NEWSLETTER

Volume 2, Issue 3

December 2020

71st IAC 2020
The CyberSpace Edition

Highlights and people behind the scene

Nobu Okada
CEO Astroscale

Exclusive Interview on Page 4

Young Professional's
* * * Newsletter * * *

December 2020, Volume 2, Issue 3

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Message

Dear friends,

I am sure that most of you will still be in a somewhat unusual situation with varying degrees of lockdowns and work-from-home schemes around the globe. Nonetheless, I do hope that by late 2021 the situation has improved enough that we will be able to see each other in-person again at the IAC in Dubai! We are already working on various aspects of this year's Young Professionals Programme, so rest assured we will be ready for it. In the meantime, please be on the lookout for announcements of WD/YPP virtual events throughout the year. We will have several and will announce these ahead of time on our various social media pages.

In this newsletter we will look at what is currently going on in our industry but we are also looking back at the 2020 IAC - The Cyberspace Edition. You can read about the events that took place and in addition get a glimpse of the team at the IAF that made that all possible.

Patrick Hambloch
Chair, IAF WD/YPP Committee

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YP Newsletter is an official information document from IAF-WD/YPP committee.

This is volume 2, Issue 3

WORKFORCE DEVELOPMENT/ YOUNG PROFESSIONALS PROGRAMME COMMITTEE (WD/YPP)

IAF YOUNG PROFESSIONALS PROGRAMME

The International Astronautical Federation—Workforce Development Young Professionals Programme Committee (IAF-WD/YPP) is one of the administrative committees dedicated to Young Professionals and Students. The committee's scope includes all matters pertaining to international space community workforce development. The committee focuses on early career professionals in all the areas of the aerospace community and provides overall guidance to IAF's Young Professional Programme:

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Editorial Board (Communications) wishes you all a very happy and prosperous New Year 2021

Nobu Okada

Founder and Chief Executive Officer
Astroscale Holdings Inc.

Vice President, Space Economy and Sponsorship, IAF

Please introduce yourself to our readers in the IAF community.

My name is Nobu Okada, and I love space! I love what we humans have been able to accomplish in space, as well as the possibilities and potential that space holds for us. That is why I feel so passionately about sustaining space for our use today and for the benefit of generations to come. As a teenager, I attended a camp at NASA's Marshall Space Flight Center in the United States and met Japan's first astronaut, Mamoru Mohri. He gave me a handwritten note that read, "Space is waiting for your challenge." I still have that note, and it has driven my desire to work in the space industry ever since.

How did you first get involved with the International Astronautical Federation (IAF)?

I attended my first IAC in 2013, where I learned about the IAF. That was just a few months after I founded Astroscale. We then joined IAF in 2014.

As newly elected IAF VP, what will be your role over the next three years?

I'll be Vice President of Space Economy and Sponsorship for the next three years. My goal is to contribute to the IAF as a representative of Japan and the Asian region, an advocate for orbital sustainability, and a voice for the emerging new space sector.

You have been in many leadership roles, but how did your career start? What did you want to be when you finished your studies? Was your space career always part of your plan?

As a child, many adults asked me "what's your dream?" and "what would you like to be?" I was always quite uncomfortable about these questions, as I had no clear ideas about my dreams or direction. It took 40 years until I found something I can be passionate about – the issue of space sustainability.

What was the turning point that made you focus on entrepreneurship and then space? Did you have any mentors or sponsors at the time?

I began my career at the Japanese Ministry of Finance. Then, I became a strategy consultant and later managed IT companies in Japan, China, India, and Singapore. However, eight years ago, as I was struggling to find satisfaction in my career, I learned of the growing issue of space debris and remembered Mamoru's note. I thought there must be better ways to address orbital sustainability than the ideas I was hearing, so in 2013 I used my personal funds to found Astroscale. Since then, we have grown to more than 150 team members in five countries, all dedicated to our mission of securing the safe and sustainable development of space for the benefit of future generations.

What was your biggest challenge? What inspired and motivated you most?

I have faced various challenges in previous companies: our products didn't sell well, team members left suddenly, I saddled myself with huge debts and problems like that. However, I believe I have tried to admit to and embrace these challenges and slowly move forward. I truly feel that's the best approach when you're in a tough situation.

What is the professional accomplishment you are most proud of?

This may not be the right answer, but what I think or say and what I do are in harmony. I'm proud of being able to do that over a long career, as it keeps me honest and drives me forward.

How do you think the space business is going to develop in the next decade?

I think we will see some contraction and consolidation, but we will also see a leap in growth as we begin to unlock the possibilities afforded by placing logistics and infrastructure into orbit. Satellite constellations are growing, plans to return to the Moon and go on to Mars are being developed in earnest, space tourism is slowly becoming a reality, Earth observation is critical in responding to climate change and large-scale disasters, and there is a greater desire to strengthen the security of space systems. This can't be passively managed in the current state of near chaos – we need on-orbit versions of transportation, maintenance, construction, traffic management, emergency services, waste management, and the other logistical capabilities that support sustainable progress on Earth.

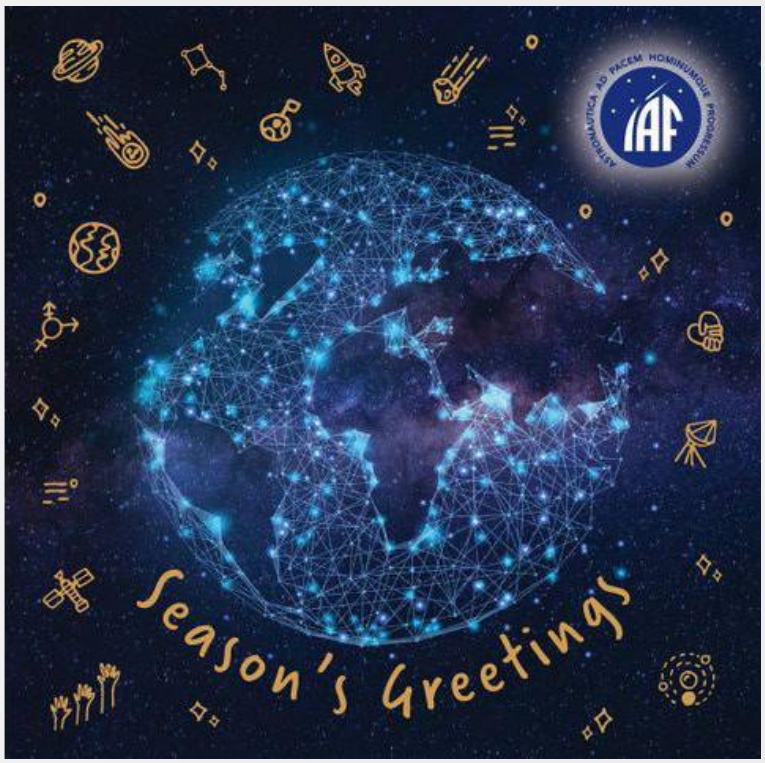
What is your advice to the young professionals and students to have a successful career in the space sector?

Keep an open mind about what skills and experiences are useful in the sector – not everyone needs to be an actual rocket science (I certainly am not!). Expertise in policy, software, marketing, business development, systems, human biology, cybersecurity – in addition to engineering – will all be needed now and in the future of space.

What three hashtags do you think will define the space business in the next decade?

#infrastructure
#scalability
#sustainability

·ASTROSCALE·
SPACE SWEEPERS
SINCE 2013



Read IAF Presifdent Prof. Dr. Pascale Ehrenfreund season's greetings here

Space Debris

Growing Threat

Astroscale

There is no issue related to space more important for all of us to get right than that issue of space situational awareness and space traffic management. We need to preserve the space environment for generations to come. The only way we're going to be able to do that internationally is to collaborate.

–NASA Administrator Jim Bridenstine, 1 October, 2018

130 million

↔ smaller than 1cm

There are millions of pieces of debris in orbit that are too small to be tracked.

34,000

↔ greater than 10cm

Pieces of space debris over 10cm in diameter being tracked, currently.

28,100 kph

Orbiting up to vast speeds

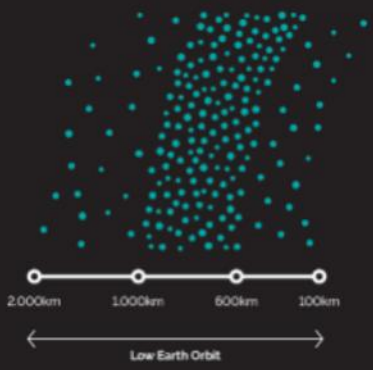
8,950+

Satellites launched to-date

5,000+

Currently orbiting, only 1,950 operational

Astroscale



Most satellites operate in Low Earth Orbit (between 800-2,000km), the same area where the majority of space debris is found.

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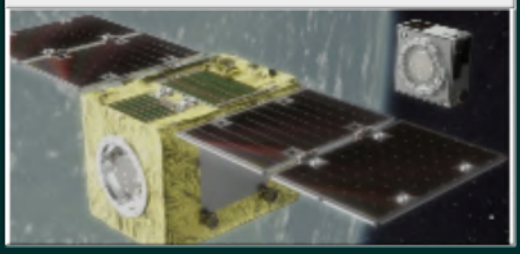
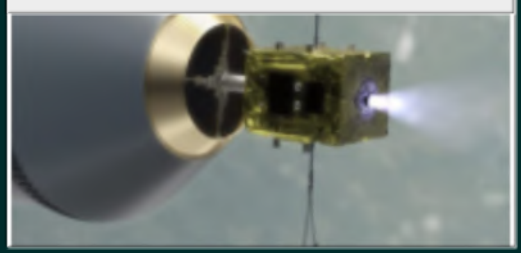
End of Life (EOL)

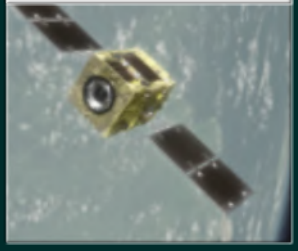


Active Debris Removal (ADR)

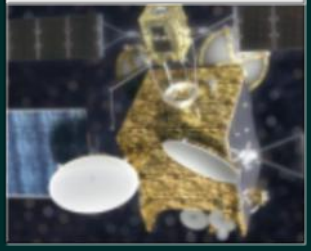


Astroscale

In situ SSA



Life Extension



Lunar Dream Capsule

- Article Source: Astroscale

Image: © NASA

MARS 2020

PERSEVERENCE

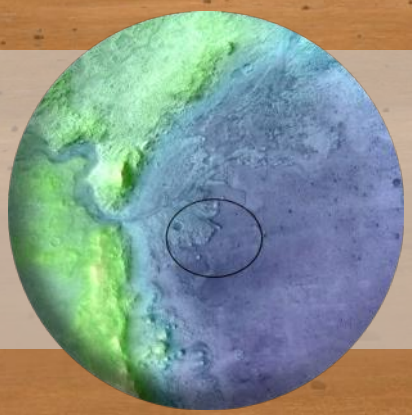
Landing on

February 18, 2021

@ Jezero Crater

Location: North of the Martian equator, in the Isidis Planitia region (18.4 degrees north/77.5 degrees east)
Diameter: 28 miles (45 kilometers)

Perseverance will touch down on Mars on Thursday, Feb. 18, 2021, at approximately 12:30 p.m. PST (3:30 p.m. EST). During landing, the rover plunges through the thin Martian atmosphere, with the heat shield first, at a speed of over 12,000 mph (about 20,000 kph). A parachute and powered descent slow the rover down to about 2 mph (three-fourths of a meter per second). A large sky crane then lowers the rover on three bridle cords to land softly on six wheels. Landing on Mars is hard. Read all about the rover's harrowing entry, descent and landing.



Jezero crater sits within the Isidis Planitia region of Mars, where an ancient meteorite impact left behind a large crater some 750 miles (1200 kilometers) across. This event is known as Isidis impact, and it forever changed the rock at the base of the crater. A later, smaller meteorite impact created the Jezero crater within the Isidis impact basin. Scientists believe that these events likely created environments friendly to life. There is evidence of ancient river flow into Jezero, forming a delta that has long since been dry.

On Landing Day, Feb. 18, 2021:

Tune in to Watch Live

The NASA TV broadcast from Mission Control starts at 11:15 a.m. PST/2:15 p.m. EST.

- Article Source: NASA

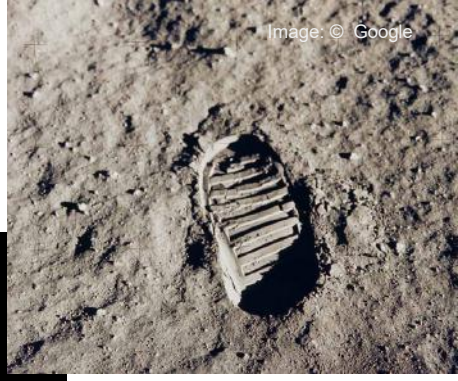


Image: © IAF

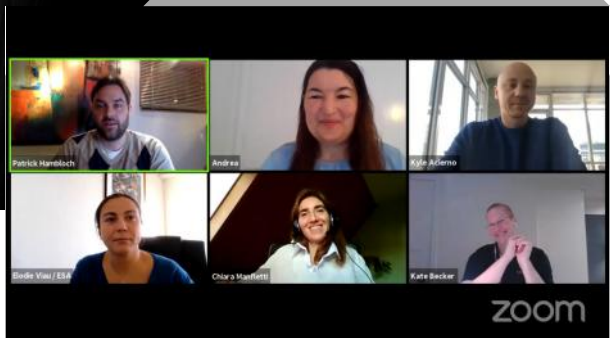


Image: © IAF

NextGen Summit Report

NextGen Summit sponsored by Blue Origin and hosted jointly by IAF committtees/sub-committtees WD/YPP, SEOC, NGP, Space Generation Advisory Council (SGAC) and Inernational Space Education Board (ISEB) focused on engaging the Next Space Generation community through an online space Summit organized by SGAC, ISEB and the SEOC, WD-YPP and NGP IAF Committees. This year, many of the in-person events around the globe have been cancelled or postponed. As the IAC CyberSpace theme was "IAF Connecting @ll Space People", given our mission to spread inspiration and keep engaged the next generation community, we wanted to create a dedicated summit for the Next Generation to keep our community connected and it happened on Saturday, October 10th, 2020 on the week-end before the 71st IAC CyberSpace edition.

It was a very successful YP event. The target audience were everyone, with a focus on our Next Generation to keep our community engaged through different activities and spread our message of unity and hope to space supporters around the world and have a fun and engaging activity before the IAC CyberSpace. The summit encouraged the Next Generation to become more involved with the IAF, and highlights the ways in which they can do that. In addition, the summit was Live Streamed for free, without requiring an entrance fee.

NextGen Summit's objective was to keep our space generation community engaged through different activities divided and organized between the NextGen Summit organizers. Each activity took a maximum of 15 to 20 minutes in order to have a dynamic experience touching different topics, activities and opportunities that can include: Keynote Speeches (CEOs, Astronauts, Space VIPs etc), IAF Speechees (Committees, ESL, YSL etc), organizers Sponsors and Partners speeches, quiz activities (e.g. online trivia night), online contests (e.g. photography, costumes etc), #askmeanything sessions (with a dedicated online chat room)

Each session was moderated by a master of ceremonies and the whole NextGen Summit was divided into specific time slots where each organizer were able to showcase and prepare specific activities during the whole NextGen Summit.

The event began with opening remarks from Pascale Ehrenfreund, President, International Astronautical Federation; Arnau Pons, Chair, Space Generation Advisory Council; Hugo Marée, Head of ESA Education/ ISEB Chair followed by a keynote from Bob Smith, CEO, Blue Origin and Sophia Porter, Test Operations Engineer, Blue Origin on career Lessons from Blue Origin moderated by Ms. Harriet Brettle, Co-Chair, Space Generation Advisory Council.

The event was well promoted by each organizer on their specific communication channels. IAF too promoted and advertised the NextGen Summit initiative on their communication platforms. There was a considerable number of participants well beyond expected and the event was a huge success.

Spring Meetings 2021

IAF SPRING MEETINGS

Save the Date:
23 – 25 March 2021
Virtual Event

Dear IAF Community,

The International Astronautical Federation (IAF) is pleased to invite you to its annual Spring Meetings to take place virtually from 23-25 March 2021.

During these three days IAF Administrative and Technical Committees meet and the International Programme Committee (IPC) selects the abstracts to be presented during the IAC 2021 in Dubai.

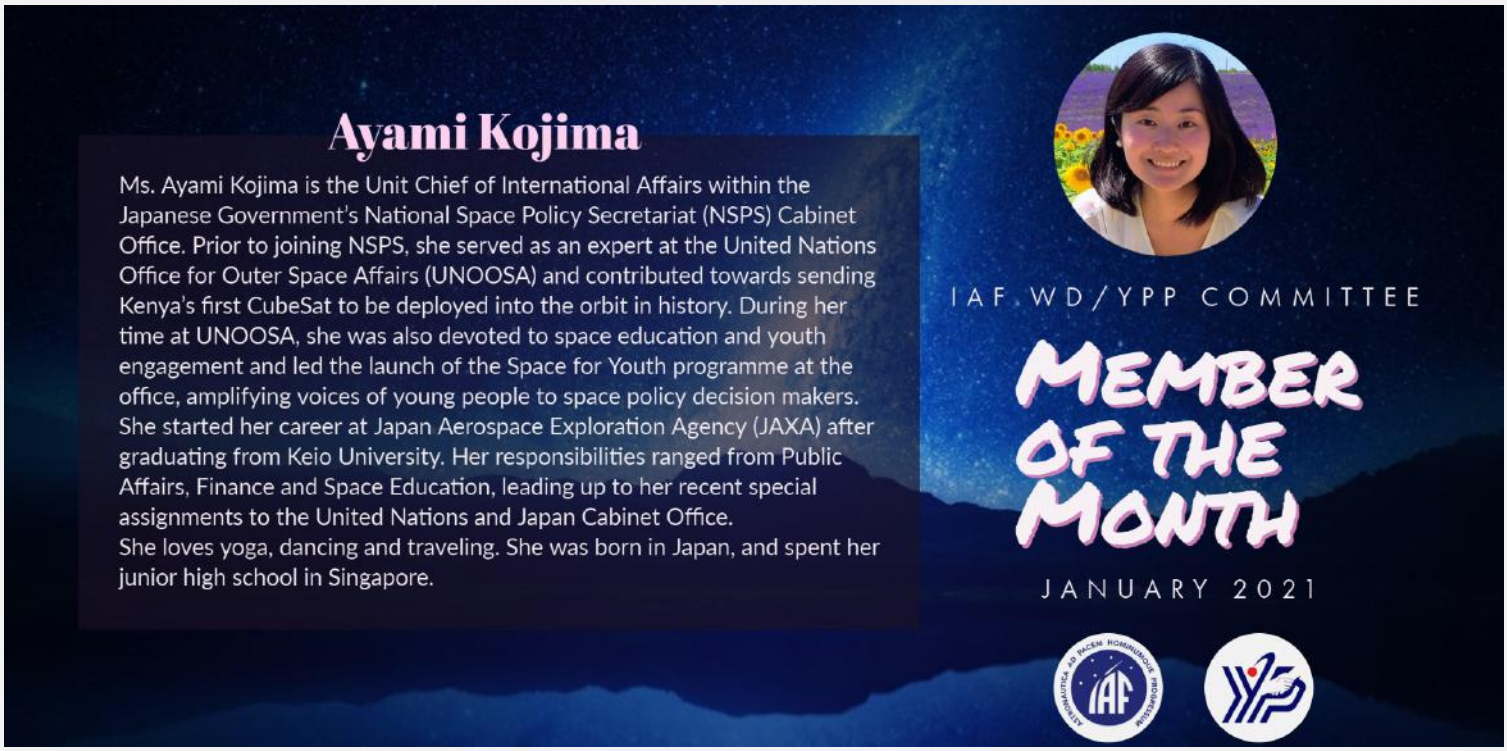
For programme details, click below

https://www.iafastro.org/events/iaf-spring-meetings/iaf-spring-meetings-2021.html

We look forward to seeing you in the meetings!

Best regards,

IAF Secretariat



SAVE THE DATES

The International Astronautical Congress IAC 2021 will be a 72nd conference this year, branded as the "IAC 2021 - Inspire, Innovate & Discover for the Benefit of Humankind. For registration and congress related details, go to IAF News on Pages 26-28. Follow us on:

@iafastro @iafastro @iafastro

The IAF , powered by Young Professionals

The International Astronautical Federation is the world's leading space advocacy organisation, with 407 members and 71 countries represented. Connecting @ll Space People is the motto that drives the passion and motivation of all the people that makes the IAF a success story. Such a huge and leading organization is, however, powered from a small office in the center of Paris: the IAF Secretariat. The team behind the scenes, that makes everything seem so smooth and easy, is composed by 15 individuals that support the work of the technical committees, manage all those 407 members and coordinate the different events organized by the IAF throughout the year. Their great work is well known by all IAF members and well appreciated and valued by the space community. But, did you know that out 15 people in the team, 10 are Young Professionals? It is refreshing and inspiring to think that the world leading space organisation is run mostly by young professionals. They all come from 8 different countries (Italy, Austria, Poland, Morocco, Sweden, Croatia, Russia, France), and deal with people from all around the world in a day to day basis: they are the clear example of working in an intercultural and diverse team. The IAF Secretariat offers them a unique working environment, and in fact, one of the team members joined the IAF Secretariat when she was only 22 years old! and 9 years later, she is still working in such a dynamic team. And last but not least, something remarkable in our sector and worth to mention: more than 70% of the IAF Secretariat is composed by women and 25% are mothers. This shows, once again, that the young workforce is capable of incredible things, that we master challenges we are faced in front of us, even at bigger scales. Take the IAF Secretariat as an inspiring role model for you, as young professionals, to continue achieving outstanding things in your career. Hear directly from them what it means to work at the IAF Secretariat:

" Working at IAF is like integrating a small family. We are a team of young space enthusiasts and our goal is to establish a link between each member of the community and make everyone feel part of it".

" At the IAF you serve a purpose with space, you have a positive impact on the people you work for and your skills are fully developed - being a small organization".

"The IAF is the right place to provide a platform where all the young space-passionate people like me can dive in and explore this world, to shape the future and become the backbone on which the space activities will lean on tomorrow."

"One of the things I love most at the Secretariat is the fact the work we do is never repetitive. Being a small (and super-friendly!) group you get support with very different tasks, and even if many characteristics of our events are now well-established traditions, each country and host is a completely new experience".

"It is great to work in a young, dynamic team! I love the fact that the IAF promotes international cooperation by connecting all space nations and that we get the chance to collaborate with people from all over the world."

"Being part of the IAF gives me a unique opportunity to contribute to the space community's awe-inspiring advancements by supporting a fruitful dialogue across institutions, expertises and cultures. I value our role as a connector – it's a source of professional growth and an ever-inspiring task, made all the more enjoyable by our small team's dedication and mutual trust!"

Image: © SPACEX

As a self-funded private spaceflight project, the SpaceX Starship system is a fully-reusable, two-stage-to-orbit, super heavy-lift launch vehicle under construction by SpaceX since 2012.

The second stage, also referred to as "Starship," is planned as a long-term cargo and, finally, a spacecraft carrying passengers. Initially, it is used without any booster stage at all, as part of a thorough development programme to prove launch-and-landing and iterate on a variety of design specifics, particularly with regard to the atmospheric reentry of the vehicle. Although the spacecraft is reportedly being tested on its own during 2019-2020 at suborbital altitudes, it will later be used with an additional booster stage on orbital flights, the Super Heavy, where the spacecraft will operate as both the second stage on the two-stage-to-orbit launch vehicle and the long-duration orbital spacecraft in space.

In March 2019, with the addition of a single Raptor rocket engine to a reduced-height prototype called Starhopper, systems design testing of a test platform for Starship commenced. Starhopper was used for static testing and low-altitude, low-velocity flight testing of vertical launches and landings in 2019 and was followed by two additional full-size tank prototype models (SN5 & SN6), which in 2020 also undertook low-altitude test flights. The first high-altitude test flight was carried out in 2020 by Starship prototype SN8, performing an effective paraglider fall using high-drag body flaps, followed by a reorientation burn and propulsive landing on the concrete landing field.

The hard landing was a consequence of lower than anticipated pressure in the methane header tank, leading to the vehicle burning on the landing pad, but a significant achievement for the Starship programme was the successful completion of several research goals on this test flight.

SpaceX could likely deploy commercial Starship payloads no earlier than 2021. NASA chose a revamped crew-rated Starship system in April 2020 as one of three potential design designs for the lunar landing system to obtain funding for the NASA Artemis programme for a 10-month long initial design period.

SPACEX

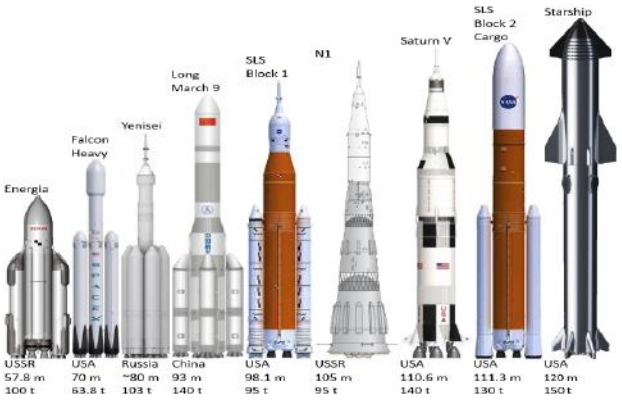
SpaceX, is an America based aerospace manufacturer and space transportation services company headquartered in Hawthorne, California. It was founded in 2002 by Elon Musk with the goal of reducing space transportation costs to enable the colonization of Mars.

www.spacex.com

Elon Reeve Musk FRS is an engineer, industrial designer, technology entrepreneur and philanthropist. He is the founder, CEO, CTO and chief designer of SpaceX; early investor, CEO and product architect of Tesla, Inc., founder of The Boring Company; co-founder of Neuralink; and co-founder and initial co-chairman of OpenAI.

Elon Reeve Musk FRS

Image: © wikipedia



Once operational, it has the capacity to carry more than 100 metric tonnes, or 220,000 pounds, of cargo to low Earth orbit, than any rocket in the world. Starship missions could potentially carry people to the moon, Mars, and other remote destinations with life support systems and in-space refuelling.

The vision of Musk, who set up the business with a plan to send people to Mars, is fundamental to Starship. Future Starships, Musk says, could cruise to Mars with up to 100 individuals.

Musk stressed the development of SpaceX in manufacturing technologies and ground infrastructure, enabling the organisation to quickly develop prototypes, test them, and incorporate enhancements and modifications to follow-on vehicles.

SpaceX has begun to develop the first Super Heavy booster modules, which will be the first step of the full-scale Starship spacecraft. The upper stage stacked on top of the Super Heavy will act as starships like the vehicles undergoing massive testing.

The first Super Heavy designs could fly to low altitudes with only a few Raptor engines, just like the early Starship test flights. The Starship would require a heat shield for re-entry for an orbital mission as well. For propulsive landings, both stages will come down to Earth, just like the first stage of Falcon 9 rocket.

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Image: © Isis Valencia / Spaceflight Now

That will make the totally reusable Super Heavy and Starship. No stranger to setting optimistic schedules for SpaceX projects, in October Musk said he was "80 to 90 percent confident that next year with Starship we will reach orbit."

Last year, Musk said the first Starship orbital launch could occur in 2020. SpaceX won't reach that schedule, despite the rapid rate of progress.

Musk said in August that SpaceX is still not doing much of the life support systems production that Starships would need to serve individuals. That will come after SpaceX can demonstrate that the vehicle can successfully fly.

SpaceX's longer-term roadmap includes an in-orbit refueling capability to make trips to the moon possible. NASA selected SpaceX's Starship vehicle in May as one of three contenders — alongside Blue Origin and Dynetics — for a human-rated lunar lander the space agency will fund for crewed moon missions later this decade.


Image: © SPACEX

SpaceX will be needed by the moon missions to master in-orbit refuelling between two Starships. Earlier this year, Musk said he believes SpaceX has a chance at achieving that in 2022.

More recently, at a Dec. 1 ceremony in Berlin at which he received the German publishing company's Axel Springer Prize, Musk said he was 'highly optimistic' that SpaceX would be able to make the first human landing on Mars in six years.

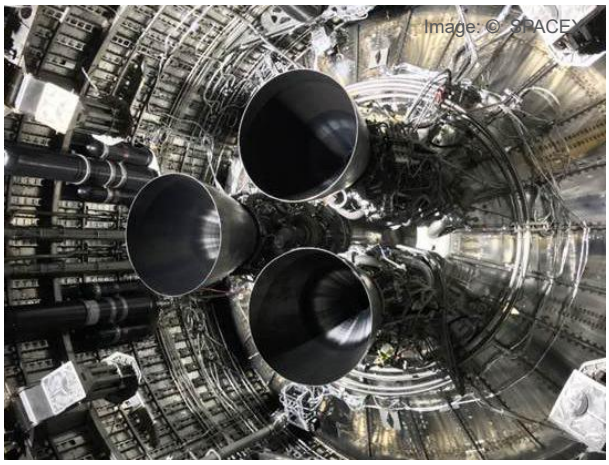


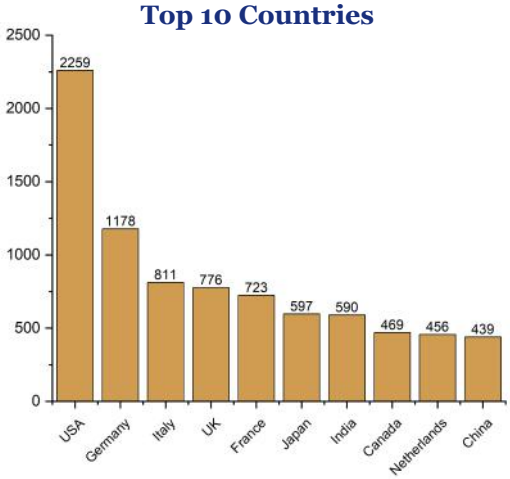
Image: © SPACEX

- Full report at: https://spaceflightnow.com/2020/12/07/gleaming-prototype-of-spacexs-starship-ready-for-experimental-flight/ and Wikipedia

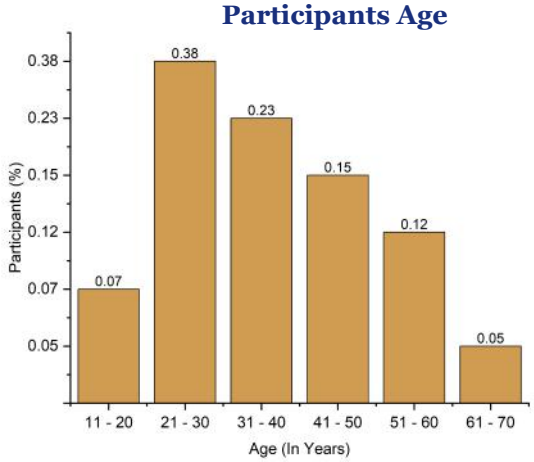
The IAC 2020 Virtual Platform was developed by the IAF together with VFairs, a professional virtual event platform. It featured virtual environments that resembled the congress centre at a regular IAC. This cover story follow the platform's structure, the different sections based on the IAC 2020 menu. In the online version of this story, the menu is interactive and will let you navigate through the different parts just as you could do on the IAC 2020 Virtual Platform.

Geographical Distribution

Top 10 Countries



Participants Age



MONDAY: OPENING CEREMONY

The 71st International Astronautical Congress was unlike any other. For the first time in the history of the congress, the entire event was virtual. The opening ceremony featured greetings from leaders around the world and also beyond with the connection from the International Space Station (ISS). The IAF President Pascale Ehrenfreund awarded the leaders of the Chang'e 4 mission with the prestigious IAF World Space Award and announced the creation of the IAF Digital Library.

"The IAF was founded to build a bridge in one of the darkest moments in our recent history—the Cold War. 2020 has been undoubtedly a challenging year for all of us and this unprecedented situation called for an unprecedented Congress." -Pascale Ehrenfreund

MONDAY: PLENARY: HEADS OF AGENCIES

The leaders of the American, Canadian, Chinese, European, Indian, Japanese, and Russian Space Agencies convened to discuss recent developments at their agencies and what they see in the future of space exploration. Some major topics of discussion included the impact of the ISS for each agency, the importance of international cooperation, and how commer- cialization is changing the role of national space agencies.

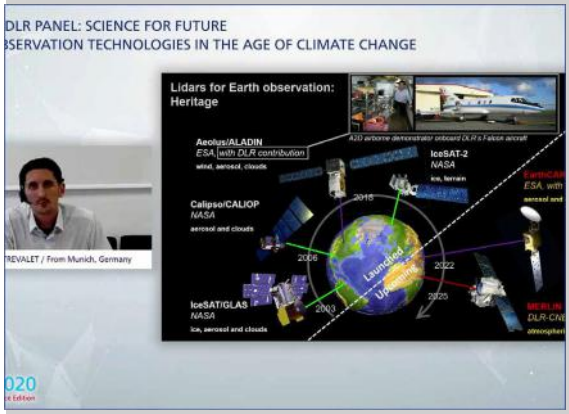
"Competition is a drive, but collaboration is an enabler. We all know that we can do more when we work together and I would say it's more important now than ever before." -Jim Bridenstine

MONDAY: SpS: STATE & ESPONSE OF GLOBAL SPACE SECTOR DURING COVID - 19

Over the past year, the world has grappled with unprecedented challenges faced as a result of the Covid-19 pandemic. In many respects, the space industry was uniquely prepared to deal with these challenges, but the ultimate impact of the pandemic is still uncertain. At this special session, a panel of industry experts with a global perspective discussed how the space sector has responded to the pandemic, its future outlook, and how to find opportunity in crisis.

"When addressing global health crises, such as the one we are currently facing space can support both national and global policies tremendously." -Pascale Ehrenfreund

MONDAY:IAF GLOBAL NETWORKING FORUM (GNF): DLR PANEL



The DLR Panel at the Global Networking forum was a discussion led by Hansjörg Dittus and Walther Pelzer, Executive Board Members at the German Aerospace Center (DLR), that highlighted three Earth Observation initiatives at the DLR focused on climate change. Dr. Dittus and Dr. Pelzer were joined by Paola Belingheri, Co-Founder of IceKing App; Mathieu Quatrevalet, a Lidar Research Scientist on the MERLIN Mission; and Pooja Pandey, a Cus- tomer Success Engineer at Planet. Each guest discussed different ways current and future satellites are fostering a better understanding of Earth's climate systems, from monitoring glaciers to pinpointing methane emission hotspots.

MONDAY: HIGHLIGHT LECTURE: THE CHANG'E 4 MISSION

The International Astronautical Federation awarded its prestigious IAF World Space Award to the leaders of China's Chang'e 4 Mission, it was awarded to Weiren WU, Dengyun YU and to Zezhou SUN. In 2019, China became the first country to soft land on the far side of the moon. The Chang'e 4 lander and rover have changed our understanding of the lunar environment and provided an unprecedented glimpse at the far side of Earth's satellite. The IAF bestowed its World Space Award in recognition of this massive accomplishment, and the Deputy Director of the Science and Technology Committee at the China Aerospace Science and Technology Corporation discussed what Chang'e 4 has discovered so far.

TUESDAY: IAF EXCELLENCE IN INDUSTRY AWARD CEREMONY

This year, Airbus Defence and Space has been awarded for its excellent achievements over the years, and in particular in 2019, for managing to deliver world-beating space technology to customers around the world: from the 2400 spacecraft equipment, to the 18 satellites successfully placed in orbit. This event featured a special Keynote Presentation by Dr. Jean-Marc Nasr, Head of Space Systems within Airbus Defence and Space and President of Airbus Defence and Space SAS. Dr. Nasr announced to the IAC audience that Airbus has successfully demon- strated the production of oxygen and metals from simulated lunar dust (regolith) with the Airbus-invented process named ROXY (Regolith to OXYgen and Metals Conversion).

TUESDAY: IAF GLOBAL NETWORKING FORUM (GNF): ISS COMMERCIALIZATION & FUTURE IN LEO

For two decades, the International Space Station has been humanity's home in low Earth orbit and the proving ground for new space technologies. But as the ISS reaches the end of its planned life, NASA and its partners are looking to the commercial space industry to plot the future of exploration and innovation in LEO. This global networking forum brought together the leaders of three companies to discuss their vision for the future of the space industry close to Earth and how the commercialization of the ISS is vital to enabling deep space exploration.

"Our mission is to improve life on Earth and foster the possibilities beyond it by building and operating the world's first commercial space station." - Michael Suffredini

TUESDAY: PLENARY: STRATEGIES FOR SURVIVAL & RECOVERY IN COVID - 19

A panel with representatives from small and medium-sized companies around the world discussed how Covid-19 has impacted their business and the space industry in general. Although small and medium-sized businesses have experienced the brunt of the economic fallout from the pandemic, each panelist offered advice on how to weather the storm going forward and what they've done in their own business to make it sustainable during this unprecedented crisis.

"A lot of times small and mid-sized companies go for aggressive growth. You see opportunities and you want to step it up. But I think it serves as a good reminder that we should not lose sight of good business fundamentals." -Lynette Tan

TUESDAY: IAF GLOBAL NETWORKING FORUM (GNF):THE ARTEMIS MISSION

In 2024, the first woman and next man will set foot on the surface of the Moon as part of the Artemis mission, an ambitious plan to establish a permanent human presence around the Moon. Artemis is led by NASA, but it is fundamentally an international mission that also depends on dozens of companies in the space industry. This panel brings Kathryn Luederes, Associate Administrator for the Human Exploration Operations Mission Directorate at NASA, in conversation with Walter Cugno, the Vice President of Exploration and Science Domain at Thales Alenia Space Italia, and Brent Shrewood, Vice President of Development Programs at Blue Origin, on the role of government and industry in the return to the moon.

TUESDAY: IAF GLOBAL NETWORKING FORUM (GNF): ORION, FOR DEEP SPACE

Before humans return to the surface of the Moon in 2024, they'll have gazed upon the lunar surface from orbit out of the window of Orion. Next year, NASA's new human-rated capsule will make its first journey into deep space by doing a lap around the Moon. The mission will be uncrewed, but it will lay the foundation for Orion's first crewed orbit around the Moon in 2023. At this Global Networking Forum panel, several Orion engineers and program managers came together to discuss the challenges of building Orion and how to design a capsule for deep space exploration.
"Artemis is not just about doing amazing science on the moon. It's also about preparing us for our next destination, which is Mars." -Shelby Hopkins

TUESDAY: IAF LAUNCHPAD MENTORSHIP PROGRAMME ANNOUNCEMENT

The IAF launched a new initiative focused on mentorship and career development, pairing early- to mid-career professionals with experienced senior professionals in the space industry. The Mentorship Programme aims to facilitate career development and leadership capabilities of the mentee, and provide a platform for enhanced communication between the various generations represented within the IAF.

TUESDAY: NEXTGEN SUMMIT: INSPIRATION AND INNOVATION

This year's IAC's NextGen Networking Session brought together the best and brightest of students and young professionals dealing with Public/Private Partnerships (PPPs). The session showcased how the next gen is working to ensure that space is both sustainable and attainable through effective PPPs. The panel was very interactive, answering mostly questions from social media. Public/Private partnerships emerged as one of the best ways to drive innovation and new business models. It was also outlined the importance of making new connections to have new business ideas. This is facilitated by the current interconnectivity all over the world – a great advantage for this young space generation. The role of emerging space nations and non-space fairing nations

TUESDAY: HIGHLIGHT LECTURE: MEV 1-WORLD's FIRST COMMMERCIAL ON- ORBITING SERVICE MISSION

In this highlight lecture, Brian Weeden, Director of Program Planning at Secure World Foundation, discusses the historic Mission Extension Vehicle mission with Joseph Anderson, the Vice President of Business Development and Operations at SpaceLogistics LLC. MEV-1 is the world's first satellite life-extension mission that was successfully launched in early 2020. Anderson describes it as the beginning of a new era for satellite operators, which have now the ability to extend indefinitely the lifetime of their spacecraft indefinitely. "The hypothesis for our business is that a cost effective, reliable and safe method for extending the lives of these satellites would make existing operators more cost effective and break down barriers." -Joseph Anderson

TUESDAY: NASA TV: INTERNATIONAL PARTICIPATION IN THE ARTEMIS PROGRAM

During a historic session at the International Astronautical Congress, NASA Administrator Jim Bridenstine outlined the Artemis Accords, the agency's plan for fostering the peaceful uses of outer space. Bridenstine was joined by leaders from seven other space agencies in signing the Artemis Accords, which commits them to abiding by the principles of the Outer Space Treaty. The eight signatories to the Artemis Accords are the United States, Australia, Canada, Japan, Luxembourg, the United Arab Emirates, Italy, and the United Kingdom.

"We are passionate proponents of the ideal of international collaboration. We are one human race and we are in this together." -Sarah bint Yousef Al Amiri

WEDNESDAY: CGTN TV/IAF: NEW ERA IN COMMERCIAL SPACE

The CGTN session was a unique experience at the 2020 International Astronautical Congress. Set aboard a fictional spaceship, it was a panel that explored the present and future of commercial activities in space. The panel brought together leading voices from global space companies that are working on everything from launch services to Earth observation systems. The diverse panel agreed that there is massive potential in the commercialization of space and that this new era for the space sector is just getting started.

WEDNESDAY: IAF EXCELLENCE IN 3G DIVERSITY AWARD CEREMONY

This event was held in the frame of the IAC's Diversity and Outreach day. This year, the IAF Excellence in "3G" Diversity Award has been awarded to the European Space Agency (ESA), for their commitment to create a modern and inclusive working environment and striving to enhance the innovative perspectives brought in by a diverse pool of talents. The event was hosted by IAF President, Pascale Ehrenfreund, Deganit Paikowsky, IAF Vice-President for Diversity Initiative and Science and Academic Relations and IAF Vice-President for Communications, Publications and Global Conferences, Mary Snitch. Ersilia Vaudo, ESA's Chief Diversity Officer gave a special Keynote on ESA's Diversity Initiative.

WEDNESDAY: SpS: HIGHLIGHTING THE POTENTIAL OF AI & ML INTO SPACE

Space exploration has always depended on intelligent robots capable of performing their duties without human intervention. But as artificial intelligence becomes cheaper and more sophisticated, it is opening up entirely new possibilities for ma- chine intelligence in space. This special session brought together leaders in space- based AI to discuss how artificial intelligence is changing space exploration today and what to expect in the future.

“AI powered space exploration might offer new perspectives and new understanding of life and its origins, and answers to questions we haven't even asked yet.” -Andrea Sapera

WEDNESDAY: PLENARY: EARLY 2020, LAUNCH OF WORLDWIDE MISSIONS TO MARS

The global pandemic has made 2020 an especially challenging year, but it’s also been an in- credibly exciting year for Mars Exploration. Three national Missions to Mars were launched this summer, an unprecedented robotic train to the Red Planet that will be used by scientists to search for evidence of ancient microbial life and lay the foundation for the first sample return mission. During this plenary, leaders of the different Mars Missions discussed their exploration ambitions and the challenges involved with sending a robot to another planet.

WEDNESDAY: IAF GLOBAL NETWORKING FORUMS (GNFs): IAF/ASE ASTRONAUT PANEL

Just like the rest of the space sector, astronautics is changing fast. For the past few decades, low Earth orbit was the sole domain of professional astronauts, but now that the world is on the brink of a full-fledged space tourism industry, spaceflight is coming into reach for an increasing number of people. At the same time, astronauts are changing the way they train to prepare for long duration missions to the moon and eventually to Mars. This Global Networking Panel brought together a group of current and past astronauts to discuss how their profession is changing and what they are looking forward to in the future.

WEDNESDAY: CLOSING CEREMONY

The Closing Ceremony provided a formal end to the activities of the IAC 2020 - CyberSpace Edition. The event featured a video summary of the week’s highlights, presentation of the IAF Awards, proper salutations to the outgoing IAF Vice-Presidents and at the end of the ceremony, the official invitation to the 72nd International Astronautical Congress in Dubai, United Arab Emirates, 25 - 29 October 2021. HOSTmi was the winner of the IAF ISEP 2020 Startup Pitch Session and was announced during the closing ceremony.

SPACE TRAFFIC MANAGEMENT CHALLENGES

Image: © spaceoneers.io

The current orbital population remains awkwardly dispersed after 60 years of space operations, with more than 90 percent of the catalogued objects being non-functional, i.e. orbital debris. Moreover, a large proportion of active spacecraft are not fitted with a propulsion system, so they are unable to navigate to prevent collisions. Compared to the one before the Feng-Yun 1C fragmentation 12 years ago, this condition has been amplified, with more than 6000 new debris left in orbit, with fewer than 2000 new spacecraft, including microsatellites.

Orbital congestion witnessed today is not just the result of space operations in the Cold-War age. Nevertheless, the present situation can be found to be bearable: it causes very valuable efforts in terms of SST/SSA and collision avoidance. In fact, there are some in-orbit collisions with smaller untracked debris and every year there are some unexplained fragmentations..

Since 1957, the ever growing number of orbital objects has posed various questions relating to future space sustainability. Of the 34,000 objects in orbit greater than 10cm, only 20,000 are numbered. These objects included in the catalogue include approximately 2,000 active satellites, of which fewer than 1,500 are manoeuvrable. All the rest are orbital debris, large satellites of launcher upper stages, mission related objects, inert pieces from fragmentations or collisions, with no maneuvering capabilities.

COLLISION AVOIDANCE

When at least one manoeuvring satellite is involved, Collision Avoidance is a common method, but it takes a very considerable effort to do so. However, it is not possible today to prevent collisions between two debris, which constitute the most common collision scenario by far.To avoid such collisions, it seems important to find solutions as they have the potential to generate thousands of new orbital pieces and feed to so-called Kessler syndrome.

The most important risk of significant catastrophic collisions in orbit between two massive non-maneuverable objects is the long-term survival of space operations because it contributes to a potentially uncontrollable cascading impact known as the Kessler syndrome.

The problem emerges from the fact that only 2,000 of the 20,000 large objects currently in the public catalogue are operational, of which 1,500 are manoeuvrable, 7.5 percent of the population, capable of executing an active collision avoidance manoeuvre if required.

LARGE CONSTELLATIONS

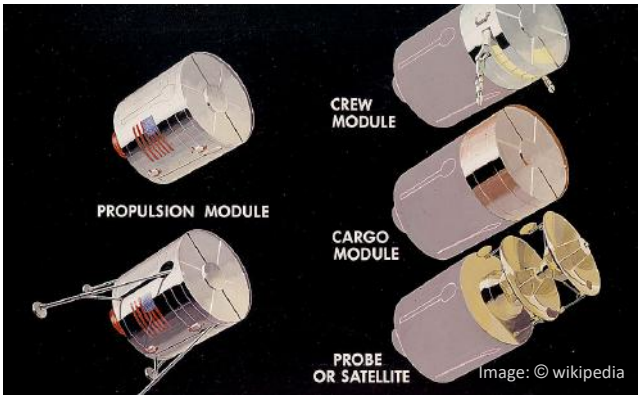
The new problem associated with satellite operations is large constellations. They are typically launched around 400-450 km in low orbits and generally use electric propulsion to enter the operational orbit at higher altitudes of around 1200 km.

What happens is that this technique produces a continuous propelled trajectory crossing densely populated orbital regions, both for the ascent and the descent legs. The existing instruments for avoiding collisions are not yet suited to such permanently varying trajectories. It needs an optimization study of high level in order to undestand these processes and to better control them.

NEW ORBITAL OPERATIONS

New space operations have been invented, such as On-Orbit-Servicing OOS, Space Tugs, refuelling flights, transfer vehicles, etc.

But we need to have a dynamic approach on a significant level for these operations such as coordinated rendezvous under different duties. These techniques may be adapted from those established in the sense of vehicles accessing the ISS, such as ATVs, but are likely to have to be streamlined and applied to any possible operator.

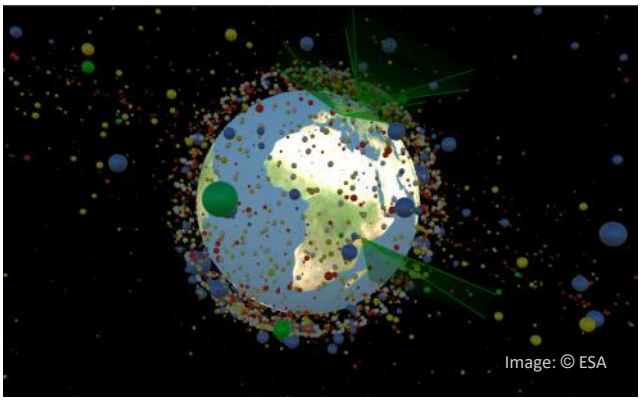


ENVIRONMENTAL INDEX

In order to maintain the sustainability of future space operations, specialized features such as "orbital environmental indexes" are required. These now under production indexes will measure in easy steps the criticality of the different orbital zones deemed for operations, based on the occupancy, the resident total mass, the rate of manoeuvrable bodies.

EOL OPERATIONS IMPROVEMENT

End-of-Life operations are an significant aspect of in-orbit activities today. These operations depend primarily on orbital altitudes and spacecraft sizes. In GEO, End-of-Life is performed via a transfer to graveyard orbit above the geostationary ark, on an orbit guaranteeing no interference with the GEO region for a 100-year duration. For Highly Elliptical Orbits such as GTO, compliance with the required time limitation in both protected regions is necessary.



In LEO, when the orbit is relatively high, typically 600 km or higher, a transfer to a lower orbit complying with the 25-year rule is necessary. Such orbital-lifetime evolutions and durations computations are tricky and require inclusion of complex perturbations modelling and statistical approach. It is nevertheless necessary to share such methodologies with operators at worldwide level in order to guarantee a common language and comparable evaluation.

PRESERVING ORBITAL ENVIRONMENT

In the immediate future, some orbital practices will be needed to help preserve the orbital environment. They do not come under the STM category, but they can be discussed even so. The Active Debris Removal (ADR), studies is mandatory, even though it is not yet formally proved. It is vital to at least recovering a certain amount of very large debris from the most heavily populated orbital regions in order to minimise the possibility of developing new debris clouds after collisions among non-maneuverable native space objects. Some thoughts have also arisen to stop collisions between two large debris.

For example, there are various ways such as Just-in-time Collision Avoidance (JCA) techniques that typically use gas and particle injection in smaller quantities expelled in front of debris or laser-matter interaction that nudges the debris, modifying its trajectory, minimising the risk of collision. Such activities, which are still forthcoming, will have to be identified worldwide, with a designated structure specifying the procedures in place.

Debris removed are not the ones that would have caused a collision statistically; it is important that we need to remove 100 large debris in order to avoid one major collision over the next 20 years, in addition to dealing with a strict 90 percent conformity with mitigation standards.

In the end, in addition to ADR, JCA can also be a good choice to plan for detectable, preventable large collisions that can be catastrophic in nature, in addition to strategic long-term measures.

This report is made using these references below:

1. https://www.nasa.gov
2. https://www.esa.int.
3. Christophe Bonnal et al, "CNES technical considerations on space traffic management", Acta Astronautica, Volume 167, 2020, Pages 296-301, ISSN 0094-5765, Copyright Elsevier B.V.
4. Christophe Bonnal et al, "Just in time collision avoidance – A review", Acta Astronautica, Volume 170, 2020, Pages 637-651, ISSN 0094-5765, Copyright Elseveir B.V.

SPACE X CREW-1 TOOK BABY YODA WITH THEM

An adorable — and powerful — stowaway was carried on board SpaceX's Crew-1 flight, floating freely inside the company's spacecraft as it heads toward the International Space Station. It was really awesome.

Full story can be accessed here:
https://www.theverge.com/2020/11/16/21569387/spacex-crew-1-dragon-baby-yoda-zero-g-indicator

- Source: theverge.com

Kat Robison

Science Communications Consultant
Coordinator-Next generation Plenary

Kathryn Robison Hasani is a Science Communications Consultant at Communicate Space Consulting working with STEM professionals and students. She is also a Ph.D. Candidate at the University of Alabama in Political Science in the fields of American Politics and International Relations, with an outside minor in Communication. Kat also holds degrees in Anthropology, Near Eastern Studies, and American Studies from the University of Arizona and Youngstown State University. She has traveled the world for research and language studies, and is a poet and podcaster. Her research interests are in the fields of space policy and communication (both political and science) with a particular interest in the role communication plays in the formation and dissemination of national space policies. In addition to her scicomm work, she currently teaches Political Science at the University of Alabama and Wake Technical Community College. Kat is also a member of the International Astronautical Federations's Space Education and Outreach and Workforce Development/Young Professionals Programme Committees and serves as the co-coordinator for the Next Generation Plenary Steering Committee.

Image: © IAF

Mariam Naseem

Space Consultant at Euroconsult, Canada
Coordinator- Next generation Plenary

Mariam Naseem is a space consultant at Euroconsult Canada working on multiple projects with various stakeholders including satellite operators, space industry players and government agencies. Mariam has a global and multi-disciplinary background, having worked as a Field Engineer on an oil rig in Russia, as a Manufacturing Engineer in a Product Development center in Texas and as a Business Development manager for a Toronto-based Quantum Computing startup. Prior to space consulting, Mariam was part of the Enterprise Innovation team of one of Canada's largest banks, evaluating the strategic impact of emerging technologies. In her free time, Mariam is involved with various non-profit organizations in the space sector including SEDS-Canada as an Advisory Board member and SGAC where she serves as the National Point of Contact for Canada.

Meet the minds behind the NextGen Plenary @ the IAC!

Among the inspiring sessions and panels hosted annually at the International Astronautical Congress (IAC), the NextGen Plenary (NGP) sessions provide a great opportunity to showcase, in front of an international audience of seniors and space sector leaders - the contributions of students and young professionals (21-35 y.o.) to the sector. But how are these sessions organized? For this Newsletter issue we bring to you the two current coordinators for the NGP Steering Committee – Kat Robison and Mariam Naseem!

Let us start from you! Who are Kat and Mariam? Please describe yourself in 3 hashtags.

Kat: I am #SciComm, #AcademicNomad, and #Poet

Mariam: and for me #Explorer, #SpaceGenm, and definitely #SciFi

As YPs, you have been involved in Space for some time. How and why did you choose space?

Kat: My interest in space comes from a rather sad story – the date of my birthday is the same as the Challenger disaster, so I grew up hearing about it every year on the news. I've also always been a stargazer; I'm fascinated by the thought of the vast reaches of space. As a kid I read a lot of science fiction and fantasy, and my favorite series, Young Wizards, along with my love for Star Trek always kept space in the back of my head. During my undergrad I studied human evolution and got interested in science communication which was my focus during my first master's degree. When I got into my PhD program, my advisor pointed out to me that every scicomm example I used dealt with space and so wondered why I wasn't more focused on political communication and space policy, which is how I ended up writing a dissertation on Making the Case for Space!

Mariam: I have a background in electrical engineering and experience working in a broad spectrum of industries, but my main passion has always been space (I am a big Star Trek fan!). When I moved to Canada to pursue my MBA at the University of Toronto, I began to revisit my interest and explore the Canadian space sector. I got involved with non-profit organizations in the space sector (like SGAC) and through my volunteer activities was lucky enough to find out about the role of space consultant which complements both my technical and business skills.

And what about the International Astronautical Federation (IAF)? How long have you been involved with the IAF, and what convinced you to join?

Kat: I've been NASA-sponsored student with ISEB to two IACs, and I have been attending the IAC since 2014. I also had additional contact with the IAF through my previous volunteer work with SGAC. For my specific committee roles – an airport conversation leaving IAC one year with JR Edwards led to me joining SEOC, and then I joined WD/YPP when I became co-coordinator of the NGP.

Mariam: It's pretty recent! I applied for the NextGen Plenary last year and was selected to moderate the panel at IAC2020. This kicked off my involvement with IAF, as after this year's NGP I was invited to serve as the co-coordinator for next year's one!

We are certainly lucky to have you both on board as coordinators of the NGP Steering Committee! As I mention it, let us dig into the NGP activities. First of all: as coordinators, what do you do?

Our role encompasses all aspects of planning and hosting the NGP panel including drafting the call for applicants, submitting the panel proposal, and working with IAF and the selected panelists to host an amazing session.

And why do you do this? Why are the NGP and the contribution of the NextGen important?

The NGP provides an amazing platform to showcase the achievements of the next generation in emerging areas within the space sector outside of the usual YP and student communities. The NGP puts our panelists in front of an audience of senior space leaders in government, industry and academia at the International Astronautical Congress. It's specifically designed to provide a voice to young professionals to share their experiences and perspectives in a global setting.

Indeed, it does sound like a great opportunity! I think we clearly saw it this year – the NGP, "Public/Private Partnerships as a Catalyst for the Next Generation", was a great success despite all the re-arrangements due to the pandemic. Kat and Mariam, you were respectively involved as coordinator and moderator of the session – how satisfied are you with the outcome? What have you learnt from the process?

Kat: I was very impressed with our panelists and our moderator (in fact, Mariam was so great, we had to keep her own to help coordinate 2021!). We had to shift our format from a plenary to a networking session which meant reimagining some elements of our panel.

We worked with the panelists to produce short videos about their work to launch prior to the session to invite audience participation even before IAC. We've definitely learned some social media best practices lessons that we hope to employ next year! I also think utilizing parts of the 3MT style presentation helped our panelists develop an excellent elevator pitch for their work for the future.

Mariam: As moderator, it was an amazing experience for me. I got to work closely with Kat and the panelists to define the session format and was very satisfied with the outcome. Despite all the external challenges of the pandemic, it turned out to be a wonderful avenue to bring the community together on the topic of PPPs in a digital format. What I learnt from the experience is that preparation is everything!

And now? Have you started working on the next NGP already? Can you tell us more about it?

Yes, we have! This year is in full swing! We will actually be submitting two plenary proposals this year, so we have twice the work. Our call for applicants is live since the beginning of December, and we're taking applications until January 2021. We're hopeful that our proposals will be selected by the IPC, though we commit to finding a home and an audience at IAC for each proposal no matter the outcome of the IAF's selection process. By the time the IAF makes these decisions, our applicants have already gone through two rounds of judging and we know we've got the best and the brightest of the NextGen.

This year our themes are: Space for Bending the Global Warming Curve and Protecting the Biosphere and Benefits and Challenges: How the Next Generation is Leading the Charge on Social Responsibility in Space. If you're involved in one of these areas, we hope you'll apply to be an NGP panelist!

Ok, sweet! We really can't wait to the plenaries now! Any specific date we should be looking forward to?

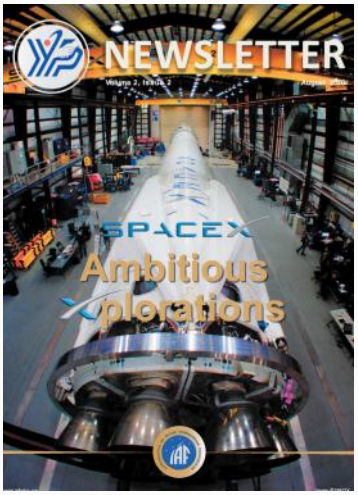
The Applications to join as panelist have opened on December 1st. Submissions are due on 8 January 2021. You can apply here ! After this, let's hope we can all meet in Dubai!

And what If people wanted to contribute to the NGP's organization, how should they do that? Who should they reach out to?

They can write to us! There are many committees within IAF looking for volunteers, we can direct them according to their interests. Please send us an email to nextgenplenary.iaf@gmail.com!

NEWSLETTER

CALL FOR ARTICLES



Interested writers are requested to submit their original articles for IAF YP Newsletter

Next Issue: April 2021

Send your articles to
iaf.wdypp@gmail.com

SPACE NEWS

December 2020 | Part of YP Newsletter | Volume 2, Issue 3

December 18, 2020

ONEWEB LAUNCHED 36 SATELLITES

OneWeb is back. The company on Friday made its fourth launch of a batch of satellites to build up its constellation in low-Earth orbit that eventually will provide broadband internet access around the globe. The latest group of 36 satellites headed to orbit atop a Russian Soyuz rocket from Vostochny Cosmodrome, ending a long delay since the last OneWeb launch, on Feb. 6. OneWeb is now flying over 100 satellites of a planned 648-bird constellation. The nine months since then have seen the company file for bankruptcy at the start of the coronavirus pandemic only to re-emerge under new ownership led by the British government and India's Bharti Global.

- Source: cnet.com

December 16, 2020

NASA WILL SEND CANADIAN ASTRONAUT AROUND THE MOON

NASA has big plans to get humans back to the moon, but the US won't be going it alone. NASA and the Canadian Space Agency formalized a multifaceted lunar partnership on Wednesday, and the big news is that a Canadian astronaut is now slated to take a ride around the moon. NASA's Artemis program already has a lineup of missions on the schedule. Artemis I will be an uncrewed test flight to try out the SLS rocket system and Orion spacecraft. Artemis II will be the first crewed flight, though it won't touch down on the lunar surface. The partnership also includes a collaboration on the lunar Gateway, an orbital outpost that will support moon missions. CSA will be responsible for the outpost's external robotic systems, including a mechanical arm. The overall agreement involves another mission that would carry a Canadian astronaut to the future Gateway.

Source: cnet.com

December 29, 2020

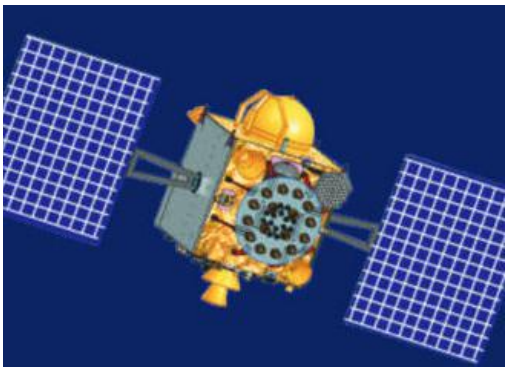
CSO-2 SATELLITE SUCCESSFULLY INJECTED INTO ORBIT

The Soyuz-ST-A carrier rocket with the Fregat-M upper stage and the CSO-2 spacecraft on board was launched on December 28, 2020 as part of the Arianespace VS25 launch campaign. The launch of the carrier rocket and the upper stage flight went nominally. After separation of the space head unit from the third stage of the launch vehicle, the Fregat-M upper stage continued to inject the spacecraft into the target orbit. The new satellite will operate in a sun-synchronous orbit. It was launched on behalf of the French National Center for Space Studies and the Directorate General for Armaments for the French Ministry of Defense.

- Source: Roscosmos

SPACE NEWS

December 2020 | Part of YP Newsletter | Volume 2, Issue 3



December 8, 2020

IMO RECOGNITION FOR IRNSS/NavIC

International Maritime Organisation (IMO) has recognized NavIC as a component of the World-Wide Radio Navigation System (WWRNS). This recognition was awarded in the 102nd meeting of Maritime Safety Committee of IMO (MSC-102) held in November 2020. The committee stated that NavIC meets the operational requirements to assist in navigation of ships in ocean waters within the area covered by 55^{o} E longitude, 50^{o} N latitude, 110^{o}E longitude and 5^{o}S latitude.NavIC has been represented at IMO by the Directorate General of Shipping (DGS), Ministry of Ports, Shipping and Waterways with technical support from ISRO.

-Source: ISRO/https://spacewatch.global/

November 15, 2020

ISS EXPEDITION - 64 HEROES

Sergey Nikolayevich Ryzhikov (born August 1974), lieutenant colonel of Russian Air Force, is a Russian cosmonaut, selected in 2006. Ryzhikov launched on his first spaceflight on board the Soyuz MS-02 spacecraft. He spent approximately six months on board the International Space Station taking part in Expedition 49/50, returning to Earth on April 10, 2017. **Sergey Vladimirovich Kud-Sverchkov** (born August 1983) has been a Russian cosmonaut since 2010 with the Russian Space Agency Roscosmos. Currently in space aboard the International Space Station as a flight engineer for ISS Expedition 63/64. This is his first spaceflight. **Kathleen Hallisey "Kate" Rubins** (born October, 1978) is an American microbiologist and NASA astronaut. She became the 60th woman to fly in space when she launched on a Soyuz spacecraft to the International Space Station on July 7, 2016. She returned to Earth on October 30, 2016, aboard a Soyuz. She was a crew member of Expedition 48/49, and is a crew member of Expedition 63/64 of the International Space Station.

- Source: Roscosmos/wikipedia

December 20, 2020

INTRIGUING SIGNAL FROM OUR NEAREST STAR PROXIMA CENTAURI

Astronomers hunting for radio signals from alien civilizations have detected an "intriguing signal" from the direction of Proxima Centauri, the nearest star system to the sun, The Guardian reported. The researchers are still preparing a paper on the discovery, and the data has not been made public, according to The Guardian. But the signal is reportedly a narrow beam of 980 MHz radio waves detected in April and May 2019 at the Parkes telescope in Australia. The Parkes telescope is part of the $100 million Breakthrough Listen project to hunt for radio signals from technological sources beyond the solar system.

- Source: Space.com

SPACE NEWS

December 2020 | Part of YP Newsletter | Volume 2, Issue 3

December 10, 2020

STARSHIP EXPLOSION AFTER SUCCESSFUL FLIGHT

Elon Musk's Starship SN8 prototype, reminiscent of something Buck Rogers might have piloted, fell serenely and silently through the Texas sky for almost two minutes on Wednesday. Then its Raptor engines roared to life, righting the rocket into a vertical orientation in preparation for landing, but it was too little or too late -- or maybe some of both. A few seconds and one spectacular explosion later, SpaceX's latest next-generation rocket prototype followed its first successful high-altitude flight with a hard landing that's sure to be an instant member of the GIF and meme halls of fame.

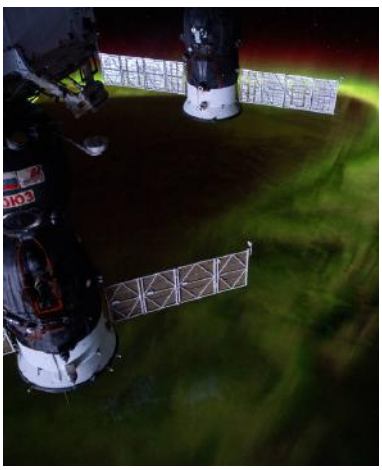
-Source: cnet.com

November 15, 2020

ISS EXPEDITION - 64 HEROES

Michael Scott Hopkins (born December, 1968) is a United States Space Force colonel and NASA astronaut. He made his first spaceflight as a Flight Engineer on Soyuz TMA-10M/Expedition 37/Expedition 38, from September 2013 until March 2014. Hopkins is the first astronaut to transfer to the U.S. Space Force, participating in a transfer ceremony on the International Space Station. **Shannon Walker** (born June, 1965) is an American physicist and a NASA astronaut selected in 2004. She launched on her first mission into space on June 25, 2010 onboard Soyuz TMA-19 and spent over 163 days in space. She returned to space for her second long duration mission on November 15, 2020, onboard SpaceX Crew-1. **Soichi Noguchi (born April 1965)** is a Japanese aeronautical engineer and JAXA astronaut. He is the sixth Japanese astronaut to fly in space, the fifth to fly on the Space Shuttle, and the first to fly on Crew Dragon. His third flight is on He is one of only three astronauts to fly on three different launch systems and one of three to fly an orbital mission on three different launch systems.

- Source: Roscosmos/wikipedia



December 30, 2020

NASA APPROVES HELIOPHYSICS MISSIONS TO EXPLORE SUN, EARTH"S AURORA

NASA has approved two heliophysics missions to explore the Sun and the system that drives space weather near Earth. Together, NASA's contribution to the Extreme Ultraviolet High-Throughput Spectroscopic Telescope Epsilon Mission, or EUVST, and the Electrojet Zeeman Imaging Explorer, or EZIE, will help us understand the Sun and Earth as an interconnected system. Understanding the physics that drive the solar wind and solar explosions – including solar flares and coronal mass ejections – could one day help scientists predict these events, which can impact human technology and explorers in space.

- Source: NASA

SPACE NEWS

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December 19, 2020

CHINA'S "CHANG'E 5" WITH 1731 GRAMS OF MOON SAMPLES

China's Chang'e-5 probe retrieved about 1,731 grams of samples from the moon, according to the China National Space Administration (CNSA). Chinese Vice Premier Liu He hailed the Chang'e-5 lunar mission as an important milestone in building China's strength in aerospace. The samples were later transferred to the lunar sample lab at the National Astronomical Observatories under the CAS. Scientists will carry out the storage, analysis, and research of the country's first samples collected from the extraterrestrial object.

- Source: CNSA/Xinhua

December 16, 2020

ESA AND CNES SIGN CONTRACT FOR MODERNISING SPACEPORT

ESA will contribute to the maintenance, operations and modernisation of Europe's Spaceport in Kourou, French Guiana over the period 2020–24. At the ESA Council meeting on 16 December, a contract for the 'Maintenance of the Guiana Space Centre launch range in operational condition for the period 2020–24, including core launch range renewal activities' was signed by Jan Wörner, ESA Director General and Jean-Yves Le Gall, President of CNES, France's space agency. ESA with CNES also plan to lower energy costs by reducing the reliance on the French Guiana grid and transitioning to 'green' and renewable energy sources on site. These new energy sources are intended to provide 90% of the electricity consumed at the base by the end of 2025. These changes will make Europe's Spaceport cleaner and achieve an overall significant reduction in operational costs.

-Source: ESA

December 17, 2020

ESA's NEW DIRECTOR GENERAL DR JOSEF ASCHBACHER

The ESA Council appointed Dr Josef Aschbacher as the next Director General of ESA, for a period of four years. He will succeed Prof. Jan Wörner, whose term of office ends on 30 June 2021. Dr Aschbacher is currently ESA Director of Earth Observation Programmes and Head of ESRIN, ESA's centre for Earth Observation near Rome. Born in Austria, Dr Aschbacher studied at the University of Innsbruck, where he obtained Masters and PhD degrees in Natural Sciences. He has over three decades of experience working in international organisations, including ESA, the European Commission, the Austrian Space Agency and Asian Institute of Technology.

- Source: ESA

SPACE NEWS

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December 1, 2020

ARECIBO FALL INDICATION OF GLOBAL DIVIDE

A mere two weeks after the National Science Foundation declared it would close the Arecibo single-dish radio telescope – once the largest in the world – the observatory took a dramatic dying breath and collapsed on Dec. 1, 2020. While drone footage captured the moment in excruciating detail, in truth, the disintegration of the telescope in Arecibo, Puerto Rico began far before this cinematic end. As someone who studies technology and infrastructure development, I see what happened at Arecibo as a classic example of the tension between facility maintenance and scientific progress.

- Source: space.com

December 17, 2020

CHOLERA PREDICTION USING CLIMATE CHANGE AND AI

Climate data taken from Earth orbiting satellites, combined with machine learning techniques, are helping to better predict outbreaks of cholera and potentially save lives. The relationship between the environmental drivers of cholera incidence are complex, and vary seasonally, with different lagged effects, for example from the monsoon season. Machine learning algorithms can help to overcome these issues by learning to recognise patterns across large datasets in order to make testable predictions. The study was led by Amy Campbell during a year-long graduate traineeship with the ESA Climate Office. Amy, along with her co-authors at the Plymouth Marine Laboratory (PML), used a machine learning algorithm popular in environmental science applications – the random forest classifier – which can recognise patterns across long datasets and make testable predictions.

- Source: ESA

November 12, 2020

JAXA AND DLR SIGNS IMPLEMENTING ARRANGEMENT TO COLLABORATE ON “DESTINY” MISSION

On November 11, 2020, the German Aerospace Center (DLR) and the Japan Aerospace Exploration Agency (JAXA) have agreed to cooperate in the development of DESTINY$^+$. Dr. Hitoshi Kuninaka, Vice President of JAXA and Dr. Walther Pelzer, Executive Board Members of DLR signed the Implementing Arrangement (IA) stating the cooperation. The IA stipulates that DLR will provide one of the main scientific instruments DDA (DESTINY$^+$ Dust Analyzer), and JAXA will have the DDA onboard the explorer and flyby the asteroid Phaethon.

- Source: JAXA

IAC-2020 - The CyberSpace Edition Videos and Photos

Read More ...

Outstanding numbers of #CyberSpaceIAC2020

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71st IAC2020 The CyberSpace Edition

#IAFDigitalLibrary #DigitalLibrary #IAC2020 #SpacePapers #KnowledgeSharing

The IAF releases the World's largest Digital Library on Space in History

Visit the library portal here

Congratulations to IAF Executive Director, Dr. Christian Feichtinger for winning in the Executive Director of the Year category at the International & European Association Awards 2020.

Read more ...

IAC 2021 CALL FOR SESSION PROPOSALS AND ABSTRACTS

The IAF's International Astronautical Congress embraces an **inclusive approach** that **is community-driven, engaged, and accessible for everyone**. We support the diversity that our congress participants bring by providing a variety of ways for people to **engage. You are all invited to contribute to the programme of the IAC 2021 to be held in Dubai from 25 to 29 October 2021!** Deadline for submitting proposals is **Friday 12 February 2021** at 23:59 CET.

PLENARIES AND HIGHLIGHT LECTURES

Do you want to present a topic of **general scientific or technological interest**? Are you a scientific or a technical expert with a solid knowledge of the **latest space-related topics**? Submit your proposal for a Plenary or Highlight Lecture, and you can be selected to present in front of a large audience during the five days of the IAC. You can find all necessary information on the selection criteria and the submission form on the IAF Website at the following link: https://www.iafastro.org/events/iac/iac-2021/plenary-programme.html. Plenaries and Highlight Lectures proposals must be submitted to the IAF Secretariat at iacplenary@iafastro.org.

IAF GLOBAL NETWORKING FORUM SESSIONS (IAF GNF)

The IAF GNF offers a unique opportunity to all IAF Members and future Members to participate actively and showcase their **latest developments** in front of a widely engaged audience. The aim of the IAF GNF is to provide Congress participants with a varied programme throughout the week, touching upon the most recent and hot topics in space, and to provide a one-of-a kind **visibility experience** for the organizers. IAF GNF sessions will be selected and placed thematically within the overall programme, and will be divided in three timeslots: 30 minutes, 45 minutes and 60 minutes. Additionally, don't forget that you can actively support the GNF by sponsoring your session! The IAF GNF Proposal Form is available for download on the IAF Website at the following link https://www.iafastro.org/events/iac/iac-2021/gnf.html

IAF GNF proposals must be submitted to the IAF Secretariat at gnf@iafastro.org

SPECIAL SESSIONS (SPS)

The goal of these special sessions is to provide a forum for **focused discussions** on new technical and multidisciplinary topics and provide opportunities for **audience engagement**. Special Session proposals must be submitted online at https://iafastro.directory/iac/account/login/ Questions about Special Sessions? Contact us at sps@iafastro.org

CALL FOR ABSTRACTS

Abstracts must be submitted online at https://iafastro.directory/iac/account/login/ by **28 February 23:59 CET** . For more information about the abstract submission process, please check https://www.iafastro.org/events/iac/iac-2021/technical-programme.html

We look forward to receiving your contributions to be presented at **IAC 2021 in Dubai**!

NEWS

72ND INTERNATIONAL ASTRONAUTICAL CONGRESS

25 - 29 October 2021, Dubai, UAE

EMERGING SPACE LEADERS (ESL) GRANT 2021

IAF is pleased to announce its **2021 Emerging Space Leaders (ESL) Grant Programme** that provides opportunities for students and young professionals to participate in the annual IAC. Selected YP's will participate in the **72nd International Astronautical Congress (IAC)** scheduled to take place in **Dubai, United Arab Emirates**, from **25 - 29 October 2021**. Students and Young Professionals between the ages of 21 and 35 on 1 January 2021 with space-related career interests are encouraged to apply for the programme. Up to twenty-five students and young professionals will be selected by the IAF to participate in the 2021 programme. **Application Deadline: 12 February 2021 15:00 Paris Time / UTC + 1:00**

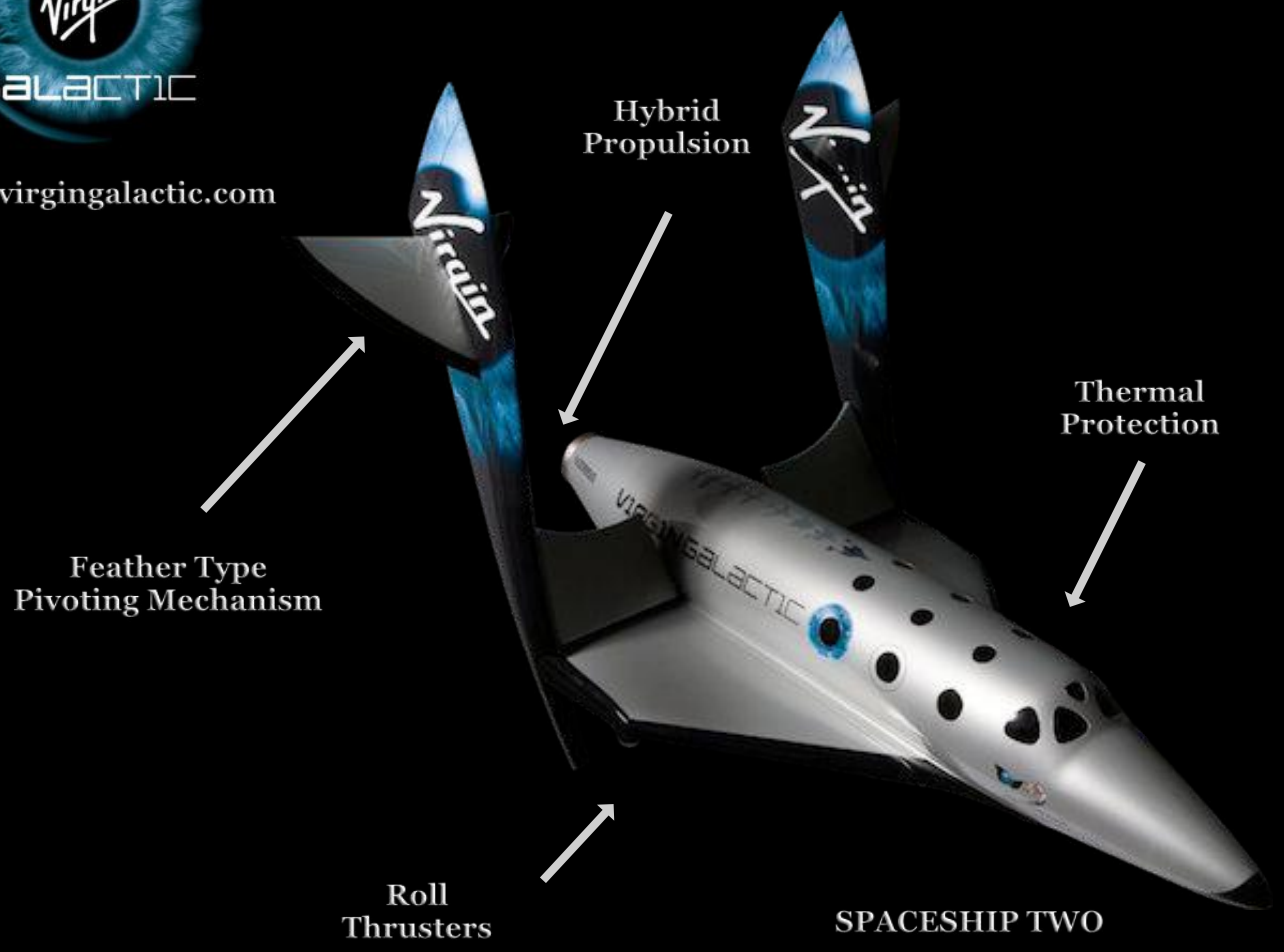
Read more ...

YOUNG SPACE LEADERS (YSL) RECOGNITION 2021

IAF is pleased to announce its 2021 IAF Young Space Leaders Recognition Programme that will provide opportunities to recognize students and young professionals who are demonstrating exceptional leadership in their academics or early careers. The IAF is soliciting nominations for the **2021 IAF Young Space Leaders Recognition Programme** from IAF Members, Regional groups and Technical and Administrative Committees on students and young professionals between the ages of 21 to 35 years on 1 January 2021. Please send the nomination material before **10 February 2021** 15:00 CET (Paris time) to the IAF Secretariat, preferably by email at award@iafastro.org (Subject line: NOMINEE'S LAST NAME Nominee's First Name-2021 YSL).

Read more ...

www.virgingalactic.com



Virgin Galactic are the first commercial space and vertically integrated aerospace business in the world. They are designing and running a new generation of space vehicles with their sister company, The Spaceship Company, to open up space for everyone. They are made up of hundreds of committed and enthusiastic experts, united in building the first commercial space line in the world.

VG is proud to be part of an amazing tale about spaceflight. The fundamental human desire to explore our world, to invent and to create a better future for our culture and our earth is thousands of years in the making and guided by it. The commitment to finding the right people for Virgin Galactic has contributed to their special and motivating sense of mission and a deep culture of safety and accomplishment.

Virgin Galactic plans to operate a fleet of five SpaceShipTwo spaceplanes in a private passenger-carrying service and has been taking bookings for some time, with a suborbital flight carrying an updated ticket price of US$250,000. The spaceplane could also be used to carry scientific payloads for NASA and other organizations.

On 31 October 2014, during a test flight, the first SpaceShipTwo VSS Enterprise broke up in flight and crashed in the Mojave Desert. A preliminary investigation suggested that the craft's descent device deployed too early. One pilot, Michael Alsbury, was killed; the other was treated for a serious shoulder injury after parachuting from the stricken spacecraft.

The second SpaceShipTwo spacecraft, VSS Unity, was unveiled on 19 February 2016. The vehicle is undergoing flight testing. Its first flight to space (above 50 miles' altitude), VSS Unity VP03, took place on 13 December 2018. The work is currently under progress. On June 25, 2020 Virgin Galactic carried out its second successful glide flight of its spaceship over Spaceport America in southern New Mexico. The first flight took place in May 2020.

-Source: Virgin Galactic/Wikipedia

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