69TH INTERNATIONAL ASTRONAUTICAL CONGRESS
BREMEN 2018

1 - 5 OCTOBER 2018 | GERMANY

GENERAL PROGRAMME

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H.H. Sheikh Mohammed bin Rashid & H.H Sheikh Mohamed Bin Zayed looking at 1st Satellite made 100% in UAE

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1 Welcome Messages

1.1 Message from the President of the International Astronautical Federation

Greetings!

As President of the International Astronautical Federation (IAF), it is with great pleasure that I welcome you to the 69th International Astronautical Congress, IAC 2018, in Bremen, Germany.

After hosting several successful congresses, the most recent in 2003, it is very exciting to be back here in Germany. Bremen is a unique city brimming with industries in the space sector, as well as cutting-edge research. It is even called the “City of Space”, making it a perfect location for IAC 2018.

This year’s theme #InvolvingEveryone is reflected throughout the programme. With more events than ever before, this will prove to be the most intense IAC week yet, truly offering something for everyone. An interesting plenary programme with a variety of subjects has been prepared. The Technical Programme received a record number of abstract submissions, and selecting the authors who will be presenting their work this week involved some tough decisions. Also, a new format of 31 Special Sessions has been added within the Technical Programme. The IAF Global Networking Forum will offer more sessions than ever before, and as usual we have many different associated and social events planned for the whole week!

This amazing congress would not be possible without the hard work and dedication of many people. I would like to congratulate the Local Organizing Committee, the Center of Applied Space Technology and Microgravity (ZARM) and the IAF Secretariat for their excellent management of what promises to be a successful and highly stimulating congress. I would also like to express my sincere gratitude and appreciation to the International Academy of Astronautics (IAA), the International Institute of Space Law (IISL), the Space Generation Advisory Council (SGAC) and the International Programme Committee (IPC). Thanks must also go to all of the volunteers: your support and assistance during IACs are strongly appreciated.

I believe it is crucial for the future of the space industry that we learn to work together across borders, challenge norms and embrace diversity. The IAC is a one-of-a-kind event that is an important platform for achieving this, as it brings together the worldwide space community in one place to share ideas, learn from each other and connect. I wish you all a fruitful IAC!

Jean-Yves Le Gall
President,
International Astronautical Federation,
France

1.2 Message from the Chair of the Local Organizing Committee

Welcome to the IAC 2018 in Bremen!

Scientific conferences are designed to foster the exchange of new ideas in an enriching environment and to provide plenty of opportunity for dialogues and social networking. IAC 2018 is a very important platform for us as space professionals to come together and discuss how to approach emerging challenges and agree on priorities within the space community. We need to secure the freedom to pursue long term scientific goals and develop sustainable solutions for the most complex projects on Earth, and beyond. This we can only do together!

As your Local Organizing Committee (LOC), we are looking to create an environment that enables all participants to get involved in interdisciplinary networking, transcending barriers relating to geography, gender and generation. We are committed to delivering a memorable and enjoyable IAC, with our motto #InvolvingEveryone as the driving force behind everything we do. One of the cornerstones of this motto is getting the public involved in space. Since the launch of the Bremen space year “STERNSTUNDEN 2018” in January 2018, we have sparked great public interest around space research and exploration. For one day the IAC will open its doors to the general public. That day is designed to give people the opportunity to visit the IAC 2018 space exhibition, which showcases how space technology influences our everyday life.

And we challenge you to get involved with Bremen! Look out for Bremen’s cultural attractions and UNESCO world heritage sites and the city’s hidden gems and vibrant quarters. We hope that the congress bag – which was locally manufactured by a young start-up company from Bremen – will make it as a souvenir back to your homes. We truly believe that you will return home not only with many important space highlights, but that you will take with you many lasting impressions about Bremen’s cultural scene and its Hanseatic way of life.

As your local host, we warmly welcome you as our guests of IAC 2018. Thank you for coming to Bremen!

Marc Avila
Director,
The Center of Applied Space Technology and Microgravity (ZARM),
Chair,
IAC 2018 Local Organizing Committee,
Germany
1.3 Message from the International Programme Committee (IPC) Co-Chairs

Dear Colleagues and Friends,

We are pleased to welcome you to the 69th International Astronautical Congress in Bremen, Germany. It has been 15 years since the IAC was last held in Germany’s “City of Space” and we are excited to welcome the space community back for a stimulating programme under the theme #InvolvingEveryone!

With the theme #InvolvingEveryone, we share our vision of a diverse space sector, including the new generation of space experts, the expansion of equal opportunities, the integration of new countries and start-up companies into the global space network, as well as increasing public participation.

IAC 2018 brings together leaders and innovators from space agencies, research organisations and space industry. Delegates can listen to international experts in the Plenary Programme, through Highlight Lectures, and in Late Breaking News. The Global Networking Forum and Exhibition showcase new commercial activities, and the Technical Programme provides a platform for researchers to present and discuss their latest discoveries, new technologies, future mission plans and their analysis of legal, institutional and economic aspects.

This year’s Call for Abstracts has attracted a record number of more than 4300 abstract submissions from 90 countries. Presentations are organized in 180 Technical Sessions including five Global Technical Sessions, the re-formatted Interactive Presentations and the new opportunity for Special Sessions. The aim is to cover interdisciplinary topics and to address important new emerging areas, providing an opportunity for extended dialogue and exchanges beyond what is usually possible in the regular technical sessions.

Prior to the congress, the Space Generation Congress (SGC), organized by the Space Generation Advisory Council (SGAC), 26th Workshop Space Technology for Socio-Economic Benefits: Industry, Innovation and Infrastructure for Development (364DI), organized by the International Astronautical Federation (IAF) and supported by the United Nations Office for Outer Space Affairs (UNOOSA) and the International Astronautical Federation (IAF), as well as the IAF International Meeting for Members of Parliaments (MoP) will take place in Bremen.

One of the highlights of this year’s IAC will take place on the 3rd of October, the German Unity Day. The public event “space is big – space is public” combines three parts: The ESA plenary event on “Space Safety”; a live call to Alexander Gerst on the ISS; and the IAF-ASE Astronaut Event. Also, during the IAC2018 Public Day, participants have the unique chance to watch the landing of the Mascot lander on the asteroid Ryugu live and discuss its tasks and progress with the project representatives at the booth of the German Aerospace Center DLR. Last but not least, the LOC introduces the IAC 2018 school kids’ congress “Teen Spirit for Space” taking place in the exhibition as a new part of the Congress programme.

Such a comprehensive programme is only possible due to the efforts of a global network of dedicated volunteers. The IPC Co-Chairs would like to thank the members of the International Programme Committee, the IAF Secretariat and the Local Organizing Committee.

Welcome to Bremen - we wish everybody a successful congress and enjoyable time during IAC 2018’s technical and social programmes through #InvolvingEveryone!

Christiane Schmullius
IPC Co-Chair, Friedrich-Schiller University (FSU), Germany

Michael Lopez-Alegria
IPC Co-Chair, American Institute of Aeronautics and Astronautics (AIAA)/AIAA Space, United States

1.4 Message from the Federal Minister for Economic Affairs and Energy

Dear Reader,

As Federal Minister for Economic Affairs and Energy with key responsibility for aerospace in Germany, I’d like to welcome you to the 2018 IAC in Bremen – one of the most important centres for aerospace in our country.

Aerospace provides an important stimulus for Germany’s well-developed high-tech sector. Alongside the automotive industry, mechanical engineering and medical technology, the aerospace sector is one of the key drivers of technological and economic development in our country – combining technological innovation and scientific excellence. Although the industrial capacity of the industry is only small, it has a major leverage effect in virtually all areas of the economy. Aerospace is thus key to Germany’s future development.

Aerospace is also a topic that is currently on everyone’s lips in Germany following Alexander Gerst’s blast-off into orbit in June for his six-month Horizon mission at the International Space Station. This is the first time that a German ESA astronaut has taken command of the Station, and the timing of his mission also coincides with the 2018 IAC. We want to use this opportunity to raise awareness of the added value that aerospace can deliver for our society in Germany.

Aerospace provides many different benefits for society, economy and science. The motto of the Federal Government’s Space Strategy, ‘Into Space for the benefit of Earth’, is straight to the point. Without aerospace, there would be no reliable weather forecasts. We also need it for navigation, telecommunications and climate protection. Indeed aerospace is a global tool for our globalised world.

Germany works to foster close European cooperation at the European Space Agency and within the European Union. For example, it has provided considerable support for the development of the ESA and EU’s joint satellite navigation system ‘Galileo’ and the ‘Copernicus’ earth observation programme.

Cooperation of this kind is crucial. As a global community, we all face the same key challenges, including climate change, careful use of resources, as well as digitalisation and other major changes taking place in the aerospace industry linked to New Space and commercialisation. We need to develop solutions and make use of the opportunities we have by working together with our international partners. ‘Involving Everyone’, the motto of the 2018 IAC, could therefore not be more appropriate.

Against this exciting backdrop, I am delighted that the IAC is once again taking place in Bremen, from 1-5 October 2018. The numerous lectures, exhibitions and events being put on by the global aerospace community provide a key opportunity for the industry to present aerospace and its economic and social benefits to the public. In this spirit, I wish all of you a very successful congress.

Peter Altmaier
Federal Minister for Economic Affairs and Energy, Germany
1.5 Message from the Mayor of Bremen

Dear Guests,

I am very pleased and honored to welcome you to the IAC 2018 in Bremen. There is no better location to host such an important space conference. We are particularly proud to look back at more than 60 years of aeronautics and space tradition in Bremen. This year we have the privilege to organize the IAC for the second time since 2003.

Bremen is the “City of Space”. This is based on the outstanding presence of the German and European aeronautics and space industries in Bremen. They make our city, together with several high-tech research centers and universities, a top European location for science and technology in aeronautics and space. With this portfolio we play a leading role in shaping national and European space programmes. Over 140 companies, including prominent groups like Airbus DS, the Ariane Group and OHB, and 20 research institutes achieve an annual turnover of more than 2 billion Euros with 12,000 employees. This makes Bremen the only place in Germany, where the full spectrum of space systems is developed and produced.

Looking back, our historic successes are orbital systems for human space flights like Spacelab or Columbus, robotic orbital systems like ATV, satellites like Sarlupe or Galileo, and launchers like Ariane 4 or Ariane 5. Current and new programs are the final batches of Galileo or the science mission Plato at OHB, the ORION cooperation with NASA at Airbus DS, and the new European launcher Ariane 6 at the ArianeGroup.

I am very glad to welcome all participants of this year’s congress, and I am sure you will find new business connections and many new friends. I encourage all of you to have a closer look at the other aspects of our beautiful city and at the many interesting sights. You will see: a visit to Bremen is always an enriching experience!

Mayor Dr. Carsten Sieling
President,
Senate of the Free Hanseatic City,
Bremen,
Germany

1.6 Message from the Chair of the DLR Executive Board

Since the earliest times of history, space has fascinated humankind. Though we could always look up to the stars, it is only recently that we began to explore space and more importantly use it for the benefit of back on Earth. Space has become a tangible aspect of our lives around the world.

In recent years, space has become increasingly solution-driven, particularly as climate change became an increasingly prevalent issue in modern society. Space helps us understand changes to our world through measurements of our atmosphere or the surveillance of glaciers for example. Space enables early identification of natural disasters and allows us to react immediately and with a precision that was previously impossible. It is these applications which will help us in achieving the Sustainable Development Goals set out by the 2030 Agenda for Sustainable Development by the United Nations to tackle issues from land degradation to renewable energies. The 2018 IAC offers a tremendous opportunity to learn from our partners, share our experience, and display the German contributions to the space sector in all these areas.

Apart from satellites, one means to understand all the facets of our Earth and our place within the galaxy is, of course, also the research conducted on-board the International Space Station (ISS). ISS is the largest international scientific cooperation ever. 2018 marks the space year within Germany with the IAC on the one hand as well as the lift off of the German astronaut Alexander Gerst for his second mission to the ISS to continue his work there and become the first German commander of the ISS. We look forward to hearing about his exploits during the IAC 2018. His research and expertise will no doubt greatly contribute to the progress of society and its relation to space!

Furthermore, during IAC we also hope for the landing of the MASCOT-Lander on the Asteroid Ryugu as part of the HAYABUSA2 asteroid sample return mission. The DLR MASCOT-Lander will help us gain insight into the origins and evolution of our Solar System and signifies the importance of international cooperation in space exploration.

All these mentioned topics and many more will be addressed at the 2018 IAC in Bremen: the technologies and dialogues of the international space community at this Congress have the potential to usher in many new possibilities for humanity.

I look forward to welcoming each and every one of you to Bremen this year and inviting you to join us at the 2018 IAC.

Pascale Ehrenfreund
Chair,
DLR Executive Board,
Germany
2 Organizers

2.1 The International Astronautical Federation (IAF)

Created in 1951 to foster dialogue between scientists around the world, and to support international cooperation in all space-related activities, the IAF today continues to connect space people. The Federation is the world’s leading space advocacy body with over 340 members, including all key space agencies, companies, societies, associations and institutes across 6 continents and 68 countries. Over 40 administrative and technical committees support the Federation in its mission to advance knowledge about space and to foster the development of space assets by facilitating global cooperation. At its annual International Astronautical Congress (IAC) and other thematic conferences, the IAF brings its multidisciplinary and international network to life.

International Astronautical Congress
1 - 5 OCTOBER 2018, Bremen, Germany

Connecting @ll Space People

Be part of the conversation @iafastro

IAF Member Organizations 2018

4th International Astronautical Congress
1 - 5 OCTOBER 2018, Bremen, Germany
2.2 The International Academy of Astronautics (IAA)

The International Academy of Astronautics (IAA) was founded in 1960 by Theodore von Karman. The Academy is an independent international community of leading experts committed to expanding the frontiers of space, the newest realm of human activity.

To foster the development of astronautics, the Academy undertakes a number of activities, including the recognition of outstanding contributors through elections and awards. It also facilitates professional communication, develops and promotes new ideas and initiatives, engages the public, and fosters a sense of community among the members. The IAA is a unique nongovernmental independent organization established in 1960 and recognized by the United Nations in 1996.

It is an honorary society with an action agenda. With 1200 elected members and corresponding members from 87 nations, it works closely with space agencies, industry, the academic community and the national science and engineering academies to determine needs and objectives and to help shape policy and forge cooperation by means of studies, position papers, conferences and publications. The IAA has published nearly 60 studies to date and is engaged in the preparation of 40 others.

The Academy also publishes the journal Acta Astronautica ranked 7th in the world and containing refereed papers and four book series. The Academy now organizes about 20 conferences per year and regional meetings focused on the development and promotion of new initiatives. This activity also includes, in cooperation with the International Astronautical Federation and the International Institute of Space Law, the traditional contribution to the International Astronautical Congress (IAC), where the Academy organizes 13 Symposia. The Academy also continues to enjoy its participation in the COSPAR Assemblies by sponsoring and co-sponsoring symposia and the International Society for Photogrammetry and Remote Sensing (ISPRS) congress. Although the IAA has many connections to these and other similar organizations, it is distinctive as the only international Academy of elected members in the broad area of astronautics and space.

International Academy of Astronautics
6 rue Galilée
75016 Paris, France
Mailing address: P.O. Box 1268-16
75766 Paris Cedex 16, France
T: +33 1 47 23 82 15
F: +33 1 47 23 82 16
W: www.iaaweb.org
E: general@iaaweb.org
IAA Shop: http://shop.iaaweb.org
2.3 The International Institute of Space Law (IISL)

Founded in 1960, the International Institute of Space Law (IISL) is an independent non-governmental organization dedicated to fostering the development of space law. The membership of the Institute is composed of individuals and institutions from more than forty countries elected on the basis of their contributions to the field of space law or other social sciences related to space activities. In addition, prospective membership is open to students and young professionals with a demonstrated interest in space law.

The purposes and objectives of the IISL include the promotion of further development of space law and expansion of the rule of law in the exploration and use of outer space for peaceful purposes, the holding of meetings, colloquia and competitions on juridical and social science aspects of space activities, the preparation or commissioning of studies and reports, the publication of books, proceedings, reports and position papers, and the cooperation with appropriate international organizations and national institutions in the field of space law.

The IISL holds an annual Colloquium at the International Astronautical Congress. During this Colloquium the Nandasiri Jasentuliyana Keynote lecture takes place, as well as a special session for Young Scholars. In addition the Institute organizes a variety of conferences on space law throughout the year in locations all over the world. It publishes an annual volume of IISL Proceedings with papers and reports of all activities during the year.

Since 1992, the IISL organizes the annual Manfred Lachs Space Law Moot Court Competition. The competition is based on a hypothetical space law case, written by IISL members, in which around sixty student teams from universities in North America, Europe, Asia Pacific and Africa participate. Members of the International Court of Justice judge the World Finals of the competition, making it unique in the world.

The IISL is an officially recognized observer at sessions of the United Nations Committee on the Peaceful Uses of Outer Space, and its Scientific & Technical and Legal Subcommittees.

Further information regarding the IISL can be found at [www.iislweb.org](http://www.iislweb.org).

International Institute of Space Law
E: info@iislweb.org
W: [www.iislweb.org](http://www.iislweb.org)
Facebook: [https://www.facebook.com/spacelaw](https://www.facebook.com/spacelaw)
Twitter: [https://twitter.com/iisl_space](https://twitter.com/iisl_space)

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2.4 The Space Generation Advisory Council (SGAC)

The Space Generation Advisory Council in Support of the United Nations Programme on Space Applications is a global non-governmental, non-profit (US 501(c)3) organization and network which aims to represent university students and young space professionals ages 18-35 to the United Nations, space agencies, industry, and academia. Headquartered in Vienna, Austria, the SGAC network of members, volunteers and alumni has grown to more than 13,000 members representing more than 150 countries.

SGAC was conceived at UNISPACE III in 1999, whereby states resolved, as part of the Vienna Declaration, “To create a council to support the United Nations Committee on the Peaceful Uses of Outer Space, through raising awareness and exchange of fresh ideas by youth. The vision is to employ the creativity and vigour of youth in advancing humanity through the peaceful uses space”. SGAC holds Permanent Observer status at the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) and regularly takes part in the annual meeting, as well as its Legal and Scientific and Technical Subcommittees. SGAC holds consultative status at the United Nations Economic and Social Council (UN ECOSOC), contributing to discussions on the role of space in achieving the UN Sustainable Development Goals.

SGAC works diligently to raise awareness among the next generation of space professionals on a global scale working together with the United Nations Office for Outer Space Affairs (UN OOSA) in promoting UN workshops and activities, and in supporting SGAC members to attend space conferences around the world. By hosting international, regional and local events, SGAC provides its members with opportunities to expand their knowledge of international space policy issues, think creatively about the future direction of humanity’s use of space and engage with current leaders from space agencies, industry and academia. SGAC steward the views and opinions of students and young professionals to ensure their creativity and vigour is employed for the advancement of humanity through the peaceful uses of outer space. Year-round project groups enable our members to further develop their thoughts on key topics of relevance to international space policy often resulting in technical papers, policy briefs and recommendations.

As a non-governmental, non-profit organization, SGAC relies on the sponsorship and support of governmental, non-governmental, and industry partners as well as private individuals. This support is administered either to fund activities. In addition, SGAC runs scholarships with its partners to enable participation of SGAC members in various events around the world. Operation of SGAC relies on a global volunteer base. As a volunteer-run organisation, SGAC believes in empowering its members and providing them with opportunities for professional development through roles in the SGAC team. The highest governing body of the organisation is the SGAC Executive Committee; a body comprised of elected and appointed members supported by industry leaders and young professionals per the below organization structure:

Further information regarding SGAC can be found at www.spacegeneration.org

Space Generation Advisory Council
SGAC’s European Space Policy Institute
Schwarzenbergplatz 6
A-1030 Vienna, Austria

E: info@spacegeneration.org
W: www.spacegeneration.org
Facebook: @spacegeneration
Twitter: @SGAC
2.5 The Local Organizing Committee (LOC)

Team Germany

From the very start of the idea to officially proposing to host an IAC in Bremen, Team Germany has always supported the project and, moreover, has dedicated a lot of time and enthusiasm to the long-lasting process of the proposal. Without these reliable partners and their commitment it would not have been possible to approach such a big challenge and it is because of this extraordinary team spirit that Bremen now has the great pleasure to invite the IAF community to Germany again after 15 years. Meet the partners of Team Germany at the IAC 2018 exhibition on the “Team Germany Boulevard” or join one of their technical visits.

Together with our committed partners DLR, OHB SE, Airbus, ArianeGroup, MT Aerospace and ZARM, the Free Hanseatic City of Bremen is welcoming you to the IAC 2018!

The Local Organizing Committee from ZARM

The Center of Applied Space Technology and Microgravity (ZARM)

The Center of Applied Space Technology and Microgravity (ZARM) at the University of Bremen is an internationally recognized research centre with multidisciplinary expertise in fluid mechanics, space technology and space science. The research at ZARM covers experimental, theoretical and computational approaches to fundamental scientific questions, as well as the development of technology for space missions and microgravity experiments. The main facility of ZARM is the Bremen Drop Tower. It offers the opportunity for short-term experiments under high-quality microgravity conditions and is the only laboratory of this kind in Europe.

ZARM is strongly committed to support students at all levels and young scientists. For example, the non-profit association Friends of ZARM (Förderverein ZARM e.V.) provides awards for outstanding Bachelor and Master theses. In cooperation with the University of Bremen ZARM is also involved in several outreach programmes for students. ZARM especially aims at increasing the percentage of girls interested in STEM (Science, Technology, Engineering and Mathematics) because women are currently still underrepresented in these fields.

The Local Organizing Committee

For the IAC 2018 Local Organizing Committee (LOC), ZARM has built a team of four professionals from different backgrounds to provide a broad expertise for organizing this challenging event:

Professor Marc Avila is the Director of ZARM - University of Bremen, CEO of the ZARM Drop Tower Operation and Service Company and the Chair of the LOC.

Professor Claus Lämmerzahl is the Director of the department of space science at ZARM.

Peter von Kampen is the CFO of the ZARM Drop Tower Operation and Service Company.

Birgit Kinkeldey is the Head of Corporate Communication at ZARM.
The Local Organizing Team from ZARM

The Local Organizing Team from ZARM is eager to prove that their experienced staff, committed partners and the beautiful city of Bremen will surpass the expectations of the IAC 2018 guests in many respects. A special focus is placed on creating new highlights, like the technical visits for students and young professionals, the Yuri’s Night @ IAC 2018 party or the Bremen Workshop Area where participants can get new inspiration for their professional life. Be prepared for a surprise!

Contact the Local Organizing Team

You can find us at the LOC office in the Central Area

Vanessa Roelfing
Ask me about: Registration
Phone: +49 421 3505-9328
Email: vanessa.roelfing@zarm.uni-bremen.de
How to get the Bremen feeling: strolling through the streets of the Ostertor-Viertel on a matchday of Werder Bremen.

Corinna Harms
Ask me about: Associated Events
Phone: +49 421 3505-9324
Email: corinna.harms@zarm.uni-bremen.de
Do visit the “Bürgerspark” and take break from the daily conference routine.

Alena Lange
Ask me about: Exhibition
Phone: +49 421 3505-9325
Email: alena.lange@zarm.uni-bremen.de
You can easily blend in by saying “Moin!” which means hello, good morning, good afternoon, good evening.

Annika Teubner
Ask me about: Outreach activities and all press related topics.
Phone: +49 421 3505-9329
Email: annika.teubner@zarm.uni-bremen.de
For coffee-lovers: Do not miss the yellow bird café where you can find the best coffee and self-made cake in town.

Alena Lange
Ask me about: Exhibition
Phone: +49 421 3505-9325
Email: alena.lange@zarm.uni-bremen.de
You can easily blend in by saying “Moin!” which means hello, good morning, good afternoon, good evening.

Thorsten Coordes
Ask me about: Interactive Presentations, technical equipment, presentation upload etc.
Phone: +49 421 3505-9331
Email: tc@zarm.uni-bremen.de
My favorite restaurant in Bremerhaven is “Gezeiten” because they have excellent fish.

Sarah Rietmüller
Ask me about: Room allocation, catering.
Phone: +49 421 3505-9327
Email: sarah.rietmueller@zarm.uni-bremen.de
I like to visit Yaya in Bremen because it offers very delicious Sri Lankan street food.

Lucie-Patrizia Arndt
Ask me about: IAC 2018 programme.
Phone:
Email: lucie-patrizia.arndt@zarm.uni-bremen.de
Do hire a bike! The almost complete absence of hills and the short distances between Bremen’s hot spots make our city the perfect place for cycling.

Almost twenty people from ZARM have been committed to organizing the IAC 2018.
3 Practical Information

3.1 City Map
Travel Information for your Arrival

Arrival from the Airport Bremen:
Travel between the Airport Bremen and the Bremen Exhibition & Conference Center is straightforward. There is a tram station immediately outside the airport terminal. Line 6 (direction “Universität”) will take you directly to the Bremen Exhibition & Conference Center (station: “Blumenthalstrasse”) in approximately 15 min. The fare is € 2.80. More information is available here: https://www.bsag.de/en/information.html

It will take more or less the same time to go by taxi from the airport to the Bremen Exhibition & Conference Center. The taxi stand is located in front of the airport exit.

Arrival by Car:
The Bremen Exhibition & Conference Center is only 10 minutes from the “Autobahn” exit (A1, A27 and A28). From the “Autobahn” exits simply follow the signs to “Centrum / Messe Bremen”.

For Parking you have two options: For the car park “Bürgerweide” with 2,300 parking bays please enter “Theodor-Heuss-Allee, 28215 Bremen” into your navigation system. For the multi-storey car park please enter “Hollerallee 99, 28215 Bremen” into your navigation system.

Arrival by Rail:
The railway station (Hauptbahnhof) is located opposite to the Bremen Exhibition & Conference Center (a 5-minute walk) and is also within walking distance of the city center. Nearly 50 InterCity (IC), InterCityExpress (ICE) and EuroCity (EC) train connections link the Bremen central railway station with major cities in Europe. Please find more information on travelling by train in Germany on the website of the “Deutsche Bahn”. https://www.bahn.com/en/view/index.shtml

Ground Transportation

Bus and Tram:
The BSAG is Bremen’s local travel agency, operating the well-developed public transport network with bus and tram services. For general timetables, routes and up-to-date information visit the BSAG (https://www.bsag.de/en/information.html) online. A general route map can be downloaded here (https://bit.ly/3HdeYj1). To keep track of your trip and not get lost on the road you can download the “VBN Fahrplaner” app. All information as well as the download link can be found here: https://envbn.de/timetable/vbn-mobile-app.html

Taxi Companies:
There is a taxi stand at the northern and southern exit of the main railway station, if you want to leave immediately. If you need a taxi to pick you up, they can drive right up to the halls. Please find a list of taxi companies below. These companies also offer transport service for wheelchair users which have to be ordered one to two days in advance. Please note that many taxis only accept cash.

Taxi-Ruf Bremen
Tel: 0049 421 14014
Web: http://www.taxi-ruf-bremen.de/en/homepage/

Taxi-Roland
Tel: 0049 421 14433
Web: http://www.14433.de/
Car Hire:
Because of the excellent public transportation system, there is no need to rent a car for transport within the city of Bremen. For tours to the countryside you can find several car rental companies in Bremen, for example at the airport and the central station.

At the airport: http://www.bremen-airport.com/en/service/local-services/car-rental/

At the central station:
Hertz
Tel: 0049 421 6491050
Web: www.hertz.de

Sixt
Tel: 0049 1896 – 66666 (per call 0.20 € from fixed network, 0.60 € from German mobile network)
Web: https://www.sixt.de/

Europcar
Tel: 0049 421 173510
Web: www.europcar.de

Bike rental:
The short distances between the congress venue and the city centre and the extensive network of cycle paths make Bremen a perfect place for cycling. There are several stations where you can hire a bike. The following one is close to the IAC 2018 venue:

ADFC Radstation Bremen GmbH
Bahnhofsplatz 14a
28195 Bremen
Web: www.radstation-bremen.de
Mail: radstation@adfc-bremen.de

Lime Bikes
Since April 2018 160 LimeBikes have been distributed in Bremen and are available for usage. The LimeBike App is required to unlock and pay for the bikes. All further information about LimeBikes can be found here: http://www.limebike.com/

3.3 Registration
Registration Information:
The registration as a participant of the IAC 2018 includes a congress badge, congress documentation and a congress bag (not for accompanying persons or exhibitors), admission to the “Plenary Programme”, access to the exhibition, the welcome reception and the opening ceremony. Further access to the conference programme is due to the registration category.

All tickets and conference materials will be handed out to the participants upon check-in at the registration desk after full payment.

Participants are requested to wear their congress badge at all times for identification and admittance to the conference rooms.

Registration fees:

<table>
<thead>
<tr>
<th>Registration Category</th>
<th>Early Registration Before 30/06/2018</th>
<th>Regular Registration Before 22/09/2018</th>
<th>On-Site Registration After 22/09/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delegate</td>
<td>980 €</td>
<td>1140 €</td>
<td>1200 €</td>
</tr>
<tr>
<td>Delegate (IAF, IAA, IISL member)</td>
<td>820 €</td>
<td>970 €</td>
<td>1080 €</td>
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<tr>
<td>Retired person</td>
<td>470 €</td>
<td>530 €</td>
<td>580 €</td>
</tr>
<tr>
<td>Young Professional</td>
<td>370 €</td>
<td>430 €</td>
<td>490 €</td>
</tr>
<tr>
<td>Student</td>
<td>100 €</td>
<td>115 €</td>
<td>130 €</td>
</tr>
<tr>
<td>Teacher</td>
<td>100 €</td>
<td>115 €</td>
<td>130 €</td>
</tr>
<tr>
<td>Accompanying person</td>
<td>90 €</td>
<td>100 €</td>
<td>130 €</td>
</tr>
<tr>
<td>Media</td>
<td>Free of charge</td>
<td>Free of charge</td>
<td>Free of charge</td>
</tr>
<tr>
<td>Exhibitor</td>
<td>see service book</td>
<td>see service book</td>
<td>see service book</td>
</tr>
</tbody>
</table>

3.3.1 Registration Categories:
- **Delegate**: The registration category “delegate” refers to a regular and full paying participant. Please check carefully if any of the other categories and discounts apply to you.
- **Delegate (IAF, IAA, IISL member)**: The registration category “delegate (IAF, IAA, IISL member)” applies to participants who are employees or elected officers of an IAF member organization or who are current members of the IAA and the IISL.
- **Retired person**: The registration category “retired person” applies to pensioners that are 60 years old or older on 01 October 2018, no longer employed and full-time retired. The registration as a retired person is only valid if a copy of your passport has been provided to BTZ as a PDF file.
- **Young Professional**: The registration category “Young Professional” applies to participants of the IAC that are 35 years old or younger on 01 October 2018. Registration as a Young Professional is only valid if a copy of your passport has been provided to BTZ as a PDF file.
- **Student**: The registration category “student” applies to full-time students at a recognized institute (no age limit). Registration as a student is only valid if a copy of your valid student certification (or student card) has been provided to BTZ as a PDF file.
- **Teacher**: The registration category “teacher” applies to educators of the primary and secondary level. The registration as a teacher is only valid if a documentation from their school or authority has been provided to BTZ as a PDF file.
- **Accompanying person**: Only one accompanying person per delegate, retired person or Young Professional is permitted. For the preparation of the name badge, please provide the first name and family name of your accompanying person.
Accompanying persons can be family members, civil partners or translators. They are entitled to have access to the "Plenary Programme", the exhibition and the welcome reception. They are not allowed to visit any sessions from the Technical Programme.

- **Media**: The registration category “media” applies to media representatives including reporters, editors, videographers and photographers affiliated with recognised broadcast or print organizations or social media platforms. To register as “media” you need to upload a valid press card. If you work in social media you can provide links to your websites, Twitter or Instagram accounts etc. Please note that in the latter case ZARM and IAF will jointly decide on the respective participation in the congress. Media participants are not entitled to present at the IAC 2018. The registration as “media” is processed separately via [https://www.iac2018.org/media](https://www.iac2018.org/media).

- **Exhibitor**: The category “exhibitor” refers to those who visit the IAC in connection with a booth in the space exhibition of the IAC 2018. The registration of the booth representatives must be made via the service book through the respective organization or company that booked the booth. Exhibitors are entitled to have access to the “Plenary Programme”, the exhibition and the Welcome Reception. They are not allowed to access any sessions from the Technical Programme.

### 3.4 Congress Venue Floor Plans

#### First Floor

- Welcome Reception
- Plenary Events
- High Light Lectures
- Global Networking Forum
- Late Breaking News
- Plenary Heads of Agencies

#### Ground Level

- Technical Sessions
- Technical Sessions
- Technical Sessions
- Special Sessions
- Global Networking Forum
- Committee Meetings
- Press Conferences
- IAC TV

---

**69th International Astronautical Congress**

1 - 5 OCTOBER 2018, Bremen, Germany
### Bremen Hall
*Technical Sessions*

### IP Hall
*Interactive Presentations*

### Central Area

- **Main Entrance**
- **Registration**
- **Lounges**
- **Press Center**
- **Information Desks**
- **Speaker Preparation Room**
- **IAFastro App Counter**
- **IAC TV**

### CCB Hall
*Technical Sessions, Special Sessions, Global Networking Forum, Committee Meetings, Press Conferences*

### ÖVB Hall
*Technical Sessions, Special Sessions, Committee Meetings*

### ÖVB Arena
Welcome Messages
Organizers
Practical Information
Congress Programme
Students & Young Professionals
Events Associated
Programmes & Events
Awards
Exhibitions
Social Events
& Technical Visits

3.5 Offices and Exhibition Desk Opening Hours

Registration and Information Desk
Location: Bremen Exhibition & Conference Center
Saturday 29 September - Friday 5 October, 08:00-18:00
Monday 1 October 07:00-18:00
Tuesday 2 October - Thursday 4 October, 08:00-18:00
Friday 5 October, 08:00-13:00

IAF Secretariat Office
Location: Bremen Exhibition & Conference Center
Saturday 29 September - Friday 5 October, 08:00-18:00

PCO Office
Location: Bremen Exhibition & Conference Center
Friday 28 September - Friday 5 October, 08:00-18:00

IAF Members’ Lounge
Location: Bremen Exhibition & Conference Center
Sunday 30 September - Friday 5 October, 08:00-18:00

ISSL Members’ Lounge
Location: Bremen Exhibition & Conference Center
Sunday 30 September - Friday 5 October, 08:00-18:00

Press Centre
Location: Bremen Exhibition & Conference Center
Sunday 30 September - Thursday 4 October, 08:00-19:00
Friday 5 October, 07:00-18:00

Speaker Preparation Room
Location: Bremen Exhibition & Conference Center
Sunday 30 September, 14:00-18:00
Monday 1 October - Thursday 4 October, 08:30-18:00
Friday 5 October, 08:30-13:00

Exhibition Hall
Location: Bremen Exhibition & Conference Center
Monday 1 October, 10:45-18:00
Tuesday 2 October - Thursday 4 October, 09:00-18:00
Friday 5 October, 09:00-17:00

3.6 Useful Information

About Bremen

Bremen, the historical Hanseatic city on the river Weser, and Bremerhaven, located some 65 kilometres further north at the mouth of the river, make up the only two-city state in Germany. Bremen is the heart of the north-west region of Germany and is the country’s smallest federal state. Approximately 550,000 people live in Bremen and 130,000 in Bremerhaven.

This fairy-tale location of the famous “Bremen Town Musicians” is known for its history and traditions, as well as for its cosmopolitan outlook. Bremen is a destination full of surprises – there’s always more to discover. The best way to appreciate the essence of the city is to get out and about and explore it for yourself. A 20-minute walk is all it takes to cover the historical city centre. In Bremen, everything is just around the corner. Stroll downriver along the Schachte Embankment, or upriver into the bohemian “Viertel” district. Go with the flow, find hidden treasures along the way, take in an exhibition or enjoy a coffee in one of the cozy cafes. Discover it for yourself!

Leisure time and going out

Bremen has a number of cafés, bars and restaurants of a wide variety of types and nationalities, usually with a free choice of table. Sometimes it is advisable to reserve a table in advance if a restaurant is very popular. If you are happy with the service, you can show this by leaving a tip (approximately 10% of the bill).

If you are a smoker please note that there are different rules and regulations on smoking in public places and buildings in Bremen. Generally, it is forbidden to smoke in restaurants but some bars in Bremen are smoking bars or offer in designated areas. To be on the safe side, be aware that smoking may not be permitted; if in doubt, ask the staff.

Communication

Germans are said to be very direct in their dealings with one another and in communication. This is true. Germans tend to get to the point quickly and work and communicate in a focused and result-driven way. In a business environment private and general small talk are usually kept separate and terms of a contract, work allocation and timetables often drive intense discussions. This can be quite confusing for people from cultural groups where the emphasis is more on relationships.

When greeting and taking leave of people, it is customary to shake hands and look at the person. In Bremen, it is common to say “Moin”, which can be used all day long as it means hello, good morning, good afternoon as well as good evening. It would be impolite not to make eye contact – this also applies in direct conversation with someone. Hugging is only customary among friends.

Shopping

Shops are generally open between 9:00 and 20:00 hrs from Monday to Saturday; large supermarkets and shopping centres will open even longer. Smaller shops or businesses on the outskirts of towns and cities, however, close between 18:00 and 19:00 during the week, and on Saturday possibly even at midday. All shops are normally closed on Sundays. Exceptions are some bakeries and florists which often open on Sunday mornings. You can buy food, newspapers and smaller household items at night...
and at the weekend at kiosks and filling stations, but this is usually a bit more expensive. Please be aware that nearly all shops and supermarkets are closed on 3 October 2018 due to the German Unity Day which is a public holiday.

In Bremen it is common to do the shopping at a farmers market. Whether fruit or vegetables, fish or meat, dairy or bakery products - at a total of 37 farmers markets, spread over all quarters of Bremen, you will find a wide range of fresh food. One of these markets is located in direct neighbourhood to the conference centre and opens on Tuesday and Thursday mornings.

Since sorting waste is a major issue in Germany, a deposit is paid for many bottles and cans. It is therefore advisable to keep bottles and cans and take them back the next time you go shopping.

Barrier-free access to the Exhibition and Congress Center Bremen:
Access and facilities for physically challenged people are provided throughout the venue. All car parks and buildings are wheelchair accessible.

Road rules
In Bremen almost all places can be reached at least by bus or tram. However, if you intend to drive, please do so on the right! Please also take special care when you are crossing the road on foot if you have been used to driving on the left. In addition, many people use bicycles throughout Europe, Bremen even ranks in third place among the bicycle cities. You can find a lot of designated cycle paths, which are usually build with red bricks. These are not for walking, so please take extra care when crossing them!

Bike rental
Bremen offers very good bicycle networks and you will sometimes see enormous numbers of bikes parked at locations such as stations and universities. If you would like to rent a bike for a specific period: The ADFC operates a bike rental station at the central station. Bicycles, e-bikes and folding bikes can be hired there by handing in a deposit and an identity card. Making a reservation is recommended.

Address:
ADFC Radstation Bremen GmbH
Bahnhofsviertel 14a
28195 Bremen
Web: www.radstation-bremen.de
Mail: radstation@adfc-bremen.de

Lime Bikes
Since April 2018 160 LimeBikes have been distributed in Bremen and are available for usage. The LimeBike app is required to unlock and pay for the bikes. All further information about LimeBikes can be found here: http://www.limebike.com/

Taxi companies
For taxi services please call the following companies which also offers transport service for wheelchair users by calling the taxi one or two days in advance.

Taxi Ruf Bremen:
Tel: 0049 421 14 0 14
Web: https://www.taxi-ruf-bremen.de/en/homepage/

Taxi Roland:
Tel: 0049 421 14 4 33
Web: http://www.14433.de/

Bremen Info Point and Tourist information
Finding your way around in a foreign city is not always easy. As we do not want to see you lost, there is a Bremen Info Point at the IAC 2018 in the Central Area, which will be operated by our Bremen Tourism Centre (BTZ) colleagues throughout the Congress. At this info point you will be able to find general information about Bremen and places worth seeing in and around the Free Hanseatic City.

Currency exchange
There are several currency exchange possibilities in and around the central station as well as at the airport.
For instance: ReiseBank AG - Bremen Hauptbahnhof
Bahnhofsplatz 15
28195 Bremen
Tel: 0049 421 13219

Also worth knowing: Banks are usually open Monday to Friday from 8:30 to 16:00 hrs; ATMs are usually accessible 24 hours a day.

Electricity
The German electricity system works on 220 volts and uses two-pin plugs. Depending on where you come from, you may need an adaptor for any electrical equipment you bring with you.
4 Congress Programme

4.1 Programmes at a Glance

IAC 2018 at a Glance
### Technical Sessions at a Glance

<table>
<thead>
<tr>
<th>Category A: Science &amp; Exploration</th>
<th>Category B: Infrastructure &amp; Operations</th>
<th>Category C: Technology</th>
<th>Category D: Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>B1</td>
<td>C1</td>
<td>D1</td>
</tr>
<tr>
<td>A2</td>
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<td>C2</td>
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<td>A3</td>
<td>B3</td>
<td>C3</td>
<td>D3</td>
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<tr>
<td>A4</td>
<td>B4</td>
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<td>D4</td>
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<tr>
<td>A5</td>
<td>B5</td>
<td>C5</td>
<td>D5</td>
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<tr>
<td>A6</td>
<td>B6</td>
<td>C6</td>
<td>D6</td>
</tr>
</tbody>
</table>

### Special Sessions at a Glance

**MONDAY**

- **1 OCTOBER**
  - **11.00** New Challenges for Planetary Protection
  - **12.00** A Global Space Partnership Towards 2030: New Approaches to Space for a Better World: Challenges, Technologies and Solutions

**TUESDAY**

- **2 OCTOBER**
  - **11.00** The Nexus of Blockchain and Space
  - **12.00** Commercial Platforms on the International Space Station - New Low Cost Opportunities

**WEDNESDAY**

- **3 OCTOBER**
  - **11.00** The Golden Age of the European Earth Observation System
  - **12.00** Twenty years of the EVA-SEV: Modern Trends in the Exploration of Icy and Ocean Worlds

**THURSDAY**

- **4 OCTOBER**
  - **11.00** Space Journalism and Outreach Workshop
  - **12.00** Latin America beyond LEO: Commercial Suborbital: Needs of Operators and Servicing

**FRIDAY**

- **5 OCTOBER**
  - **11.00** A Scientific “Wish List” for Research Facilities
  - **12.00** How to Solve Almost Any Challenge in Less Than a Week

*Note: The sessions are scheduled in the CCB Focke-Wulf building.*
Main Congress Schedule

Monday 1 October

08:00 - 09:00  VIP Gathering for Opening Ceremony
Location: Bremen Exhibition & Conference Center – IP Hall

09:00 - 10:30  Opening Ceremony
Location: Bremen Exhibition & Conference Center – ÖVB Arena

The IAC 2018 Opening Ceremony will feature an interesting combination of performances by local artists and musicians. Several high-level welcome messages will also be included in the programme.

- **Master of Ceremony**
  
  Gayle Tufts  
  Actress and Comedian, Germany

- **Welcome Addresses**
  
  Carsten Stelling  
  President of the Senate and Mayor of the Free Hanseatic City of Bremen, Germany

  Thomas Jarzombek  
  Space Coordinator of the German Federal Government, Member of the German Bundestag, Germany

  Jean-Yves Le Gall  
  President, International Astronautical Federation (IAF), France

  Pascale Ehrenfreund  
  Chair of Executive Board, German Aerospace Center (DLR), Germany

  Marc Avila  
  Director, Applied Space Technology and Microgravity [ZARM], Chair: IAC 2018 Local Organizing Committee, Germany

- **IAA 2018 Official Opening**
  
  Jean-Yves Le Gall  
  President, International Astronautical Federation (IAF), France

  Peter Jankowitsch  
  President, International Academy of Astronautics (IAA), Austria

  Kai-Uwe Schrogl  
  President, International Institute of Space Law (IISL), Germany

4.2 Day-by-Day

Pre-Congress Schedule

**Thursday 27 September**

Space Generation Congress (SGC) (see page 157)

**Friday 28 September**

Space Generation Congress (SGC) (see page 157)

Educators Professional Development Workshop (see page 138)

26th Workshop Space Technology for Socio-Economic Benefits: Industry, Innovation and Infrastructure for Development (3Is4D) (see page 136)

**Saturday 29 September**

Space Generation Congress (SGC) and Gala Dinner (see page 157)

Tutorial 3: Planetary Protection 101 (see page 147)

26th Workshop Space Technology for Socio-Economic Benefits: Industry, Innovation and Infrastructure for Development (3Is4D) (see page 136)

**Sunday 30 September**

IAA Academy Day (see page 140)

9th IAF International Meeting for Members of Parliaments (see page 141)

IAAC Hosts Summit (see page 145)

YP IPMC Young Professionals Workshop (see page 114)

Young Professionals Networking Events (see page 114)

Cross Cultural Communications and Presentation Workshop (see page 139)

26th Workshop Space Technology for Socio-Economic Benefits: Industry, Innovation and Infrastructure for Development (3Is4D) (see page 136)
The International Astronautical Federation is organizing its flagship plenary with world space agency leaders. The theme for this year's plenary is “Involving Everyone – What’s New for the Space Agencies?” Participating Heads of Agencies will present and discuss how their respective agencies are reacting to a changing space environment with new actors getting involved and how they are successfully involving the broadest spectrum of space and non-space actors. The event will be divided into 3 main sections. In the first part, the Heads of Agencies will be asked to give a 3-4 minute presentation and will raise questions to the audience. In the second part, the Heads of Agencies will be presented with a series of questions by the moderator, engaging them into a lively discussion. The Plenary will conclude with an interactive session with the audience.

Speakers:

1. **Jim Bridenstine**
   - Administrator, National Aeronautics and Space Administration (NASA), United States
2. **Kaijia Zhang**
   - Administrator, China National Space Administration, China
3. **Dmitry Rogozin**
   - Chairman, Roscosmos, Russian Federation
4. **K. Sivan**
   - Chairman, Indian Space Research Organisation (ISRO), India
5. **Kejian Zhang**
   - Administrator, China National Space Administration, China
6. **Sylvain Laporte**
   - President, Canadian Space Agency (CSA), Canada
7. **Jan Woerner**
   - Director General, European Space Agency (ESA), Germany
8. **Jean-Yves Le Gall**
   - President, French Space Agency (CNES), France
9. **Hiroshi Yamakawa**
   - President, Japan Aerospace Exploration Agency (JAXA), Japan
10. **Maggie Adkin-Pocock**
    - Space Scientist, British Broadcasting Corporation (BBC), United Kingdom
11. **Zhang Changwu**
    - Founder and CEO, LandSpace
12. **Jim Bridenstine**
    - President, International Astronautical Federation (IAF), United States
13. **Gabriela Arrigo**
    - Co-Founder, President, Global Networking Forum (GNF), United States

**14:15 - 15:00 Press Conference – LandSpace Technology**

Location: Bremen Conference Center – CCB Gallery

LandSpace's CEO Mr. Zhang Changwu will give a comprehensive introduction to the business highlight of Land Space in the Chinese private launcher enterprises, including its strategic layout of the three locations “Two Centers & One Base” in China, as well as its human resource strength. He will focus on Land Space’s business line planning of the LOX+LCH4 LRE based launcher ‘ZQ-2’ with complete independent intellectual property, among which the corresponding progress have been made recently; moreover, he will announce, on site of the press conference, the maiden flight of the first Chinese private carrier Rocket ‘ZQ-1’, to be executed in mid-October.

- **Zhang Changwu**, Founder and CEO, LandSpace

**15:00 - 15:15 IAF Global Networking Forum (GNF) Opening**

Location: Bremen Exhibition & Conference Center – DLR Hall

Welcome Addresses:

- **Jean-Yves Le Gall**
  - President, International Astronautical Federation (IAF), France
- **Gabriela Arrigo**
  - Vice President for Science & Academic Relations and Global Networking Forum, International Astronautical Federation (IAF), Italy
**15:00 - 16:30**  
**SpS – New Challenges for Planetary Protection**  
**Location:** Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

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**15:00 - 17:00**  
**Technical Sessions**

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.1</td>
<td>Behaviour, Performance and Psychosocial Issues in Space</td>
<td>CCB Danzig</td>
</tr>
<tr>
<td>A2.1</td>
<td>Gravity and Fundamental Physics</td>
<td>Bremen 2</td>
</tr>
<tr>
<td>A3.1</td>
<td>Space Exploration Overview</td>
<td>CCB Kaisen</td>
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<tr>
<td>A6.1</td>
<td>Space Debris Detection, Tracking and Characterization</td>
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<td>A7.1</td>
<td>Space Agency Strategies and Plans</td>
<td>CCB Rosellius</td>
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<tr>
<td>B1.1</td>
<td>International Cooperation in Earth Observation Missions</td>
<td>ZARM 3</td>
</tr>
<tr>
<td>B2.1</td>
<td>Advanced Space Communications and Navigation Systems</td>
<td>OVB 3</td>
</tr>
<tr>
<td>B3.1</td>
<td>Governmental Human Spaceflight Programs (Overview)</td>
<td>ZARM 4</td>
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<tr>
<td>B4.2</td>
<td>Small Space Science Missions</td>
<td>ZARM 2</td>
</tr>
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<td>B5.1</td>
<td>Tools and Technology in Support of Integrated Applications</td>
<td>Bremen 3</td>
</tr>
<tr>
<td>B6.3</td>
<td>Mission Operations, Validation, Simulation and Training</td>
<td>CCB Frankfurt</td>
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<tr>
<td>C1.1</td>
<td>Orbital Dynamics (1)</td>
<td>CCB Borgward</td>
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<tr>
<td>C2.1</td>
<td>Space Structures I - Development and Verification (Space Vehicles and Components)</td>
<td>OVB 2</td>
</tr>
<tr>
<td>C3.1</td>
<td>Solar Power Satellite</td>
<td>CCB Bergen</td>
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<tr>
<td>C4.1</td>
<td>Propulsion System (1)</td>
<td>ZARM 5</td>
</tr>
<tr>
<td>D1.1</td>
<td>Innovative and Visionary Space Systems</td>
<td>CCB London</td>
</tr>
<tr>
<td>D2.1</td>
<td>Launch Vehicles in Service or in Development</td>
<td>CCB Lloydsaal</td>
</tr>
<tr>
<td>D3.1</td>
<td>Strategies &amp; Architectures as the Framework for Future Building Blocks in Space Exploration and Development</td>
<td>Bremen 1</td>
</tr>
<tr>
<td>E1.6</td>
<td>Calling Planet Earth - Space Outreach to the General Public</td>
<td>CCB Scharoun</td>
</tr>
<tr>
<td>E2.3</td>
<td>Student Team Competition</td>
<td>OVB 4</td>
</tr>
</tbody>
</table>

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**15:15 - 16:45**  
**GNF – Results from the AMS Experiment on the International Space Station**  
**Location:** Bremen Exhibition & Conference Center – DLR Hall

The Alpha Magnetic Spectrometer (AMS), is a large magnetic spectrometer operating on the ISS since May 2011, searching for antimatter particles and dark matter signals in cosmic rays. AMS has collected so far more than 120 billion cosmic ray particles providing for the first time a wealth of high precision data on the flux of the different species of cosmic rays from GeV up to TeV region. The talk will present the results obtained so far and the physics implications.

Organized by:  
Italian Space Agency (ASI)

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**15:15 - 16:00**  
**Press Conference – Heads of Agencies**

**Location:** Bremen Exhibition & Conference Center – CCB Gallery

- Jim Bridenstine, Administrator, National Aeronautics and Space Administration (NASA)  
- Kjell Engdahl, Director General, Roscosmos,  
- K. Sivan, Chairman, Indian Space Research Organisation (ISRO)  
- Jan Woerner, Director General, European Space Agency (ESA)  
- Hiroshi Yamakawa, President, Japan Aerospace Exploration Agency (JAXA)

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**15:50 - 16:20**  
**GNF – Presentation of Results of the 26th Workshop on Space Technology for Socio-Economic Benefits: Industry, Innovation and Infrastructure for Development (3IS4D)**

**Location:** Bremen Exhibition & Conference Center – DLR Hall

The role of industry in the access to space is increasing, and strengthening the cooperation with the space industry is a way to increase the opportunities for developing countries to access space technologies and services. The workshop is expected to discuss and provide inputs on potential areas for partnerships considering the needs of developing countries, least developed countries and landlocked developing countries. The workshop shall also propose actions to progress in the definition of pilot projects that could foster partnership.

**Organized by:**  
United Nations Office for Outer Space Affairs (UNOOSA)

**Speakers:**

- Cenan Al-Elabi  
  Projects Manager, International Astronautical Federation (IAF), France

- Joachim Post  
  International Relations, German Aerospace Center (DLR), Germany

- Pontiffo Maruping  
  Chair, Science and Technical Subcommittee, UNCOPUOS, Austria

- Shrish Ravan  
  Senior Programme Officer, United Nations Office for Outer Space Affairs (UNOOSA), Austria

- Simonetta Di Pippo  
  Director, United Nations Office for Outer Space Affairs (UNOOSA), Austria

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**69th International Astronautical Congress**

1 - 5 October 2018, Bremen, Germany

Location: Bremen Exhibition & Conference Center – DLR Hall

The International Space Station (ISS) utilization is a key point of the ISS partners’ human spaceflight programme until 2024 and, most likely, for the entire next decade. Roscosmos and NASA, as Governmental entities of Russian Federation and the United States of America, as well as Energia and Boeing, as major industrial contributors to the ISS Program, work hard to make the ISS a « launch pad » for the future human space missions beyond the Low Earth Orbit (LEO). They cooperate in the area of the ISS elements integration and utilization, ensuring operation and maintenance of the onboard facilities and systems, testing and application of innovative technologies aboard the ISS, which is a great open-architecture technological platform in space.

The ISS paves the way to the deep space. In this connection the partners face the future of human space flight and cooperate in development of a variety of novel space systems and complexes including: cis-lunar habitats, docking systems of new generation for spacecraft, new efficient solar arrays, and also in the area of commercial flights into the LEO.

The philosophy of cooperative efforts of the partners is: careful selection of the best (primarily simple and reliable) technical solutions, flexibility at designing and development of the space infrastructure's elements, application of new technologies at their manufacturing. All these will ensure reliability and effectiveness of the space systems operation and utilization.

Organized by:
S.P. Korolev Rocket and Space Corporation Energia

Speakers:
Evgeny Miklin
General Designer, RSC Energia, Russian Federation

Mark Mulqueen
ISS Program Manager, The Boeing Company, United States

Sergey Krikalev
Executive Director for Human Spaceflight, ROSCOSMOS, Russian Federation

William Gerstenmaier
Associate Administrator for Human Spaceflight, National Aeronautics and Space Administration (NASA), United States

Moderator:
Lena De Winne
Deputy Head of Administration, ASGARDIA, Austria

16:45 - 18:15  SpS – Open Source Space Workshop

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

17:15 - 18:00  GNF – Human Spaceflight Beyond Low Earth Orbit

Location: Bremen Exhibition & Conference Center – DLR Hall

In recent years, several private companies and national governments have set their sights on the Moon. This renewed lunar focus has various drivers including space tourism, colonization, and resource mining. Northrop Grumman has been actively engaged in a detailed architecture and vehicle design study for NASA’s Next Space Technologies for Exploration Partnerships (NextSTEP) program. A major architectural element derived from this study is a cis-lunar module design based on Northrop Grumman’s Cygnus spacecraft. Cygnus currently provides cargo resupply services to the International Space Station. This session will detail how Northrop Grumman is taking advantage of this human-rated and operational system to develop and deploy an affordable and reliable vehicle supporting the Cislunar Gateway objectives within the next few years. Designed to perform long duration missions in cis-lunar space, the Northrop Grumman Cislunar Module is extensible and evolvable to support future exploration missions.

Key topics will include:
- An overview of Northrop Grumman’s progress to date towards a cis-lunar vehicle
- Design features that allow the vehicle to be reconfigured to perform a variety of functions and services at the Gateway including habitat functions, the logistics transportation function, and science utilization
- Key partnerships between NASA, international space agencies and commercial industry from across the world that will enable development and operation of the Gateway

Organized by:
Northrop Grumman

Speaker:
Robert T. Richards
Vice President, Strategy and Business Development, Advanced Programs Division, Northrop Grumman, United States

17:45 - 18:05  Press Conference – The Moon Race Announcement

Location: Bremen Exhibition & Conference Center – CCB Gallery

Nearly 50 years after Neil Armstrong first set foot on the Moon, institutions and industry players around the world are working on the preparation of new missions to the Moon. “The Moon Race” initiative aims to capitalise on these analogous ambitions by bringing together a group of partners from the moon-bound community, creating a movement around Moon exploration, and finally enabling the development of technologies necessary for its sustainable exploration. The Moon Race will be set up as an international competition offering the opportunity for demonstrations up to the lunar surface to the best participating teams.

Organized by: The Moon Race NPO, founded by Airbus Defence and Space

18:15 - 19:30  Plenary 2 – Host Plenary: How to Live and Work on ISS, Moon and Mars

Location: Bremen Exhibition & Conference Center – DLR Hall

Today’s visions of sending astronauts to Moon and Mars do not seem to be scheduled for a far distant future anymore. It is not the question of whether, but when we will be ready to go. ZARM (Center of Applied Space Technology and Microgravity) wants to focus the Host Plenary on research under space conditions and the practical requirements for working and living in space. We aim to show how the foundations for future extraterrestrial astronomical missions are being laid out.

Our guests will give short presentations (TED talk style) on their scientific work and their personal experience focusing on the following questions:
- Why is research under space conditions so important?
- What are the demands of an ideal workplace on ISS, Moon or Mars?
Tuesday 2 October

07:00 - 08:30  Industry Breakfast (Upon Invitation Only)

Location: Bremen Exhibition & Conference Center – ÖVB Olbers

Sponsored by:
Lockheed Martin

Speakers:
Lisa B. Callahan
Vice President & General Manager, Commercial/Civil Space, Lockheed Martin, United States
Pascale Ehrenfreund
Chair of Executive Board, German Aerospace Center (DLR), Germany

08:30 - 09:30  Plenary 3: High Tech Entanglement: How the Diverse Global Space Industry and Other High-tech Sectors are Becoming More Entwined and Interdependent

Location: Bremen Exhibition & Conference Center – DLR Hall

The global space industry has become entwined with other high tech sectors, which rely on satellites to provide enhanced imagery, weather data, communications, precision navigation, and timing to their customers. Space-based capabilities are now embedded in many popular terrestrial applications, enabling them to provide these enhanced services that improve lives.

In parallel, startups and maturing technology companies are leveraging advances in computing, analytics, artificial intelligence, machine learning, additive manufacturing, and robotics to improve their products offerings. These new applications are helping developed and developing economies alike to leapfrog old infrastructure, drive investment, growth, and create new jobs.

This plenary brings together speakers from high tech businesses who are leveraging space-based technology in their products and services. They will share stories about how they use space to improve applications and enhance services for users around the world.

Speakers:
Antonio Abad Martín
Chief Technical Officer, Hispasat, Spain
James Brayshaw
Vice President Sales, EMEA, Planet, United States

Hervé Clauss
Director MAPS Global Sourcing, TomTom, France

Alison Lowndes
Artificial Intelligence DevRel, NVIDIA, United Kingdom

MODERATOR:
Clay Mowry
VP – Global Sales, Marketing & Customer Experience, Blue Origin, United States

19:30 - 23:00  IAC 2018 Welcome Reception

Location: Bremen Exhibition & Conference Center – Festival Hall

Join Congress participants and partners for drinks, refreshments and networking. Held within the Festival Hall at the Bremen Exhibition & Conference Center, guests will delight with the wonderful food and drinks on offer and have the opportunity to unwind after the first official day of the Congress.

• How does the living and working environment influence the team dynamics?
• What are the technical and architectural specifications for a habitat that allows human beings to physically and psychologically cope with extreme living conditions?
• What are the expected benefits of astronomic missions to Moon or Mars?

Speakers:
Hanns-Christian Gunga
Head of Work Group, Center for Space Medicine and Extreme Environments, Germany
Christiane Heinicke
Team Lead – Moon and Mars Base Analog (MMBA), Center of Applied Space Technology and Microgravity (ZARM), University of Bremen, Germany
Tokuya Onishi
Astronaut, Japan Aerospace Exploration Agency (JAXA), Japan

MODERATOR:
Marc Avila
Director, Center of Applied Space Technology and Microgravity (ZARM), University of Bremen, Germany
**GNF INDUSTRY STREAM**
Room: DLR Hall

**GNF SOCIETY & EDUCATION STREAM**
Room: CCB Hansesaal

### 09:40 - 11:15  GNF – Including Everyone in Lunar Exploration

**Location:** Bremen Exhibition & Conference Center – DLR Hall

The international space community is focusing its attention on the challenge and excitement of establishing a permanent human presence beyond LEO. Now 50 years after the first Apollo mission, the idea of humans inhabiting the moon is becoming a reality. The Orion spacecraft’s journey to the Moon in 2019, NASA’s plans for the Deep Space Gateway, and a wide array of private initiatives are just a few examples of work that’s well underway. The current international focus on lunar missions is fueling innovation – necessitating support from reusable lunar landers, In-Situ Resource Utilization (ISRU) facilities, and possibly even the European concept of a Moon Village as an open architecture where all players contribute. NASA and ESA are open to investigating the role of commercial companies to provide payloads delivery services to the lunar surface. Today’s global space industry sector – traditional companies and new space – holds the keys to technology, talent, resources, and capabilities needed to usher in this next phase of human space exploration. Collaboration between international enterprises, both large and small, will be essential to achieve these goals. Lunar exploration is the global enterprise that will inspire young students to choose an aerospace career and be a crucial part of this great vision. The session moderator will set the stage by describing how the “lightning round” speakers will cover all aspects of lunar exploration – technology, programmatic, policy, economic/societal, and education/workforce. The series of speakers – representing large and small companies, educators, and venture capitalists – will offer fast-paced presentations in their area of expertise, and the moderator with facilitate questions from the audience in the last half hour.

**Organized by:** IAF Industry Relations Committee (IRC)

**Speakers:**
- Juergen Ackerman, General Secretary, ArianeGroup, France
- Kyle Azceno, Managing Director, iSpace Europe, Luxembourg
- Dominic “Tony” A. Antonelli, Director, Advanced Programs Commercial Civil Space, Lockheed Martin Space Systems Company, United States
- Olivier Juckenhoefel, Founder and CEO, PTScientists, Germany
- Ahson Chaudhuri, Director, NASA JPL Center for Space Exploration & Tech Research, University of Texas at El Paso, United States
- Nicolas Faber, CEO, Blue Horizon, Luxembourg
- Peter McGrath, Global Sales and Marketing Director, Space Exploration, The Boeing Company, United States
- Maria Antonietta Perino, Director of Relations with Space Associations, Thales Alenia Space, Italy
- MODERATOR
  - Eric Stallmer, President, Commercial Spaceflight Federation, United States

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**10:00 - 10:45  Press Conference – MILO Space Science Institute**

**Location:** Bremen Exhibition & Conference Center – CCB Gallery

- Jim Bell, Professor, School of Earth and Science Exploration, Director, ASU Space Technology and Science ("NewSpace") Initiative, Arizona State University
- Elizabeth (Betsy) Cantwell, CEO, Arizona State University Research Enterprise
- Lon Levin, President and CEO, GEOshare
- Lisa Callahan, Vice President and General Manager Commercial Civil Space, Lockheed Martin
- Bill Nye, CEO, The Planetary Society

**11:00 - 12:00  Press Conference – Announcement on the Call of Interest for the ATLANTIC International Satellite Launch Programme**

**Location:** Bremen Exhibition & Conference Center – CCB Gallery

In line with their national space strategy (Portugal Space 2030), the government of Portugal together with the Regional Government of Azores plans to design, install and operate a spaceport in the Island of Santa Maria, in the Azores, associated with the development and operation of a new generation of satellite launch services. The announcement will present and discuss the opportunity for qualified entities worldwide to express their interest to cooperate with Portuguese enterprises and research centers in this endeavour.

- Manuel Heitor, Portuguese Minister for Science, Technology and Higher Education

**11:30 - 12:00  GNF – The Australian Space**

**Location:** Bremen Exhibition & Conference Center – DLR Hall

During the Opening Ceremony of IAC 2017 in Adelaide, it was announced that the Australian government had approved the establishment of a new Space Agency. In less than one year, that announcement became a reality on July 1, 2017. In one of her first interviews on the international stage, Dr. Megan Clark will discuss the strategic vision of the Australian Space Agency. And she will describe how the Agency will support and build the space industry of Australia and collaborate with traditional and new industrial leaders around the globe.

**Organized by:** IAF Industry Relations Committee (IRC)

**Speakers:**
- Megan Clark, Head, Australian Space Agency, Australia
- MODERATOR
  - Pamela A. McRoy, Director of Space Technology and Policy, Nova Systems, Australia
09:45 - 10:45  GNF – Orbits, Arts & Culture

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

The Committee for the Cultural Utilisations of Space (ITACCUS) will present a panel with a selection of its current members to challenge the traditional view that space activities are owned by national space agencies and the private sector. This panel will include a series of performative presentations to show how artists and cultural practitioners have always shaped the way we envision our future on Earth and beyond.

Organized by:
IAF Committee for the Cultural Utilisation of Space (ITACCUS)

Presenters:
Nelly Ben Hayoun
Director, NBH Studios, France
Rob La Frenais
Curator, United Kingdom
Melanie King
Director, Lumen Studios, United Kingdom

09:45 - 11:15  SpS – A global space partnership towards 2030: Addressing the Needs of Member States of The United Nations to Achieve the Sustainable Development Goals

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

09:45 - 12:45  Technical Sessions

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11:00 - 12:00  GNF – Bridging Space and Society: Strategies of Space Agencies to Foster the Uptake of Satellite-Based Services

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

Space agencies worldwide are promoting the creation and use of increasingly effective and accessible satellite-based services that contribute addressing social, economic and environmental challenges. The success of their endeavors will depend on their ability to seize final users’ needs and to reach out to public and private user organizations at the national, regional and local levels.

Indeed, to make satellite data and signals available to the public is not enough to actually transfer the potential benefits of space to society. For this to happen, such data and signals need to suit the needs of final users, to be embedded in their operations, and to finally enable the provision of better services to the public.

Eurisy proposes the organization of a roundtable to discuss the strategies adopted by space agencies to transfer the potential benefits of satellite applications to society.

The session will bring together representatives of space agencies, with the following objectives:

- Identifying best practices in the mechanisms and programmes designed by space agencies and supra-national organizations to promote the development and operational use of satellite-based services;
- Analyzing the challenges that the space community still faces to effectively reach out to civil society;
- Stimulating discussion on how to overcome the challenges and transfer the good practices identified to other contexts.

Speakers will give a short introduction on their activities, describing a case in which they successfully supported a public administration or a non-space private company to embed satellite-based services into their operations.

The moderator will ask them to analyze the main features of such experiences. In particular, the moderator will try to pinpoint some of the challenges that public and private organizations face to access and use satellite-based services, and to identify good practices that could be transferred to other contexts.

Organized by:
Eurisy

Speakers:

Carlo Des Dorides
Executive Director, European GNSS Agency (EASA), Czech Republic

Simonetta Di Pippo
Director, United Nations Office for Outer Space Affairs (UNOOSA), Austria

Isabelle Duvaux-Béchon
Head of the Member States Relations and Partnerships Office, European Space Agency (ESA), France
13:30 - 14:30  Plenary 4: The Game Changers – for a Joint Future in Space

Location: Bremen Exhibition & Conference Center – DLR Hall

Claudia Kessler, founder of the Astronautin initiative, will lead a discussion panel with women in leading space roles from politics, industry and international institutions. The all-female panel will be discussing their vision for the future of space. The topics of this panel will include the future of human spaceflight, opportunities in space exploration, and the impact of policies such as the United Nations Sustainability Agenda or EU Space Strategy on society and the planet.

The unique insights and experiences gained by the participants through achieving excellence in their respective professional fields promise an inspirational and engaging debate. The event is set out to open with a short statement from each panelist, followed by questions from Ms. Kessler and the audience.

Speakers:

- Elżbieta Bieńkowska, European Commissioner for Internal Market, Industry, Entrepreneurship and SMEs, European Commission, Belgium
- Lisa B. Callahan, Vice President & General Manager, Commercial/Civil Space, Lockheed Martin, United States
- Pascale Ehrenfreund, Chair of the Executive Board, German Aerospace Center (DLR), Germany
- Grazia Vittadini, Chief Technology Officer (CTO), Airbus Defence and Space, Germany
- Claudia Kessler, Founder, First German Astronaut Foundation, HE Space Holding B.V., Germany
- Simonetta di Pippo, Director, United Nations Office for Outer Space Affairs (UNOOSA), Austria

14:45 - 16:15  SpS – The Nexus of Blockchain and Space (Part I)

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

14:45 - 17:45  Technical Sessions

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<tr>
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<td>C4.9</td>
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14:45 - 15:45 GNF – Aircraft Parabolic Flight Campaigns for Microgravity and Student Experiments

**Location:** Bremen Exhibition & Conference Center – CCB Hansesaal

Aircraft parabolic flight is well known as test opportunity for experiments in zero-g and partial-g conditions since many years. Aircraft parabolic Flight covers the areas of fundamental research, spaceflight equipment test, human spaceflight training as well as educational purposes. The film industry uses zero-g aircraft for special effects and meanwhile even private individuals can book tickets for zero-g flights.

A few nations provide parabolic flight opportunities with large aircraft (Boeing, Airbus) mainly paid and organized by space agencies (ESA, DLR, CNES, NASA, etc.). In addition there are several providers with smaller aircraft.

Aircraft parabolic flight is a perfect example of international and global cooperation and networking since the number of providers worldwide is rather low. Student campaigns are highlights in national and international education programs and are very attractive. Last not least the growing commercial space market can benefit from zero-g and partial-g flight opportunities.

The panel discussion will address the following topics:

- The past, the present and the future of parabolic flight
- Student programs: What can be learned with parabolic flight programs?
- What makes parabolic flight attractive as test platform for scientific research and testing
- The perspective of parabolic flight in a changing “space market” – chances for private enterprises
- The panel consists of speakers from space agencies, program managers, scientists and providers.

**Speakers:**

- Markus Braun
  Head of Space Life Sciences Programme, German Aerospace Center (DLR), Germany
- Derek Gawanlock
  Test Flight Engineer, National Research Council, Canada
- Jean-Baptiste Renard
  Scientist, The National Center for Scientific Research (CNRS), France
- Nigel Savage
  Programme Coordinator for Gravity-Related University Student Experiments, European Space Agency (ESA), The Netherlands
- Hansi Selly
  Project Manager MIGROP Parabolic Flight, Gerads GmbH, Germany
- Vladimir Pletzer
  Space Operations Training Director, Blue Abyss, Belgium
- MODERATOR

**Organized by:**

- IAF Industry Relations Committee (IRC)

**Judges:**

- Antje Bulmann
  Manager and Coach, Airbus Bizlab – Aerospace Accelerator, Germany
- Ahsan Choudhuri
  Director, NASA MIRI Center for Space Exploration & Tech Research, University of Texas at El Paso, United States
- Bruno Correia Da Costa
  Accelerator Director, Starhub, France
- Michael Grosse
  Economic Advisor, Luxembourg Ministry of Economy Space Resources Initiative, Luxembourg
- Jonathan Hung
  President, Singapore Space and Technology Association, Singapore
- Ralf Janovsky
  Director of Predevelopment, OHB, Germany

**Additional Information:**

- The 10 startups with the most compelling applications will be short-listed and notified on September 10th. On October 2nd, each start-up will have 5 minutes to pitch their idea or business and 2 minutes to answer questions from the judges. The winning startup of this Pitch Session, will get access to exclusive coaching sessions from Airbus Bizlab and from Boeing Horizon X, and will receive an IAF Certificate and goodies bag. Lockheed Martin will award the winning startup with up to three free registrations to the IAC2019.

- In addition, OHB will be awarding the two startups with the most amount of public votes, with the following:
  - 2nd Prize: diploma and bag of goodies
  - 1st Prize: diploma, bag of goodies, consultancy session with OHB Venture Capital (with 300€ to partially cover any travel costs), and a second pitch opportunity at the OHB Fostering Innovation Session in the OHB Booth on Wednesday at the IAC.

- The IAF will also provide the two startups with the most amount of public votes with IAF goodies bags.

- The 10 Startups that have been selected to participate in the IAF Startup Pitch Session are:
  - Space Products and Innovation (SPIN)
  - Sensoo GmbH
  - Dawn Aerospace
  - AlphaLink
  - Insitek
  - Precious Payload Inc.
  - Manastu Space Technologies Pvt Ltd
  - Virtual Space Systems
  - Vallspace
  - SPACE WALKER Inc.

- The 10 startups will have 5 minutes to pitch their idea or business and 2 minutes to answer questions from the judges. The winning startup will get exclusive coaching sessions from Airbus Bizlab and from Boeing Horizon X, and will receive an IAF Certificate and goodies bag.
15:00 - 16:00  Press Conference – ESA Director General

Location: Bremen Exhibition & Conference Center – CCB Gallery

Jan Wörner, ESA Director General and IAF Vice President for Agency, Parliamentarian and Ministerial Relations will meet the Media to present the status of preparation of the ESA Council at Ministerial Level which will be held at the end of 2019 and for which a preparatory Council meeting will be organised as Intermediary Meeting of Ministers (IMM2018) on 25 October 2018, in Madrid, Spain.

• Jan, Director General, European Space Agency (ESA)

15:55 - 16:55  GNF – The Role of Education in Support of Emerging Countries

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

The UN Agreement on the Sustainable Development Growth (SDG) adopted in 2015 highlights that international collaboration is becoming increasingly important as it is one of critical factors to improve the welfare of people. This is especially relevant for developing countries through education activities in order to have a more important role to play in inspiring and motivating the next generation, capacity building and promoting the use of space technology for sustainable socioeconomic development. Space agencies can be catalysts in preparing with joint education activities the future workforce for the space sector as well as other sectors.

In this regard, the GNF will engage space agencies leaders and experts in reflecting on role of education in support of emerging countries and promote the initiative of IAF members’ collaboration to enhance the utilization of space technology to enhance capabilities of emerging space nations.

Organized by: IAF Committee for Liaison with International Organisations and Developing Nations (CLUDON)

16:30 - 16:50  GNF – Industry Deep Dives: Lockheed Martin Ventures

Location: Bremen Exhibition & Conference Center – DLR Hall

Organized by: Lockheed Martin

Speaker:
Chris Moran
Vice President, Corporate Development & Executive Director and General Manager, Lockheed Martin Ventures, United States

MODERATOR
Roble L. Samanta Roy
Vice President for Technologies and Innovations, Lockheed Martin Space Systems Company, United States

16:30 - 18:00  SpS – The Nexus of Blockchain and Space (Part II)

Location: Bremen Exhibition & Conference Center – ÖVB 6

16:30 - 18:00  SpS – Swarm Systems for Future Space Exploration

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal
69th International Astronautical Congress
1 - 5 OCTOBER 2018, Bremen, Germany

16:50 - 17:10


Location: Bremen Exhibition & Conference Center – DLR Hall

ispace is a lunar exploration company developing micro-robotic systems to explore the Moon for water and other resources. ispace raised nearly $95M USD in its Series A funding round, which will be used to fund its first two lunar missions. Kyle Acierno, Managing Director or ispace’s subsidiary in Europe, will dive deeper into the recently announced details of ispace’s upcoming missions and its roadmap toward its envisioned 2040 “Moon Valley”.

Speaker:

Kyle Acierno
Managing Director, ispace Europe, Luxembourg

MODERATOR
Robie I. Samanta Roy
Vice President for Technology and Innovation, Lockheed Martin Space Systems Company, United States

17:05 - 17:50

GNF – New Space – Rocking Earth Observation

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

Space based Earth observation has become a unique success story, as evidenced by the European Copernicus programme. However, Earth observation is currently undergoing fundamental changes that epitomise the New Space approach and that are addressed by the concept of Space 4.0. Major trends comprise the exponential growth in availability of Earth Observation data; the impact of big data and cloud processing, novel data analytics and the use of platform solutions. This has led to significant overlap between Earth observation and the domains of Internet of Things (IoT), Artificial Intelligence (AI) and Machine Learning. Further technological trends are constituted by satellite constellations – often of small and low cost sensors –, formation flying and convoys, as well as by High Altitude Platforms.

The event will inform the wider space community about these structural changes and offer the possibility to discuss the resulting implications. Contributions will be provided by speakers from various domains like public institutions, commercial entities and industry.

Organized by:

European Space Agency (ESA)

Speakers:

Rafal Modrzewski
Chief Executive Officer (CEO), Iceye, Finland

Peter Platzer
Chief Executive Officer (CEO), Iceye Global, United States

Yasu Yonemaki
Brand Manager, AXELSPACE, Japan

17:15 - 17:45

Press Conference – Global Conference on Space for Emerging Countries - GLEC 2019

Location: Bremen Exhibition & Conference Center – CCB Gallery

The International Astronautical Federation (IAF) together with Centre Royal De Télédétection Spatiale (CRTS) and with the support of the Centre National D’Études Spatiales (CNES) are very proud to officially announce the Global Conference on Space for Emerging Countries (GLEC 2019) to be held in Marrakech, Morocco from 24 to 26 April 2019.

• Driss El Hadani, Director, Centre Royal de Télédétection Spatiale (CRTS)

• Valanathan Munusami, CEO, South African National Space Agency (SANSA)

• Jean-Pascal Le Franc, Director of Planning, International Relations and Quality, Centre National d’Études Spatiales (CNES)

17:20 - 17:35


Location: Bremen Exhibition & Conference Center – DLR Hall

Planet designs, builds, and launches satellites faster than any company or government in history by using lean, low-cost electronics and design iteration. Their Doves, which make up the world’s largest constellation of Earth-imaging satellites, “line scan” the planet to image the entire Earth daily. They launch new satellites into orbit every three or four months. Agnieszka Lukaszczyk, Planet’s Senior Director for European Affairs, will dive deeper into the notion of the agile space that Planet operates by and the game changer small satellites have been to the Earth observation ecosystem.

Organized by:

Planet

Speaker:

Agnieszka Łukaszczyk
Senior Director – European Affairs, Planet, Belgium

MODERATOR
Robie I. Samanta Roy
Vice President for Technology and Innovation, Lockheed Martin Space Systems Company, United States

17:30 - 17:50


Location: Bremen Exhibition & Conference Center – DLR Hall

The MILO Space Science Institute is a non-profit research collaborative dedicated to making deep space missions affordable and accessible to universities and space agencies around the world. Affordability is achieved by sharing mission costs across a significant member base. Institute members participate in all aspects of space missions from development to operation, at a fraction of the total cost. Participation accelerates space industry growth by giving organizations first access to new data and a platform for technology development. The Institute views education as an integral part of its program to enable unprecedented exploration and scientific discovery while fostering economic growth. The MILO Space Science Institute is led by Arizona State University Research Enterprise, with support from GEOshare LLC and Lockheed Martin Space. Together, these entities shape mission objectives, and will be available to advise participants on satellite design and engineering to achieve a successful mission.

Organized by:

The MILO Space Science Institute

Speakers:

José Alexandre Chaloub
Director of Earth Observation Programmes and Head of EOM, European Space Agency (ESA), Italy

MODERATOR
Robie I. Samanta Roy
Vice President for Technology and Innovation, Lockheed Martin Space Systems Company, United States
**18:00 - 19:00**  
**Highlight Lecture 1: The Growing Role of Artificial Intelligence in Space Exploration**

*Location: Bremen Exhibition & Conference Center – DLR Hall*

Artificial Intelligence is playing an increasing role in not only our everyday lives but also the space sector where AI has the potential to revolutionize almost every aspect of space exploration. This talk begins by describing a number of success stories highlighting the tremendous impact of Artificial Intelligence: over a dozen years of operations of the Autonomous Sciencecraft on EO-1 and Sensorweb tracking volcanoes, flooding and wildfires, Machine Learning to triage enormous data streams in radio (V-FASTR) and visual (i-PTF) astronomy, Automated Targeting onboard the MER and MSL rovers (AEGIS), automatic semantic indexing of science features (Mars Target Encyclopedia), and automation of data management for Rosetta Orbiter operations. Finally, we describe how AI is critical to future mission concepts to search for life beyond Earth: a Europa Submersible to hunt for life on under-ice oceans of Europa, and an interstellar mission to explore distant solar systems.

*Speaker:*

- **Steve Ankuo Chien**  
  Senior Research Scientist, NASAJet Propulsion Laboratory (JPL), California Institute of Technology, United States

- **MODERATOR**  
  **Leon Alkalai**  
  Manager, Office of Strategic Planning, NASAJet Propulsion Laboratory (JPL), United States

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**19:00 - 22:00**  
**German Night Reception (Upon Invitation Only)**

*Location: Dorint Park Hotel Bremen*

**19:15 - 21:15**  
**Young Professionals Networking Event (restricted to Young Professionals)**

*Location: Bremen Exhibition & Conference Center – CCB Borgward*
Wednesday 3 October

07:00 - 08:30  IAF IDEA “3G” Diversity Breakfast

Location: Bremen Exhibition & Conference Center – ÖVB Olibers

Programme:

07:00 – 07:05  Introduction to IAF IDEA “3G” Diversity Day by Moderator, Mary Snitch

07:05 – 07:10  Welcome by IAF President, Jean-Yves Le Gall

07:10 – 07:30  An International Asteroid Endeavour – A Splendid Achievement of International Cooperation and Excellent Example of Geographical Diversity

Hayabusa2 is an asteroid sample return mission of the Japanese Space Agency (JAXA); its aim is to learn more about the nature and composition of near Earth asteroids and the origin and evolution of our Solar System. The MASCOT lander (Mobile Asteroid Surface Scout) - developed by the German Aerospace Center DLR and built in close cooperation with the French Space Agency CNES – is on board the Japanese Hayabusa2 spacecraft. In the very early hours of 3 October 2018, it will touch down on the C-type near-Earth asteroid Ryugu. For about 16 hours, four instruments (camera, radiometer, magnetometer, spectrometer) will be operated on the asteroid’s surface. In addition, MASCOT is able to ‘hop’ around on the surface and take measurements in several places. This will be the first time that a lander was especially built to operate on an asteroid surface and the first time that data will be collected at more than one site on an asteroid’s surface. The international effort of the asteroid sample return mission Hayabusa2, the MASCOT lander and possibly the confirmation of touchdown will be announced by the following speakers:

- **Pascale Ehrenfreund**, Chair of the Executive Board of DLR

- **Jean-Yves Le Gall**, President of CNES

- **Hiroshi Yamakawa**, President of the Japan Aerospace Exploration Agency JAXA

07:30 – 08:00  How to Engage the very Young Generation? – ESA’s Kid’s Weightless Dreams Campaign

In August 2018 ESA helped to provide children with disabilities the opportunity to experience weightlessness and lunar gravity on aircraft flights. Eight children from five ESA member states – UK, France, Germany, Belgium, and Italy – boarded the converted Airbus A310 in Bordeaux, France on 24 August as part of the Kid’s Weightless Dreams campaign organised by Novespace and Reves de Gosse. The children also took part in science demonstrations, including lighting a candle, mixing liquids of different densities, playing ping pong with bubbles of water and working a fidget spinner to demonstrate the effects of microgravity.

Joining the children were ESA astronauts from their corresponding member states: Tim Peake (UK), Frank De Winne (Belgium), Maurizio Cheli (Italy), Thomas Reiter (Germany), Claudie Haigneré (France) and Jean-François Clervoy (France) were on board to mentor the children and answer their questions.

Two disabled adults, former athlete and German television personality Samuel Koch, a strong advocate for disabled causes, and Philippe Carette, a very active Reve de Gosse volunteer, also took part in the flight.

ESA Director General Jan Woerner joined the Kid’s Weightless Dreams flight and will welcome one of them, Paula Monfeld (from Cologne), to talk with her about this exceptional experience. Also joining the flight will be ESA astronaut and former ESA Director of Human Spaceflight Thomas Reiter, who had accompanied Paula at this flight experience.

08:00 – 08:15  UNOOSA’s “Space for Women” – Project

UNOOSA is looking for partners for the implementation of the activities developed during the “Space for Women” - Expert Meeting held in October 2017 in New York to answer the recurring questions of:

- How to attract more women for space?
- What can women do for space?
- What can space do more for women?
- What do women need from space?

With a special focus on Sustainable Development Goals 4 (Quality Education) and 5 (Gender Equality) this project seeks to promote the critical role of women in the implementation of all the Sustainable Development Goals (SDG) as many targets specifically recognizing women’s equality and empowerment as both the objective, and part of the solution.

The “Space for Women” project will facilitate the strengthening of the awareness, capacity and skills of individuals and institutions related to the importance of promoting gender equality in the space sector and its fundamental educational fields.

Simoneetta Di Pippo, Director of UNOOSA, will give a keynote on the project and its current status focusing on:

- Space for Women
- Importance of inclusion, equality and empowerment
- Networking and importance of role models and the possible established champions programme under “Space for Women”
- Some personal experience
08:15 – 08:30  
Lockheed Martin Early Career Role Models  
Keynote Speech by two Lockheed Martin Early Career Females:  
- Danielle Richey, Space Exploration Architect, LMC  
- Kat Codere, Systems Engineer, LMC

08:30 - 09:30  
Plenary 5: Next Generation Plenary: Small Sats – Involving Everyone through their Applications  
Location: Bremen Exhibition & Conference Center – DLR Hall  
Space Satellites are making the vision of a more diverse space sector a reality today. The expanding pool of developers are finding more diverse ways of using satellites well beyond what was imagined a few years ago. Through new and innovative applications, the global space network will affect the lives of people around the world. The expanding knowledge base and reduced cost of engagement are enabling the Next Generation to be in the front ranks of the industrial expansion regardless of generation, gender, or geography. Here they have the opportunity to be leaders in finding new ways to use space resources to affect life on earth. In this plenary, students and young professionals will bring the story of how they are engaged in developing or using these applications.

The 69th IAC brings together another edition of the Next Generation Plenary. This year, we are pleased to introduce 6 panelists from around the world that are making an impact. The panelists will address how they expect to advance knowledge, improve conditions, protect life and property, and increase prosperity for an expanding portion of the global population through the use of Small Sats

Speakers:  
- Alec Courtright  
  Research Assistant, Global Science & Technology, Inc., United States  
- Marco Gómez  
  Research Engineer, Costa Rica Institute of Technology, Costa Rica  
- Alain Charmeau  
  Chief Executive Officer, Arianespace Group, France  
- Marco Gómez  
  Research Engineer, Costa Rica Institute of Technology, Costa Rica  
- David Henret  
  Chief Executive Officer (CEO), ExoP, France  
- Ana-Mia Swardt  
  Chief Project Officer, Simera Sense, South Africa  
- Esterina Timakhova  
  Final-year student, Aerospace department of Bauman State Technical University (BMSTU), Russian Federation  
- Anastasiia Volkova  
  Aeronautical Engineer, University of Sydney, Australia  
- Hans Steininger  
  Chief Executive Officer, MT-Aerospace, Germany  
- Martin Guenther  
  Senator of Economic Affairs, Labour and Ports, Bremen Senate, Germany  
- Dirk Lorenzen  
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- Agnieszka Łukaszczyk  
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- Thomas Jarzombek  
  Member of German Parliament and Federal Government Coordinator of German Aerospace Policy, German Parliament, Germany  
- Matthias Maurer  
  Astronaut, European Space Agency (ESA), Germany  
- Jon Wolmer  
  Director General, European Space Agency (ESA), France  
- Stéphane Israël  
  Chief Executive Officer, Arianespace, France  
- Jan Wilner  
  Director General, European Space Agency (ESA), France  
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Keynote Speech by two Lockheed Martin Early Career Females:  
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Location: Bremen Exhibition & Conference Center – CCB Hansesaal

China HEAD Aerospace is inviting executive level speakers to have an in-depth discussion during the session, speakers will include government and private stakeholders alone the satellite value chain. The panel will focus on the exchanges of data and service requirements based on small satellite technology. What is the prospective in terms of market demand and market offer in satellite-based application in a global context? What are the common interests and needs of this region in data and application requirement? We are inviting end-users to share with us their needs in application and how the space technology can bring social-economic benefits to support sustainable development. On the other hand, HEAD Aerospace which is commercialising the Chinese Earth observation data and will operate its commercial AIS/IoT constellation will share its perspective in the space infrastructure development and the China’s ‘One Belt & One Road’ initiative. Speaker representing the service providing market will share the experience in market needs/demand and the trends in certain vertical market.

Organized by:
China HEAD Aerospace

Speakers:

Kammy Brun
Head of Global Business Development, China HEAD Aerospace, China

Driss El Hadani
Director, Centre Royal de Télécommunications Spatiales (CRTS), Morocco

MODERATOR
Steve Bachinger
CEO, Euroconsult, France

9:45 - 11:15  SpS – Earth Observation and Sustainable Development Goals – Views from a Decade with the Group on Earth Observations. Panel Discussion on Readiness for a Terrestrial Forecasting System

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

9:45 - 12:45  Technical Sessions

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09:45 - 10:45  Press Conference – ESA/NASA

Location: Bremen Exhibition & Conference Center – CCB Gallery

10:35 - 11:05  GNF – Introduction of the System and Current Development on Aerospace Components in China

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

China aerospace components has an integrated industrial system in terms of manufacture and quality assurance. In recent years, the development of technological ability has been improved especially in the field of components engineering technical service. We would like to seek opportunities to exchange and cooperate with international counterparts on the themes of radiation hardened components and ICs design. Moreover, our international collaboration aims to jointly create innovative programme in the future.

Organized by:
China Academy of Space Technology (CAST)
China Aerospace Components Engineering Center (CACEC)
**10:50 - 11:10  GNF – Space Spin-Ins from the Underground – CERN’s Aerospace Applications**

**Location:** Bremen Exhibition & Conference Center – DLR Hall

CERN, the European Organization for Nuclear Research based in Geneva (CH), has a worldwide reputation in the field of High Energy Physics and it is mainly known for the Large Hadron Collider, the most powerful particle accelerator and one of the biggest and most complex machines on Earth, built to probe the fundamental structure of the universe and study the basic constituents of matter. However, the technologies and facilities developed in order to reach its core scientific objectives find short-term tangible applications in many other domains, from medicine to aerospace.

In line with IAC 2018 theme “Involving Everyone”, this presentation will show the impact that a non-space organization can have in the aerospace field through examples of past, present and future projects ranging from large scientific instruments devoted to the study of cosmic rays to CubeSat payloads for technology demonstration. Beyond purely technological aspects, successful translational projects are always the result of partnerships and multilateral cross-fertilizing exchanges, fostered by CERN’s Knowledge Transfer Group through an original open innovation approach.

When it comes to developing solutions for expanding the limits of human knowledge, the efforts dedicated to explore the largest and the smallest structures of the Universe can ultimately converge.

**Organized by:**
European Organization for Nuclear Research (CERN)

**Speaker:**
Enrico Chesta
Aerospace Applications Coordinator, Knowledge Transfer Group, European Organization for Nuclear Research (CERN), Switzerland

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**11:15 – 12:15  GNF – ESA’s Jam Session on Space Safety**

**Location:** Bremen Exhibition & Conference Center – CCB Hansesaal

It is becoming more and more important for the Space Community to tackle Space Safety which addresses the protection of humanity, of our planet and assets in space and on Earth from dangers (man-made and natural) originating in Space, and includes three segments:

- Planetary defence (NEO threat detection and analysis – incl. characterisation, follow-up observation, modelling, deflection techniques; warnings and mitigation measures)
- Debris and Cleanspace (debris – detection, tracking, mitigation and removal, intelligent systems leading to autonomous collision avoidance, clean systems, including regulatory aspects – space traffic management, ...

Space Safety is a topic that no nation, no agency, no space actor can tackle alone. Global collaboration is a must. International cooperation is seen today but there is space for more.

Space Safety is not a single project or activity but a series of projects and activities contributed from players worldwide towards the vision of a resilient society safe from dangers originating in space.

ESA DG Jan Wörner together with his Programme Advisor, Chiara Manfletti, wishes to discuss the role and importance Space Safety is going to have in the future. Jan Wörner will give a short overview about the topic and would like to engage the audience in an open discussion. The opinion on this matter is of high importance for shaping of future activities. Therefore, everyone is invited to give his/her comments and remarks on Space Safety. Only no comments are stupid comments

**Organized by:**
European Space Agency (ESA)

**Speakers:**
Chiara Manfletti
Programme Advisor to the Director General, European Space Agency (ESA), France
Jan Wörner
Director General, European Space Agency (ESA), France

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**11:20 – 12:20  GNF – Reusability: The Key to Reliability and Affordability**

**Location:** Bremen Exhibition & Conference Center – DLR Hall

In the dynamic landscape of today’s aerospace industry, reusability has emerged as a major differentiator to achieving highly reliable, affordable access to space. This presentation explores the development of reusability at SpaceX and the ways in which reusability has revolutionized the company’s business model. Although SpaceX is a relatively new player compared to other providers, it has already had a profound impact on the industry due to its rapid innovation, with a core focus on reusability. The first stage of its Falcon 9 launch vehicle has landed 25 times as of July 2018—both on land and at sea on autonomous spaceport drone ships. These recovered first stages have been refurbished and flown again on 13 missions, successfully demonstrating the true reusability of the design. In early 2018, SpaceX demonstrated a simultaneous landing of both Falcon Heavy side boosters at Landing Zone 1 at Cape Canaveral in Florida.

Reusability is also a fundamental feature of SpaceX’s Dragon spacecraft, the cargo capsule that supplies the International Space Station. In fact, four previously flown Dragon spacecraft have been used on resupply missions for the National Aeronautics and Space Administration (NASA). Other projects in work include fairing reusability for Falcon vehicles. SpaceX’s reusability initiative also provides invaluable flight data to further refine flight environment analysis models and, in turn, vehicle design. Data from each first stage can be stored onboard—enabling multiple cameras and additional high-speed data—and post-flight inspections allow SpaceX to track and control any fatigue-related effects. Observations are logged over multiple flights and facilitate an accurate assessment of a first stage’s flight readiness. With these intrinsic benefits and far-reaching efficiencies, reusability has become a principle technology that will increase the launch rate, reduce the launch cost and ultimately enable more reliable vehicles.
At IAC 2018 this award will be given for the second time. This year’s winner of this award is the Space Generation Advisory Council (SGAC). This luncheon is dedicated to the award ceremony for the 2018 IAF Excellence in “3G” Diversity Award.

Programme:
12:45 – 12:50 Welcome by Jean-Yves Le Gall, IAF President
12:50 – 12:55 Introduction of the IAF 3G Diversity Award Mary Snitch, IAF VP for Diversity Initiatives
12:55 – 13:00 Award Ceremony and Photo

IAC 2018 PUBLIC DAY
13:30 - 16:00 Space is Big – Space is Public

Location: Bremen Exhibition & Conference Center – ÖVB Arena

Outer space. Vast expanses of the universe...over 4,500 experts will meet during the International Astronautical Congress 2018 (IAC 2018) to discuss the immense scope of the various space-related disciplines. Interested members of the public are also invited. On 3 October, German Unity Day, the conference organizers invite you to the “Public Day”. Visitors will meet and experience high-level representatives from science, politics, and industry, and experience a live call to the International Space Station ISS.

The highlight event “Space is Big – Space is Public” is currently planned to begin at 13:30 with a roundtable discussion on “Space Safety”. The subject: How can space traffic be regulated? How to avoid collisions in outer space? The number of space objects in orbit is steadily on the increase. Along with the many satellites out there, space debris or junk has increased to about 750,000 objects larger than 1 cm! Sun storm and cosmic radiation from other distant sources are just some of the other hazards that dictate space weather and which impact the Earth’s climate and terrestrial technology causing disruptions and malfunctions in our power grids, etc. The discussion also includes “planetary defence systems”: These ensure early warnings about possible asteroid or comet impacts, and their avoidance or mitigation. Is playing billiards with comets an option we need to consider seriously?

As from 14:30, the audience will tune-in live to the International Space Station, ISS. The schedule currently includes a live session with Alexander Gerst, who will be the second ESA and first German commander of the International Space Station in the twenty years of its existence. The 42-year-old geophysicist has arrived on the ISS in June this year and will assume command in October.

At about 15:00, visitors will be able to get close-up to real astronauts. They will report on their experiences in outer space, taking enough time to answer questions from the audience.

Master Of Ceremony:
Maggie Adam-Pocock
Space Scientist, British Broadcasting Corporation (BBC), United Kingdom

Welcome Addresses:
Martin Guenthner
Senator of Economic Affairs, Labour and Ports, Bremen Senate, Germany
Jean-Yves Le Gall
President, International Astronautical Federation (IAF), France
13:30 - 14:30  Plenary 6: From Deep Impact to Gravity through Space Weather: Working Together to Protect From Space Hazards, Human-made or Natural

**Location:** Bremen Exhibition & Conference Center – ÖVB Arena

Space Safety is a topic that no nation, no agency, no space actor can tackle alone. Global collaboration is a must. International cooperation is seen today but there is space for more.

Space Safety is not a single project or activity but a series of projects and activities contributed from players worldwide towards the vision of a resilient society safe from dangers originating in space.

The aim of the plenary is to explore international cooperation beyond what is already done and initiate/provide impulse for more. This plenary event is thus conceived as a working plenary. The plenary starts with the current roadmaps at major space agencies on space safety topics and aims at identifying gaps in current activities and deriving concrete actions those on stage can agree to take up at home and with one-another.

**Speakers:**

- **Jim Bridenstine**
  Administrator, National Aeronautics and Space Administration (NASA), United States

- **Nicolas Chamussy**
  Executive Vice President Space Systems, Airbus Defence and Space, France

- **Matteo Emanuelli**
  Co-Chair Space Generation Advisory Council (SGAC), Denmark

- **Patrick Michel**
  Director of Research, Centre National de la Recherche Scientifique (CNRS), France

14:30 – 15:00  GNF – IAF-ASE Astronauts Event

**Location:** Bremen Exhibition & Conference Center – ÖVB Arena

New Space also means that the astronaut profession undergoes changes and new astronauts’ stories are being told. On stage in Bremen astronauts from all over the world will share their views on their unique professional careers with the audience. Can we really go to Moon and Mars faster, better? What role does safety play in private space missions? Are the international crews on ISS a role model for future spaceflights? Tag up with people who have the combined experience of years in space in a fleet of spacecraft vehicles!

**Organized by:**
International Astronautical Federation (IAF)
Association of Space Explorers (ASE)

**Speakers:**

- **Jim Bridenstine**
  Administrator, National Aeronautics and Space Administration (NASA), United States

- **Thomas Jaroszynski**
  Member of German Parliament and Federal Government Coordinator of German Aerospace Policy, Germany

- **Pascale Ehrenfreund**
  Chair of Executive Board, German Aerospace Center (DLR), Germany

- **Alexander Gerst**
  Astronaut, European Space Agency (ESA), Germany

- **Thomas Reiter**
  ESA Astronaut, Interagency Coordinator and Advisor to the Director General, European Space Agency (ESA), France

- **Matthias Maurer**
  Astronaut, European Space Agency (ESA), Germany

- **Jan Wörner**
  Director General, European Space Agency (ESA), France

- **Maggie Aderin-Pocock**
  Space Scientist, British Broadcasting Corporation (BBC), United Kingdom

- **Patrick Michel**
  Director of Research, Centre National de la Recherche Scientifique (CNRS), France

- **Matteo Emanuelli**
  Co-Chair Space Generation Advisory Council (SGAC), Denmark

- **Nicolas Chamussy**
  Executive Vice President Space Systems, Airbus Defence and Space, France

15:00 - 16:00  GNF – IAF-ASE Astronauts Event

**Location:** Bremen Exhibition & Conference Center – ÖVB Arena

On the occasion of the IAC 2018 Public Day, the Congress audience and participants will tune-in live to the International Space Station, ISS for a live session with Alexander Gerst, who will be the second ESA and first German commander of the International Space Station in the twenty years of its existence. Gerst launched to the International Space Station (ISS) on 6 June 2018 for his mission ‘Horizons – Knowledge for Tomorrow’, his second mission to work on the largest international technology project in the history of humankind. In this scientific laboratory, the major spacefaring nations are joining forces to develop solutions for the global challenges of our society: ‘Health, Environment and Climate Change’, as well as ‘Digitisation, Industry 4.0, Energy Supply and Mobility of Tomorrow’. He will carry out 60 European experiments – the German Aerospace Center contributes to 41.

Alexander Gerst will assume command of the ISS on 3rd October 2018 during the week of IAC, and will be connecting live from the Station on that same day, to interact and answer questions from the audience.

**Organized by:**
European Space Agency (ESA)
German Aerospace Center (DLR)

**Speakers:**

- **Michael Lopez-Alegria**
  Principal, M-theory, LLC, United States

- **Matthias Maurer**
  Astronaut, European Space Agency (ESA), Germany

- **Ernst Messerschmid**
  Professor, University of Stuttgart, Germany

- **Thomas Reiter**
  ESA Astronaut, Interagency Coordinator and Advisor to the Director General, European Space Agency (ESA), France

- **Kaichi Wakata**
  Vice President, Director General of Human Spaceflight Technology Directorate, Japan Aerospace Exploration Agency (JAXA), Japan

- **Pamela A. Melroy**
  NASA Space Shuttle Commander; Director of Space Technology and Policy, Boeing, Australia

- **Jan Wörner**
  Director General, European Space Agency (ESA), France

- **Alexander Gerst**
  Astronaut, European Space Agency (ESA), Germany

- **Thomas Jaroszynski**
  Member of German Parliament and Federal Government Coordinator of German Aerospace Policy, Germany

- **Pascale Ehrenfreund**
  Chair of Executive Board, German Aerospace Center (DLR), Germany

- **Matthias Maurer**
  Astronaut, European Space Agency (ESA), Germany

- **Jan Wörner**
  Director General, European Space Agency (ESA), France

- **Maggie Aderin-Pocock**
  Space Scientist, British Broadcasting Corporation (BBC), United Kingdom

- **Patrick Michel**
  Director of Research, Centre National de la Recherche Scientifique (CNRS), France

- **Matteo Emanuelli**
  Co-Chair Space Generation Advisory Council (SGAC), Denmark

- **Nicolas Chamussy**
  Executive Vice President Space Systems, Airbus Defence and Space, France
14:00 - 15:00 Joint Press Conference – Colombian Space Agency (AEC) and Ecuadorian Civilian Space Agency (EXA)

Location: Exhibition & Conference Center – CCB Gallery

LATCOSMOS Joint Manned Missions treaty sign:
The AEC and the EXA will sign a binding document to move forward together towards the implementation of the first Latin American manned mission into space within the IAF GRULAC’s LATCOSMOS programme and will answer questions from the media.

14:40 – 16:10 GNF – The Need For a Solid SME Base Within the Industrial Chain on Space and Defence Programmes

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

Start-up and scale-up firms are important drivers of economic growth and thus for the creation of jobs. During recent years, professional, scientific and technical activities have represented the sector with the highest share of high-growth firms.

SME firms play an steadily increasing role within the industrial chain working for space and defence programmes, the analysis of which is subject of this presentation and panel session. On the other hand, within the new space and defence industries there are also companies opting for an approach having most production under one roof.

The public procurement authorities provide industrial policy reflections/directives on the share of the involvement of SME companies within the space and defence contracts. In addition to this, public procurement authorities can play an increasingly important role by providing supporting measures to the SME in many different forms (e.g. improving SME visibility, networking opportunities, supply chain integration and ability to bid for contracts).

The respective views will be presented by the 3 important actors involved i.e. the Public Procurement Authorities, Large System Integrators, SME companies and their representative bodies.

As the topic is relevant worldwide, high level representatives from different continents, with a special role for SME’s, will participate to this session.

Key questions to be addressed during this panel / presentation sessions are:
- Which are the advantages and responsibilities for Large System Integrators / Prime contractors to have a solid SME industrial base, instead of a company owned vertically integrated industrial structure.
- Which are the views of the SME community that their actual share in development contracts is much below their share of winning space technology contracts and what should be done about this.
- What is the present role of the Public Procurement Authorities and how should this role further evolve in the future?

Organized by:
European Space Agency (ESA)
14:45 - 17:45 Technical Sessions

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16:00 - 17:45 IAF IDEA “3G” Diversity Afternoon

Location: Bremen Exhibition & Conference Center – ÖVB OIbers

The IAF IDEA “3G” Diversity Afternoon is organized in cooperation with and with participation of Young ESA, SGAC and WIA-Europe.

Programme Overview:

Master of Ceremony:
IAF VP for Diversity Initiatives, Mary Snitch

16:00 – 16:05 Welcome by IAF President, Jean-Yves Le Gall

16:05 – 16:30 Young ESA / SGAC Diversity Award

About the award
This competition was organized for a second year by Young ESA in cooperation with Space Generation Advisory Council (SGAC). Participants were asked to submit a video and an essay on a diversity related topic as well as their CV. The selection was done through an internal committee of ESA representatives lead by the Strategy Department.

About the winners
This years’ first place Katherine Pangalos, 21 years old, of Dutch nationality and MSc in Astronautics and Space Engineering. For the first time, the second and third places also recognized. This year, these are held by Christopher Ogunlesi and Kwasi Khansah.

Programme:
- Short Welcome by Young ESA Moderator, Christopher Vasko
- Welcome by ESA Director General, Jan Woerner
- ESA DG, Jan Woerner to present winners with their Awards
- Closing remarks by SGAC Executive Director, Clementine Decoopman
- Group photo

16:30 – 16:50 WIA-E Update & Awards Ceremony

Background information

Passionate about expanding women’s opportunities for leadership and increasing their visibility in the aerospace sector WIA-E is encouraging members of the space community to be part of their ever-growing network of like-minded professionals. Rich with opportunity, their various functions offer something for everyone. WIA-E offers mentoring programmes, awards, grants, training workshops, networking local groups and much more. In addition to this, both regional and central events regularly feature speakers and panel discussions on a wide range of topics of interest to the community, and keep members updated with valuable industry information such as scholarships and conferences.

Awards Background information

WIA-Europe would like to encourage and support upcoming talent – young professionals and students alike – and for this a grants programme was established. The programme provides grants of € 1000 to cover attendance at aerospace workshops and conferences and is intended to support new and young colleagues with their first experiences in presenting a paper in an international context. Applicants were selected based on their papers from all related aerospace disciplines. A grants committee of space professionals under the lead of Chris Welch, Professor at the International Space University, evaluated and decided on the winners. Along with the grant of € 1000 for the conference, they will also win a year-long free membership to WIA-Europe for the following year.
Programme

• Welcome and Keynote by WIA – E President, Luisella Giulicchi

• Introduction to the WIA-E Grant programme by Chris Welch, WIA-E Chair of Awards and Grants Committee,

• Short 5 minute presentation by Grant winner(s) about their work

• Congratulation by WIA-E Director of Professional Development, Christina Giannopapa

• Group photo

16:50 – 17:45 IAF IDEA Mentoring Session with Young ESA / SGAC / WIA-E & Networking reception

About the Mentoring Session
The IAF, SGAC, Young-ESA and WIA-E have joined forces for the first time to offer a joint Mentoring Session to Young Professionals with top space professionals. This speed mentoring serves as a bridge between the experienced and the incoming generation of actors in the space sector

Programme

• Welcome by the Moderator, Mary Snitch (5 minutes)
• 5 Speed mentoring sessions of 9 minutes each (45 minutes)
• Summary and closing remarks by Moderators (5 minutes)

Event Structure
There will be 5 tables for 6 participants and 1 mentor each.

Speed mentoring participants were be selected by:

• IAF Workforce Development and Young Professionals Programme Committee – 12 participants (2 tables)
• Young ESA – 6 participants (2 tables)
• SGAC – 6 participants (1 table)
• WIA-E – 6 participants (1 table)

Speed mentoring participants were selected beforehand by the host organisations. While the mentors from table to table will rotate, participants remain seated. During the event, a networking reception is offered for all spectators.

List of Mentors:

• IAF – Jean-Yves Le Gall, President

• AIRBUS – Oliver Juckenhoefel, Vice President On-Orbit Services and Exploration

• ESA – Jan Woerner, Director General

• OHB SE – Fritz Merkle, Representative of the Executive Board

• IISL – Kai-Uwe Schrogl, President

Moderators

• IAF VP for Diversity Initiatives, Mary Snitch

• Young ESA, Christopher Vasko

• WIA-E Director for Professional Development, Christina Giannopapa

• SGAC Executive Director, Clementine Decoopman

16:20 - 17:20 GNF – Italian Space Economy for the Sustainable Development Goals

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

The workshop will focus on the tools that the Italian space economy is providing in support of the goals of the UN Agenda 2030 for sustainable development.

The evolution of new space systems with the possibility to conceive and realize, through miniaturization of on board functions, advanced digital communication processors and space based radars, new generation optical sensors and cost effective
microsatellite constellations and satellite formations is paving the way to a new class of space services and applications. This "new space" economy is developing new business models and technologies and promoting the growth of the space sector in general.

Italy is at the forefront of this process and is expanding its space capacity, both in terms of infrastructure and data sources, also through international cooperation, to create a wider portfolio of products and services, that offer new and better tools to address several sustainable development issues.

In the field of Earth observation, for example, the integration of "traditional" space systems with new satellites, equipped with new generation sensors, is paving the way to a complete new class and generation of geospatial services and applications.

The workshop will show the role of the main actors of the Italian space economy in this process, from that of the Italian Space Agency to that of the of Italian space-related companies represented within the three main associations.

Organized by:
Italian Space Agency (ASI)

Speakers:
- Roberto Battiston
  President, Italian Space Agency (ASI), Italy
- Massimo Comparini
  Representative, Federazione Aziende Italiane per la Nanoscienza, Italia
- Luca Rossetti
  President, Association Of Italian Space Enterprises (AIPAS), Italy
- Simonetta Di Pippo
  Director, United Nations Office for Outer Space Affairs (UNOOSA), Austria
- Andrea Zanini
  Communication, Italian Space Agency (ASI), Italy

MODERATOR
Claus Lämmerzahl
Professor for Theoretical Physics and Director for Space Sciences, Center of Applied Space Sciences, Hannover, Germany

18:00 - 19:00 Highlight Lecture 2: Gravitational Wave Detection on Ground and in Space – The New Window to The Universe

Location: Bremen Exhibition & Conference Center – DLR Hall

According to Einstein, gravitational waves are created by accelerated masses like in binary systems of Black Holes or Neutron Stars which circle around each other, approach each other, and finally merge. The gravitational wave signals carry information about the physics of the Black Holes, in particular of their event horizons, and of the highly extreme states of matter inside Neutron Stars. Such gravitational waves can also be used for a highly precise method to establish a cosmological distance scale which will contribute to a further independent and improved determination of the Hubble parameter and of the dark energy in our universe. Furthermore, gravitational waves can provide a better understanding of the fluctuations of matter and space-time in the very early universe and its inflationary phase. Besides electromagnetic radiation, gravitational waves thus provide a second and very clean way to observe the dynamics of Black Holes, stars, and the whole universe.

Speakers:
- Detlef Wilde
  Program Manager for Suborbital Missions, Airbus Defence and Space, Germany
- Karsten Danzmann
  Director, Max Planck Institute for Gravitational Physics (Albert Einstein Institute) and Institute for Gravitational Physics, Leibniz Universität Hannover, Germany
- Claus Lämmerzahl
  Professor for Theoretical Physics and Director for Space Sciences, Center of Applied Space Sciences, Hannover, Germany

19:00 - 22:00 IAC 2019 Kick-Off Event (Upon Invitation Only)

Location: Location: Dorint Park Hotel

19:15 - 21:15 Young Professionals Networking Event (restricted to Young Professionals)

Location: Bremen Exhibition & Conference Center – CCB Borgward
Thursday 4 October

**08:30 - 09:30** Plenary 7: Greenhouse Gas Measurements from Space – Difficult Challenges, Emerging Success, and Plans for the Future

**Location:** Bremen Exhibition & Conference Center – DLR Hall

Atmospheric carbon is steadily increasing. The Keeling Curve, depicting the concentration of CO2 in the atmosphere over Hawaii, started in 1958 and initially measured 315 ppm. In April 2014, the concentration topped 401 ppm. Contributions to this increase are coming from anthropogenic and natural sources. As the concentration of greenhouse gases (GHG) grow, Earth is warming and changing the future environment with major challenges to the life on the planet. The COP 21 Declaration is an international recognition of this increase and consequences on life across the planet. Creating a well-calibrated, accurate, and globally accepted time series of GHG levels and sustaining those over decades represents a major commitment of space agencies. Leaders from involved agencies will articulate the difficult challenges of making the needed measurements, convey emerging successes from efforts already underway, and describe plans for the future of these critical observations.

**Speakers:**
- Josef Aschbacher, Director of Earth Observation Programmes and Head of ESA, European Space Agency (ESA), Italy
- Michael Freilich, Director Earth Science Division, National Aeronautics and Space Administration (NASA), United States
- Naoto Matsuura, Senior Chief Officer of Satellite Applications and Director of Earth Observation Research Center (GERIC), Japan Aerospace Exploration Agency (JAXA), Japan
- Alain Ratier, Director General, EUMETSAT, France
- Juliette Lambin, Earth Observation Program Manager, Centre National d’Études Spatiales (CNES), France
- Mario Cilabre, Director of the Center for Satellite Applications and Research (CSAR), National Oceanic and Atmospheric Administration's (NOAA), United States

**MODERATOR:** Juliette Lambin

**09:45 - 11:15** SpS – Space Journalism and Outreach Workshop

**Location:** Bremen Exhibition & Conference Center – CCB Lilienthal

**09:45 - 12:45** Technical Sessions

**No.** | **Title** | **Room**
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A1.6 | Astrobiology and Exploration | CCB Danzig
A2.4 | Science Results from Ground Based Research | Bremen 2
A3.4A | Small Bodies Missions and Technologies (Part 1) | CCB Kaiserslautern
A6.5 | Post Mission Disposal and Space Debris Removal (1) | ZARM 1
B1.5 | Earth Observation Applications, Societal Challenges and Economic Benefits | ZARM 3
B2.5 | Space-Based Navigation Systems and Services | ÖVB 3
B3.5 | Astronaut Training, Accommodation, and Operations in Space | ZARM 4
B4.6A | Generic Technologies for Small/Micro Platforms | ZARM 2
B5.2 | Integrated Applications End-to-End Solutions | Bremen 3
C1.6 | Guidance, Navigation & Control (2) | CCB Borgward
C2.6 | Space Environmental Effects and Spacecraft Protection | ÖVB 2
C4.5 | Propulsion Technology (2) | ZARM 5
D1.4A | Space Systems Engineering - Methods, Processes and Tools (1) | CCB London
D2.5 | Technologies for Future Space Transportation Systems | CCB Lloyds
D4.3 | Conceptualizing Space Elevators and Tethered Satellites | Bremen 1
D6.3 | Enabling safe commercial spaceflight: vehicles and spaceports | ÖVB 4

- The ISS Crew Transportation: Launching Boeing Starliner and Commercial Travel to Space
- The ISS Next Generation: Private Astronaut Preparation Opening up the New Space Ecosystem

Following the Topics, a Q&A Round table with all Presenters that will be moderated by The Boeing Company

**Speakers:**
- Chris Ferguson, Boeing Starliner Astronaut, The Boeing Company, United States
- John Mulholland, CST-100 Starliner Program Manager, The Boeing Company, United States
- Mark Mulqueen, ISS Program Manager, The Boeing Company, United States

**GTF FUTURE STREAM**

**Room:** DLR Hall

**GNF – Space Station and the Next Generation: Launching the LEO Ecosystem**

**Location:** Bremen Exhibition & Conference Center – DLR Hall

Space Station: Next Generation Celebration of the 20th Anniversary of the International Space Station and the bold future ahead. Today the ISS serves as the launch destination of commercial human spaceflight, including Boeing’s Starliner, and operates as the only laboratory that provides government and industry a firm foundation for research and commercialization opportunities in low Earth orbit. As the largest structure ever built in orbit, the ISS provides flexibility in its scientific capabilities and plays a central role as customer in the development of an Earth orbit economy. The Station also acts as a producer in the arena of conducting foundational research. With early steps made to enhance the ISS role in space commerce, this event will examine what steps are needed to open the Station further to commercial use, what markets may most benefit from its use and how to provide more opportunities for private and government astronauts to capitalize on its unique capabilities. Speakers will share their perspectives in a TED-talk format followed by a roundtable of Q&A from the audience on the following topics:

- The ISS Destination: The impact, importance and the future Off the Earth, For the Earth
Building up from the IAC 2018 “Plenary 7: Greenhouse Measurements from Space – Difficult Challenges, Emerging Success, and Plans for the Future”, the young professionals, those who will face the difficult consequences of Climate Change and might need to more aggressively work against it, will sit with senior experts to discuss about which are the main challenges and priorities to focus in the near and mid-term future.

Since the birth of the space age in 1957 and in particular in the past 40 years, space-based technologies have evolved to provide the knowledge needed to enhance our scientific understanding of planet Earth in many ways. The Earth system and its climate have been modulated by natural phenomena since the Earth was created. However, since the industrial revolution, the growing exploitation of fossil fuel combustion for energy and land use change has led to a rapid growth in population (i.e. from 1 Billion to 7.6 Billion), over 50% of population living today in urban areas.

The increase in the atmospheric abundance of the two most important greenhouse gases, carbon dioxide, CO2, and methane, CH4, is well recognised to have direct and negative impacts on climate, environment, ecosystem services, agriculture, human health, and ultimately in economy.

Global leaders are developing environmental policies (e.g. the United Nations Framework Convention on Climate Change) to regulate and mitigate the impact of man on the climate and environment to achieve ultimately sustainable development, but how young professionals can influence the future?

Organized by: 
OHB

Speakers:

Charlotte Bewick
Systems Engineer, Earth Observation Predevelopment, OHB System AG, Germany

John Burrows
Director of the Institute of Environmental Physics, University of Bremen, Germany

Timo Stuffer
Director Business Development, OHB System AG, Germany

MODERATOR

Rommy Arndt
News Anchorwoman, n-tv German Private News Television, NRW Aktuell German Public News Radio, Germany

11:00 – 12:00
Joint Press conference – RBC Signals and Ecuadorian Civilian Space Agency (EXA) – Cooperation MOU for Laser Communications Technology Development

Location: Bremen Exhibition & Conference Center – CCB Gallery

Cooperation MOU for Laser Communications Technology Development

RBC signals and the EXA will sign an MOU to move forward together into the field of satellite laser telecommunications development using EXA space technologies and RBC network capabilities and will answer questions from the media.

11:30 – 13:00
SpS – Quantum Technologies for Space – Development and Applications

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

12:00 – 13:00
GNF – URBAN: Conceiving a Lunar Base Using 3D Printing Technologies

Location: Bremen Exhibition & Conference Center – DLR Hall

Human exploration and permanent settlement on the Moon surface is the one of the most attractive and next logical goals in space. The key to any sustainable presence in space is the ability to manufacture necessary structures and spare parts in situ and on demand reducing the cost, volume, and up-mass constraints that could prohibit launching everything needed for long-duration missions from Earth. Additive Manufacturing (AM) has been identified as having the potential to provide a number of sustainability advantages. These advantages include the
generation of less waste during manufacturing: the capability to optimize geometries and create lightweight components that reduce material and energy consumption; the subsequent reduction in transportation in the supply chain; and inventory waste reduction due to the ability to create spare parts on-demand.

The topic of the event will be focused on Conceiving a Lunar Base Using 3D Printing Technologies via an interactive brainstorming session.

A keynote presentation will introduce the session. 4 tables will be established on 4 different topics (each with a rapporteur):
1. Permanent and long lasting items to be printed for Moon base
2. Print-on-demand
3. Waste as resource
4. Additive manufacturing process feasibility from a lunar perspective.

Organized by:
OHB System AG

Speakers:
Adeneit Makaya
Materiell and Processes Section IAC-MSP
European Space Agency (ESA)
The Netherlands

Matthias Spelt
Group Leader Granular Matter
German Aerospace Center (DLR)
Germany

MODERATOR
Marco Berg
Head of Human Spaceflight & Exploration
OHB System AG,
Germany

RAPPORTEUR
Anna Dourskikh
System Engineer for ALM
Sonaca Space GMBH,
Belgium

RAPPORTEUR
Robert Davenport
Senior Systems Engineer, LIQUIFER Systems Group,
Austria

RAPPORTEUR
Antonella Sgambati
Human Spaceflight Senior Engineer
OHB System AG,
Germany

RAPPORTEUR
Peter Weiss
Space Department Manager,
Comex,
France

12:00 - 13:00
GNF – Prospect of China’s New Generation Recoverable Satellite Piggyback Service

Location: Bremen Exibition & Conference Center – CCB Hansesaal

China will launch its first commercial recoverable satellite in 2019. During 2019-2025, 15 missions are planned, creating new prospects of commercial space services for flying and returning payloads/satellites from orbit, and a potential new commercial niche for China in the burgeoning commercial space economy. This new system is highly improved in microgravity, flying duration, power supplying, and payload interface. It will compete in the market with commercial return services currently offered from the International Space Station, and eventually with future commercial space stations and research laboratories. Potential commercial customers may include the agriculture industry, space materials, space pharmacy, new tech demonstration, and microgravity science/life science research, returning commercial payloads by parachute, within a new system developed from the previously-flown Shijian-10 mission architecture. The panel will share some details of the new recoverable satellite system, and coordinate an open discussion on promoting piggyback payload opportunities and markets for agencies, research institutes, industry and governments.

Organized by:
Global Aerospace and Telecom Consulting Ltd. (GATC)
Chinese Society of Astronautics (CSA)

Speakers:
John Norack
Professor and Neil Armstrong Chair,
The Ohio State University,
United States

LI Ming
Vice President,
China Academy of Space Technology (CAST),
China

Jeffrey Manber
CEO,
NanoRacks,
United States

Alfred Ng
Deputy Director, Space Science and Technology,
Canadian Space Agency (CSA),
Canada

ZHUI Linqi
CEO,
Global Aerospace and Telecom Consulting Ltd.,
China

12:30 - 13:30
The Aerospace Corporation Luncheon – A Traffic Jam Around the World: Space Is Getting Crowded; What Can We Do About It?

Location: Bremen Exhibition & Conference Center – ÖVB Olbers

Sponsored by:
The Aerospace Corporation

Speakers:
Jamie Morin
Vice President and Executive Director,
Center for Space Policy and Strategy
The Aerospace Corporation,
United States

Pamela A. Melroy
Director of Space Technology and Policy,
Nova Systems,
Australia
13:10 - 14:10  GNF – Introduction to Manned Environment and Scientific Experimental Resources of Chinese Space Station

Location: Bremen Exhibition & Conference Center – DLR Hall

The China Manned Space Engineering Office, on behalf of Chinese government, has made a strategic framework with United Nations Office for Outer Space Affairs to offer opportunities on crew participation and scientific experiments of Chinese Space Station to members of United Nations. Technical characteristics of manned environment of Chinese space station are introduced. Some key factors, including space experimental conditions, experimental resource for intravelucial and extravelucial, micro-gravity level, attitude and space environment are also described. It is helpful to know manned environment and experiments can be performed on Chinese Space Station, making a good fundament for international cooperation.

Organized by: China Academy of Space Technology (CAST)

Speaker: LI Ming
Chief Designer, China Academy of Space Technology (CAST), China

MODERATOR: YANG Hong
Vice President, China Academy of Space Technology (CAST), China

12:45 - 13:15 Interactive Presentations Award Ceremony and Cocktail Reception

Location: Bremen Exhibition & Conference Center – IP Hall

The Interactive Presentation Award Ceremony and cocktail reception, held on the fourth day of IAC, is the must-attend event of the Congress!

Sponsored by Glavkosmos, the Ceremony will present the 5 category winners among more than 400 presenters. Members of the International Programme Committee and delegates. The prize-giving ceremony will kick-off the Interactive Presentation session and will include a cocktail reception to meet and celebrate the winners. The interactive presentations will begin following the ceremony at 13:15.

The Interactive Presentation session aims at stimulating discussions concerning the contribution. Using software developed by ZARM, the presenters have been encouraged to emphasize their contributions by means of multimedia, such as audio and video, as well as images and animations. The presenters will be available throughout the session in order to answer questions and have scientific exchanges with the participants of the Congress, and they have indicated other times during the Congress in which they can provide additional presentations.

Do not miss out on this great opportunity to meet with the presenters and make new connections.

Please note that this event is open to all IAC participants

Sponsored by: Glavkosmos

13:15 - 14:45 Interactive Presentations Session

Location: Bremen Exhibition & Conference Center – IP Hall

13:45 - 14:45 GNF – The Young Generations’ Perspective of Space and Security

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

The Global Network Forum (GNF) for Space Safety and Security – “In and from Space” will be held during the IAC 2018 in Bremen. This GNF is expected to be an excellent occasion to promote IAF activities for space safety and security.

In this regard, the GNF will engage key space actors in reflecting on their views on space safety and security in and from space. This GNF invites panellists to reflect on the nature of space safety and security and its important role in space activities. This debate will focus on security in and from space, what the priorities of governments, industry and space agencies are.

Organized by: Space Generation Advisory Council (SGAC) European Space Agency (ESA)
Quantum Technologies is a cross and multidisciplinary area which has possibly disruptive impact on many fields relevant to the space industry. The so-called second quantum revolution is now about to come, and the way the space sector works and approach solutions might change sooner than later affecting all industries worldwide.

Quantum Technologies applications in the space sector range from Earth Observation, GNSS, Telecommunications, and many others. 2017 has witnessed the publication of the Quantum Manifesto and the announcement of the Quantum Flagship by the European Commission, the first satellites using QKD were launched in China and Japan and are successfully proving the technology, and many governments around the world are keeping an eye on the developments of Quantum Computing and quantum technologies, especially for security reasons.

The panel will offer an overview of the current status of the developments of Quantum Technologies, highlighting those with a relevance for the space sector; as well as tackle the needs to push forward these technologies and how agencies/organisations are pursuing this to adapt to the future.

**Organized by:**
OHB System AG

**Speakers:**

- **Narayan Prasad**
  Co-Founder, satsearch.co, The Netherlands

- **Harald Hauschildt**
  Programme Manager, Envisat Programme, European Space Agency (ESA), The Netherlands

- **Christoph Marquardt**
  Group Leader Quantum Information Processing Group, Max Planck Institute of Light (MPi), Germany

- **Aline Decool**
  Rocket Scientist, MSF Space Operations BV, The Netherlands

- **Kai-Uwe Schrogl**
  XIS President and Chief Strategy Officer, International Institute of Space Law (IISL), European Space Agency (ESA), France

- **Yann Gouy**
  Deputy Head of the Space Flag Team, Airbus Defense and Space, France

- **MODERATOR**
  Christine Giannopapa
  Head of Political Affairs, European Space Agency (ESA), France
15:30 - 16:30  GNF – Life in Space: the Science, the Challenges, and the Broad Horizon

Location: Bremen Exhibition & Conference Center – DLR Hall

This event will showcase our current understanding of life in space, including the potential for extraterrestrial life and the search for life in our solar system (Ehrenfreund), and the potential for live humans to capably and safely deal with the fundamental challenges of spaceflight, including: biomedical (Mukai), long-duration life support (Mankins); and the projection of individual human capabilities and presence on the surface of another world (Newman). A clarification of these life-related issues will be provided by these distinguished panelists, and via (live) audience engagement.

Organized by:
The SETI Institute

Speakers:
- Pascalle Ehrenfreund
  Chair of Executive Board, German Aerospace Center (DLR), Germany
- John C. Mankins
  President, Mankins Space Technology, Inc., United States
- Chiaki Mukai
  Vice President, JAXA Astronaut, Tokyo University of Science (TUS), Japan
- Dave J. Newman
  Apollo Program Professor, Massachusetts Institute of Technology, United States
- Olga Zhdanovich
  Standardisation Engineer and ISEC Vice-Chair, Workforce Development, Modis for European Space Agencies, The Netherlands
- Vera Mayorova
  Professor and Director of Youth Space Centre, Bauman Moscow State University (BMSTU), Russian Federation
- Andrew Herd
  Senior Engineer Knowledge Management, European Space Agency (ESA), The Netherlands
- Lisa La Bonte
  Founder & CEO, Arab Youth Venture Foundation, United Arab Emirates
- Maria Antonietta Perino
  Director of Relations with Space Associations, Thales Alenia Space, Italy
- Mary Snitch
  Senior Staff, Global S&T Organizations, Lockheed Martin, United States
- YANG Yuguang
  Professor, China Aerospace Science & Industry Corporation Limited (CASIC), China

MODERATOR
- John C. Mankins
  President, Mankins Space Technology, Inc., United States

16:05 - 17:05  GNF – Developing Space Workforce – Industry Focus

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

Attracting of skilled workforce for space industry is always a challenge. There are few important issues to consider: lack of motivation of young people to study engineering subjects, aging of workforce in space industry especially in Europe, scarcity of certain professions as for example system engineering, product assurance etc.

The panellists will discuss the specific problems space industry faces today: scarcity of certain professions, aging of workforce and capture of knowledge accumulated as well as discuss the way forward. The panellists are invited from major prime industrial companies from the United States, Europe, China as well as academia and space agencies.

Organized by:
IAF Global Workforce Development Subcommittee

Speakers:
- Andrew Herd
  Senior Engineer Knowledge Management, European Space Agency (ESA), The Netherlands
- Lisa La Bonte
  Founder & CEO, Arab Youth Venture Foundation, United Arab Emirates
- Vera Mayorova
  Professor and Director of Youth Space Centre, Bauman Moscow State University (BMSTU), Russian Federation
- Maria Antonietta Perino
  Director of Relations with Space Associations, Thales Alenia Space, Italy
- Mary Snitch
  Senior Staff, Global S&T Organizations, Lockheed Martin, United States
- YANG Yuguang
  Professor, China Aerospace Science & Industry Corporation Limited (CASIC), China

MODERATOR
- Olga Zhdanovich
  Standardisation Engineer and ISEC Vice-Chair, Workforce Development, Modis for European Space Agencies, The Netherlands

Speakers:
- Pascale Ehrenfreund
  Chair of Executive Board, German Aerospace Center (DLR), Germany
- John C. Mankins
  President, Mankins Space Technology, Inc., United States
- Chiaki Mukai
  Vice President, JAXA Astronaut, Tokyo University of Science (TUS), Japan
- Dave J. Newman
  Apollo Program Professor, Massachusetts Institute of Technology, United States

MODERATOR
- John C. Mankins
  President, Mankins Space Technology, Inc., United States

16:30 - 18:00  SpS – Quantum Key Distribution – The Future of Cryptography

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

The presentation will focus on the current state of research and development of Quantum Key Distribution (QKD) technology, with a particular emphasis on the future potential of QKD for securing communication channels against eavesdropping. The speakers will discuss recent advances in QKD, challenges that need to be overcome, and the implications for future applications in various industries, including finance, defense, and cloud computing. The event will also provide opportunities for networking with industry experts and researchers.
**Friday 5 October**

**07:30 - 08:30  GNF – Ahead of the Curve – How Our Next Steps Fuel the Path to the Moon and Beyond**

*Location: Bremen Exhibition & Conference Center – DLR Hall*

Humanity is moving out into the solar system, starting with a return to the Moon. In this GNF, Lockheed Martin will build on last year’s session which introduced the role of the lunar-orbiting Gateway in preparation for an orbital Mars Base Camp. By using the Gateway as a lunar outpost for deep space exploration, NASA and its international partners are establishing a unique scientific, commercial, and exploration infrastructure which can fuel an Earth/Moon economy and allow humanity to embark on its first mission to the Red Planet. The forum will describe how the collaboration of government and commercial partners lay the foundation for the Moon in preparation for Mars, with a detailed vision for an inner solar system where astronauts and their robotic partners are conducting science, testing deep space systems, and refining operations for long duration missions. Near-term lunar objectives include telerobotic and crewed exploration of the Moon, including resource prospecting to enable a sustainable Earth/Moon economy. In meeting these objectives humans will be living and working in deep space for longer durations than ever before, requiring significant changes in the way we operate in orbit and new capabilities for operating on the lunar surface. We also explore today’s activities are establishing the framework for tomorrow’s Earth/Moon economy on the path to Mars, and conclude with commercial steps Lockheed Martin is taking to make this future a reality.

*Organized by:*  
Lockheed Martin

*Speakers:*

- **Dominic “Tony” A. Antonelli**  
  Director, Advanced Programs Commercial Civil Space, Lockheed Martin Space Systems Company, United States

- **Danielle Richey**  
  Systems Engineer, Advanced Programs, Lockheed Martin Space Systems Company, United States

- **Timothy Cichan**  
  Space Exploration Architect, Lockheed Martin Space Systems Company, United States

- **Rob Chambers**  
  Director, Human Spaceflight Strategy and Business Development, Lockheed Martin Space Systems Company, United States

**08:30 - 09:30  LBN: Breaking News on Hayabusa2, MASCOT and MINERVA II**

*Location: Bremen Exhibition & Conference Center – DLR Hall*

The Hayabusa2 mission is an asteroid sample-return mission operated by the Japan Space Exploration Agency (JAXA). It is intended to image and sample the asteroid 1999 JU3, discovered in May 1999, now known as Ryugu, and to return samples of the asteroid to Earth for laboratories analysis. C-type asteroid Ryugu belongs to the most common variety of near-Earth asteroids. The aim of the Hayabusa2 mission is to learn more about the origin and evolution of the Solar System.

The MASCOT lander (Mobile Asteroid Surface Scout) - developed by the German Aerospace Center (Deutsches Zentrum für Luft-
and Raumfahrt; DLR) and built in close cooperation with the Centre national d’Études Spatiales (CNES) – is currently on board the Hayabusa2 spacecraft. At the beginning of October 2018 (3 October, tcp), it will touch down on the asteroid Ryugu. For about 16 hours, the four instruments (camera, radiometer, magnetometer, spectrometer) will be operated on the asteroid’s surface. In addition, MASCOT is able to ‘hop’ around on the surface and take measurements in several places. This will be the first time that a lander was especially built to operate on an asteroid and the first time that data will be collected at more than one site on an asteroid’s surface.

The MINERVA “hoppers”, MINERVA-II1A and MINERVA-II1B will land at several locations on the surface of Ryugu to study these locations with cameras and thermometers. The two tiny MINERVA-II1A and MINERVA-II1B robots were successfully deployed on September 21. They won’t move on the asteroid’s surface in the traditional sense, similar to MASCOT, the duo will ‘hop’ from place to place on Ryugu.

Speaker:

Passcale Ehrenfreund
Chair of Executive Board, German Aerospace Center (DLR), Germany

Jean-Yves Le Gall
President, International Astronautical Federation (IAF), France

Hiroshi Yamakawa
President, Japan Aerospace Exploration Agency (JAXA), Japan

MODERATOR
Bernard Fausey (invited)
Director ILW, Press VU, Amsterdam, FACTUS Vizier Chair, European Space Agency (ESA), The Netherlands

09:45 - 12:45 Technical Sessions

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<td>CCB Danzig</td>
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<td>Life and Microgravity Sciences on board ISS and beyond (Part I)</td>
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<td>Joint Session on Advanced Nuclear Power and Propulsion Systems</td>
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<td>Lessons Learned in Space Systems: Achievements, Challenges, Best Practices, Standards.</td>
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<td>D2.8-A5.4</td>
<td>Space Transportation Solutions for Deep Space Missions</td>
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<td>Strategies for Rapid Implementation of Interstellar Missions: Precursors and Beyond</td>
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<td>E1.1</td>
<td>Ignition - Primary Space Education</td>
<td>CCB Scharnau</td>
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<tr>
<td>E3.6</td>
<td>Strategic Risk Management for successful space &amp; defence programmes</td>
<td>CCB Franzius</td>
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09:40 – 10:40  GNF – Monitoring Asteroids: Defending our Planet. Threats or Opportunities?

Location: Bremen Exhibition & Conference Center – DLR Hall

Shooting stars are wish makers, everybody is certainly excited about seeing one crossing the sky. These are tiny little pieces of meteoroids, dust and/or space debris that burn into the atmosphere. However, imagining that one or the millions of bigger pieces that are orbiting in our universe close to our planet decides their orbit collides with Earth’s one: that wish-maker will certainly become a real nightmare. Earlier species that inhabited Earth, such as dinosaurs, faced a complete extinction due to the impact of one of those asteroids, and the Earth, although protected by its atmosphere, is still very fragile if bigger rocks cross our skies.

Raising awareness about Asteroids can help not only be ready to protect our planet, but also learn more about the origin of the Universe and to exploit those for a common benefit. In other words, asteroids are both: threats and opportunities.

This panel will talk about these two faces of Asteroids, covering the topics of resources exploitation and planetary defence.

Panellists will talk about their national programmes and strategies to protect planet Earth from asteroids, which are the remaining challenges ahead, and which initiatives exists already in place.

And in addition, the discussion will also addressed whether commercial initiatives to exploit asteroids can also be used by governments to deflect/destruct those that pose a threat to Earth. Are there any synergies and services currently offered in that direction from the commercial sector?

Organized by:

OHB System AG

Speakers:

Ian Connell
ESA General Studies Programme Manager, European Space Agency (ESA), France

William Crowe
Chief Executive Officer, High Earth Orbit Robotics, Australia

Fritz Merkle
Representative of the Executive Board, OHB SE, Germany

MODERATOR
Marc Schopper
Head of Exploration Programme in Predevelopment, OHB System AG, Germany

09:45 - 10:45  SpS – #HiddenNoMore: Empowering Young Women in the Space Sector

Location: Bremen Exhibition & Conference Center – OV 4
For the first time in history, NASA and ESA are joining forces to launch the first of a series of missions to send astronauts beyond the moon. This bold endeavor will ignite the next generation of space exploration that will include a journey to Mars and future interplanetary expeditions throughout our solar system.

NASA's next generation spacecraft – Orion – will be the first human-spacecraft to venture this far since the last Apollo mission in 1972. Exploration Mission-1 will be an uncrewed flight test that will launch atop the new Space Launch System rocket from NASA's Kennedy Spaceport in Florida for a 21-day mission to the far side of the moon and back. This flight will be the most exciting human spaceflight launch since the first International Space Station module was launched in 1998 to become the renowned orbiting laboratory it is today.

The ESA/NASA/Industry team is coordinating international communications and outreach initiatives through innovative social media campaigns, eye-catching graphics, captivating multimedia productions, supporting hundreds of community and educational events, garnering thousands of news headlines around the world, and fostering positive morale among employees with fun and engaging internal communications and events. Strategic partnerships with Peanuts Worldwide, Cinemark and other well-known organizations will so generate excitement and interest in space exploration, inspiring today’s youth to study and seek careers in STEAM fields – science, technology, engineering, art and math.

Orion’s first flight test – Exploration Flight Test-1 — generated thousands of news stories and over 3.8 billion social media impressions for Orion, with the #1 Trending hashtags on Dec. 5, 2014. On launch day, NASA TV's YouTube site reached more than 1.2 million people – nearly twice the number reached on the seven days surrounding Curiosity's Mars landing in 2012. We expect Exploration Mission-1 to generate twice that excitement. Come hear and see how.

Organized by:
Lockheed Martin

Speakers:
Siegfried Monser
Communications Business Partner
Airbus Space Systems, Germany

Barbara Zelon
Strategic Communications Manager
National Aeronautics and Space Administration (NASA), United States

Thomas Reiter
ESA Astronaut, Interagency Coordinator and Advisor to the Director General, European Space Agency (ESA), France

MODERATOR
Linda Singleton
Communications & Integration Manager, Lockheed Martin, United States

Roxita Suenson
Communication Programme Officer for Human Spaceflight, European Space Agency (ESA), The Netherlands

10:50 - 11:50  GNF – Igniting International Excitement for Interplanetary Space Travel

Location: Bremen Exhibition & Conference Center – DLR Hall

For the first time in history, NASA and ESA are joining forces to launch the first of a series of missions to send astronauts beyond the moon. This bold endeavor will ignite the next generation of space exploration that will include a journey to Mars and future interplanetary expeditions throughout our solar system.

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Airbus Space Systems, Germany

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Strategic Communications Manager
National Aeronautics and Space Administration (NASA), United States

Thomas Reiter
ESA Astronaut, Interagency Coordinator and Advisor to the Director General, European Space Agency (ESA), France

MODERATOR
Linda Singleton
Communications & Integration Manager, Lockheed Martin, United States

Roxita Suenson
Communication Programme Officer for Human Spaceflight, European Space Agency (ESA), The Netherlands

11:00 - 12:00  SpS – Adoption of Space Technologies and Applications in Emerging/NewSpace Actors

Location: Bremen Exhibition & Conference Center – ÖVB 4

It is time to debate how to involve everyone as a Global community to benefit from Earth, Moon and Mars space activities. The panelists will review recent EarthMoonMars key space missions and projects. They will discuss potential EarthMoonMars research (Earth observations, science and environment monitoring, planetary & space science, human spaceflight, astrophysics, technologies, life support, operations, technical validation and development). They will debate benefits and values of an EarthMoonMars approach for engaging everyone. The panel will address various aspects & questions from the community e.g.:

1. What are current EarthMoonMars missions & plans for different space agencies and space actors?
2. Why EarthMoonMars? How to engage Earth community to support and invest in space?
3. How to promote EarthMoonMars data and science for new users groups, public and youth?
4. What are Knowledge Gaps and precursor robotic missions for MoonMars and how do they build on activities on Earth or Earth orbit?
5. How do MoonMars activities contribute to address Earth problems and bring benefits?
6. How to make EarthMoonMars missions contribute to Global Sustainable Development Goals
7. What technical & research synergies between space missions around Earth, on the Moon or Mars?
8. What infrastructures in Earth-Moon sphere, on the Moon or Mars surface to benefit multiple users?
9. What is the role of small or emerging space countries and new partners? How to use cubesats?
10. How to collaborate effectively between countries, agencies and new stakeholders?

Organized by:
European Space Agency (ESA)

Speakers:
Maria Grulich
SGAC Scholarship Coordination
German Aerospace Center (DLR), Germany

Andreas Jaime
Business Development Manager, OHB Quantum Technologies Working Group, OHB System AG, Germany

Agata Koldziejczyk
Neuroscientist & LunAres Founder, Space Garder, Poland

11:00 - 12:00  SpS – Creating Strategic University Partnerships through International Student Projects

Location: Bremen Exhibition & Conference Center – CCV Focke-Wulf-Saal

11:30 - 13:00  SpS – A Scientific “Wish List” for Research Facilities on the Moon

Location: Bremen Exhibition & Conference Center – ÖVB 1

11:30 - 13:00  SpS – Innovative Spacecraft Concepts and Servicing

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

12:00 - 13:00  GNF – EarthMoonMars: Involving Everyone

Location: Bremen Exhibition & Conference Center – DLR Hall
13:45 - 14:45  GNF – Digitization in the Space Sector – from Hardware to Software

**Location:** Bremen Exhibition & Conference Center – DLR Hall

Our modern societies are undergoing a fundamental transformation of our life-styles that is largely based on a technological revolution from analogue to digital processes—commonly referred to as digitization. This development where information and communication technology is enabling simplified, streamlined, fast and connected products is also increasingly affecting the space sector that traditionally has a large part of high-technology manufactured products relying on robust hardware. In the last years however, research has also lend an eye to this new development and started to see the benefits of its application. New companies have entered the space market and gained success using methods and products of a digitalized world.

The overall trend of digitization is thus manifesting itself in the space sector—upstream and downstream. In the upstream sector, rocket and satellite manufacturing is being streamlined and new technologies as wireless communication is replacing cables to simplify the handling of the satellite and reducing its weight. But also in the downstream sector digitization is bringing new benefits to customers and challenges to developers: multi-temporal global earth observation, real-time observation, independent exploration missions through machine-learning, or citizen sciences going in hand with the challenge to manage, analyse and process large and heterogeneous amounts of data. Institutions such as ESA have picked up this topic, coined it “Space 4.0” and put it on the agenda. In Germany, an initiative from companies, universities and research institutes have brought forward a paper this year “Departure for Space 4.0. Software Defined Satellite” which highlights the increasing relevance of software in the space domain.

Thus the need for an even greater adaption of the whole sector is required. This panel seeks to bring attention to this fundamental development, map challenges, explore solutions and discuss the necessity for a software strategy in the space sector that would allow to make future space missions more secure, more flexible and cheaper.

**Organized by:**

German Aerospace Center (DLR)

**Speakers:**

- **Robert Axmann**
  Head of DLR Program Strategy, Executive Board Division Space Research and Technology & Acting Director Institute of Data Science, German Aerospace Center (DLR), Germany

- **Frank Dannemann**
  Head of the Department of Avionics Systems, German Aerospace Center (DLR), Germany

- **Christina Giannopapa**
  Head of Political Affairs, European Space Agency (ESA), France

- **Dietmar Ratzsch**
  President and CEO, Jena-Optronik GmbH, Germany

- **Antonio Martelo**
  Head of the Department of CEF, German Aerospace Center (DLR), Germany

- **MODERATOR**
  Head of the Department of CEF, German Aerospace Center (DLR), Germany

13:30 - 16:30 Technical Sessions

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<td>Safe Transportation Systems for Sustainable Commercial Human Spaceflight / Small Launchers: Concepts and Operations (Part II)</td>
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<td>Germany’s Contribution to Astronautics Post WWII</td>
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<td>E4.3B</td>
<td>“Can you believe they put a man on the moon?”</td>
<td>CCB Roselius</td>
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<td>E7.7-B3.8</td>
<td>Legal framework for collaborative space activities - New ways of launching (microlaunched) and large constellation microsat (Joint IAF/RSSL session)</td>
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Location: Bremen Exhibition & Conference Center – CCB Bergen

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| SpS – 2018: 10 years Columbus in Space and Delivery of Orion European Service Module |
| Location: Bremen Exhibition & Conference Center – ÖVB 4 |

| SpS – Space Needs Everyone’s Ideal! Prizes and Challenges in the Space |
| Location: Bremen Exhibition & Conference Center – CCB Bergen |

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</table>

<table>
<thead>
<tr>
<th>13:15 - 14:45</th>
<th>SpS – Space Needs Everyone’s Ideal! Prizes and Challenges in the Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location: Bremen Exhibition &amp; Conference Center – CCB Bergen</td>
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**No. Title**

<table>
<thead>
<tr>
<th>13:30 - 16:30</th>
<th>Technical Sessions</th>
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<tbody>
<tr>
<td>Room</td>
<td>TS</td>
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<tr>
<td>CCB Danzig</td>
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<tr>
<td>Bremen 2</td>
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<tr>
<td>CCB Kaisen</td>
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<td>ÖVB 3</td>
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<td>ZARM 1</td>
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<td>ZARM 2</td>
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<td>ÖVB 4</td>
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<td>CCB Borgward</td>
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<td>ÖVB 2</td>
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<td>Bremen 3</td>
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<td>ZARM 5</td>
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<td>CCB London</td>
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<td>CCB Lloydvaal</td>
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<td>Bremen 1</td>
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<td>ZARM 3</td>
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<td>CCB Scharoun</td>
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<td>CCB Roselius</td>
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<td>CCB Roselius</td>
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<td>ZARM 4</td>
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</tbody>
</table>

**Location:** Bremen Exhibition & Conference Center – CCB Focke-Wulf Saal
14:55 - 15:40  GNF – Creating the Moon Village: First Results from the Drawing Board

Location: Bremen Exhibition & Conference Center – DLR Hall

The workshop will feature MVA President and Vice-President giving an overview of the main lines of the Association’s activities (total 10 minutes).

This will be followed by a panel discussion (total 20 minutes), moderated by Oleg Ventskovsky, with selected presentations (about 3 minutes each) by two of MVA’s institutional members and two of the MVA working group leads, including both world-known and well-established space companies, start-ups and NGOs. They will describe their Moon-related activities and explain the preliminary results of the MVA working groups and their relevance for the implementation of the Moon settlement. Also, an official announcement of results of the International Moon Pitch Competition 2018, in cooperation with Newspace2060, will be made and first MVA awards given to the winners.

This panel will include audience participation with questions and answers for the panel (15 minutes).

Organized by:
The Moon Village Association

Speakers:

John C. Mankins
Vice President, Moon Village Association (MVA), United States

Giuseppe Reibaldi
President, Moon Village Association (MVA), Italy

Panellists:

Kate Arkless Gray
Head of Communications and Outreach, PTScientists, United Kingdom

Yoshifumi Inatani
Professor, Department of Space Systems and Astronautics, Institute of Space and Astronautical Science (ISAS)/Japan Aerospace Exploration Agency (JAXA), Japan

Jim Keravala
CEO, OffWorld, Inc., United States

Chris Johnson
Space Law Advisor, Secure World Foundation, United States

MODERATOR
Oleg Ventskovsky
Director of the European Representation in Brussels, Yuzhnoye Design Office, Ukraine

15:00 - 16:30  SpS – Latin America beyond LEO: Securing regional participation in the Moon Village

Location: Bremen Exhibition & Conference Center – CCB Focke-Wulf-Saal

16:45 - 17:45  Closing Ceremony

Location: Bremen Exhibition & Conference Center – DLR Hall

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

The video of the winner for the #MYIAC2018 competition will be shown during the closing ceremony.

18:30 - 22:00  Gala Dinner

Location: Bremen Town Hall

On Friday evening we would like to welcome you to an UNESCO world heritage site: the more than 600-year-old Bremen Town Hall. The Gala Dinner will be a night of sophistication and elegance. Held in the historic “Obere Rathausalle”, guests will enjoy fantastic food and wine and get a taste of what it was like hundreds of years ago when important political decisions were made in this time-honoured hall. This will be the last special event of the Congress and a night not to be missed.
### 4.3 Meetings Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
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</thead>
<tbody>
<tr>
<td><strong>THURSDAY 27 SEPTEMBER 2018</strong></td>
<td></td>
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</tr>
<tr>
<td>09:00 - 18:30</td>
<td>SPACE GENERATION CONGRESS (SGAC)</td>
<td>UNIVERSITY OF BREMEN</td>
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<tr>
<td><strong>FRIDAY 28 SEPTEMBER 2018</strong></td>
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<tr>
<td>08:00 - 17:00</td>
<td>26th WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: “INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)”</td>
<td>CCB BORGWARD, CCB DANZING, CCB LONDON</td>
</tr>
<tr>
<td>09:00 - 18:30</td>
<td>SPACE GENERATION CONGRESS (SGAC)</td>
<td>UNIVERSITY OF BREMEN</td>
</tr>
<tr>
<td>09:00 - 18:00</td>
<td>TUTORIAL 3: PLANETARY PROTECTION 101</td>
<td>CCB FOCKE-WULF-SAAL</td>
</tr>
<tr>
<td>10:00 - 13:00</td>
<td>IAA SPACE DEBRIS COMMITTEE MEETING</td>
<td>CCB LILIENTHAL</td>
</tr>
<tr>
<td>11:00 - 13:00</td>
<td>IAF FINANCE COMMITTEE MEETING</td>
<td>ÖVB 1</td>
</tr>
<tr>
<td>12:30 - 13:00</td>
<td>IAA COMMISSION PLenary MEETING</td>
<td>CCB OSLO</td>
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<tr>
<td>13:00 - 15:00</td>
<td>IAF SPACE EXPLORATION COMMITTEE MEETING</td>
<td>CCB GAUß</td>
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<tr>
<td>13:00 - 15:00</td>
<td>IAF NEXT GENERATION COORDINATION COMMITTEE (NGCC) MEETING</td>
<td>CBB HERSHEYCL</td>
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<tr>
<td>13:00 - 16:00</td>
<td>IAA COMMISSION MEETING 1</td>
<td>CBB LLOYDSAA</td>
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<td>13:00 - 16:00</td>
<td>IAA COMMISSION MEETING 2</td>
<td>CBB ROSELIIUS</td>
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<td>13:00 - 16:00</td>
<td>IAA COMMISSION MEETING 3</td>
<td>CBB BERGEN</td>
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<td>13:00 - 16:00</td>
<td>IAA COMMISSION MEETING 4</td>
<td>CBB SCHAROUN</td>
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<tr>
<td>13:00 - 16:00</td>
<td>IAA COMMISSION MEETING 6 - SPACE &amp; SOCIETY, CULTURE &amp; EDUCATION</td>
<td>CCB OSLO</td>
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<tr>
<td>13:00 - 17:00</td>
<td>IAA SPACE EDUCATION AND OUTREACH</td>
<td>ÖVB 6</td>
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<tr>
<td>13:00 - 17:00</td>
<td>IAA SPACE EDUCATION AND OUTREACH</td>
<td>ÖVB 5</td>
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<tr>
<td>14:00 - 15:30</td>
<td>IPC Steering Group Meeting Session I</td>
<td>CBB BESEL</td>
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<tr>
<td>15:00 - 16:30</td>
<td>IAF TECHNICAL ACTIVITIES COMMITTEE (TAC) MEETING</td>
<td>CBB BESEL</td>
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<tr>
<td>16:00 - 17:30</td>
<td>IAA SCIENTIFIC ACTIVITIES COMMITTEE (SAC) MEETING</td>
<td>CCB OSLO</td>
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<tr>
<td>17:00 - 18:30</td>
<td>IPC GENERAL MEETING</td>
<td>CBB HANSESAA</td>
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<tr>
<td><strong>SATURDAY 29 SEPTEMBER 2018</strong></td>
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<tr>
<td>08:00 - 17:30</td>
<td>26th WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: “INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)”</td>
<td>CCB BORGWARD, CCB DANZING, CCB LONDON</td>
</tr>
<tr>
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<td>CCB FOCKE-WULF-SAAL</td>
</tr>
<tr>
<td>10:00 - 13:00</td>
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<td>CBB ROSELIIUS</td>
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<td>CBB BERGEN</td>
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<td>CCB OSLO</td>
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<tr>
<td>17:00 - 18:30</td>
<td>IPC GENERAL MEETING</td>
<td>CBB HANSESAA</td>
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<tr>
<td><strong>SUNDAY 30 SEPTEMBER 2018</strong></td>
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<tr>
<td>08:00 - 17:30</td>
<td>26th WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: “INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)”</td>
<td>CCB BORGWARD, CCB DANZING, CCB LONDON</td>
</tr>
<tr>
<td>08:00 - 18:00</td>
<td>SGAC PROFESSIONAL DEVELOPMENT WORKSHOP</td>
<td>CCB GAUß</td>
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<tr>
<td>08:00 - 18:30</td>
<td>IAA ACADEMY DAY</td>
<td>CBB HANSESAA</td>
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<tr>
<td>09:00 - 12:00</td>
<td>CROSS-CULTURAL WORKSHOP</td>
<td>CCB ROSELIIUS AND CCB OSLO</td>
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### Monday 1 October 2018

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
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<tbody>
<tr>
<td>08:00 - 09:00</td>
<td>VIP Gathering</td>
<td>IP HALL</td>
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<tr>
<td>08:00 - 09:00</td>
<td>HDA Preparatory Meeting</td>
<td>ÖVB ARENA</td>
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<tr>
<td>09:00 - 10:30</td>
<td>OPENING CEREMONY</td>
<td>ÖVB 6</td>
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<tr>
<td>10:00 - 10:30</td>
<td>IAA STUDY GROUP 2.18</td>
<td>ÖVB 6</td>
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<tr>
<td>10:30 - 11:30</td>
<td>OPENING EXHIBITION AND VIP TOUR</td>
<td>EXHIBITION HALL</td>
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<tr>
<td>11:00 - 13:00</td>
<td>IAF SPACE LIFE SCIENCES COMMITTEE MEETING</td>
<td>CCB GAUß</td>
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<tr>
<td>11:00 - 13:00</td>
<td>IAF SPACE SYSTEMS COMMITTEE MEETING</td>
<td>ÖVB 5</td>
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<tr>
<td>11:30 - 13:30</td>
<td>IAA STUDY GROUP 4.23</td>
<td>ÖVB 6</td>
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<tr>
<td>11:30 - 12:15</td>
<td>PRESS CONFERENCE: IAC KICK-OFF</td>
<td>CCB GALLERY</td>
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<tr>
<td>13:00 - 18:00</td>
<td>ISU BOARD OF DIRECTORS</td>
<td>ÖVB 5</td>
</tr>
<tr>
<td>13:15 - 14:45</td>
<td>PE1: HEADS OF AGENCIES: INVOLVING EVERYONE - WHAT'S NEW FOR THE SPACE AGENCIES?</td>
<td>DLR HALL</td>
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<tr>
<td>14:15 - 15:00</td>
<td>LANDSCAPE TECHNOLOGY PRESS CONFERENCE</td>
<td>CCB GALLERY</td>
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<tr>
<td>15:00 - 15:15</td>
<td>GNF: GNF OPENING</td>
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<td>15:00 - 17:00</td>
<td>IAA COMMISSION MEETING 5</td>
<td>ÖVB 6</td>
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<td>15:00 - 18:00</td>
<td>IAF GENERAL ASSEMBLY SESSION 1</td>
<td>CBB HANSESAA</td>
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<td>15:15 - 15:45</td>
<td>GNF: RESULTS FROM THE AMS EXPERIMENT ON THE INTERNATIONAL SPACE STATION</td>
<td>DLR HALL</td>
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<tr>
<td>15:15 - 16:00</td>
<td>PRESS CONFERENCE: HEADS OF AGENCIES</td>
<td>CCB GALLERY</td>
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<tr>
<td>15:50 - 16:20</td>
<td>GNF: PRESENTATION OF RESULTS OF THE 26TH WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: &quot;INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)&quot;</td>
<td>DLR HALL</td>
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<tr>
<td>16:00 - 17:30</td>
<td>IAA STUDY GROUP 3.27</td>
<td>ÖVB 1</td>
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<tr>
<td>Time</td>
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<tr>
<td>08:00 - 10:00</td>
<td>IAF CONGRESS AND SYMPOSIA ADVISORY COMMITTEE (CSAC) REPORT/MEETING/INTERVIEW</td>
<td>CCB BESSEL</td>
</tr>
<tr>
<td>08:30 - 09:30</td>
<td>PE3: HIGH TECH ENTLAGEMENT: HOW THE DIVERSE GLOBAL SPACE INDUSTRY AND OTHER HIGH-TECH SECTORS ARE BECOMING MORE ENTWINED AND INTERDEPENDENT</td>
<td>DLR HALL</td>
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<tr>
<td>09:00 - 11:00</td>
<td>IAF SPACE ASTRONOMY TECHNICAL COMMITTEE (SATC) MEETING</td>
<td>CCB HUMBOLDT</td>
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<tr>
<td>09:00 - 12:00</td>
<td>IAF SPACE OPERATIONS COMMITTEE MEETING</td>
<td>DLR HALL</td>
</tr>
<tr>
<td>09:00 - 12:00</td>
<td>IAF INTERNATIONAL PROJECT/PROGRAMME MANAGEMENT COMMITTEE (IPMC) MEETING</td>
<td>CCB HUMBOLDT</td>
</tr>
<tr>
<td>10:30 - 11:30</td>
<td>MOON VILLAGE ASSOCIATION ADVISORY COUNCIL</td>
<td>ÖVB 5</td>
</tr>
<tr>
<td>09:45 - 10:45</td>
<td>ORBITS, ARTS &amp; CULTURE</td>
<td>CCB HANSESAAL</td>
</tr>
<tr>
<td>09:45 - 11:15</td>
<td>IAF INCLUDING EVERYONE IN LUNAR EXPLORATION</td>
<td>DLR HALL</td>
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<tr>
<td>10:00 - 10:45</td>
<td>PRESS CONFERENCE: MILO SPACE SCIENCE INSTITUTE</td>
<td>CCB GALLERY</td>
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<tr>
<td>10:00 - 12:00</td>
<td>IAF SPACE SECURITY COMMITTEE MEETING</td>
<td>ÖVB 1</td>
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<tr>
<td>11:00 - 12:00</td>
<td>IAF SPACE ASTRONOMY TECHNICAL COMMITTEE (SATC) MEETING</td>
<td>ÖVB 5</td>
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<tr>
<td>11:00 - 12:00</td>
<td>IAF INTERNATIONAL PROJECT/PROGRAMME MANAGEMENT COMMITTEE (IPMC) MEETING</td>
<td>CCB HUMBOLDT</td>
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<tr>
<td>11:00 - 12:30</td>
<td>IAF GRULAC COMMITTEE MEETING</td>
<td>ÖVB 5</td>
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<tr>
<td>11:30 - 12:00</td>
<td>IAF: THE AUSTRALIAN SPACE</td>
<td>DLR HALL</td>
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<tr>
<td>11:30 - 13:45</td>
<td>IAA SPACE MINERAL RESOURCES STUDY GROUP</td>
<td>CCB HUMBOLDT</td>
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<tr>
<td>12:00 - 13:00</td>
<td>INTERNATIONAL LUNAR OBSERVATORY ASSOCIATION MEETING</td>
<td>ÖVB 1</td>
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<tr>
<td>12:00 - 12:30</td>
<td>IAA STUDY GROUP 4.25</td>
<td>CCB BESSEL</td>
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<tr>
<td>12:10 - 12:30</td>
<td>SPACE SUSTAINABILITY RATING – NEW WAY OF ADDRESSING THE ORBITAL DEBRIS CHALLENGE</td>
<td>ÖVB 5</td>
</tr>
<tr>
<td>13:00 - 14:00</td>
<td>IAA SMALL SATELLITE PROGRAMS COMMISSION</td>
<td>CCB HANSESAAL</td>
</tr>
<tr>
<td>13:00 - 18:00</td>
<td>ISL IODC COURT COMPETITION (SEMİ-FINALS)</td>
<td>ÖVB 1</td>
</tr>
<tr>
<td>13:30 - 14:30</td>
<td>PE4: THE GAME CHANGERS: FOR A JOINT FUTURE IN SPACE</td>
<td>CCB HUMBOLDT</td>
</tr>
<tr>
<td>14:00 - 15:30</td>
<td>IAF CLIODN COMMITTEE MEETING</td>
<td>CCB HUMBOLDT</td>
</tr>
<tr>
<td>14:00 - 16:00</td>
<td>IAF INTEGRATED APPLICATIONS COMMITTEE MEETING</td>
<td>CCB GAUR</td>
</tr>
<tr>
<td>14:45 - 15:45</td>
<td>GNF: AIRCRAFT PARABOLIC FLIGHT CAMPAIGNS FOR MICROGRAVITY AND STUDENT EXPERIMENTS</td>
<td>CCB HANSESAAL</td>
</tr>
<tr>
<td>14:45 - 16:15</td>
<td>IAF STARTUP PICK SESSION</td>
<td>DLR HALL</td>
</tr>
<tr>
<td>15:00 - 16:00</td>
<td>PRESS CONFERENCE: EUROPEAN SPACE AGENCY DIRECTOR GENERAL</td>
<td>CCB GALLERY</td>
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</table>

**TUESDAY 2 OCTOBER 2018**

**WEDNESDAY 3 OCTOBER 2018**
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 - 08:35</td>
<td>GNF: THE NEED FOR A SOLID SME BASE WITHIN THE INDUSTRIAL CHAIN ON SPACE AND DEFENCE PROGRAMMES</td>
<td>CCB LIUENTSCHAL</td>
</tr>
<tr>
<td>08:35 - 09:00</td>
<td>IAF WORKING GROUP ON EMERGING COUNTRIES MEETING</td>
<td>CCB GAUR</td>
</tr>
<tr>
<td>09:00 - 09:30</td>
<td>GNF: IAF-ASE ASTRONAUTS EVENT</td>
<td>ÖVB ARENA</td>
</tr>
<tr>
<td>09:30 - 10:00</td>
<td>IAF IDEA 3G DIVERSITY AFTERNOON</td>
<td>ÖVB OLBERS</td>
</tr>
<tr>
<td>10:00 - 10:20</td>
<td>GNF: ITALIAN SPACE ECONOMY FOR THE SUSTAINABLE DEVELOPMENT GOALS</td>
<td>CCB HANSESAAL</td>
</tr>
<tr>
<td>10:20 - 10:40</td>
<td>GNF: EUROPEAN INDUSTRY CONTRIBUTION TO A LUNAR ORBITAL PLATFORM</td>
<td>DLR HALL</td>
</tr>
<tr>
<td>10:40 - 11:00</td>
<td>IAF CONGRESS AND SYMPOSIUM ADVISORY COMMITTEE (CSAC) INTERVIEW II AND DEBRIEFING</td>
<td>ÖVB 1</td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>GNF: THE UK SPACE AGENCY – TOWARDS 2030</td>
<td>CCB HANSESAAL</td>
</tr>
<tr>
<td>11:30 - 12:00</td>
<td>HIL2: GRAVITATIONAL WAVE DETECTION ON EARTH AND IN SPACE – THE NEW WINDOW TO THE UNIVERSE</td>
<td>DLR HALL</td>
</tr>
<tr>
<td>12:00 - 12:15</td>
<td>GNF: INTERNATIONAL CONTRIBUTION TO THE PATH TO THE MOON AND BEYOND</td>
<td>DLR HALL</td>
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<tr>
<td>12:15 - 12:45</td>
<td>IAF CONGRESS AND SYMPOSIUM ADVISORY COMMITTEE (CSAC) INTERVIEW III AND DEBRIEFING</td>
<td>ÖVB 5</td>
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<tr>
<td>12:45 - 13:15</td>
<td>IAF CONGRESS AND SYMPOSIUM ADVISORY COMMITTEE (CSAC) INTERVIEW IV AND DEBRIEFING</td>
<td>ÖVB 6</td>
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<tr>
<td>13:30 - 13:45</td>
<td>IAF SPACE AND DEFENCE COMMITTEE MEETING</td>
<td>ÖVB B</td>
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<tr>
<td>13:45 - 14:00</td>
<td>GNF: THE YOUNG GENERATIONS’ PERSPECTIVE OF SPACE AND SECURITY</td>
<td>CCB HANSESAAL</td>
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<tr>
<td>14:00 - 14:15</td>
<td>IISL MUT COURT COMPETITION (FINALS)</td>
<td>BREMEN COURT</td>
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<tr>
<td>14:15 - 14:45</td>
<td>GNF: HOW WILL QUANTUM TECHNOLOGIES CHANGE THE FUTURE OF SPACE?</td>
<td>DLR HALL</td>
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<td>14:45 - 15:00</td>
<td>GNF: SFAC SPACEGEN ENTRPRENEURS FORUM</td>
<td>CCB HANSESAAL</td>
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<td>15:00 - 15:15</td>
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<tr>
<td>15:15 - 15:30</td>
<td>GNF: SPACE – THE NEW WINDOW TO THE UNIVERSE</td>
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<td>15:30 - 15:45</td>
<td>GNF: THE YOUNG GENERATIONS’ PERSPECTIVE OF SPACE AND SECURITY</td>
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<td>GNF: LIFE IN SPACE: THE SCIENCE, THE CHALLENGES, AND THE FUTURE OF SPACE</td>
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<td>16:15 - 16:30</td>
<td>GNF: THE YOUNG GENERATIONS’ PERSPECTIVE OF SPACE AND SECURITY</td>
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5 Students and Young Professionals Events

5.1 Young Professionals Events

All Young Professionals, please join us at these events included in your registration.

5.1.1 2018 IPMC Young Professionals Workshop

Date: Sunday 30 September 2018
Time: 08:45 – 18:00
Venue: CCB Focke-Wulf-Saal

The International Programme/Project Management Committee Young Professional Workshop sought to gather ideas and recommendations from early career employees in the international space community and provide the IPMC and IAF member organizations with greater knowledge, insights, and perspectives that can help better develop and empower the next generation of space program employees.

For this purpose, 4 topics have been identified to be researched for the 2018 workshop:
- Fostering Project Management in the world of diversity
- Space 4.0 and the evolution of the (aero) space Sector
- Challenges faced by multi-disciplinary teams working on space projects between emerging space economies and legacy space economies
- Knowledge Management practices

The observations and recommendations from the topic working groups will be presented and discussed on Sunday September 30, 2018.

The IPMC YP Workshop welcomes interested to join the presentations in the afternoon starting at 1pm in room CCB Focke-Wulf-Saal.

The workshop is sponsored by

BOEING
UAE SPACE AGENCY

5.1.2 2018 Young Professionals Programme

<table>
<thead>
<tr>
<th>Sunday 30 September 2018</th>
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<tr>
<td>19:00 – 21:00</td>
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<tr>
<td>YPP Networking Reception</td>
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<tr>
<td>Room CCB Borgward</td>
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<tr>
<td>ESL Programme 10th Anniversary Celebration</td>
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<tr>
<td>Moderator:</td>
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<tr>
<td>• Victoria Alonsoperez, Founder, ChipSafer</td>
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<tr>
<td>• Sanat Biswas, Assistant Professor, Indraprastha Institute of Information Technology</td>
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<tr>
<td>• Manisha Dwa, Project Coordinator, Nepal Astronomical Society</td>
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<tr>
<td>• Merve Erdem, Research Assistant, International Law Department, Ankara University Faculty of Law</td>
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<tr>
<td>• Minoo Rathnasabapathy, Research Engineer, Space Enabled Research Group, Massachusetts Institute of Technology (MIT)</td>
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<tr>
<td>• Ali Nasseri, Entrepreneur in Residence at TandemLaunch</td>
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<th>Tuesday 2 October 2018</th>
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<tr>
<td>19:15 – 21:15</td>
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<tr>
<td>YPP Networking Reception</td>
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<tr>
<td>Room CCB Borgward</td>
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<tr>
<td>NASA/Blue Origin/Lockheed Martin Joint Event</td>
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<tr>
<td>Speakers:</td>
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<tr>
<td>• Jim Bridenstine, Administrator, NASA</td>
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<tr>
<td>• Bob Smith, CEO, Blue Origin</td>
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<tr>
<td>• Lisa Callahan, Vice President and General Manager, Commercial Civil Space, Lockheed Martin Space</td>
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<tr>
<th>Wednesday 3 October 2018</th>
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<tr>
<td>19:15 – 21:15</td>
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<tr>
<td>YPP Networking Reception</td>
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<tr>
<td>Room CCB Borgward</td>
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<tr>
<td>YP Astropreneur Panel &amp; #UnlockYourIAC Competition</td>
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</table>
5.2 Students Events

5.2.1 International Space Education Board (ISEB) Student Programme

Dear Students,

I extend to you a most sincere welcome to the 69th International Astronautical Congress (IAC) in Bremen, Germany. The International Space Education Board has carefully designed a program which will offer you a unique opportunity to meet and exchange with and learn from the world’s leading experts, young professionals, and peers from around the world.

The ISEB is sponsoring more than 70 outstanding students to attend the Congress this year. During your time at the IAC, I strongly encourage you not only to visit, but also extensively utilize the International Student Zone (ISZ). Throughout the week, the ISZ will host the majority of the students’ activities and will provide you access to unique resources for your professional and personal development.

This year, the ISZ has been designed to share a common exhibition experience with Start-up companies from the space sector. This will give you the chance to meet the audacious entrepreneurs and learn how they overcame the challenges to achieve a successful endeavour. Additionally, the ISZ is located in the center of the exhibition hall thus highlighting the importance of education for the future of the space sector.

On behalf of the International Space Education Board (ISEB), I would like to thank the International Astronautical Federation and the Local Organizing Committee for their support in offering an exciting program this year again. I wish you a fruitful conference and a memorable experience in Bremen.

Sincerely,

Marie-Claude Guérard, CPA, CGA
Chair, International Space Education Board
Director General, Space Science and Technology
Canadian Space Agency / Government of Canada

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### International Space Education Board (ISEB) Student Programme

**Friday 28 September:** IAF Educators Professional Development Workshop – DLR SchoolLab

08:30 - 17:00 Educator Professional Development Workshop - EPDW (for teachers)

**Sunday 30 September:** ISEB Students Orientation Day – Hotel Swiss, room Zurich, Bremen

13:30-14:15 Welcome and ISEB Students Orientation Session with Heads of Education
14:30-17:30 Cross Cultural Awareness and Communication in an International Forum - Workshop
17:45-19:30 Icebreaker and Networking Meal

**Monday 1 October:** First IAC Day: Messe Bremen (MB), Main Exhibition Hall, International Student Zone (ISZ)

09:00-10:30 IAC Opening Ceremony
10:30-12:00 Opening Exhibition
13:30-15:00 IAC Plenary 1
16:30-17:30 IAC Plenary 2
18:15-19:30 IAC Welcome Reception

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**Tuesday 2 October:** Messe Bremen, ISZ, Universum Bremen

08:30-09:30 IAC Plenary 3
12:00-13:00 ISEB Students Lunchtime Presentation Session (NASA/JAXA), ISZ (open to all)
13:30-14:30 IAC Plenary 4
14:30-15:30 Outreach session “Tickle My Droid”, ISZ
15:00-16:30 Tear-down of the ISZ
16:45-17:45 IAC Closing ceremony

**Wednesday 3 October:** Messe Bremen, ISZ

08:30-09:30 IAC Plenary 5
12:00-13:00 ISEB Students Lunchtime Presentations Session (CSA/ESA), ISZ (open to all)
13:30-14:30 IAC Plenary 6
14:30-15:30 Outreach session “Tickle My Droid”, ISZ
15:00-16:30 Tear-down of the ISZ
17:45-18:45 IAC Highlight Lecture 2

**Thursday 4 October:** Messe Bremen, ISZ

08:30-09:30 IAC Plenary 7
12:00-13:00 ISEB Students Lunchtime Presentations Session (VSSEC, KARI), ISZ (open to all)
17:45-18:45 IAC Highlight Lecture 3

**Friday 5 October:** Messe Bremen, ISZ

08:30-09:30 IAC Plenary 8
09:00-11:30 ISEB Students Lunchtime Presentations Session (NASA/JAXA), ISZ (open to all)
12:00-13:00 Lunch time supplementary session
13:30-15:00 Outreach session “Tickle My Droid”, ISZ
15:00-16:30 Tear-down of the ISZ
16:45-17:45 IAC Closing ceremony

**Saturday 6 October:** Port of Bremen

08:30-15:00 ISEB Students Cultural Outreach Activity
5.3. IAF Grant and Recognition Programmes for Students and YPs

5.3.1 IAF Young Space Leaders (YSL) Recognition Programme

These awards are issued to students and young professionals who are in the course of their academic or professional activities, and have helped promote astronautics by enhancing outreach opportunities, expanding knowledge of space among the general public or fostering deeper engagement within the international space community. The three winners will be awarded their prizes during the Closing Ceremony of the 69th IAC on 5 October. They will also be invited to the gala dinner as guests of honor of the IAF President, Dr. Jean-Yves Le Gall.

Ali Nasseri

Ali Nasseri recently completed a Marie Curie Early Stage Researcher Fellowship at ISI Foundation along with a PhD from the Politecnico di Torino, where he worked as part of the ITN WALL project on modeling magnetic phenomena in nanostructures. Prior to that, Ali conducted graduate research on developing surrogates for aerospace fuels at the University of Toronto, and worked on system level modeling and design optimization of space systems at K. N. Toosi University of Technology. He is also a graduate of the ISU SSP 2014.

All the is the outgoing Chair and Advisory Board Member of the Space Generation Advisory Council, an organization he has worked with since 2012. Within the International Astronautical Federation, he serves as a member on the Space Education and Outreach Committee (SEOC) and the Workforce Development-Young Professionals Programme Committee (WD-YP).

When not conducting research or volunteering with professional organizations, Ali works with organizations such as the University of Toronto’s Engineering Outreach Office and Let’s Talk Science to deliver STEM outreach programs, or consults with organizations such as the Schlumberger Foundation with their start-up incubation programs.

Jackelynne Silva-Martinez

Jackelynne was born in Cusco, Peru. She earned two bachelor degrees from Rutgers University; one in Mechanical and Aerospace Engineering, and a second one in Spanish Translation and Interpretation. She earned a Certificate in Lean Six Sigma from the Lockheed Martin Greenbelt Program, and a Certificate in Engineering Management from Drexel University. Jackelynne obtained a Master’s Degree in Aeronautical Science with concentration in Human Factors Aviation/Aerospace Systems from Embry-Riddle Aeronautical University; and a second Master’s Degree in Aerospace Engineering with concentration in Space Systems Integration at Georgia Institute of Technology. Jackelynne is an alumna of the 2015 Space Studies Program from the International Space University.

Jackelynne works at NASA Johnson Space Center in the International Space Station Mission Planning Operations within the Flight Operations Directorate. She conducts research on crew autonomous scheduling aboard the ISS, and supports ground tests for lunar Orbital Platform-Gateway. At JSC, she has also worked in the aircraft operations division with the T-38 trainer aircraft primary flight displays, and in the human health and performance branch conducting human in the loop evaluations for Orion. Prior to JSC, she worked as Mechanical Engineer and Test Operator at NASA Ilet Propulsion Laboratory on the Robotic Manipulators and Deployable Booms group performing verification and validation ground tests for the Mars Science Laboratory, Curiosity Rover mission. And earlier, Jackelynne worked for Lockheed Martin Space Systems Company as Antennas Mechanical Design Engineer and as a Systems Integration and Test Engineer for commercial and government satellite programs. Her research is on human Systems Integration. She participated as Mission Specialist in the Human Exploration Research Analog mission, and as Executive Officer in the Mars Desert Research Station analog mission.

Jackelynne is the founder of the Centro de Ciencia, Liderazgo y Cultura, which brings topics of science, leadership and culture to the young generation at an international level. She is an active member of the American Institute of Aeronautics and Astronautics, Space Generation Advisory Council in support of the United Nations programme in space applications, and the International Astronautical Federation. She has served as chair for the habitability and human factors subcommittee of the Space Architecture Technical Committee, the AIAA Young Professionals Committee, and the IAF Workforce Development and Young Professionals Committee. She has many conference and journal publications. Jackelynne and her husband have a son and a daughter. She enjoys reading, traveling, dancing, and learning from different cultures. Her interests include human spaceflight, mission operations, space architecture, systems engineering, project management, STEM and STEAM initiatives.

Michal Kunes

Michal Kunes has been involved in the space industry for more than six years. He holds two Master’s degrees. Michal studied Business Administration and Management at the University of Economics between 2008 and 2013, and Aerospace Systems at the Czech Technical University between 2013 and 2016. This unique combination of education helps him to close the gap that often separates technical and business professionals in the space sector.

He is currently working as a Project Manager at the European Space Agency’s Business Incubation Centre in Prague (ESA BIC Prague). His aim is to inspire entrepreneurs to turn space-connected business ideas into commercial companies and to provide them with technical expertise and business development support. Between 2012 and 2017, Michal worked as a consultant at the Czech Space Office. In that position, he sought to develop space activities in the Czech Republic and to provide Czech organizations with information on international space programs.

He is also active as a volunteer, supporting and inspiring other young people to get involved in space projects, competitions and other activities. Between 2014 and 2018, he served as the National Point of Contact for the Czech Republic and later as the Scholarships Coordinator and also as a member of the Executive Council at the Space Generation Advisory Council (SGAC). As National Point of Contact, he acted as a communication channel between Czech students and young professionals and SGAC. As Scholarships Coordinator, he was responsible for running all scholarships and competitions and communication with sponsors and partners. Furthermore, in 2015, Michal established the Czech Space Network. This platform connects Czech students and young professionals interested in being involved in space activities, enabling them to communicate, meet and work together.

Since 2014, Michal has been actively contributing to the activities of the International Astronautical Federation (IAF). He currently serves as a member of the Workforce Development and Young Professionals Programme Committee, the Space Education and Outreach Committee and the Entrepreneurship and Investment Committee. Previously he was also a member of two more committees, the International Project/Programme Management Committee and Knowledge Management for Space Organisations Committee.
5.3.2 IAF Emerging Space Leaders (ESL) Grant Programme

Twenty-five students and young professionals were chosen by the Emerging Space Leaders Steering Committee composed of six highly experienced space stakeholders. They will attend the 69th International Astronautical Congress and have the opportunity to extend their network, gain knowledge and meet all the relevant people in space industry.

Akshata Krishnamurthy

Akshata Krishnamurthy is a fourth year PhD Candidate in the Department of Aeronautics and Astronautics at MIT, specializing in Space Systems Engineering. For her doctoral dissertation, she is developing an end-to-end framework for the characterization of detector systematics for space telescopes. As part of the Transiting Exoplanet Survey Satellites (TESS) Science Team, she is developing novel tools and techniques for the validation and improvement of the photometric performance of the mission. She was awarded the Schlumberger Faculty for the Future Fellowship for five consecutive years (2014-2019), the 2017 Luigi G. Napoli Award by the International Astronautical Federation (IAF) and more recently, the 2018 Zonta Amelia Earhart Fellowship.

Amr Elhussein

Amr Elhussein is a Mechanical Design engineer from Sudan. He received his Bachelor degree from University of Khartoum. Amr got the prize of the best graduation project on his final year project "Design and manufacturing of a 3 axis low-cost CNC router". During his studies, Amr founded "Mech Expo" an annual engineering exhibition held by the mechanical engineering department to help inspire the young generations. He also co-founded the first student chapter of the Institution of mechanical engineers (IMechE) and currently, he serves as the first Sudan Young Member Representative.

Amr is interested in areas like robotics and space structures, following his graduation Amr worked at the space research center at University of Khartoum. His research was focusing on the UoKSat structure optimization with the aid of 3d printing. During the IAC 2018 in Bremen Amr will present his work on “Topology optimization of UoKSat”. Through his research, Amr is aiming to help reduce the cost associated with the development of CubesatS to be accessible for the developing countries.

Anastasia Stepanova

Anastasia Stepanova is junior researcher at Institute of Biomedical Problems of Russian Academy of Science, studies Robotics as her second degree at Bauman Moscow State Technical University, space journalist, member of Mars Society, first responder at volunteer search and rescue squad SpaceRezerv. Anastasia was crewmember at unique twin study Mars analogue mission “Mars160” in Utah desert and Devon island (Arctic). The international team Mars160 carried out Mars-relevant microbiological, geological, psychological and engineering researches. Anastasia designated as crew journalist, health and safety officer and assistant to microbiologist. In addition, she conducted tests for the research “Cognitive psychology and the psychology of small groups” by Institute of Biomedical Problems RAS.

Anastasia has master degree in journalism at Moscow State University, spent four years at school of space journalism with Russian cosmonaut Yuri Baturin. Together with two other journalists she wrote the book about cosmonautics “I wish you a good flight”.

Anastasia dedicates her free time to educational projects, such as organizing summer space camps, giving the public talks in schools, universities and space conferences.

Antonio Caiazzo

“I am Antonio Caiazzo, aerospace engineer with several work experiences all around the world in the frame of space debris mitigation and remediation activities for the ESA clean space initiative and space sustainability, where the international cooperation plays a crucial role.”

Ashwati Das

Ashwati Das is a Ph.D student at Purdue University (United States). Her research seeks to exploit artificial intelligence to address the challenge that infinite trade-spaces present to constructing trajectory solutions. Specifically, she blends Artificial Neural Networks and Reinforcement Learning with traditional design techniques, to aid in path-planning focused on an efficient transport architecture for near-term activities to the Moon. She has contributed to trade-studies for the Mars Sample Return concept and Europa Lander studies at NASA JPL, evolved rapid trajectory design frameworks with NASA Goddard, and is currently working with NASA Marshall on a systems-based mission architecture analysis for a return to the Moon and onwards to Mars. Space inspires her to think beyond herself – with its broad-ranging impacts and ability to unite the world to push the boundaries of the unknown. She hopes to give back by leading missions as well as helping steer the vision for growth in the industry. She is passionate about collaborations on multiple fronts, and believes that strong international relationships, industry-government-academia partnerships, and human-robot synergy bears the potential to catalyze the space economy and broaden its humanitarian impact. As President of the Purdue Mars Society student organization, she advocates for such efforts by facilitating inter-disciplinary events on campus, to outreach with children, inspiring them to learn about and join the space journey. She hopes to continue to develop the technical knowledge, a global understanding of stakeholder perspectives, and leadership skills, to become a dependable leader and help expand human presence beyond Earth.

Barret Schlegelmilch

Barret Schlegelmilch is a new graduate of the MIT Leaders for Global Operations program with an MBA and masters in astronomical engineering and a former U.S. Navy nuclear submarine officer originally from Brussels, Belgium. He will be joining Blue Origin’s Advanced Development Programs division after completing the 2018 International Space University Space Studies Program this summer. Barret’s passion is working towards the future of humanity being an interplanetary species, and he still has the dream of becoming an astronaut one day. His hobbies include ultramarathons, exploring remote locations (most recently the North Pole and a marathon in Antarctica), and drumming.

Dante Bolatti

Dante Bolatti is a Ph.D. Candidate in the Department of Aerospace Engineering at Ryerson University in Toronto (Canada). He is currently a member of the Ryerson Aerospace Control Systems research group (RACS), where he is performing research on the topics of spacecraft dynamics, guidance, navigation and control (GNC) for asteroid exploration, having presented results from this research at international conferences. Dante received a B.Eng. in Electronics Engineering from the National University of Rosario (Argentina) in 2011. He has more than eight years of industry experience in safety-critical electronic systems. He is a student member of the American Institute of Aeronautics (AIAA), and of the American Astronautical Society (AAS). In addition, Dante is also a graduate student member of the Institute of Electrical and Electronics Engineers (IEEE), where he volunteered during 2016 and 2017 as Vice-Chair in the Toronto chapter of the Aerospace and Electronics Systems Society (AESS). In this role, he contributed to the planning and execution of aerospace events open to the academic, general and professional public.

He strongly believes that for humans to colonize Mars in the upcoming decades, several complex challenges will need to be solved, and the only path to achieve this is through international collaboration. For this reason, he considers that increasing international public awareness of space exploration is critical towards this goal, and that the contribution of expertise from each country will be the most efficient way to enhance manned and robotic space exploration in the near future.
**Ekaterina Timakova**

“I am a final-year student of the Aerospace department of Bauman State Technical University. Since 2015, I am a member of the BMSTU Youth Space Center (YSC). In 2016, I started working with a team of students and graduates on the nanosatellite maneuver device on the base of the solar sail. The project helped a lot to get practical experience in space technology and was awarded the first prize in the Sino-Russian Satellite Students Innovation Design Contest. It inspired our team to develop the device, so today we work on the nanosatellite constellation for solar activity research in cooperation with the Physical Institute of Russian Academy of Science.

In the last three years, I have been taking part in many space-related conferences, exhibitions and nanosatellite sessions, where I presented our ideas to national and international experts and learned the latest news and trends of space industry. I also had a chance to participate in the “Space Station Design Workshop” (Stuttgart, Germany) and schools “Space Development: Theory and Practice” held both in Moscow and Houston, where I got unforgettable experience of cooperation and working in an international team. Besides, I enjoy sharing knowledge with younger students and high schoolers visiting YSC and try to motivate them to be involved in space educational projects.

My dream is to become a part of one big International and intercultural team that will expand the role of nanosatellites and their constellations and makes them even more competitive comparing to big spacecraft.”

**Elizabeth Barrios**

Elizabeth Barrios is currently a materials engineer working at NASA’s Kennedy Space Center and a PhD NASA Space Technology Fellow at the University of Central Florida. With a passion for advancing the technical capability of space exploration, her current work focuses on the development of lightweight, Earth-abundant materials for energy generation and storage applications. This interest in lightweight materials has also led to her involvement in the fabrication of the Advanced Plant Habitat, recently installed on the International Space Station. In the past, Elizabeth has worked on multiple NASA projects, across the agency, including lightweight patch antennas (NASA Glenn Research Center) and in-situ resource utilization (NASA Marshall Space Flight Center). Elizabeth’s interests also reach into engaging with the public and mentoring the younger generation in the field of aerospace engineering. In 2012, she was selected to become a NASA Student Ambassador, received full sponsorship from NASA’s Office of Education to attend the 2017 IAC and serve as a NASA delegate, and helped organize the Young Professionals PMC Workshop at the 2018 IAC, among many other outreach activities. With a newfound interest in the global space network, her hope is to take her experience as an engineer and her passion of advancing spaceflight while involving younger generations and manifest it into a platform that can both mentor and guide future engineers and scientists in the aerospace industry. Her other interests include traveling and learning about new cultures, weightlifting, and going to the ballet.

**Esteban Martinez**

Esteban Martinez is an electronic engineer who is currently pursuing MSc in Embedded Systems at the Costa Rica Institute of Technology (TEC) in San Jose, Costa Rica. His main interest and main research is the Store & Forward systems for remote sensing in small satellites as CubeSats. In the Space Systems Laboratory (SETEC-Lab), he worked as the telecommunications engineer in the Irazú Project, the first satellite in Central America that aims to monitor the carbon dioxide fixation in the Costa Rica’s forests. After integrating and long-distance testing of the communications subsystems of the flight and ground segments, he went to the Kyushu Institute of Technology (Kyutech) in Japan to perform the satellite environmental tests and get the certification for the ISS launch with JAXA.

He was part of the International Workshop of Lean Satellite (IWLS) in 2018 organized by Kyutech, where he had the opportunity of participating in the First Ground Station Operation Workshop for the IRISOS project, consisting of a ground station network with more than 13 countries involved.

In collaboration with George Washington University (GWU) and TEC, he is working on the GW-CubeSat secondary mission: contribute to the preservation of the biodiversity and hydrological equilibrium of the Costa Rican wetlands by improving their remote sensing network.

Esteban is a space enthusiast, and with his research in the field of telecommunications, he hopes to enable universities, developing countries, and smaller organizations to partake in the exploration of space.

**Karl Domjahn**

Karl Domjahn is a Graduate Mechanical Systems Engineer at Boeing Defence Australia, working on an upgrade to the 737 Wedgetail Airborne Early Warning & Control aircraft. After graduating from the University of Queensland with a Bachelor and Master of Mechanical and Aerospace Engineering (University Medalist 2017), Karl was named as the only Australian in the 2017 US Aviation Week and AAIA’s “Tomorrow’s Engineering Leaders: The 20 Twenties”, an international award recognising the future leaders of the aerospace industry. Key events leading up to this award included undertaking his Master Thesis at the German Aerospace Centre (DLR) in Munich, representing the youth perspective as the National Secretary and Queensland Representative of the Australian Youth Aerospace Association, and studying on exchange at Purdue University in the United States.

Although Karl’s current passions lie within the technical realm of launch and transportation, he has strong desires to explore and understand the interactions between the technology, policy and business drivers. He believes that the world is on the cusp of a second space race, however this time it is being driven by commercialisation. Within this new economy, governments and space agencies should play a guiding role, advocating for global regulatory frameworks that allow the commercial sector to innovate and grow whilst still maintaining minimum standards for safety and security. Although creating this framework may be difficult, Karl firmly believes open collaboration between governments, agencies and the private sector will aid to bring the right expertise and knowledge to the table to generate a solution.

**Ksenia Lisitsyna**

Ksenia grew up in St. Petersburg, Russia. After graduating from the Baltic State Technical University, she got her master’s degree in Sustainable Development at the University of Nordland in Northern Norway.

Currently, she is a business development lead in Precious Payloads – a US-based startup that has built an online booking system for small satellites. There she works on the development of a marketplace for launch providers, satellite manufacturers, insurance brokers, and integrators. The team advocates for adopting standard procedures for the launch search and integration process to reduce the amount of time required for the prelaunch activities. Using this platform, all the market players can meet each other’s needs in a more efficient way increasing market transparency and accessibility. The booking system aims to bring more clarity for the users from space-faring nations and awareness of the market opportunities for newcomers.

As a side project in 2018, she is participating in the research conducted together with the European Space Policy Institute: It resulted in publishing a report on Russia’s modern posture in space followed by an online course with the same topic coming up in July 2018.

Being a member of the Russian North-West Federation of Cosmonauts and representing SGAC in her home country Ksenia is taking part in space outreach activities. She is covering such topics as legal aspects of international activities and capacity building in space-related projects and helping students and young professionals to find their way to the space industry.

**Marco Alejandro Murillo Alcocer**

Marco Alejandro Murillo Alcocer obtained his BSc in Electrical Engineering from the North Dakota State University, United States on a full scholarship, his focus of study during that time was communications and signal processing. He was selected to be part of a government project and receive a specialization for a year, by the China Academy of Space Technology, in ground satellite control and operation. After placing on the top of the program, currently he holds the position of Communications Payload Team Leader for the Bolivian Space Agency, which he has been working for almost 5 years. His main functions at the agency include managing and operating the communications payload of TSAT-1 satellite, and developing new projects for telecommunications inclusion throughout the national satellite. During his time at the agency he has participated actively in different activities related to the space field, as a speaker in satellite seminars, post graduate courses and vocational orientations. By being an active researcher and a semi-autodidact in his field, he intends to play a great role to the development of his country’s space and satellite industry.
Monique Hollick

“I am a Space Systems Engineer in the Small Satellite Experimentation Team at Defence Science and Technology Group (DST Group) in Edinburgh, Australia. During my 18 months in this role, I have been involved with several aspects of spacecraft testing, ground station development, and spacecraft operations and operational analysis associated with the Buccaneer Risk Mitigation Mission – DST Group’s first satellite in 50 years. I hold First-Class Honours in both Mechanical Engineering and Physics from the University of Western Australia. After working in the mining industry for two and a half years, I completed a Masters of Engineering Science in Satellite Systems (with Excellence) at the University of New South Wales and became the first student of the program. My childhood passion for space was reignited through my Physics Honours studies, in which my thesis project involved analysis of Apollo Dust Detector Experiment data and collaboration with an ex-Apollo Principal Investigator. This research produced a paper published in Space Weather (for which I was lead author) and presented at the Lunar and Small Bodies Graduate Conference at NASA Ames in 2014.

I am very proud to be involved in the space industry at a time where space is becoming increasingly accessible and collaborative. I intend to use my science literacy and communication skills, with the recent bolstering of the Australian space industry and the Australian space agency, to inspire more young Australians to pursue careers in space and other STEM fields.”

Onur Celik

Onur is a PhD candidate in space and astronomical science as a Japanese government scholarship holder. He is specialized in spacecraft mission and trajectory design, particularly in interplanetary medium and in complex dynamical environments, such as those found in small bodies. His experience ranges from trajectory optimization to asteroid surface exploration. Through his research, he is currently involved in multiple JAXA missions, such as Martian Moons exploration (MMX) to Phobos and DESTINY+ to asteroid Pheboon. Prior to Japan, he completed his bachelor’s degree in astronomical engineering at Istanbul Technical University (2013). Then, he received a double degree from Cranfield University (UK) and Lund University of Technology (Sweden) within Erasmus Mundus Master Course in Space Science and Technology (SpaceMaster) programme, with the Erasmus Mundus Scholarship and the SpaceMaster prize from Cranfield University. During his master’s studies, he had a chance to take part in high altitude balloon experiment programme for student (BEXUS) organized by ESA/DFLR, in which a rover was teleoperated from the balloon to mimic future exploration on the Martian surface. Thanks to the multiculturial and interdisciplinary background, Onur has equipped himself with significant knowledge and experience on the space exploration and its societal impacts. Through employing this and the ESL experience, he hopes to become a bridge between emerging countries and the international space community for the development of space activities and inspire people to follow their dreams in space.

Paola Escobar Vargas

Paola Escobar Vargas is an electronic engineer graduated from the Higher University of San Andrés in Bolivia and holding a MSc in radiofrequency and microwave engineering from the University of Surrey (England), she is also alumna of the scholarships for a training in the China Academy of Space Technologies as part of the first Bolivian satellite TS01 of the Bolivian government, and a Chevron alumni.

She currently works as a Teleport Engineer for the Bolivian Space Agency and works also as a lecturer in the electronics engineering faculty of the Higher University of San Andrés, she is part of several volunteering bodies as the IEEE in Bolivia, the ISAC as NIPoC and others with social focus.

Prabin Gyawali

Prabin Gyawali is currently a third year undergraduate student of Geomatics Engineering at Kathmandu University, Nepal. He is a dedicated space enthusiast and researcher working to promote space education and the development of space technology in his country and take it to global race. He has participated in various space events inside and outside the country. His researches mainly focus on the use of navigation technology for the emerging countries like Nepal. He likes exploring the application of navigation technologies. He also conducts small talk programs and interactions with the upcoming generations about the space science and its importance in Nepalese society. He believes changes can be made through the small steps.

As, the part of his study, Mr. Gyawali is involved in use of various surveying technologies based on Remote Sensing and navigation technology. He loves using the advanced navigation technologies for land surveying. He is interested in pursuing his master’s degree in Navigation technology and their applications.

Roman Mykhalyshyn

Roman Mykhalyshyn was born and raised in Dnipro city, Ukraine. He started his space engineering studies in 2006 at Dnipro National University, he focused on the propulsion systems and improving their efficiency. Roman’s work experience started in 2012, since then he has been working in Yuzhnoye State Design Office. He took part in such projects as Cyclone-4, Cyclone-4M, Zent, Antares etc.

Roman is a PhD student, his work consists in the pneumatic and hydraulic systems improvement of launch vehicles. This work is considered as highly important and topical, as its materials allow improving the performance of launch vehicles. The second important area of his researches is the study of the features of methane as a fuel for launch vehicles.

Roman is active member of Space Generation Advisory Council, from July 2018 is a National Point of Contact in Ukraine. He was awarded as a finalist of the SingularityU Kyiv Global Impact Challenge 2017, the best worker of Ukraine space industry 2016.

He assumes the most important problems of XXI century is global climate changing. An aspect of particular concern is total growth of earthquakes, storm cyclones, tsunamis and other natural disasters that prevails in last decade. Roman believes space technologies will be able to help to save more lives in case of such disasters. International collaboration is crucial for success in this direction.

Samantha Le May

Samantha is currently a PhD candidate at RMIT University and the Space Environment Research Centre (SERC), in Australia. Her research is in the field of Space Situational Awareness (SSA) and Space Traffic Management (STM), and aims to create a unique dataset which pools together multiple SSA-related data types from the Web. The motivation for her work is to support safe operations alongside increased participation in the space sector driven by the innovative technologies and business models that are continuing to reduce the cost of launch and manufacture of space infrastructure. Samantha is a member of the IAA Permanent Committee on Space Debris, and the IAF Committee on Space Security, and has a keen interest in the legal, political and security issues related to space debris and the broader field of STM. She is grateful for the opportunity to attend the IAC in Bremen as part of the Emerging Space Leaders programme and network with the international community of experts in space operations. “As a PhD student, I want to ensure that my work is not only contributing to human knowledge, but that it has direct applications in addressing the needs of space operations. This is not possible without actively engaging with the community that attend the annual IAC.”
Shambo Bhattacherjee

“Currently, I am a PhD research student at the University of Leeds. The theme of my research is space debris and the objective is to develop improved methods to track space debris based on directional statistics. I am in the department of Statistics and my supervisor is Prof. John T. Kent. The project is funded by the U.S.A Air Force Office of Scientific Research. We have already published several research papers. Recently I have been selected to present my research work at the Parliament. Before joining the University of Leeds, I worked as a project associate at the Physical Research Laboratory (PRL), India. At the PRL, my work was based on analyzing crater formation under microgravity conditions. I did my masters from the International Space University and I was selected to do my internship at the NASA Goddard Space Flight Center (GSGF) under the supervision of Dr. Marc Kuchner. At the GSGF, I worked on a citizen science project named “Disk Detective” and my key contributions were correcting inaccurate WISE-4 magnitudes for disk detective objects (around 273,000 objects), modelling SED plots and classifying debris disks and other objects discovered with the WISE. Our team also won the “Robert H. Goddard Honor Award for Exceptional Achievement in Outreach”. In addition to my PhD study, I am a volunteer project leader of the SGAC space debris project group. Some of my other interests are machine learning, image processing and computer programming.”

Siti Amalina Enche Ab Rahim

Siti Amalina received her Diplôme d’Ingénieur from École Nationale Supérieure d’Electronique et de Radiocommunications de Grenoble, France and her Doctor of Engineering from Kyushu University, Japan, both in electronics engineering, in 2008 and 2017, respectively. She is currently a lecturer at Universiti Teknologi MARA (UiTM), Malaysia and also a research coordinator at Center for Satellite Communication, UiTM. Her current project is the development of ground communication system for the first UiTM’s nanosatellite, which is a collaboration project with other universities from Japan, Bhutan and Philippines. As a beginner in space and satellite technology, she believes in teamwork, where, the development of space research activities in Malaysia can be accelerated when every worker works in a team. For that reason, collaborations or partnerships, both national and international, are important.

Oniosun Temidayo

Oniosun is currently the Regional Coordinator (Africa) for Space Generation Advisory Council of the United Nations where he is leading African Students and Young Professionals in the creation of International Space Policy, ensuring their opinion is heard in key policy making at the United Nations Office for Outer Space Affairs. He has been listed as one of the World 24 Under 24 Leaders and Innovators in SPACE and STEAM by The Mars Generation and by BellaNaija as one of the 25 under 25 Nigerians who are influencing and disrupting the world of Entrepreneurship, Leadership, Governance and Corporate World. Oniosun was a research scientist at the Centre for Space Research and Applications, Federal University of Technology, Akure where he coordinated all Space Education and Outreach of the Centre and was on the Ground Station development team of Nigeria’s first CubeSat NAUSAT.

As a YouthMappers fellow, he works to create and use open-source software for geographic information to address chronic development problems in countries where USAID works to end poverty. Earlier this year, he was featured by USAID for solving urban waste problem in one of Nigerian cities using geospatial technologies. He Co-Founded Spatial Technologies with a mission to capitalize on space technologies and open data to solve developmental challenges in Africa. He is an editor for Space in Africa, the primary source of space related information from Africa. Oniosun is highly interested in building a commercial space ecosystem in Africa

Wares Chanchaoren

“When I was undergraduate student in Mechanical engineering, I did microgravity research about fluid flow in textile with IAIKA parabolic flight. Subsequently, last year our research team in Thailand has been awarded as a team in National Space Exploration project governed by GISTDA, Thailand space agency that the study was 3D food printer in space. Then, on March 2018, I joined a Y-ISEF side event of SEF2 at Tokyo. In that time, our team has been awarded by Dentissu space lab that the work was a space debris destroy game (we call a Debris GO game) for sustain the funding to eliminate space debris. Recently, I am a director of citizen achieved technology (CAT) space research team in Futuristic Research in Ergonomic + Aesthetics Knowledge (FAEKA) laboratory at King Mongkut’s University of Technology Thonburi (KMUTT), Thailand and also be a CEO, co-founder of Space Zab limited company where is a space company founded by multidiscipline and multi-generation people in Thailand. For my perspectives about space, space is area to achieve our dreams and can do fantastic challenges. In my opinion, space is no boundaries and no nation. Therefore, we should make space easy to access, share resource, and dream together. Especially, starting from space education, we should equitate space education of children and young generation in developing country. Finally, once again space is accessible area for everyone in the world.”

Wasanchai Vongsantisavich

Wasanchai is currently a Satellite Systems Engineer at GISTDA (Thai Space Organization). He obtained his degree from ISAE, Toulouse, France. Currently, he is the project manager for EOS constellation mission planning and scheduling platform. This system is also being used and adopted by Sentinel Asia Pacific Regional Space Agencies’ Forum (APRSAF) to collaborate among satellite operators to acquire and use data from space for disaster resilience. He’s also working on “ThaiSpace Consortium” scientific satellite project as a satellite systems team leader. He also helps to promote Space to the young generations in Thailand. He was involved and took part as a creator to develop and create contents and exhibitions for “Space Inspirium” the first Space Museum in South East Asia. For space outreaches, in 2017, he was selected as one of the Thai Science Ambassador by National Science Museum to promote STEM education throughout the country.

Erdenebaatar Dashdondog

“I am the head of Nano-Satellite development laboratory of the National University of Mongolia. I was interested in space activities and involved in space programs when it was just emerged in university level. I have participated National CanSat Competition as a supervisor of NUM CanSat team. I have got my doctor degree in space engineering while I design, build and operate first Mongolian satellite named MAZALAI with team of Mongolia at Kyutech (Kyushu Institute of Technology) Japan. We, team who build the first Mongolian satellite, founded a non-governmental organization so called Mongolian Space Technology Association (MSTA) in 2017, with the support of NUM and Institute of Astronomy and Geophysics Mongolian Academy of Sciences. MSTA’s goals are to promote education and application of space technology, and then to support research and collaboration of local and foreign institutions, and to advise to the government in this field. Yet, Mongolia has no space agency, but demands, interests and activity in this field have been increasing rapidly. MSTA will be the helpful non-governmental organization for establishment of national space agency by collective knowledge, information and human resource.”
5.3.3 Future Space Leaders (FSL) Grant Programme

The Future Space Leaders Foundation (FSLF) organizes the Future Space Leaders Grant Programme providing opportunities for U.S. graduate students and young professionals pursuing space and satellite-related careers to participate in the 69th International Astronautical Congress (IAC).

Chris Beauregard is a second-year graduate student at the George Washington University Elliott School of International Affairs, where he is studying the interaction of space policy and commercial activity, and a member of the International Space University Space Studies Program class of 2018. During his studies, he has supported several organizations in various capacities, including United Launch Alliance, the United Nations Office for Outer Space Affairs, European Space Policy Institute, and the Space Policy Institute at George Washington University. He currently volunteers as a regulatory compliance advisor for the Micropropulsion and Nanotechnology Laboratory to support the launch of NWU’s first satellite, and is the manager for the SGA Conference. His authored and co-authored works have been published by the Journal of Science Policy and Governance, the International Association for Advancement of Space Safety, the International Astronautical Federation, the European Space Policy Institute and American Institute of Aeronautics and Astronautics.

Stephanie Booth, a data professional at Byrae Space and Technology, leads analytics and knowledge management initiatives for government and commercial space clients. Her passion lies in the optimization and digital transformation of aerospace organizations through actionable insights gained from both big and small data. Stephanie also brings relevant interdisciplinary experience in microbiology, virology, and homeland security to the aerospace community. She holds a M.S. in Computational Science and Informatics from George Mason University and a B.S. in International Studies from the University of Nebraska-Lincoln.

Hiroshi Furuya is a recent NASA Space Technology Research Fellow investigating the development of augmented reality technology for use in manned space flight operations. During the course of this work, he led the development and evaluation of a prototype augmented reality application to guide astronauts in completing cargo logistics operations, which he will present at IAC. His passion is engineering and advocating for the integration of augmented reality technology in manned space exploration efforts. Previously, he interned as a Testing and Evaluations Scholar at Arnold Engineering Development Complex, White Oak Hypervelocity Wind Tunnel 9. He received his M.S. in Computer Science from Columbia University and his B.S. in Aerospace Engineering from the University of Maryland, College Park.

Emily Peterson is a graduate student in Aeronautics & Astronautics at Purdue University, having earned her B.S. in Materials Science & Engineering from Michigan Technological University (’17). She has earned highly competitive internships at NASA JPL, Lockheed Martin Aeronautics, and Lockheed Martin Skunk Works. She presented her work in artificial gravity design and strategic business development at the 2016 IAC and the 2018 International Space Development Conference, and she looks forward to being a speaker at this year’s IAC in Bremen. Her prior research has ranged in focus from additive manufacturing economics to composite materials to high-temperature alloys, culminating in 4 journal publications and numerous speaking engagements at local, national, and international conferences.

Barret Schlegelmilch recently graduated from the MIT Leaders for Global Operations program with an MS in Aeronautics and Astronautics and an MBA. He earned his BS in Astrophysics from UCLA in 2011 and is a former U.S. Navy Nuclear Submarine Officer. He will be joining Blue Origin’s Advanced Development Programs division after completing the 2018 International Space University Space Studies Program. Barret’s passion is working towards the future of humanity being an interplanetary species, and he still has the dream of becoming an astronaut one day. His hobbies include ultramarathons, exploring remote locations (most recently the North Pole and a marathon in Antarctica), and drumming.

Lauren Smith currently works at Northrop Grumman as the Mechanical Test Engineering Manager for the James Webb Space Telescope (JWST) and has also supported as the JWST Integration and Test Non-Explosive Actuator Lead. Before JWST, Lauren held diverse roles in air and space, most recently as a program manager for NG Next. In this role, she led rapid design and strategy development for new space systems and small satellites. Prior to joining Northrop, Lauren worked at NASA Glenn Research Center as an engineer in the Simulated Lunar Operations Lab; she conducted her thesis research there and developed a novel, patent-pending locomotion mechanism that increases robot mobility. Lauren graduated from Case Western Reserve University with an M.S. in Mechanical Engineering, B.S. degrees in Aerospace Engineering and Mechanical Engineering, and a minor in Political Science. Outside of work, Lauren serves as the U.S. National Point of Contact for the Space Generation Advisory Council, which represents young space professionals to the United Nations. She is also the vice president of Caroline’s Project, a nonprofit that awards scholarships to girls who wish to attend STEM summer camps.

Jeffrey Stuart is a member of Mission Design and Navigation Section at the Jet Propulsion Laboratory, having received his Ph.D. from Purdue University in 2014. While at JPL, he has worked on a variety of missions in flight and development, including as the MIDNap lead for the SunRISE heliophysics mission proposal. Jeff actively explores and develops a wide range of aerospace topics, including automated trajectory design, advanced navigation techniques, combinatorial optimization, interactive visualization methods, and formation flying. Beyond his technical work, Jeff seeks to grow JPL’s research capabilities by leading the New Researchers Support Group and pursuing strategic partnerships with several universities. In his free time, Jeff enjoys hiking, flying, travel, reading, and is passionate about helping foster the next generation of space explorers.
6  Associated Events

6.1 IAF IDEA "3G" DIVERSITY DAY

Master of Ceremony:

Mary Snitch
IAF VP for Diversity Initiatives

Sponsored by:
Lockheed Martin

6.1.1 IAF IDEA “3G” Diversity Breakfast

Date:  Wednesday 3 October 2018
Time:   07:00 – 08:30
Venue:  Bremen Exhibition & Conference Center – ÖVB Olbers

Programme:

07:00 – 07:05  Introduction to IAF IDEA "3G" Diversity Day by Moderator, Mary Snitch

07:05 – 07:10  Welcome by IAF President, Jean-Yves Le Gall

07:10 – 07:30  An International Asteroid Endeavour – A Splendid Achievement of International Cooperation and Excellent Example of Geographical Diversity

Hayabusa2 is an asteroid sample return mission of the Japanese Space Agency (JAXA). Its aim is to learn more about the nature and composition of near Earth asteroids and the origin and evolution of our Solar System. The MASCOT lander (Mobile Asteroid Surface Scout) - developed by the German Aerospace Center DLR and built in close cooperation with the French Space Agency CNES – is on board the Japanese Hayabusa2 spacecraft. In the very early hours of 3 October 2018, it will touch down on the C-type near-Earth asteroid Ryugu. For about 16 hours, four instruments (camera, radiometer, magnetometer, spectrometer) will be operated on the asteroid’s surface. In addition, MASCOT is able to ‘hop’ around on the surface and take measurements in several places. This will be the first time that a lander was especially built to operate on an asteroid surface and the first time that data will be collected at more than one site on an asteroid’s surface. The international effort of the asteroid sample return mission Hayabusa2, the MASCOT lander and possibly the confirmation of touchdown will be announced by the following speakers:

• Pascale Ehrenfreund, Chair of the Executive Board of DLR
• Jean-Yves Le Gall, President of CNES
• Hiroshi Yamakawa, President of the Japan Aerospace Exploration Agency JAXA

07:30 – 08:00  How to Engage the very Young Generation? – ESA’s Kid’s Weightless Dreams Campaign

In August 2018 ESA helped to provide children with disabilities the opportunity to experience weightlessness and lunar gravity on aircraft flights. Eight children from five ESA member states – UK, France, Germany, Belgium, and Italy - boarded the converted Airbus A310 in Bordeaux, France on 24 August as part of the Kid’s Weightless Dreams campaign organised by Novespace and Reves de Gosse. The children also took part in science demonstrations, including lighting a candle, mixing liquids of different densities, playing ping pong with bubbles of water and working a fidget spinner to demonstrate the effects of microgravity. Joining the children were ESA astronauts from their corresponding member states: Tim Peake (UK), Frank De Winne (Belgium), Maurizio Cheli (Italy), Thomas Reiter (Germany), Claudie Haigneré (France) and Jean-Francois Cleverly (France) were on board to mentor the children and answer their questions.

Two disabled adults, former athlete and German television personality Samuel Koch, a strong advocate for disabled causes, and Philippe Carette, a very active Rêve de Gosse volunteer, also took part in the flight.
ESA Director General Jan Woerner joined the Kid’s Weightless Dreams flight and will welcome one of them, Paula Monfeld (from Cologne), to talk with her about this exceptional experience. Also joining the event will be ESA astronaut and former ESA Director of Human Spaceflight Thomas Reiter, who had accompanied Paula at this flight experience.

08:00 – 08:15 UNOOSA’s “Space for Women” – Project

UNOOSA is looking for partners for the implementation of the activities developed during the “Space for Women” - Expert Meeting held in October 2017 in New York to answer the recurring questions of:

- How to attract more women for space?
- What can women do for space?
- What do women need from space?

With a special focus on Sustainable Development Goals 4 (Quality Education) and 5 (Gender Equality) this project seeks to promote the critical role of women in the implementation of all the Sustainable Development Goals (SDG) as many targets specifically recognizing women’s equality and empowerment as both the objective, and part of the solution.

The “Space for Women” project will facilitate the strengthening of the awareness, capacity and skills of individuals and institutions related to the importance of promoting gender equality in the space sector and its fundamental educational fields.

Simonetta di Pippo, Director of UNOOSA, will give a keynote on the project and its current status focusing on:

- Space for Women
- Importance of inclusion, equality and empowerment
- Networking and importance of role models and the possible established champions programme under “Space for Women”
- Some personal experience

6.1.2 IAF IDEA Excellence in “3G” Diversity Award Luncheon

Date: Wednesday 3 October 2018
Time: 12:30 – 13:30
Venue: ÖVB Arena Olbers

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

At IAC 2018 this award will be given for the second time. This year’s winner of this award is the Space Generation Advisory Council (SGAC). This Luncheon is dedicated to the award ceremony for the “2018 IAF Excellence in 3G Diversity Award”.

Programme:

12:45 – 12:50 Welcome by Jean-Yves Le Gall, IAF President

12:50 – 12:55 Introduction of the IAF 3G Diversity Award
- Mary Snitch, IAF VP for Diversity Initiatives

12:55 – 13:00 Award Ceremony and Photo

13:00 – 13:15 Presentation by the Award winner
- Space Generation Advisory Council (SGAC)


13:20 – 13:30 Networking
6.1.3 IAF IDEA “3G” Diversity Afternoon

Date: Wednesday 3 October 2018
Time: 16:00 – 17:45
Venue: ÖVB Olbers

The IAF IDEA 3G Diversity Afternoon is organized in cooperation with and with participation of Young ESA, SGAC and WIA-Europe.

Programme Overview:

Master of Ceremony:
IAF VP for Diversity Initiatives, Mary Snitch

16:00 – 16:05 Welcome
by IAF President, Jean-Yves Le Gall

16:05 – 16:30 Young ESA / SGAC Diversity Award

About the award
This competition was organized for a second year by Young ESA in cooperation with Space Generation Advisory Council (SGAC). Participants were asked to submit a video and an essay on a diversity related topic as well as their CV. The selection was done through an internal committee of ESA representatives lead by the Strategy Department.

About the winners
This year’s first place Katherine Pangalos, 21 years old, of Dutch nationality and MSc in Astronautics and Space Engineering. For the first time, the second and third places also recognized. This year, these are held by Christopher Ogunlesi and Kwasi Kkansah.

Programme:
- Short Welcome by Young ESA Moderator, Christopher Vasko
- Welcome by ESA Director General, Jan Woerner
- ESA DG, Jan Woerner to present winners with their Awards
- Closing remarks by SGAC Executive Director, Clementine Decoopman
- Group photo

16:30 – 16:50 WIA-E Update & Awards Ceremony

Background information
Passionate about expanding women’s opportunities for leadership and increasing their visibility in the aerospace sector WIA-E is encouraging members of the space community to be part of their ever-growing network of like-minded professionals. Rich with opportunity, their various functions offer something for everyone. WIA-E offers mentoring programmes, awards, grants, training workshops, networking local groups and much more. In addition to this, both regional and central events regularly feature speakers and panel discussions on a wide range of topics of interest to the community, and keep members updated with valuable industry information such as scholarships and conferences.

Awards Background information
WIA-Europe would like to encourage and support upcoming talent – young professionals and students alike – and for this a grants programme was established. The programme provides grants of € 1000 to cover attendance at aerospace workshops and conferences and is intended to support new and young colleagues with their first experiences in presenting a paper in an international context. Applicants were selected based on their papers from all related aerospace disciplines. A grants committee of space professionals under the lead of Chris Welch, Professor at the International Space University, evaluated and decided on the winners. Along with the grant of € 1000 for the conference, they will also win a year-long free membership to WIA-Europe for the following year.

Programme
- Welcome and Keynote by WIA – E President, Luisella Giulicchi
- Introduction to the WIA-E Grant programme by WIA-E Chair of the Awards and Grants Committee, Chris Welch,
- Short 5 minute presentation by Grant winner(s) about their work
- Congratulations by WIA-E Director of Professional Development, Christina Giannopapa
- Group photo
16:50 – 17:45 IAF IDEA Mentoring Session with Young ESA / SGAC / WIA-E & Networking reception

About the Mentoring Session

The IAF, SGAC, Young-ESA and WIA-E have joined forces for the first time to offer a joint Mentoring Session to Young Professionals with top space professionals. This speed mentoring serves as a bridge between the experienced and the incoming generation of actors in the space sector.

Programme

- Welcome by the Moderator, Mary Snitch (5 minutes)
- 5 Speed mentoring sessions of 9 minutes each (45 minutes)
- Summary and closing remarks by Moderators (5 minutes)

Event Structure

There will be 5 tables for 6 participants and 1 mentor each.

Speed mentoring participants were be selected by:

- IAF Workforce Development and Young Professionals Programme Committee – 12 participants (2 tables)
- Young ESA – 6 participants (1 table)
- SGAC – 6 participants (1 table)
- WIA-E – 6 participants (1 table)

Speed mentoring participants were selected beforehand by the host organisations. While the mentors from table to table will rotate, participants remain seated. During the event, a networking reception is offered for all spectators.

List of Mentors:

- IAF – Jean-Yves Le Gall, President
- AIRBUS – Oliver Juckenheefel, Vice President On-Orbit Services and Exploration
- ESA – Jan Woerner, Director General
- OHB SE– Fritz Merkle, Representative of the Executive
- IISL – Kai-Uwe Schrogl, President

Moderators

- IAF VP for Diversity Initiatives, Mary Snitch
- Young ESA, Christopher Vasko
- WIA-E Director for Professional Development, Christina Giannopapa
- SGAC Executive Director, Clementine Decoopman
The main objectives of the Workshop are:

1. Raise awareness on how space exploration and innovations can trigger new partnerships and help develop capabilities that create new opportunities in addressing global challenges;
2. Examine space applications for developing countries and, in particular, for Africa region;
3. Foster dialogue amongst space industry and the public sector;
4. Share experiences of space-related start-ups and emerging industries especially from developing countries;
5. Discuss the role of space industry for development and contribution to Sustainable Development Goals (SDGs), in particular SDG 9 (Industry, Innovation and Infrastructure) and SDG 17 (Partnerships for the Goals);
6. Bring together policy and decision makers and the research and academic communities to help integrate space solutions into policy and decision-making process.

The role of industry in the access to space is increasing and strengthening the cooperation with the space industry is a way to increase the opportunities for developing countries to access space technologies and services. This workshop shall provide inputs on potential areas for partnerships considering the needs of developing countries, in particular Africa;

• Propose actions to progress in the definition of pilot projects that could foster collaboration;
• Promote collaboration in capacity-building at regional and international levels;
• Exploring the role of space industry in cooperation on the use of space for global health; and
• Exploring the role of space industry towards building resilient space technologies and applications.

THEMATIC SESSIONS

Session 1: Space for Socio-Economic Development

Participants are encouraged to present their vision and provide examples of space applications programmes supporting socio-economic development in their countries and region. The session is expected to discuss:

• the challenges faced in mainstreaming space-based inputs in national development providing;
• policy inputs that can be incorporated into national planning or strategies; and
• recommendations on the integration of space data with in-situ data, in particular, of national missions engaged in achieving targets of important global frameworks namely, the 2030 Agenda for Sustainable Development, the Sendai Framework on Disaster Risk Reduction 2015-2030, and the Paris Agreement stemming from the United Nations Framework Convention on Climate Change Conference of the Parties 21 (COP21).

The session will provide comprehensive discussion on contribution of space in achieving targets of these frameworks.
6.6 IAF/ISEB Educators Professional Development Workshop

Date: Friday 28 September 2018
Time: 09:00 - 18:00
Venue: School Lab, Germany

Friday 28 September 2017

Time: Programme:
08:30 - 09:00 Participants registration and welcome
09:00 - 09:10 Introducing the presenters, the schedule of the day, the objectives of the session
09:10 - 10:15 VSSEC – Teaching science – a holistic approach based on Classroom Instruction that Works
10:15 - 10:30 Break
10:30 - 12:30 Grades 3-6 DLR_School_Info Experiments and activities at school
10:30 - 12:30 Grades 7+ STEM education with satellite imagery and ISS videos
10:30 - 12:30 Grades ? Fascinating Universe: how satellite telescopes see the cosmos - from ‘colour’ images to science
12:30 - 13:15 Lunch
13:15 - 14:45 DLR_School_Lab Experiments at DLR site
13:15 - 14:45 ESA Education
13:15 - 14:45 Grades ? Astronomical experiments on (exo-)planet research at the school laboratory ‘Our Spaceship Earth’
14:45 - 15:15 VSSEC Discussion
15:15 - 15:45 Break
15:45 - 16:30 Wrap-up – VSSEC Classroom Instruction that Works revisited.
16:30 - 17:15 DLR guided tour or Open session on teaching STEM to kids or DLR (Optional)
17:15 - 17:30 Return on the day and closing

Organized by:

Sponsored by:

6.7 Cross-Cultural Communications and Presentation Workshop

Date: Sunday 30 September 2018
Time: 08:15 - 13:30
Venue: Bremen Exhibition and Conference Center - CCB Roselius and CCB Oslo

The Cross-Cultural Communications and Presentation Workshop is organized for Emerging Space Leader grant recipients and Next Generation Plenary speakers to provide them with the opportunity to improve their oral skills for their presentations and to sensitize them to the issues of speaking at large multi-cultural events.

Session presenters:
Scott Madry
Scott Madry is a research associate professor at the University of North Carolina at Chapel Hill and a member of the faculty of the International Space University in Strasbourg, France. He has been doing international teaching and research for some 30 years and is interested in effective international communications and presentation skills.

Carol Carnett
Carol Carnett is an attorney and a teacher of English to Speakers of Other Languages. She is Director of English Programs for the International Space University Summer Space Studies Program and Southern Hemisphere Space Studies Program, where she teaches language skills, including writing and presentation workshops focused on effective English communication in international meetings and conferences.
6.8 IAA Academy Day

Date: Sunday 30 September 2018
Time: 09:00 - 19:45
Venue: Bremen Exhibition and Congress Center - CCB Hansesaal

THE INTERNATIONAL ACADEMY OF ASTRONAUTICS (IAA) – ACADEMY DAY – PROGRAMME

IAA Plenary Session - Open Meeting

09:00 Welcome address, Peter Jankowitsch, IAA President
09:10 Introduction to the Laurels by Prof. Hiroki Matsuo, Vice-President
09:15 The 2018 IAA Laurels for Team Achievement: Mars 500 International Project, Dr. Oleg Orlov, M3, Russia
10:05 Technical Presentations
12:30 IAA Luncheon (in advance Registration)

IAA Plenary Session - Open Meeting

13:30 Study Groups Presentations Chair: Dr. Rainer Sandau, M2, Germany
13:35 Introduction, Mr. Anatoly Perminov, M4, Vice-President Scientific Programs
13:45 Study 2.18 Sleeping Brain in Space and Analog Environments, Dr. Dr Kourtidou-Papadeli, M3, Greece, Dr. Panagiotis Bamidis, M3, Greece
14:15 Study 1.15 International Cooperation on Space Weather McKenna-Lawlor, Prof. Susan McKenna-Lawlor, M1, Ireland
14:45 Study 3.30 Space and its Utility in Forecasting Climate Change, Roger Lenard, M2, USA
15:15 Study 4.22 Through Optimization of Aerospace Trajectories, Prof. Paolo Teofilato, M2, Italy
15:45 Study 5.10 Orbital Debris Removal: Policy, Legal, Political and Economic Considerations, Prof. Stefan Hobe, M4, Germany, Dr. Ray Williamson, M4, USA, Prof. Lesley Jane Smith, M4, UK
16:15 Study 6.17 Multicultural foundations and influences of human space exploration, Dr. Jacques Arnould, M4, France, Dr. Louis Laidet, M4, France
17:00 End of Session
18:30 Induction Ceremonies for Newly Elected Academicians
19:45 Joint IAA Awards Gala Dinner and IAF Members of Parliaments Dinner (MoP) (in advance Registration)

6.9 9th IAF International Meeting for Members of Parliaments (Closed Meeting)

Date: Sunday 30 September 2018
Venue: Bremen Parliament

The Seamless Chain of Innovation – From Space Science to Business

Saturday 29 September 2018

All day: Arrival of Participants
18:30 MoP Welcome Reception at ZARM Drop-tower

Sunday 30 September 2018

08:30 Welcome Coffee
09:00 Welcome
• Christian Weber, President of the Bremen State Parliament
• Jean-Yves Le Gall, President, International Astronautical Federation (IAF)
• Jan Wörner, Vice President for Agency, Parliamentarians and Ministerial Relations, International Astronautical Federation (IAF)
• Klaus-Peter Wilrich, Member of German Bundestag and Chairman of Aviation and Space Group, IAC 2018 host country
• Chris Schacht, Former Senator of Australia, IAC 2017 host country
09:30 Keynote 1: Space in Germany: A Case for Business and Science
• Pascale Ehrenfreund, Chair of the DLR Executive Board and IAF Vice President for Communications, Publications and Global Conferences
09:45 Keynote 2: SPACE 4.0: The Value of STE(A)M
• Jan Wörner, Director General, European Space Agency (ESA) and IAF Vice President for Agency, Parliamentarian and Ministerial Relations
10:00 Keynote 3: Space Innovation in and for Africa
• Valanathan Munsami, Chief Executive Officer, South African National Space Agency (SANSA) and IAF Vice President for Developing Countries and Emerging Nations
10:15 Keynote 4: New Actors in Space
• Mohammed Nasser Al Ahbabi, Director General, United Arab Emirates Space Agency (UAEESA)
10:30 Keynote 5: Transforming the Space Sector
• Hiroshi Yamakawa, President, Japan Aerospace Exploration Agency (JAXA) (Invited)
10:45 Coffee Break
### Monday 1 October 2018

#### 08:00 – 08:30
VIP Gathering – Exhibition & Conference Center Bremen, IP Hall

#### 09:00 – 10:30
IAC 2018 Opening Ceremony (reserved seats for MoPs)

#### 10:30 – 11:30
Opening of the IAC 2018 Exhibition and VIP Tour
- Gathering at the VIP area of the Exhibition Hall
- Opening and Tour to the Exhibition
- End of visit at the DLR Booth

#### 12:00 – 13:00
Luncheon sponsored by EUMETSAT - Exhibition & Conference Center Bremen, OVB Oliers

#### 13:15 – 14:45
Plenary Event 1: Heads of Space Agencies “Involving Everyone—What is new for Space Agencies?” - Exhibition & Conference Center Bremen, DLR Hall

#### 15:00 – 16:00
Free time to visit the Exhibition

#### 16:00
Gathering at the “Meeting Point” in the foyer of the Central Area for transport to the reception

#### 16:30 – 17:30
Reception “The Earth from outer Space” hosted by the Mayor Dr. Carsten Sieling – Bremen Town Hall

#### 17:30
Transportation from Bremen Town Hall to the Exhibition and Conference Center Bremen

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#### 11:15
Interventions by Members of Parliaments and Discussion

#### 12:00
Session 1: Education to Business
Space provides an endless reservoir for business opportunities. Incubation is one of the main tasks for space agencies to fulfill the promises in a more and more dynamic sector. This has to be based on an excellently educated workforce with a broad variety of skills including entrepreneurship.

Presentations (10 min) and Roundtable discussion
- **Andreas Jorstad**, Coordinator ENV Commission, European Committee of the Regions
- **Jean-Claude Piedboeuf**, Chair, IAF International Space Education Board, Canadian Space Agency (CSA)
- **Thorsten Rudolph**, Chief Executive Officer, Application Centre for Satellite Navigation (AZO)
- **Oliver Junkenhöfle**, Vice President On-Orbit Services and Exploration, Airbus Defence and Space

#### 13:00
Lunch Break
- Address by Pierre Godart, CEO, Ariane Group - IAC 2018 Team Germany
- Group photo

#### 14:30
Keynote 6: UNISPACE+50 Outcomes and the Way Forward on Space 2030
- Simonetta Di Pippo, Director, United Nations Office for Outer Space Affairs (UNOOSA)

#### 14:45
Session 2: Science to Research and Development
The space sector is based on science meeting the highest challenges posed to research and technology development and manufacture alike. Space as the foundation of a mature and comprehensive space effort is thus pushing R&D to also enable commercial competitiveness.

Presentations (10 min) and Roundtable discussion
- **Günther Hasinger**, Director of Science, European Space Agency (ESA)
- **Gilles Robin**, Director of Innovation, Applications and Science, Centre National d’Études Spatiales (CNES)
- **Hansjörg Dittus**, Executive Board Member for Space Research and Technology, German Aerospace Center (DLR)

#### 15:45
Coffee Break

#### 16:00
Keynote 7: NASA’s Exploration Campaign
- **Jim Bridenstine**, Administrator, National Aeronautics and Space Administration (NASA)

#### 16:15
Session 3: Innovation and Regulation
Innovation is emerging from a fruitful environment, bringing together an interactive biotope of science, R&D and industry. It also has to be accompanied by a supporting legal and regulatory framework. For this, Parliaments around the world are in the lead to establish respective provisions.

Presentations (10 min) and Roundtable discussion
- **Gabriel Swens**, Attorney Advisor, U.S. Department of State
- **Lionel Suchet**, Chief Operating Officer, Centre National d’Études Spatiales (CNES)
- **Fritz Merkle**, Member of the Board, OHB
- **Marc Avila**, Executive Director, Center of Applied Space Technology and Microgravity (ZARM)
- **Sergio Marchisio**, Professor and Chairman of the European Centre for Space Law
- **Felix Menicocci**, General Secretary, Comisión Nacional de Actividades Espaciales (CONAE)

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#### 17:25
Closing Remarks
Closing remarks by Klaus-Peter Willis, Member of German Bundestag and Chairman of Aviation

Moderation of the event by
- Kai-Uwe Schrogl, ESA Chief Strategy Officer

#### 17:35
Adjourn

#### 18:30
Joint IAF MoP and International Academy of Astronautics Dinner (IAA)
Dorint Park Hotel Bremen
6.10 IAC Hosts Summit – Sixth Session (Closed Meeting)

Date: Sunday 30 September 2018
Time: 10:30-13:00
Venue: Bremen Exhibition and Conference Center – CCB Kaisen

Programme

Opening
Welcome Address and Opening Remarks by Master of Ceremony & Moderator
Clay Mowry
Vice President – Global Sales, Marketing & Customer Experience, Blue Origin, United States
IAF VP for Financial Matters and IAC Evolution
Welcome Address by Sponsors (United Arab Emirates Space Agency)

Presentation
IAC 2017: Reflections on a Success Story
“[This conference has set the benchmark for IAC events and Adelaide, and Australia should be justifiably proud of the legacies it will leave.”]
Michael Davis
Chair, Space Industry Association of Australia and the IAC 2017 Local Organizing Committee

Presentation
A Retrospective View on IAC Evolution
An in-depth analysis of how IAC has rocketed to the next level of success over the last 6 years in terms of number of participants, diversity of the programme, financial income and other aspects.
Christian Feichtinger
Executive Director, International Astronautical Federation (IAF)

Panel Discussion
IAC 2018: “Involving Everyone”
The 69th IAC comes with the theme “IAC 2018 – involving everyone” and has the vision of a more diverse space sector. This year’s extensive outreach programme will place special emphasis on the new generation of space experts, the expansion of equal opportunities, the integration of new countries and start-up companies into the global space network, as well as increasing the public participation.

Panelists:
Claus Lämmerzahl
Professor, Director of Space Science, ZARM, University of Bremen
Christiane Schmullius
IAC 2018 IPC Co-Chair
Chair, Friedrich-Schiller-Universität Jena
Nicolas Peter
Head of International Relations, German Aerospace Center (DLR)
Fritz Merkle
Member of the Management Board, OHB System AG-Bremen

Coffee break
6.11 Tutorial 3: Planetary Protection 101

Date: Saturday 29 September 2018
Time: 09:00 – 18:00
Venue: Bremen Exhibition and Conference Center – CCB Focke Wulf Saal

2018 Planetary Protection Of Outer Solar System (PPOSS) Tutorial

The PPOSS project (Planetary Protection of Outer Solar System bodies) is a project supported by the European Commission Horizon 2020 programme for research and technology development. PPOSS addresses the issues of planetary protection dissemination of knowledge and of strategic scientific foresight for outer solar system exploration.

In 2017-2018 PPOSS – COSPAR is organizing a series of international seminars/tutorials intended to present planetary protection framework, policy and practices to partner organisations.

In this context, PPOSS – COSPAR, the International Astronautical Federation (IAF) and ZARM are collaborating to organize a free Planetary Protection Tutorial on Saturday September 29th 2018, prior to the International Astronautical Congress (IAC) 2018.

Main Objective and attendance

The main objective of the PPOSS seminar is to provide a tutorial on the basics of Planetary Protection. The seminar will be structured around the current international policy framework for Planetary Protection and cases studies attached to the different planetary protection categories recognized in the COSPAR policy. The seminar will be held in English. Expected size of the tutorial: 100 participants.

Potential participants are:

Bremen/ZARM/DLR/engineers and managers involved in PP activities
Scientists, engineers, and managers in universities, industry, etc. who are involved in PP applied missions
Nation-wide students and researchers in the field of astrobiology.

Keynote

Engaging Delegates: Where Does the IAC Stand Compared to Other Space Events?

Encouraging delegate engagement is critical to participation and the success of IAC. New tools and online platforms have changed the way how attendees experience the world’s premier global space event, but how does this compare with other space conferences?

Steve Eisenhart
Senior Vice President - Strategic & International Affairs, Space Foundation

Keynote

Making IAC More Accessible and Affordable

IAC audience is becoming increasingly diverse. How can new technology help IAC make progress towards greater diversity and inclusion, and how will this shape the future landscape of IAC?

Valanathan Munsami
CEO, South African National Space Agency (SANSA)
IAF VP for Developing Countries and Emerging Nations

Panel Discussion

A Comparative Perspective on IAC Challenges

Delivering a large-scale event such as IAC is immensely rewarding. However by pushing the boundaries of innovation, creativity and inspiration, and raising standards, all parties are continually challenged.

Panellists:

Christian Feichtinger
Executive Director, International Astronautical Federation (IAF)

Michel Arnaud
Special Advisor to IPC Co-Chairs

Mary Snitch
Senior Staff, Global S&T Organizations, Lockheed Martin
IAF VP for Global Membership Development and Diversity Initiatives

Chris Welch
Professor of Space Engineering, International Space University (ISU)
IAF VP for Education and Workforce Development

Victoria Alonso Perez
Founder of Chipsafer, IAF 2016 Young Space Leader
Special Advisor to IAF President (Next Generation)

Closing Remarks by Master of Ceremony

13:00 - 14:00 Hosts Summit Lunch - CCB Foyer

Sponsored by:

UAE Space Agency
6.12 IISL Manfred Lachs Space Law Moot Court Competition

Date: Thursday 4 October 2018
Time: 15:00-18:30
Venue: Landgericht Chamber in Bremen

27th MANFRED LACHS SPACE LAW MOOT COURT COMPETITION
ORGANIZED BY THE INTERNATIONAL INSTITUTE OF SPACE LAW (IISL)

The Manfred Lachs Space Law Moot Court Competition is organized annually by the International Institute of Space Law (IISL). The first competition was organized for law students from North America by the Association of US Members of the IISL (AUSMISL) during the first World Space Congress held in Washington, D.C., United States in 1992. One year later, the Competition was extended to include European students. In 2000, the Asia Pacific Round was added, and the African Round was inaugurated in 2011.

Preliminary competitions are held between April and June in each region. The winning teams of the regional Rounds meet in the World Finals, which are held in conjunction with the annual IISL Colloquium on the Law of Outer Space. The Final Round is traditionally judged by three Judges of the International Court of Justice. This unique feature makes the Manfred Lachs Moot Court one of the most prestigious moot court competitions in the world.

The competition is based on a hypothetical space law dispute before the International Court of Justice. The Problem is written by a Member of the IISL upon invitation by the Organizing Committee of the Competition, alternating between different regions. The 2018 hypothetical Problem is entitled the "THE DEMOCRATIC REPUBLIC OF NEAPILIA (APPLICANT) v. THE REPUBLIC OF KAUVION (RESPONDENT)." The Moot Problem presents issues relating to conflicts in Outer Space, planetary protection and space security.

Regional Rounds must comply with the Official Rules for the Competition adopted by the IISL Board of Directors. Participating teams are required to submit a 'Memorial' as formal written arguments for both the Applicant State and the Respondent State on the legal issues of the hypothetical case.

In the regional Preliminary Rounds each team with two speakers presents Oral Arguments before panels of three judges. Memorials and Oral Arguments each carry a weight of 50% of the total score of a team. The four winning teams of the regional Preliminary Rounds move on to the Final Rounds.

The expenses of the teams taking part in the Final Rounds are borne by the Japan Aerospace Exploration Agency (JAXA), the European Centre for Space Law (ECLS), NASA, the Secure World Foundation, Obafemi Awolowo University and the South African Department of Trade and Industry. Teams are allowed to revise their Memorials before they resubmit them for the Final Rounds. A panel of judges review and grade the Memorials, and the scores are used to determine the team pairings for the semi-finals. Oral arguments must be submitted three weeks before the final rounds. A panel of judges will then review and grade the Oral Arguments, and the scores will be used to determine the team pairings for the final rounds.

The 27th Manfred Lachs Space Law Moot Court Competition will be held in Bremen, Germany. The Semi-finals will be conducted in closed sessions on Tuesday, 2 October 2018. The Final is a public event and will take place on Thursday 4 October, at the Landgericht Chamber in Bremen, before a panel of Judges of the International Court of Justice at The Hague. Exact timings and transportation arrangements will be announced at the start of the IAC.

Contact details of the Manfred Lachs Moot Court Committee:
Chair Milton "Skip" Smith, lachs mootchair2@iislweb.org
Co-Chair Les Tennen, Esq, lachs mootchair1@iislweb.org
Co-Chair Melissa K. Force, Esq, melissa.force@spaceportamerica.com

Websites:
Lachs Space Law Moot Court: http://www.iislweb.org/lachsmoot/
IISL: www.iislweb.org
Facebook: Lachs Moot Court: http://www.facebook.com/spacepromoot
Twitter: Lachs Moot Court: http://twitter.com/SpaceLawMoot

6.13 17th Space Generation Congress (SGC)

Date: 27 - 29 September 2018
Venue: University of Bremen, Geisteswissenschaften 1 (GW1) Universitätsallee 28359 Bremen, Germany
Website: www.spacegeneration.org

THE GLOBAL SPACE CONGRESS FOR UNIVERSITY STUDENTS AND YOUNG PROFESSIONALS INTERESTED IN TODAY’S KEY SPACE ISSUES

The Space Generation Congress (SGC) is the annual meeting of the Space Generation Advisory Council (SGAC) held in conjunction with the International Astronautical Congress. SGC brings together 150 of top university students and young professionals from various areas of the international sector – government, industry, and academia, who have a passion for space.

With SGC, SGAC aims to hone and promote the perspectives of tomorrow’s space leaders on today’s key space issues. SGC delegates also have the opportunity to meet many high-level international space leaders through networking events. SGC is proudly endorsed by the United Nations Office of Outer Space Affairs.

Aims
The aim of the SGC is threefold:
• First, to strengthen the international network of the Space Generation Advisory Council. From the perspective of the individual delegate, many of whom come from developing countries, it is a chance to interact and engage with the incoming generation of space policy professionals from all over the world. From the perspective of the Space Generation Advisory Council, it allows us to consolidate our international links in order to best represent and facilitate the voice of the next generation.
• Second, to examine and consider key questions that are facing the space and international community at large and to provide input to international thinking from the next generation of space professionals.
• Third, to allow tomorrow’s space sector leaders to grow their network within their generation and to also have the opportunity to interact with today’s space leaders by way of our high-level speakers.

SGC Delegates at the 16th Space Generation Congress in Adelaide, Australia
The Space Generation Advisory Council in support of the United Nations Programme on Space Applications (SGAC) is a non-governmental, non-profit organization, which aims to represent students and young space professionals to the United Nations, industry, agencies and academia. SGAC has permanent observer status in the UN Committee on the Peaceful Uses of Outer Space (COPUOS). SGAC has a long history, and was conceived at the Third United Nations Conference on the Exploration and Peaceful Uses of Space (UNSPACE-III) in Vienna in 1999. The SGAC Executive Council is made up of representatives from each of the six UN regions, and has a larger body of representatives from nation states. Our focus is on pragmatic space policy advice to policy makers based on the interests of students and young professionals, broadly in the age range 18-35, interested in space from around the world.

For more information, please contact:
Clémentine Decoopman
SGAC Executive Director
clementine.decoopman@spacegeneration.org

Florian Ruhhammer
SGC 2018 Event Manager
florian.ruhammer@spacegeneration.org

Christopher Nie
SGC 2018 Deputy Manager
christopher.nie@spacegeneration.org

SGC at the 69th IAC

Sunday 30 September 2018, 09:00 – 16:00 - SGAC Professional Development Day (advanced registration required), CBB Gauß and CCB Herschel Messe Bremen

A one day event for SGAC members to learn from experienced professionals about topics germane to their career or entrepreneurial success.

One of the strategic goals of SGAC is to provide "opportunities for personal and professional development and skill-building through volunteer opportunities within SGAC" and we believe this event can help further this goal for our members. We want to ensure that membership in SGAC is valuable to all of our members, no matter their level of involvement within our organization.

Topics include:
- Ingredients for a Successful Job Application: Bring your own resume and cover letter and work with a small group lead by an industry mentor or HR professional to make it stand out from the crowd.

SGC 2018 Programme **

Thursday 27 September
08:00 - 18:00 SGC Sessions
20:00 - 23:00 SGC International Cultural Night

Friday 28 September
08:00 - 16:30 SGC Sessions
19:00 - 22:00 Space Night

Saturday 29 September
08:30 - 15:00 SGC Sessions
14:15 -16:50 SGC Working Groups Final Presentations
19:30 - 22:30 SGC 2018 Closing Dinner

** Note:
All sessions require attendees to register in advance unless otherwise specified. “SGC Sessions” include featured speakers, Working Group time, networking opportunities

** More information at: https://spacegeneration.org/sgc2018

SGC GALA DINNER – Saturday 29 September
19:30 - 22:30 SGC 2018 Closing Dinner (Invitation only)
Address: Bremen City Hall, Am Markt 21, 28195 Bremen, Germany
Website: https://spacegeneration.org/sgc2018

For more information about the SGC 2018 Closing Dinner, please email: christopher.nie@spacegeneration.org

Wrapping up three days of SGAC’s 17th Space Generation Congress, the annual SGC Closing Dinner honours the extraordinary work of SGAC’s volunteer members, and appreciation of the continuous support of our partners to inspire the next generation of space leaders.

SGAC would like to thank all the Sponsors and Supporters of the Space Generation Congress 2018.
**Wednesday 3 October 2018, 16:00 - 17:45 - IAF IDEA 3G Diversity Day, Exhibition Hall, Students Zone**

The IAF IDEA 3G Diversity Afternoon is organized in cooperation with and with participation of Young ESA, SGAC and WIA-Europe. IDEA is the International platform for Diversity and Equality in Astronautics and 3G Diversity includes Geography, Generation, and Gender. SGAC will select 6 winners to attend this event as SGAC representatives and will sit at a table with a high-level space expert in order to get one-on-one speed mentoring.

For more information, please contact:
Clementine Decoopman  
SGAC Executive Director  
clementine.decoopman@spacegeneration.org

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**Networking Cocktail:** 15:55 - 17:00 / Room CCB Bessel

**Sponsored by:**
Mohammed Bin Rashid Space Center (MBRSC)

The SpaceGen Entrepreneurs Forum is an event organized by the Space Generation Advisory Council as part of the Global Networking Forum during IAC. It is designed to connect entrepreneurs and potential entrepreneurs with start-up veterans and Venture Capitalists, Investors, Business Angels and Business Incubators. This event is set to attract proactive and high-calibre entrepreneurs that are passionate about commercial space (both upstream and downstream) and are looking to meet with mentors/VCs/Investors. The SpaceGen Entrepreneurs format is the following:

- Startup ecosystem panel (30 min): the panel will feature several prominent space entrepreneurs, investors and experts from the space startup world sharing their experiences and tips for success.
- TED-style talks (30 min): Three inspiring entrepreneurs and space advocates from all over the world will share their personal stories related to space. Learn about the challenges they overcame, their experiences along the way, and how they found their path to success.
- Networking cocktail (30 min): after the event there will be a networking cocktail for entrepreneurs and potential entrepreneurs to meet with investors, VCs, business incubators and members of the wider space landscape.

Speakers and moderators:

Start-up ecosystem panel speakers:
Thursday 4 October 2018, 13:45 - 14:45 – IAF Global Networking Forum: The Young Generations’ Perspective of Space and Security

Location: CCB Hansaesal

Sponsored by: ESA Technology Transfer Programme Office and Young ESA

The IAF Global Networking Forum (GNF) for Space Safety and Security - in and from Space - will be held during the IAC 2018 in Bremen. This GNF is expected to be an excellent occasion to promote IAF activities for space safety and security. In this regard, the GNF will engage key space actors in reflecting on their views on space safety and security in and from space.

This GNF invites panelists to reflect on the nature of space safety and security and its important role in space activities. This debate will focus on security in and from space, what the priorities of governments, industry and space agencies are.

Speakers and moderators:

Round Table Discussion:
1. Norina Antoni: PhD in Space and Security, Eindhoven University of Technology
2. Aline Decadé: Rocket Scientist, HE Space Operations BV
3. Yann Gouy: Deputy Head of the Space Tug Team, Airbus Defence and Space
4. Eleanor Morgan: Reserve Officer and Pilot, U.S. Air Force
5. Narayan Prasad: Co-Founder, satsearch.co
6. Kai-Uwe Schrögl: ISS President and Chief Strategy Officer, International Institute of Space Law (RSL), European Space Agency (ESA),

Moderators:

Dr. Christina Giannopapa, Head of Political Affairs, European Space Agency (ESA)
Dr. Christopher Vasko, Research Fellow, Young ESA, European Space Agency (ESA),

On-site contact:
Clementine Decoopman
SGC Executive Director
Tel: +33 (0)6 95 40 43 96
Email: clementine.decoopman@spacegeneration.org

Florian Ruhhammer
SGC 2018 Event Manager
Tel: +49 (0)6222 86357936
Email: florian.ruhammer@spacegeneration.org

Web: www.spacegeneration.org

The Space Generation Advisory Council in support of the United Nations Programme on Space Applications (SGAC) is a non-governmental, non-profit organisation, which aims to represent students and young space professionals to the United Nations, industry, agencies and academia. SGAC hosts conferences around the world to mobilize today’s young minds on key space issues.
69th
International Astronautical Congress
1 - 5 OCTOBER 2018, Bremen, Germany

Tania María Robles-Hernández (Mexico)

Tania Robles is a mechanical engineering senior student specialized in mechanical design at the National Autonomous University of Mexico. From 2013, she has served as volunteer for astronomical and science groups in science outreach. She has worked as science journalist at the Mexican National Council of Science and Technology, specializing in space science and technology, working hand in hand with the Mexican Space Agency. She is co-founder and former Director of the Aerospace Association of the Faculty of Engineering of her university. Since 2016, she is the National Contact Point from Mexico at Space Generation Advisory Council. She was recognized by the Mexican Space Agency as a young talent in the Mexican space sector. She has been awarded by the Thematic Network of Space Science and Technology in Mexico to be part of the International Summer Space School at Samara University in Russia, and for the International Space University to attend to the Southern Hemisphere Space Studies at the University of South Australia in Adelaide, Australia. In 2018, she participated in the analogue mission to Mars, Latam II, at the Mars Desert Research Station (MDRS) in Utah, United States. In December 2018, she will participate at MDRS as Commander with the first Mexican crew.

7 Awards 2018

7.1 IAF Awards 2018

7.1.1 IAF Allan D. Emil Memorial Award

Allan D. Emil (1898 – 1976) was a noted U.S. lawyer and philanthropist who became one of the foremost lawyers in the field of flight, and was appointed counsel to the Institute of the Aeronautical Sciences. Since 1977, the IAF’s Allan D. Emil Memorial Award has been presented annually for an outstanding contribution to space science, space technology, space medicine or space law. This contribution either involved the participation of more than one nation or furthered the possibility of greater international cooperation in astronautics.

The recipient of this year’s award is Xia Guohong.

Dr. Xia Guohong from Jintan, Jiangsu Province, China was born in October 1939, and is a researcher. Being the former General Manager of China Aerospace Science and Industry Corporation (CASIC) and the former Vice President of the Chinese Society of Astronautics, Professor Xia is a member of the Scientific Committee of China Satellite Navigation Conference (CSNC), the Control Theory Committee of Chinese Association of Automation and the expert committee of the Beidou Project of China. When Dr. Xia acted as the Vice Director of China National Space Administration, he organized experts to work out China space technology development plan for the 20th century; as a representative of China Aerospace, he participated in the international space cooperation research, and he had made outstanding contributions to the international space technology cooperation and aerospace industry. When he worked as the General Manager of CASIC, he pioneered the small satellite and small career rocket R&D, so he is an advocate and founder in CASIC’s developing the aerospace industry. He pioneered GPS and FLONASS compatible chip R&D in China through joint venture with the Russian Space Agency, and up to now, he has contributed significantly to the space industry. He once acted as general commander in technology in multiple national key projects, accomplished those missions successfully, and got multiple state science and technology progress awards.

7.1.2 IAF Frank J. Malina Astronautics Medal

Since 1986, the IAF’s Frank J. Malina Astronautics Medal has been presented annually to an educator who has demonstrated excellence in taking the fullest advantage of the resources available to them to promote the study of astronautics and related space sciences. The International Astronautical Federation is delighted to announce that the winner of the 2018 Malina Medal is Dr. David B. Spencer.

The recipient of this year’s award is David B. Spencer.

Dr. David Spencer is a Professor in the Department of Aerospace Engineering at The Pennsylvania State University. His research areas include: spacecraft dynamics and controls, trajectory optimization, space systems engineering, and theoretical and applied astrodynamics.
He is a Fellow of the American Astronautical Society, an Associate Fellow of the AIAA, and a Corresponding Member of the IAA.

Dr. Spencer received a B.S. in Mechanical Engineering from the University of Kentucky, an M.S. in Aeronautics and Astronautics from Purdue University, an M.B.A. from Penn State, and a Ph.D. in Aerospace Engineering Sciences from the University of Colorado at Boulder.

7.1.3 IAF Excellence in “3G” Diversity Award

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

For its exceptional engagement towards diversity, the IAF is proud to present the 2018 IAF Excellence in “3G” Diversity Award to:

Space Generation Advisory Council – SGAC

The award will be presented during the 69th International Astronautical Congress (IAC) in Bremen, Germany during the IDEA luncheon.

SPACE GENERATION ADVISORY COUNCIL – SGAC

The Space Generation Advisory Council (SGAC) is delighted and honoured to accept the IAF “3G” Diversity Award for 2018. SGAC was conceived at the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) in 1999, whereby states resolved, as part of the Vienna Declaration, “To create, within the framework of the Committee on the Peaceful Uses of Outer Space, a consultative mechanism to facilitate the continued participation of young people from all over the world, especially young people from developing countries and young women, in cooperative space-related activities.”

In line with this mandate, SGAC focuses on pragmatic space policy advice to policy makers based on the interests of students and young professionals from around the world, broadly in the age range 18-35, and interested in space. SGAC holds Permanent Observer status at the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) and regularly takes part in the annual meeting, as well as its Legal and Scientific and Technical Subcommittees.

In recent years SGAC has enjoyed unprecedented success in ensuring we have diversity reflected in our interactive events and across our organization. Our network is culturally and geographically diverse, and includes members from government, military, non-profit and private organizations – with more than 13,000 members and alumni in over 150 countries around the world with educational backgrounds that include engineering, management, law, international relations, economics, and more. Many of our events, including our flagship event the Space Generation Congress, have over 40% women in attendance, and proactively ensure a wealth of global representation. Visit our website for more information: www.spacegeneration.org.

SGAC has worked tirelessly to support a goal of diversity – which enables our interactive events to boast an eclectic mix of attendees which results in a unique range of outputs. In the same discussion group, you will see attendees from a range of backgrounds – such as a young woman engineer at ESA, a CEO of a space startup from Nigeria, a lawyer from a space policy think tank, and an Officer from the US Air Force. Despite their varied backgrounds, they are all united in their passion for space – and the opportunity to learn from each other truly demonstrates how SGAC’s mission not only promotes diversity as a concept – but results in actionable outcomes from it that will bring a positive and brilliant vision for the future of the international space sector.

We are honoured to have this work recognised by the IAF and thank all of our members past and present that have made this possible!

7.1.4 IAF Hall of Fame

The IAF Hall of Fame is intended to create a standing forum of personalities that have contributed substantially to the progress of space science, technology, and space benefits to mankind, within the framework of the IAF activities. It consists of a permanent gallery of these personalities, including a citation, biographical information, and a picture, in a special part of the IAF web presence.

The recipients of this year’s award are Long Lehao, Barbara Ryan, Joan Vennikos and Kiyoshi Higuchi.

Long Lehao, Technical expert of launch vehicle, Researcher, Academician of Chinese academy of engineering, the chief designer of launch vehicle series for China Academy of Launch Vehicle Technology (CALT). Former vice president and director of Science and Technology Committee of CALT, the chief designer and commander of China Launch Vehicle, the deputy chief designer for the China first Lunar Exploration Engineering Program. He was in charge of the development of C2-3A, which is the most commonly used rocket till now in China.

He has been honored numerous national, provincial and ministerial level awards (including 2 National Science and Technology Progress Awards), for instance, Science and Technology Progress Awards of Ho Leung Ho Lee Foundation, National Outstanding Professional Technical Talent Awards and National May 1st Labor Medal, etc...

Barbara J. Ryan, is the Secretariat Director of the intergovernmental Group on Earth Observations (GEO) in Geneva, Switzerland. GEO is comprised of nearly 104 Member States, the European Commission, and 126 international scientific and technical partner organizations, including IAF.

Under Ryan’s leadership, millions of satellite images and other Earth observation data have been made available to the general public at no charge, allowing scientists, planners and policy makers to make better-informed decisions on problems that transcend political boundaries. Her work addresses critical issues in agriculture, biodiversity, climate change, disaster planning, energy, health and water.

Since becoming Director of GEO in 2012, Ryan has worked to integrate Earth observation systems from around the world into a single, comprehensive system that uses coordinated data to understand how environmental factors impact human life. Like Ryan’s career body of work, the system helps guide decision makers toward better agricultural, energy and land-use decisions.
After graduating from the State University of New York (SUNY) at Cortland with a degree in geology in 1974, Ryan joined the United States Geological Survey (USGS), the nation’s largest civilian mapping agency. She became an expert in groundwater contamination and eventually was selected as staff assistant to the Department of the Interior’s top official for water and science. Ryan advanced steadily in the USGS, earning master’s degrees in geography from the University of Denver and in civil engineering from Stanford University along the way. As associate director for geography at the USGS, she was responsible for the agency’s remote sensing, geography and civilian mapping programmes, including the Landsat satellites. It was during this time she led the effort to change the decade-old Landsat data policy to full and open, an action resulting in more than 72 million scenes being downloaded globally to date. Ryan has served as chair of the International Committee on Earth Observation Satellites, which coordinates information from more than 100 civilian satellite missions, and in 2008 became director of the World Meteorological Organization’s space programme. Ryan has been awarded an honorary doctorate of science degree from SUNY Cortland. She was recently named an Honorary Fellow of the American Geographical Society, and in January 2017, was one of 10 global Leaders to be named to the Geospatial World Forum’s Hall of Fame.

Higuchi helped establish the International Utilisation Coordination Working Group (IUCWG), to strengthen collaboration among the ISS partners in utilising ISS.

From the mid-1990’s, he became increasingly involved in the overall planning and management of NASA. When NASA merged with the Institute of Space and Astronautical Science (ISAS) and the National Aerospace Laboratory of Japan (NAL), to establish JAXA in 2003, he facilitated the efforts to bring these distinctive organisations with different cultures to work together as one. Under his leadership, JAXA also focused its efforts on strengthening its capacity in system engineering as well as in safety and mission assurance. Higuchi also made substantive contributions to the development of JAXA’s long-term vision, “JAXA 2025”, released in 2009, that provides a roadmap for the next 20 years.

7.1.5 IAF Interactive Presentations Competition Award

To be announced on Thursday 4 October at 12:45 during the IP Award Ceremony. The five best Interactive Presentations of the IAC2018 will be awarded during a dedicated ceremony to be held just before the Interactive Presentation Session. A dedicated jury has chosen one winner for each of the five categories: A. Science and Exploration; B. Applications and Operations; C. Technology; D. Infrastructure; E. Space and Society. This event will kick-off the IP Session and the IP cocktail reception, so don’t miss your chance to mingle with the presenters and make sure to join us in the IP Hall!

7.1.6 IAF Luigi G. Napolitano Award

The IAF Luigi G. Napolitano Award is presented annually by the Space Education and Outreach Committee (SEOC) of the International Astronautical Federation to a young scientist, below 30 years of age, who has contributed significantly to the advancement of the aerospace science and has given a paper at the International Astronautical Congress on the contribution. The Luigi G. Napolitano Award will be given during the closing ceremony on Friday 5 October 2018 of the 69th IAC and the recipient will be invited to participate in the gala dinner of the IAC. The award was donated by the Napolitano family and consists of the Napolitano commemorative medal and a certificate of citation. The Luigi Gerardo Napolitano Society sponsors this annual award.
7.2 IISL Awards 2018

7.2.1 IISL Lifetime Achievement Award

George S. Robinson

Dr. George S. Robinson was unthreading in his exceptional service to the space law profession for over 40 years, contributing innovative and original scholarship to the development of international and national space law and policy. Dr. Robinson authored numerous articles and books on a broad range of subjects, including public and private international law relating to space activities, space commerce, and international aviation; science/technology activities; maritime activities, and terrestrial and oceanographic environmental activities.

7.2.2 IISL Distinguished Service Award

Jason Steptoe

For 25 years, Jay Steptoe made rich contributions to international law, including space law; domestic law impacting NASA’s international cooperation; issues involving the United Nations or other multilateral organizations; international trade; telecommunications and use of the radiofrequency spectrum; international aspects of commercialization; export control; and national security, and served as Deputy General Counsel and as the Associate General Counsel for International Law at NASA Headquarters. He also strongly lent his support for Lachs Moot Court competition in North America for a decade.

7.2.3 IISL Certificate of Gratitude

China Institute of Space Law (CISL)

The CISL has greatly contributed support for the National funding rounds for Manfred Lachs Moot Court competition since 2003, and supported IISL events in the past. It publishes space law journals, and supports research in space law and in the shaping of the national Chinese space law and policy. It has also served as an inspiring source for many Chinese and foreign students, researchers and public in general. The IISL recognizes the exemplary work of this institution.

8 Exhibition

8.1 Exhibition Area Layout
## 8.2 Exhibitor List in Alphabetical Order

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3D PLUS is a world leading supplier of advanced high density 3D microelectronic products and Die and Wafer Level stacking technology meeting the demand for high reliability, high performance and very small size of today’s and tomorrow’s electronics in space.

Its patented technology portfolio starts with standard package upward to die-size and wafer-level stacking processes, and enables stacking heterogeneous active, passive, Opto-electronics and MEMS devices in a single highly miniaturized package. 3D PLUS offers catalogue products upward to more complex System-In-Package (SiP) solutions and associated services, which offers high Quality standards:

- Manufacturing line and capability domain qualified by the European Space Agency (ESA) and the French Space Agency (CNES) for Space applications,
- Catalogue products listed in the ESA EPPI, (European Preferred Parts List) for space applications,
- Approved supplier for NASA and Jet Propulsion Laboratory (JPL) in the United States,
- Customers’ specific qualifications and approvals.

3D PLUS is the largest Space qualified catalogue products and custom System-In-Packages (SiPs) manufacturer in Europe. Its 3D stacking technology is the sole space qualified worldwidwide and with a recognized flight heritage of more than 16 years.

**Stand: E31**

**3D PLUS**

**Contact:** Atanu Pellegrino

**Email:** mpellegrino@3d-plus.com

**Web:** www.3d-plus.com

Aeron Technologies develops scalable engineering software for simulation and design, including high-speed aerospace applications (i.e. launch vehicle aerodynamics).

Our solutions are designed to be flexible enough to accommodate external tools and existing processes. Our architecture and licensing make high-volume use in an HPC environment easy and affordable.

All of the above, combined with source code that was written for speed, results in a faster, and more cost-effective design cycle.

**Stand: G20**

**Aeron Technologies Corporation**

**Contact:** Charles Schnake

**Email:** sales@aerion-tech.com

**Web:** www.aerion-tech.com

In 2019 humanity will celebrate the 50th anniversary of a feat once thought impossible: humans walking on the moon. With the 70th International Astronautical Congress (IAC), the American Institute of Aeronautics and Astronautics (AIAA) and the IAC 2019 Local Organising Committee (LOC) invite the world to commemorate that "one giant leap" and celebrate the international accomplishments and partnerships that have become the hallmark of space exploration.

Washington, D.C., the seat of U.S. government, also boasts a large concentration of civil and commercial space entities, as well as proximity to both domestic and international decision and policymakers and leading universities and research centers. It is the perfect backdrop to give your company's potential and existing customers and partners a reason to remember. It also gives your company unrivaled locations to celebrate the next deal with excellent restaurants, entertainment venues, and cultural attractions.

More than 3,000 delegates are expected, with participation from leaders of the world’s major space agencies, industry, and academia. IAC 2019 provides a remarkable opportunity for organizations to highlight their capabilities and advances; network with space leaders across government, industry, and academia; and make critical business connections.

Join the global space community in Washington, D.C., next year to envision what the next “giant leap” will be. Please stop by our booth to learn more about our exciting exhibiting and sponsorship opportunities.

**Stand: E20**

**IAC 2019 Hosted by AIAA**

**Contact:** Christopher Semon

**Email:** Chris@iaa.org

**Web:** www.iaa.org

Air Liquide is a historic partner in space industry for more than 50 years. Air Liquide has built a solid reputation in the space field thanks to its expertise in rocket equipment for satellites and also in space exploration (MTS, Herschel, Planck, MSL, Curiosity, ExoMars…). The Group continues to innovate and push back the frontiers by developing new technologies to address two major challenges: help overcome the major international challenges related to space and take part in observing Earth to understand, anticipate, and act on climate change. Our core business in space industry:

- Launchers:
  - Cryogenic propellant tanks for propulsion stages: oxygen, hydrogen, helium
  - Cryogenic launch pads infrastructure: cryogenic lines, hydrogen and helium liquefiers
  - Cryogenic systems on board and on the ground
  - Test equipment on the ground for launchers and satellites: space simulation chambers, test benches
- Engineering, tests and services
- Satellites:
  - Onboard cryogenic systems for satellites: cold production from 0.1K to 200K - pulse tube cryocoolers, dilution coolers, turbo-Brayton coolers
  - Cold management and distribution
  - Onboard gas management devices - valves, propellant storage and regulation
  - Ground support equipment: loading carts, gas production, tests
- Engineering, tests and services
- Space exploration:
  - Energy production and storage
  - Life support
  - Engineering, tests and services

**Stand: E36**

**Air Liquide**

**Contact:** Anna Qu

**Mobile:** anna.qu@airliquide.com

**Web:** www.airliquide.com

Air Liquide is a nanotechnological venture focused on large-scale production and supply of graphene materials and development of graphene applications. The company holds international patents for unique method of graphene growth (technology patented in Poland, Europe and United States). AGP offers assistance in any queries regarding graphene materials. Our standard services include:

- commissioning feasibility studies;
- scientific assistance in graphene characterization, processing methods and data analysis;
- partnership in research initiatives, especially those aimed at the development of graphene applications (R&D consortium with academia and industry).

AGP’s offer includes a unique selection of graphene materials such as: HSMG®, GO, rGO, etc. All parameters of our graphene products can be tailored to individual needs.

Innovative manufacturing process is based on the controlled precipitation of carbon atoms from the liquid metal matrix. In result, AGP’s graphene layers are characterized by larger grain sizes, quasi-monocrystalline two-dimensional structure and, consequently, improved graphene properties. This process is fully controlled and enables the production of large-scaled graphene sheets with specified number of layers, including also monolayer and quasi-monocrystalline graphene HSMG®.

**Stand: G21**

**Advanced Graphene Products**

**Contact:** Dominika Gnatek

**Tel:** office@agp-corp.com

**Web:** www.advancedgrapheneproducts.com

AGP is a nanotechnological venture focused on large-scale production and supply of graphene materials and development of graphene applications. The company holds international patents for unique method of graphene growth (technology patented in Poland, Europe and United States). AGP offers assistance in any queries regarding graphene materials. Our standard services include:

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**Stand: D70**

**Airbus**

**Contact:**

**Web:** www.airbus.com

With cutting edge capabilities and decades of experience, the Space Systems Business Line of Airbus has all it takes to design, develop and operate major space systems. Around the globe commercial and institutional customers alike rely on Airbus’ leading space technology and solutions. The Airbus portfolio contains the whole range of Space products and services: mobility, environment, communication, security, Space exploration, science and access to Space.

From the smallest electronics parts to the full in-orbit delivery of satellites, from very-high-resolution Earth observation instruments to unprecedented deep space exploration missions, from today’s most reliable telecommunications satellites to flawless International Space Station operations - reaching for the stars is our daily business.

Airbus is a global leader in aeronautics, space and related services. In 2017 it generated revenues of € 59 billion restated for IFRS 15 and employed a workforce of around 129,000.
Stand: H22
Amphinicy Technologies
Contact: Mirta Medanic
Email: mirta.medanic@amphinicy.com
Web: http://www.amphinicy.com

Amphinicy Technologies is the world’s leading software provider for companies operating in the satellite and space application sectors. With offices in Zagreb, Croatia and Luxembourg, the company has been on the market for more than 20 years and has delivered over 100 projects to the international market. Their customer base includes international space and communications agencies, leading satellite operators and global satellite service providers, teleports and space mission operation centres and satellite equipment manufacturers. Amphinicy products and services are:
- Blink – a software-based satellite data acquisition system
- Monica – a monitoring and control solution for satellite ground stations
- SatScout – a mobile application for VSAT terminal commissioning

Software services – complex tailor-made software solutions and end-to-end software support for the satellite industry:
- Ground segment simulation, MMS Solutions, beam roaming, passive satellite ranging, mobile solutions, content distribution platforms, aircraft tracking, and others.

Amphinicy is involved in several flagship ESA projects and is a beneficiary of EU Horizon 2020 and ESA programs.

Stand: A65
Analytical Graphics inc.

Stand: D80
ArianeGroup
Contact: Laurence Gelbmann
Email: laurence.gelbmann@ariane.group
Web: www.ariane.group

ArianeGroup develops and supplies innovative and competitive solutions for civil and military space launchers, with expertise in all aspects of state-of-the-art propulsion technologies. ArianeGroup is lead contractor for Europe’s Ariane 5 and for the future Ariane 6 launchers, responsible for both design and the entire production chain, up to and including marketing in its ArianeSpace subsidiary, as well as for the missiles of the French oceanic deterrent force. ArianeGroup and its subsidiaries enjoy strong reputations as suppliers and experts in the field of propulsion and propulsion for space applications, while their expertise also benefits other industrial sectors. The group is a joint venture equally owned by Airbus and Safran, and employs nearly 9,000 highly qualified staff in France and Germany. Its estimated pro forma revenues exceed 3 billion euros.

Stand: C5
A.5.1 (Agenzia Spaziale Italiana)

Contact: Stefania Arena
Email: info.comunicazione@asi.it
Web: www.asi.it

ASI was founded in 1988. Its purpose was to coordinate all Italy’s efforts and investments in the space sector that had begun in the 1960s. Italy has become one of the most significant players in the world in space science, satellite technologies and the development of mobile systems for exploring the Universe. Today, it has a key role at the European level where Italy is the third contributor country to the European Space Agency. ASI’s strong relationship with NASA has led to its participation in many of the most interesting scientific missions of recent years such as the construction and activities of the International Space Station. Thanks to ASI’s efforts, the Italian scientific community has had unprecedented successes in recent years in astrophysics and cosmology. ASI has also significantly contributed to space exploration. One of ASI’s most important programmes is Cosmo-SkA, aimed at improving our knowledge of the Earth, but ASI also has the leadership in the European programme VegaL, the small rocket fully designed in Italy.

Stand: A60
Asia-Pacific Space Cooperation Organization
Contact: Gao Ye
Email: secretariat@gpsoe.net
Web: www.gpsoe.net

The Asia-Pacific Space Cooperation Organization (APSCO) was officially inaugurated in 2008, and is headquartered in Beijing, China. As an inter-governmental organization, APSCO provides a cooperative mechanism for developing countries in the Asia-Pacific Region to be able to maintain peaceful uses of space as a driver of development. By resource sharing in space science, space technology and space application, APSCO promotes multilateral cooperation to facilitate capacity building for its Member States: Bangladesh, China, Iran, Mongolia, Pakistan, Peru, Thailand, and Turkey, Indonesia, Mexico and Egypt.

Stand: A40
Astos Solutions GmbH
Contact: Andreas Wiegand
Email: andreas.wiegand@astos.de
Web: www.astos.de

Astos Solutions is a SME providing innovative software and hardware solutions that help to reduce cost and to increase productivity. Products and services are dedicated to any space mission, like launcher ascent, constellations, rendezvous, electric propulsion orbit transfer, interplanetary flight, and landing. The software is dedicated to trajectory and vehicle design optimization, mission and system concept simulation, GNC/DOCS design and analysis, safety and risk analysis for space debris and launcher ascent, error budget engineering, and magnetic cleanliness. High performance visualization capabilities allow to compute drag and solar radiation perturbations for solar applications. A fluent workflow from model over processor to hardware in the loop simulation is embedded in validation facilities. The E3DGE product family is extended by a reconfigurable AOGC-SCCE based on-DEPCE components, a GCMSS simulator from SYMONTE, and a camera and lidar simulator for real-time testing of vision based navigation algorithms.

Stand: E38
Astro- und Feinwerktechnik Adlershof GmbH
Contact: Dr. Sebastian Schilling
Email: info@afad.de
Web: www.afad.de

Astro- und Feinwerktechnik Adlershof GmbH is a medium-sized enterprise for space applications with more than 20 years experiences in space engineering, situated in Berlin-Adlershof, Germany. We are specialized in design, simulation, manufacturing, assembly and verification of space hardware and offer consulting in these disciplines. We developed a range of different products for the space market such as our flight proven reaction wheel applicable to several satellite sizes, 1U to 12U CubeSat launchers and custom designed ADS solutions in space and on-ground. Besides that we also provide flight proven standard satellite bus up to 120 kg. Our team designs, manufactures, integrates and verifies with the aid of our own modern CAD/CAM process lines, clean rooms and environmental test facility that provides services for ECS conform vibration, shock, thermal and thermal-vacuum testing and for micro vibration investigations.

Our processes are certified according to EN 9100.

Stand: G03
Astroscale PTE. LTD.
Contact: Karen Rogers
Email: k.rogers@astroscale.com
Web: www.astroscale.com

Astroscale is the first private company with a mission to remove space debris in order to secure long-term spaceflight safety and orbital sustainability for the benefit of future generations. Founded in 2013 by IT entrepreneur Nobu Okada, the company uses a start-up mentality to address orbital debris mitigation. Astroscale is currently developing the robust requirements and concept of operations for their first technology demonstrator - End-of-Life Service by Astroscale-demonstration (ELSA-d), to prove debris removal capabilities. ELSA-d is scheduled to be launched in early 2020. Astroscale has three global offices, with its corporate headquarters in Singapore, an R&D office in Japan and an operators centre and European R&D office in the UK. The company now employs over 50 personnel with an aim to increase to over 100 staff by 2020. The team originates from space agencies, government, start-ups and the aerospace industry, and provide a unique portfolio of experience and expertise to solve the technical, policy and business case issues around space debris.

Stand: F23
ATG Europe BV
Contact: Michiel Velling
Email: contact-us@atg-europe.com
Web: www.atg-europe.com

ATG Europe is an innovation driven group of companies that adds value to its customers by enabling them to enhance their position in the market through the services, products and technologies it brings. This is reflected in the way we set up our business and the three business lines we have established. ATG SpaceSails focuses on project based thermo-mechanical engineering and technology developments in the field of carbon composite materials. ATG BrightMind provides consultancy support of highly skilled personnel to International Agencies, institutes and industry. ATG Mediais ATG Europe’s 3D graphics design, 3D animation and visualization studio, known for its ability to transform technical subjects into scientifically accurate and visually appealing animations and illustrations.

With close to 250 employees spread over 4 subsidiaries across the continent and our headquarters right next to Estec in the Netherlands, we are a truly European group of companies located in the heart of the European space community.
Tom Segert
Email: info@azist-bst.com
Contact: Joe Andrews
Email: joe.andrews@space.gov.au
Web: www.azist-bst.com

The Australian Government established the Australia Space Agency on 1 July 2018 with an investment of $1 million over four years for its ongoing operations. The establishment the Australia Space Agency, which is a whole-of-government body, aligns with the Australian Government’s emphasis for Australia to build on its niche industry capabilities and strategically develop new commercial opportunities to compete in the global space economy. The purpose of the Agency is to transform and grow a globally respected Australian space industry and the use of space to lift the broader economy. This will be underpinned by strong international and national engagement. In achieving this purpose, the Australian Space Agency will aspire and improve the lives of all Australians.

Stand: A80
BavAIRia E.V.
Contact: Bärbel Deisting
Email: info@bavaira.net
Web: www.bavaira.net

In 2006 the Bavarian government bestowed BavAIRia e.V., located at the Oberpfaffenhofen Special Airport near Munich, the responsibility to manage the Bavarian Aerospace Cluster. Since then it has been a competent point of contact for questions relating to aviation, space and space applications in Bavaria.

In addition to encouraging cooperation among industry, small- and medium-sized companies, universities, research institutions and the political sphere, BavAIRia e.V. has the goal of supporting its members with local marketing, advise and services. Such activities enhance the competitiveness of Bavarian companies and their global visibility. BavAIRia’s international pursuits stimulate and consolidate business contacts and it is involved in developing innovative applications and services through its contributions to national and international projects.

Stand: A01
Azista Bit Aerospace
Contact: Tom Segert
Email: info@pist-bit.com
Web: www.azista-bit.com

Here at gebueult, your bag is manufactured by professional seamstresses – of course hand made. The quality of the material is selected with expert knowledge, you can look forward to a long-lasting bag. At the booth H 30 you can make your own wishes, and add some special seams or patches to individualize your bag. I have the know-how and the technical understanding to implement your ideas, or to propose alternatives for your bag.

The selection of gebueult bags ranges from duffel bags, sports bags, bicycle bags, toiletry bags to backpacks. Discover a wide selection of colourful fabrics and strong seams.

Stand: A55
Belgium Space
Contact: Michel Stassart
Email: michel.stassart@skywin.be
Web: www.skywin.be

The “Belgium Space” booth brings together 12 Belgian industrial and scientific actors (Arcos, Centre Spatial de Liège (CSL), Deltawerf, Lernitz-If, ORI Geoinfo, SABCA, Safan Aero Boosters, Spatialex, Technikum Space Belgium, RHEA Group and ViTOS) as well as BELSPO (The Belgian Federal Science Policy Office) and 3 regional space associations (Wallonie Espace, Vlaams Brabant and Brussels).
Stand: G01
Berlin Space Technologies GmbH
Contact: Tom Segert
Email: info@berlin-space-tech.com
Web: www.berlin-space-tech.com

Berlin Space Technologies is a global leader in high performance small satellite systems. Astrea Aerospace is high tech supplier with more than 25 years of space manufacturing experience. Together Astrea and BST have teamed up to form the new global power-house in mass manufacturing of satellites. Engineered in Germany and manufactured in India – with a team of 125 people and more than 60,000/m² of the most modern satellite design and manufacturing facilities, Astrea and BST are excellently positioned to bring your constellation to orbit – on time and on budget.

Stand: F27
Bishop GmbH - Aeronautical Engineers
Contact: Peter Bishop
Email: bishop.peter@bishop-gmbh.com
Web: www.bishop-gmbh.com

The future has begun – without qualified specialists no company can survive. “Know-how” is essential for the realisation of projects which, at first, appear to require an uncertain amount of time. At the same time, it is necessary to keep an eye on the resources – to be, in other words, entirely requirement oriented.

Since 1997 the Bishop GmbH has been successful in the procurement of first class personnel for the Space sector. More than 200 highly specialized employees work for our company throughout Europe. From the Engineering and Development of new rocket and satellite systems to the marketing and management positions in the space industry; we have at our disposal a great pool of qualified and motivated aeronautic personnel.

Special skills, which – if so you wish – are available also for limited time and selective tasks. Naturally, you may also secure the collaboration of our staff indefinitely, by taking them on.

The perfect crew is the key to the success of your company. Only with the right body of co-workers situated in the right positions, do we arrive together at our destination. We are looking forward to meeting you.

Peter Bishop
Managing Director of Bishop GmbH - Aeronautical Engineers

Stand: G13
Black Engine Aerospace UG
Contact: Oliver Durst
Email: o.durst@blackengine-aero-space.com
Web: www.blackengine-aero-space.com

Development, designing and production of rocket engines with ceramic thrust chamber.

Stand: D20
Blackout Technologies UG
Contact: Lisa Fischer
Email: info@blackout.ai
Web: www.blackout.ai

Blackout Technologies offers a platform with which anybody can build their own Digital Assistant, using Artificial Intelligence, for Natural Language Processing and other analytics. We can connect this self-learning network to not only state of the art Artificial Intelligence, but also to a multitude of different user interfaces, such as Pepper robots, websites, mobile apps or any other robot, sensor or user interface!

These technologies are used for robotic personalities, assisting chatbot personalities or any other platform that specializes in communicating information.

Blackout Technologies offers a branch-independent solution, it doesn’t matter if your business is in pharmaceuticals, e-m, banking or space.

Possible uses are robots for marketing and HR purposes, chatbots for front office work or also a solution that is your personal Digital Assistant!

For more information, please visit: www.blackout.ai

Stand: B30
Boeing
Contact: Pamela Workings & Daniel Peck
Email: info@boeing.com
Web: www.boeing.com

Boeing is the world’s largest aerospace company and leading manufacturer of commercial jetliners and defense, space and security systems.

A top U.S. exporter, the company supports airlines and U.S. and allied government customers in 150 countries. Boeing products and services include commercial and military aircraft, satellites, weapons, 4GISR, electronic and defense systems, launch systems, and performance-based logistics and training. Boeing has a long tradition of aerospace innovation, but a broad range of capabilities includes creating new, more efficient members of its commercial airplane family, creating advanced technology solutions for military customers and integrating aircraft, defense and space systems and warfighters through network-enabled solutions.

Stand: D20
Bremen - City of Space
Contact: Christine Schlenker
Email: info@aviaspace-bremen.de
Web: www.aviaspace-bremen.de

Within the space industries and aeronautics sectors more than 145 companies and 20 institutes, a workforce of about 12,000 employees, generate more than 4 billion euros per year. Considering the number of residents, Bremen has the highest employment density within these sectors in Germany.

Future-oriented workplaces, especially for highly qualified people, characterise the space industries and aeronautics sectors. Cutting-edge research in the State of Bremen sustainably supports the industries in the fields of materials sciences and production technologies, space systems, remote sensing, biocells, robotics among others. Major products from Bremen are the wings of the Airbus aircraft, the Ariane upper stages and the satellite navigation system GALILEO.

Stand: D20
Bremeninvest
Contact: Andreas Gerber
Email: mail@bremen-invest.com
Web: www.bremen-invest.com

One-stop business support services

We are the central services provider for economic development, the promotion of Bremen as a location for investment, events and trade fairs. International investors will be looked after by the competent international team of Bremeninvest, bundling all services which meet with the requirements of foreign investment.

The competent team of Bremeninvest will provide you with full support for the set up of an office, formation of a company, find logistics services provider, help with immigration affairs for international managing directors, find office space or warehouse facilities or put you in contact with the relevant authorities respectively business partners – all what is needed to start and focus on your business start up and successful market penetration.

Come and speak with us! You are welcome to contact us. Your individual business shall be your success!

Stand: C24
Centro Estero Internazionalizzazione Piemonte S.C.P.A.
Contact: Diana Giorgini
Email: info@centrostero.org
Web: www.centrostero.org

Stand: C70
Chinese Society of Astronautics
Contacts: Zhang Yuxi / Yang He
Email: css_zhangyi@163.com
Web: www.css.org.cn

Chinese Society of Astronautics (CSA) was founded in 1979 and formally registered in Beijing. It is a non-government and non-profit academic organization, which has 39 technical committees, 137 institutional members and over 3000 individual members. CSA has the premier and trusted resources for space activities.

The main tasks of CSA:
- To organize and host high level conferences, forums, meetings and workshops to provide a unique platform for space professionals from home and abroad to exchange and cooperate.
- To edit and publish Journal of Astronautics in Chinese and Advances in Astronautics Science and Technology in English for space professionals to present findings and deal with key space topics.
- To host 8 to 8 meetings to promote the practical cooperation between domestic and international space companies.
- To organize space education programs such as “U.S. Space Summer Camp Tour” and “World Space Week Celebration in China” to enhance young people’s scientific awareness.
- To conduct a broad range of policy research programs to ensure that the space industry is well-informed on critical space policy issues.
Deutsches Zentrum für Satelliten-Kommunikation e.V. (DeSK) is an industry-led initiative with initial seed funding provided by the Defense Advanced Research Projects Agency (DARPA) that aims to leverage best practices from government and industry to research, develop, and publish non-binding, consensus-derived technical and operations standards for OOS and RPO. These standards would provide the foundation for a new commercial repertoire of robust space-based capabilities and a future in-space economy. CONFERS will be open to participation by private sector stakeholders in the international satellite servicing community. All companies and academic institutions developing, operating, insuring and purchasing OOS and RPO capabilities are encouraged to join and contribute their experience and expertise.

Deutsche Gesellschaft für Luft- und Raumfahrt (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)) is the largest, most comprehensive institute for space research in Europe. The DLR, Germany’s Aerospace Center, is among the largest centers for aerospace in Europe with more than 6000 employees at 40 institutes and 20 locations in Germany. DLR’s Space Administration has been given responsibility by the federal government for the planning and implementation of the national German space program. DLR is also the umbrella organisation for the nation’s largest project management agency. DLR operates innovative and applied research in various fields ranging from aeronautics, space, energy, transportation, security and digitalisation in national, European and international cooperation. DLR operates more than 170 research institutions including Europe’s largest fleet of civil research aircraft. DLR’s mission comprises excellent research and technology development to address global challenges and to support industrial partners. It also fosters the development of the next generation of researchers and provides expert advisory services to the government.

Deutsches Zentrum für Satelliten-Kommunikation e.V.

The German Center for Satellite Communications (DeSK) is a SME located in Bremen, Germany, providing high-end electronics for airborne and space applications. Founded as a spin-off of the University of Applied Sciences Bremen in 1997 by Professors Dr. H. Michalk and Dr. L. Hinsenkamp, DeSK has continued to deliver future-oriented solutions in the time terms of both aerospace technology and IT security systems. The DeSK group currently comprises three independently operating companies:

- **DSI Aerospace Technologie GmbH**: originally founded as Digitale Signaleverarbeitungssysteme & Informationstechnik GmbH provides dependable electronics for space, airborne and terrestrial platforms
- **DSI Daten sicherheit GmbH**: acts as a holding company for DSI-AS and DSI-DS
- **DSI Informatikstechnik GmbH**: acts as a holding company for DSI-AS and DSI-DS

The fields of activity are dedicated to the engineering, development, manufacturing and qualification of solutions for aerospace electronic equipment, information technology and advanced communication systems. We are specialized in designing digital systems, which provide significant savings in required resources in terms of power consumption, mass and volume. At the same time, our integrated approach provides significant increases in processing power as well as in reliability due to the usage of the newest, qualified FPGAs and ASICs technologies.

**Contact:**

Dilara Betz
dilara.betz@desk-sat.com
www.desk-sat.com

**Contact:**

Claudia Ricke
claudia.ricke@dsi-as.de
www.dsi-as.de

**Contact:**

Daniel Voigt
daniel.voigt@dlr.de
www.dlr.de

**Contact:**

Swantje Schmidt
uk-hb@dfki.de
www.dfki.de/robotik

**Contact:**

H. Michalik and Dr. L. Hinsenkamp, DSI has continued to deliver future-oriented solutions in the time terms of both aerospace technology and IT security systems. The DSI group currently comprises three independently operating companies:

- **DSI Aerospace Technologie GmbH**: originally founded as Digitale Signaleverarbeitungssysteme & Informationstechnik GmbH provides dependable electronics for space, airborne and terrestrial platforms
- **DSI Daten sicherheit GmbH**: acts as a holding company for DSI-AS and DSI-DS
- **DSI Informatikstechnik GmbH**: acts as a holding company for DSI-AS and DSI-DS

The fields of activity are dedicated to the engineering, development, manufacturing and qualification of solutions for aerospace electronic equipment, information technology and advanced communication systems. We are specialized in designing digital systems, which provide significant savings in required resources in terms of power consumption, mass and volume. At the same time, our integrated approach provides significant increases in processing power as well as in reliability due to the usage of the newest, qualified FPGAs and ASICs technologies.
Stand: A81
ECM Space Technologies GmbH

Email: www.ecm-space.de

ECM Space is a leading European launch services provider and cluster integrator, offering easy, cost-effective and regular access to space for small satellites. Over the past year, ECM Space has arranged launches for more than 40 international small satellites to sun-synchronous orbits and plans to launch over 50 international small satellites in 2018-2019. With a variety of launch opportunities (SSO, RED, LEO/GOES) and focusing on an individual approach to each satellite, ECM Space provides the most optimal launch solutions for start-ups, universities, commercial companies, space agencies and space institutions. Supplementary to the launch services, ECM Space designs and manufactures in-house 12U/18U CubeSat launch developers and deploys low-thrust separation systems for microsatellites. For more information, please visit: www.ecm-space.de

Stand: G14
Emerging Countries

We have received the exhibitor profile from the Emerging Countries. Please find the text below:

The International Astronautic Federation (IAF) has adopted the Global Innovation Agenda 2016-2019 with a number of targeted interventions, of which the first is to Reach out to Emerging Countries and Connect with New Communities. A proposed definition of Emerging countries are those countries that have space ambitions, but have not moved to establish national space programmes through the formal adoption of national space policies/strategies and/or no resources have been committed as yet. The IAF aims to understand challenges facing these nations with the intent of supporting their aspirational space programmes. There are proposed interventions from the Federation through its networks to provide political support, financial support, technology readiness support, human capital development and support for infrastructure improvements. Countries within this classification are located in South America, Africa and parts of Asia.

Stand: F22
Enpulsion GmbH

Contact: Dr. Thomas Nennadle
Email: nennadle@enpulsion.com
Web: www.enpulsion.com

ENPULSION was founded in 2016 as product spin-out of FOTEC, the research subsidiary of the University of Applied Sciences (Werner Neudörfl), Austria, to produce and commercialise the Field-Emission Electric Propulsion (FEEP) technology for the global market. This technology is based on more than 15 years of research and development work in cooperation with the European Space Agency (ESA). In its own semi-automated production facility, ENPULSION is manufacturing the IFM Nano Thrusters – a compact, scalable, and modular electric propulsion system with commodity pricing as well as ultra-short lead times. The IFM Nano Thruster has been qualified as a compact pre-qualified building block in order to provide customised propulsion solutions for nano- and microsatellites. By clustering the IFM Nano-module the scaled version – the IFM Micro Thruster – can be created to target small and medium size space crafts as well.

ENPULSION propulsion systems are provided to customers on a global scale and have expanded the company to the San Jose, California U.S.A in 2017.

Stand: B25
EUMETSAT

Contact: EUMETSAT Media Relations
Email: press@eumetsat.int
Web: www.eumetsat.int

EUMETSAT – monitoring the weather and climate from space

Established in 1986, EUMETSAT is Europe’s operational satellite agency for monitoring the weather and climate, which have increasing impacts on our society and our economy. EUMETSAT delivers vital weather and climate data to 30 Member States from its headquarters in Darmstadt, Germany. EUMETSAT operates four geostationary Meteosat spacecraft over Europe, Africa and the Indian Ocean, providing frequent observations vital for severe weather warnings, and two Metop polar orbiting satellites which give access to a unique wealth of ocean, land and atmospheric parameters that are essential for forecasting of high impact weather up to 10 days in advance. Reprocessing and cross calibration of long series of data from both systems provide unique climate data records.

EUMETSAT is also a partner in the Jason ocean altimeter missions exploited jointly with NOAA, NASA and CNES. Since 2018 EUMETSAT exploits the Copernicus Sentinel-3 marine mission, in cooperation with ESA and on behalf of the EU, and delivers data services to the Copernicus Marine Environment Monitoring Service. EUMETSAT delivers real-time, integrated data streams to users worldwide and makes its more than 30-year archive of observations available to scientists, research and operational users.

Stand: C27
European Commission

Contact: Samantha Christy
Email: samantha.christy@ec.europa.eu
Web: erc.europa.eu

The ERC is the first European funding organisation for excellent frontier research. Every year, it selects and funds the very best, creative researchers of any nationality and age, to run projects based in the EU. The ERC has a budget of over €1.1 billion for the year 2019 to 2020.

Stand: C50
European Space Agency

Contact: Maria Menendez
Email: maria.menendez@esa.int
Web: www.esa.int

ESA develops the space infrastructure needed to keep Europe at the forefront of global activities and plays a critical role in building a strong and competitive local industry. ESA develops launchers, ground facilities and the technology to send satellites into space for Earth observation, navigation, telecommunications, and astronomy, sending probes to the far reaches of the Solar System, as well as cooperating in the human exploration of space and creating practical applications for space on Earth.

ESA has 22 Member States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. Slovenia is an Associate Member. Canada takes part in certain programmes under a cooperation agreement.

ESA has signed European Cooperating States Agreements with Latvia, Lithuania, Slovakia, Bulgaria and Cyprus and cooperation agreements with Malta and Croatia.

Stand: F22
Firefly Aerospace

Contact: Tom Markusic
Email: info@fireflyspace.com
Web: www.fireflyspace.com

Firefly Aerospace is committed to providing economical and convenient access to space through the design, manufacture and operation of reliable launch vehicles. Led by CEO Tom Markusic and a team of space industry veterans, Firefly is developing the Alpha launch vehicle. Alpha combines the highest payload performance with the lowest cost per kilogram to orbit in its vehicle class.

capable of delivering 1 metric tons to Low Earth Orbit (LEO) and 600 kg to the highly desirable 500 km Sun-synchronous Orbit (SSO). Alpha will provide launch options for both full vehicle and ride share customers. Firefly is based in Austin and has rapidly grown our workforce to over 120 employees.

Stand: F70
Fraunhofer Space Alliance

Contact: Angela Haberlath
Email: Angela.Haberlath@int.fraunhofer.de
Web: www.int.fraunhofer.de

The Fraunhofer Space Alliance, whose core is the Insitute for Reliability and Sensor Systems and Analysis, is a network of the 30 institutes of the Fraunhofer-Gesellschaft, which cover the entire spectrum of space-related research. The Fraunhofer Space Alliance is the leading European player in space-related research and offers its customers a unique range of services.

Weather forecasts, navigation, real-time transmission for satellite TV or global Internet access – space industry applications and services have become an indispensable part of daily life, underpinning the importance of space technology for a modern industrialized society. In the Fraunhofer Space Alliance, the institutes pool their technological expertise in order to provide the industry and funding agencies such as the European Space Agency (ESA) and the European Commission with a central contact.

Fraunhofer acts as a system provider, developing a wide range of top-quality components, integrating them into an overall system and delivering that system to the customer. The strong technological variety of the participating institutes enables the Fraunhofer Space Alliance to offer its customers a unique range of services. Its business units are Communication and Navigation, Materials and Processes, Energy and Electromagnetics, Surfaces and Optical Systems, Protection Technology and Reliability and Sensor Systems and Analysis.
German Orbital Systems GmbH

German Orbital Systems is a provider of a wide range of space-related products and services, based in Berlin. We believe that space has an enormous meaning for our planets future and that everyone should have the possibility to part of it. We work hard, to make satellite technology understandable and affordable while staying fair to our employees and customers as causing no unnecessary harm to our environment.

Without venture backing, GOS developed a wide range of new products which generate regular revenues and enable further growth. The company participates in multiple satellite projects, develops electronics for launch vehicles and is involved in separation system development. Combining the full palette of services and products, GOS is one of very few companies in Europe which can provide turnkey microsatellite missions, delivered to the customer as a working satellite in-orbit.

German Orbital Systems is an innovative provider of turnkey microsatellite missions, delivered to the customer as a working satellite in-orbit.

Stand: A86

Contact:
Email: info@geros.de
Web: www.orbited.de

GERADTS GMBH

GERADTS GMBH develop and manufacture individual components, subsystems and systems to the very highest standards.

We work extremely precisely, quickly and economically. As well as producing highest-quality technical components, we have a focus on developing innovative solutions for complex problems for the aerospace industry. We design and produce systems, machines, modules, devices and individual components for satellite structures, landing systems, robots and sensor systems using a holistic and solution-oriented approach. GERADTS make everything from simple parts to complex modules for the IS space station, satellites, Mars projects, aerodynamics and life sciences. Our customers include OHB-System AG, Airbus Defence & Space, Ariane Satcom Launchers, German Aerospace Center (DLR) and the Fraunhofer Institute (IAPM). Experiments in near-zero gravity conditions. Innovative, flexible, economical. GERADTS "MARK" parabolic flights are an innovative platform for experiments and payload tests in near-gravity conditions. Both industry and scientific research profit from the up to 7.5 seconds of weightlessness, which can be repeated and adjusted with great flexibility. Our specially adapted aeroplanes provide precise gravity conditions for reliable results.

Stand: F35

GERADTS GMBH

Contact:
Email: c.lauter@geradts.de
Web: www.geradts.de

GKN Aerospace's Space business unit, in Trollhättan, Sweden, has been active in the Ariane program from its inception in 1974 and has made over 1,300 combustion chambers and nozzles as well as over 250 turbines for the Ariane rocket to date. Today it is the European center of excellence for turbines and metallic nozzles, having contributed to the program at every stage of initial research and development through cooperation with academia to the serial production. GKN's involvement is set to continue with the development of the new-generation Ariane 6 rocket. Engineers at GKN Aerospace are in the most intense part of the development phase for a new nozzle for the Vulcain 2.1 engine using the latest technology like laser welding and additive manufacturing.

We are also a world leader in manufacturing compressor rotors, compressor and turbine blades and vanes, blisks and integrated bladed rotors using high-speed 5-axes machining. Innovation is a continuous process of taking advanced aerospace technologies to the next technology readiness level. Lightweight composites, additive manufacturing, innovative engine systems and smart transparencies help us to reduce emissions and weight on the aircraft and enhance passenger comfort.

Stand: F21

GKN Aerospace

Contact:
Email: marcus.broberg@gkanerospace.com
Web: www.gkn.com

GMV Inyen AG

GMV Inyen AG is a globally leading manufacturer & supplier of nanosatellite solutions for customers in the academic, government and commercial markets. Our team of 250 employees serves customers in more than 50 countries based on a wide range of qualifications – including systems integration, nanosatellite platforms and advanced miniaturised radio technology.

Our mission is clear: "We help teams across the globe achieve their goals in space". Nanosatellites should be put to work delivering revenue and/for mission critical services for their owners, and we can deliver the - often complex - products and solutions enabling our customers in doing so. Due to our more than 10 years of experience in the field and a history of successful missions, we offer our customers a strong set of profound knowledge and competencies within radio technology, nanosatellite platform, project management and innovation.

Our knowledge and competencies enable us to provide everything from component parts to complete solutions, that include – for instance - mission design, mission specific development, production, assembly integration and testing, launch and commissioning as well as ground station(s) and training of operators & users. These complete solutions can be used for services within tracking, Internet of Things, Communication, Defense and Security, Remote Sensing and Science Missions.

Stand: B40

GMV Inyen AG

GOMSpace

GOMSpace is a globally leading manufacturer & supplier of nanosatellite solutions for customers in the academic, government and commercial markets. Our team of 250 employees serves customers in more than 50 countries based on a wide range of qualifications – including systems integration, nanosatellite platforms and advanced miniaturised radio technology.

Our mission is clear: "We help teams across the globe achieve their goals in space". Nanosatellites should be put to work delivering revenue and/for mission critical services for their owners, and we can deliver the - often complex - products and solutions enabling our customers in doing so. Due to our more than 10 years of experience in the field and a history of successful missions, we offer our customers a strong set of profound knowledge and competencies within radio technology, nanosatellite platform, project management and innovation.

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Stand: B40

GOMSpace

Gradel S.A.R.L.

Contact:
Email: w.winkel@gradel.lu
Web: www.gradel.lu

HE Space Operations GmbH

HE Space Operations is a thriving privately owned company specialising in personnel recruitment and services exclusively for space agencies and the space industry. HE Space Operations is international, with offices in the Netherlands (Noordwijk), Germany (Bremen, Darmstadt) and the United States (Houston).

HE Space Operations is a significant supplier of specialist knowledge and expertise to European space programmes bringing together more than 200 professionals of 32 nationalities from Europe and beyond. In 2014, HE Space won the German Corporate Social Responsibility Award for Gender Equality.

Our company provides expert engineering, scientific management and administration support to ESA, EUMETSAT, Airbus Defence and Space, ArianeGroup, OHB Systems, DLR, Tråth, Thales Alenia, Roving, Lena-Optronik, TESAT Spacecom, IAB, SST Space Tech and Mynaric. Our staff have made significant contributions to many of Europe’s most exciting space projects.

We will show you how to boost your career. Our recruiting team offers one-on-one advice sessions and will give career tips on how to prepare for a job interview, how to revise your CV and cover letter and last but not least how to find the right job. We are looking forward to meeting you at our booth E 705.

Stand: E70

HE Space Operations GmbH

Contact:
Email: manhemann@hespace.com
Web: www.hespace.com

Stand: B23

GomSpace
Stand: F80
HPS GmbH

High Performance Space Structure Systems GmbH ("HPS-DS"), Munich, was founded in the year 2000. In May 2018, HPS-DS, a subsidiary of HPS Group, was spun off as an independent group. HPS Group is 100% owned by HPS-DE. HPS Group is developing high end space technology and delivering flight hardware on equipment up to subsystem level across its business areas:

1. Antenna Subsystems
2. Large Deployable Reflector Subsystems
3. Deployable Drag-Dail Subsystems for Re-orbiting
4. Thermal Hardware
5. Composite & Metal Structures
6. MDOE Subsystems and Elements
7. New Materials and Processes
8. Engineering and Integration Services.

HPS Group is meanwhile onboard of 15 space missions (telecom, earth observation, science, exploration, launcher) and is aiming to grow up to 100 employees in the year 2020. UAP product areas are:

• Ka/Q/V-band Reflector antennas for high data rates (0.3m - 2.4m diameter)
• LDR sub-systems for Earth Observation and telecom (up to 15 diameter), incl. arm, reflector, HDRM, electronics
• Lightweight mobile deployable ground antennas for high data rates
• AER-D N-dop sail for nano-satellites, AER-D L dop sails for up to 1-ton-satellites
• Radiation protection components for electronic parts
• Electronic housings out of carbon composites.

Stand: C24
ICE - Italian Trade Agency

Contact: Giuliaelle Oliva
Email: info@ice.it
Web: www.ice.it

Stand: F02
Indian Space Research Organisation

Contact: Sumit Kumar
Email: sumit.kumar@isro.gov.in
Web: www.isro.gov.in

ISRO is the space agency of the Govt. of India headquartered in the city of Bangalore. Its vision is to "harness space technology for national development while pursuing science research and planetary exploration. Over the last four decades, Indian Space Program has made remarkable progress towards building the space infrastructure as the community resource to accelerate various developmental processes and harness the benefits of space applications for socio-economic development.

Stand: G02
Infostellar

Contact: Hazel Naylor
Email: info@infostellar.com
Web: www.infostellar.com

Infostellar is a satellite communications infrastructure provider developing a quick and flexible ground station network called StellarStation. Using StellarStation, satellite operators can easily and securely access ground stations around the world with no hassle, no upfront costs, and no need to worry about licenses. StellarStation also leverages a ground station sharing model to deliver cost effective access and tap into under-utilised ground station capacity. By lowering barriers to entry in the ground segment, Infostellar empowers startups to build better missions and improve the quality of their service.

Stand: E35
IABG MBH

Contact: Christian Henjes
Email: space@iabg.de
Web: www.iabg.de

IABG is closely interlinked with the space sector. In its national space centre IABG offers comprehensive environmental test campaigns, qualification tests, technical analyses as well as studies and consulting services in one stop. Handily any larger German or European aeronautics or space project in the last decades was implemented without IABG support. Experience of many years and the adaptability of its facilities make IABG an ideal partner for challenging product qualifications as well.

Overview of services:

- Mechanical tests (vibration, acoustic noise, mass property measurements, shock, modal)
- Space simulation tests (incl. bake-out and distortion measurements)
- Measurement, calibration and qualification of electro-optical systems
- Electromagnetic tests
- Infrastructure
- Engineering support
- Management consulting

For many years IABG has also operated the environmental test facilities in ESA’s ESTEC research centre together with a European partner. For this purpose the daughter company “European Test Services” (ETS) was created in the Netherlands. IABG’s test facilities and services were originally developed for space applications. Today, a number of other industries, such as the mechanical engineering, the electronic, automotive, medicine, defense or aviation industry benefit from IABG’s lead in product qualification.

Stand: G15
IAC2018 Media Booth
### Stand: C50
**ISEB International Space Education Board**

**Contact:**

**Email:** m-haas(at)ispace-inc.com  
**Web:** www.ispace-inc.com

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### Stand: F38
**i space S.A.**

**Contact:** Milos Haas  
**Email:** m-haas(at)ispace-inc.com  
**Web:** www.ispace-inc.com

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### Stand: A30
**Israel Aerospace Industries**

**Email:** corragm@iai.co.il  
**Web:** www.iai.co.il

Israel Aerospace Industries Ltd (IAI) is a large defense and aerospace company in Israel. It provides cutting edge technologies and solutions for Space, Air, Land, Sea and Cyber. IAI develops and manufactures advanced systems for the Israel Defense Forces and foreign customers worldwide. The company is active in both defense market and commercial market.

In space - IAI is the Israeli Space House, offering a One-Stop-Shop for satellites, ground systems, mission centers and launchers. IAI's satellite portfolio includes: observation satellites (optical - OPTSAT, EROS, OFOS series as well as Synthetic Aperture Radar - TECAR series); scientific/research satellites (such as Venus, Shalom, BSUASAT, Speeclon, moonlander,灵鸿); communication satellites (like the AMOS series) and a full range of space sub-systems - all with amazing capabilities and useful contribution for their users. IAI also offers the Shaot launcher, enabling launch of mid-size satellites to LEO orbits.

Recently, nonprofit Spacas; and IAI announced that the first Israeli lunar spacecraft set to be launched from Cape Canaveral on December 2018, and land on the moon on Feb. 15, 2019.

IAI provides comprehensive training solutions, including ground stations, mission centers and related services.

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### Stand: A35
**Israel Space Agency**

**Contact:** Mr. Leo Vinovezky  
**Email:** LeoVext@most.gov.il  
**Web:** http://www.space.gov.il/en

The Israel Space Agency, founded following a government decision in 1983, is a national agency operating under the auspices of the Ministry of Science and Technology. The Agency is responsible for initiating, leading and coordinating all activities of the civilian space program.

The Agency especially supports scientific research and development with real, economic potential such as the development of unique and innovative technologies. In addition, the Agency operates on the premise that all space related activities contribute to the Israeli economy, to the country’s international standing and also benefit its citizens in terms of agriculture, communications, monitoring of environmental pollution and research.

The Israel Space Agency’s goals are many and diverse. They include expanding cooperation and reciprocal relationships with various countries in the field of space, promoting infrastructure research studies in the academic sector and research institutes, investing in start-up developing components for the Israeli and international space industry, the development and construction of satellites for civilian purposes and supporting the development of unique and innovative technologies. The Agency also cultivates a cadre of future scientists, through space education and community projects, who will work in the field of space research in the future. In general, the Agency seeks to increase Israel’s relative lead in this field and position the country amongst the leading nations involved in space research and its exploitation.

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### Stand: C34
**Japan Aerospace Exploration Agency (JAXA)**

**Contact:** Ryosuke Yamaguchi  
**Email:** yamaguchi.ryosuke@jaxa.jp  
**Web:** global.jaxa.jp

The Japan Aerospace Exploration Agency (JAXA) is the Japanese national aerospace and space agency. JAXA is responsible for research, technology development and launch of satellites into orbit, and is involved in many more advanced missions such as astrodynamics and possible manned exploration of the Moon. Our corporate slogan is “Explorer to Realize”.

Our vision can be summarized in the following two points. First, it is to create a world where our research and development outcomes are fully utilized and take root in the society. Second, it is for JAXA to retain challenging research and development that opens up new horizons in the field of aerospace, so that JAXA will be the driving force aerospace research and development in Japan.

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### Stand: B45
**Jena-Optronik GmbH**

**Contact:** Dietmar Ratzsch  
**Email:** info@jena-optronik.de  
**Web:** www.jena-optronik.de

For decades now we’ve been making space missions possible: enterprises that are as spectacular as they are successful. Today we’re the global leader for attitude and orbit control sensors for satellites and optical instruments for Earth observation.

As vast as the universe is, there is no space for inaccuracy: sensors by Jena-Optronik keep satellites stable and reliable on track. Visionary technology in the finest sense of the word: our optic-e electronic components generate crucial data, helping to improve the quality of life on earth. Facing the future together: we’re proud to count the world’s leading space companies among our clients.

What challenges in space are you facing? We are happy to help you reach your goal. And to give you what we stood for the past years: space for success.

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### Stand: F38
**Kleos Space S.A.R.L.**

**Contact:** Katie Saffolk  
**Email:** office@kleos.space  
**Web:** www.kleos.space

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### Stand: A50
**Korea Aerospace Research Institute (KARI)**

**Contact:** Eui Chan Kim  
**Email:** eckim@kari.re.kr  
**Web:** www.kari.re.kr

The Korea Aerospace Research Institute (KARI) is a specialized organization for national aerospace development, which was established with the purpose of enhancing the national development. Despite its rather short history, KARI has been exerting its tireless efforts to develop world class aerospace technology and contributing to the improvement of national competitiveness and the quality of people’s lives.

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### Stand: F36
**Land Space Technology Co. LTD.**

**Contact:**  
**Email:** market@landspacetech.com  
**Web:** www.landspace.com

As an emerging aerospace company established in 2015, Land Space Technology Corporation Ltd. (LandSpace) is aiming to become an innovative commercial aerospace enterprise with global influence, to meet the boomingly increasing launch requirements from the small satellite industry.

LandSpace is devoted to the R&D of a family of low-cost commercial launch vehicles based on a series of LON+CM LEOs with its own independent intellectual property rights, providing the small satellite industry with one-stop and all-inclusive quality commercial launch service solutions, covering the mission design, launcher development /manufacture /AIT, launch site operation, TT&C support, and tailor-made insurance placement.

LandSpace is making continuous innovation in line with the industry requirements and the technology advancement, constructing a new transportation route for the small satellites into space.

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### Stand: B80
**Lockheed Martin**

**Contact:**  
**Email:** emil.pantea@eco.etat.lu  
**Web:** www.tradeandinvest.lu

Headquartered in Bethesda, Maryland, Lockheed Martin is a global security and aerospace company that employs approximately 100,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services.

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### Stand: F38
**Luxembourg- Ministry of the Economy**

**Contact:** Emil Pantoe  
**Email:** emil.pantoe@eco.etat.lu  
**Web:** www.tradeandinvest.lu
Stand: F38
Luxspace S.A.R.L.
Contact: Simone Moser
Email: info@luxspace.lu
Web: www.luxspace.lu

Stand: F38
Matchmaking at IAC 2018 by Enterprise Europe Network
Contact: Ellen Horstmann
Email: ellen.horstmann(at)wah.bremen.de
Web: ia2018.b2match.is/home
For IAC 2018, Bremen’s Enterprise Europe Network contact point at the Ministry of Economic Affairs has teamed up with the congress organizers to make this years’ edition of IAC Matchmaking happen! All exhibitors and attendees are invited to make use of this complementary service free of charge during the congress from Monday to Thursday.
Meet other participants in pre-scheduled one-on-one meetings, get in touch with providers of innovative technologies and other potential partners for future collaborations or find new partners for research and development projects!
Register now and get to know other participants already in advance on the interactive matchmaking platform: ia2018.b2match.is/home. Request and book bilateral meetings with relevant contacts and get your personal meeting agenda.
Meet & greet the respective contacts during the congress in the matchmaking zone in the exhibition hall, where everything will be arranged to conduct a pleasant meeting! Please register before 28 September, 2018!

Stand: D20
Mercedes-Benz Werk Bremen
Contact: Annette Abram
Email: annette.abram(at)daimler.com
Web: www.mercedes-benz.com
Tradition meets future: Mercedes-Benz passenger cars have been coming off the assembly lines at the Bremen plant for 40 years. What began with the S123 is now a success story for the North: With more than 12,500 employees, the Bremen plant is the largest private employer in the region. Ten models are currently being produced at the site: The sedan, the T-model, the coupe and the convertible of the C-Class, the coupe and convertible of the E-Class, the off-road vehicle GLC. As the lead plant, the Bremen plant controls worldwide production of the C-Class and the GLC. Vehicles “Made in Bremen” will cover the entire range of intelligent drives by the end of the decade – from classic combustion engines and plug-in hybrids to fuel cell and electric vehicles. In 2017, the plant received the Automotive Lean Production Award and the Industrial Excellence Award (Start-up category) for its series production of the T-model, the coupe and the convertible of the C-Class, the coupe and convertible of the E-Class, the off-road vehicle GLC, and the plug-in hybrid of the E-Class.

Stand: G22
MetaSensing BV
Contact: Simone Moser
Email: info(at)metasensing.com
Web: www.metasensing.com
MetaSensing is an Italian-Dutch company providing advanced radar technology, mainly focusing on advanced Synthetic Aperture Radar. MetaSensing provides airborne, space-borne and ground-based radar systems at several frequencies for high-resolution, all-weather, night and day mapping, monitoring and surveillance services with compact radar sensors, applying state-of-the-art Synthetic Aperture Radar (SAR) techniques.
MetaSensing develops advanced airborne SAR systems and provides airborne SAR services to ESA, NASA, Environment Canada, and for several commercial businesses.
MetaSensing Space offers its high-resolution satellite SAR payload at X-band featuring 15 cm slant range resolution for imaging, mapping and surveillance. The new space-borne SAR system is a X-band multi-modes high-resolution SAR sensor with multiple channels to offer various capabilities for imaging, surveillance and mapping target indicator. The MSS-X will be hosted on a small satellite platform weighing around 120 Kg and flying in a Low Earth Orbit (LEO).
The ground-segment section to process the SAR data is based on innovative heterogeneous computer and parallel processing making use of FPGA, CPU and cluster of GPUs for providing fast SAR images with the best existing SAR focusing algorithm, the Global Back Projection algorithm. MetaSensing has offices in The Netherlands, Italy and Singapore.

Stand: F20
Microchip Technology GmbH
Contact: Josh Milligan
Email: josh.milligan(at)microchip.com
Web: www.microchip.de
Microchip’s Committed Engagement to the Aerospace and Defense Industry:
For over 30 years, Microchip France Aerospace has been a leading provider of highly integrated solutions, serving a wide variety of aerospace applications, delivering leading-edge, highly integrated technology and solutions to the Aerospace Industry. Microchip is proud to continue delivering the same high-quality solutions and services which customers have come to expect from Almer’s flight heritage, and to expand this portfolio with radar tolerant and extended temperature devices.
Microchip uses the latest innovative commercial technologies such as 8-bit AVR® MCUs, Arm® and DOC®-based MCUs, adapting these to rad-hard, rad-tolerant and high-reliability application requirements in order to provide proven solutions to volumes and long-term reliability. With more than 20,000 flight models per year delivered in a wide range of aerospace and defense applications (space, aeronautics, military and harsh environments), our offering affords extended temperature, radiation tolerant or hardened devices issued from our widely deployed Microchip products portfolio to reduce your costs, to boost your time to market and to improve performances of your critical system.
Microchip offers long term supply commitment, full traceability, the most demanding qualification flows, and a rich ecosystem: reference hardware, software environment and transversal system solutions with a dedicated support team for Aerospace and Defense.

Stand: C40
Mohammed Bin Rashid Space Centre (MBRSC)
Contact: Ellen Horstmann
Email: ellen.horstmann(at)wah.bremen.de
Web: www.mbrspace.ae
MT Aerospace is an internationally leading company in the field of aerospace and defence as well as a global partner for antennas and mechatronics. We develop and produce essential subsystems for the European launch vehicle ARIREVE, the Ariane fleet as well as for spacecrafts and satellites. 700 employees are located in Augsburg and Mainz (Germany), Cagliari (Italy), Santiago de Chile and Kourou (French Guiana). With 45 years of heritage in major programs and continuous investments in research and development we are technology leader in lightweight structures and tanks using metal, composite and composite materials. World-class performance and minimum weight is assured by leading production technologies, including counter-roller flow forming, spin-forming, complex welding technologies and out-of-autoclave composite technologies.

Stand: D40
MT Aerospace AG
Contact: Josh Milligan
Email: josh.milligan(at)microchip.com
Web: www.microchip.de
Microchip’s Committed Engagement to the Aerospace and Defense Industry:
For over 30 years, Microchip France Aerospace has been a leading provider of highly integrated solutions, serving a wide variety of aerospace applications, delivering leading-edge, highly integrated technology and solutions to the Aerospace Industry. Microchip is proud to continue delivering the same high-quality solutions and services which customers have come to expect from Almer’s flight heritage, and to expand this portfolio with radar tolerant and extended temperature devices.
Microchip uses the latest innovative commercial technologies such as 8-bit AVR® MCUs, Arm® and DOC®-based MCUs, adapting these to rad-hard, rad-tolerant and high-reliability application requirements in order to provide proven solutions to volumes and long-term reliability. With more than 20,000 flight models per year delivered in a wide range of aerospace and defense applications (space, aeronautics, military and harsh environments), our offering affords extended temperature, radiation tolerant or hardened devices issued from our widely deployed Microchip products portfolio to reduce your costs, to boost your time to market and to improve performances of your critical system.
Microchip offers long term supply commitment, full traceability, the most demanding qualification flows, and a rich ecosystem: reference hardware, software environment and transversal system solutions with a dedicated support team for Aerospace and Defense.

Stand: B20
Nano Racks LLC
Email: info(at)nanoracks.com
Web: nanoracks.com
NanoRacks is the world’s first commercial space station company with an existing customer base. The company offers low-cost, high-quality solutions to the most pressing needs for satellite deployment, basic and educational research and both at home and in 30 nations worldwide for those new to the industry and aerospace veterans. Since 2009, Texas-based NanoRacks has truly created new markets and ushered in a new era in space services.
In July 2015, NanoRacks signed a teaming agreement with Blue Origin to offer integration services on their New Shepard space vehicle. NanoRacks, along with partners at LSA and Space Systems Loral was also selected by NASA to participate in the NextSTEP Phase II program to develop commercial habitation systems in low-Earth orbit and beyond.
As of July 2016, over 700 payloads have been launched to the International Space Station via NanoRacks services, and our customer base includes the European Space Agency (ESA) the German Space Agency (DLR), the American space agency (NASA), US Government Agencies, SpaceX, NanoRacks Space Systems, Space Florida, N2O3, Virgin Galactica, pharmaceutical companies, and organizations in Vietnam, UK, Romania and Israel.
69th International Astronautical Congress
1 - 5 October 2018, Bremen, Germany

Welcome to the 69th International Astronautical Congress, held in Bremen, Germany from 1st to 5th October 2018. This prestigious event brings together scientists, engineers, policymakers, and industry leaders from around the world to discuss the latest advancements in space exploration and technology. Attendees can expect a comprehensive programme featuring lectures, workshops, and exhibitions, along with networking opportunities to foster collaborations and innovations in the field of space.

The Congress programme includes sessions on various aspects of space exploration, such as Earth observation, human spaceflight, planetary science, and astrophysics. In addition, there are special focus sessions on emerging technologies, including solar power, small satellites, and robotics. The event is co-hosted by the German Aerospace Center (DLR) and the German Space Agency (DARA) and is organized by the International Astronautical Federation (IAF).

Visitors can also explore the exhibition area, which features the latest rockets, drones, and space-related technologies from leading companies and institutions. This is a unique opportunity to see the cutting-edge developments in the space industry and interact with representatives from leading organizations.

The Congress also includes social events and networking opportunities, providing a platform for participants to exchange ideas and forge new partnerships. Whether you are a seasoned professional in the space industry or a student, this event offers a valuable learning experience and a chance to connect with like-minded individuals.

Visit www.iac2018.de for more information and to register for the Congress.
Stand: C24
Planetek Italia SRL

Contact: Daniela Drimaco
Email: info@planetek.it
Web: www.planetek.it

Founded in 1994, Planetek is specialised in Geoinformatics, Space solutions & Earth science. We exploit the value of spatial data through all phases: acquisition, management, analysis & sharing. Links is attached.

Stand: G18
PDL Space

Contact: Francisco Garcia
Email: francisco.garcia@pdl.space
Web: www.pdl.space

PDL Space is a Spanish rocket company developing reusable and cost effective launch vehicles. Founded in 2011, based in Alcantar and with more than 50 employees, PDL Space is developing two different rockets: ARION 1 and ARION 2.

ARION 1, a suborbital sounding rocket, has been designed to provide flight opportunities to perform research and technology demonstration under microgravity conditions. Its maiden flight is set for Q3 2020 and it will also be used as the technology demonstrator of the next PDL rocket, ARION 2.

ARION 2, the European micro launcher, will be a reusable rocket capable of lifting 100 kg to 500 km SSD-incl. ARION 2, counting with 70% of the technology validated already on ARION 1, will have its maiden flight on Q3 2021.

Stand: C88
Polish Space Sector

Contact:
Email: zbigniew.burdzy@polsa.gov.pl
Email: michal.chwieduk@arp.pl
Email: biuro@space.biz.pl

The „Polish Space Sector” stand is organized by three entities:

Polish Space Agency (POLSA)

POLSA was established in 2014. The key tasks of the Agency include supporting the Polish space industry, promoting the development of satellite technologies and increasing Polish defence capabilities through the use of satellite systems. The Polish Space Agency is responsible for the arrangement and implementation of the National Space Programme. The programme aims at establishing a set of instruments to be used for supporting domestic space companies. www.polsa.gov.pl

Industrial Development Agency (IDA)

IDA supports Polish enterprises in performing and developing their business activities and plays a major role in increasing the competitiveness of the Polish industry. IDA is a government-owned company which since 2015 has been conducting dedicated support program for Polish space companies. IDA organises internship programmes, offers financial support mechanisms (Open Innovation Network Project) and is responsible for establishing ESA BIC in Poland. www.ida.pl

Polish Space Industry Association (SPACE PL)

SPACE PL was established in 2012. It consolidates the business community of almost 110 entities operating in the Polish space sector. Its fundamental mission is to boost and accelerate creation of Polish strong space industry, which will successfully compete on the European market. SPACE PL undertakes series of actions to support members and to consolidate of businesses, science and research environments, for e.g. it organises the Space Sector Forum. The association also cooperates with other clusters (from Poland and abroad) and associations. www.space.pl

Stand: H21
Portugal Looks Up

Portugal Looks Up is a joint undertaking for promotion of Aeronautics, Space, Defence and Security, and gathers the main institutional Portuguese stakeholders.

Our aim is twofold:
1. Promoting our cluster by supporting our members and participate in events and missions abroad.
2. Attracting foreign direct investments in these growing sectors in Portugal.

Portugal possesses talent, an English-speaking qualified workforce and an open and accessible market with an expanding economy. The country’s unique geographical location makes Portugal a gateway between continents.

Stand: D10
REXUS/BEXUS Programme

Contact:
Email: simon.mawn@zarm.uni-bremen.de

The Center of Applied Space Technology and Microgravity (ZARM) continues to stress to set new standards and to achieve a sustainable progress - in science and research, as well as in teaching. We are highly committed to the education of students and young scientists by offering the early opportunity to work on realistic and practical space projects. This is done through our involvement in several international study and outreach programmes. ZARM is especially honored to be a cooperating partner in the REXUS/BEXUS Programme.

The REXUS/BEXUS Programme allows students from universities and higher education colleges across Europe to carry out scientific and technological experiments on sounding rockets and balloons. Each year, two rockets and two balloons are launched from the Esrange Space Center in northern Sweden, carrying up to 20 experiments designed and built by student teams.

The REXUS/BEXUS Programme is realized under a bilateral Agreement between the German Aerospace Center (DLR) and the Swedish National Space Agency (SNSA) and conducted in collaboration with the Swedish Space Corporation (SSC), the Mobile Rocket Base (MORAB) of SBL, the European Space Agency (ESA) and ZARM.

Stand: A89
Romanian Space Agency

Contact:
Email: alexandra.dita@spacescience.ro
Web: www.rosa.ro

The Romanian Space Agency (ROSA) is the coordinator of Romania’s national and international space activities. The Romanian Space Agency (ROSA) is a public institution entirely self-funded, operating under Government Decision no. 923/20.11.1995 and the subsequent decisions of the Ministry of Education and Research – National Authority for Scientific Research and Innovation (A.N.C.S.I.). ROSA’s mission is to promote space development, to coordinate the national space research and applications programs, and, as a government representative, promote international co-operation. ROSA serves as a project integrator and developer with the overall objective to produce science space and technology, transfer results to the users and generate physical and human infrastructure capacity building. ROSA is authorized to develop specific project oriented research through its own centers.

ROSA is acting on behalf of the Romanian Government for: ESA, EU - Space & Security Research NATO – Science for Peace and Security and Space-related R&T issues. On the 20th of January 2011 Romania, represented by ROSA, signed its Accession Agreement to the ESA Convention, becoming the 39th ESA Member State.

ROSA is currently managing the national support program on Space Technology and Advanced Research (STAR). Under it, ROSA manages a set of Competence Centres, among which the Romanian nanoGaleilei Technology (ROST-CC).

Stand: E25
PT Scientists GmbH

Contact:
Email: pt.sci@pt-scientists.com

PTScientists is a German commercial space company that aims to land the first private mission on the Moon and develop reusable lunar infrastructures.

We believe that “Space belongs to everybody” and through our work we aim to reduce the cost of access to space and encourage more people around the world to get involved in exploration and space research. Our goal is to become the leading provider of lunar transport and communications infrastructure, enabling future missions at a lower cost.

We are working with Key Technology Partners Audi and Vodafone Germany on Mission to the Moon, our first lunar mission. We will send a pair of Audi lunar rovers to the lunar surface to capture the first high resolution images of Apollo 11’s original lunar rover vehicle, more than 45 years since it was left on the Moon.

During Mission to the Moon we will also be carrying out a technology demonstration with Vodafone for an innovative on-surface communications solution using 4G, as well as carrying out multiple scientific experiments with our payload partners.

PTScientists is based in Berlin and is a proud member of the global space community.
69th International Astronautical Congress 1 - 5 OCTOBER 2018, Bremen, Germany

Stand: F80  
**Rosenberger Hochfrequenztechnik GmbH & Co. KG**  
Contact: Fritz Hennemann  
Email: info@rosenberger.com  
Web: www.rosenberger.com  

Rosenberger, a worldwide leading manufacturer of RF and fiberoptic connectivity solutions, is a reliable supplier for aerospace and spaceflight industries. The company is qualified according AS9100 and ISO 9001 which is mandatory to become an aerospace supplier. Founded 1958, approx. 10,000 employees all over the world. www.rosenberger.com/aerospace

Stand: C10  
**RUAG Space**  
Together ahead. RUAG  
Contact: Nike Moehle  
Email: nike.moehle@ruag.com  
Web: www.ruag.com/space  

RUAG Space is the leading supplier to the space industry in Europe, with a growing presence in the United States. With more than 1,400 staff across six countries, it develops and manufactures products for satellites and launch vehicles - playing a key role both in the institutional and commercial space market. RUAG Space is a division of the international technology group RUAG. RUAG develops and markets internationally sought-after technology applications in the fields of aerospace and defense for use on land, in the air and in space. 56% of RUAG's products and services are destined for the civil market and 44% for the military market. The Group is headquartered in Bern (Switzerland). It has production sites in Switzerland and in 15 other countries in Europe, the United States and Asia-Pacific. RUAG generates sales of approximately CHF 1.36 billion and has over 9,200 employees.

Stand: F26  
**Safran Aircraft Engines**  
Contact: Xavier Cavelon  
Email: marine.michon@safrangroup.com  
Web: safran-aircraft-engines.com  

Safran Aircraft Engines designs, develops, produces and sells engines for commercial and military aircraft and satisfies. We also offer a complete range of support services to airlines, armed forces and other operators, including fleet management. Part of the international high tech group Safran, Aircraft Engines deploys design, development and production capabilities that are behind some of the world’s most innovative technology developments. Our extensive Research & Technology efforts help the aviation industry meet its ambitious environmental protection objectives, by developing aircraft engines that are increasingly quiet and economical.

Stand: B43  
**SATLANTIS Microsats SL**  
Contact: Eider Ocerin  
Email: ocerin@satlantis.com  
Web: www.satlantis.com  

SATLANTIS is a technology start-up that designs and builds payloads for small Earth observation satellites. The company development strategy is based on alliances with commercial microsatellite manufacturers to offer complete EO solutions. SATLANTIS core product is S3M, a very high resolution multi-spectral optical imager for Earth Observation micro-satellites, that provides the best mass and size to performance ratio, for a fraction of the cost of today’s Earth Observation instruments. This product is commercialized in two sizes for different micro satellite sub-segments. S3M-250, a very high-resolution imager for 50-250 kg micro satellites and at the origin of SATLANTIS Technology. S3M-50, a high resolution imager for 20-50 kg micro satellites. This product is tailored for the upper-size cubesat market segment (12U / 22 kg) both will be sold in two versions: RADMONIC, high spatial resolution panoramic, and PRECISION, very high resolution in paranchmonic and multispectral modes.

Stand: E75  
**SCISYS Deutschland GmbH**  
Contact: Christoph Wichmann  
Email: info@scisy.de  
Web: www.scisy.de  

SCISYS SPACE is a leading provider of integrated solutions and products for ground & on-board systems. Within the ground segment SCISYS SPACE is a reliable and experienced partner for monitoring & control, data processing, automation autonomous & intelligent systems, system modelling & simulations, infrastructures, data services and applications. PLEMETER® is our unique and highly integrated software suite for the planning, implementation and operation of complete satellite missions. It provides flexible and scalable solutions perfectly adjusted to the specific requirements of our customers. Therefore the PLEMETER® software suite is designed on a modular basis and can be adapted to meet the needs of different operations scenarios. For us, a long-standing partnership based on trustworthy collaboration with our customers holds the key to sustained success in the exciting and sophisticated space market. Our customers are satellite operators, system integrators, space agencies and major research organisations, as well as companies and organisations that are part of the international space industry.

Stand: H15  
**Sierra Nevada Corporation**  
Contact: Anna Kelley  
Email: anna.kelley@sncorp.com  
Web: sncorp.com  

Sierra Nevada Corporation (SNC) is a trusted leader in solving the world’s toughest challenges through advanced engineering technologies in Space Systems, Commercial Solutions, and National Security and Defense. Honored as one of the most innovative U.S. companies in space, SNC’s Space Systems business area designs and manufactures advanced spacecraft and satellite solutions, space habitats and environmental systems, propulsion systems, precision space mechanisms and subsystems, and SNC’s celebrated Dream Chaser® spacecraft. With 30 years of space heritage working with the U.S. government, commercial customers, and the international market, SNC has participated in more than 450 successful space missions and delivered 4,000+ systems, subsystems and components around the world. For more information, visit www.sncorp.com.

Stand: C32  
**SITAELE**  
Contact: Giovanni Tuccio  
Email: info@sitael.com  
Web: www.sitael.com  

SITAELE is the largest privately-owned Space Company in Italy and worldwide leader in the Small Satellites sector. With over 350 employees and state-of-the-art facilities, SITAELE covers a wide range of activities in development of small satellite platforms, advanced propulsion systems and on board avionics, providing turn-key solutions for Earth observation, telecom and science. Being one of the main players of the Space Economy, SITAELE is changing the way to conceive space products, both in the upstream and downstream segments, providing, thanks to its IoT capabilities, competitive smart services for a wide range of applications. SITAELE belongs to Angel Group, an Italian holding world leader in Railway, Aerospace and Aeronautics markets. For further information visit www.sitael.com.

Stand: F80  
**Smart Small Satellite Systems GmbH**  
Contact: sekretariat@r4-space.com  
Web: www.r4-space.com  

S4 provides professional advanced pico-satellite space product from complete satellite system solutions to advanced subsystems like ACS, miniature reaction wheels and OBCs for Cubesats.

Stand: A84  
**South African National Space Agency (SANSA)**  
Contact: Vaneeshree Maharaj  
Email: information@sansa.org.za  
Web: www.sansa.org.za  

The South African Space Industry is led by the South African National Space Agency (SANSA) which is an entity of the South African Department of Science and Technology. SANSA has a mandate to drive South Africa’s space industry and capability of the industry as well as provide knowledge, skill and innovation through the National Space Programme. The Agency manages the Earth observation, Space Operations, Space Science and Space Engineering programmes for the benefit of policy makers and citizens in the country. The Industry partners exhibiting at the South African Pavilion include CubeSpace/NewSpace, SCI Aerospace, CPIT F’Tel and Simers are also supported by the Department of Trade and Industry. These industry players offer a wide range of products and services to the local and international market, from component development and assembly/testing to applications from space data. They also provide support to academic programmes to ensure the skills development of future scientists and engineers for the space industry.
The "Werkstatt Bremen" municipal enterprise in Bremen is responsible for operating the Martinroth workshops for people with disabilities. 37 such workshops provide work for more than 1,280 people with serious mental, physical or multiple disabilities who cannot be employed on the first employment market. Support is provided by about 300 instructors, social workers, production planners and administration staff.

Werkstatt Bremen is both: a social services agency and a business enterprise - not just one or the other.

Our broad working spectrum

It is one of the biggest such agencies in Germany and distinguished by the fact that around 450 people with psychological disabilities are employed in the workshops, and that about 250 of its employees are assigned to external workshops in 14 Bremen companies.

Variety of products for Bremen and surrounding areas.

Martinroth is active both in Bremen and the surrounding areas. Contacts have also been established with the Netherlands, Ireland, Spain, Austria and Latvia in connection with funding assistance from the European Social Fund. The products made and services provided by the many different workshops are as highly varied as the people who work there. Martinroth was recently appointed official jam supplier to the Bremen state government, for example. Have you tried one of our delicious jams yet?

Stand: B44

Space Applications Services NV/SA

Email: hilde.stenuit@spaceapplications.com

Web: www.spaceapplications.com

Space Applications Services NV/SA is an independent Belgian company founded in 1987, with a subsidiary in Houston, United States. Staff of 90, and growing. Our aim is to research and develop innovative technology, solutions and services for the aerospace and security markets and related industries. Research and develop technologies for specific domains or subsystems which may be used stand alone or integrated within an overall system. Services to design, develop and process satellite hardware and technology payloads, mission critical systems, facilities and command and control centres. Services to operate facilities and command and control centres and to train persons to perform operations.

Stand: A64

Space Flight Laboratory (SFL)

Contact: Dr. Robert E. Zee

Email: zee@utias-sfl.net

Web: www.utias-sfl.net

The Space Flight Laboratory (SFL) builds smaller satellites for bigger return at low cost. SFL is Canada’s most prolific satellite builder and exporter of satellite internationally. Small satellites built by SFL consistently push the performance envelope of small satellites, and SFL is the only Canadian company to have 100% commercial success. SFL is an advanced engineering centre with a tradition of high volume and low unit cost capability. Satellites are built with advanced power systems, stringent attitude control and high volume data capacity that are striking relative to the budget. SFL arranges launches globally and maintains a mission control center accessing ground stations worldwide. SFL's mandate is to lower the entry barrier for organizations around the world to meet their needs in space while requiring modest investment. Commercial business models are sensitive to cost and SFL solutions allow businesses to close financial models for new satellite services. The pioneering and barrier breaking work of SFL is a key enabler to tomorrow's cost aggressive satellite constellations.

B41

Space Generation Advisory Council (SGAC)

Contact: Lauren Napier

Email: lauren.napier@spacegeneration.org

Web: www.spacegeneration.org

The Space Generation Advisory Council in Support of the United Nations Programme on Space Applications is a global non-governmental, non-profit (US 501 c 3) organization and network which aims to represent university students and young professionals from ages 18 - 35 to the United Nations, space agencies, industry, and academia. Headquartered in Vienna, Austria, the SGAC network of members, volunteers, and alumni has grown to more than 13,000 members representing more than 150 countries. SGAC is also a proud member and partner of IAF.

Stand: C86

Space Tech Europe

Space Tech Expo (Bremen, Germany, 19-21 November 2019) is Europe's premier B2B engineering & manufacturing trade fair for space business, technology and innovation.

Stand: B21

Spacety Co. LTD

Web: www.spacety.co
Syrlinks designs and manufactures high-end, cost effective radio-communication and geolocation subsystems for space, defense, and safety. Syrlinks’ products combine innovative technology and reliability to offer both advanced performances and easy integration.

COMPETENCIES
Syrlinks is the pioneer player of Radios based on qualified active COTS. Since ROSETTA and DEEP IMPACT missions, more than 60 spacecrafts have been equipped with Syrlinks cumulating 400 years in orbit, with 100% reliability. Expertise of Syrlinks team includes mastery of ESA CLASS 3 and CLASS 2 Standards (ECSS-Q-ST-60C design (equivalent to NASA Level II and NASA Level I).

PRODUCTS / SERVICES
Portfolio is one the largest on the market, offering radios for medium-sized satellite (up to 10 years life-time) to Nano/ Cube Satellites
- HighDataRate transmitters, transceivers (TT&C/SLR) in different frequency bands (L, S, X, K), and several quality levels (COTS to ESA CLASS 2 (similar to NASA Level I).
- GNSS SDR Receiver, based on multi-frequencies / multi-platform.

Stand: G19
Syrlinks
Contact: Stefano Gualandris
Email: stefano.gualandris@syrlinks.com
Web: www.syrlinks.com

Telespazio, a Leonardo and Thales 67/33 joint venture, is one of the world’s leading operators in satellite services. Its activities range from the design and development of ground systems to the management of launch services, from in-orbit satellite control to integrated communications, satellite navigation and localisation services, from Earth observation to scientific programmes. Telespazio plays a leading role in the reference markets harmonising technological experience acquired over the years. Since its establishment, the company has participated in major European space programmes such as Galileo, Copernicus and COSMO-SkyMed – be it through its headquarters in Italy or through its numerous subsidiary companies worldwide.

At the same time, Telespazio, together with its subsidiary company Telespazio VEGA Deutschland, has taken actions to become a first-choice supplier for the new commercial space industry. The modular and easy to select portfolio ranges from operations as a service, ground systems as a service, innovative global monitoring solutions, geospatial activity-based intelligence products, up to end-to-end suborbital spaceflight brokerage services to access microgravity.

Stand: E37
Tesat-Spacecom GmbH & Co. KG
Contact: Nina Backes
Email: info@tesat.de
Web: www.tesat.de

Tesat-Spacecom’s product range includes highly reliable devices such as traveling wave tube amplifiers, multiplexers, switches, modulators, as well as entire systems, payload, and optical terminals for data transmission via laser. For the latter Tesat-Spacecom is world leading in technology, feasibility and heritage with more than 12 GEO data relay laser terminals actually in orbit or currently in production. The laser portfolio further includes smaller terminals for LEO, direct-to-earth or Cube Satellites and we are ready for new applications like Quantum Key Distribution and so on.

Stand: C24
Techno Systems Development SRL
Contact: Francesco Monti
Email: fmonti@tsd-space.it
Web: www.tsd-space.it

Techno System developments is a private company specialized in design, development, manufacturing and testing of high performing on board and ground electronic equipment for space applications.

Stand: C24
Technosprings Italia SRL
Contact: Stefano Guslodrè
Email: info@technosprings.com
Web: www.technosprings.com

Technosprings Italia s.r.l. design and produces high quality springs, actuators and precision metallic components for any application, we are certified EN/AGS-ISO 9000, UNI-CEI ISO 14081:2012 (ISO 14081:2003), EN ISO 9001:2008, Nadcap for Heat Treatment. Logo is attached.

Stand: F85
Telespazio Vega Deutschland
Contact: Alexander Sokolowski
Email: info@telespazio-vega.de
Web: www.telespazio.de

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Web: www.telespazio.de

Tyvak, a Leonardo and Thales 67/33 joint venture, is one of the world’s leading operators in satellite services. Its activities range from the design and development of ground systems to the management of launch services, from in-orbit satellite control to integrated communications, satellite navigation and localisation services, from Earth observation to scientific programmes. Telespazio plays a leading role in the reference markets harmonising technological experience acquired over the years. Since its establishment, the company has participated in major European space programmes such as Galileo, Copernicus and COSMO-SkyMed – be it through its headquarters in Italy or through its numerous subsidiary companies worldwide.

At the same time, Telespazio, together with its subsidiary company Telespazio VEGA Deutschland, has taken actions to become a first-choice supplier for the new commercial space industry. The modular and easy to select portfolio ranges from operations as a service, ground systems as a service, innovative global monitoring solutions, geospatial activity-based intelligence products, up to end-to-end suborbital spaceflight brokerage services to access microgravity.
Dedicated to Science. Together

Bremen is an outstanding location for science. Here, the University of Bremen and eleven non-university research institutes financed in part by the Federal Government have formed the ‘U: Bremen Research Alliance’. The twelve members of the Alliance join forces to formulate mutual strategies, establish bridge and cooperation professorships among each other; and promote young researchers via graduate programs and junior research groups. At the heart of their collaboration are four high-profile areas, in which the members of the Alliance are particularly strong and active (Marine, Polar and Climate Research, Materials Sciences and Production Engineering, Health Sciences, Mind, Media Machines). The Alliance adds momentum to this bundling of complementary competences. The distinguishing features of our Alliance include excellent infrastructure and creative competence in providing solutions. We bundle our strengths working in flat hierarchies with short communication channels and nurturing a interdisciplinary culture that offers maximum freedom of scope.

We invite you to get to know us. You will find us in the Exhibition Hall at booth C 94.

Stand: C94
U: Bremen Research Alliance
Contact:
Derk H. Schönfeld
Email: derk.schoenfeld@vwe.uni-bremen.de
Web: www.uni-bremen.de/research-alliance

University of Bremen: Brand new Space Study Programs
Top-performing, diverse, reform-minded and singularly cooperative – that sums up the University of Bremen. Around 23,000 people learn, teach, research and work on its international campus. Their shared goal is to contribute to the advancement of society. With well over 100 degree programs, the University of Bremen offers a broad range of subjects. Several faculties also reflect the city’s key role as one of Europe’s leading space centers. The newly established, international and very hands-on master programs in Space Engineering and Space Sciences and Technologies are the University’s answer to the ever-rising demands of highly trained engineers and scientists in research institutes and space industry.

Also as one of Europe’s leading research universities, the University of Bremen maintains close cooperation with the non-university research institutions in the region. This spirit of cooperation led to the founding of the U: Bremen Research Alliance in 2010. The University’s competence and dynamism have also attracted numerous companies to settle in the technology park surrounding the campus. This has created an important national location for innovation – with the University of Bremen at its heart.

Stand: D90
Universität Bremen
Contact:
Kristine Logemann
Email: presse@uni-bremen.de
Web: www.uni-bremen.de

The United Nations Office for Outer Space Affairs (UNOOSA) works to bring the benefits of space to all humankind by being a capacity builder, a global facilitator, and the gateway to space in the United Nations. The Office is responsible for implementing the United Nations programme on the peaceful uses of outer space, and helps United Nations Member States, particularly developing countries, to use space science, technology and applications for sustainable development, as well as disaster recovery and risk reduction.

UNOOSA serves as the secretary for the United Nations General Assembly’s only committee dealing exclusively with international cooperation in the peaceful uses of outer space: the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and its Technical and Scientific and Legal Subcommittees. In addition, UNOOSA is the executive secretariat of the International Committee on Global Navigation Satellite Systems, and the permanent secretariat to the Space Mission Planning Advisory Group.

The Office is also responsible for implementing the Secretary General’s responsibilities under international space law and maintaining the United Nations Register of Objects Launched into Outer Space.

UNOOSA is located at the United Nations Office at Vienna, Austria, and has offices in Bonn, Germany, and Beijing, China.

Stand: G01
United Nations Office for Outer Space Affairs (UNOOSA)
Contact:
Marco Witzmann
Email: contact-us@valispace.com
Web: www.valispace.com

Valispace is an agile, browser-based engineering software to help you build better spacecraft on time and budget. Managing complexity with Excel spreadsheets and e-mails has reached its limit and it’s showing in cost and schedule overruns. Instead, Valispace digitizes your engineering process by providing a modern data storage and calculation software, which fits into your existing workflow (unified integrations to MS Office, SIMLAB, CAD, FEA, requirements software etc.). The software is easy to use and can be accessed by all team members from any web browser at any time. Valispace is used by companies such as ARUBIS and GOMSPACE and frees your engineers from spending time managing and syncing documents and gives them more time to innovate and create new projects.

Stand: G10
Valispace UG
Contact:
Marco Wittmann
Email: contact-us@valispace.com
Web: www.valispace.com

The Board of Directors may establish branches or other offices within and outside the state.

The law defined that the main head quarters of the Agency are to be in Abu Dhabi, and the Agency is to have a branch in Dubai. The Board of Directors may establish branches or other offices within and outside the state.

The main aims of the UAE Space Agency are:
- To organize, regulate and support the space sector in the country and to enhance its position in this area.
- To encourage the development and use of space science and technology in the country and advance within the industry.
- The establishment of international partnerships in the space sector and to enhance the role of the state and its position in the space sector.
- To contribute to the diversification of the national economy through the space sector.
- To raise awareness of the importance of the space technologies, enhance national capabilities and encourage peaceful application of space research.

Stand: H02
United Nations Office for Outer Space Affairs (UNOOSA)

The United Nations Office for Outer Space Affairs (UNOOSA) serves as the secretariat for the United Nations General Assembly’s only committee dealing exclusively with international cooperation in the peaceful uses of outer space: the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and its Technical and Scientific and Legal Subcommittees. In addition, UNOOSA is the executive secretariat of the International Committee on Global Navigation Satellite Systems, and the permanent secretariat to the Space Mission Planning Advisory Group.

The Office is also responsible for implementing the Secretary General’s responsibilities under international space law and maintaining the United Nations Register of Objects Launched into Outer Space.

UNOOSA is located at the United Nations Office at Vienna, Austria, and has offices in Bonn, Germany, and Beijing, China.

Stand: C44
UAE Space Agency
Contact:
Email: info@space.gov.ae
Web: www.space.gov.ae

The UAE Space Agency is a federal agency that was created under Federal Law by Decree No. 1 of 2014. The space sector includes all projects, activities and programs related to outer space.

The decree stipulates that the UAE Space Agency works in line with the Council of Ministers and has an independent legal personality, enjoys financial and administrative independence as well as the legal capacity necessary to direct all activities that will ensure the achievement of its objectives.

The law defined that the main head quarters of the Agency are to be in Abu Dhabi, and the Agency is to have a branch in Dubai. The Board of Directors may establish branches or other offices within and outside the state.

The main aims of the UAE Space Agency are:
- To organize, regulate and support the space sector in the country and to enhance its position in this area.
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- To contribute to the diversification of the national economy through the space sector.
- To raise awareness of the importance of the space technologies, enhance national capabilities and encourage peaceful application of space research.

Stand: C36
UK Pavilion - The British Interplanetary Society
Contact:
Web: www.bis-space.com

The British Interplanetary Society (the world’s oldest organisation dedicated to promoting spaceflight) presents a pavilion highlighting the United Kingdom’s Space industry. It features the UK Space Agency’s hospitality suite and meeting room and also exhibits from many British Space companies.

- Clyde Space: an award-winning company delivering quality innovations for CubeSats and SmallSats.
- Commercial Space Technologies: founded in 1983 CIT offer space launch brokering, earth imagery analysis and consulting services.
- Energise-ABL: leaders in lithium ion batteries for space applications.
- Seradata: the producers of the SpaceTrak, a web-based launch and satellite analytical system.
- Skyspace: developing the Skyspace X, commercial small launch system.
- The Science & Technology Facilities Council’s RAL Space department is the UK’s National Laboratory advancing the exploration of space and our environment for the benefit of all.

Stand: F80
Uni Würzburg, Informatik VII
Contact:
Email: schil@informatik.uni-wuerzburg.de
Web: www.informatik.uni-wuerzburg.de

Lehnstuhl Informatik VII (Robotic und Telematik)
Wittenstein SE develops customized products, systems and solutions for highly dynamic motion, maximum-precision positioning and smart networking for mechatronic drive technology.

**Stand: F80**

**Wittenstein SE**

**Email:** info@wittenstein.de  
**Web:** www.wittenstein.de

Wittenstein SE offers turnkey solutions for mechatronics and drives. Their core competences are design, development, manufacturing and testing of customer-tailored solutions adapted to very specific requirements. The focus is on mechatronics and mechatronic drive systems. Wittenstein SE is known for its innovative approach and dedication to excellence in the field of mechatronics.
Social Events, Technical Visits & Bremen Tours

**Film Night Ride**

**Date**: Wednesday 3 October 2018  
**Time**: 19:00-22:00  
**Location**: Bremen  
**Cost**: 5 €

This evening event is a “must-do” for all cycling enthusiasts and fans of short films. On the 3rd of October 2018 we invite you to a slightly different bike ride through space and time! The tour will bring you across the city to unusual places where brick walls, warehouses and buildings will turn into open air movie theatres. Approximately four stations will be approached and three to four short films on the fascinating topic of space exploration and travel will be presented.

**Please note:**  
You will need a bicycle to participate in the event. Bicycles can be rented at your own expense at the bike rental station near the central station. The “Film Night Ride” is an outdoor event and can get cancelled in case of bad weather. Participants will be notified and tickets reimbursed.

**'First Man' Movie**

**Date**: Wednesday 3 October 2018  
**Time**: 20:00  
**Location**: Cinema ‘CineSpace’  
**Cost**: *admission only with valid congress badge

Discover in preview the new film about Neil Armstrong’s life ‘First Man’ exclusively shown to the IAC 2018 participants in Bremen. The movie is directed by Chazelle from a script by Josh Singer, based on Hansen’s book “First Man: The Life of Neil A. Armstrong.” The film stars Ryan Gosling as Neil Armstrong and focuses on the years leading up to the Apollo 11 mission in 1969.

**Yuri’s Night@IAC2018**

**Date**: Thursday 4 October 2018  
**Time**: 20:00  
**Location**: Modernes  
**Cost**: 5 €

Ladies and gents, space-suit up for the “Yuri’s Night@IAC2018”! We invite you to a special evening dedicated to young professionals, students and everyone who feels young enough to rock the club. This event is all about having fun, enjoying chilled drinks and dancing, while meeting space professionals from the Bremen space sector and getting first-hand insider info on career opportunities in our City of Space. Celebrate the universe, yourself, Yuri’s Night and the world space week and make this event the biggest space party on Earth.

**Gala Dinner**

**Date**: Friday 5 October 2018  
**Time**: 18:30-22:00  
**Location**: Bremen Town Hall  
**Cost**: 130 €  
**Dress**: Formal Attire

On Friday evening we would like to welcome you to an UNESCO world heritage site: the more than 600-year-old Bremen Town Hall. The Gala Dinner will be a night of sophistication and elegance. Held in the historic “Obere Rathaushalle”, guests will enjoy fantastic food and wine and get a taste of what it was like hundreds of years ago when important political decisions were made in this time-honoured hall. This will be the last special event of the Congress and a night not to be missed.
Concert of the International Youth Symphony Orchestra

Date: Friday 5 October 2018
Time: 20:00-22:00
Location: Glocke
Cost: 15 €
Dress: Formal Attire

The International Youth Symphony Orchestra invites you to a classical concert with young musicians from different countries. Enjoy the concert with up to 190 musicians from 21 different countries and some members of the Youth Symphony Orchestra Bremen. Apart from works by Franz Liszt and Gustav Holst, you can look forward to the premiere of a work composed especially for this occasion.

Technical Visits

Airbus Defence & Space and ArianeGroup Young Professionals Tour

Date: Friday 5 October 2018
Time: 08:15-11:00
Location: Airbus Defence and Space / Ariane Group
Cost: 10 €

Get to know the space industry from the perspective of a Young Professional: During your tour of the Airbus Defence & Space and ArianeGroup facilities you will receive an exclusive insight into the current space programs. You will have the chance to have a look around the cleanroom, where the Spacelab, the Columbus space laboratory and all five ATVs were built. The Ariane 5 Vehicle Equipment Bays are currently being integrated here, as well as the service module for the new American spacecraft Orion. You also can see a 1:1 mock-up of parts of the of the ISS and the original GERMAN O2-Spacelab, that flew 8 times into space with the US Space Shuttle.

Center of Applied Space Technology and Microgravity (ZARM) Young Professionals Tour

Date: Wednesday 3 October 2018
Time: 09:15-12:00
Location: ZARM
Cost: 10 €

This tour is especially tailored for our next generation of space experts. Young Professionals from ZARM will guide you through the facility and provide behind-the-scenes information on their working fields.

The Center of Applied Space Technology and Microgravity (ZARM) is an internationally recognized research centre at the University of Bremen with multidisciplinary expertise in fluid mechanics, space technology and space science. The research at ZARM covers experimental, theoretical and computational approaches to fundamental scientific questions, as well as the development of technology for space missions and microgravity experiments (for example on the International Space Station). The main facility of ZARM is the Bremen Drop Tower. It offers the opportunity for short-term experiments under high-quality microgravity conditions and is the only laboratory of this kind in Europe.

German Aerospace Center (DLR) Young Professionals Tour

Date: Thursday 4 October 2018
Time: 09:15-12:00
Location: German Aerospace Center
Cost: 10 €

This tour is dedicated to all Young Professionals and students. Scientists of the DLR Institute of Space Systems will give exclusive insight into the current research topics and their objectives: Why do we want to grow tomatoes on the moon and Mars? How does a lander descend onto an asteroid or how do we monitor ships from space? In addition, you will have the opportunity to visit a selection of laboratories and test facilities, including the Concurrent Engineering Facility of DLR within the Young Professionals tour, where you will have the chance to play through a concurrent engineering system analysis scenario based on an example mission.
OHB System AG Young Professionals Tour

Date: Tuesday 2 October 2018
Time: 09:15-12:00
Location: OHB System AG
Cost: 10 €

OHB System AG is one of the three leading space companies in Europe. It belongs to the listed high-tech group OHB SE, where more than 2,000 specialists and executives work on key European space programs. With two strong sites in Bremen and Oberpfaffenhofen and more than three decades of experience, OHB System specializes in high-tech solutions for space, science and industry.

Our Young Professionals are looking forward to inducting you into the exciting company structure of an aspiring enterprise.

Airbus Defence & Space and ArianeGroup Tour

Date: Tuesday 2 October 2018
Time: 09:15-12:00
Thursday 4 October 2018
Location: Airbus Defence and Space / Ariane Group
Cost: 10 €

During your tour of the Airbus and Ariane Group facilities you will receive exclusive insight into the current space programmes. You will have the chance to have a look around the cleanroom, where the Spacelab, the Columbus space laboratory and fife ATV had been built. The Ariane 5 Vehicle Equipment Bays are currently being integrated here, as well as the service module for the new American spacecraft Orion. You also can see a 1:1 mock-up of parts of the ISS and the original GERMAN D2 Spacelab, that flew eight times into space with the US Space Shuttle.

Alfred Wegener Institute (AWI) Tour

Date: Tuesday 2 October 2018
Time: 09:15-12:00
Location: AWI
Cost: 20 €

As an internationally respected centre for polar and marine research, the AWI is one of the very few scientific institutes in the world that are equally active in the Arctic and Antarctic. There the scientists explore nearly all aspects of the Earth system in order to get a better understanding of climate related processes and phenomena.

The tour will focus on the topic of polar snow – from remote sensing to microscale: Polar snow is a fascinatingly complex and fast evolving porous medium. It covers several millions of square kilometres of the Earth’s surface. In this guided tour through our ice laboratories you will have the opportunity to get in touch with our snow and ice research, visit the world unique X-ray Ice-tomograph and might get a better idea of how the real snow pack in polar regions can look like.

Beck’s Brewery Tour

Date: Tuesday 2 October 2018
Time: 15:15-18:00
Location: Becks Brewery
Cost: 20 €

Beck’s is one of Germany’s most popular beers and the green bottles are famous all over the world. But did you know that Bremen is the hometown of Beck’s? During the guided tour visitors can discover where and how Beck’s is brewed. The tour takes you through the museum, the raw materials area and the brew house. You will also pass the malt silos, the fermentation and storage tanks and a guide will introduce you to the art of brewing and the history of Beck’s. After the tour participants are invited to a beer tasting where different beers from the Beck’s product range are served - soft drinks will also be available.

Center for Industrial Mathematics (ZeTeM) Tour

Date: Thursday 4 October 2018
Time: 13:15-14:45
Location: ZeTeM
Cost: 10 €

The guided tour introduces all participants to our fascinating research that aims at gaining a deeper understanding of our human cognitive abilities, such as our ability to orientate in complex environments and navigate in space. Learn more about our methodological approaches and experiments and find out how these results can be applied to spaceflight projects in order to enable spacecraft to achieve long-term autonomy in space. Localization, planning, determination of optimal flight paths and fusion of sensory information are only some of the crucial aspects that play a pivotal role in current research projects that will be presented during the tour.
Center for Marine Environmental Sciences (MARUM) Tour

Date: Thursday 4 October 2018
Time: 09:15-11:00 / 13:45-15:45
Location: MARUM
Cost: 10 €

MARUM uses modern methods to decipher the role of the oceans in the Earth system. It captures the interactions between geological and biological processes in the ocean and contributes to the sustainable use of the oceans.

Come with us on a journey down to the bottom of the sea and discover the secrets of the deep sea. In our deep-sea cinema you can see videos taken by our diving robot at several thousand meters of water depth. On a tour through MARUM, we will then go into the engineering workshops with deep-sea technologies such as the MeBo seabed drill or the MARUM-Quest diving robot. Only the use of these underwater technologies enables research work at MARUM.

In addition, we will also show you the Bremen core repository of the International Ocean Discovery Program (IODP), in which samples from the seabed are stored. Selected samples will be used to explain how scientists obtain information from the seabed – for example, to reconstruct the climate of bygone times.

Center of Applied Space Technology and Microgravity (ZARM) Tour

Date: Tuesday 2 October 2018
Time: 09:15-11:15 / 13:45-15:45
Date: Wednesday 3 October 2018
Time: 13:45-15:45
Date: Thursday 4 October 2018
Time: 09:15-11:00 / 13:45-15:45
Date: Thursday 4 October 2018
Time: 09:15-11:00 / 13:45-15:45
Location: ZARM
Cost: 10 €

The Center of Applied Space Technology and Microgravity (ZARM) is an internationally recognized research centre with multidisciplinary expertise in fluid mechanics, space technology and space science. The research at ZARM covers experimental, theoretical and computational approaches to fundamental scientific questions, as well as the development of technology for space missions and microgravity experiments (for example on the International Space Station). The main facility of ZARM is the Bremen Drop Tower. It offers the opportunity for short-term experiments under high-quality microgravity conditions and is the only laboratory of this kind in Europe.

German Research Center for Artificial Intelligence (DFKI) Tour

Date: Tuesday 2 October 2018
Time: 13:45-15:30
Location: DFKI
Cost: 10 €

The Robotics Innovation Center (RIC) is part of the Bremen location of the German Research Center for Artificial Intelligence (DFKI). This is where scientists develop mobile robotic systems for complex tasks, which are used on shore, at sea, in the air and in space. The RIC cooperates closely with the Robotics Group at the University of Bremen.

The tour takes visitors to the DFKI’s 288 m² space exploration hall, where the use of intelligent robots for exploring foreign planets is being tested.

German Aerospace Center (DLR) Tour

Date: Tuesday 2 October 2018
Time: 09:15-12:00
Location: German Aerospace Center
Cost: 10 €

During your tour of the DLR Institute of Space Systems you will receive exclusive insight into the current research topics and their objectives: Why do we want to grow tomatoes on the moon and Mars? How does a lander descend onto an asteroid or how do we monitor ships from space? In addition, you will have the opportunity to visit a selection of laboratories and test facilities.

Institute of Environmental Physics (IUP) Tour

Date: Tuesday 2 October 2018
Time: 13:15-16:00
Location: IUP, University of Bremen
Cost: 10 €

Research activities of the IUP aim at understanding the mechanisms controlling the Earth System (atmosphere, ocean, soil, cryosphere and their interfaces) and its response to change by using methods of physics. Measurements are conducted from satellites, aircrafts, ground stations and ships. The guided tour will include a visit to the labs and to the observational dome on top of the building, which hosts a station of the network for greenhouse gas measurements TCCON.
Mercedes-Benz Tour

Date: Tuesday 2 October 2018
Time: 13:30-16:30
Location: Mercedes-Benz
Cost: 20 €

Bremen is home to the world’s largest Mercedes production facility. The guided tour of the Mercedes-Benz plant reveals how these prestigious vehicles are made and what makes the brand so special. It provides an opportunity to look behind the scenes at one of the most modern automotive factories in the world and witness the genesis of the SL, SLC, C-Class, E-Class Coupé and the all-terrain GLC.

OHB System AG Tour

Date: Thursday 4 October 2018
Time: 13:15-16:00
Location: Mercedes-Benz
Cost: 20 €

The system specialist OHB System AG is one of the leading independent forces in European space. Embedded into the listed high-tech group OHB SE, we have been making a name for ourselves on the market with our creative and business approach for 35 years now, particularly in our core business comprising low-orbiting and geostationary satellites. We develop and execute some of the key projects of our times such as the Galileo navigation satellites, the SARah reconnaissance system, the MTG meteorological satellites, the EnMAP environment satellite, the TET-1 technology testing vehicle and the HispaSat, ELECTRA and EDRS-C telecommunications satellites.

Bremen Tours

Artists in Spaces – Exclusive Guided Tour

Date: Thursday 4 October 2018
Time: 12:30-14:30 / 15:30-17:30
Date: Friday 5 October 2018
Time: 12:30-14:30 / 15:30-17:30
Location: Ateliers in the “Viertel”
Cost: 15 €

The exclusive guided tour takes you to the hidden hot spots of Bremen’s creative scene. Local guides will introduce you to artists, their studios and creative work ranging from photography, to ceramics, paintings and the design of jewellery. Further, participants will learn interesting facts about the history and architecture of Bremen’s district called “Vierelt” which is famous for its cosmopolitan flair, arts, quirky shops and diverse, offbeat nightlife. Experience the city like a local would and get insights into the authentic Bremen way of life.

Beer Dinner

Date: Wednesday 3 October 2018
Time: 18:00-21:30
Location: Alexander von Humboldt
Cost: 72 €

Striking green sails and a cold beer - the story of the Alexander von Humboldt and the history of Bremen beers are inseparably linked. Enjoy a 3-course meal in a rustic atmosphere with a beer accompaniment. Look forward to a convivial evening on the sailing ship and learn many amusing facts on the subject of beer.

Bremerhaven Tour

Date: Wednesday 3 October 2018
Time: 09:30-16:30
Location: Bremerhaven
Cost: 59 €

Discover the maritime charm of the port town of Bremerhaven and enjoy the invigorating effects of the fresh sea air. First on your itinerary is a stop at the Schaufenster Fischereihafen, literally the window into the fishing port. In this traditional harbour you explore a seafront promenade lined with historical ships, fish smoke-houses, restaurants and inviting taverns. Afterwards, you can either go for a stroll along the Weser dyke or visit in any order you choose the German Maritime Museum, the German Emigration Centre, the Klimahaus or Bremerhaven’s seaside zoo. Before returning to Bremen, you are given a tour of the old and new harbours by coach. Along the way our tour guide shows you the longest riverside quay in Europe, the Columbus train station serving the cruise ships, and the container observation tower, which offers views across the entire port. Maritime charm and ocean liners ahoy!
Ess-Klasse - Cooking Event (3-course meal)

Date: Tuesday 02 October 2018
Time: 18:30 - 22:30
Location: EssKlasse Bremen
Cost: 70 €

Enjoy great team work and learn how to prepare some typical German dishes!

Prepare a 3-course menu under the supervision of a professional chef. Thanks to years of experience in international luxury hotels the owner of EssKlasse, Guido Albrecht, has a great sense of creativity and is accustomed to leading groups of multiple people. After a short introduction you will be divided into small groups and the chefs will help you to prepare the diverse menu.

Nightwatchman

Date: Tuesday 02 October 2018
Thursday, 04 October 2018
Time: 18:30-20:30
Location: City Center
Cost: 12.50 €

An entertaining journey back to the Bremen of a bygone era. While the good people of Bremen are sleeping, the nightwatchman does his rounds: follow him on his tour of the old quarter by night. But watch out! Make sure you stay close to your group, or you could find yourself suspected of a crime or fall victim to dangers that are unheard of nowadays. This walk by lantern light is presented in an enjoyable and enlightening way and takes you back to long-forgotten times. And when you return to the present day at the end of the tour, not only will you have transgressed the boundaries of time, you’ll also be well versed in the ancient stories of the city.

Craft beer brewery “Union”

Date: Sunday 30 September 2018
Time: 17:00-19:00
Date: Tuesday 02 October 2018
Time: 17:00-19:00
Location: Union Brauerei Bremen
Cost: 39 €

Find out everything on the subject of beer and the BREMEN craft beers in a personal and transparent craft beer brewery. The BREMEN Craft beers are 100% produced and bottled in Bremen. In a walk around the brewery you will be lead through the brewer malt camp, the broth house, the camp cellar and the filling. You will get to see and learn about the production and have a taste of the variety of our handmade craft beers.

Wine & chocolate

Date: Sunday 30 September 2018
Time: 15:00-18:30
Date: Thursday, 04 October 2018
Time: 15:00-18:30
Location: Bremer Ratskeller
Cost: 40 €

A combination that will make your heart melt. Discover the extensive vault of the Bremer Ratskeller and get to taste a selection of five of the finest wines combined with selected chocolate. Get to know many exciting details about German wine and let our guide give you expert tips on how to combine different wines and food.
#MYIAC2018

Be part in our competition by uploading your own IAC 2018 Highlights video on Facebook using the hashtag #MYIAC2018

Dear IAF Community,

During this #IAC2018 in Bremen you will have the chance to tell us your IAC, who did you meet? which events did you like the most? What was your IAC2018 experience like? Using the Hashtag #MYIAC2018 publish on Facebook your IAC 2018 Highlight video of max 3 minutes on Thursday 4th at 1pm (13h) Bremen time (CET). The most liked video by Friday 5th at 1pm (13h) Bremen time (CET) will be shown during the #IAC2018 Closing Ceremony.

Good luck!

Show us your week at the IAC 2018 in Bremen!

Connecting @all Space People


The International Astronautical Federation (IAF) together with the Centre Royal De Télédétection Spatiale (CRTS) and with the support of the Centre National D’Études Spatiales (CNES) are very proud to officially invite you to the Global Conference on Space for Emerging Countries (GLEC2019) to be held in Marrakech, Morocco from 24 to 26 April 2019.

Being the first Conference of its kind, GLEC2019 aims at actively engaging emerging countries in the global space sector by highlighting the socio-economic benefits of space applications; by understanding the various financial models for the optimal resourcing of national space programmes; by identifying opportunities for technology and skills transfer; by creating awareness about the base infrastructure requirements needed for operationalizing national space programmes and by creating awareness on the essential legislative and policy elements that must be considered in establishing the foundation for national space programmes.

High-level Keynotes and Round Tables focusing on:
- Benefits of Space Technology and Applications to Socio-Economic Development,
- Financial Models and Resourcing,
- Technology and Skills Development,
- Base Infrastructure Requirements,
- Space Industry Development and Support,
- Legal and Policy.

For more information:
Website: www.glec2019.org
E-mail: glec2019@iafastro.org

Be part of the conversation @iafastro and #GLEC2019

IPC Co-Chairs:
- Driss El Hadani
  Director General, Centre Royal de Télédétection Spatiale (CRTS), Morocco
- Jean-Pascal Le Franc
  Director of Planning, International Relations & Quality, Centre National d’Études Spatiales (CNES), France
- Valanathan Munsami
  VP: Developing Countries and Emerging Countries, IAF, Chief Executive Officer (CEO), South African National Space Agency (SANSA), South Africa
Join Us!

The International Astronautical Federation (IAF) is creating a space-faring world cooperating for the benefit of humanity.

All associations, professional societies, research and development institutes, space agencies or offices, space industries, space museums and universities are invited to join the Federation to make the world a better place.

By becoming an IAF Member, your organization will also gain a worldwide visibility and will have access to a global networking of potential business partners, experts and decision-makers, among many other benefits.

Visit www.iafastro.org/membership/ and contact us at info@iafastro.org to find out how to join the IAF movement!
Are you an IAF Member?
Are you in an IAF Committee?

If yes, as each year, the IAF is pleased to invite you to its Spring Meetings taking place in Paris, France where the IAF community will get together for three days, from 26 – 28 March 2019.

Contact us on info@iafastro.org to find out more.

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pradels@aerospace-valley.com

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