

#INVOLVINGEVERYONE



69TH INTERNATIONAL
ASTRONAUTICAL CONGRESS
BREMEN 2018

1 - 5 OCTOBER 2018 | GERMANY



GENERAL
PROGRAMME

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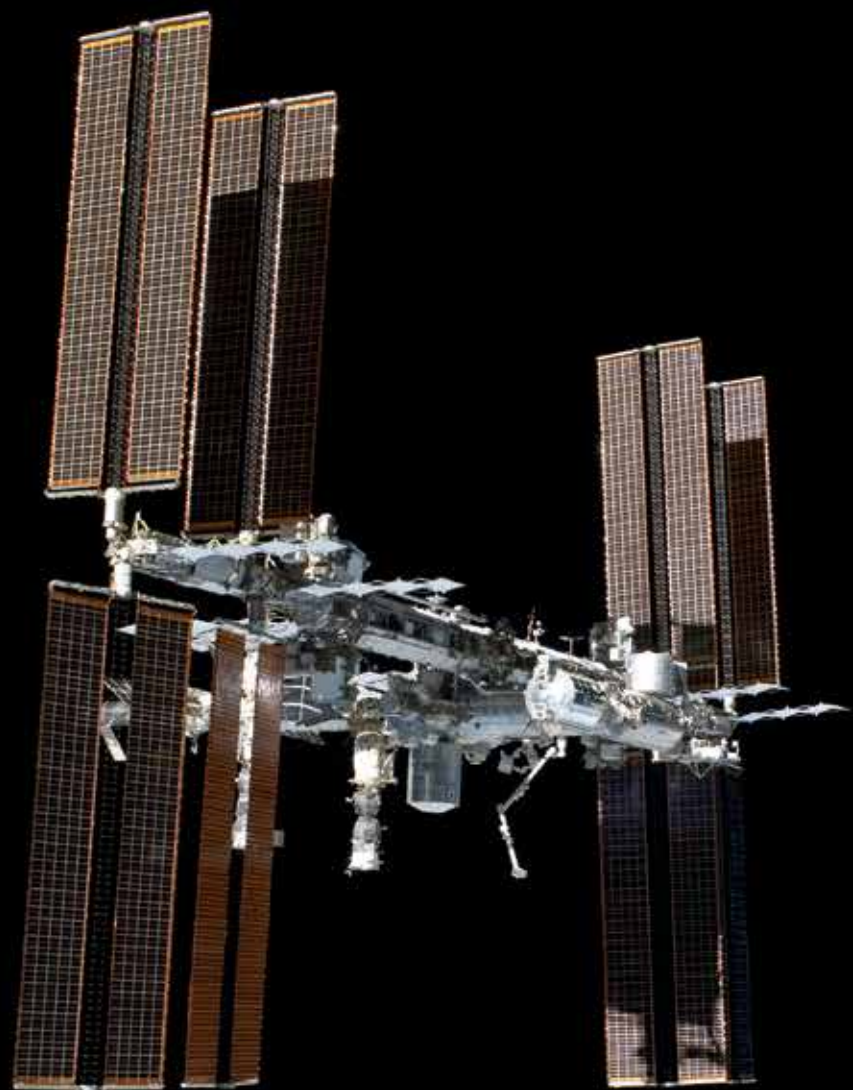


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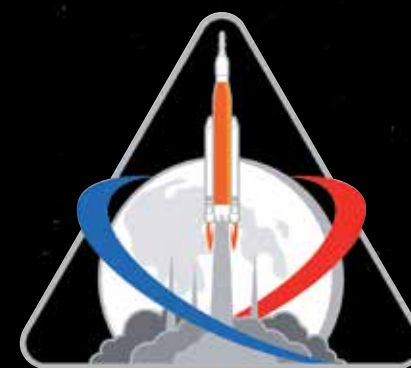


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CITY OF SPACE

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YOU TO THE IAC 2018!**



69TH INTERNATIONAL
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BREMEN 1-5 OCT 2018



EXPLORATION MISSION-1

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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 (3Is4D), 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)/MLA 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 to this day 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.

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IAF Member Organizations 2018

A9C Capital	Bahrain	Association of Space Explorers (ASE)	United States
Access e.V.	Germany	Associazione Italiana di Aeronautica e Astronautica (AIDAA)	Italy
Advanced Instrumentation and Technology Centre (AITC)	Australia	Astronautic Technology SDN BHD	Malaysia
Aerojet Rocketdyne	United States	Astronautical Society of India	India
Aerospace Research Institute	Iran	Astrosat Ltd	United Kingdom
Aexa Aerospace LLC	United States	ASTROSCALE Pte. LTD.	Singapore, Republic of
Agence Spatiale Algérienne (ASAL)	Algeria	ATUCOM - Tunisian Association for Communication and Space Sciences	Tunisia
Agencia Espacial Mexicana (AEM)	Mexico	Auspace Pty Ltd	Australia
Agrupacion Astronautica Espanola	Spain	Austrian Research Promotion Agency	Austria
Airbus Defence and Space GmbH	Germany	AUSTROSPACE	Austria
Airbus Defence and Space Netherlands B.V.	The Netherlands	Axiom Space LLC	United States
Airbus Defence and Space SA	Spain	Bauman Moscow State Technical University	Russian Federation
Airbus Defence and Space SAS	France	Beihang University	China
Airbus Ltd.	United Kingdom	Beijing Sunwise Space Technology Ltd.	China
American Astronautical Society (AAS)	United States	Belgian Federal Science Policy Office (BELSPO)	Belgium
American Institute of Aeronautics and Astronautics (AIAA)	United States	beSpace GmbH	Germany
Andøya Space Center	Norway	Blue Origin LLC	United States
ArianeGroup SAS	France	Brazilian Space Agency (AEB)	Brazil
Arianespace	France	Bryce Space and Technology	United States
Asher Space Research Institute (ASRI)	Israel	Bulgarian Aerospace Agency	Bulgaria
Association Aéronautique & Astronautique de France (3AF)	France	California Polytechnic State University	United States
Association Dedicated to Development in Astronautics (A.D.D.A)	Romania	Canadian Aeronautics & Space Institute (CASI)	Canada
Association of Arab Remote Sensing Centers (AARSC)	Libya	Canadian Space Agency (CSA)	Canada

Canadian Space Commerce Association (CSCA)	Canada	Eurockot Launch Services GmbH	Germany
Canadian Space Society	Canada	Euroconsult	France
Center for Innovation in Aerospace Technology (CINAE)	Spain	European Conference for Aero-Space Sciences (EUCASS)	Belgium
Center for Planetary Science and Exploration, Western University	Canada	European Space Agency (ESA)	France
Center of Space Exploration, Ministry of Education (COSE)	China	European Space Policy Institute (ESPI)	Austria
Central American Association for Aeronautics and Space (ACAE)	Costa Rica	European Test Services (ETS) B.V.	The Netherlands
Central Research Institute for Machine Building (FGUP TSNIMASH)	Russian Federation	Eurospace	France
Centre for Mechanical and Aerospace Science and Technologies (C-MAST)	Portugal	Faculty of Aviation and Space Sciences, Necmettin Erbakan University	Turkey
Centre National de la Cartographie et de la Télédétection (CNCT)	Tunisia	Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST)	United States
Centre National d'Études Spatiales (CNES)	France	Finnish Astronautical Society	Finland
Centre Royal de Télédétection Spatiale	Morocco	Flinders University	Australia
Centro de Investigacion y Difusion Aeronautico Espacial (CIDA-E)	Uruguay	Friedrich-Schiller-Universität Jena	Germany
China Head Aerospace Technology Co.	China	Future Space Leaders Foundation	United States
Chinese Society of Astronautics (CSA)	China	G.A.U.S.S. Srl	Italy
CIRA Italian Aerospace Research Centre	Italy	General Organization of Remote Sensing (GORS)	Syria
Comision Nacional de Actividades Espaciales (CONAE)	Argentina	Geo-Informatics and Space Technology Development Agency (GISTDA)	Thailand
Commission d'Astronautique de l'Académie Roumaine	Romania	Georgia Institute of Technology, School of Aerospace Engineering	United States
Cosmoexport Aerospace Research Agency	Russian Federation	German Aerospace Industries Association (BDLI)	Germany
Croatian Astronautical and Rocket Federation (HARS)	Croatia	GIFAS	France
CSIRO Astronomy & Space Science	Australia	GKN Aerospace Engine Systems	Sweden
CSL (Centre Spatial de Liège)	Belgium	Global Student Commercial Space Society (GSCSS)	United States
Curtin University	Australia	GMV Aerospace & Defence SAU	Spain
CVA (Community of Ariane Cities)	France	GMV Insyen AG	Germany
Cyprus Astronautical Society	Cyprus	GomSpace Aps	Denmark
Cyprus Space Exploration Organisation (CSEO)	Cyprus	Graz University of Technology (TU Graz)	Austria
Czech Space Alliance	Czech Republic	Gumush Aerospace & Defense	Turkey
Czech Space Office	Czech Republic	HE Space	Germany
Danish Aerospace Company ApS	Denmark	Hermann-Oberth-Raumfahrt Museum e.V.	Germany
Danish Astronautical Society	Denmark	Hungarian Astronautical Society (MANT)	Hungary
Dassault Aviation	France	IABG Industrieanlagen - Betriebsgesellschaft mbH	Germany
Deimos Space S.L.	Spain	IHI Aerospace Co, Ltd.	Japan
Delft University of Technology	The Netherlands	Incomspace	Mexico
Denel Spaceteq	South Africa	Indian Space Research Organization (ISRO)	India
Department of Space Studies, University of North Dakota	United States	Indonesian National Institute of Aeronautics and Space (LAPAN)	Indonesia
Desà Engineering srl	Italy	Institut Français d'Histoire de l'Espace	France
Deutsche Gesellschaft für Luft- und Raumfahrt, Lilienthal-Oberth e.V. (DGLR)	Germany	Institut Supérieur de l'Aéronautique et de l'Espace (ISAE)	France
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)	Germany	Institute of Space Technology (IST)	Pakistan
Dnipropetrovsk National University	Ukraine	Instituto de Aeronáutica e Espaço (IAE)	Brazil
Dniprotekhservice, SPF, LLC	Ukraine	Instituto de Geofísica, Universidad Nacional Autónoma de México	Mexico
DTU Space	Denmark	Instituto Geográfico Agustín Codazzi (IGAC)	Colombia
Ecolé Polytechnique Fédérale de Lausanne (EPFL)	Switzerland	Instituto Nacional de Pesquisas Espaciais (INPE)	Brazil
Ecuadorian Civilian Space Agency (EXA)	Ecuador	Instituto Nacional de Técnica Aeroespacial (INTA)	Spain
Embry Riddle Aeronautical University	United States	Instituto Tecnológico de Costa Rica (TEC)	Costa Rica
EMXYS (Embedded Instruments and Systems S.L)	Spain	Intelligent Materials and Systems Lab, University of Tartu	Estonia
Engineers Australia	Australia	International Association for the Advancement of Space Safety	The Netherlands
Enterprise Estonia	Estonia	International Institute of Space Commerce	Isle of Man
EOS Data Analytics Inc.	United States	International Lunar Observatory Association	United States
EUMETSAT	Germany	International Space Center - Space Park Israel Ashkelon	Israel
EURISY	France	International Space University (ISU)	France
Euro Space Center	Belgium	Internationaler Förderkreis für Raumfahrt – Hermann Oberth – Wernher von Braun e.V.	Germany

Intersputnik International Organization of Space Communications	Russian Federation	Netherlands Space Office (NSO)	The Netherlands
Invap S.E.	Argentina	Netherlands Space Society (NVR)	The Netherlands
Iranian Space Agency	Iran	New Zealand Space Agency	New Zealand
ispace, inc	Japan	NGC Aerospace Ltd.	Canada
Israel Aerospace Industries. Ltd.	Israel	Nigerian Meteorological Agency	Nigeria
Israel Space Agency	Israel	Norsk Astronautisk Forening	Norway
Istanbul Technical University	Turkey	Norwegian Space Centre	Norway
Italian Space Agency (ASI)	Italy	Novespace	France
Japan Aerospace Exploration Agency (JAXA)	Japan	Office National d'Etudes et de Recherches Aérospatiales (ONERA)	France
Japan Manned Space Systems Corporation (JAMSS)	Japan	OHB Italia SpA	Italy
Japan Society for Aeronautics and Space Sciences (JSASS)	Japan	OHB System AG - Munich	Germany
Japanese Rocket Society	Japan	OHB System AG-Bremen	Germany
Joanneum Research	Austria	Orbital Access Ltd	UK
JSC Glavkosmos	Russian Federation	Pakistan Space and Upper Atmosphere Research Commission	Pakistan
JSC NPO Energomash	Russian Federation	Peoples's Friendship University of Russia	Russian Federation
JSC SRC Progress	Russian Federation	PISC "Elmiz"	Ukraine
KBRwyle	United States	Planet Labs Germany GmbH	Germany
Kenya National Space Secretariat	Kenya	Polish Academy of Sciences	Poland
Khrunichev State Research & Production Space Center	Russian Federation	Polish Astronautical Society	Poland
King Abdulaziz City for Science & Technology (KACST)	Saudi Arabia	Politecnico di Milano	Italy
Kongsberg Satellite Services AS	Norway	Politecnico di Torino	Italy
Korea Aerospace Industries, Ltd	Korea, Republic of	PRATIEN LLC	Puerto Rico
Korea Aerospace Research Institute (KARI)	Korea, Republic of	Proespaço-The Portuguese Association of Space Industries	Portugal
Korea Association for Space Technology Promotion (KASP)	Korea, Republic of	Project Management Institute	United States
Korea Astronomy and Space Science Institute	Korea, Republic of	Purple Mountain Observatory (PMO)	China
Kyiv Polytechnic Institute (NTUU "KPI")	Ukraine	PwC Advisory	France
Kyushu Institute of Technology	Japan	QinetiQ Space nv	Belgium
Lavochkin Science and Production Association	Russian Federation	Rafael Advanced Defense Systems Ltd.	Israel
Law Offices of Sterns and Tennen	United States	Ramirez de Arellano y Abogados, S.C. Law Firm	Mexico
Lithuanian Space Association (LSA)	Lithuania	RHEATECH LTD	UK
Lockheed Martin Corporation	United States	RMIT University, Australia	Australia
Max-Planck-Institute for Ornithology	Germany	Rocket Research Institute, Inc.	United States
Mc Gill Institute for Aerospace Engineering (MIAE)	Canada	Romanian Space Agency (ROSA)	Romania
MDA Corporation	Canada	ROSCOSMOS	Russian Federation
Microcosm, Inc.	United States	Rovsing A/S	Denmark
Mitsubishi Electric Corporation	Japan	RUAG Space	Sweden
Mitsubishi Heavy Industries, Ltd.	Japan	Russian Academy of Sciences	Russian Federation
Mohammed Bin Rashid Space Centre (MBRSC)	United Arab Emirates	S.P. Korolev Rocket and Space Corporation Energia	Russian Federation
Moscow Aviation Institute	Russian Federation	Safran Aircraft Engines	France
MT Aerospace AG	Germany	Samara State Aerospace University (SSAU)	Russian Federation
MX Space A.C.	Mexico	Sapienza University of Rome	Italy
National Aeronautics and Space Administration (NASA)	United States	Satrec Initiative	Korea, Republic of
National Aerospace Agency (NASA) of Azerbaijan Republic	Azerbaijan	Secure World Foundation	United States
National Institute of Information and Communications Technology (NICT)	Japan	SEMECCEL Cité de l'Espace	France
National Oceanic and Atmospheric Administration (NOAA)	United States	SENER Ingeniería y Sistemas, S.A.	Spain
National Space Agency of Malaysia (ANGKASA)	Malaysia	Sergio Arboleda University	Colombia
National Space Centre	Ireland	SES	Luxemburg
National Space Research and Development Agency (NASRDA)	Nigeria	Shaanxi Engineering Laboratory for Microsatellites	China
NEC Corporation	Japan	Shamakhy Astrophysical Observatory	Azerbaijan
Neptec Design Group	Canada	Shoal Engineering Pty Ltd	Australia
Netherlands Aerospace Centre (NLR)	The Netherlands	Sierra Nevada Corporation	United States

SIMEON Technologies	France	The British Interplanetary Society	United Kingdom
Singapore Space and Technology Association (SSTA)	Singapore	The Chinese Aeronautical and Astronautical Society located in Taipei	Taiwan, China
Sirius XM Radio	United States	The Federal University of Technology, Akure (FUTA)	Nigeria
Sitael Spa	Italy	The Fisher Institute for Air and Space Strategic Studies	Israel
Sky and Space Global (UK) Ltd	United Kingdom	The Johns Hopkins University Applied Physics Laboratory	United States
SODERN	France	The Korean Society for Aeronautical and Space Sciences	Korea, Republic of
Solar MEMS Technologies S.L.	Spain	The National Aerospace Educational Centre of Youth	Ukraine
Soletop Co., Ltd	Korea	The Ohio State University College of Engineering	United States
South African National Space Agency (SANSA)	South Africa	The Planetary Society	United States
South African Space Association (SASA)	South Africa	The Sergei Korolev Space Museum	Ukraine
Space Canada Corporation	Canada	The University of Sydney	Australia
Space Center Houston	United States	TNO	The Netherlands
Space Commercial Services Holdings (Pty) Ltd	South Africa	TÜBITAK	Turkey
Space Cooperative Inc.	United States	Turkish Aerospace Industries	Turkey
Space Coordination Office, Department of Industry & Science	Australia	U.S. Geological Survey	United States
Space Environment Research Centre Limited	Australia	UAE Space Agency	United Arab Emirates
Space Foundation	United States	UK Space Agency	United Kingdom
Space Generation Advisory Council (SGAC)	Austria	United Rocket and Space Corporation	Russian Federation
Space Industry Association of Australia	Australia	Universiti Teknologi Mara (UITM)	Malaysia
Space Policy Institute, George Washington University	United States	University of Adelaide	Australia
Space Systems/Loral	United States	University of Alabama in Huntsville	United States
Space Tech Expo - Smarter Shows Ltd	United Kingdom	University of Colorado, Colorado Center for Astrodynamics Research	United States
Space Trust	United Kingdom	University of Naples "Federico II"	Italy
SpaceLand Africa	Mauritius	University of South Australia	Australia
SpaceNed	The Netherlands	University of the Western Cape	South Africa
Spacety	China	University of Vigo	Spain
SpaceX	United States	University POLITEHNICA of Bucharest - Research Center for Aeronautics and Space	Romania
SSC	Sweden	University Wuerzburg	Germany
Starsem	France	UNSW Australia	Australia
State Enterprise Production Association Kyivpnylad	Ukraine	Victorian Space Science Education Centre	Australia
State Space Agency of Ukraine (SSAU)	Ukraine	Vieira de Almeida & Associados	Portugal
Stellenbosch University	South Africa	Vietnam National Space Center (VNSC)	Vietnam
STM (Savunma Teknolojileri Muhendislik ve Ticaret A.S.)	Turkey	Virgin Galactic L.L.C	United States
Surrey Satellite Technology Ltd (SSTL)	United Kingdom	Viterbi School of Engineering	United States
Swedish Society for Aeronautics and Astronautics	Sweden	VITO nv	Belgium
Swiss Space Office (SSO)	Switzerland	von Karman Institute for Fluid Dynamics	Belgium
SwissSpace Association	Switzerland	WFB - Wirtschaftsförderung Bremen	Germany
Tallinn University of Technology	Estonia	Wildcard Mavericks Ltd	United Kingdom
TAMSAT - The Society of Amateur Satellite Technologies of Turkey	Turkey	Women in Aerospace Europe (WIA-E)	The Netherlands
Tartu Observatory	Estonia	World Space Week Association	United States
Techno System Developments S.R.L.	Italy	Xovian Research & Technologies Pvt. Ltd	India
Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences	China	Youth Network for Reform, Inc (YONER - LIBERIA)	Liberia
Teledyne Brown Engineering	United States	Yuzhnoye State Design Office	Ukraine
Telespazio S.p.A.	Italy	ZARM Fab GmbH	Germany
Telespazio VEGA UK LTD	United Kingdom	Zero2infinity	Spain
Tesat-Spacecom GmbH & Co. KG	Germany		
Thales Alenia Space France	France		
Thales Alenia Space Italia	Italy		
The Aerospace Corporation	United States		
The Boeing Company	United States		

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Chinese Society of Astronautics
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Science and Technology
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China



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2016 Young Space Leader,
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Isabella Marchisio, Projects Manager
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Giulia Angeletti, Secretary/Accountant
Michel Arnaud, IPC Co-Chairs Advisor (Volunteer)
Elena Feichtinger, Projects Manager and Special
Advisor (Volunteer)
Martin Feichtinger, Intern

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 sponsors 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.



The International Academy of Astronautics held its 4th IAA Conference on University Satellite Missions and CubeSat Workshop from 4 to 7 December 2017 in Roma, Italy. During this forum, high level speakers have presented scientific and technical Papers on the Microsatellites related field, sharing their knowledge on the several aspects of the small satellite missions and the CubeSats community

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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.

International Institute of Space Law

E: info@iislweb.org

W: www.iislweb.org

Facebook: <https://www.facebook.com/spacelaw>

Twitter: 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 stewards 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 % European Space Policy Institute
Schwarzenbergplatz 6
A-1030 Vienna, Austria

E: info@spacegeneration.org
W: www.spacegeneration.org
Facebook: @spacegeneration
Twitter: @SGAC



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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

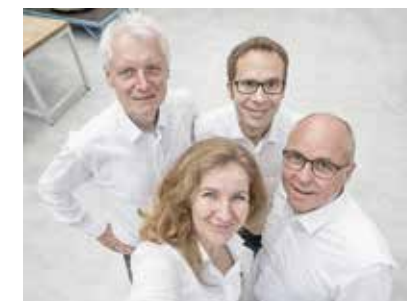
For the IAC 2018 Local Organizing Committee (LOC), ZARM has built a team of four professionals from different backgrounds to provide a broad expertise for organizing this challenging event:

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.



Claus Lämmerzahl, Marc Avila, Peter von Kampen and Birgit Kinkeldey (clockwise from the left)

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!



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

Contact the Local Organizing Team

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



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.



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.



Vanessa Roofing

Ask me about: Registration

Phone: +49 421 3505-9328

Email: vanessa.roofing@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 "Bürgerpark" and take break from the daily conference routine.



Alena Lange

Ask me about: Exhibition

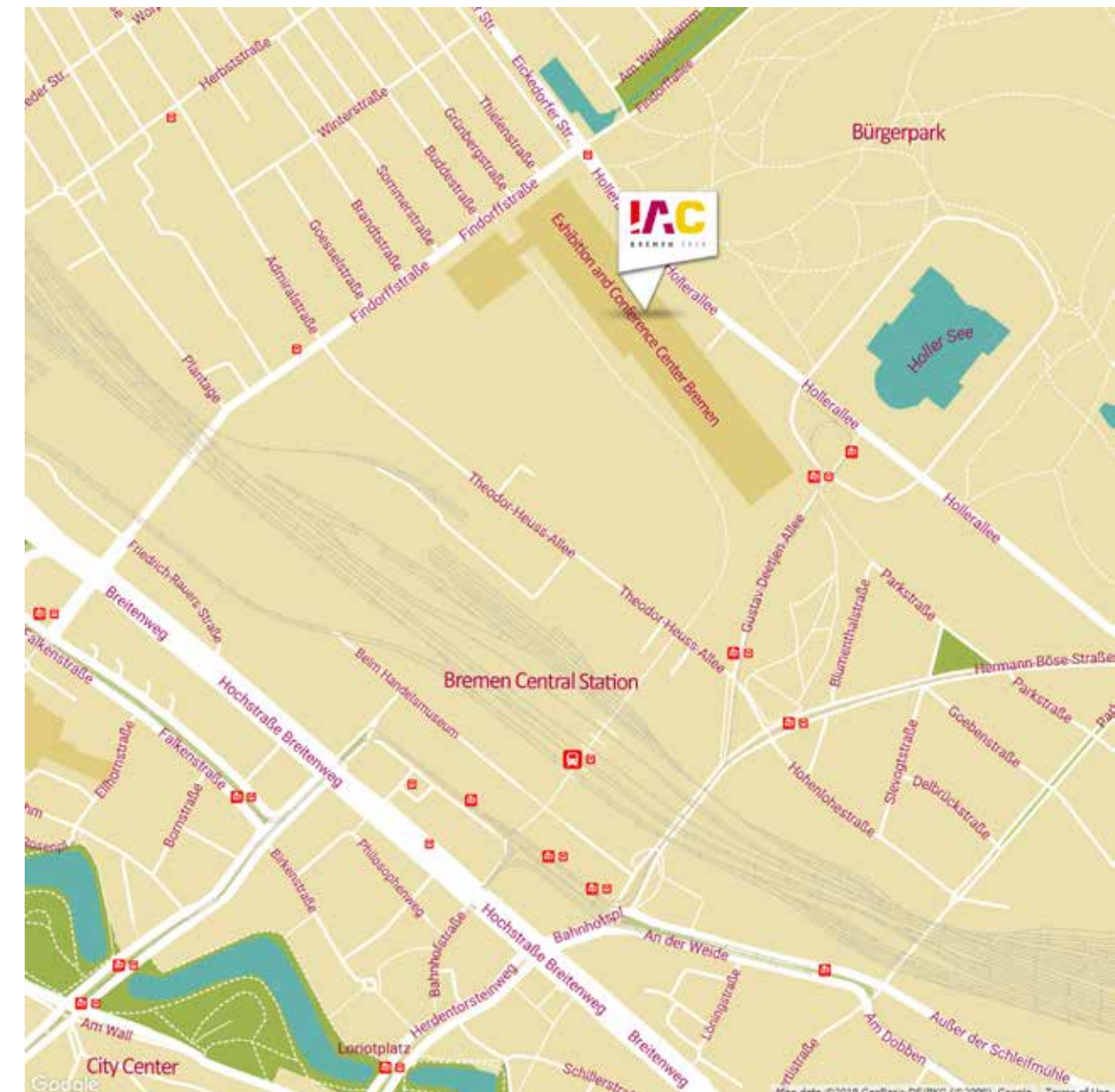
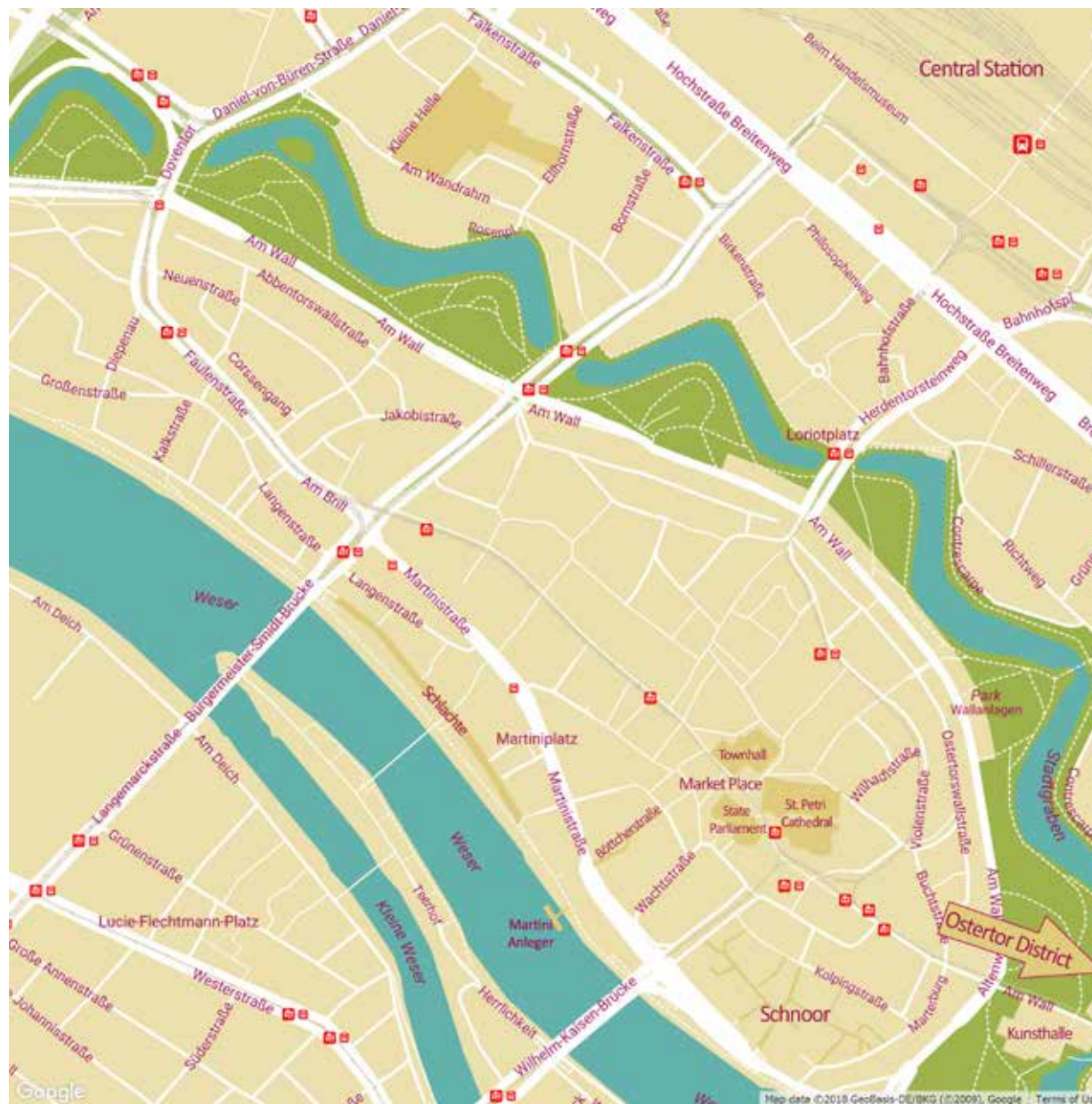
Phone: +49 421 3505-9325

Email: alena.lange@zarm.uni-bremen.de

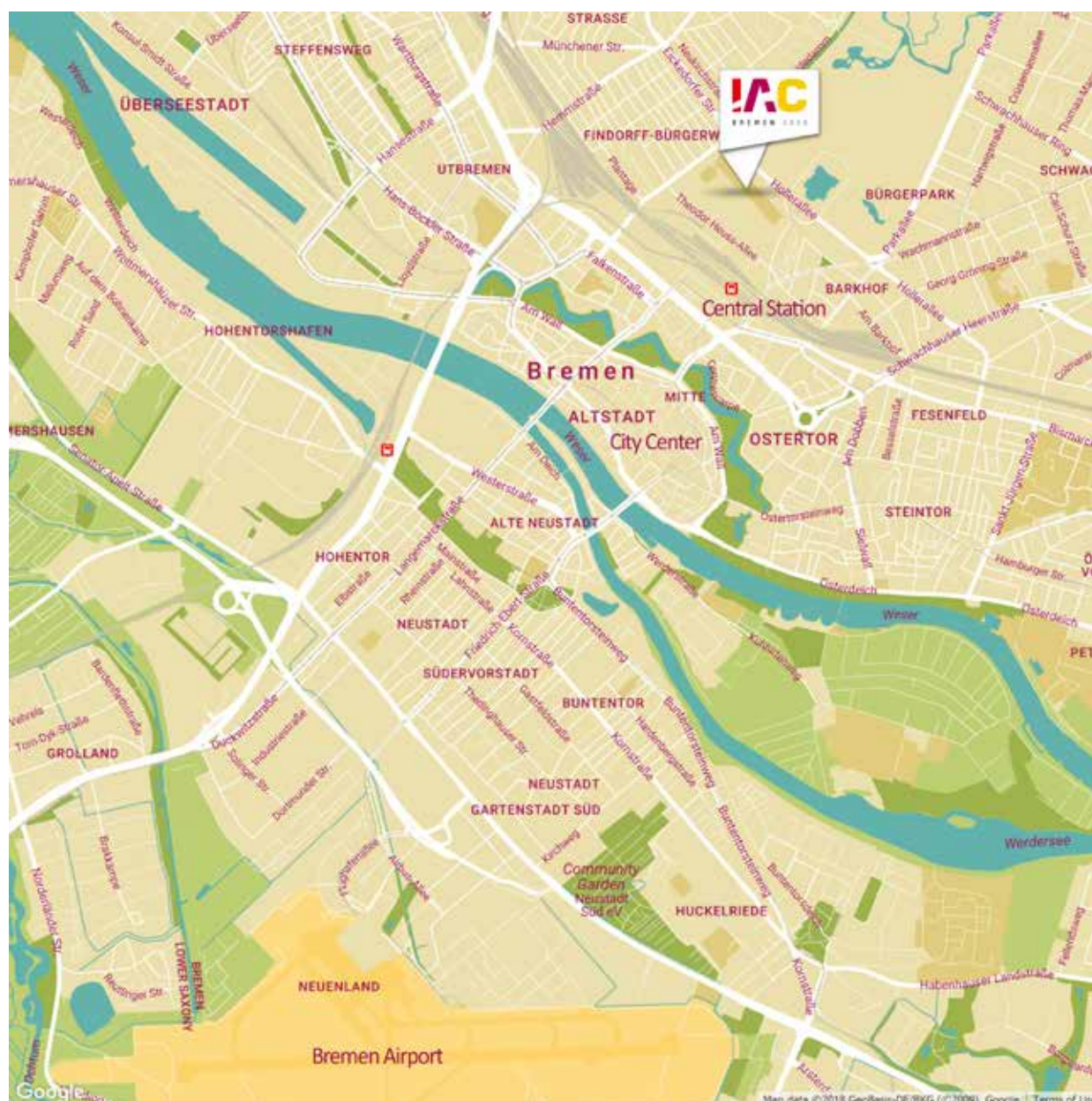
You can easily blend in by saying "Moin!" which means hello, good morning, good afternoon, good evening.

3 Practical Information

3.1 City Map



3.2 Airport & Ground Transportation



Travel Information for your Arrival

Arrival from the Airport Bremen:

Travel between the Airport Bremen and the Bremen Exhibition & Conference Center is straight forward. 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/2Hq6nv7>). 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://en.vbn.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 1806 – 666666 (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
Bahnhofplatz 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:

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

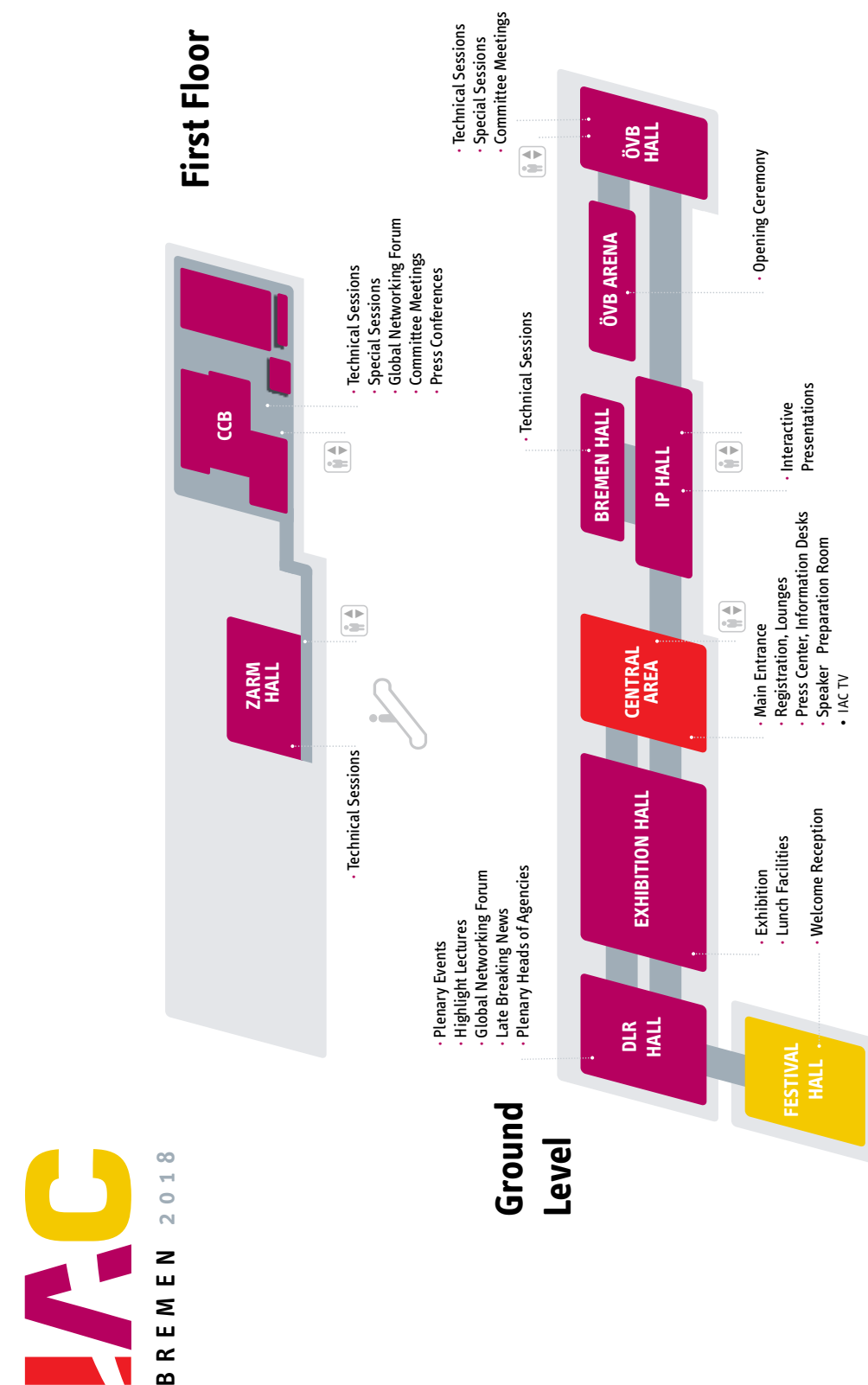
Registration Categories:

- **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 recognized 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>.
- **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



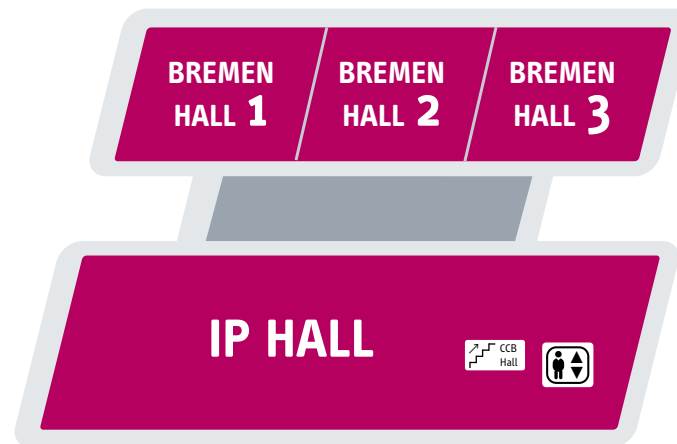


Bremen Hall

Technical Sessions

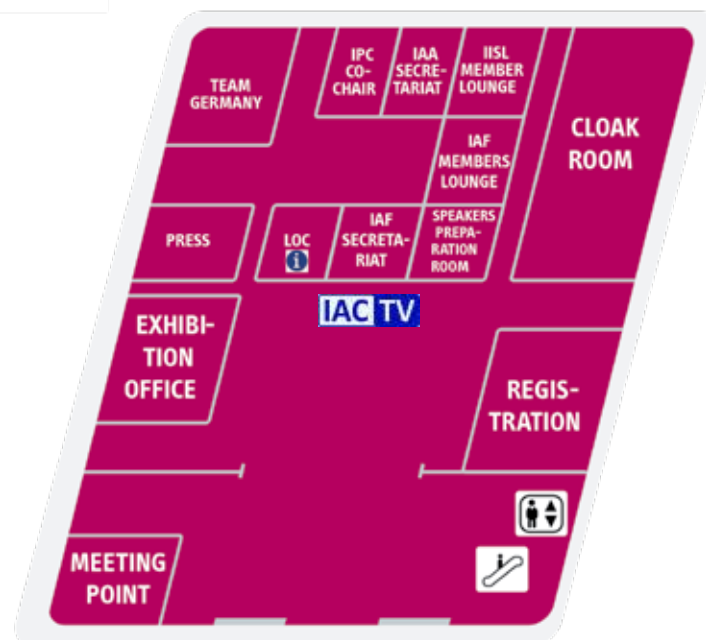
IP Hall

Interactive Presentations



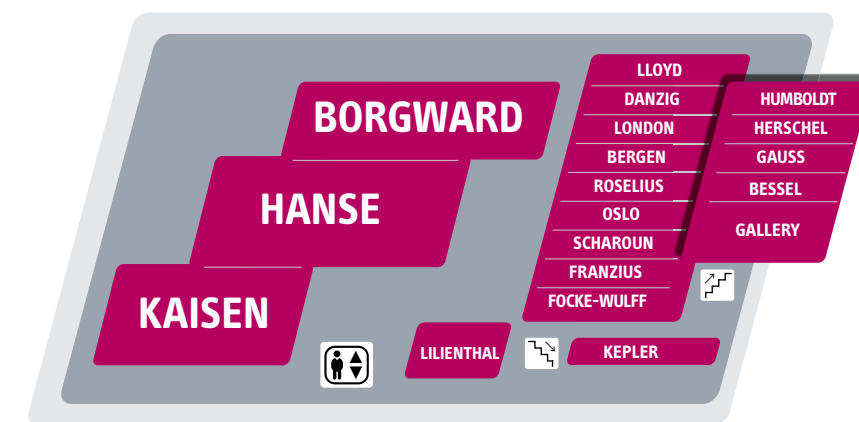
Central Area

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



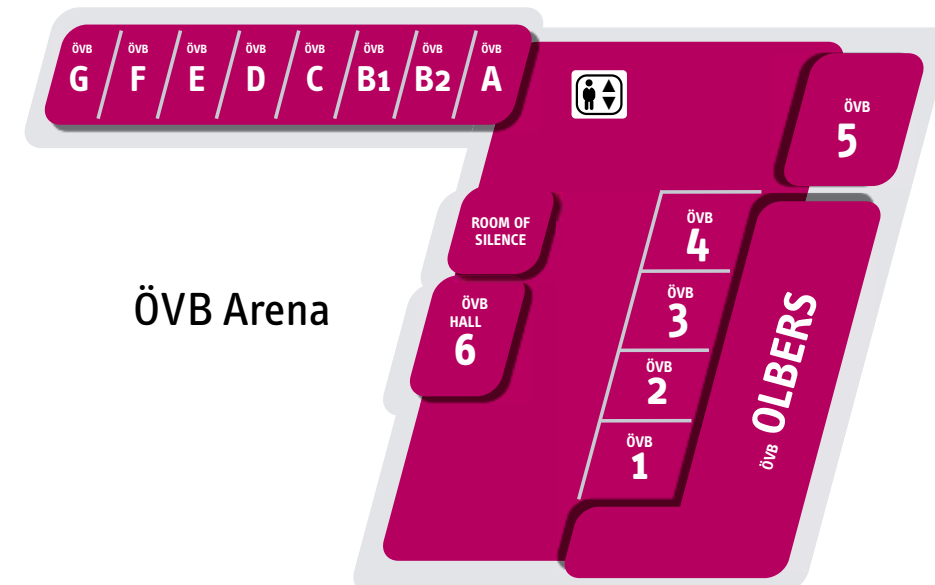
CCB Hall

Technical Sessions, Special Sessions,
Global Networking Forum,
Committee Meetings, Press Conferences



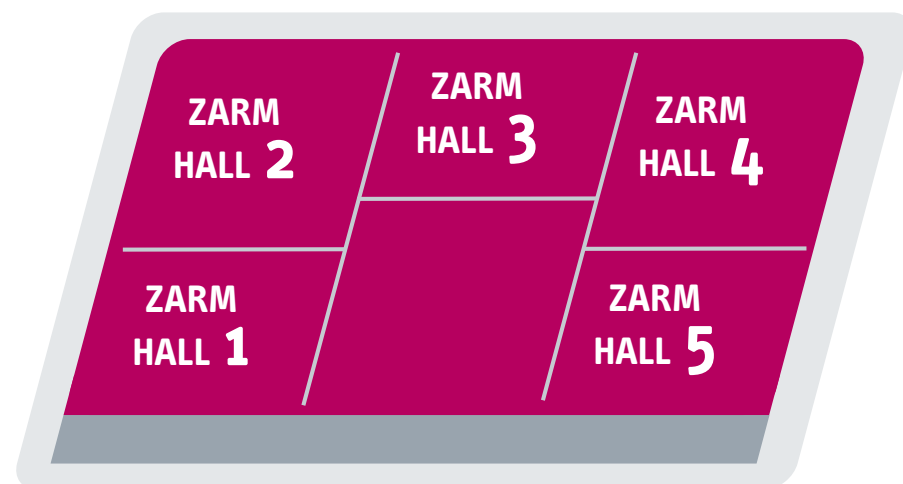
ÖVB HALL

Technical Sessions
Special Sessions
Committee Meetings





ZARM Hall Technical Sessions



3.5 Offices and Exhibition Opening Hours

Registration and Information Desk

Location: Bremen Exhibition & Conference Center

Saturday 29 September, 13:00-18:00

Sunday 30 September, 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

IAA Secretariat Office

Location: Bremen Exhibition & Conference Center

Saturday 29 September - Friday 5 October, 08:00-18:00

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

IAF Members' Lounge

Location: Bremen Exhibition & Conference Center

Sunday 30 September - Friday 5 October, 08:00-18:00

IISL 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

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 Schlachte 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 cosy cafés. 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
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/>

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 the 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.

IAC 2018 at a Glance



7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	TOPIC	STREAM																																																											
Monday 1 Oct	*Industry Breakfast sponsored by Lockheed Martin	PE 3 - High Tech Entanglement: How the Diverse Global Space Industry and Other High-tech Sectors are Becoming More Entwined and Interdependent	Opening Ceremony			Opening Exhibition and VIP Tour			*EUMESAT Lunch			PE 1 - Heads of Agencies Plenary			GNF Opening			The ISS as the "launch pad" for the future astronautics	Human Spaceflight Beyond Low Earth Orbit	PE 2: Host Plenary - How to Live and Work on BS, Moon and Mars	GNF Opening Day																																																					
			Including Everyone in Lunar Exploration			The Australian Space			* Industry luncheon sponsored by Lockheed Martin			PE 4 - The Game Changes - for a Joint Future in Space			IAF Startup Pitch Session							Industry Deep Dives - Space			Industry Deep Dives - Planet			Industry Deep Dives - LM Ventures			New Space - Rocking Earth Observation			The Role of Education in Support of Emerging Countries			Aircraft Parabolic Flight Campaigns for Microgravity and Student Experiments			European Industry Contribution to a Lunar Orbital Platform			In-Flight Call with Australian Gen			MF-ASE Astronauts Event			The Need For a Solid SME Base Within the Industrial Chain on Space and Defence Programmes			Life in Space, The Challenge and the Broad Horizon			How Will Quantum Technologies Change the Future of Space?			The Young Generations' Perspective of Space and Security			SGAC SpaceGen Entrepreneurs			Developing Space Workforce - Industry Focus			The UK Space Agency - Towards			HL 2 - Gravitational Wave Detection on Ground and in Space			HL 3 - The Sky is not the Limit - Paving the Way for an Orbital Society	
Tuesday 2 Oct	*Industry Breakfast sponsored by Lockheed Martin	PE 3 - High Tech Entanglement: How the Diverse Global Space Industry and Other High-tech Sectors are Becoming More Entwined and Interdependent	Including Everyone in Lunar Exploration			The Australian Space			* Industry luncheon sponsored by Lockheed Martin			PE 4 - The Game Changes - for a Joint Future in Space			IAF Startup Pitch Session			Industry Deep Dives - Space			Industry Deep Dives - Planet			Industry Deep Dives - LM Ventures			New Space - Rocking Earth Observation			The Role of Education in Support of Emerging Countries			Aircraft Parabolic Flight Campaigns for Microgravity and Student Experiments			European Industry Contribution to a Lunar Orbital Platform			In-Flight Call with Australian Gen			MF-ASE Astronauts Event			The Need For a Solid SME Base Within the Industrial Chain on Space and Defence Programmes			Life in Space, The Challenge and the Broad Horizon			How Will Quantum Technologies Change the Future of Space?			The Young Generations' Perspective of Space and Security			SGAC SpaceGen Entrepreneurs			Developing Space Workforce - Industry Focus			The UK Space Agency - Towards			HL 2 - Gravitational Wave Detection on Ground and in Space			HL 3 - The Sky is not the Limit - Paving the Way for an Orbital Society			GNF Future Stream		
			PE 5 - The Next Generation' Plenary' - Small Sats: Involving Everyone through their Applications			What Will Shape the Future of European Launchers?			Space Spin-offs from Aerospace to Industry			Reusability - The Key to Reliability and Affordability			ESA's Jam Session on Space Safety			Introduction of the system and current development on aerospace components in China			Applications Development and Socio-Economic Benefits			Space Station and the Next Generation: Launching the LEO Ecosystem			Space & Mobility			Conceiving a Lunar Base Using 3D Printing			IP Award Ceremony			How Will Quantum Technologies Change the Future of Space?			Life in Space, The Challenge and the Broad Horizon			The UK Space Agency - Towards			HL 2 - Gravitational Wave Detection on Ground and in Space			HL 3 - The Sky is not the Limit - Paving the Way for an Orbital Society			GNF Future Stream																							
Wednesday 3 Oct	IDEA "3G" breakfast - sponsored by Lockheed Martin	PE 5 - The Next Generation' Plenary' - Small Sats: Involving Everyone through their Applications	What Will Shape the Future of European Launchers?			Space Spin-offs from Aerospace to Industry			Reusability - The Key to Reliability and Affordability			ESA's Jam Session on Space Safety			Introduction of the system and current development on aerospace components in China			Applications Development and Socio-Economic Benefits			Space Station and the Next Generation: Launching the LEO Ecosystem			Space & Mobility			Conceiving a Lunar Base Using 3D Printing			IP Award Ceremony			How Will Quantum Technologies Change the Future of Space?			Life in Space, The Challenge and the Broad Horizon			The UK Space Agency - Towards			HL 2 - Gravitational Wave Detection on Ground and in Space			HL 3 - The Sky is not the Limit - Paving the Way for an Orbital Society			GNF Future Stream																										
			PE 6 - From Deep Impact to Gravity Well: Working Together to Protect from Space Hazards, Human-Made or Natural			IDEA "3G" Weather Diversity Luncheon sponsored by Lockheed Martin			ESA's Jam Session on Space Safety			Introduction of the system and current development on aerospace components in China			Applications Development and Socio-Economic Benefits			Space Station and the Next Generation: Launching the LEO Ecosystem			Space & Mobility			Conceiving a Lunar Base Using 3D Printing			IP Award Ceremony			How Will Quantum Technologies Change the Future of Space?			Life in Space, The Challenge and the Broad Horizon			The UK Space Agency - Towards			HL 2 - Gravitational Wave Detection on Ground and in Space			HL 3 - The Sky is not the Limit - Paving the Way for an Orbital Society			GNF Future Stream																													
Thursday 4 Oct	PE 7 - Greenhouse Gas Measurements from Space: Enabling Changes, Efficient Changes, and Plans for the Future	PE 7 - Greenhouse Gas Measurements from Space: Enabling Changes, Efficient Changes, and Plans for the Future	Space Station and the Next Generation: Launching the LEO Ecosystem			Space & Mobility			Conceiving a Lunar Base Using 3D Printing			IP Award Ceremony			How Will Quantum Technologies Change the Future of Space?			Life in Space, The Challenge and the Broad Horizon			The UK Space Agency - Towards			HL 2 - Gravitational Wave Detection on Ground and in Space			HL 3 - The Sky is not the Limit - Paving the Way for an Orbital Society			GNF Future Stream																																												
			PE 8 - The Next Generation: Monitoring Asteroids: Defending our Late Breaking News			EarthMo onmars: Involve			Lighting International Excitement for			Speakers Luncheon			Digitisation in the Space Sector - from			Creating the Moon Village: First Results			Closing Ceremony			GNF Challenge a Stream																																																		
Friday 5 Oct	Ahead of the Curve - How Our Next Steps Fuel the Path	PE 8 - The Next Generation: Monitoring Asteroids: Defending our Late Breaking News	EarthMo onmars: Involve			Lighting International Excitement for			Speakers Luncheon			Digitisation in the Space Sector - from			Creating the Moon Village: First Results			Closing Ceremony			GNF Challenge a Stream																																																					
			PE 9 - The Next Generation: Monitoring Asteroids: Defending our Late Breaking News			EarthMo onmars: Involve			Lighting International Excitement for			Speakers Luncheon			Digitisation in the Space Sector - from			Creating the Moon Village: First Results			Closing Ceremony			GNF Challenge a Stream																																																		

Technical Sessions at a Glance

01/10/2018	02/10/2018	02/10/2018	03/10/2018	03/10/2018	04/10/2018	04/10/2018	05/10/2018	05/10/2018
15:00-18:00	09:45-12:45	14:45-17:45	09:45-12:45	14:45-17:45	09:45-12:45	14:45-17:45	09:45-12:45	13:30-16:30
A3.1	A3.2A	A3.2B	A3.3A	A3.3B	A3.4A	A3.5	A3.2C	A3.4B
D2.1	D2.2	D2.7	D2.3	D2.4	D2.5	D2.6	D2.8/A5.4	D6.2/D2.9
C1.1	C1.2	C1.3	C1.4	C1.5	C1.6	C1.7/A6.10	C1.8	C1.9
A6.1	A6.2	A6.4	A6.3	A6.9	A6.5	A6.6	A6.7	A6.8
B4.2	B4.1	B4.3	B4.4	B4.5	B4.6A	B4.6B	B4.8	B4.7
B1.1	B1.2	B1.3	A5.2	A5.1	B1.5	D5.3	B1.4	D5.4
B3.1	B3.2	B3.3	B3.4/B6.4	C3.3	B3.5	B3.6/A5.3	B3.7	B3.8/E7.7
C4.1	C4.2	C4.9	C4.3	C4.4	C4.5	C4.6	C4.7/C3.5	C4.8/B4.5A
C2.1	C2.2	C2.3	C2.4	C2.5	C2.6	C2.7	C2.8	C2.9
C3.1	C3.2	E5.1	E5.3	E5.2	E5.4	E5.5	B6.2	
A1.1	A1.2	A1.3	A1.4	A1.5	A1.6	C3.4	A1.7	A1.8
E1.6	E1.3	E1.4	E1.8	E1.5	E1.7	E1.9	E1.1	E1.2
D3.1	D4.1	D3.2	D4.2	D3.3	D4.3	D3.4	D4.4	D4.5
B5.1	E7.1	E7.2	E7.3	E7.4	B5.2	B5.3	E7.5	C4.10
B2.1	B2.2	A4.1	B2.3	B2.4	B2.5	B2.6	B2.7	A4.2
B6.3	E3.1	E3.2	E3.3	E3.4	E3.5/E7.6	B6.1	E3.6	
A2.1	A2.2	D5.1	D5.2	A2.3	A2.4	A2.5	A2.6	A2.7
A7.1	E6.1	E4.1	A7.2	E6.2	E4.2	A7.3	E6.3	E4.3A/E4.3B
D1.1	D1.2	D1.3	E2.2	E2.4	D1.4A	D1.4B	D1.5	D1.6
E2.3/GTS.4	E2.1	B2.8/GTS.3	D6.1	B3.9/GTS.2	D6.3	B1.6/GTS.1	E8.1	B4.9/GTS.5

Category A:
Science & Exploration

A1--> A7

Category B:
Applications & Operations

B1--> B6

Category C:
Technology

C1--> C4

Category D:
Infrastructure

D1--> D6

Category E:
Space & Society

E1--> E8

Special Sessions at a Glance

IAC 2018 SPECIAL SESSIONS (Sps)									
10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	
MONDAY 1 OCTOBER									CCB FOCKE-WULF-SAAL
TUESDAY 2 OCTOBER	A Global Space Partnership Towards 2030: Achieving the Vision of a Sustainable Space Station - New Low Cost Opportunities for Commercial and Institutional Missions	Commercial Platforms on the International Space Station - New Low Cost Opportunities for Commercial and Institutional Missions	LandSat-Copernicus Sentinel 2 Collaboration: Integrated Operational Land Imaging to Meet User Needs Worldwide	The Golden Age of the European Earth Observation	Quantum technologies for Space - Development and Applications	Space Journalism and Outreach Workshop	Commercial Suborbital: Opening the Aperture for Space Utilization	Adoption of Space Technologies and Applications in Emerging / NewsSpace Actors	2018: 10 Years Columbus in Space and Delivery of Orion European Service Module
WEDNESDAY 3 OCTOBER	Earth Observation and Sustainable Development Goals - Views from a Decade with the Group on Earth Observations, Joint Declaration on Readiness for a Territorial Resilient System	Twenty years of the International Space Station: Shaping the Future of Human Space Exploration	Space Journalism and Outreach Workshop	Commercial Suborbital: Opening the Aperture for Space Utilization	Adoption of Space Technologies and Applications in Emerging / NewsSpace Actors	2018: 10 Years Columbus in Space and Delivery of Orion European Service Module	Creating Strategic University Partnerships through International Student Projects	Space Chemistry: a Key to Fostering Space Exploration	A Scientific "Wish List" for Research Facilities on the Moon
THURSDAY 4 OCTOBER	Commercial Suborbital: Opening the Aperture for Space Utilization	Adoption of Space Technologies and Applications in Emerging / NewsSpace Actors	2018: 10 Years Columbus in Space and Delivery of Orion European Service Module	Creating Strategic University Partnerships through International Student Projects	Space Chemistry: a Key to Fostering Space Exploration	A Scientific "Wish List" for Research Facilities on the Moon	Quantum Key Distribution - The Future of Cryptography	Quantum Key Distribution - The Future of Cryptography	Quantum Key Distribution - The Future of Cryptography
FRIDAY 5 OCTOBER	Commercial Suborbital: Opening the Aperture for Space Utilization	Adoption of Space Technologies and Applications in Emerging / NewsSpace Actors	2018: 10 Years Columbus in Space and Delivery of Orion European Service Module	Creating Strategic University Partnerships through International Student Projects	Space Chemistry: a Key to Fostering Space Exploration	A Scientific "Wish List" for Research Facilities on the Moon	Quantum Key Distribution - The Future of Cryptography	Quantum Key Distribution - The Future of Cryptography	Quantum Key Distribution - The Future of Cryptography

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)

IAC 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)

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 message will also be included in the programme.

• Master of Ceremony



Gayle Tufts
Actress and Comedian,
Germany

• Welcome Addresses



Carsten Sieling
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

• IAC 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



Marc Avila
Director,
Applied Space Technology
and Microgravity (ZARM),
Chair,
IAC 2018 Local Organizing
Committee
Germany

10:30 - 11:30 Official Opening of the Exhibition and VIP Tour

Location: Bremen Exhibition & Conference Center - Exhibition Hall

11:30 - 12:15 Press Conference – IAC 2018 Kick-off

Location: Bremen Exhibition & Conference Center – CCB Gallery

- **Jean-Yves Le Gall**, *President, International Astronautical Federation (IAF)*
- **Pascale Ehrenfreund**, *Chair of the Executive Board, German Aerospace Center (DLR)*
- **Marc Avila**, *Director, Center of Applied Space Technology and Microgravity (ZARM), University of Bremen*
- **Thomas Jarzombek**, *Space Coordinator of the German Federal Government, Member of the German Bundestag*
- **Mayor Carsten Sieling**, *President of the Senate of the Free Hanseatic City of Bremen*

12:00 - 13:00 EUMETSAT Luncheon (Upon Invitation Only)

Location: Bremen Exhibition & Conference Center – ÖVB Olbers

Sponsored by:
EUMETSAT



Speaker:



Alain Ratier
Director General,
EUMETSAT,
France

13:15 - 14:45 Plenary 1: Heads of Agencies

Location: Bremen Exhibition & Conference Center – DLR Hall

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:



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



Kejian Zhang
Administrator,
China National Space
Administration,
China



Sylvain Laporte
President,
Canadian Space Agency
(CSA),
Canada



Dmitry Rogozin
Director General,
Roscosmos,
Russian Federation



K. Sivan
Chairman,
Indian Space Research
Organisation (ISRO),
India



Jan Woerner
Director General,
European Space Agency
(ESA),
France



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



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

14:15 - 15:00 Press Conference – Landspace Technology

Location: Bremen Conference Center – CCB Gallery

Land Space'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, along with 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



Gabriella 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

SpS

15:00 - 17:00 Technical Sessions

TS

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

15:15 - 15:45 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)



Speaker:



Roberto Battiston
President,
Italian Space Agency (ASI),
Italy

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)
- **Kejian Zhang**, Administrator, China National Space Administration
- **Sylvain Laporte**, President, Canadian Space Agency (CSA)
- **Dmitry Rogozin**, 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)

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)

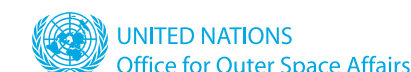
Location: Bremen Exhibition & Conference Center – DLR Hall



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:



Cenar Al-Ekabi
Projects Manager,
International Astronautical Federation (IAF),
France



Pontsho Maruping
Chair,
Science and Technical Subcommittee,
UNCOPUOS,
Austria



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



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



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

16:25 - 17:10 GNF – The ISS as a « Launch Pad » for the Future Astronautics: Innovative Technologies, Open Architecture, and International Cooperation for Deep Space Missions

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 Mikrin
General Designer,
RSC Energia,
Russian Federation



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



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



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



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 cislunar 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 cislunar 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 cislunar 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 capitalize 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 astronautic 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?

- 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 astronautic 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
(MAMBA),
Center of Applied
Space Technology and
Microgravity (ZARM),
University of Bremen,
Germany



Takuya Onishi
Astronaut,
Japan Aerospace
Exploration Agency
(JAXA),
Japan



MODERATOR
Marc Avila
Director,
Center of Applied
Space Technology and
Microgravity (ZARM),
University of Bremen,
Germany

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.

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

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 payload 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 will facilitate questions from the audience in the last half hour.



Organized by:

IAF Industry Relations Committee (IRC)



Speakers:



Juergen Ackerman
General Secretary,
Arianespace,
France



Kyle Acierio
Managing Director,
ispace Europe,
Luxembourg



Dominic "Tony" A. Antonelli
Director, Advanced
Programs Commercial
Civil Space,
Lockheed Martin Space
Systems Company,
United States



Robert Boehme
Founder and CEO,
PTScientists,
Germany



Ahsan Choudhuri
Director, NASA MIRO
Center for Space
Exploration & Tech
Research,
University of Texas at El
Paso,
United States



Nicolas Faber
COO,
Blue Horizon,
Luxembourg



Oliver Juckenhoefer
Vice President On-Orbit
Services and Exploration,
Airbus Defence and Space,
Germany



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

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. Melroy
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,
Lumen Studios,
United Kingdom



Melanie King
Director,
Lumen Studios,
United Kingdom



Nahum Romero Zamora
Director,
KOSMICA Institute,
Mexico



Aoife Van Linden Tol
Artist,
United Kingdom



MODERATOR
Bernard Foing
Director ILEWG, Prof VU
Amsterdam,
ITACCUS Vice Chair,
European Space Agency
(ESA),
The Netherlands

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

SpS

09:45 - 12:45 Technical Sessions

TS

No.	Title	Room
A1.2	Human Physiology in Space	CCB Danzig
A2.2	Fluid and Materials Sciences	Bremen 2
A3.2A	Moon Exploration – Part 1	CCB Kaisen
A6.2	Modelling and Risk Analysis	ZARM 1
B1.2	Future Earth Observation Systems	ZARM 3
B2.2	Fixed and Broadcast Communications	ÖVB 3
B3.2	Commercial Human Spaceflight Programs	ZARM 4
B4.1	19th Workshop on Small Satellite Programmes at the Service of Developing Countries	ZARM 2
C1.2	Orbital Dynamics (2)	CCB Borgward
C2.2	Space Structures II - Development and Verification (Deployable and Dimensionally Stable Structures)	ÖVB 2

C3.2	Wireless Power Transmission Technologies and Application	CCB Bergen
C4.2	Propulsion System (2)	ZARM 5
D1.2	Space Systems Architectures	CCB London
D2.2	Launch Services, Missions, Operations, and Facilities	CCB Lloydssaal
D4.1	Innovative Concepts and Technologies	Bremen 1
E1.3	On Track - Undergraduate Space Education	CCB Scharoun
E2.1	Student Conference - Part 1	ÖVB 4
E3.1	International Cooperation for the benefits of developing countries and emerging space nations	CCB Franzius
E6.1	Entrepreneurship and Innovation: The Practitioners' Perspectives	CCB Roselius
E7.1	10th Nandasiri Jasentuliyana Keynote Lecture on Space Law and Young Scholars Session	Bremen 3

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
(GSA),
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



Naoto Matsuura
Senior Chief Officer of
Satellite Applications,
Japan Aerospace
Exploration Agency
(JAXA),
Japan



MODERATOR
Toby Clark
Secretary General,
Eurisy,
France

11:30 - 13:00 SpS – Commercial Platforms on the International Space Station – New Low Cost Opportunities for Commercial and Institutional Missions

SpS

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

12:10 - 12:30 GNF – Space Sustainability Rating – New Way of Addressing the Orbital Debris Challenge

Location: Bremen Conference Center – CCB Hansesaal

The significant rise in space debris poses an increasing threat to economically vital orbital regions, threatening to substantially impact not only the space sector, but the whole international community. The Space Sustainability Rating framework will support long-term sustainability of the space environment by increasing transparency of actors' debris mitigation efforts.



Organized by:

World Economic Forum



Speaker:



Nikolai Khlystov
Lead, Aerospace Industry,
World Economic Forum,
United States

12:30 - 13:30 Industry Luncheon (Upon Invitation Only)

Location: Bremen Exhibition & Conference Center – ÖVB Olbers

Sponsored by:

Lockheed Martin



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



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



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



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



Grazia Vittadini
Chief Technology Officer
(CTO),
Airbus Defence and
Space,
Germany



MODERATOR
Claudia Kessler
Founder,
First German Astronaut
Foundation,
HE Space Holding B.V.,
Germany

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

SpS

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

14:45 - 17:45 Technical Sessions

TS

No.	Title	Room
A1.3	Medical Care for Humans in Space	CCB Danzig
A3.2B	Moon Exploration – Part 2	CCB Kaisen
A4.1	SETI 1: SETI Science and Technology	ÖVB 3
A6.4	Mitigation and Standards : status, lessons learnt and future with smallsats and constellations	ZARM 1
B1.3	Earth Observation Sensors and Technology	ZARM 3
B2.8-GTS.3	Space Communications and Navigation Global Technical Session	ÖVB 4
B3.3	Utilization & Exploitation of Human Spaceflight Systems	ZARM 4
B4.3	Small Satellite Operations	ZARM 2
C1.3	Attitude Dynamics (1)	CCB Borgward
C2.3	Space Structures - Dynamics and Microdynamics	ÖVB 2
C4.9	Hypersonic Air-breathing and Combined Cycle Propulsion	ZARM 5
D1.3	Technologies to Enable Space Systems	CCB London

D2.7	Small Launchers: Concepts and Operations (Part I)	CCB Lloydsaal
D3.2	Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development	Bremen 1
D5.1	Quality and safety, a challenge for traditional and new space	Bremen 2
E1.4	In Orbit - Postgraduate Space Education	CCB Scharoun
E3.2	Ways ahead in Space Exploration	CCB Franzius
E4.1	Memoirs & Organizational Histories	CCB Roselius
E5.1	Space Architecture: Habitats, Habitability, and Bases	CCB Bergen
E7.2	Financing space: Procurement, competition and regulatory approach	Bremen 3

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



Hanns Selig
Project Manager MIGROP Parabolic Flight, Geradts GmbH, Germany



MODERATOR
Vladimir Pletser
Space Operations Training Director, Blue Abyss, Belgium

14:45 - 16:15 GNF – IAF Startup Pitch Session

Location: Bremen Exhibition & Conference Center – DLR Hall



The IAF Startup Pitch Session is an event where startups will be able to present their companies in front of an audience and get feedback from a panel of world renowned judges.

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 registration 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)
- Sensovo GmbH
- Dawn Aerospace
- AlphaLink
- Insitek
- Precious Payload Inc.
- Manastu Space Technologies Pvt Ltd
- Virtual Space Systems
- Valispace
- SPACE WALKER Inc.

Organized by:

IAF Industry Relations Committee (IRC)



Judges:



Antje Bulmann
Manager and Coach, Airbus BizLab – Aerospace Accelerator, Germany



Ahsan Choudhuri
Director, NASA MIRO Center for Space Exploration & Tech Research, University of Texas at El Paso, United States



Bruno Correia Da Costa
Accelerator Director, Starburst, France



Michael Grasso
Economic Advisor, Luxembourg Ministry of Economy Space Resources Initiative, Luxembourg



Jonathan Hung
President, Singapore Space and Technology Association (SSTA), Singapore



Rolf Janovsky
Director of Predevelopment, OHB, Germany



Michael Lohnert
Investing Director,
Boeing HorizonX,
United States



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



Grégory Pradels
Chief Executive officer,
Newspace Factory,
France



Thomas Snitch
Director of Federal and
Government Programs,
Bowling Green State
University,
United States

Masters of Ceremony:



Victoria Alonsopérez
Founder,
Chipsafer,
Uruguay



Kyle Acierno
Managing Director,
ispace Europe,
Luxembourg

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, Parliamentary 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 motivation the next generation, capacity building and promoting the use of space technology for sustainable socioeconomic development. Space agencies can be catalysers in preparing with joint education activities the future works force 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 Liason with International
Organisations and Developing Nations (CLIODN)



Speakers:



Roberto Battiston
President,
Italian Space Agency
(ASI),
Italy



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



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



Jörg Feustel-Büechl
Advisor,
Bavarian State Ministry
for Economic Affairs
and Media, Energy and
Technology (MWMET),
Germany



Seishiro Kibe
Senior Advisor of
International Relations
and Research Dept.,
Japan Aerospace
Exploration Agency
(JAXA),
Japan



**Francisco Javier
Mendieta Jiménez**
Director General,
Mexican Space Agency
(AEM),
Mexico



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



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



**MODERATOR
Valanathan Munsami**
CEO,
South African National
Space Agency (SANSA),
South Africa

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
Robie I. Samanta Roy**
Vice President for
Technology and
Innovation,
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



16:50 - 17:10 GNF – Industry Deep Dives: ispace's First Commercial Lunar Missions: Launcher, Lander, and Roadmap

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 of 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),
Spire Global,
United States



Yasu Yamazaki
Brand Manager,
Axelspace,
Japan



MODERATOR
Josef Aschbacher
Director of Earth Observation
Programmes and Head of
ESRIN,
European Space Agency
(ESA),
Italy



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'Etudes 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 Munsami**, 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 GNF – Industry Deep Dives: Earth Observation to the Power of Hundreds – the Story of Planet

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 Lukaszczuk, 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 Łukaszczuk
Senior Director – European
Policy,
Planet,
Belgium



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



17:30 - 17:50 GNF – Industry Deep Dives: Affordable, Accessible, Accelerated – The MILO Space Science Institute

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:
GEOshare LLC



Speakers:



Jim Bell
School of Earth and Science Exploration, Director, ASU Space Technology and Science ("NewSpace") Initiative, Arizona State University, United States



Lisa Callahan
Vice President and General Manager Commercial Civil Space, Lockheed Martin, United States



Lon Levin
President and CEO, GEOshare, United States



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, NASA Jet Propulsion Laboratory, (JPL) California Institute of Technology, United States



MODERATOR
Leon Alkalai
Manager, Office of Strategic Planning, NASA Jet Propulsion Laboratory (JPL), United States

19:00 - 21:30 ISEB Networking Event (Upon Invitation Only)

Location: Universum Bremen

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 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 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 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 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.

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



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 Coderre**, 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



David Henri
Chief Executive Officer
(CEO),
Exotrail,
France



Ana-Mia Swardt
Chief Project Officer,
Simera Sense,
South Africa



Ekaterina Timakova
Final-year student,
Aerospace department of
Bauman State Technical
University (BMSTU),
Russian Federation



Anastasia Volkova
Aeronautical Engineer,
University of Sydney,
Australia



MODERATOR
Agnieszka Łukaszczyk
Senior Director – European
Policy,
Planet,
Belgium

GNF PUBLIC STREAM Room: DLR Hall

GNF DEVELOPMENT STREAM Room: CCB Hansesaal

09:40 - 10:40 GNF – What Will Shape the Future of European Launchers?

Location: Bremen Exhibition & Conference Center – DLR Hall



Acknowledging that launchers have always been the hyphen between Earth and space, this GNF event will enable interesting exchanges on how Europe sees its space transportations' future evolutions and what could be the potential roadmap to face and contribute to the upcoming changes and challenges. Next to expansion of space sciences and human experiences in Outer Space including future space logistics the new challenges will embrace eco-efficient "greener in space" transportation from Europe.

The launchers' landscape is about to experience a radical reshuffling with a new generation expected by the next decade, in Europe and worldwide. What would be the future missions and their impact for the European launchers sector?

From the one-way ticket for satellites, to the back and forth trip needed by Moon-based activities, today's Space launch services have to face future space logistic challenges with some similarities with today's Earth based logistics.

With regard to such future space logistics it is obvious that the protection of Space Environment becomes an important issue. Europe's vision should be to utilize green launcher systems for transporting in space and maintaining other space assets by on-orbit servicing and refueling.

Organized by:

Ministry of Economic Affairs, Labour and Ports

Ministry of Economic Affairs,
Labour and Ports

Freie
Hansestadt
Bremen

Speakers:



Alain Charmeau
Chief Executive Officer,
ArianeGroup,
France



Martin Guenther
Senator of Economic
Affairs, Labour and Ports,
Bremen Senate,
Germany



Stéphane Israël
Chief Executive Officer,
Arianespace,
France



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



Hans Steininger
Chief Executive Officer,
MT-Aerospace,
Germany



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



MODERATOR
Dirk Lorenzen
Science Journalist,
Senior Science Reporter
German Public Radio,
Germany

09:40 - 10:25 GNF – Small Satellite Applications Development Leveraging Socio-Economic Benefits

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 along 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



Jorge Del Rio Vera
Space Application Section,
United Nations Office
for Outer Space Affairs
(UNOOSA),
Austria



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



Valanathan Munsami
CEO,
South Africa National
Space Agency (SANSA),
South Africa



MODERATOR
Steve Boehinger
COO,
Euroconsult,
France

09:45 - 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

09:45 - 12:45 Technical Sessions



No.	Title	Room
A1.4	Medicine in Space and Extreme Environments	CCB Danzig
A3.3A	Mars Exploration – missions current and future	CCB Kaisen
A5.2	Human Exploration of Mars	ZARM 3
A6.3	Impact-Induced Mission Effects and Risk Assessments	ZARM 1

A7.2	Science Goals and Drivers for Future Exoplanet, Space Astronomy, Physics, and Outer Solar System Science Missions	CCB Roselius
B2.3	Mobile Satellite Communications and Navigation Technology	ÖVB 3
B3.4-B6.4	Flight & Ground Operations of HSF Systems (A Joint Session of the Human Spaceflight and Space Operations Symposia)	ZARM 4
B4.4	Small Earth Observation Missions	ZARM 2
C1.4	Attitude Dynamics (2)	CCB Borgward
C2.4	Advanced Materials and Structures for High Temperature Applications	ÖVB 2
C4.3	Propulsion Technology (1)	ZARM 5
D2.3	Upper Stages, Space Transfer, Entry and Landing Systems	CCB Lloydssaal
D4.2	Contribution of Space Activities to Solving Global Societal Issues	Bremen 1
D5.2	Knowledge management for space activities in the digital era	Bremen 2
D6.1	Commercial Spaceflight Safety and Emerging Issues	ÖVB 4
E1.8	Hands-on Space Education and Outreach	CCB Scharoun
E2.2	Student Conference - Part 2	CCB London
E3.3	Space economy – Stimulating measurable economic activities through space policies and budgets	CCB Franzius
E5.3	Contemporary Arts Practice and Outer Space: A Multi-Disciplinary Approach	CCB Bergen
E7.3	Integrated space applications, EO telecoms navigation	Bremen 3

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)



Speaker:



ZHANG Lei
Assistant of Director,
China Academy of Space
Technology (CAST),
China



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

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

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)

- Space Weather (solar and beyond)
- 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

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.

Organized by:

SpaceX



Speaker:



Hans Koenigsmann
Vice President of Build and Flight Reliability,
SpaceX,
United States

11:30 - 13:00 SpS – Landsat-Copernicus Sentinel 2 Collaboration: Integrated Operational Land Imaging to Meet User Needs Worldwide

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

SpS

11:30 - 13:00 SpS – The Golden Age of the European Earth Observation

Location: Bremen Exhibition & Conference Center – CCB Gallery

SpS

12:30 - 13:30 IAF "3G" IDEA – Excellence in "3G" Diversity Award Luncheon (Upon Invitation Only)

Location: Bremen Exhibition & Conference Center – ÖVB, Olbers

The IAF Excellence in "3G" Diversity Award recognizes IAF member organizations (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)



13:15 – 13:20 Premier Presentation of joint IAF/SGAC video on
"Fostering Generational Diversity"

13:20 – 13:30 Networking

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

Welcome Addresses:



Martin Guenther
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



Thomas Jarzombek
Member of German
Parliament and Federal
Government Coordinator of
German Aerospace Policy,
German Parliament,
Germany



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



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



MODERATOR & SPEAKER
Jan Wörner
Director General,
European Space Agency
(ESA),
France

14:30 – 15:00 GNF – In-Flight Call with Alexander Gerst

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 'Digitalisation, Industry 4.0, Energy Supply and Mobility of Tomorrow'. He will carry out 65 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:



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



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



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



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



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



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

15:00 - 16:00 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:



Michael Lopez-Alegria
Principal,
MLA Space, LLC,
United States



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



Pamela A. Melroy
NASA Space Shuttle
Commander,
Director of Space
Technology and Policy,
Nova Systems,
Australia



Ernst Messerschmid
Professor,
University of Stuttgart,
Germany



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



Koichi Wakata
Vice President; Director
General of Human
Spaceflight Technology
Directorate,
Japan Aerospace
Exploration Agency (JAXA),
Japan



MODERATOR

Maggie Aderin-Pocock

Space Scientist,
British Broadcasting
Corporation (BBC),
United Kingdom



MODERATOR

Reinhold Ewald

Professor, European
Astronaut,
Institute of Space Systems,
University of Stuttgart,
Germany

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)



Opening Address:



Marco Fuchs

CEO,
OHB SE / OHB System AG,
Germany

Speakers:



Nicolas Chamussy

Executive Vice President –
Head of Space Systems,
Airbus Defence and Space,
France



Iain Christie

Executive Vice President,
Aerospace Industries
Association of Canada,
Canada



Jeff Cullen

Director of Procurement
Program Operations,
National Aeronautics
and Space
Administration (NASA),
United States



Thibaud Delourme

Team Leader for Copernicus
User Uptake,
European Commission,
Belgium



Eric Morel

Director of Industry,
Procurement and Legal
Services,
European Space Agency
(ESA),
France



Ernst Pfeiffer

CEO,
HPS GmbH,
Germany



Matt Tetlow

CEO,
Inovor Technologies,
Australia

Presenters:



Luca del Monte

Head of the Industrial
Policy & SME Division,
European Space Agency
(ESA),
France



Leo Loiacono

Senior Director, Program
Management Value Stream
Lead-Aerospace Business,
Valcor Engineering
Corporation,
United States



Sias Mostert

Executive Chairman,
SCS Aerospace Group,
South Africa



MODERATOR

Pieter van Beekhuizen

Senior Consultant,
Bexperience,
The Netherlands



RAPPORTEUR

Karina Miranda Sanchez

Head of the Industrial Audit
Section,
European Space Agency
(ESA),
Luxembourg

14:45 - 16:15 SpS – New Approaches to Space for a Better World: Space for Sustainable Development

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



14:45 - 17:45 Technical Sessions

TS

No.	Title	Room
A1.5	Radiation Fields, Effects and Risks in Human Space Missions	CCB Danzig
A2.3	Microgravity Experiments from Sub-Orbital to Orbital Platforms	Bremen 2
A3.3B	Mars Exploration – Science, Instruments and Technologies	CCB Kaisen
A5.1	Human Exploration of the Moon and Cislunar Space	ZARM 3
A6.9	Orbit Determination and Propagation	ZARM 1
B2.4	Advanced Satellite Services	ÖVB 3
B3.9-GTS.2	Human Spaceflight Global Technical Session	ÖVB 4
B4.5	Access to Space for Small Satellite Missions	ZARM 2
C1.5	Guidance, Navigation & Control (1)	CCB Borgward
C2.5	Smart Materials and Adaptive Structures	ÖVB 2
C3.3	Advanced Space Power Technologies	ZARM 4
C4.4	Electric Propulsion	ZARM 5
D2.4	Future Space Transportation Systems	CCB Lloydsaal
D3.3	Novel Concepts and Technologies to Enable Future Building Blocks in Space Exploration and Development	Bremen 1
E1.5	Enabling the Future - Developing the Space Workforce	CCB Scharoun
E2.4	Educational Pico and Nano Satellites	CCB London
E3.4	Assuring a Safe, Secure and Sustainable Environment for Space Activities	CCB Franzius
E5.2	Is Space R&D Truly Fostering A Better World For Our Future?	CCB Bergen
E6.2	Finance and Investment: The Practitioners' Perspectives	CCB Roselius
E7.4	Space law at Unispace +50: consequences and future perspectives	Bremen 3

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

Location: Bremen Exhibition & Conference Center – 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 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 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 **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 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 Juckenhoefer**, 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 fore front 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 l'Aerospazio, la Difesa e la Sicurezza (AIAD),
Italy



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



Lorenzo D'Onghia
President,
Association for Space-based Applications and Services (ASAS),
Italy



Luca Rossettini
President,
Association Of Italian Space Enterprises (AIPAS),
Italy



MODERATOR
Andrea Zanini
Communication,
Italian Space Agency (ASI),
Italy

16:30 - 17:30 SpS – Galileo, the European Global Navigation System

Location: Bremen Exhibition & Conference Center – CCB Gallery



16:30 - 18:00 SpS – Challenges, Technologies and Solutions for Exploration of Icy and Ocean Worlds

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



16:30 - 17:30 GNF – European Industry Contribution to a Lunar Orbital Platform

Location: Bremen Exhibition & Conference Center – DLR Hall



The next step in human spaceflight could be the establishment of a human presence in cislunar space through the operations and the deployment of a Lunar Orbital Platform-Gateway. This gateway would be central to advancing and sustaining human space exploration, and would be the unifying single stepping off point in architecture for human cislunar operations, lunar surface access and missions to Mars. Airbus is working for the European Space

Agency on two studies for this programme. This industrial framework will be introduced and discussed with the audience during this Global Network Forum (GNF).

Organized by:

Airbus Defence and Space



Speaker:



Detlef Wilde
Program Manager for
Suborbital Missions,
Airbus Defence and Space,
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. Beside 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



Karsten Danzmann
Director,
Max Planck Institute for Gravitational Physics (Albert Einstein Institute) and
Institute for Gravitational Physics, Leibniz Universität Hannover,
Germany



MODERATOR
Claus Lämmerzahl
Professor for Theoretical Physics and Director for Space Sciences,
Center of Applied Space Technology and Microgravity (ZARM),
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 anthropomorphic 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 ESRIN, European Space Agency (ESA), Italy



Michael Freilich
Director Earth Science Division, National Aeronautics and Space Administration (NASA), United States



Juliette Lambin
Earth Observation Program Manager, Centre National d'Études Spatiales (CNES), France



Naoto Matsuura
Senior Chief Officer of Satellite Applications and Director of Earth Observation Research Center (EORC), Japan Aerospace Exploration Agency (JAXA), Japan



Alain Ratier
Director General, EUMETSAT, France



MODERATOR
Harry Cikanek
Director of the Center for Satellite Applications and Research (STAR), National Oceanic and Atmospheric Administration's (NOAA), United States

GNF FUTURE STREAM Room: DLR Hall

GNF CHALLENGES STREAM Room: CCB Hansesaal

09:40 - 10:40 GNF – Space Station and the Next Generation: Launching the LEO Ecosystem

Location: Bremen Exhibition & Conference Center – DLR Hall

Space Station: Next Generation celebrates the 20th anniversary of the start 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



- 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

Organized 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

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

Location: Bremen Exhibition & Conference Center – CCB Lilienthal



09:45 - 11:15 SpS – Twenty years of the International Space Station: Shaping the future of human space exploration

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



09:45 - 12:45 Technical Sessions



No.	Title	Room
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 Kaisen
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 Lloydsaal
D4.3	Conceptualizing Space Elevators and Tethered Satellites	Bremen 1
D6.3	Enabling safe commercial spaceflight: vehicles and spaceports	ÖVB 4

E1.7	New Worlds - Non-Traditional Space Education and Outreach	CCB Scharoun
E3.5-E7.6	33rd Joint IAA/IISL Round Table: Global Cooperation in Planetary Defence	CCB Franzius
E4.2	Scientific & Technical History	CCB Roselius
E5.4	Space Assets and Disaster Management	CCB Bergen

10:50 - 11:50 GNF – Space & Mobility

Location: Bremen Exhibition & Conference Center – DLR Hall

Present and future mobility systems and mobility concepts are not conceivable without (German) space know-how.



Many examples illustrate this: Autonomous driving – in its eventual mature state – is only possible if navigation data is reliably, highly precise and continuously available.

Satellite navigation ensures that transport solutions can be operated efficiently and safely.

Satellite technology helps to make transportation networks more efficient, saving billions of euros in costs and contributing to climate protection by avoiding traffic.

The panel will demonstrate the usefulness of space exploration for everyday applications, especially in the area of mobility.

It will introduce highly innovative urban air mobility solutions by Airbus Defence and Space as well as Volocopter GmbH and discuss the following questions:

- How do space and mobility providers work together?
- What do both sides expect from each other?
- How will future mobility solutions look like?

Organized by:

Ministry of Economic Affairs, Labour and Ports

Ministry of Economic Affairs,
Labour and Ports

Freie
Hansestadt
Bremen

Speakers:



Hansjörg Dittus
Executive Member for Space
Research and Technology,
German Aerospace Center
(DLR),
Germany



Marco Fuchs
CEO,
OHG SE / OHG System AG,
Germany



Stefan Klocke
Chairman of the Advisory
Board,
Volocopter GmbH,
Germany



ROMMY ARND
News Anchorwoman,
n-tv-German Private News
Television,
MDR Aktuell German Public
News Radio,
Germany

10:50 - 11:50 GNF – Climate Change – How Can Space Based Measurements Be Used to Understand the Changing Human Impact on the Sources and Sinks of Greenhouse Gases and Global Climate Change?

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

In this roundtable, young professionals are welcome to participate in an open roundtable discussion with senior experts, to express their concerns and discuss on how the future can be improved using space technologies.



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:

OHG



Speakers:



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



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



MODERATOR
Timo Stuffer
Director Business
Development,
OHG System AG,
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 spares *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:



Advenit Makaya
Materials and Processes
Section TEC-MSP,
European Space Agency
(ESA),
The Netherlands



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



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



RAPPORTEUR
Anna Dauriskikh
System Engineer for ALM,
Sonaca Space GMBH,
Germany



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



RAPPORTEUR
Antonella Sgambati
Human Spaceflight Senior
System 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 Exhibition & 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 Horack
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 & Technology,
Canadian Space Agency
(CSA),
Canada



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



MODERATOR
YU Dengyun
Deputy Director of S&T
Steering Committee,
China Aerospace
Science and Technology
Corporation (CASC),
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 intravehicular and extravehicular, 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:



YANG Hong
Chief Designer,
China Academy of Space
Technology (CAST),
China



MODERATOR
LI Ming
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

No.	Symposium
A1.IP	IAF/IAA SPACE LIFE SCIENCES
A2.IP	IAF MICROGRAVITY SCIENCES AND PROCESSES
A3.IP	IAF SPACE EXPLORATION
A4.IP	47 th IAA SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps
A5.IP	21 st IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM
A6.IP	16 th IAA SYMPOSIUM ON SPACE DEBRIS
A7.IP	IAF SYMPOSIUM ON FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS
B1.IP	IAF EARTH OBSERVATION SYMPOSIUM
B2.IP	IAF SPACE COMMUNICATIONS AND NAVIGATION
B3.IP	IAF HUMAN SPACEFLIGHT
B6.IP	IAF SPACE OPERATIONS
C1.IP	IAF ASTRODYNAMICS
C2.IP	IAF MATERIALS AND STRUCTURES
C3.IP	IAF SPACE POWER
C4.IP	IAF SPACE PROPULSION
D1.IP	IAF SPACE SYSTEMS
D2.IP	IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS
D3.IP	16 th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT
D4.IP	16 th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FUTURE
D5.IP	51 st IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE ACTIVITIES
E1.IP	IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM
E3.IP	31 st IAA SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS
E5.IP	29 th IAA SYMPOSIUM ON SPACE AND SOCIETY
E6.IP	IAF BUSINESS INNOVATION
E7.IP	61 st IISL COLLOQUIUM ON THE LAW OF OUTER SPACE

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)



Speakers:



Ntorina Antoni
PhD in Space and Security,
Eindhoven University of Technology,
The Netherlands



Aline Decadi
Rocket Scientist,
HE Space Operations BV,
The Netherlands



Yann Gouy
Deputy Head of the
Space Tug Team,
Airbus Defence and
Space,
France



Eleanor Morgan
Reserve Officer and Pilot,
U.S. Air Force,
United States



Narayan Prasad
Co-Founder,
satsearch.co,
Germany



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



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



MODERATOR
Christopher Vasko
Research Fellow, Young
ESA,
European Space Agency
(ESA),
France



MODERATOR

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

14:45 - 16:15 SpS – Global Space Exploration: Increasing Benefits through International and Commercial Partnerships

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



14:45 - 17:45 Technical Sessions



No.	Title	Room
A2.5	Facilities and Operations of Microgravity Experiments	Bremen 2
A3.5	Solar System Exploration	CCB Kaisen
A6.10-C1.7	Orbital Safety and Optimal Operations in an Increasingly Congested Environment (Joint Astrodynamics/Space Debris Session)	CCB Borgward
A6.6	Post Mission Disposal and Space Debris Removal (2)	ZARM 1
A7.3	Technology Needs for Future Missions, Systems, and Instruments	CCB Roselius
B1.6-GTS.1	Citizen Science in Global Earth Observation Systems	ÖVB 4
B2.6	Near-Earth and Interplanetary Communications	ÖVB 3
B3.6-A5.3	Human and Robotic Partnerships in Exploration - Joint session of the Human Spaceflight and Exploration Symposia	ZARM 4
B4.6B	Generic Technologies for Nano/Pico Platforms	ZARM 2
B5.3	Satellite Commercial Applications	Bremen 3
B6.1	Ground Operations - Systems and Solutions	CCB Franzius
C2.7	Space Vehicles – Mechanical/Thermal/Fluidic Systems	ÖVB 2
C3.4	Space Power System for Ambitious Missions	CCB Danzig
C4.6	New Missions Enabled by New Propulsion Technology and Systems	ZARM 5
D1.4B	Space Systems Engineering - Methods, Processes and Tools (2)	CCB London
D2.6	Future Space Transportation Systems Verification and In-Flight Experimentation	CCB Lloydsaal
D3.4	Space Technology and System Management Practices and Tools	Bremen 1
D5.3	Prediction, Testing, Measurement and Effects of space environment on space missions	ZARM 3
E1.9	Space Culture – Public Engagement in Space through Culture	CCB Scharoun
E5.5	Space Societies, Professional Associations and Museums	CCB Bergen

14:55 - 15:55 GNF – SGAC SpaceGen Entrepreneurs Forum

Location: Bremen Exhibition & Conference Center – CCB Hansesaal

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



14:20 - 15:20 GNF – How Will Quantum Technologies Change the Future of Space?

Location: Bremen Exhibition & Conference Center – DLR Hall

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 relevancy 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:



Hansjörg Dittus
Executive Member for
Space Research and
Technology,
German Aerospace Center
(DLR),
Germany



Harald Hauschildt
Programme Manager,
Scylight Programme,
European Space Agency
(ESA),
The Netherlands



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

Incubators. SGAC's SpaceGen Entrepreneurs Forum will be held at CCB Hansesaal at Messe Bremen on Thursday, 4 October 2018 at 14:55, followed by a networking cocktail at 15:55 at CCB GauB. 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.

Organized by:

Space Generation Advisory Council (SGAC)



Speakers:



Adnan Al Rais
Director, Remote Sensing Department,
Mohammed Bin Rashid Space Centre (MBRSC),
United Arab Emirates



Robert Boehme
Founder and CEO,
PTScientists,
Germany



Chris Boshuizen
Operating Partner,
Data Collective VC,
United States



MODERATOR
Manny Shar
Head of Analytics,
Bryce Space and Technology,
United Kingdom

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:



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



Dava J. Newman
Apollo Program Professor,
Massachusetts Institute of Technology,
United States



MODERATOR
John D. Rummel
Senior Scientist,
SETI Institute,
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 Bonté
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 SEOC Vice-Chair Workforce Development,
Modis for European Space Agency,
The Netherlands

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

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



18:00 - 19:00 Highlight Lecture 3: The Sky is not the Limit – Paving the Way for an Orbital Society

Location: Bremen Exhibition & Conference Center – DLR Hall

Tom Enders, CEO of the aerospace company Airbus, will speak about business opportunities in space.

Today, space – be it Low Earth Orbit or even outer space – is not anymore an area reserved to states and their institutions. We see an increasing amount of private ventures investing massively into new space capabilities, setting new records in the coming years in terms of investments, product / services development and launches.

For more than 10 years Mankind has had an orbital outpost in Low Earth Orbit – the International Space Station ISS. But now LEO is not an area only to discover anymore it has clearly become a part of Earth's Economic area. Orbital Economy is a reality, it happens now, we need to reinforce it and we need to expand it further out to GEO and to the Moon.

Speaker:



Tom Enders
Chief Executive Officer (CEO),
Airbus Group,
Germany



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

19:00 - 22:30 IISL Dinner (Upon Invitation Only)

Location: Restaurant Meierei Bremen, Im Bürgerpark 1

Friday 5 October

GNF EXPLORATION STREAM
Room: DLR Hall

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 how 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



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



Danielle Richey
Systems Engineer, Advanced
Programs,
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-

und Raumfahrt; DLR) and built in close cooperation with the Centre National d'Etudes Spatiales (CNES) – is currently on board the Hayabusa2 spacecraft. At the beginning of October 2018 (3 October, tbc), 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:



Pascale 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 Foing (invited)
Director ILEWG, Prof VU
Amsterdam,
ITACCUS Vice Chair,
European Space Agency
(ESA),
The Netherlands

09:45 - 12:45 Technical Sessions

No.	Title	Room
A1.7	Life Support, habitats and EVA Systems	CCB Danzig
A2.6	Life and Microgravity Sciences on board ISS and beyond (Part I)	Bremen 2
A3.2C	Moon Exploration – Part 3	CCB Kaisen
A6.7	Operations in Space Debris Environment, Situational Awareness	ZARM 1
B1.4	Earth Observation Data Management Systems	ZARM 3
B2.7	Advanced Technologies for Space Communications and Navigation	ÖVB 3
B3.7	Advanced Systems, Technologies, and Innovations for Human Spaceflight	ZARM 4
B4.8	Small Spacecraft for Deep-Space Exploration	ZARM 2
B6.2	New Space Operations Concepts and Advanced Systems	CCB Bergen
C1.8	Mission Design, Operations & Optimization (1)	CCB Borgward
C2.8	Specialised Technologies, Including Nanotechnology	ÖVB 2
C4.7-C3.5	Joint Session on Advanced and Nuclear Power and Propulsion Systems	ZARM 5
D1.5	Lessons Learned in Space Systems: Achievements, Challenges, Best Practices, Standards.	CCB London
D2.8-A5.4	Space Transportation Solutions for Deep Space Missions	CCB Lloydssaal
D4.4	Strategies for Rapid Implementation of Interstellar Missions: Precursors and Beyond	Bremen 1
E1.1	Ignition - Primary Space Education	CCB Scharoun
E3.6	Strategic Risk Management for successful space & defence programmes	CCB Franzius

E6.3	Innovation: The Academics' Perspectives	CCB Roselius
E7.5	The relationship between space law and cyberlaw, and other recent developments in space law	Bremen 3
E8.1	Multilingual Astronautical Terminology	CCB Herschel

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 of 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/destroy 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 Carnelli
ESA General Studies
Program 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 Scheper
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 – ÖVB 4

09:45 - 11:15 SpS – Commercial Suborbital: Opening the Aperture for Space Utilization

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



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.

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



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



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



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



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

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

Location: Bremen Exhibition & Conference Center – ÖVB 4



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

Location: Bremen Exhibition & Conference Center – CCB Bessel



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



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, astrobiology, 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 Scholarships Coordinator,
German Aerospace Center (DLR),
Germany



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



Agata Kolodziejczyk
Neuroscientist & LunAres Founder,
Space Garden,
Poland



Chiaki Mukai
Vice President,
JAXA Astronaut,
Tokyo University of Science
(TUS),
Japan



Henk Rogers
Chairman,
Blue Planet Foundation,
HiSeas and International
Moon Base Alliance,
United States



MODERATOR
Bernard Foing
Director ILEWG, Prof VU
Amsterdam, ITACUS Vice
Chair,
European Space Agency
(ESA),
The Netherlands

12:15 - 13:15 SpS – Space Chemistry: a Key to Fostering Space Exploration

Location: Bremen Exhibition & Conference Center – CCB Bessel



12:15 - 13:15 SpS – 2018: 10 years Columbus in Space and Delivery of Orion European Service Module

Location: Bremen Exhibition & Conference Center – ÖVB 4



13:15 - 14:45 SpS – Space Needs Everyone's Ideas! Prizes and Challenges in the Space

Location: Bremen Exhibition & Conference Center – CCB Bergen



13:30 - 16:30 Technical Sessions



No.	Title	Room
A1.8	Biology in Space	CCB Danzig
A2.7	Life and Microgravity Sciences on board ISS and beyond (Part II)	Bremen 2
A3.4B	Small Bodies Missions and Technologies (Part 2)	CCB Kaisen
A4.2	SETI 2: SETI and Society	ÖVB 3
A6.8	Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal (Joint Session with IAF Space Security Committee)	ZARM 1
B4.7	Highly Integrated Distributed Systems	ZARM 2
B4.9-GTS.5	Small Satellite Missions Global Technical Session	ÖVB 4
C1.9	Mission Design, Operations & Optimization (2)	CCB Borgward
C2.9	Advancements in Materials Applications and Rapid Prototyping	ÖVB 2
C4.10	Propulsion Technology (3)	Bremen 3
C4.8-B4.5A	Joint Session between IAA and IAF for Small Satellite Propulsion Systems	ZARM 5
D1.6	Cooperative and Robotic Space Systems	CCB London
D2.9-D6.2	Safe Transportation Systems for Sustainable Commercial Human Spaceflight / Small Launchers: Concepts and Operations (Part II)	CCB Lloydsaal
D4.5	Space Resources: Technologies, Systems, Missions and Policies	Bremen 1
D5.4	Cyber-security threats to space missions and countermeasures to address them	ZARM 3
E1.2	Lift Off - Secondary Space Education	CCB Scharoun
E4.3A	Germany's Contribution to Astronautics Post WWII	CCB Roselius
E4.3B	"Can you believe they put a man on the moon?"	CCB Roselius
E7.7-B3.8	Legal framework for collaborative space activities - New ways of launching (micro-launching) and large constellation microsats (Joint IAF/IISL session)	ZARM 4

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 digitized 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 go in hand with the challenge to manage, analyze 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



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

13:50 - 14:50 SpS – RF Spectrum for TT&C – Regulatory Framework vs. Needs of Operators

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



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



Jim Keravala
CEO,
OffWorld, Inc.,
United States



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

15:00 - 16:30 SpS – The European Research Council – funding opportunities for Bright Minds

Location: Bremen Exhibition & Conference Center – CCB Franzius



15:00 - 16:30 SpS – The Design Sprint: How to Solve Almost Any Challenge in Less Than a Week

Location: Bremen Exhibition & Conference Center – CCB Bergen



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 Rathausshalle", 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

Time	Event	Room
THURSDAY 27 SEPTEMBER 2018		
09:00 - 18:30	SPACE GENERATION CONGRESS (SGAC)	UNIVERSITY OF BREMEN
FRIDAY 28 SEPTEMBER 2018		
08:00 - 17:00	26 TH WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: "INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)"	CCB BORGWARD, CCB DANZING, CCB LONDON
09:00 - 18:30	SPACE GENERATION CONGRESS (SGAC)	UNIVERSITY OF BREMEN
09:00 - 18:00	IAF/ISEB EDUCATORS PROFESSIONAL DEVELOPMENT WORKSHOP	DLR SchoolLab
SATURDAY 29 SEPTEMBER 2018		
08:00 - 17:30	26 TH WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: "INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)"	CCB BORGWARD, CCB DANZING, CCB LONDON
09:00 - 18:00	TUTORIAL 3: PLANETARY PROTECTION 101	CCB FOCKE-WULF-SAAL
09:00 - 18:30	SPACE GENERATION CONGRESS (SGAC)	UNIVERSITY OF BREMEN
10:00 - 13:00	IAA SPACE DEBRIS COMMITTEE MEETING	CCB LILIENTHAL
11:00 - 13:00	IAF FINANCE COMMITTEE MEETING	ÖVB 1
12:30 - 13:00	IAA COMMISSION PLENARY MEETING	CCB OSLO
13:00 - 15:00	IAF SPACE EXPLORATION COMMITTEE MEETING	CCB GAUß
13:00 - 15:00	IAF NEXT GENERATION COORDINATION COMMITTEE (NGCC) MEETING	CCB HERSCHEL
13:00 - 16:00	IAA COMMISSION MEETING 1	CCB LLOYDSAAL
13:00 - 16:00	IAA COMMISSION MEETING 2	CCB ROSELIUS
13:00 - 16:00	IAA COMMISSION MEETING 3	CCB BERGEN
13:00 - 16:00	IAA COMMISSION MEETING 4	CCB SCHAROUN
13:00 - 16:00	IAA COMMISSION MEETING 6 - SPACE & SOCIETY, CULTURE & EDUCATION	CCB OSLO
13:00 - 17:00	JAXA SPACE EDUCATION AND OUTREACH	ÖVB 6
13:00 - 17:00	JAXA SPACE EDUCATION AND OUTREACH	ÖVB 5
14:00 - 15:30	IPC STEERING GROUP MEETING SESSION I	CCB BESSEL
15:00 - 16:30	IAF TECHNICAL ACTIVITIES COMMITTEE (TAC) MEETING	CCB BESSEL
16:00 - 17:30	IAA SCIENTIFIC ACTIVITIES COMMITTEE (SAC) MEETING	CCB OSLO
17:00 - 18:30	IPC GENERAL MEETING	CCB HANSESAAL
SUNDAY 30 SEPTEMBER 2018		
08:00 - 17:30	26 TH WORKSHOP ON SPACE TECHNOLOGY FOR SOCIO-ECONOMIC BENEFITS: "INDUSTRY, INNOVATION AND INFRASTRUCTURE FOR DEVELOPMENT (3IS4D)"	CCB BORGWARD, CCB DANZING, CCB LONDON
08:00 - 18:00	SGAC PROFESSIONAL DEVELOPMENT WORKSHOP	CCB GAUß
08:00 - 18:00	SGAC PROFESSIONAL DEVELOPMENT WORKSHOP	CCB HERSCHEL
08:00 - 18:30	IAA ACADEMY DAY	CCB HANSESAAL
08:15 - 13:30	CROSS-CULTURAL WORKSHOP	CCB ROSELIUS AND CCB OSLO
09:00 - 12:00	IAF SPACE EDUCATION AND OUTREACH COMMITTEE (SEOC) MEETING SESSION I	ÖVB 1

Time	Event	Room
09:00 - 17:30	IAF INTERNATIONAL MEETING FOR MEMBERS OF PARLIAMENTS	BREMEN STATE PARLIAMENT
09:00 - 18:00	IPMC YP WORKSHOP	CCB FOCKE-WULF-SAAL
10:30 - 13:00	IAC HOSTS SUMMIT	CCB KAISEN
13:00 - 15:00	IAF EARTH OBSERVATION COMMITTEE MEETING	CCB HUMBOLDT
13:00 - 18:00	IAF ASTRODYNAMICS COMMITTEE MEETING	ÖVB 6
14:00 - 17:00	IAF BUREAU MEETING SESSION 1	ÖVB 5
14:00 - 17:00	IAF WORKFORCE DEVELOPMENT - YOUNG PROFESSIONALS PROGRAMME (WD / YPP) COMMITTEE MEETING	ÖVB 1
14:00 - 18:00	ISEB CROSS-CULTURAL WORKSHOP	CCB ROSELIUS
14:00 - 18:00	IAF MATERIALS AND STRUCTURES COMMITTEE MEETING	CCB SCHAROUN
15:00 - 17:00	IAA BOARD OF TRUSTEES	CCB BERGEN
15:00 - 17:00	IAF GEOS SUBCOMMITTEE MEETING	CCB HUMBOLDT
15:00 - 17:00	IAF SPACE PROPULSION COMMITTEE MEETING	CCB LILIENTHAL
15:00 - 17:30	IAF MICROGRAVITY SCIENCES AND PROCESSES COMMITTEE MEETING	CCB OSLO
16:00 - 18:00	IAF COMMERCIAL SPACEFLIGHT SAFETY COMMITTEE MEETING	CCB BESSEL
17:00 - 19:30	IAF SPACE TRANSPORTATION COMMITTEE MEETING	CCB LILIENTHAL
17:00 - 21:00	IAF HUMAN SPACEFLIGHT COMMITTEE MEETING	CCB BERGEN
18:00 - 19:00	IAF ESL/ YSL COMMITTEE MEETING	CCB BESSEL
18:00 - 21:00	A CONVERSATION ABOUT SPACE ARCHITECTURE	CCB FRANZIUS
19:00 - 20:00	YP NETWORKING EVENT: ESL 10TH ANNIVERSARY CELEBRATION	CCB BORGWARD
MONDAY 1 OCTOBER 2018		
08:00 - 09:00	VIP GATHERING	IP HALL
08:00 - 09:00	HOA PREPARATORY MEETING	CCB HUMBOLDT
09:00 - 10:30	OPENING CEREMONY	ÖVB ARENA
10:00 - 10:30	IAA STUDY GROUP 2.18	ÖVB 6
10:30 - 11:30	OPENING EXHIBITION AND VIP TOUR	EXHIBITION HALL
11:00 - 13:00	IAF SPACE LIFE SCIENCES COMMITTEE MEETING	CCB GAUß
11:00 - 13:00	IAF SPACE SYSTEMS COMMITTEE MEETING	ÖVB 5
11:00 - 13:30	IAA STUDY GROUP 4.23	ÖVB 6
11:30 - 12:15	PRESS CONFERENCE: IAC KICK-OFF	CCB GALLERY
13:00 - 18:00	IISL BOARD OF DIRECTORS	ÖVB 5
13:15 - 14:45	PE1: HEADS OF AGENCIES: INVOLVING EVERYONE - WHAT'S NEW FOR THE SPACE AGENCIES?	DLR HALL
14:15 - 15:00	LANDSPACE TECHNOLOGY PRESS CONFERENCE	CCB GALLERY
15:00 - 15:15	GNF: GNF OPENING	DLR HALL
15:00 - 17:00	IAA COMMISSION MEETING 5	ÖVB 6
15:00 - 18:00	IAF GENERAL ASSEMBLY SESSION 1	CCB HANSESAAL
15:15 - 15:45	GNF: RESULTS FROM THE AMS EXPERIMENT ON THE INTERNATIONAL SPACE STATION	DLR HALL
15:15 - 16:00	PRESS CONFERENCE: HEADS OF AGENCIES	CCB GALLERY
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)"	DLR HALL
16:00 - 17:30	IAA STUDY GROUP 3.27	ÖVB 1

Time	Event	Room
16:25 - 17:10	GNF: THE ISS AS A « LAUNCH PAD » FOR THE FUTURE ASTRONAUTICS : INNOVATIVE TECHNOLOGIES, OPEN ARCHITECTURE, AND INTERNATIONAL COOPERATION FOR DEEP SPACE MISSIONS	DLR HALL
17:15 - 18:00	GNF: HUMAN SPACEFLIGHT BEYOND LOW EARTH ORBIT	DLR HALL
17:45 - 18:45	NASA ADMINISTRATOR MEETING WITH STUDENTS	CCB LILIENTHAL
17:45 - 18:15	PRESS CONFERENCE: MOON RACE ANNOUNCEMENT	CCB GALLERY
18:15 - 19:30	PE2: HOST PLENARY: HOW TO LIVE AND WORK ON ISS, MOON AND MARS	DLR HALL
19:30 - 22:00	WELCOME RECEPTION	FESTIVAL HALL
TUESDAY 2 OCTOBER 2018		
08:00 - 10:30	IAF CONGRESS AND SYMPOSIA ADVISORY COMMITTEE (CSAC) REPORT/MEETING/INTERVIEW I	ÖVB 6
08:30 - 09:30	PE3: HIGH TECH ENTANGLEMENT: HOW THE DIVERSE GLOBAL SPACE INDUSTRY AND OTHER HIGH-TECH SECTORS ARE BECOMING MORE ENTWINED AND INTERDEPENDENT	DLR HALL
09:00 - 11:00	IAF SPACE ASTRONOMY TECHNICAL COMMITTEE (SATC) MEETING	ÖVB 5
09:00 - 12:00	IAF SPACE OPERATIONS COMMITTEE MEETING	CCB GAUß
09:00 - 12:00	IAF INTERNATIONAL PROJECT/PROGRAMME MANAGEMENT COMMITTEE (IPMC) MEETING	CCB BESSEL
09:30 - 11:30	MOON VILLAGE ASSOCIATION ADVISORY COUNCIL	CCB HUMBOLDT
09:45 - 10:45	GNF: ORBITS, ARTS & CULTURE	CCB HANSESAAL
09:45 - 11:15	GNF: INCLUDING EVERYONE IN LUNAR EXPLORATION	DLR HALL
10:00 - 10:45	PRESS CONFERENCE: MILO SPACE SCIENCE INSTITUTE	CCB GALLERY
10:00 - 12:00	IAF SPACE SECURITY COMMITTEE MEETING	ÖVB 1
11:00 - 12:00	GNF: BRIDGING SPACE AND SOCIETY: STRATEGIES OF SPACE AGENCIES TO FOSTER THE UPTAKE OF SATELLITE-BASED SERVICES	CCB HANSESAAL
11:00 - 12:00	ANNOUNCEMENT ON THE CALL OF INTEREST FOR THE ATLANTIC INTERNATIONAL SATELLITE LAUNCH PROGRAMME	CCB GALLERY
11:00 - 12:30	IAF GRULAC COMMITTEE MEETING	ÖVB 5
11:30 - 12:00	GNF: THE AUSTRALIAN SPACE	DLR HALL
11:30 - 13:45	IAA SPACE MINERAL RESOURCES STUDY GROUP	CCB HUMBOLDT
12:00 - 13:00	INTERNATIONAL LUNAR OBSERVATORY ASSOCIATION MEETING	ÖVB 1
12:00 - 13:30	IAA STUDY GROUP 4.21	CCB BESSEL
12:10 - 12:30	GNF: SPACE SUSTAINABILITY RATING – NEW WAY OF ADDRESSING THE ORBITAL DEBRIS CHALLENGE	CCB HANSESAAL
13:00 - 14:00	IAA SMALL SATELLITE MISSIONS PROGRAMME	CCB GAUß
13:00 - 18:00	IISL MOOT COURT COMPETITION (SEMI-FINALS)	ÖVB 1
13:00 - 18:00	IISL MOOT COURT COMPETITION (SEMI-FINALS)	ÖVB 5
13:15 - 18:30	GERMAN - JAPANESE B2B WORKSHOP	CCB LILIENTHAL
13:30 - 14:30	PE4: THE GAME CHANGERS: FOR A JOINT FUTURE IN SPACE	DLR HALL
14:00 - 15:30	IAF CLIODN COMMITTEE MEETING	CCB HUMBOLDT
14:00 - 16:00	IAF INTEGRATED APPLICATIONS COMMITTEE MEETING	CCB GAUß
14:45 - 15:45	GNF: AIRCRAFT PARABOLIC FLIGHT CAMPAIGNS FOR MICROGRAVITY AND STUDENT EXPERIMENTS	CCB HANSESAAL
14:45 - 16:15	GNF: IAF STARTUP PITCH SESSION	DLR HALL
15:00 - 16:00	PRESS CONFERENCE: EUROPEAN SPACE AGENCY DIRECTOR GENERAL	CCB GALLERY

Time	Event	Room
15:00 - 16:00	IAF KMTC MODEL BASED SYSTEM ENGINEERING WORKING GROUP MEETING	ÖVB 6
15:55 - 16:55	GNF: THE ROLE OF EDUCATION IN SUPPORT OF EMERGING COUNTRIES	CCB HANSESAAL
16:00 - 18:00	IAF KNOWLEDGE MANAGEMENT TECHNICAL COMMITTEE (KMTC) MEETING	CCB GAUß
16:30 - 16:50	GNF: INDUSTRY DEEP DIVES: LOCKHEED MARTIN VENTURES	DLR HALL
16:50 - 17:10	GNF: INDUSTRY DEEP DIVES: ISPACE'S FIRST COMMERCIAL LUNAR MISSIONS: LAUNCHER, LANDER, AND ROADMAP	DLR HALL
17:05 - 17:50	GNF: NEW SPACE – ROCKING EARTH OBSERVATION	CCB HANSESAAL
17:10 - 17:30	GNF: INDUSTRY DEEP DIVES: EARTH OBSERVATION TO THE POWER OF HUNDREDS – THE STORY OF PLANET	DLR HALL
17:15 - 17:45	PRESS CONFERENCE: GLOBAL CONFERENCE ON SPACE FOR EMERGING COUNTRIES - GLEC 2019	CCB GALLERY
17:30 - 17:50	GNF: INDUSTRY DEEP DIVES: AFFORDABLE, ACCESSIBLE, ACCELERATED – THE MILO SPACE SCIENCE INSTITUTE	DLR HALL
18:00 - 19:00	HHL1: THE GROWING ROLE OF ARTIFICIAL INTELLIGENCE IN SPACE EXPLORATION	DLR HALL
19:15 - 20:15	YP NETWORKING EVENT	CCB BORGWARD
WEDNESDAY 3 OCTOBER 2018		
08:00 - 09:30	IAF SPACE COMMUNICATIONS AND NAVIGATION (SCAN) COMMITTEE MEETING	CCB BESSEL
08:00 - 10:00	WORLD SPACE WEEK ASSOCIATION BOARD OF DIRECTORS MEETING	CCB HUMBOLDT
08:30 - 09:30	PE5: THE NEXT GENERATION PLENARY: SMALL SATS – INVOLVING EVERYONE THROUGH THEIR APPLICATIONS	DLR HALL
09:00 - 18:00	INTER-AGENCY SPACE DEBRIS COORDINATION (IADC) STEERING GROUP	ÖVB 5
09:00 - 18:00	SPACE CLIMATE OBSERVATORY INTERNATIONAL MEETING	ÖVB 6
09:30 - 12:30	IAA SETI PERMANENT COMMITTEE MEETING	CCB LILIENTHAL
09:40 - 10:40	GNF: WHAT WILL SHAPE THE FUTURE OF EUROPEAN LAUNCHERS?	DLR HALL
09:40 - 10:25	GNF: SMALL SATELLITE APPLICATIONS DEVELOPMENT LEVERAGING SOCIO-ECONOMIC BENEFITS	CCB HANSESAAL
10:00 - 11:00	PRESS CONFERENCE: ESA/NASA	CCB GALLERY
10:00 - 11:30	IAF HONOURS AND AWARDS COMMITTEE (HAC) MEETING	CCB GAUß
10:00 - 12:00	IAF INDUSTRY RELATIONS COMMITTEE (IRC) MEETING	CCB HUMBOLDT
10:35 - 11:05	GNF: INTRODUCTION OF THE SYSTEM AND CURRENT DEVELOPMENT ON AEROSPACE COMPONENTS IN CHINA	CCB HANSESAAL
10:50 - 11:10	GNF: SPACE SPIN-INS FROM THE UNDERGROUND – CERN'S AEROSPACE APPLICATIONS	DLR HALL
11:00 - 12:00	GLEC 2019 INTERNATIONAL PROGRAMME COMMITTEE MEETING	CCB BESSEL
11:15 - 12:15	GNF: ESA'S JAM SESSION ON SPACE SAFETY	CCB HANSESAAL
11:20 - 12:20	GNF: REUSABILITY: THE KEY TO RELIABILITY AND AFFORDABILITY	DLR HALL
13:00 - 15:00	IAF STUDENT ACTIVITIES SUBCOMMITTEE MEETING	CCB GAUß
13:30 - 14:30	PE6: FROM DEEP IMPACT TO GRAVITY THROUGH SPACE WEATHER: WORKING TOGETHER TO PROTECT FROM CIVILIAN SPACE HAZARDS, HUMAN-MADE OR NATURAL	ÖVB ARENA
13:30 - 15:30	IAA STUDY GROUP 3.28	CCB HUMBOLDT

Time	Event	Room
14:00 - 15:00	PRESS CONFERENCE: COLOMBIAN SPACE AGENCY (AEC) AND ECUADORIAN SPACE AGENCY (EXA)	CCB GALLERY
14:40 - 16:10	GNF: THE NEED FOR A SOLID SME BASE WITHIN THE INDUSTRIAL CHAIN ON SPACE AND DEFENCE PROGRAMMES	CCB HANSESAAL
14:30 - 15:00	GNF: IN-FLIGHT CALL WITH ALEXANDER GERST	ÖVB ARENA
14:45 - 16:15	BELGIUM SPACE DAY CONFERENCE	CCB LILIENTHAL
15:00 - 16:00	IAF WORKING GROUP ON EMERGING COUNTRIES MEETING	CCB GAUß
15:00 - 16:00	GNF: IAF-ASE ASTRONAUTS EVENT	ÖVB ARENA
16:00 - 17:45	IAF IDEA 3G DIVERSITY AFTERNOON	ÖVB ÖLBERS
16:20 - 17:20	GNF: ITALIAN SPACE ECONOMY FOR THE SUSTAINABLE DEVELOPMENT GOALS	CCB HANSESAAL
16:30 - 17:30	GNF: EUROPEAN INDUSTRY CONTRIBUTION TO A LUNAR ORBITAL PLATFORM	DLR HALL
16:30 - 18:00	IAF CONGRESS AND SYMPOSIA ADVISORY COMMITTEE (CSAC) INTERVIEW II AND DEBRIEFING	ÖVB 1
17:30 - 17:45	GNF: THE UK SPACE AGENCY – TOWARDS 2030	CCB HANSESAAL
18:00 - 19:00	HLL2: GRAVITATIONAL WAVE DETECTION ON GROUND AND IN SPACE – THE NEW WINDOW TO THE UNIVERSE	DLR HALL
19:15 - 20:15	YP NETWORKING EVENT: YP ASTROPRENEUR PANEL	CCB BORGWARD

THURSDAY 4 OCTOBER 2018

08:00 - 10:00	IAF/IAA/IISL ADVISORY COMMITTEE ON HISTORY ACTIVITIES (ACHA) MEETING	CCB HUMBOLDT
08:00 - 11:00	SPACE CLIMATE OBSERVATORY INTERNATIONAL MEETING	ÖVB 6
08:00 - 11:00	ANALYTICAL GRAPHICS PRODUCT SUMMIT	CCB OSLO
08:30 - 09:30	PE7: GREENHOUSE GAS MEASUREMENTS FROM SPACE: DIFFICULT CHALLENGES, EMERGING SUCCESS, AND PLANS FOR THE FUTURE	DLR HALL
08:30 - 10:30	IAF ENTREPRENEURSHIP & INVESTMENT (EIC) COMMITTEE MEETING	CCB GAUß
09:40 - 10:40	GNF: SPACE STATION AND THE NEXT GENERATION: LAUNCHING THE LEO ECOSYSTEM	DLR HALL
09:45 - 12:30	IAF BUREAU MEETING SESSION 2	ÖVB 5
10:00 - 12:00	IAF SPACE MUSEUMS AND SCIENCE CENTRES COMMITTEE MEETING	CCB BESSEL
10:00 - 13:00	ESA CONVENTION COMMENTARY PROGRAMME "GET TOGETHER"	CCB HUMBOLDT
10:30 - 12:30	IAF SPACE ECONOMY COMMITTEE MEETING	CCB GAUß
10:50 - 11:50	GNF: SPACE & MOBILITY	DLR HALL
10:50 - 11:50	GNF: CLIMATE CHANGE – HOW CAN SPACE BASED MEASUREMENTS BE USED TO UNDERSTAND THE CHANGING HUMAN IMPACT ON THE SOURCES AND SINKS OF GREENHOUSE GASES AND GLOBAL CLIMATE CHANGE?	CCB HANSESAAL
11:00 - 12:00	MOON VILLAGE ASSOCIATION GENERAL MEETING	ÖVB 6
11:00 - 12:00	PRESS CONFERENCE: RBC SIGNALS AND ECUADORIAN CIVILIAN SPACE AGENCY (EXA)	CCB GALLERY
12:00 - 13:00	GNF: URBAN: CONCEIVING A LUNAR BASE USING 3D PRINTING TECHNOLOGIES	DLR HALL
12:00 - 13:00	GNF: PROSPECT OF CHINA'S NEW GENERATION RECOVERABLE SATELLITE PIGGYBACK SERVICE	CCB HANSESAAL
12:00 - 13:30	IAF SPACE SOCIETIES COMMITTEE MEETING	CCB BESSEL
12:30 - 14:30	IAA HISTORY COMMITTEE MEETING	CCB GAUß
12:45 - 13:15	INTERACTIVE PRESENTATIONS (IP) AWARD CEREMONY	IP HALL

Time	Event	Room
13:10 - 14:10	GNF: INTRODUCTION TO MANNED ENVIROMENT AND SCIENTIFIC EXPERIMENTAL RESOURCES OF CHINESE SPACE STATION	DLR HALL
13:30 - 15:00	IAF SPACE UNIVERSITIES AND ADMINISTRATIVE COMMITTEE (SUAC) MEETING	CCB HUMBOLDT
13:45 - 14:45	GNF: THE YOUNG GENERATIONS' PERSPECTIVE OF SPACE AND SECURITY	CCB HANSESAAL
14:00 - 19:00	IISL MOOT COURT COMPETITION (FINALS)	BREMEN COURT
14:20 - 15:20	GNF: HOW WILL QUANTUM TECHNOLOGIES CHANGE THE FUTURE OF SPACE?	DLR HALL
14:55 - 15:55	GNF: SGAC SPACEGEN ENTREPRENEURS FORUM	CCB HANSESAAL
15:00 - 17:00	IPC STEERING GROUP MEETING SESSION II	ÖVB 5
15:00 - 17:00	IAF ENTERPRISE RISK MANAGEMENT COMMITTEE (ERMC) MEETING	CCB HUMBOLDT
15:30 - 16:30	GNF: LIFE IN SPACE: THE SCIENCE, THE CHALLENGES, AND THE BROAD HORIZON	DLR HALL
16:00 - 17:30	IAA STUDY GROUP 3.24	CCB GAUß
16:05 - 17:05	GNF: DEVELOPING SPACE WORKFORCE – INDUSTRY FOCUS	CCB HANSESAAL
17:00 - 18:00	IAF ASTRODYNAMICS COMMITTEE MEETING	ÖVB 6
17:00 - 19:30	SGAC EXECUTIVE COMMITTEE MEETING	ÖVB 5
18:00 - 19:00	HLL3: THE SKY IS NOT THE LIMIT: PAVING THE WAY FOR AN ORBITAL SOCIETY	DLR HALL

FRIDAY 5 OCTOBER 2018

07:30 - 08:30	GNF: AHEAD OF THE CURVE – HOW OUR NEXT STEPS FUEL THE PATH TO THE MOON AND BEYOND	DLR HALL
08:30 - 09:30	LBN: MASCOT - MINERVA 11 - HAYABUSA2	DLR HALL
09:30 - 13:00	IAF GENERAL ASSEMBLY SESSION 2	CCB HANSESAAL
09:40 - 10:40	GNF: MONITORING ASTEROIDS: DEFENDING OUR PLANET. THREATS OR OPPORTUNITIES?	DLR HALL
10:50 - 11:50	GNF: IGNITING INTERNATIONAL EXCITEMENT FOR INTERPLANETARY SPACE TRAVEL	DLR HALL
12:00 - 13:00	GNF: EARTHMOONMARS : INVOLVING EVERYONE	DLR HALL
13:45 - 14:45	GNF: DIGITIZATION IN THE SPACE SECTOR – FROM HARDWARE TO SOFTWARE	DLR HALL
14:00 - 14:30	IAF BUREAU MEETING SESSION 3	ÖVB 5
14:55 - 15:40	GNF: CREATING THE MOON VILLAGE: FIRST RESULTS FROM THE DRAWING BOARD	DLR HALL
16:45 - 17:45	CLOSING CEREMONY	DLR HALL

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



5.1.2 2018 Young Professionals Programme

Sunday 30 September 2018

19:00 – 21:00 **YPP Networking Reception**
Room CCB Borgward

ESL Programme 10th Anniversary Celebration

Moderator:

- **Victoria Alonsoperez**, Founder, ChipSafer

Speakers :

- **Sanat Biswas**, Assistant Professor, Indraprastha Institute of Information Technology
- **Manisha Dwa**, Project Coordinator, Nepal Astronomical Society
- **Merve Erdem**, Research Assistant, International Law Department, Ankara University Faculty of Law
- **Minoo Rathnasabapathy**, Research Engineer, Space Enabled Research Group, Massachusetts Institute of Technology (MIT)
- **Ali Nasser**, Entrepreneur in Residence at TandemLaunch

Tuesday 2 October 2018

19:15– 21:15 **YPP Networking Reception**
Room CCB Borgward

NASA/Blue Origin/Lockheed Martin Joint Event

Speakers:

- **Jim Bridenstine**, Administrator, NASA
- **Bob Smith**, CEO, Blue Origin
- **Lisa Callahan**, Vice President and General Manager, Commercial Civil Space, Lockheed Martin Space

Wednesday 3 October 2018

19:15– 21:15 **YPP Networking Reception**
Room CCB Borgward

YP Astropeneur Panel & #UnlockYourIAC Competition



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

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: Mess 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
18:15-19:30 IAC Plenary 2
19:30-22:00 IAC Welcome Reception

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
17:45-18:45 IAC Highlight Lecture 1
19:00-21:30 ISEB Students Networking Session at Universum Bremen

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
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 5 Messe Bremen, ISZ

08:30-09:30 IAC Late-breaking News (LBN)
09:00-11:30 Outreach session "Tickle My Droid", ISZ
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 Nasser

Ali Nasser 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.

Ali 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-YPP).

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 Skolkovo 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 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 Jet 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 Satellite (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. Napolitano 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 UoKSat3". 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 SpasRezerv. 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 Yuriy 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 Caiazza

"I am Antonio Caiazza, 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 systemsbased 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 astronautical 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 (DGNC) 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 electronics 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 last 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 scholars 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 exploration. As such, she was selected to become a NASA Student Ambassador in 2012, 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 IPMC 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 Martínez

Esteban Martínez 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 BIRDS 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 AIAA'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 Payload – 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 Cosmonautics 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 TKSAT-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 graduate 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 astronautical 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 Phaethon. Prior to Japan, he completed his bachelor's degree in astronautical engineering at Istanbul Technical University (2013). Then, he received a double degree from Cranfield University (UK) and Luleå 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/DLR, in which a rover was teleoperated from the balloon to mimic future exploration on the Martian surface. Thanks to this multicultural 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 Escobari Vargas

Paola Escobari 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 alumni of the scholarships for a training in de China Academy of Space Technologies as part of the first Bolivian satellite TKSAT-1 of the Bolivian government, and a Chevening 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 SGAC as NPoC 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 Mykhalchyshyn

Roman Mykhalchyshyn 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, Zenit, Antares etc.

Roman is a PhD student, his work consists in the pneumatic and hydraulic systems improvement of launch vehicle. 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, hurricanes 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 curate 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 Bhattacharjee

"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 (GSFC) under the supervision of Dr. Marc Kuchner. At the GSFC, 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 Radioélectricité 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 party 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 NigeriaEduSAT-1 (Nigeria's first CUBESAT).

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 ISpatial 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 Chancharoen

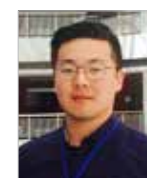
"When I was undergraduate student in Mechanical engineering, I did microgravity research about fluid flow in textile with JAXA parabolic flight. Subsequently, last year our research team in Thailand has been awarded as a team in National Space Exploration project governed by GISTDA, Thailand space agency that the study was 3D food printer in space. Then, on March 2018, I joined a Y-ISEF side event of ISEF2 at Tokyo. In that time, our team has been awarded by Dentsu 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 Enigmatic + Aesthetics Knowledge (FREAK) 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 freak 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 equitize space education of children and young generation in developing country. Finally, once again space is accessible area for everyone in the world."



Wasanchai Vongsantivanich

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, a framework under Asia Pacific Regional Space Agencies' Forum (APRSF) to collaborate among satellite operators to acquire and use data from space for disaster resilience. He's also working on 'Thailand Space 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.

Wasanchai is also an SGAC member and was an NPoC for Thailand. He is actively working internationally with other space organizations/agencies, especially among the emerging space countries to foster collaborations for space related activities. His perspective is to see the emerging space nations work together to be able to make use of space and contribute to the world space community efficiently and sustainably.



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 MAZAALAI 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 (MoSTA) in 2017, with the support of NUM and Institute of Astronomy and Geophysics Mongolian Academy of Sciences. MoSTA'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. MoSTA 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 intersection 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 GWU's first satellite, and is the manager for the SGx Conference. His authored and co-authored works have been published by the Journal of Science Policy and Governance, International Association for Advancement of Space Safety, International Astronautical Federation, European Space Policy Institute and American Institute of Aeronautics and Astronautics.



Stephanie Booth, a data professional at Bryce 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 Petersen 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 LaRC, 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 conference



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.



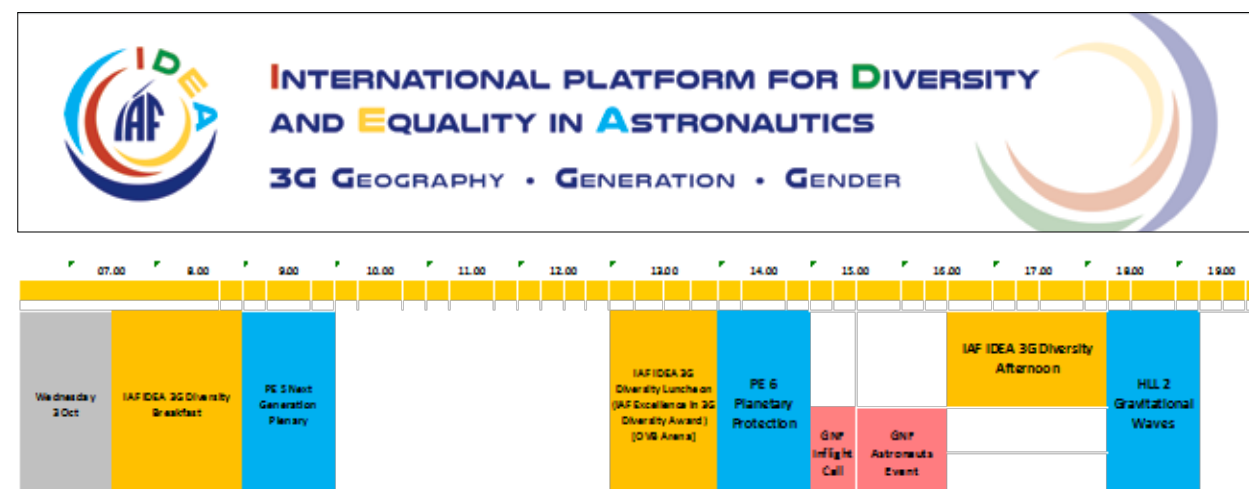
Lauren Smith currently works at Northrop Grumman as the Mechanical Test Engineering Manager for the James Webb Space Telescope (JWST) and has also supported as the JWST Integration and Test Non-Explosive Actuator Lead. Before JWST, Lauren held diverse roles in air and space, most recently as a program 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 MDNav 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 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 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 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.

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



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 Coderre**, Systems Engineer, LMC



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) |
| 13:15 – 13:20 | Premier Presentation of joint IAF/SGAC video on
"Fostering Generational Diversity" |
| 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 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 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
- 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 will 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 Juckenhoefel**, 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**



6.5 26th Workshop “Space Technology for Socio-Economic Benefits: “Industry, Innovation and Infrastructure for Development (3Is4D)”, organized by the International Astronautical Federation (IAF) and supported by the United Nations Office for Outer Space Affairs (UNOOSA)

Date: Friday 28 - Sunday 30 September 2018
Time: 08:30 - 17:15
Venue: Bremen Exhibition and Congress Center - CCB Borgwald, CCB Danzig & CCB London

Organized by:



Supported by:



OBJECTIVES

The Workshop will discuss space science, technologies and applications in support of economic, social and environmental development with a focus on the role of industries as key player to offer innovation and infrastructure needed for sustainable development. In particular, the Workshop will be a forum to share experiences of leaders in space industries, for networking amongst decision-makers in governments and opportunities for start-ups and emerging space related business in developing countries.

The main objectives of the Workshop are to:

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); and
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

Session 2: Space Applications for Developing Countries, in Particular those in the Africa

Developing countries are facing major challenges due to fast pace of development and it is crucial for these countries to ensure that it is sustainable. The session will provide presentations on specific applications towards supporting developing countries. Presentations from industry from developing countries are encouraged. The emphasis will be given to the experience and needs of the countries that are beginning to use space for development. The session will attempt to address the challenges developing countries are facing in using space technologies and proposals on how to overcome these challenges.

Session 3: Experience Sharing of Space-Related Industries, Start-Ups and Emerging Industries from Developing Countries

The session will engage the space-related industries to share their insight on space-related innovations and infrastructure, success stories and technology trends for the benefit of start-ups and emerging businesses from developing countries. The start-ups and emerging industries will also be provided opportunities to share their experiences, difficulties and lessons learnt. The session expects to bring together space related industries ranging from satellite and hardware manufacturing to end user application and services developers.

Session 4: Space Industries for Supporting Specific Sustainable Development Goals

The session will discuss how investment in space and supporting infrastructure by public and private actors will bring long-term benefits to the society. The session will focus on how space industries could support and contribute to all SDGs and, in particular, to SDG 9 industry, innovation and infrastructure and SDG 17 Partnerships for the Goals. The SDG 9 highlights that technological progress is key to finding lasting solutions to both economic and environmental challenges, such as providing new jobs and investing in scientific research and innovation are important ways to facilitate sustainable development. The SDG 17 aims to enhance partnerships. This Workshop will contribute to the modalities such as North-South, South-South, regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing.

High level panel: UNISPACE+50 - The role of Industry

The leaders from international organisations, space agencies and industries will speak about their vision on role of space-related industries in UNISPACE+50.

Breakout sessions

Breakout parallel sessions will be organized on specific topics to get contribution from the participants on the objectives of the workshop. The topics for breakout sessions are:

1. Improving access to Earth observation technologies and data for socio-economic benefits;
2. Developing programmes to help developing countries with technical advisory services and capacity building support to develop space-based applications; and
3. Space investments and socio-economic impacts- Raising awareness amongst decision-makers to invest more in space related industries.

Concluding session

Summary of the outcomes of the sessions of the workshop will be presented.

Poster Session

Participants may indicate their interest in exhibiting posters.

Co-Sponsored by:

European Space Agency (ESA)



Hosted by:

Center of Applied Space Technology and Microgravity (ZARM)



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 <i>Classroom Instruction that Works</i>		
10:15 - 10:30	Break		
10:30 - 12:30	Grades 3-6 DLR_School_Info Experiments and activities at school	Grades 7+ STEM Education with satellite imagery and ISS videos	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	ESA Education	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 <i>Classroom Instruction that Works</i> 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 English 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 Willsch**, 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 (UAESA)

10:30 **Keynote 5: Transforming the Space Sector**

- **Hiroshi Yamakawa**, President, Japan Aerospace Exploration Agency (JAXA) (Invited)

10:45 **Coffee Break**

11:15	Interventions by Members of Parliaments and Discussion
12:00	<p>Session 1: Education to Business</p> <p>Space provides an endless reservoir for business opportunities. Incubation is one of the main tasks for space agencies to fulfil 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.</p> <p><i>Presentations (10 min) and Roundtable discussion</i></p> <ul style="list-style-type: none"> • Andres Jaadla, Coordinator ENVE 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 Juckenhöfel, Vice President On-Orbit Services and Exploration, Airbus Defence and Space
13:00	<p>Lunch Break</p> <ul style="list-style-type: none"> • Address by Pierre Godart, CEO, Ariane Group - IAC 2018 Team Germany • Group photo
14:30	<p>Keynote 6: UNISPACE+50 Outcomes and the Way Forward on Space 2030</p> <ul style="list-style-type: none"> • Simonetta Di Pippo, Director, United Nations Office for Outer Space Affairs (UNOOSA)
14:45	<p>Session 2: Science to Research and Development</p> <p>The space sector is based on science meeting the highest challenges posed to research and technology development and manufacturing alike. Science as the foundation of a mature and comprehensive space effort is thus pushing R&D to also enable commercial competitiveness.</p> <p><i>Presentations (10 min) and Roundtable discussion</i></p> <ul style="list-style-type: none"> • Günther Hasinger, Director of Science, European Space Agency (ESA) • Gilles Rabin, 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	<p>Keynote 7: NASA's Exploration Campaign</p> <ul style="list-style-type: none"> • Jim Bridenstine, Administrator, National Aeronautics and Space Administration (NASA)
16:15	<p>Session 3: Innovation and Regulation</p> <p>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.</p> <p><i>Presentations (10 min) and Roundtable discussion</i></p> <ul style="list-style-type: none"> • Gabriel Swiney, Attorney Advisor, U.S. Department of State • Lionel Suchet, Chief Operating Officer, Centre National d'Etudes 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)

17:25	<p>Closing Remarks</p> <p>Closing remarks by Klaus-Peter Willsch, Member of German Bundestag and Chairman of Aviation</p> <p><i>Moderation of the event by Kai-Uwe Schrogl, ESA Chief Strategy Officer</i></p>
17:35	Adjourn
18:30	<p>Joint IAF MoP and International Academy of Astronautics Dinner (IAA)</p> <p><i>Dorint Park Hotel Bremen</i></p>
18:30	Welcome drink
19:00	<p>Welcome messages from:</p> <ul style="list-style-type: none"> • Peter Jankowitsch, President of the International Academy of Astronautics (IAA) • Jean-Yves Le Gall, President of the International Astronautical Federation (IAF) • Senator Prof. Dr. Eva Quante-Brandt, Senator of Science, Health and Consumer Protection
19:10	Introduction of the newly elected IAA Members
20:00	<p>Address by:</p> <ul style="list-style-type: none"> • Pascale Ehrenfreund, Chair of the DLR Executive Board and IAF Vice President for Communications, Publications and Global Conferences, • Jan Wörner, Director General, European Space Agency (ESA) and IAF Vice President for Agency, Parliamentarian and Ministerial Relations
21:30	<p>IAA Awards:</p> <ul style="list-style-type: none"> • Books Awards • Section Awards • Laurels for Team Achievements • Von Karman Award

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	<p>Opening of the IAC 2018 Exhibition and VIP Tour</p> <ul style="list-style-type: none"> • 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, ÖVB Olbers
13:15 – 14:45	<p>Plenary Event 1: Heads of Space Agencies "Involving Everyone-What is new for Space Agencies?"</p> <p>- Exhibition & Conference Center Bremen, DLR Hall</p>
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

18:15 – 19:30 **Plenary Event 2: Host Plenary “How to live and work on ISS, Moon and Mars”** - Exhibition & Conference Center Bremen, DLR Hall

19:30 – 21:30 **IAC Welcome Reception** - Exhibition & Conference Center Bremen, Festival Hall

Tuesday 2 October 2018

08:30 - 14:00 **MoP Technical Visit**

08:30 **Gathering Point** in the foyer of the Central Area of the Exhibition and Conference Center Bremen
09:00 - 10:30 ZARM Tour

At choice

10:30 - 13:30 Tour to DLR and OHB
13:30 Transfer to Fair Center

Alternatively

10:30 - 12:30 Tour to Airbus and ArianeGroup
12:30 - 13:00 Transfer to Fair Center

15:00 **Team Germany Reception** – Exhibition hall, Booth D20

19:00 - 22:00 **German Night**
Dorint Park Hotel Bremen

Address Information

Recommended Hotel: **Atlantic Grand Hotel Bremen**
Dorint Park Hotel Bremen

MoP Venue: **Bremen State Parliament**
Am Markt 20, 28195 Bremen

IAC Venue: **The Exhibition & Conference Center Bremen**
Central Area, Findorffstraße, 28215 Bremen, Germany

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

Time:	Programme
Opening	<p>Welcome Address and Opening Remarks by Master of Ceremony & Moderator</p> <p>Clay Mowry Vice President – Global Sales, Marketing & Customer Experience, Blue Origin, United States IAF VP for Financial Matters and IAC Evolution</p> <p>Welcome Address by Sponsors (United Arab Emirates Space Agency)</p>
Presentation	<p>IAC 2017: Reflections on a Success Story</p> <p><i>“This conference has set the benchmark for IAC events and Adelaide, and Australia should be justifiably proud of the legacies it will leave”.</i></p> <p>Michael Davis Chair, Space Industry Association of Australia and the IAC 2017 Local Organizing Committee</p>
Presentation	<p>A Retrospective View on IAC Evolution</p> <p><i>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.</i></p> <p>Christian Feichtinger Executive Director, International Astronautical Federation (IAF)</p>
Panel Discussion	<p>IAC 2018: “Involving Everyone”</p> <p><i>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.</i></p>
Panellists:	<p>Claus Lämmerzahl Professor, Director of Space Science, ZARM, University of Bremen</p> <p>Christiane Schmullius IAC 2018 IPC Co-Chair Chair, Friedrich-Schiller-Universität Jena</p> <p>Nicolas Peter Head of International Relations, German Aerospace Center (DLR)</p> <p>Fritz Merkle Member of the Management Board, OHB System AG-Bremen</p>
	Coffee break

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 Alonsopez

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



6.11 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.



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 (AUSMIISL) 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 Region 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 the different regions. The 2018 hypothetical Problem is entitled the "THE DEMOCRATIC REPUBLIC OF NEAPILIA (APPLICANT) v. THE REPUBLIC OF KALVION (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 (ECSL), 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. These oral arguments are conducted in closed sessions before three judge panels, and the two winning teams qualify for the Final.

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 in 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, lachsmootchair2@iislweb.org Co-Chair Les Tennen, Esq. lachsmootchair1@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/spacemoot>

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 space 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

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.



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 (UNISPACE-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.ruhhammer@spacegeneration.org

Christopher Nie
SGC 2018 Deputy Manager
christopher.nie@spacegeneration.org



SGAC 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.

- Navigating the Space Industry: Meet in small groups with industry leaders to discuss important career topics such as mentoring, work life balance, and advancement.
- Network Like a Professional: Learn how to effectively network in professional settings from a networking and communication expert.
- The Art of the Successful Interview: Practice and improve answers to common interview questions in small groups lead by an industry mentor or HR professional.
- Startup 101: Perfecting the Elevator Pitch: Bring your 3 minute elevator pitches and work on them in a small group with experienced entrepreneurs and venture capitalists. Opportunities to practice it in front of the friendly crowd and maybe catch the attention of our industry mentors. Don't have a pitch? There will be opportunities to meet with a professional about how to market yourself or your idea in a 3 minute pitch!

For more information, please contact:

Kathryn Robison
Recruitment Manager
kathryn.robison@spacegeneration.org

Lauren Napier
SGAC Consultant
lauren.napier@spacegeneration.org

Sunday 30 September 2018, 09:00 – 17:00 - Space Exploration Workshop (advanced registration required), ZARM, Bremen

The Space Exploration Workshop will teach participants about Mission Control activities for Analog Space Missions. This workshop is organized by SGC Organizing Team members and the co-leads of the Space Exploration Project Group of SGAC. The participants will form mission control (MC) for a simulated analog. The participants will learn from experts about how to run Mission Control Operations in the first half of the workshop and then in the second half they will have a practical exercise to put their mission control skills to the test by running a simulate of a simulated mission (SimSim). The participants will have to decide how to respond to situations and relay their decisions to Analog Astronauts. The experts will score them on their choices/results and at the end of the workshop feedback will be provided.

For more information, please contact:

Ani Vermeulen
SGC Organising Team Member
ani.vermeulen@spacegeneration.org

Tuesday 2 October 2018, 16:00 - SGAC Booth Reception, Exhibition Hall 5B 41

Join SGAC and Space Foundation for refreshments at our Booth (Exhibition Hall 5B 41) and get acquainted with fellow SGAC members, IAC delegates, speakers and panellists.



For more information, please contact:

Lauren Napier
Space Generation Advisory Council
SGAC Consultant
lauren.napier@spacegeneration.org

Bernadette Maisel
Space Foundation
Director - Program Initiatives
bernadette@spacefoundation.org

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



Thursday 4 October 2018, 14:55 - 15:55 – IAF Global Networking Forum: SpaceGen Entrepreneurs Forum, Room CCB Hansesaal

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 (1h): 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:

Startup ecosystem panel speakers:

TED-style talks speakers:

1. Adnan Al Rais: Director, Remote Sensing Department, Mohammed Bin Rashid Space Centre (MBRSC)
2. Robert Boehme: Founder and CEO, PTScientists
3. Chris Boshuizen, Operating Partner, Data Collective VC, United States

Moderators:

Mr. Mansoor Shar, SGAC

Thursday 4 October 2018, 13:45 - 14:45 – IAF Global Networking Forum: The Young Generations' Perspective of Space and Security

Location: CCB Hansesaal

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 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.

Speakers and moderators:

Round Table Discussion:

1. Ntorina Antoni: PhD in Space and Security, Eindhoven University of Technology
2. Aline Decadi: 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 Schrogl: IISL President and Chief Strategy Officer, International Institute of Space Law (IISL), 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:

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SGC 2018 Event Manager Email: florian.ruhhammer@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.

SGAC 2018 Space Generation Leadership Award

One of the main missions of SGAC is to facilitate access to the world's major space conferences for young professionals and students. The Space Generation Leadership Award enables five outstanding SGAC members to attend the 17th Space Generation Congress and the 69th International Astronautical Congress in Bremen, Germany.

Every year, SGAC receives an outstanding number of high quality applications. Congratulations to all selected awardees of the SGAC 2018 Space Generation Leadership Awards.

Abraham Akinwale (Nigeria)



Akinwale Abraham Tobiloba is a graduate of Mechanical Engineering, Obafemi Awolowo University (OAU), Ile-Ife, Nigeria. He is the Co-Founder of AirDroneCorp, a start-up that designs and manufactures fixed wings unmanned aerial vehicle. He is currently the National Point of Contact Nigeria for the Space Generation Advisory Council. He is one of the student representatives of the University Space Engineering Consortium, Nigerian Chapter. He was the Event Manager for the First African Space Generation Workshop 2017. He has a passion for building the youths and developing young minds on space matters. In his private time, he loves writing, cooking and meditating. He is very much interested in economic development in terms of structural growth and industrialisation, and building capacity towards producing results. Self-awareness is key to development and growth especially in Africa.

Anthony Yuen (Australia)



Anthony Yuen is a medical doctor and a mechanical and space engineer, currently working as an Assistant Professor at Weill Cornell Medical College and an Assistant Attending in the Division of Pediatric Emergency Medicine at New York-Presbyterian Hospital in New York City. He studied at the University of Queensland in Brisbane, Australia where he obtained his engineering and medical degrees. His past interests and experience span areas as diverse as ramjets, needle-free delivery of drugs and vaccines, global health, artificial hearts, and high-fidelity medical simulations. His eventual goal is to develop innovative approaches at the intersection of medicine, engineering and technology to overcome the challenges of long duration spaceflight on the human body. Within SGAC, he is currently one of the Web Coordinators and recently lead the rebuild of the SGAC website. He has previously been the Delegates Coordinator for SGFF2018 and was a Web Editor in 2015. Anthony received the SGAC Pioneer Award and Member of the Month along with the whole Web Team in 2018.

Arnau Pons (Spain)



Arnau Pons is a Ph.D. candidate in Aeronautics and Astronautics Engineering at Purdue University in West Lafayette, IN and working at the Maurice J. Zucrow Laboratories. He has been awarded the "la Caixa" fellowship in order to research on rocket propulsion and combustion instabilities in aerospace propulsion systems. Arnau holds a Master's Degree of Aerospace Propulsion Theory and Engineering by Beihang University in Beijing, China. Furthermore, he received his Aeronautical Engineering degree (B.S. and M.S.) specialized in Space Engineering from the Polytechnic University of Catalonia (UPC) in Terrassa, Spain. He attended the International Space University Space Studies Program 2015 hosted by the Ohio University in Athens, Ohio, in partnership with NASA Glenn Research Center. In addition to his academic interests, Arnau is fully engaged with the SGAC community. He is currently the acting Treasurer and prior to that, he has been Financial Comptroller, SGC 2017 Congress Manager, SGC 2016 Deputy Congress Manager and delegate in SGC 2015. He is a glider pilot and loves playing soccer.

Laura Bettiol (Italy)



Laura has recently concluded her Ph.D. in Space Sciences, Technologies and Measurements and is currently a Post-Doctoral Research Fellow at the Center of Studies and Activities for Space of the University of Padova (Italy). After pursuing her Master's and Bachelor's degrees in Aerospace Engineering, she completed the interdisciplinary Space Studies Program 2015 of the International Space University at the Ohio University in Athens, Ohio (USA). As an SGAC member, Laura has been the National Point of Contact for Italy since November 2015. She has also been part of different projects of the Space Safety and Sustainability and Space Exploration project groups and has organized several events in Italy. She is also the deputy lead of the flight planning team of the Austrian Space Forum and is currently a member of the Core Team of the Local Group of Rome of Women in Aerospace Europe. In her free time, Laura loves travelling and scuba diving.



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 worked 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 cofounder and former Director of the Aerospace Association of the Faculty of Engineering of her university. Since 2016, she is National Contact Point from México 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 was part of 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.



Allan D. Emil
(1898 – 1976)



2018 Awardee
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 advocator 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.



Frank J. Malina
(1912 – 1981)



2018 Awardee
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 organisations (industry, government, academia) worldwide for outstanding contributions to the fostering of “3G” (Geography, Generation, Gender) Diversity within the space sector. It is an annual award presented at the IAC, but is given only when nominations of exceptional merit are received.

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 recognized 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 Leahao, Barbara Ryan, Joan Vernikos and Kiyoshi Higuchi.



2018 Awardee
Long Leahao

Long Leahao, 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 CZ-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...



2018 Awardee
Barbara Ryan

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.



2018 Awardee
Joan Vernikos

Dr. Vernikos is leading research to the right path for future Space missions. She first developed a unique device, a human powered centrifuge as the most efficient countermeasure to microgravity conditions and no other has been evidenced so far. She was the mentor of most astronauts, being there when they needed her, resolving most of their problems and dared to send John Glenn at age 77 into Space. She contributed substantially during the course of her career to the progress of space science, space technology, and management of space projects and space benefits to mankind within the framework of the IAA/IAF activities.

She is an active member of IAA with significant achievements. After her retirement she is sharing her experience and knowledge with advising Space research committees and spreads this knowledge all over the world, writing several books translated in many languages and giving lectures internationally on healthy aging, leading the third age activities. She is a famous leader and needs to be recognized by our community.



2018 Awardee
Kiyoshi Higuchi

Kiyoshi Higuchi is former IAF President and former JAXA Vice-President. He took office in April 2010 to provide general oversight and overall coordination of JAXA activities and retired from JAXA in 2015.

From the very beginning of his career, Higuchi has been always at the center of Japan's efforts to advance the development of space technology and its applications and to pursue space exploration.

Higuchi was born in 1946 in Mie Prefecture, Japan. He received a bachelor's degree in mathematics from Nagoya University and a master's degree in aeronautics and astronautics from the Massachusetts Institute of Technology (MIT) in 1977.

Higuchi started his career in 1969 with the Science and Technology Agency of the Government of Japan. Upon the establishment of the National Space Development Agency of Japan (NASDA) that year, he joined NASDA as an engineer to be involved in developing sounding rockets and H-series rockets.

From the early 1980's, he started to play a key role in the Japanese participation in the International Space Station (ISS) Programme. Higuchi helped establish the International Utilisation Coordination Working Group (IUCWG), to strengthen collaboration among ISS partners in utilising ISS.

From the mid-1990's, he became increasingly involved in the overall planning and management of NASDA. When NASDA 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 untiring 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

Exhibitors	Stand	Exhibitors	Stand
3D-Plus	E 31	D-Orbit Spa	B24
Advanced Graphene Products	G21	DSI Aerospace Technologie GmbH	E34
Aerion Technologies Corporation	G20	DTM SRL	C24
IAC 2019 Hosted by AIAA	E20	ECM Space Technologies GmbH	A81
Air Liquide	E36	Emerging Countries	G14
Airbus	D70	Enpulsion GmbH	F24
Amphinicy Technologies	H22	EUMETSAT	B25
Analytical Graphics inc.	A65	European Commission	C27
ArianeGroup	D80	European Research Council	H19
A.S.I. (Agenzia Spaziale Italiana)	C25	European Space Agency	C50
Asia-Pacific Space Cooperation Organization	A60	Firefly Aerospace	F22
Astos Solutions GmbH	A40	Fraunhofer Space Alliance	F70
Astro- und Feinwerktechnik Adlershof GmbH	E38	Gauss Srl	C24
Astroscale PTE. LTD.	G03	GERADTS GMBH	F35
ATG Europe BV	F23	German Orbital Systems GmbH	A86
Australian International Airshow	A75	GK LAUNCH SERVICES	F82
Australian Space Agency	A75	GKN Aerospace	F21
AVIASPACE BREMEN e. V.	D20	GMV Insyen AG	B40
Azista Bst Aerospace	G01	GomSpace	B23
Bag Manufacturer	H10	Gradel S.A.R.L.	F38
bavAIRia E.V.	F80	HE Space Operations GmbH	E70
Bayern-Chemie GmbH	F80	HPS GmbH	F80
Beijing SpaceD Aerospace Application & Science Education Co., Ltd.	A80	IABG MBH	E35
Belgium Space	E55	IAC2018 Media Booth	G15
Berlin Space Technologies GmbH	G01	ICE- Italian Trade Agency	C24
Bishop GmbH - Aeronautical Engineers	F27	Indian Space Research Organisation	F02
Black Engine Aerospace UG	G13	Infostellar	G02
Blackout Technologies UG	D20	Institut für Raumfahrtssysteme, TU Braunschweig	C87
Boeing	B30	International Space University - ISU	C90
Bremen - City of Space	D20	ISEB International Space Education Board	C50
Bremeninvest	D20	ISPACE S.A.	F38
Centro Estero Internazionalizzazione Piemonte S.C.P.A.	C24	Israel Aerospace Industries	A30
Chinese Society of Astronautics	C70	Israel Space Agency	A35
Centre National d'Etudes Spatiales (CNES)	E50	Japan Aerospace Exploration Agency (JAXA)	C34
Confers	F25	Jena-Optronik GmbH	B45
Deutsche Gesellschaft für Luft- und Raumfahrt	H03	Kleos Space S.A.R.L.	F38
Deutsches Zentrum für Luft- und Raumfahrt e.V.	D15/D50	Korea Aerospace Research Institute (KARI)	A50
Deutsches Zentrum für Satelliten-Kommunikation e.V.	G11	Land Space Technology Co. LTD.	F36
DFKI GmbH, Robotics Innovation Center	A61	Lockheed Martin	E80
		Luxembourg- Ministry of the Economy	F38
		Luxspace S.A.R.L.	F38
		Matchmaking at IAC 2018 by Enterprise Europe Network	D25
		Mercedes-Benz Werk Bremen	D20

MetaSensing BV	G22	Space Tech Expo Europe	C86
Microchip Technology GmbH	F20	Spacety Co. LTD	B21
Mohammed Bin Rashid Space Centre	C40	SSC- Swedish Space Corporation	C84
MT Aerospace AG	D40	Start-Up Zone powered by ESA Space Solutions	C50
Nano Racks LLC	B20	STFC	C36
NASA	C30	Surrey Satellite Technology Limited	C80
New Zealand Space Agency	A55	Syrlinks	G19
NL-Space	E60	T4I-Technology for Propulsion and Innovation SRL	C24
Northrop Grumman	A45	Techno Systems Development SRL	C24
Northwestern Polytechnical University	F30	Technosprings Italia SRL	C24
Norway Pavilion	A20	TeleOrbit GmbH	F80
OHB SE	D40	Telespazio Vega Deutschland	F85
Planetek Italia SRL	C24	Tesat-Spacecom GmbH & Co. KG	E37
PLD Space	G18	Thrustme	H20
Polish Space Sector	C88	Tyvak International SRL	C24
Portugal Looks Up	H21	U Bremen Research Alliance	C94
PT Scientists GmbH	E25	UAE Space Agency	C44
REXUS/BEXUS Programme	D10	UK Pavilion - The British Interplanetary Society	C36
Romanian Space Agency	A89	Uni Würzburg, InformatikVII	F80
Rosenberger Hochfrequenztechnik GmbH & Co. KG	F80	Universität Bremen	D90
RUAG Space	C10	UNOOSA	H02
Safran Aircraft Engines	F26	Valispace UG	G10
SATLANTIS Microsats SL	B43	WEPA-Technologies GmbH	G12
SCISYS Deutschland GmbH	E75	Wittenstein SE	F80
Sierra Nevada Corporation	H15	Woman in Aerospace Europe	G17
SITAEL	C32	ZARM Center of Applied Space Technology and Microgravity, University of Bremen	D30
Smart Small Satellite Systems GmbH	F80	Zarm Drop Tower Operation and Service Company	D30
South African National Space Agency (SANSA)	A84	ZARM Technik AG	D30
Souvenir Shop	H12	Zentrum für Telematik e.V.	F80
Space Applications Services NV/SA	B44		
Space Flight Laboratory (SFL)	A64		
Space Generation Advisory Council (SGAC)	B41		

8.3 Exhibitor List

Stand: E 31	3D PLUS
	<p>Contact: <i>Manon Pellegrino</i></p> <p>Email: mpellegrino@3d-plus.com Web: www.3d-plus.com</p> <p>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.</p> <p>Its patented technology portfolio starts with standard package scale 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.</p> <p>3D PLUS offers catalogue products upward to more complex System-In-Package (SiP) solutions and associated services, which offers high Quality standards:</p> <ul style="list-style-type: none"> • 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 EPPL (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. <p>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 worldwide and with a recognized flight heritage of more than 16 years.</p>
Stand: G21	Advanced Graphene Products
 Advanced Graphene Products	<p>Contact: <i>Dominika Gnatek</i></p> <p>Tel: office@agp-corp.com Web: www.advancedgrapheneproducts.com</p> <p>AGP is a nanofechnological 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:</p> <ul style="list-style-type: none"> - commissioned 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 consortia with academia and industry). <p>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.</p> <p>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 quasis-monocrystalline graphene HSMG®.</p>
Stand: G20	Aerion Technologies Corporation
	<p>Contact: <i>Charles Schnake</i></p> <p>Email: sales@aerion-tech.com Web: www.aerion-tech.com</p> <p>Aerion Technologies develops scalable engineering software for simulation and design, including high-speed aerospace applications (i.e. launch vehicle aerodynamics).</p> <p>Our solutions are designed to be flexible enough to accommodate external tools and existing processes.</p> <p>Our architecture and licensing make high-volume use in an HPC environment easy and affordable.</p> <p>All of the above, combined with source code that was written for speed, results in a faster, and more cost-effective design cycle.</p>

Stand: E20	IAC 2019 Hosted by AIAA
	<p>Contact: <i>Christopher Semon</i></p> <p>Email: ChrisS@aiaa.org Web: www.aiaa.org</p> <p>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 Organizing Committee (LOC) invite the world to commemorate that "one giant leap" and celebrate the international accomplishments and partnerships that have become the hallmarks of space exploration.</p> <p>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 an experience to remember. It also gives your company unrivaled locations to celebrate the next deal with excellent restaurants, entertainment venues, and cultural attractions.</p> <p>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.</p> <p>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.</p>
Stand: E36	Air Liquide
	<p>Contact: <i>Anna Qu</i></p> <p>Mobile: anna.qu@airliquide.com Email: www.airliquide.com</p> <p>As a world leader in gases, Technologies and Services for Industry and Health, 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 launchers (ground resources and Ariane launchers) from Ariane 1 to the future Ariane 6, in the design of cryogenic equipment for satellites and also in space exploration (MTG, Herschel, Planck, Melfi, Curiosity, ExoMars...). The Group continues to innovate and push back the frontiers by developing new technologies to address two major challenges: help overcome major international challenges related to space and take part in observing Earth to understand, anticipate, and act on climate impacts. Our core business in space industry:</p> <p>Launchers:</p> <ul style="list-style-type: none"> • Cryogenic propellant tank for propulsion stages: oxygen, hydrogen, helium • Cryogenic launch pad infrastructures: 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 <p>Satellites:</p> <ul style="list-style-type: none"> • Onboard cryogenics for satellites: cold production from 0.1K to 200K - pulse tube cryocoolers, dilution coolers, turbo-Brayton, cryostats • 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 <p>Space exploration:</p> <ul style="list-style-type: none"> • Energy production and storage • Life support • Engineering, tests and services
Stand: D70	Airbus
	<p>Contact:</p> <p>Web: www.airbus.com</p> <p>With cutting-edge capabilities and decades of experience, the Space Systems Business Line of Airbus has all that it takes to design, develop and operate major space systems.</p> <p>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</p> <p>From the smallest electronic 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 telecommunication satellites to flawless International Space Station operations - reaching for the stars is our daily business.</p> <p>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.</p>

Stand: H22 Amphinicy Technologies

Contact:

Mirta Medanic

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Web: <http://www.amphinicy.com>

Amphinicy Technologies is the world's leading software provider for companies operating in the satellite and space industry 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 humanitarian 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 all-round software support for the satellite industry: ground segment simulation, NMS Solutions, beam roaming, passive satellite ranging, mobile solutions, content distribution platforms, aircraft tracking, and other.

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

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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 Ariane 6 launcher families, responsible for both design and the entire production chain, up to and including marketing by its Arianespace subsidiary, as well as for the missiles of the French oceanic deterrent force. ArianeGroup and its subsidiaries enjoy a global reputation as specialists in the field of equipment 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 proforma revenues exceed 3 billion euros.

Stand: C25 A.S.I. (Agenzia Spaziale Italiana)



Contact:

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ASI was founded in 1988. Its purpose was to coordinate all of Italy's efforts and investments in the space sector that had begun in the 1960s. ASI 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 most important programme is Cosmo-SkyMed, aimed at improving our knowledge of the Earth, but ASI also has the leadership in the European programme VEGA, the small rocket fully designed in Italy.

Stand: A60 Asia-Pacific Space Cooperation Organization

Contact:

Gao Ye

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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 mainstream 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:

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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/AOCS 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 sail applications. A fluent workflow from model over processor to hardware in the loop simulation is embedded in validation facilities. The EGSE product family is extended by a reconfigurable AOCS-SCOE based on dSPACE components, a GNSS simulator from SYNTONY, and a camera and LIDAR simulator for real-time testing of vision based navigation algorithms.

Stand: E38 Astro- und Feinwerktechnik Adlershof GmbH



Contact:

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Web: www.astrofein.com

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 family applicable to several satellite sizes, 1U to 12U CubeSat launchers and custom designed ACS solutions in space and on ground. Besides that we also provide flight proven standard satellite buses 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 ECSS 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:

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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 operations 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 originate 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 Vullings

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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 SpaceLabs focuses on project based thermo-mechanical engineering and technology developments in the field of carbon composite materials.

ATG Brightest Minds provides consultancy support of highly skilled personnel to International Agencies, Institutes and industry.

ATG Medialab is ATG Europe's 2D graphic 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.

Stand: A75 Australian International Airshow



Contact person:
Chris Macdarlane

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Avalon 2019 is Australia's principal aerospace trade event. Featuring defence, commercial and recreational exhibitors; 2019 will host the first space conference.

Visit our stand to meet with Space Industry representatives from Australia.

Stand: A75 Australian Space Agency



Contact:
Joe Andrews

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The Australian Government established the Australia Space Agency on 1 July 2018 with an investment of \$41 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: D20 AVIASPACE BREMEN e. V.



Contact:
Christine Schlenker

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AVIASPACE BREMEN e. V. is an association of dedicated companies and application-oriented research institutes in the Federal State of The Free Hanseatic City of Bremen and the surrounding areas. The network implements the aeronautics and space industries sector strategy of the Federal State of Bremen.

Our key areas are network formation, technology transfer, and economic growth through fostering young entrepreneurs and start-ups in particular. This includes both technical and organizational networking among final producers, suppliers and/or service providers and scientific institutions in the fields of materials science, high-lift systems, production technology, robotics and earth observation. Within the space industries and aeronautics sectors more than 140 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.

Stand: G01 Azista Bst Aerospace



Contact:
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Web: www.azista-bst.com

Here at gebeutel, your bag is manufactured by professional sailmaker hands – 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 10 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 gebeutel bags ranges from duffel bags, sports bags, bicycle bags, toiletry bags to backpacks. Discover a wide selection of cheerful colours and strong scarves.

Stand: H10 Bag Manufacturer



Contact:
Niklas Brede

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Web: www.gebeutel.net

DLR is the national aeronautics and space research centre of the Federal Republic of Germany. Its extensive research and development work in aeronautics, space, energy, transport and security is integrated into national and international cooperative ventures. In addition to its own research, as Germany's space agency, DLR has been given responsibility by the federal government for the planning and implementation of the German space programme. DLR is also the umbrella organisation for the nation's largest project management agency.

DLR has approximately 8000 employees at 20 locations in Germany: Cologne (headquarters), Augsburg, Berlin, Bonn, Braunschweig, Bremen, Bremerhaven, Dresden, Goettingen, Hamburg, Jena, Juelich, Lampoldshausen, Neustrelitz, Oberpfaffenhofen, Oldenburg, Stade, Stuttgart, Trauen, and Weilheim. DLR also has offices in Brussels, Paris, Tokyo and Washington D.C.

Stand: F80 bavAIRia E.V.



Contact:
Bärbel Deisting

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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, advice 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: F80 BAYERN-CHEMIE GMBH



Contact:
Axel Ringeisen

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Web: www.bayern-chemie.com

Our special skills and expertise in ramjets rocket motors and gas generators makes us a competent and reliable partner for space projects today, tomorrow and in the future. We've been designing and producing propulsion systems for international projects for over 60 years. This experience gives us the capability to quickly and sustainably bring space propulsion systems to market-maturity.

Future Space Transport:

Since 2014, we have been a project partner in the development of the SABRE (Synergetic Air Breathing Rocket Engine). For its high efficiency SABRE combines various propulsion technologies into a single engine which also employs an integrated ramjet from Bayern-Chemie. This results in a significant reduction in both weight and volume compared to conventional launchers.

De-Orbiting:

The steady increase of space junk especially in LEO is already a significant problem. It is becoming necessary to equip certain satellites with propulsion systems that will assure their return at the end of service life. Bayern-Chemie develops and produces solid rocket motors for such de-orbiting missions. The recognised benefits of solid rocket motors are simple design, low cost, easy handling and insensitivity to space radiation. Bayern-Chemie is a 100% subsidiary of MBDA-Germany.

Bayern-Chemie GmbH
Liebigstr. 17
84544 Aschau am Inn, Germany

Stand: A80 Beijing SpaceD Aerospace Application & Science Education Co., Ltd.



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Beijing SpaceD Aerospace Application & Science Education Co., Ltd. is a company focusing on aerospace science education, popularization and satellite application. Combining satellite remote sensing data with computer technology such as virtual reality (VR) and augmented reality (AR), we are aimed at a vivid simulation of spaceflight on the ground, creating immersive space experiences. Coping with several science research teams and strategic planners, the company is to promote public understanding of aerospace science through modern technologies.

Stand: E55 Belgium Space



Contact:
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The "Belgium Space" booth brings together 12 Belgian industrial and scientific actors (Amos, Centre Spatial de Liège (CSL), Deltatec, Lambda-X, OIP, Qinetiq, SABCA, Safran Aero Boosters, Spacebel, ThalesAleniaSpace Belgium, RHEA Group and VITO) as well as BELSPO (The Belgian Federal Science Policy Office) and 3 regional space associations (Wallonie Espace, VRI and Bruspace).

Stand: G01 Berlin Space Technologies GmbH



Contact:
Tom Segert

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Berlin Space Technologies is a global leader in high performance small satellite systems. Azista Aerospace is high tech supplier with more than 25 years of space manufacturing experience. Together Azista 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 175 people and more than 60,000sqft of the most modern satellite design and manufacturing facilities, Azista 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

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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 orientated.

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



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Web: www.blackengine-aero.space

Development, desing and production of rocket engines with ceramic thrust chamber.

Stand: D20 Blackout Technologies UG



Contact:
Lisa Fischer

Email: lf@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 specialises in communicating information.

Blackout Technologies offers a branch-independent solution, it doesn't matter if your business is in pharmaceuticals, cars, banking or space!

Possible usecases 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



Contacts:
Pamela Workings & Daniel Peck

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, C4ISR, electronic and defense systems, launch systems, and performance-based logistics and training. Boeing has a long tradition of aerospace innovation. Its 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



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Within the space industries and aeronautics sectors more than 140 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, characterize 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, bionics, 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

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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.

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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.

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Diana Giorgini

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Stand: C70 Chinese Society of Astronautics



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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 30000 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, seminars 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 hosts B to B 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.

Stand: E50 Centre National d'Etudes Spatiales (CNES)



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CNES (4 Centers, 2500 employees) plays a key role on the French, European and International space stage, lending impetus, stimulating new proposals and providing technical expertise. At the crossroads of research and industry, CNES supports the French space industry, helping companies seeking to export. CNES activities focus on 5 strategic areas: independent access to space with ARIANE, SCIENCE especially with space exploration, EARTH OBSERVATION to survey our planet, TELECOMMUNICATION including positioning, and DEFENCE.

Stand: F25 Confers



Contact:
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The Consortium for Execution of Rendezvous and Servicing Operations (CONFERS) 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 end 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.

Stand: H03 Deutsche Gesellschaft für Luft- und Raumfahrt



Email: kommunikation@dglr.de
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Die DGLR – Informieren, Vernetzen, Fördern

Die Deutsche Gesellschaft für Luft- und Raumfahrt - Lilienthal-Oberth e.V. (DGLR) ist die älteste Institution in der Bundesrepublik Deutschland, die allen, die sich privat oder beruflich mit Luft- und Raumfahrt beschäftigen, ein gemeinsames Forum bietet. Hier vernetzt sich das Wissen der Luft- und Raumfahrt, aktuelle Projekte und Entwicklungen werden vorgestellt und gute Ideen gefördert und honoriert.

Stand: D15/D50 Deutsches Zentrum für Luft- und Raumfahrt e.V.



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DLR, the German Aerospace Center, is among the largest centers for aerospace in Europe with more than 8200 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 programme. DLR is also the umbrella organisation for the nation's largest project management agency. DLR carries out innovative basic and applied research in the fields of space, aeronautics, energy, transportation, security and digitalization in national, European and international cooperation. DLR operates more than 170 research infrastructures including Europe's largest fleet of civil research aircrafts. 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.

Stand: G11 Deutsches Zentrum für Satelliten-Kommunikation e.V.



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The German Center for Satellite Communications r.S. (DeSK) was founded in 2008, bringing together enterprises, scientific institutions and universities, operating in the area of satellite communications. The objective of this network is to promote the extension of business relations among its members as well as to initiate synergies. Furthermore common activities to support recruiting qualified employees are organized. Additionally, the institution is responsible for the operation of a showroom and a UHF ground station.

Stand: A61 DFKI GmbH, Robotics Innovation Center



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Space Robotics is a key technology for improving the competitiveness of the European space sector. The European Union's H2020 space program has initiated a Strategic Research Cluster on space robotics technologies with the aim to enable major advances for future on-orbit satellite servicing, and the exploration of the surfaces of other celestial bodies in our solar system. The "PERASPERA (ad ASTRA)" consortium composed by the European and National Space Agencies is responsible for overseeing the cluster, and for creating and sustaining a roadmap to achieve the strategic objectives. In the current first phase of the SRC, six parallel Research and Innovation projects are being implemented as reliable and high performance common robotic building blocks to be used in the subsequent phases. These include a space robot control operating system, robot autonomy framework, common data fusion framework, inspection sensor suite, modular interfaces for handling payloads and validation platforms and field tests for testing orbital and surface robotics building blocks. These technologies are designed for both orbital (incl. in-orbit demonstration) and planetary surface applications and to explore synergies with terrestrial robotics applications.

Stand: B24 D-Orbit Spa



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D-Orbit is a service provider for the traditional and new space sectors, with capabilities in satellite manufacturing, launch, deployment, satellite operations, end-of-life strategies and solutions, space propulsion and related critical software. Its products and services cover the entire lifecycle of a space mission, including mission analysis and design, engineering, manufacturing, integration, testing, launch, and end-of-life decommissioning. InOrbit NOW is the first SmallSat launch and deployment service in the market that can deliver up to 16 CubeSats to orbit and release them individually into distinct orbital slots. The service guarantees a wider separation between CubeSats, enabling a faster signal acquisition and a stable collision-free formation that is essential for spacecraft with no independent propulsion. Committed to pursuing business models that are profitable, friendly for the environment, and socially beneficial, D-Orbit is the first certified B-Corp space company in the world. Founded in 2011, D-Orbit employs 30 people. The firm is based in Milan, Italy, in Washington DC, United States, and Lisbon, Portugal.

Stand: E34 DSI Aerospace Technologie GmbH



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we think electronics dependable

DSI Aerospace Technologie GmbH 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. Michalik and Dr L. Hinsenkamp, DSI has continued to deliver future-oriented solutions since that time in 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 Signalverarbeitungssysteme & Informationstechnik GmbH) provides dependable electronics for space, airborne and terrestrial platforms
- DSI Datensicherheit GmbH provides dependable and accredited solutions and equipment for IT-security applications
- DSI Informationstechnik 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: C24 DTM SRL



DTM is active since 1994 in the design, development and testing of aerospace structures, testing equipments and GSE (mechanical, fluidic, thermal) for satellites, launchers and experiments for manned or unmanned missions.

LOGO is attached

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, HEO, GTO/GEO) 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 scientific institutions. Supplementary to the launch services, ECM Space designs and manufactures in-house 12U/16U CubeSat launch deployers and develops low-shock separation systems for microsatellites. For more information, please visit: www.ecm-space.de

Stand: G14 Emerging Countries



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We have received the exhibitor profile from the Emerging Countries. Please find the text below:

The International Astronautical 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: F24 Enpulsion GmbH



Contact:
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ENPULSION was founded in 2016 as product spin-out of FOTEC, the research subsidiary of the University of Applied Sciences Wiener Neustadt, Austria, to produce and commercialize 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 is used as a compact pre-qualified building block in order to provide customized propulsion solutions for nano- and microsatellites. By clustering the IFM Nano modules 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



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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 altimetry missions exploited jointly with NOAA, NASA and CNES. Since 2016 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

Stand: H19 European Research Council



European Research Council
Established by the European Commission

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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 € 13 billion for the year 2014 to 2020.

Stand: C50 European Space Agency



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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



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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 ton 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



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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 systems provider, developing a wide range of top-quality components, integrating them into an overall system and delivering that system to the customer. The sheer 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 Electronics, Surfaces and Optical Systems, Protection Technology and Reliability and Sensor Systems and Analysis.

Stand: C24 Gauss Srl



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Stand: F35 GERADTS GMBH



Contact:

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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-orientated approach. GERADTS' make everything from simple parts to complex modules for the ISS space station, satellites, Mars projects, aeronautics and life sciences. Our customers include OHB-System AG, Airbus Defence & Space, Airbus Safran Launchers, German Aerospace Center (DLR) and the Fraunhofer Institut (IFAM). Experiments in near-zero gravity conditions. Innovative, flexible, economical. GERADTS' MIGROP parabolic flights are an innovative platform for experiments and payload tests in near-zero 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 aeroplane provides precise gravity conditions for reliable results.

Stand: A86 German Orbital Systems GmbH



Web: www.orbitalsystems.de

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 planet's future and that everyone should have the possibility to be part of it. We work hard, to make satellite technology understandable and affordable while staying fair to our employees and customers as well 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.

Stand: F82 GK LAUNCH SERVICES



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GK LAUNCH SERVICES is an operator of Soyuz-2 commercial launches from the Russian space ports. Soyuz-2.1 family launch vehicles can be used both for dedicated and cluster (multiple satellite) launch missions.

Stand: F21 GKN Aerospace



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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 1,000 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 on a new nozzle for the Vulcain 2.1 engine using the latest technology like laser welding and additive manufacturing.

We are also a proven leader in manufacturing compressor rotors, compressor and turbine blades and vanes, blisks and integrated bladed rotors using high-speed 5-axis 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: B40 GMV Insyen AG

Stand: B23 GomSpace



Email: info@gomspace.com

Web:

GomSpace is a globally leading manufacturer & supplier of nanosatellite solutions for customers in the academic, government and commercial markets. Our team of 250 employees serve 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/or 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 platforms, 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: F38 Gradel S.A.R.L.

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Stand: E70 HE Space Operations GmbH



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HE Space Operations is a thriving privately owned company specialised 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 Diversity.

Our company provides expert engineering, scientific, management and administration support to ESA, EUMETSAT, Airbus Defence and Space, ArianeGroup, OHB Systems, DLR GfR, Thales Alenia, Roversing, Jena-Optronik, TESAT Spacecom, IABG, STI 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 70!

Stand: F80	HPS GmbH  High Performance Space Structure Systems GmbH Contact: <i>Dr.-Ing. Ernst Pfeiffer</i> Email: info@hps-gmbh.com Web: www.hps-gmbh.com <p>High Performance Space Structure Systems GmbH" (in the following "HPS-DE"), Munich, was founded in the year 2000. Meanwhile, HPS has evolved into an independent group. In May 2016 HPS-RO was founded in Bucharest, Romania, owned 100% 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 of:</p> <ol style="list-style-type: none"> 1. Antenna Subsystems 2. Large Deployable Reflector Subsystems 3. Deployable Drag-Sail Subsystems for Re-orbiting 4. Thermal Hardware 5. Composite & Metal Structures 6. MGSE Subsystems and Elements 7. New Materials and Processes 8. Engineering and Integration Services. <p>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. USP product areas are:</p> <ul style="list-style-type: none"> • Ka/Q/V-band Reflector antennas for high data rates (0.3m - 2.4m diameter) • LDR subsystems for Earth Observation and telecom (up to 15 diameter), incl. arm, reflector, HDRM, electronics • Lightweight mobile deployable ground antennas for high data rates • ADEO-N drag-sail for nano-satellites, ADEO-L drag-sails for up to 1-ton-satellites • Radiation protection components for electronic parts • Electronic housings out of carbon composites.
Stand: E35	IABG MBH  Contact: <i>Christian Henjes</i> Email: space@iabg.de Web: www.iabg.de <p>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. Hardly 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.</p> <p>Overview of services:</p> <ul style="list-style-type: none"> • 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 <p>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, defence or aviation industry benefit from IABG's lead in product qualification.</p>
Stand: G15	IAC2018 Media Booth

Stand: C24	ICE- Italian Trade Agency  Contact: <i>Giuseppe Oliva</i> Email: tecnologia.industriale@ice.it Web: www.ice.it
Stand: F02	Indian Space Research Organisation  Contact: <i>Sumit Kumar</i> Email: sumit.kumar@antrix.co.in Web: isro.gov.in - www.antrix.co.in <p>ISRO is the space agency of the Gov. of India headquartered in the city of Bengaluru. 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.</p>
Stand: G02	Infostellar  Contact: <i>Hazel Naylor</i> Email: info@istellar.jp Web: www.infostellar.net <p>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-utilized ground station capacity. By lowering barriers to entry in the ground segment, Infostellar empowers newspace startups to build better missions and improve the quality of their service.</p>
Stand: C87	Institut für Raumfahrtssysteme, TU Braunschweig  Contact: <i>Prof. Dr.-Ing. Enrico Stoll, B.Sc.</i> Email: e.stoll@tu-braunschweig.de Web: www.space-systems.eu <p>The Institute of Space Systems at Technical University of Braunschweig is led by Prof. Dr.-Ing. Enrico Stoll. It consists of four working groups: Space Debris, Satellite Technology, Culture and Spaceflight, and Exploration- and Propulsion Systems.</p> <p>The Space Debris group models the space debris environment and develops and maintains MASTER, the European reference model for space debris and DRAMA for debris risk assessment and mitigation analysis. Additionally, the group simulates SST systems and performs re-entry predictions using high precision orbital propagators.</p> <p>The satellite technology group performs research in the field of Active Debris Removal (ADR) and develops docking mechanisms with bionic inspired Gecko materials. Within the Experimental Lab for proximity operations and Space Situational Awareness (ELISSA), formation flight and rendezvous & docking experiments are conducted using a 4 m x 7 m air bearing table.</p> <p>The Exploration- and Propulsion Systems group focuses on the development of hybrid rocket systems and technologies for In-Situ Resource Utilization (ISRU) on the Moon. In this context, the lunar regolith simulants TUBS-M and TUBS-T, and the rover-arm-prototype MIRA3D are developed. MIRA3D is a prototype for proof-of-concept experiments for additive layer manufacturing of lunar regolith without additives.</p>
Stand: C90	International Space University (ISU)  Contact: <i>Geraldine Moser</i> Email: geraldine.moser@isunet.edu Web: www.isunet.edu <p>The International Space University, founded in 1987 in Massachusetts, US and now headquartered in Strasbourg, France, is the world's premier international space education institution . It is supported by major space agencies and aerospace organizations from around the world. The graduate level programs offered by ISU are dedicated to promoting international, interdisciplinary and intercultural cooperation in space activities. ISU offers the Master of Science in Space Studies program at its Central Campus in Strasbourg. Since the summer of 1988, ISU also conducts the highly acclaimed two-month Space Studies Program at different host institutions in locations spanning the globe and Southern Hemisphere Space Studies Program. ISU programs are delivered by over 100 ISU faculty members in concert with invited industry and agency experts from institutions around the world. Since its founding, 30 years ago, more than 4400 students from over 100 countries graduated from ISU.</p>

Stand: C50 ISEB International Space Education Board

Stand: F38 ispace S.A.

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Stand: A30 Israel Aerospace Industries

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Israel Aerospace Industries Ltd (IAI) is a largest 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 satellites portfolio includes: observation satellites (optical – OPTSAT, EROS, OFEQ series as well as Synthetic Aperture Radar - TECSAR series); scientific/research satellites (such as Venus, Shalom, BGUSAT, SpacEL moon lander, UltrSAT); 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 Shavit launcher, enabling launch of mid-size satellites to LEO orbits.

Recently, nonprofit SpacEL 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. 13, 2019.

IAI provides comprehensive turnkey solutions, including ground stations, mission centers and related services.

Stand: A35 Israel Space Agency

Contact: Mr. Leo Vinovezky
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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-ups 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 space 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.

Stand: C34 Japan Aerospace Exploration Agency (JAXA)

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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 asteroid exploration and possible manned exploration of the Moon. Our corporate slogan is "Explore to Realize".

Our vision can be summarized in the following two points. First is to create a world where our research and development outcomes are fully utilized and take root in the society, Second is for JAXA to initiate 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.

Stand: B45 Jena-Optronik GmbH

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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 truest sense of the word: our opto-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.

Stand: F38 Kleos Space S.A.R.L.

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Stand: A50 Korea Aerospace Research Institute (KARI)

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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.

Stand: F36 Land Space Technology Co. LTD.

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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 booming 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 LOX+LCH4 LREs 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.

Land Space 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.

Stand: E80 Lockheed Martin

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.

Stand: F38 Luxembourg- Ministry of the Economy

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Stand: F38 Luxspace S.A.R.L.

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Stand: F38 Matchmaking at IAC 2018 by Enterprise Europe Network



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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: iac2018.b2match.io/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



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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 coupé and the convertible of the C-Class, the coupé and convertible of the E-Class, the off-road vehicle GLC, the GLC coupé as well as the two roadsters SLC and SL. 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 and innovative approaches.

Stand: G22 MetaSensing BV



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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-mode high-resolution SAR sensor with multiple channels to offer various capabilities for imaging, surveillance and moving target indicator. The MSS-X will be hosted on a small satellite platform weighing around 150 Kg and flying in a Low Earth Orbit (LEO).

The ground-segment section to process the SAR data is based on innovative heterogeneous computing and parallel processing making use of FPGA, CPU and cluster of GPGPU's 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



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Microchip's Continued Commitment 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 Atmel's flight heritage, and to expand this portfolio with rad-tolerant and extended temperature devices.

Microchip uses the latest innovative commercial technologies such as 8-bit AVR® MCUs, Arm® and dsPIC®-based MCUs, adapting these to rad-hard, rad-tolerant and high-reliability application requirements in order to provide proven solutions, 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, avionics, 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)



Stand: D40 MT Aerospace AG



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 ARIANE, the Airbus 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 light weight structures and tanks using metallic 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: B20 Nano Racks LLC



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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 of 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 ULA 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 2018, 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, Spire, Millennium Space Systems, Space Florida, NCSSE, Virgin Galactic, pharmaceutical companies, and organizations in Vietnam, UK, Romania and Israel.

Stand: C30 The National Aeronautics and Space Administration (NASA)



Email: www.nasa.gov

The National Aeronautics and Space Administration (NASA) was established in 1958 as an independent agency of the executive branch of the federal government of the United States of America.

The NASA workforce of 17,400 civil servants, supported by a contractor workforce providing technical and business operations services, inspires the world with our exploration of new frontiers, our discovery of new knowledge, and our development of new technology. The Agency's history is written with each unique scientific and technological achievement. We have landed people on the Moon, visited every planet in the solar system, touched the Sun, and solved some of the core mysteries of our home planet. A key tenant of NASA's challenging mission is to lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and bring new knowledge and opportunities back to Earth.

NASA accepts the challenge to continue our legacy of achievement and greatly expand the benefits we provide to mankind.

Stand: A55 New Zealand Space Agency



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The New Zealand Space Agency is the lead government agency for commercial and civil use of space. The Agency sits within the Ministry of Business, Innovation and Employment (MBIE), and its functions include space policy, regulation and industry development in New Zealand.

New Zealand has an emerging space industry ecosystem. With clear seas and skies, access to valuable launch angles for rocket launchers, and a future-focused regulatory regime setting international best practice, we use our geographical isolation to our competitive advantage.

But it's New Zealand's nimble, innovative nature and appetite for new opportunities that are what is setting it apart from other destinations enabling space activity.

While New Zealand's space industry has gained momentum in recent years with Rocket Lab's successful launches, a number of well-established space industry participants have been operating throughout the value chain for many years. From ground station and information services to space-related components and emerging research bodies, New Zealand's contribution to the global space economy is establishing a legacy of sustainability and value.

Will you join us?

Stand: E60 NL-Space



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Space in the Netherlands

The Netherlands is one of the primary architects of space activities in Europe and has always played a leading international role in space science research.

As a high-tech country, the Netherlands has a sound knowledge infrastructure within specific areas of local expertise. This allows the Dutch space industry to create and capitalise on opportunities, to distinguish itself and to play a leading role worldwide. Dutch space companies and institutions are recognised for delivering reliable technology and ground-breaking science. In addition, they develop satellite applications for everyday life on Earth. Thereby contributing to improved safety, food security, a better environment and a sustainable future. Dutch companies and Institutions offer solutions wherever they are needed in the world - Global Challenges NL Space Solutions! Come and meet us at the NL Space stand and learn more about Dutch activities in Space.

Stand: A45 Northrop Grumman



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Northrop Grumman is a leading global security company providing innovative systems, products and solutions to government and commercial customers worldwide. Products include launch vehicles and related propulsion systems; missile products, subsystems and defense electronics; precision weapons, armament systems and ammunition; satellites and associated space components and services; and advanced aerospace structures.

Stand: F30 Northwestern Polytechnical University



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Located in the historic city of Xi'an, cradle of Chinese civilization and terminus of the ancient Silk Road, Northwestern Polytechnical University (NPU) is the only multidisciplinary and research-oriented in China that is simultaneously developing education and research programs in the fields of aeronautics, astronautics, and marine technology engineering. It is now affiliated to the Ministry of Industry and Information Technology (MIIT). Since the establishment of the People's Republic of China (PRC), NPU has always been one of the nation's key universities. It ranked among

China's top 15 universities in the state's 7th and 8th Five-Year plans; and NPU is one of the first 22 universities to have established a graduate school. It was one of the first universities to enter into the 211 Project in 1995 and the 985 Project in 2001. NPU adheres to the motto "

Loyalty Integrity Courage and Perseverance" while carrying forward the spirit of " Strong Preparation Diligent Effort, Practical Attitude and Creative Innovation". Now NPU will continue to pioneer new pathways into the future in the process of building a world first-class university and world first-class disciplines.

Stand: A20 Norway Pavilion



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The space industry association of Norway, NIFRO, in collaboration with the Norwegian Space Centre, are proud to showcase the best of Norwegian space services, applications, technology and science to our colleagues in other nations. By investing in major European Space Agency programs, EU programs and national space infrastructure, Norway has developed its industry and scientific base. The main areas for the industry today are:

- Satellite Operation and Ground Network Services
- Earth Observation and services
- Space infrastructure (satellite hardware, launchers)
- Navigation
- IT software for Space projects and Science Operations

Building on more than 50 years of experience in the space industry Norway have today a innovative space industry with total revenue of about 1 billion USD.

Participants at Norway Pavilion:

Andøya Space Center/NAROM
CMR Prototech
FFI, Norwegian Defence Research Establishment
IDEAS AS
Kongsberg Nordspace
Kongsberg Seatex
Kongsberg Space Systems
Kongsberg Spacetec
Kongsberg Satellite Services, KSAT
NAMMO Raufoss
NIFRO
Norwegian Space Centre
Space Norway
T&G Elektro

Welcome to Norway Pavilion!

Stand: D40 OHB SE



Contact:
Sabine von der Recke

Web: www.ohb.de

OHB SE - The European family-guided company for Space Technology & Security, Telematics and Satellite Services. Domiciled in Bremen, OHB SE is Germany's first listed aerospace and technology company. Two business units offer national and international customers sophisticated solutions and systems. With more than 35 years of experience in high technology together with its integrated skills in the areas of space technology and telematics, the Group is ideally positioned as a leading independent force in the European aerospace and astronautics industry.

In the business sector "Space systems", OHB focuses on the development and implementation of satellite systems for Navigation, Telecommunications, Earth Observation and Science missions. In the field of Exploration, OHB delivers a wide range of experience in different missions as well as in Human Space Flight.

OHB is one of the leading German suppliers for Aerospace structures, the activities are summarized in the sector "Aerospace and Industrial products". With MT Aerospace, OHB in Augsburg is the biggest supplier for Europe's current Space launcher Ariane 5 and is part of the Industrial team for Ariane 6. Total consolidated revenues came to EUR 860 million in 2017. OHB SE currently has approx. 2,500 employ- in different companies all over Europa.

Stand: C24 Planetek Italia SRL



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Founded in 1994, Planetek is specialised in Geoinformatics, Space solutions & Earth science. We exploit the value of geospatial data through all phases: acquisition, management, analysis & sharing. Logo is attached

Stand: G18 PLD Space



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PLD Space is a Spanish rocket company developing reusable and cost effective launch vehicles. Founded in 2011, based in Alicante and with more than 50 employees, PLD 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. It's maiden flight is set for Q3 2019 and it will also be used as the technology demonstrator of the next PLD rocket, ARION 2.

ARION 2, the European microlauncher, will be a reusable rocket capable of lifting 300 kg into 500 km SSO orbit. ARION 2, counting with 70% of the technology validated already on ARION 1, will have its maiden flight on Q2 2021.

Stand: C88 Polish Space Sector

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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 2016 has been conducting dedicated support program for Polish space companies. IDA organizes internship programmes, offers financial support mechanisms (Open Innovation Network Project) and is responsible for establishing ESA BIC in Poland. www.arp.pl

Polish Space Industry Association (SPACE PL)

SPACE PL was established in 2012. It consolidates the business community of almost 70 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 organizes the Space Sector Forum. The association also cooperates with other clusters (from Poland and abroad) and associations. www.space.biz.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. Intensifying 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: E25 PT Scientists GmbH



Web: PTScientists.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 quattro rovers to the lunar surface to capture the first high resolution images of Apollo 17's original lunar roving 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.

Stand: D10 REXUS/BEXUS Programme



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The Center of Applied Space Technology and Microgravity (ZARM) continually strives to set new standards and to achieve a sustainable progress - in science and research, as well as in teaching. We are highly committed to support the education of students and young scientist 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 programs. 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 Agency 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 (MORABA) of DLR, the European Space Agency (ESA), and ZARM.

Stand: A89 Romanian Space Agency



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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, co-ordinate 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 space science 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 RTO issues. On the 20th of January 2011 Romania, represented by ROSA, signed its Accession Agreement to the ESA Convention, becoming the 19th 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 nanoSatellite Technology (ROST-CC).

Stand: F80 **Rosenberger Hochfrequenztechnik GmbH & Co. KG**

Rosenberger

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Rosenberger, a worldwide leading manufacturer of RF and fiberoptic connectivity solutions, is a reliable supplier for aviation and spaceflight industries. The company is qualified according IATF 16949:2016 and also ESCC and DIN EN 9100 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

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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 1.96 billion and has over 9,200 employees.

Stand: F26 **Safran Aircraft Engines**

SAFRAN

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Safran Aircraft Engines designs, develops, produces and sells engines for commercial and military aircraft and satellites. 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, 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**

SATLANTIS

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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 iSIM, a very high-resolution multi-spectral optical imager for Earth-Observation microsattellites, 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. ISIM-170, a very high-resolution imager for 50-100 kg micro satellites and at the origin of SATLANTIS Technology. ISIM-90, 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: PANORAMIC, high spatial resolution panchromatic, and PRECISION, very high resolution in panchromatic and multispectral modes.

Stand: E75 **SCISYS Deutschland GmbH**

SCISYS

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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.

PLENITER® 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 PLENITER® 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, systems 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**

SNC SIERRA NEVADA CORPORATION

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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 **SITAEI**

SITAEI
AN ANGEL COMPANY

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SITAEI 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, SITAEI 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, SITAEI 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. SITAEI 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**

S4
Smart Small Satellite Systems GmbH

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S4 provides professional advanced pico-satellite space product from complete satellite system solutions to advanced subsystems like ADCS, miniaturized reaction wheels and OBCs for CubeSats.

Stand: A84 **South African National Space Agency (SANSA)**

sansa
SOUTH AFRICAN NATIONAL SPACE AGENCY

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Web: www.sansa.org.za

The South African Space industry exhibition 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 showcase and develop the capacity 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, SCS Aerospace, CPUT F'Sati and Simera 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 assimilation/ 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.

Stand: H12 Souvenir Shop



Web: www.werkstatt-bremen.de

The "Werkstatt Bremen" municipal enterprise in Bremen is responsible for operating the Martinshof workshops for people with disabilities. 37 such workshops provide work for more than 1,880 people with serious mental, psychological 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 spektrum

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 workgroups in 14 Bremen companies.

Variety of products for Bremen and surrounding areas

Martinshof 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 richly varied as the people who work there. Martinshof 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 subsifüry in Hauston, 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 integrate scientific 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: rzee@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 satellites internationally. Small satellites built by SFL consistently push the performance envelope and disrupt the traditional cost paradigm. 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 Expo 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



Stand: C84 SSC- Swedish Space Corporation



Contact:
Aurélie Domargård

Email: info@sscspace.com
Web: www.sscspace.com

SSC is a leading global provider of advanced space services. We are a full-service-supplier of satellite ground segment and engineering services along with launch services to commercial, defence and institutional customers. WE HELP EARTH BENEFIT FROM SPACE.

Stand: C50 Start-Up Zone powered by ESA Space Solutions



Web: www.esa.int

24 international start-ups have been selected from an international open call to exhibit on rotation at this year's IAC, showcasing their businesses, prototypes and sharing their passion for space. Coming from Europe, Japan, Canada and Russia, these innovative entrepreneurs present a wide range of novel space technologies and innovative spin-off solutions for terrestrial services.

The young entrepreneurs will showcase their space technology at four pitching sessions under the theme 'We need more Space', where also ESA's Technology Transfer and Business Incubation Programme with its 'ESA space solutions' network will illustrate the strong potential of bringing space into every aspect here on Earth.

'ESA space solutions' focus on encouraging and fostering space connected entrepreneurship and innovation. Through its 20 Business Incubation Centres (ESA BICs) and 16 Technology Transfer Brokers throughout Europe it has successfully brought space technology, systems and expertise as well as the use of satellite data down to Earth improving our everyday lives and European non-space industry with many innovative and profitable solutions.

Over 650 start-ups have been fostered and another 150 new start-ups are taken in yearly at the ESA BICs to be supported under the two-years business development boosting programme.

1. - 3. October:

AIKO SRL: www.aikospace.com
Drift+Noise: www.driftnoise.com
Elise GmbH
HOSTmi: www.hostmi.biz
Lens R&D: www.lens-rnd.com
"LoReTT" LLC, Engineering Company: www.lorett.org
OKB FIFTH GENERATION LIMITED: 5okb.ru
Open Cosmos: open-cosmos.com
satsearch: www.satsearch.co
Valispace: www.valispace.com
VEOWARE SPACE: www.veoware.space
Vultus AB: www.vultus.se

3. - 5. October:

AT Space: www.at-space.com
Avant Space Systems: avantspace.com
Blackwave GmbH: www.blackwave.de
Coletti Biotechnologies LLC: www.cltbiotech.com
GITAI Inc.: <http://gitai.tech>
Klepsydra Robotics: www.klepsydra.org
Orbital Oracle Technologies: www.ororatech.com
PlanBlue: www.planblue.com
Skyflox B.V.: <https://skyflox.eu>
SPiN: www.spinintech.com
Sputnix: www.sputnix.ru
Reaction Dynamics: <https://www.reactiondynamics.space>

Stand: C36 STFC

Stand: C80 Surrey Satellite Technology Limited



Email: info@sstl.co.uk
Web: www.sstl.co.uk

Surrey Satellite Technology Limited (SSTL) is the world's leading small satellite company, delivering operational space missions for a range of applications including Earth observation, science, communications, navigation, in-orbit servicing and beyond Earth infrastructure. The Company designs, manufactures and operates high performance satellites and ground systems for a fraction of the price normally associated with space missions, with 500 staff working on turnkey satellite platforms, space-proven satellite subsystems and optical instruments.

SSTL is at the forefront of space innovation, exploiting advances in technologies and challenging conventions, to bring affordable space exploration to our international customers.

Since 1981, SSTL has built and launched more than 50 satellites for 20 international customers – as well as providing training and development programmes, consultancy services, and mission studies for ESA, NASA, international governments and commercial customers, with an innovative approach that is changing the economics of space.

Stand: G19 Syrlinks



Email: contact@syrlinks.com
Web: www.syrlinks.com

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.

COMPETENCES

Syrlinks is the pioneer player of Radios based on qualified active COTS. Since ROSETTA and DEEP-IMPACT missions, more than 60 spacecrafts are equipped by Syrlinks cumulating 400 years in orbit, with 100% reliability. Expertise of Syrlinks team includes mastery of ESA CLASS 3 and CLASS 2 Standards (ECCS-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/ISL) 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: C24 T4i-Technology for Propulsion and Innovation SRL



Contact:
Elena Toson

Email: info@t4innovation.com
Web: www.t4innovation.com

T4i provides the space market with innovative propulsion systems and services. The key products are electric and chemical propulsion systems for nano/microsatellites and launcher applications
Logo is attached

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 Gualandris

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/AS/JISQ 9100, UNI CEI EN ISO 13485:2012 (ISO 13485:2003), EN ISO 9001:2008, Nadcap for Heat Treatment.
Logo is attached

Stand: F80 TeleOrbit GmbH



Contacts:
Daniel Seybold / Jürgen Seybold

Email: info@teleorbit.eu
Web: www.teleorbit.de

An experienced Locatineering® enterprise, TeleOrbit GmbH sets new standards as a manufacturing and sales company for GNSS and mobile positioning technologies in its segment. In the GNSS-segment TeleOrbit® raises the bar by recording and processing each and every globally available satellite data and applying the newest verified technologies and innovations. This is done in cooperation with Fraunhofer IIS, Nuremberg. Combined with a software-based simulator for all GNSS and SBAS signals, which is sold on behalf of TeleConsult Austria, TeleOrbit® offers a very capable multi-GNSS simulation and test environment that includes capabilities to simulate different jamming and spoofing scenarios. TeleOrbit® also offers capable mobile positioning technologies used, among others, by the Styrian Mountain rescue services to track, monitor and guide their rescue personnel during SAR missions. TeleOrbit® invites you to meet with passionate and skilled engineers, innovative products, and professional services to assure that your needs are met best.

Stand: F85 Telespazio Vega Deutschland



Contact:
Alexandra Sokolowski

Email: info@telespazio-vega.de
Web: www.telespazio.de

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 harnessing 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 headquarter 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 brokering 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 travelling wave tube amplifiers, multiplexers, switches, modulators, as well as entire systems, payloads, 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 Satellite applications and we are ready for new applications like Quantum Key Distribution and so on.

Stand: H20 Thrustme



Contact:
Ane Aanesland

Email: contact@thrustme.fr
Web: www.thrustme.fr

ThrustMe enables NewSpace to be economically and environmentally sustainable by developing and commercialising breakthrough electric space propulsion systems and services for these next-generation satellites. Satellite integrators and operators turn to us to deliver station-keeping, constellation phasing, mission life extension, orbit raising and de-orbiting. Our first product, the NPT30-XE, is a 2U 1mN gridded ion thruster that is available for order today with a lead time of 9 months. Additionally, ThrustMe's expert team offers premium engineering consulting services of thermal management, design and production of custom power electronics, mission planning optimization focused on propulsion utility and the development of standard and specialized diagnostics for plasma, beams and particle flow analysis. Located in the outskirts of Paris, ThrustMe has its own 300 m2 headquarters with a well-equipped experimental laboratory containing several vacuum facilities, an electronics workshop for circuit design, a mechanical workshop that facilitates prototyping and low-batch production as well as a chemical laboratory designed for iodine flow tests and simulations. ThrustMe has grown into a team of 15 people and has secured 4.6 M€ of funding since its creation in February 2017.

Stand: C24 Tyvak International SRL



Email: administration@tyvak.eu
Web: www.tyvak.eu

Tyvak (booth C 24)
Tyvak provides end-to-end small satellite solutions, specialising in developing miniaturised custom spacecraft, launch services and aerospace technologies for defence, intelligence and scientific programs.

Stand: C94 U Bremen Research Alliance



Contact:
Derk H. Schönfeld
Email: derk.schoenfeld@vw.uni-bremen.de
Web: www.uni-bremen.de/research-alliance

Dedicated to Science. Together.

Bremen is an outstanding location for science. Here the University 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, Minds 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 an 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: C44 UAE Space Agency



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 position, enjoying 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.
- 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.
- Contribute to the diversification of the national economy through the space sector.
- 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



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 CST offer space launch brokering, earth imagery analysis and consulting services.
- **EnergSys-ABSL:** leaders in lithium ion batteries for space applications.
- **Seradata:** the producers of the SpaceTrak, a web-based launch and satellite analytical system.
- **Skyrora:** developing the Skyrora XL 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, InformatikVII



Contact:
Prof. Dr. Klaus Schilling
Email: schi@informatik.uni-wuerzburg.de
Web: www.informatik.uni-wuerzburg.de

Lehrstuhl Informatik VII (Robotik und Telematik)

Stand: D90 Universität Bremen



Contact:
Kristina Logemann
Email: presse@uni-bremen.de
Web: www.uni-bremen.de

University of Bremen: Brand new Space Study Programs

Top-performing, diverse, reform-minded and singularly cooperative – that about 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 2016. 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: H02 United Nations Office for Outer Space Affairs (UNOOSA)



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 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: G10 Valispace UG



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 tool landscape (with integrations to MS Office, MATLAB, CAD, PLM, 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 AIRBUS 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: G12 WEPA-Technologies GmbH



Contact:

Dr.-Ing. Peter Weuta

Email: info@wepa-technologies.de

Web: www.wepa-technologies.de

WEPA-Technologies GmbH offers Engineering-, Automation- and Aerospace Solutions.

Core competences are development, manufacturing and testing of customer tailored solutions adapted to even very specific requirements.

The Aerospace Field is focused on rocket technology related activities.

Main products of the Aerospace Field are listed below:

- 1) Re-usable Liquid Propellant Rocket Engines (propellants used: liquid oxygen, liquid methane / LNG, liquid hydrogen, alcohol, (kerosene))
- 2) Solid Propellant Rocket Engines (chlorine free exhaust)
- 3) Hydrogen Peroxide Production plants (90 – 98 % HTP; 25 – 1000 kg / day)
- 4) Turbo Pumps (liquid oxygen, hydrogen peroxide, kerosene, liquid methane / LNG, alcohol)
- 5) Low and High Pressure Propellant tanks (storable and cryogenic propellants)

For testing of Turbo Pumps a test stand is available. (~ 200 kW @ 32,000 RPM)

To assure rapid project implementation many machining and manufacturing steps can be conducted in the workshop of WEPA-Technologies.

Stand: G17 Woman in Aerospace Europe (WIA-E)



Email: Communications@wia-europe.org

Web: wia-europe.org

Women in Aerospace (WIA), founded in the United States in 1985, is dedicated to increasing the leadership capabilities and visibility of women in the aerospace community. WIA acknowledge and promote innovative individuals who strive to advance the aerospace industry as a whole.

Simonetta Di Pippo and Claudia Kessler founded in 2009 the Women In Aerospace Europe (<http://wia-europe.org/>) to support the creation of a diverse environment in the European space sector.

WIA-Europe, since its foundation, became even more one of the reference professional association in Europe for women and men who wants to work and develop professionally in the space sector, to promote space programs and to support the young generation to come and to contribute in shaping the future. WIA-Europe is for women and men who want to be part of a modern association, global network to build all levels of diversity and inclusion.

WIA-Europe (WIA-E) has come into existence through tight and fruitful coordination and cooperation with WIA and the same process is in place for the other sisters at worldwide (e.g.: WIA Canada in 2010, WIA Africa in 2011, WIA Japan and Mexico in 2017).

WIA-Europe has also become partner of an important project in collaboration with the United Nations Office for Outer Space Affairs (UNOOSA): "Space for Women".

Stand: F80 Wittenstein SE



Email: info@wittenstein.de

Web: www.wittenstein.de

Wittenstein SE develops customized products, systems and solutions for highly dynamic motion, maximum-precision positioning and smart networking for mechatronic drive technology.

Stand: D30 ZARM Center of Applied Space Technology and Microgravity, University of Bremen



Contact:

Dr. Thorben Könemann

Email: thorben.koenemann@zarm.uni-bremen.de

Web: www.zarm.uni-bremen.de

The Center of Applied Space Technology and Microgravity (ZARM) of the University of Bremen - headed by Executive Director Prof. Marc Avila - is an internationally recognized institute with multidisciplinary expertise in fluid mechanics, space technology and space science. Our research covers experimental, theoretical and computational approaches, fundamental scientific questions, as well as the development of technology for space missions and microgravity experiments.

The Bremen Drop Tower is the main facility of ZARM and the only laboratory of this kind in Europe. Up to three times a day, it offers the most economic opportunity for short-term experiments under highest-quality microgravity conditions. The increasing demand for drop experiments paved the way for ZARM's brand new test facility (GTB-PRO), which will allow conducting over 100 microgravity experiments per day.

Due to the broad space engineering know-how and the very successful operation of the drop tower, the ZARM team has established expertise in the design, integration and conduction of experiments under space conditions also on platforms such as sounding rockets and stratospheric balloons. Our expertise is highly appreciated by our cooperation partners and scientists from all over the world.

ZARM is honored to be the local organizer of the IAC 2018 in Bremen.

Stand: D30 Zarm Drop Tower Operation and Service Company



Contact:

Dr. Thorben Könemann

Email: thorben.koenemann@zarm.uni-bremen.de

Web: www.zarm.uni-bremen.de

It is our mission to make science happen: The Bremen Drop Tower is the main facility of ZARM and the only laboratory of this kind in Europe. Up to three times a day, it offers the most economic opportunity for short-term experiments under highest-quality microgravity conditions (10-6 g). The increasing demand for drop experiments paved the way for ZARM's brand new lab: the GraviTower Prototype, which allows the conduction of over 100 microgravity experiments per day. The start of its operation is scheduled for 2019.

Through the very successful operation of the Bremen Drop Tower for more than 25 years, the ZARM team has gained extensive experience in space engineering. We have become experts for the design, integration and conduction of experiments under space conditions also on platforms such as sounding rockets and stratospheric balloons. Our expertise is highly appreciated by our cooperation partners and scientists from all over the world.

ZARM is honoured to be the local organizer of the IAC 2018 in Bremen.

Stand: D30 ZARM Technik AG



Contact:

Holger W. Oelze

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Web: www.zarm-technik.de

ZARM Technik AG was founded in 1997 as a spin-off from the Centre of Applied Space Technology and Microgravity, an institute of the University of Bremen. Since its founding ZARM Technik became one of the leading manufacturers of magnetic torquer and magnetometers. Components produced for satellites are in use on most European and numerous international spacecrafts as the European Navigation system Galileo, Sentinel 2, Sentinel 5, Sentinel 6, Astro-H, Radarsat, CYGNSS, ICESAT2, Galileo or NuStar. ZARM Technik AG is manufacturing for all large system integrators as Airbus Defence & Space, OHB System, Thales Alenia Space, NEC, Melco, Orbital ATK, SpaceX etc., universities and Space agencies as ESA, DLR, Jaxa, NASA etc worldwide. By now more than 160 missions have been successfully supplied. A number of these are for more than a decade in orbit as for instance the Grace mission since 2002.

Over the last years ZARM Technik AG has received several awards for successful work in different national and international projects.

PRODUCTS AND SERVICES OFFERED

- Customized magnetic torquer for cubesat, EO-missions etc. in the range from 0.1Am² up to 1000Am²
- Low cost magnetometer
- High-Rel magnetometer
- RIU
- Environmental tests

Stand: F80 Zentrum für Telematik e.V.



Contact:

Daniel Eck

Email: ceo@telematik-zentrum.de

Web: www.telematik-zentrum.de

ZFT is an independent research institute located in Würzburg, Germany, active in the fields of Industry 4.0, mobile Systems and small satellite technology with focus on CubeSats and formation control.

9 Social Events, Technical Visits & Bremen Tours

Social Events

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..

Bremen Artists in Spaces

Date: Thursday 4 October 2018
Time: 11:00-18:00
Date: Friday 5 October 2018
Time: 11:00-18:00
Location: Ateliers in the "Viertel"

This event highlight brings you right into the heart of Bremen's creative scene. Artists and artisans open the doors of their studios for the IAC 2018 and invite all guests to learn more about their creative work ranging from photography, to ceramics, paintings and the design of jewellery. While exploring exquisite handicrafts, artistic uniques and exhibits visitors will get the chance to connect with the locals, meet new people and have fun in Bremen's most vibrant, colourful and cosmopolitan city district – including first-hand insider tips on where to eat, drink and shop.

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 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.



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 D2-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 €

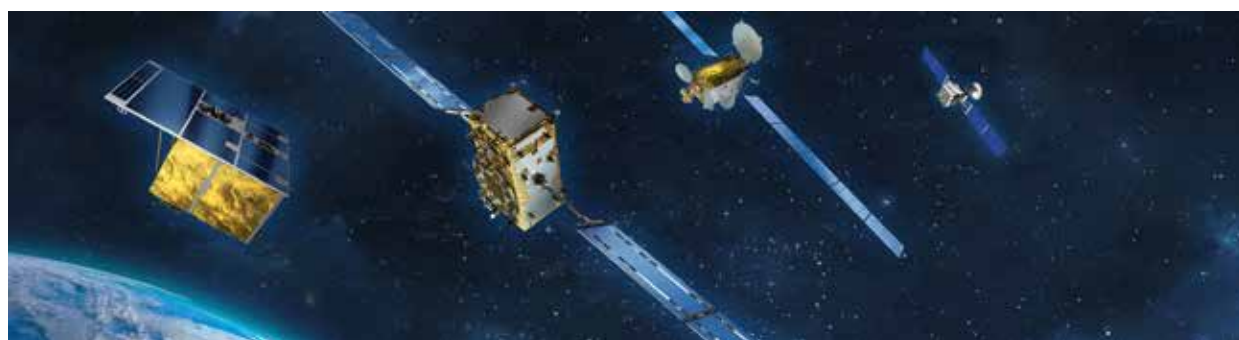
This tour is dedicated to all Young Professionals and students. Scientists of the DLR Institute of Space Systems will give exclusive insight into the current research topics and their objectives: Why do we want to grow tomatoes on the moon and Mars? How does a lander descend onto an asteroid or how do 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
Thursday 4 October 2018
Time: 09:15-12:00
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 five 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 / 13:15-15:00
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 €

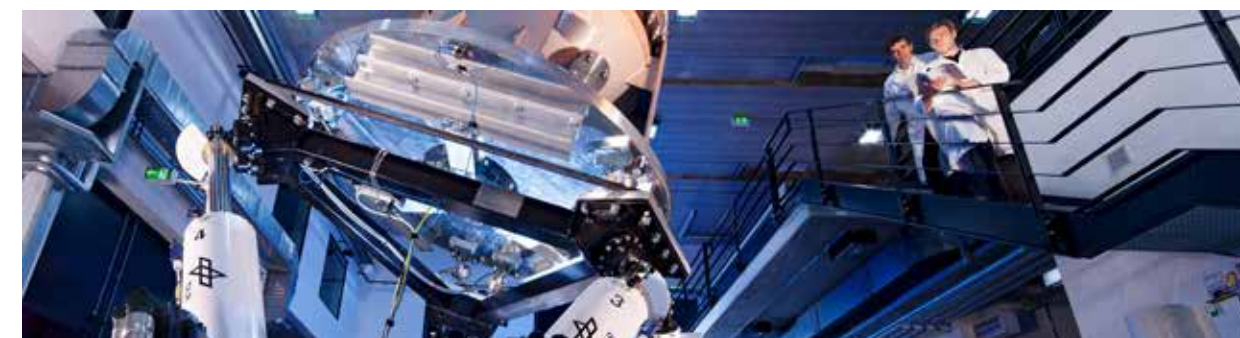
The Robotics Innovation Center (RIC) is part of the Bremen location of the German Research Center for Artificial Intelligence (DFKI). This is where scientists develop mobile robotic systems for complex tasks, which are used on shore, at sea, in the air and in space. The RIC cooperates closely with the 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
Wednesday, 03 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
Thursday 4 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
Thursday 4 October 2018
Time: 13:30-16:30
Date: Friday 5 October 2018 IUP, University of Bremen
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 "Viertel" 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 @ll Space People

www.glec2019.org



GLEC2019
GLOBAL CONFERENCE
ON SPACE FOR
EMERGING COUNTRIES



**MARRAKECH,
MOROCCO**
24-26 APRIL 2019

#IAC2018 Delegates: Do not miss the Global Conference on Space for Emerging Countries – GLEC 2019 Press Conference, on Tuesday 2 October 2018 from 17:15 – 17:45 at CCB Gallery in the Bremen Conference Center.

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.**

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

Conference at a glance:

	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
24 April		Registration	Opening Ceremony	High Level Keynote	Coffee Break	High-Level Panel Part 1: Benefits of Space Technology and Applications to Socio-Economic	Welcome Lunch	High-Level Panel Part 2: Benefits of Space Technology and Applications to Socio-Economic	Coffee Break	Plenary 2: Financial Models and Resourcing	Welcome Reception			
25 April		Registration	Plenary 3: Technology and Skills Development	Coffee Break	Plenary 4: Base Infrastructure Requirements	IDEA Lunch		SGAC/IAF Seminar					Gala Dinner	
26 April		Registration	Plenary 5: Space Industry Development and Support	Coffee Break	Plenary 6: Legal and Policy	Lunch		Results & Recommendations of Plenaries	Closing					

For more information:

Website: www.glec2019.org

E-mail: glec2019@iafastro.org

**Be part of the conversation
@iafastro and #GLEC2019**



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Visit www.iafastro.org/membership/ and contact us at info@iafastro.org to find out how to join the IAF movement!





Organizers:



3rd International Space Forum 2018 - The Latin American Chapter

Space Science and Academia for better Solution to Latin America's Challenges.

Buenos Aires, Argentina | 1 November 2018

Venue: Centro Cultural de la Ciencia | Avenida Godoy Cruz 2320, C1425FQD, Buenos Aires

The third edition of the International Space Forum – the Latin American Chapter (ISF 2018) – is expected to bring together Latin American Ministers of Education, Science and Research, Heads of Space Agency, representatives of Universities and Academia involved in space activities, as well as members of International Space Organizations, with the aim to encourage the discussion on how Space education and technology can support the understanding and exploitation of space benefits to help solving some of Latin American's challenges.

3 Keynote Speeches on:

- Management of Natural Resources and Prevention of Disasters
- Space Partnerships
- Education and Capacity Building

Contact: spaceforum@iafastro.org

Be part of the conversation @iafastro and #ISFBuenosAires



Spring Meetings 2019

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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CONTACT: GrégoryPradels
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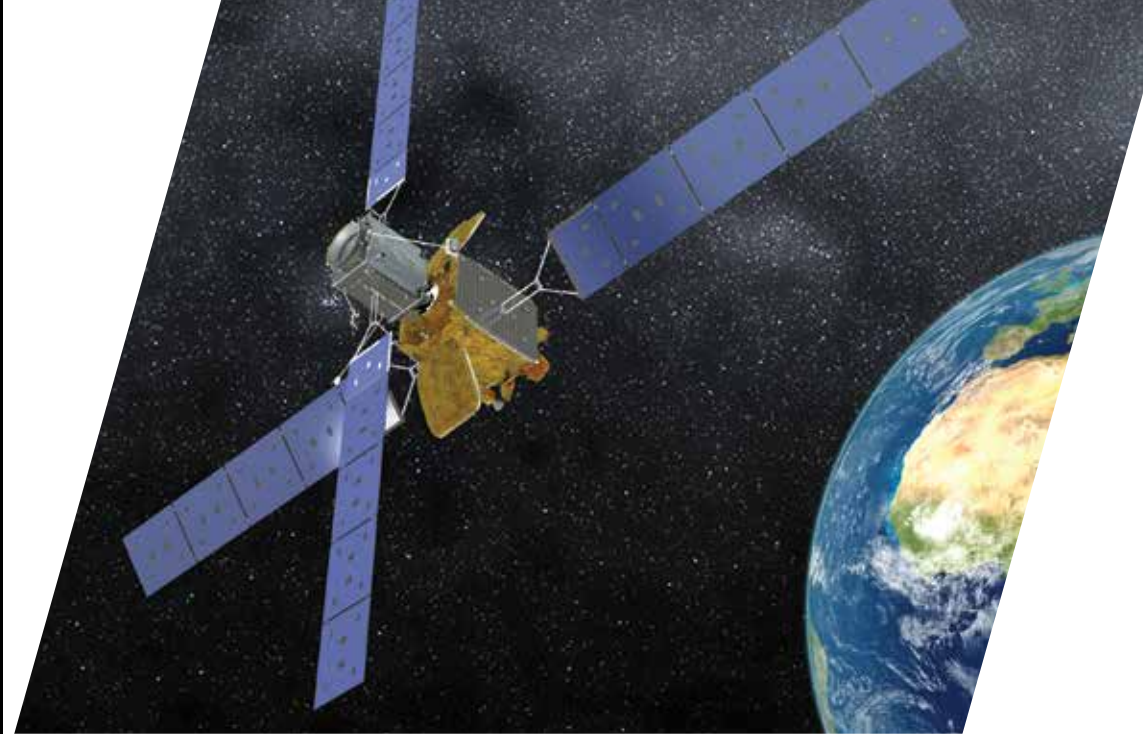
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THE NEXT STEP

BUILDING THE FUTURE

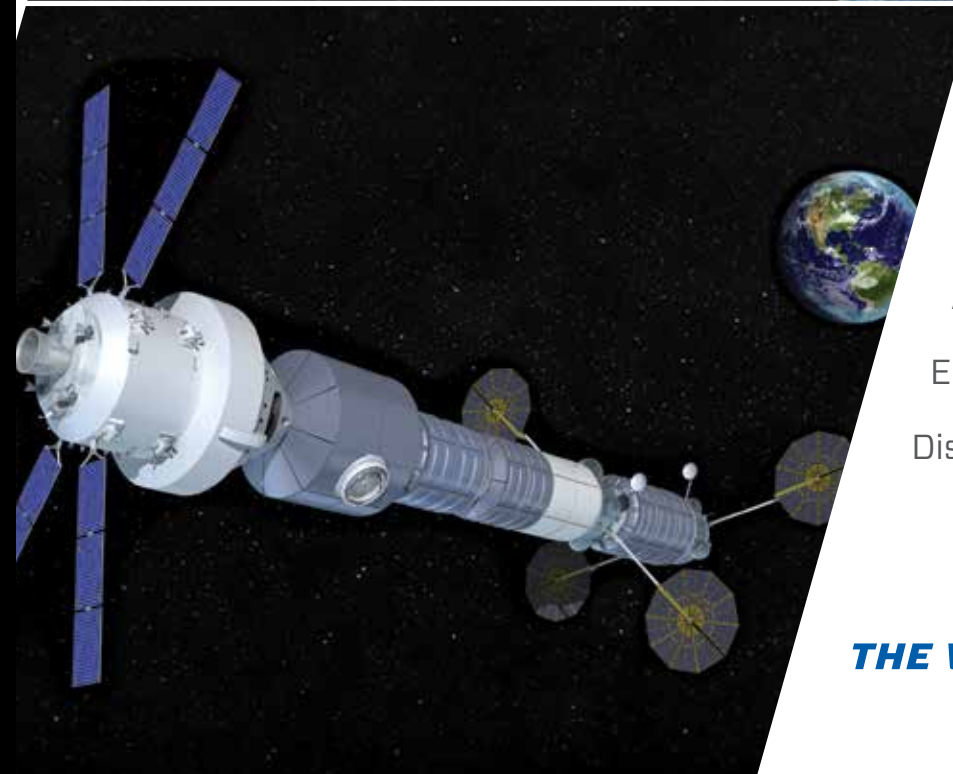
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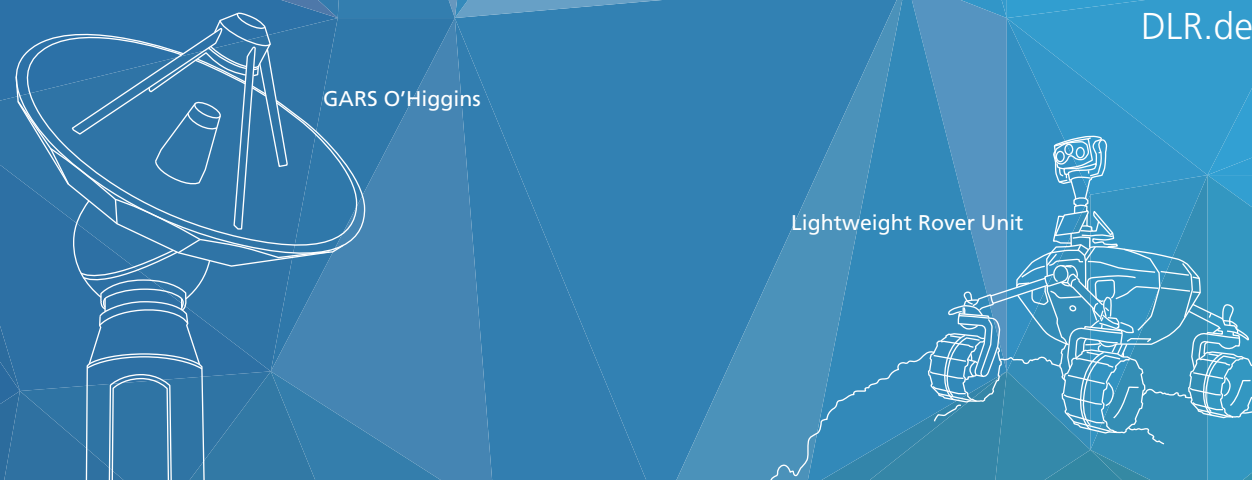
Knowledge for Tomorrow

The German Aerospace Center (DLR) is the national aeronautics and space research centre of the Federal Republic of Germany. Its extensive research and development work in aeronautics, space, energy, transport, security and digitalisation is integrated into national and international cooperative ventures. In addition to its own research, as Germany's space agency, DLR has been given responsibility by the federal government for the planning and implementation of the German space programme. DLR is also the umbrella organisation for the nation's largest project management agency.

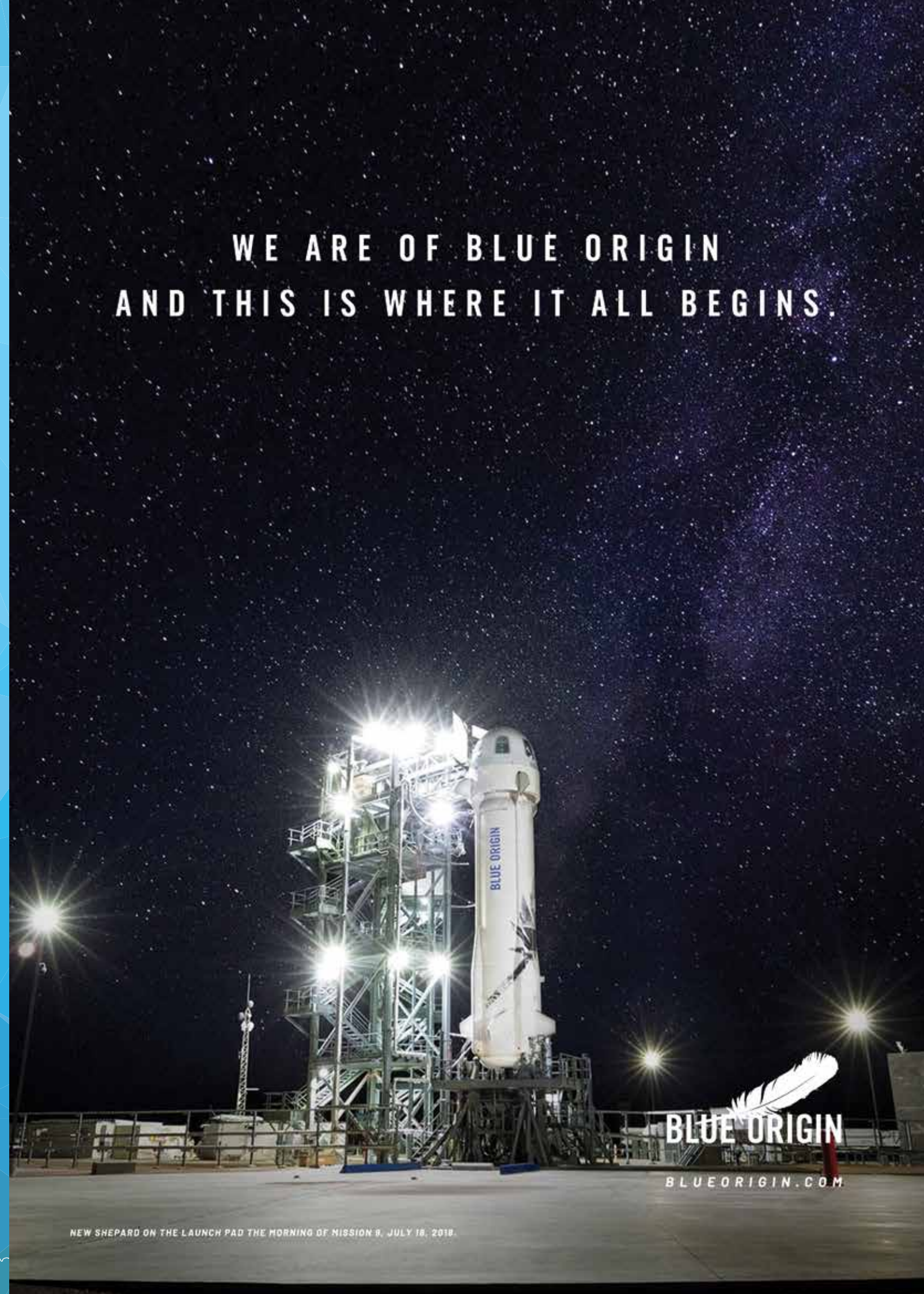
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Visit us at booths 5D50 and 5D15

DLR.de



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NEW SHEPARD ON THE LAUNCH PAD THE MORNING OF MISSION 9, JULY 18, 2019.



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