and valuable advice to me. Your work experience is extremely valuable to me. At present, the color design of the manned spacecraft I am studying seems to be an unpopular study in the world, and the published research is almost negligible. But your opinion enriches my research content and corrects my research direction for me, which is also an important existence of the AMP project.

At the same time, I am also very grateful to the International Astronautical Federation and the AMP programme for giving me this precious opportunity. The AMP programme can help students and young researchers quickly match experienced experts and industry leaders, and can learn about the cutting-edge knowledge and valuable experience of this research direction, which is difficult for us to contact and find. This also highlights the importance of this programme for the sustainable development of space research.

I highly recommend that future participants, after participating in the AMP programme, should also actively keep in touch with their mentors and find more opportunities for cooperation, which can quickly improve their professional level and integrate into the research field, and contribute to the development of international aerospace. Make your own contribution!



Ao Jiang - Mentee
PhD Student
University of Leeds
Human factors expert at ILEWG EuroMoonMars
United Kingdom





At the start of the space programs, we didn't know how to contend with threats of micro-meteoroids, cosmic rays, zero gravity and thermal extremes of direct sunlight vs. shade. DuPont, General Electric, Owens Corning, Union Carbide and Dow Corning scaled up materials which would perform in the environments of space and on the moon. Where acceptable materials or components weren't available for the intended use, we made them. There were no mentors because none of this had been done before. It was like learning to swim by being thrown in over your head (sink or swim). As soon as one problem was solved, the next critical one screamed for attention before the next flight schedule. Average engineer was 27 years old.

Upgraded flight suits looked like Flash Gordon, but they melted in thermal chambers. A combination of reflective film and spacer fabrics as outer layers offered improved heat and cold resistance, but looked like the Michelin Man tire guy. The emphasis was on form, fit and function. What did it look like? Can it be made? Will it work and permit completion of the mission objectives? On repairs and installations in space at zero gravity (EVA's), rushing to accomplish tasks in the time allotted could result in heat stroke. There was nothing to push against, resulting in exhaustion. Underwater experiments demonstrated a slow steady approach with leverage resulted in clearer thinking and shorter time to task completion.

Likewise we should consider the niceties that will relax and facilitate contemplation of what would work best to complete the objective. Maybe a tack hammer would be better than a sledge. Less clutter, better design transitions, cool colors and lights of reasonable intensity would provide a productive environment in space or on the moon/Mars.



Tim Parker - Mentor
Retired Supervisor, Apollo Program, Materials and Process Engineering
ILC Dover
United States



First, I wish to congratulate with the IAF for establishing the AMP Programme. I really enjoyed being a Mentor and I think that this initiative is beneficial not only for Mentees but also for Mentors. To write an abstract is a difficult task, even for experienced scientific writers, and to have the possibility to review the abstract written by an inexperienced writer gives the opportunity to remind the errors that must be avoided in scientific writing.

Practically, my approach consisted of writing my comments on some critical sentences of the abstract, explaining why it was a good or a bad sentence. After that, I asked the Mentee to rewrite the abstract trying to follow my advice. After some iteration, the Mentee was able to produce a very good abstract. I was very proud of my Mentee's progress. The research field of the Mentee wasn't my field of expertise, but I think that this was a positive aspect. In fact, I was able to be more critical on the writing without any bias. I appreciate that there was not any constraint from IAF on how to help the Mentee. In this way, I helped him following my time scheduling and my own teaching approach.

In the future, I think that it will be very useful to draw up a checklist on how to write a good abstract. Furthermore, in the framework of the AMP Programme and after that the Mentee has submitted her/his abstract, I think that it will be very useful that the Mentees send to their Mentors also their "lesson learned". In this way the Mentees will have the opportunity to realize how she/he progressed in their writing and, above all, how to write a good abstract



Dr. Manuel Salvoldi - Mentor
Postdoc & Scientific Center Manager of the VENUS microsatellite mission
Ben-Gurion University of the Negev
Israel



I had the great chance to be put in contact with Dr. Manuel Salvoldi, a real professional of the field whose help and sense of understanding was of utmost importance for me to succeed in my task. Even if separated by two different time zones, the communication was very efficient (9 days were enough) as Dr. Salvoldi was fully devoted into supporting me. Dr. Salvoldi started by suggesting an approach, then through the communication he kept on explaining me the exact mistakes that I made, suggesting corrections, cheering me up with very kind words and making himself available. I was willing to do an effort for the abstract to be accepted but also towards him, as his professionalism made the interaction even more fluid, motivating and enjoyable. I will always be grateful for this chance: the abstract was accepted and I have established contact with a very knowledgeable person that I am planning to certainly meet, one day, outside of the Programme.

If anyone is hesitating about taking part of the Programme: Just do it! The most important is to exchange ideas and learn from an experienced point of view. As a mentee, you shall be considerate of the time mentors are taking for us even if busy. It would be obvious to say, but being respectful is the essence of all interactions: show your appreciation by, at least, putting as much effort as you can, to ease the task for your mentor but also for your own self! Another good advice is to communicate as much as you can: In order to help you efficiently, your mentor shall know as much as possible about your abstract. Also, if you are facing any challenges (technical or not), let your mentor know about it. Good luck for everyone!



Fahd Mounni - Mentee
Student
Laboratory of Spacecraft Environment Interaction Engineering
Kyushu Institute of Technology
Japan



First of all, I would like to thank you for the opportunity to participate as a mentor in the IAF Abstract Mentor Programme - IAC 2021, it is an honor for me. We were able to contribute to the production of knowledge for the scientific community with new and relevant results in the area of satellite control that include innovative ideas applied directly to satellites, the architecture of the terrestrial segment, with approaches in the area of communication protocols, ontologies and the Based System in Models Engineering and development and operation of space missions from the perspective of the ground segment. In addition, we will be able to collaborate in the communication between mentees and technical specialists, postgraduate professors and evaluate the participation of mentees in international cooperation projects. My mentee is a student of computer science and engineering and has shown a strong interest in the area of technology, including physics, astronomy and space engineering, and she would like to pursue a career in the aerospace domain. The presented abstract caught my attention for the innovative idea and the collaborative work allowed a better understanding of the subject and we managed with your dedication and interest to reach the objective of improving the summary according to the expectations of the IAC 2021 selection committee. Finally, we are contributing to maintaining the interest and dedication of the new generations of space professionals.



Prof. Antonio Cassiano Julio Filho - Mentor
Project Manager
National Institute for Space Research
Brazil



I highly appreciate the mentor programme, since it facilitates the process of creating scientific papers a lot. Most of the young researchers are in a certain state of 'panic' if they want to publish their ideas. If they don't have a supportive background - like an institute / professor - that tries to supervise this process - a lot of creative ideas will be forgotten or never reach the scientific community. Nevertheless - the backbone of science has still to be provided - that means that the scientific process of rigorous planning an experiment, including analysis, fair testing and comparing it to e.g. a golden standard has to be fulfilled. The mentor-programme facilitates this and give the mentors the possibility to get a glance of fresh sometimes unconventional ideas.



Prof. Dr DI Lars Mehnen - Mentor
Senior Lecturer/Researcher
University of Applied Sciences Technikum Wien
Austria

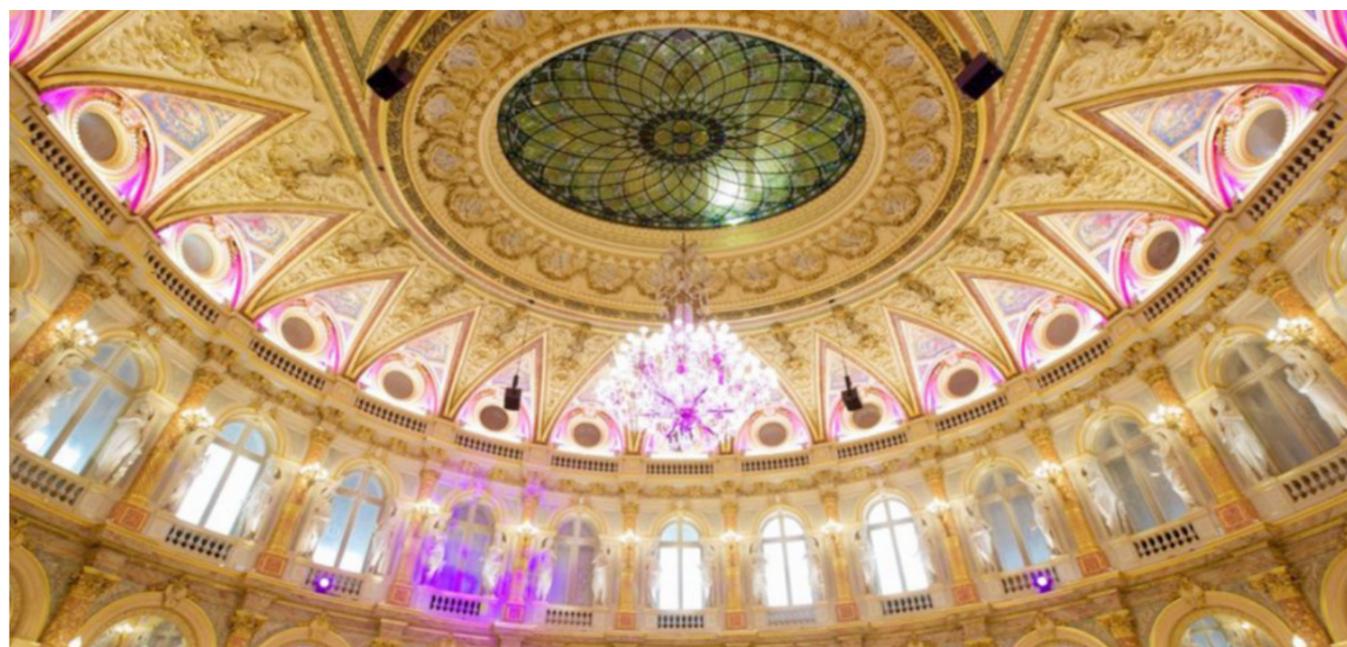


The International Astronautical Federation (IAF) is celebrating 70 years of existence in 2021!

It has been an incredible journey, and no matter what they are, celebrations play an important role in our lives. Without celebrations, we can't enjoy this life fully!

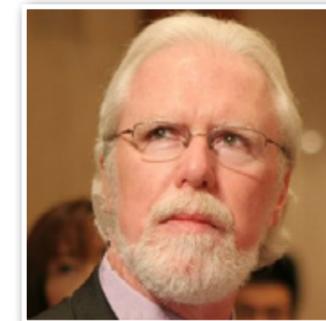
So the IAF will shortly invite you to a wonderful celebration on 10 December 2021 with an Opening Ceremony, Round tables, a Closing Ceremony and an entertaining and festive Gala Dinner in the beautiful Intercontinental Paris Le Grand Hotel!

Stay Tuned IAF Members and get your dancing shoes!



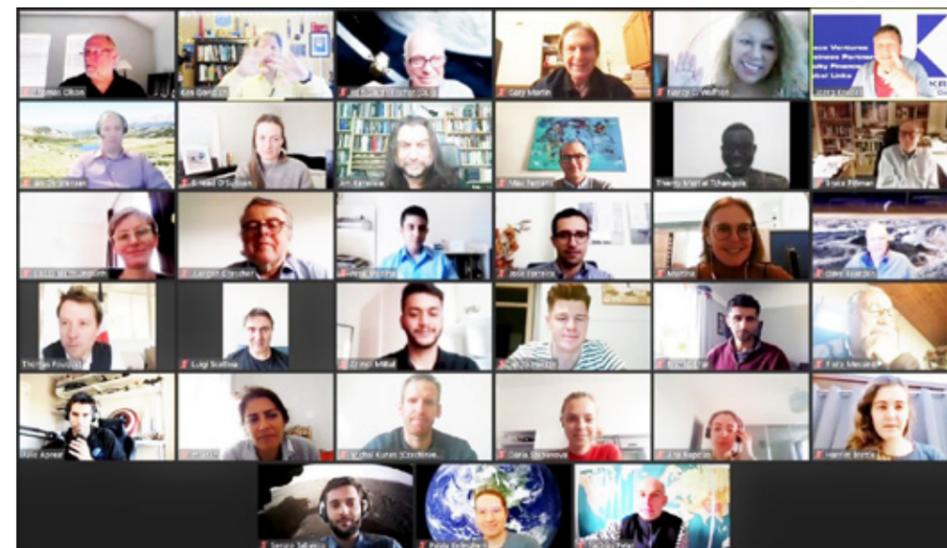
Private and Public Sector Cooperation During COVID-19

We sadly lost a pillar of our space community this past March 2021 when our friend and colleague, Charles Lauer, passed away. He was one of the founders of Rocketplane Global and President of Spacebit North America. The Entrepreneurship and Investment Committee will miss him. He will remain in our memories as we go forward to new horizons -- keeping his ideas alive.



Due to the pandemic, we can see a growing digitalization of the space economy. Entrepreneurship and start-up activity has shown resilience. The commercial space sector is adapting to the "new normal" by navigating through challenges and continuing to work on ground-breaking technology for space application solutions and data for socio-economic development. However, the global space industry and space agencies need to remain mindful of the risks that small and medium-sized space enterprises are facing as these commercial actors are a key source of innovation from the private sector. Despite the pandemic, the frontiers of the space economy keep expanding. We can see growing private and public sector cooperation, for example, NASA recently awarded a contract to SpaceX to take astronauts from lunar orbit to the surface of the moon. We have other major private companies working toward important upcoming breakthroughs to sustainably put people in space such as Boeing, Blue Origin and Virgin Galactic. These companies are leading this new chapter of spaceflight and, with this, mark the opening of a new chapter led by the private space sector.

The Entrepreneurship and Investment Committee (EIC) members continue their great work following the new COVID-19 safety protocols. Our Chair Ken Davidian (FAA) won the 2021 Distinguish achievement award, our Vice-Chair Juergen Drescher continues his work with DLR Aerospace Medicine/Radiation Biophysics and is joining the first commercial mission to the Moon with ASTROBOTIC on the Peregrine "Lunar Lander." Our distinguished EIC members: Julio Aprea (EAS HQ), David Bearden (JPL), A.C. Charania (Blue Origin), Doug Comstock (NASA), John Culton (CSPSR), Max Ferraris (Saipem), Rolf-Dieter Fischer (DLR), Luisella Giulicchi (ESA), Jacob Hacker (KPMG), Philippe Hazane (SPM. Inst), Jim Keravala (OffWorld), Joerg Kreisel (JKIC), Lisa La Bonte (AYVF), Gary Martin (ISU), Jose Medina (Space Latam), Piero Messina (ESA), Marc Boucher (Canadian Space Commerce Assn), Joyeeta Chatterjee (Airbus), Brad Cheetham (AdvancedSpace), Yann Guoy (Airbus Defence and Space), Jenn Gustetic (NASA HQ), Michal Kunes (ESA), Zoi Lendway (Airbus), Benjamin Lenoir (Thales Alenia Space), Clay Mowry (Blue Origin), Nancy C. Wolfson (PD-NEOs Research), Thomas Olson (AVEALTO), Misuzu Onuki (New Space Consultant), Sinead O'Sullivan (Harvard Business School), Ana Raposo (ESA ECSAT), Christian Sallaberger (Canadensys Aerospace Corp), Luigi Scatteia (PwC Advisory), Elizabeth Seward (Airbus Ltd), Manny Shar (Bryce Space & Technology), Olga Stelmakh-Drescher (Exolaunch), Daria Stepanova (German Orbital Systems GmbH), Sergio Tabasco (SGAC; MODIS), Helen Tung (Moon Village Assn), Dapeng Wang (Biehang University). EIC Friends: Aldrich, Andrea Harrington, Scott Hubbard, Claire Jolly, Nicole Jordan, Monica Phang, Bruce Pittman, Sarah Maria-Gabriella and Dennis Stone are persevering through the pandemic and continue to promote dialogue among entrepreneurs, established companies, government, and academia, focusing on encouraging economic innovation and attracting private investment. The EIC is also working on generating ideas and inspiring initiatives in various regions around the world that concretely contribute to technology-driven economic growth. Our EIC article is written by Nancy C. Wolfson and sponsored by the IAF Entrepreneurship and Investment Technical Committee.



Planetary Defense Perseveres Through the Pandemic and Welcomes 2021

Devastating impacts from comets and asteroids have been responsible for creating giant landmarks on our planet. The pandemic forced us to rethink our approach in many aspects, but the Planetary Defense (PD) effort didn't slow down. Many of our observatories that support essential ground-based efforts like discovering, tracking, and characterizing NEOs (Near-Earth Objects) were temporarily disrupted. However, like champions -- these observatories were able to resume their operations with new COVID-19 safety protocols.

NEOs measuring 1000 meters or one kilometer) or larger can have a serious, devastating impact and might lead to global consequences. We must not forget the powerful explosion on June 30, 1908, which flattened an entire forest along the Podkamennaya Tunguska River in Central Siberia. The Chelyabinsk Asteroid was a wake-up call -- its shockwave left damage for over 55 miles on either side of the NEO trajectory, which entered the Earth's atmosphere over the city of Chelyabinsk in Russia on February 15, 2013. The risks posed by potential asteroid impacts and the pandemic can be taken as opportunities to analyze effective international communication, cooperation, and responsiveness. Planetary defense activities continued during the pandemic. NASA's Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-Rex) has been orbiting asteroid (101955) Bennu since December 2018. In October of 2020, it successfully executed a Touch-and-Go (TAG) maneuver on the surface of Bennu and collected samples. ESA's Ministerial Meeting approved the funding of the HERA mission's design for manufacturing and testing. The HERA mission is unprecedented in its scientific, technical objectives and it is the ESA's contribution to the international double-spacecraft collaboration with NASA's spaceship, DART (Double Asteroid Redirection Test). The mission aims to determine how asteroids could be deflected if on a collision course with Earth. In December of 2020, after a six-year journey, JAXA's Hayabusa2 spacecraft re-entered Earth's atmosphere carrying the collected sample from the asteroid Ryugu.

In 2021, planetary defense activities will continue with the launching of new asteroid missions: NASA's Lucy mission, NEA Scout, and the experts continue working on the DART and Hera missions. There will also be a 25th-anniversary celebration for NASA's NEAR-Shoemaker spacecraft. With the challenges of the pandemic coming to an end, the IAF Technical Committee (TC) on Near-Earth Objects (NEO) is committed to raising awareness across the globe about the important work being done within the planetary defense and NEO communities. The TC on NEOs covers Near Earth Object related topics as well as asteroid mining, capacity building for decision makers, education and communication with the general public. Our committee gathers an interdisciplinary team of top experts in the field. Our leadership: Chair Alex Karl and Vice Chair Nancy C. Wolfson. Our members: V. Admurthy., William Ailor, Ian Carnelli, Alison Gibbings, Mariella Graziano, Alan Harris, Alissa Haddaji, Ghulam Murtaza, Maier Philipp, Daniel Mazanek, Joseph Mousel, Alejandro Roman Molinas, Smiriti Srivasta, S.P. Worden, Makoto Yoshikawa, Changyin Zhao. Our Committee Experts: Jose Luis Galache, Peter Marquez, Patrick Michel. Our Committee friends, Erik Asphaug, Alan Fitzsimmons, and Harold Reitsema. We are adapting to the "new normal" by participating in several virtual meetings and conferences such as Planetary Defense Conference (PDC), The American Geophysical Union Meeting (AGU), and Space Resources Week in 2021 among others. This article is written by Nancy C. Wolfson and sponsored by TC on NEOs.



NEWS!



AIDAA Newsletter #3-2021 is now available, with highlights including the new AIDAA website (www.aidaa.it), the preface of the 100th volume of our centennial Journal "Aerotecnica M&S" now edited by Springer, info about the next AIDAA conference and more. Don't miss it out!

Click [here](#) to see the AIDAA newsletter!

Host City Candidacy

The Italian Association of Aeronautics and Astronautics (AIDAA) is founding member of the IAF and is recognized as the second oldest scientific aerospace society in the world. Since 1920 we promote and celebrate aerospace ingenuity and collaboration.



Together with the Italian Space Agency (ASI) and Leonardo, AIDAA submitted Milan's candidacy as the host city of the 75th International Astronautical Congress (IAC) to be held on October 11-18, 2024. The Milano Convention Centre (MICO), the largest Convention Centre in Europe and one of the largest conference facilities worldwide, is the proposed venue. Various academic and non-academic institutions granted support for this bid, including Thales Alenia Space, Altec, OHB, the Italian industrial clusters, many Universities, and local entities. IAC2024 will gather some 6000 delegates and 100 exhibitors, amounting to 200 scientific sessions and 5000 sqm of exposition. IAC2024 would be the fifth edition held in Italy after Rome (1956 and 1981), Turin (1997), and Naples (2012).



Click [here](#) to see the latest AIDAA newsletter or visit us on www.aidaa.it to know more about our history, our free webinars held by International recognized experts, or to register for the upcoming AIDAA Conference.



About IngeNiArs S.r.l.

IngeNiArs was founded in 2014 as **innovative start-up** and **University of Pisa spin-off company**, from the long experience of our co-founders in the area of Electronics and Computer Science Engineering advanced research. We are specialized in design and development of **innovative high-tech electronic/informatics and embedded systems** mainly in the domains of [Aerospace](#), [Artificial Intelligence](#), [Healthcare](#) and [Cybersecurity](#).

In the **Aerospace field**, we offer products and design services both for satellite design and ground testing mainly related to data handling, high-speed data interfaces (i.e., SpaceWire, SpaceFibre, Wizardlink, etc.) and satellite communication (i.e., CCSDS 131.2-B, etc.). Our products portfolio includes:

- **Intellectual properties macrocells (IP Core)** for the realization of high-speed reliable communication link (SpaceWire, SpaceFibre, CCSDS 131.2-B) on board of satellites, implementable on ASIC and FPGA technologies.
- **Test-equipment/software** in order to simplify systems verification during the development phase. Our flagship product family is [SPACEART®](#) (SpaceWire/SpaceFibre Analyser Real Time) which are standalone devices for the functional verification of the high-speed links on-board of satellite (i.e., SpaceWire, SpaceFibre, Wizardlink).
- **Design services:** FPGA and ASIC design following customer specifications.
- **Verification Services:** Advanced independent verification and Verification IPs using SystemVerilog and UVM.





We are particularly active in the aerospace business providing design services in several space missions funded by the European and Italian Space Agency such as Meteosat Third Generation, Copernicus Sentinel 3, FLEX, PLATO, EUCLID, PLATINO and PHISAT-1. We are also official **Microchip Design Partner** and **Xilinx Alliance Partner** with our solutions available on their websites.

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Twitter: https://twitter.com/IngeniArs_Srl



Global Expert Group on Sustainable Lunar Activities (GEGSLA)

The Moon Village Association (MVA) has taken the lead in advancing initiatives for peaceful cooperation in the Moon exploration and settlement. With this objective, in 2021 the MVA decided to promote a neutral forum for multi-stakeholder discussions on safe and sustainable lunar missions: The Global

Expert Group on Sustainable Lunar Activities (GEGSLA).

The group has started its work with the 1st Kick-off Meeting on the 25th of February 2021, creating the basis for increasing global coordination for a new era of sustainable space exploration. The main goal of GEGSLA is to draft a "Recommended Framework and Key Elements for Peaceful and Sustainable Lunar Activities" to be submitted to the UNCOPUOS in 2023, where the MVA has permanent observer status.

Meetings of the group meets are held on a monthly basis, and it's composed of a Secretariat, 38 members, and more than 150+ observers from major stakeholders in lunar activities. The MVA has recently informed in the UNCOPUOS 58th Session of the Scientific and Technical Subcommittee (STSC) about the GEGSLA mission and work, and the committee has shown support in its activities.



The group is actively working on defining the Key Elements for Sustainable Lunar Activities. The next GEGSLA 4th Meeting will take place on the 26th of May 2021. Applications for becoming sponsors and observers are still open: <https://moonvillageassociation.org>

GEGSLA looks forward to expanding its mission in ensuring a sustainable lunar exploration together with you! <https://moonvillageassociation.org>



CEAS Conference 2021

The Council of European Aerospace Societies – CEAS is pursuing one of its main objectives, that is to foster the development of aeronautics and astronautics and to disseminate the research results in these fields, also during the Covid emergency. The CEAS board is in fact organizing two main events, the 1st CEAS Woman in Aerospace Conference, that will be held virtually the 25th of June and the Aerospace Europe Conference 2021

that will be held in Warsaw, Poland from November 23rd to November 26th. The first event has been promoted by the Asociación de Ingenieros Aeronáuticos de España – AIAE, one of the CEAS Members, and it aims firstly to promote goal 5 of the United Nations that is to "achieve gender equality and empower all women and girls". Moreover, by means of 4 round table spanning from Academy to Industry, the Conference aims to promote diversity and to capture all talent in aerospace. The second event represents the biennial CEAS Conference, organized this year by the Council together with the Polish Society of Aeronautics and Astronautics (<https://aec2021.meil.pw.edu.pl/>). The main motto for the conference is a 3R triptych "Restore, Rethink, Redesign" and it will collect presentations on all topics relevant to aeronautics and space. The conference will also select the best articles to be recommended for publication in the "CEAS Aeronautical Journal" and "CEAS Space Journal". Thus, stay safe, we look forward to meeting you soon in the CEAS events.



NGC Aerospace celebrates 20 years of success

Celebrating 20 years of success and innovation since its foundation on April 30, 2001, NGC Aerospace, based in Sherbrooke (Québec), Canada, has acquired a solid reputation in over 20 countries for developing intelligent software enabling the autonomous control of terrestrial satellites, pilotless aerial vehicles and Moon exploration probes. Founded by Jean de Lafontaine, CEO, as the sole employee, the company now counts 18 highly-qualified professionals from Canada and abroad.

The company has found success most notably in designing the onboard software controlling four autonomous Earth-orbiting satellites of the European Space Agency, all four still in operation. Two more satellites are in an advanced state of development. Such expertise has allowed the company to sell licences worldwide for the right to use NGC satellite software technology. NGC has extended this mastery of autonomous software to the operation of pilotless aerial vehicles, with the development of an autopilot capable of hazard detection and avoidance to ensure the safe operation of drones. With partners in Canada, USA and Europe, NGC is also developing the technology that will ensure the safe and high-precision landing of lunar and planetary vehicles.

While the company has grown in both expertise and personnel over the years, it has maintained its core values of dedication, rigour, and work-life balance, and a family atmosphere, a place

where all employees are valued members of the organization and contribute daily to its success.

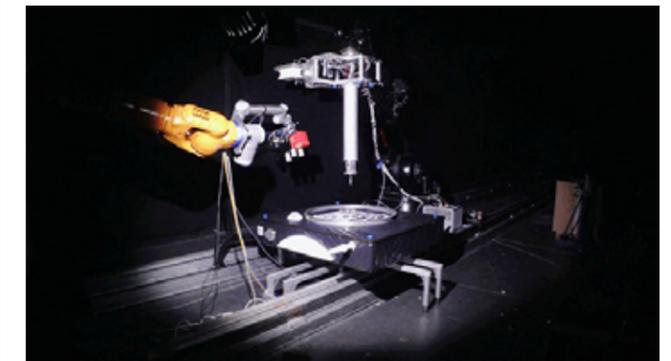
For more information:
www.ngcaerospace.com



EROSS tests validate the on-orbit servicing technology

Last April the testing campaign to validate the H2020 EROSS project's technologies was conducted in GMV's **Platform art**® robotic testbed.

The objective of European Robotic Orbital Support Services (EROSS) is to demonstrate European solutions for the Servicer and the Served LEO/GEO satellites, enabling a large range of efficient and safe orbital support services. The project assesses and demonstrates the capability of the on-orbit servicing spacecraft to perform rendezvous, capture, berthing and manipulation of a collaborative client satellite provisioned for servicing operations including refueling and payload transfer/replacement. This project is developing and merging the building blocks of the previous Operational Grants from 1 to 6 of the Strategic Research Clusters on Space Robotics within the Horizon 2020 programme, three of them led by GMV from 2016 to 2019.



Thales Alenia Space France (TASF), as project coordinator, is leading the mission and system designs within the overall GNC architecture and its validation on robotic testbeds. In the EROSS project, GMV is supporting the integration of the building blocks from previous Operational Grants, i.e. ESROCOS (OG1) and ERGO (OG2). In particular GMV is inputting the design of the satellite guidance function for rendezvous, capture, docking and

servicing operations and supporting Thales Alenia Space France in the GNC and Autonomy validation. GMV is also providing support for inclusion of the ESA ASSIST refueling interface device within the EROSS demonstration. Moreover, GMV's **Platform-art**® is the proposed test facility for the overall EROSS demonstration.



The validation result was excellent and highlighted the efforts over the last 2 years, through the Covid outbreak and the countless technical challenges. During platform-art testing activities EROSS's visual-based GNC for rendezvous operations was validated in closed loop including the autonomous management of a contingency scenario during the approach. Capture operations using a gripper, docking operations with ESA ASSIST breadboard and servicing operations like orbital replaceable unit exchange using SIROM were also validated in open loop.

The **Platform art**® facility enabled us to step up the technology readiness level of EROSS software and hardware elements in a space-representative scenario for on-orbit servicing operations based on visual navigation, promoting the autonomous activation of the different phases to accomplish the mission.

During late May and early June, additional testing activities are planned in NTUA, PIAP and TASF facilities to demonstrate the capabilities of on-orbit servicing technologies developed in EROSS.

The EROSS H2020 project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821904.



EUMETSAT CELEBRATES 35 YEARS OF MONITORING WEATHER AND CLIMATE FROM SPACE

This summer, EUMETSAT will celebrate its 35th year as an intergovernmental space agency dedicated to monitoring weather and climate from space.

EUMETSAT started life in June 1986 with a handful of staff, and was based in a modest residential building in Darmstadt. At the time, the organisation had 16 member states but had not yet taken over satellite operations.

Thirty-five years later, the organisation is thriving. The workforce has grown to nearly 1,000 and member states now number 30. The new EUMETSAT headquarter building in the west of Darmstadt, which was inaugurated in 1995, has grown into a busy campus. This growth has been driven by a rapid increase in the number of missions exploited by EUMETSAT. Currently, the organisation operates 11 satellites in geostationary, Polar- and low-Earth orbits, hosts 5 PB of data and over 30 years of climate data records, has eight Satellite Application Facilities - dedicated centres of excellence for processing satellite data - and is a key player in the European Union's Earth observation programme Copernicus.

Future programmes are underway, with several missions planned in the near future such as Meteosat Third Generation (MTG) and the second generation of the EUMETSAT Polar System (EPS-SG). These next-generation geostationary and low-Earth-orbiting satellite systems will revolutionise weather forecasting and climate monitoring. New and better instruments will provide insights into our planet faster and in higher quality than ever before. EUMETSAT will also play a key role in the new phase of the EU's Copernicus programme, by operating the planned CO2 monitoring mission and providing global oceanography and atmosphere products provided by the CRISTAL and CIMR missions.

At the same time, EUMETSAT is making its weather and climate data available to more people more easily than ever before through new cloud based access services coming on stream this year.



Pléiades Neo brings Earth into focus

On 20th May, Airbus shared the first 30cm native resolution images acquired by the first Pléiades Neo satellite, launched from Kourou, French Guiana, late April.

Entirely funded, designed, manufactured and operated by Airbus, it is the first of a family of 4 identical satellites which will form the Pléiades Neo constellation. The highly compact spacecraft are equipped with light weight, next generation silicon carbide optical instruments. They also have inter-satellite links with SpaceDataHighway (EDRS) geostationary satellites to enable urgent acquisitions just 30 to 40 minutes following the tasking request to swiftly respond to the most critical situations. Once complete, the constellation will be able to cover the same point on Earth at least twice a day, with each satellite acquiring up to 500,000km² per day. The design of the Pléiades Neo ground segment constitutes a real technological breakthrough to handle this huge volume of data. The images will be easily accessible on Airbus' OneAtlas digital platform, allowing customers immediate access to both freshly acquired and archive data and providing analysts with a high level of detail, including more visibility of small objects, such as vehicles and road markings

Images:

These Pléiades Neo images, covering a variety of global locations and featuring diverse acquisition angles, provide an impressive level of detail, even before full radiometric and system calibration. The quality will continue to improve over the next few months, and Pléiades Neo imagery is expected to become commercially available in early autumn.





Production Plants for Highly Concentrated Hydrogen Peroxide for propulsion applications

WEPA-Technologies' business activities in the area of storable propulsion technology at current is focused on Hydrogen Peroxide (HTP) based technologies.

Due to an increased market demand, as a supplement to already marketed HTP production plants delivering 90, 95, 98 % H₂O₂ (10 – 1500 kg / day), plants producing exceptionally pure 99.5 % quality now can be provided commercially.

(All plants use commercially available, low cost 30 – 70 % H₂O₂ feedstock – due to the use of proprietary purification technology.)

99.5 % H₂O₂ is of exceptional stability and very advantageous to use in Reaction Control Systems, Satellites or In-Space Propulsion applications as an attractive alternative to traditional systems using Nitrogen Tetroxide (N₂O₄) and Hydrazines.

Commercial availability of production plants is likely to be a major help to actually implement this "greener" propulsion technology, as despite very attractive overall systems performance HTP challenges met to commercially source this HTP in many cases did lead to a premature exclusion of this combination.

Advantages of HTP production technology offered by WEPA-Technologies compared to offers of competitors:

- Very high safety and reliability level through use of industrial automation systems
- Safe Purification technology without dangerous use of ion exchanges
- Remote diagnostics / troubleshooting of plant
- Life Display and Recording of process parameter
- Commercial available, low cost standard feedstocks to be used. (High cost, difficult to source semiconductor grade feedstocks can be avoided.)

For further information please contact:
info@wepa-technologies.de



International Lunar Observatory Association Updates

International Lunar Observatory Association (ILOA Hawai'i) invites everyone to visit our new website at www.iloa.org to read about current projects including 5 Moon missions and Headquarters Campaign, and view the image gallery. ILO-X precursor astronomy instruments are being prepared for NET January 2022 launch aboard Intuitive Machines IM-1 Nova-C spacecraft to land between Mare Serenitatis and Mare Crisium, Moon near side 24.5° N. An exact set date should be made public within the next few weeks, allowing for further refinements and preparations for ILOA to conduct Astronomy from the Moon – soon! ILOA now has 2 professional Lunar Astronomers working with our Executive Committee and Board of Directors: Dr. Ana Mosquera Rovira and Dr. Chien-Hsiu Lee. Our Director, Steve Durst, is looking forward to his first visit to Russia since 1998 where he gave a presentation on "International Lunar Observatories" atop the Russian Academy of Sciences major facility "Golden Brains" in Moscow representing Lunar Enterprise Corporation, precursor to ILOA. Hope to see many of you at GLEX in St. Petersburg, while Russia Luna-25 lander is being prepared to launch 1 October 2021 to Boguslavsky Crater near Moon South Pole. Ad Luna!



Let's build a global space community

This year's International Astronautical Congress (IAC) on 25-29 October in Dubai will play a key role to strengthen the space industry and to define the pathway for the years to come. Space is a global success story – especially in Germany. We will offer you key industry insights at this year's IAC. Don't miss out key players from large system integrators, small and medium-sized enterprises and start-ups!

The global space industry is a booming sector, but more coordination is needed to ensure everyone benefits from this strategic industry of the future. The German industry will play its part in sharing key insights and supporting cooperation in a global space industry.

The German space industry is active in all segments of space – we develop and produce satellites for high-resolution Earth observation, precise navigation and secure communication as well as launchers to secure the independent access to space. In addition, as the German space industry, we operate ground segments and in-orbit services, and are leading in astronautics and exploration. We are at the forefront of international space developments, including future manned moon missions and connectivity constellations.

Our team at the IAC will encompass global space leaders, such as OHB, Jena-Optronik, HENSOLDT Optronics, Tesat-Spacecom and promising German space start-ups such as Isar Aerospace Technologies, Hyimpulse Technologies and Rocket Factory Augsburg.

Come visit us in the German pavilion where 20 German aerospace companies will await for you: <https://www.bdli.de/en> Let us take off together!



The Way to Space!

For the first time in autumn 2020, the Hungarian Astronautical Society (MANT) issued a call for all Hungarian-speaking high-school students to participate in a national space contest. The primary goals were to raise awareness about space activities, and to demonstrate how closely space is connected to most of the school subjects – not only physics, but also chemistry, biology, geography, informatics, and even humanities. Teams composed of 3 students were eligible to register. We planned the first two rounds on-line and the final as a live event. Surpassing our most optimistic expectations, amid the COVID-19 pandemic, there were 91 teams participating in the first round in Nov-Dec 2020. They represented 51 schools from 31 cities in 4 countries. By solving a diverse set of space-related tasks, the best 37 teams qualified for the second round in Jan-Feb 2021. Finally the last round with only 5 selected teams was held on April 10, 2021 – unfortunately, contrary to the original plans, we had to move the event to the cyberspace. Nevertheless, the final was streamed live and the contest became an astounding success. Thanks to our main sponsor, the Ministry of Foreign Affairs and Trade, participants received valuable prizes. The winners and their teacher will have the possibility to visit ESTEC, the technical heart of ESA near Noordwijk, the Netherlands. The first contest of this kind was so successful that we are already planning the continuation.





Valispace introducing educational series around data-driven systems engineering (DDSE)

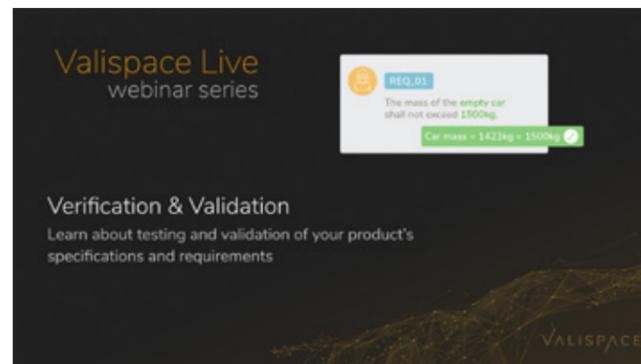
Valispace is committed to revolutionize the way hardware engineers work and collaborate. Besides developing powerful software helping engineers build better satellites, rockets, cars, airplanes & medical devices, Valispace is launching a new webinar series: the Valispace Live webinar series aims to help engineers improve their workflows & get innovative products to market faster.

So far, the educational series have been on [Valispace LIVE 1 - How to do efficient requirements engineering](#) and [Valispace LIVE 2 - How to perform Concept Design Studies and Tradeoffs](#), teaching viewers how to structure these valuable engineering processes.

This stems from the currently being developed complete guide to Data-Driven Systems Engineering: the DDSE Handbook - a set of rules, best practices, and pro-tips from experienced engineers on how to develop complex hardware products from the conceptualization up to the testing phase.

If you are interested in learning more, you can follow the links above or join for the [next webinar on the 30th of June about Verification & Validation](#).

In the meantime, you can take a look at the first DDSE Handbook article about Breaking Down Requirements for Complex Hardware Projects [here](#).



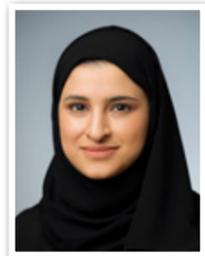
Beijing Interstellar Glory Space Technology Co.,Ltd. (referred to as 'i-Space') is a private aerospace company in China. The company successfully launched two sub-orbital sounding rockets in 2018, and a to-orbit rocket Hyperbola-1 in July 2019. The successful launch of this to-orbit-rocket, not only achieved a “zero” breakthrough in the to-orbit launch mission of China’s private aerospace industry, but also made China the world’s second country have a private enterprise that can independently develop and successfully launch a to-orbit rocket.

In 2020, the company have achieved great progress in developing reusable liquid rocket. So far, Focus-1, the reusable liquid oxygen methane engine manufactured by i-Space, has completed more than 7500 seconds of full system long-range test run. The Focus-1 engine will be used in the VTVL (vertical take-off and vertical landing) test of Hyperbola-2, the reusable liquid carrier rocket by i-Space.

Hyperbola-2 is a small reusable liquid carrier rocket, which has continuous variable thrust capability. It has conducted a series of landing device ground tests, and completed the joint test of rocket control system with rocket engine. In 2021, i-Space plans to carry out VTVL tests of the first sub stage of Hyperbola-2 to the height of meter-level, kilometer-level and a hundred kilometer-level.



Interview with Her Excellency Sarah bint Yousef Al Amiri, Minister of State for Advanced Technology and Chairwoman of the UAE Space Agency



Sarah Al Amiri is UAE Minister of State for Advanced Technologies. Her responsibilities include defining industrial and economic opportunities based on the development of advanced technologies in The Emirates and building the country's technology and innovation ecosystem. She also serves as the chairperson of the UAE Space Agency, the regulator of the UAE's space sector and the funding body behind EMM.

1. What are your expectations for the first International Astronautical Congress – IAC, in the Arab region?

It is my hope that IAC will bring together a global dialogue that widens the active participation of nations and peoples around the world who may never have even considered themselves as somehow 'worthy' of launching a space program. I think that's an important change in perceptions of space exploration as no longer seen as the preserve of a few wealthy nations with large economies. We see a much faster path to innovation, with an active private sector commercializing new opportunities and I think that is going to need a great deal more agility from governments and regulators. I would hope we are going to see a challenging and lively dialogue developing..

2. How do you see the IAC 2021, in Dubai next October, supporting the UAE in moving towards the future?

I think IAC will further catalyse the progress we have made in driving the Emirates' space sector and open up new avenues for exploration and collaboration with our international partners and friends, particularly in the private sector as we move to develop not only our blue sky research programmes but also drive fundamental, real-world commercial opportunities on the back of our investments in space exploration, mission operations and spacecraft engineering. It's yet another step in our journey to building a space sector that is truly limitless in its scope and international in its ambitions.

3. The IAC 2021 will give a great boost to international cooperation in the UAE region. Which sector, in the Industry and Advanced Technology world, do you think will benefit the most?

Continuing to develop international co-operation at a time when countries quite naturally are focusing inwards is undoubtedly a challenge, although by no means insurmountable. We're seeing some great progress with initiatives such as the Artemis Accords but I think there is a great deal more to be done, and leadership to be shown by other, perhaps less well-established players in the space sector. For sure the faster time to iteration in innovation that today's cubesats and small satellite projects is a huge opportunity for faster development and more nimble opportunities, but it also comes with challenges when we look at the proliferation of space junk and I think that's a challenge that hasn't been highlighted enough. We need to strike a balance between the gold rush and regulation to preserve our fragile planet. I think it's not until you have actually been to space that you realise how fragile the balance we depend upon for our children's futures is, to be honest.

3. What do you think are the future challenges of the space sector?

Continuing to develop international co-operation at a time when countries quite naturally are focusing inwards is undoubtedly a challenge, although by no means insurmountable. We're seeing some great progress with initiatives such as the Artemis Accords but I think there is a great deal more to be done, and leadership to be shown by other, perhaps less well-established players in the space sector. For sure the faster time to iteration in innovation that today's cubesats and small satellite projects is a huge opportunity for faster development and more nimble opportunities, but it also comes with challenges when we look at the proliferation of space junk and I think that's a challenge that hasn't been highlighted enough. We need to strike a balance between the gold rush and regulation to preserve our fragile planet. I think it's not until you have actually been to space that you realise how fragile the balance we depend upon for our children's futures is, to be honest.

Interview with Salem Humaid Al Marri, Chair, IAC 2021 Local Organizing Committee, and Adnan Al Rais, Co-Chair, IAC 2021 Local Organizing Committee



Salem Humaid Al Marri
Chair,
IAC 2021 Local Organizing Committee,
United Arab Emirates



Adnan Al Rais
Co-Chair,
IAC 2021 Local Organizing Committee,
United Arab Emirates

1. Why did you choose the theme "Inspire, Innovate & Discover for the Benefit of Humankind"?

We believe that the IAC provides the perfect platform for what we hope to accomplish, that is to inspire, innovate and discover new insights and solutions within the space industry that will have a beneficial impact on humanity, now and in the future. The theme also reflects our aspirations as an organisation to help contribute to the advancement of the space sector, regionally and globally, and to inspire young minds and future generations from this part of the world to get involved in all ways possible in space exploration. In addition, this theme reflects the very essence of what Dubai is as a city and the UAE as a nation – we value innovation and are committed to making significant contributions to the progress of human society as a whole.

2. What are the main distinctive features of the IAC 2021 in Dubai and what make it special?

Hosting the IAC 2021 in Dubai is special on many levels. First, it is the first time that this event will be held in the Arab world, where a nascent space industry is rife with potential and opportunities. It is also being held at a unique junction when the Dubai Expo 2021 is happening. Congress delegates, participants and guests will have the distinct opportunity to attend the event and be able to experience the many cultural and scientific showcases on offer at the Expo. This rare confluence of events will be a once-in-a-lifetime opportunity and can be a truly enriching experience. It will also host a popular space science exhibition that has been meticulously curated to reflect the region's thriving space sector and to encourage greater engagement from guests.

3. What do you expect delegates to get from the IAC 2021 in Dubai?

The congress offers a multitude of opportunities for learning and discovering new insights about the space industry, which will hopefully lead to new inspiration. The event is structured to offer participants a plethora of platforms for networking and establishing partnerships across government, business and industry as well as academia. The IAC 2021 also presents the perfect opportunity for regional players to reach out to the world and showcase capabilities, experience, contribution and innovations to a wider audience. Overall, we hope delegates will be inspired to contribute new insights and innovations or advancements that will help push the boundaries for the space sector as a whole.

4. What legacy do you wish to see IAC 2021 leave in the space sector?

We seek to be able to make a difference in contributing to a more robust space sector in the Middle East, and to bring it to the level where we can say we are at a stage where it can be a source of sustained innovation and provide commercial benefits for the countries in the region who are looking to be more active in the space industry regionally and internationally. We also hope to see local and regional businesses getting access to a wider market and seeing talent from the Middle East being recognised on the global stage; or getting access to space industry leaders, thinkers and innovators from around the world.



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The next IAF newsletter will be issued in October 2021