



# International Astronautical Federation **News**

*Connecting Space People*

2/2016 (May 2016)

## President's Welcome

Dear IAF Community,

This edition of our newsletter comes out just before one of the year's signature events: the Global Conference on Space and the Information Society #GLIS2016 in Geneva, organized in partnership with the International Telecommunication Union (ITU).

We are particularly pleased with this gathering, which is attracting great interest from throughout the world space community. You will find here all you need to know regarding the Opening Event, the 5 plenaries, the venue, accommodation, etc.

The IAF also showed up at the U.S.A.'s foremost space event, the National Space Symposium in Colorado Springs in April, where the #IAC2016 booth had its prominent position and it was visited by many participants.

Another IAF expanding event, the Global Networking Forum, attracted many participants during the Spring Meetings. This wide interest is continuing to rise and the GNF program of #IAC2016 looks extremely rich.



You will also discover the most recent news from IAF members!

I would like to express my special appreciation to our IAF members and committees for their presence and contribution to this newsletter. Many thanks to all and enjoy the reading!

**Kiyoshi Higuchi**  
President

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#### IMPORTANT DEADLINES:

- Early registration rate IAC 2016 – until **15 June 2016**
- Closing of Call for Nominations of IAF Distinguished Service Award – **31 August 2016**
- IAC Presentation Confirmation Deadline – **17 June 2016**
- UN/IAF Workshop Registration/Application Submission Deadline (for applicants seeking funding support) – **19 June 2016**



*Connecting Space People*

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**International Astronautical Federation**

3, Rue Mario Nikis, 75015 Paris, France - Tel. +33 1 45 67 42 60 - E-mail: [newsletter@iafastro.org](mailto:newsletter@iafastro.org)

## IAF & Diversity: Connecting ALL Space People

The International Astronautical Federation is passionately dedicated to the fostering of diverse talent. Therefore, we interviewed some of our many stakeholders to see if we are ensuring a concrete support for the diverse communities around us. The IAF Diversity video presents the Federation's commitment to diversity. We all – individually and collectively – have a vital role to play in connecting ALL space people. We might not have reached our goals yet, as we are only at the beginning of this journey, but we are ready to invest all our energy and dedication to make sure we go far. Let the discussion begin!



<https://www.youtube.com/watch?v=dGdZzuT76e0>



## IAC 2016

The International Programme Committee (IPC) has completed a thorough review process of abstracts submitted in response to our Call for Papers. More than 2100 abstracts from 73 countries have been selected for presentation IAC 2016 in Guadalajara, Mexico.

All the notifications letters have been sent out to our authors confirming the status of their abstracts. In case you have not yet received any letter please contact us as soon as possible at [support@iafastro.org](mailto:support@iafastro.org) and we will send a new one to you (it might have been rejected as spam). Remember that you have to confirm your presentation before the 17th of June and until the 15th of June you can also benefit from the early registration fee!

Congratulations to all those that have been accepted! We look forward to welcoming you to Guadalajara in September!



## Call for Delegates

**2016 IPMC Young Professionals Workshop at the 67<sup>th</sup> IAC in Guadalajara, Mexico**  
**Sunday September 25<sup>th</sup>, 2016**

### Call for Delegate Nominations for the 2016 IPMC Young Professionals Workshop

**Goal:** The International Project/Programme Management Committee (IPMC) Young Professionals Workshop seeks to gather input from young professionals in the international space community to gain the knowledge they need to better develop and empower the next generation workforce.

**Check for more news on our Social Media**





We would like your IAF affiliated organisation to nominate delegates for this workshop and represent your views in this international forum. Names and contact details for your nominations are to be sent before Friday June 3<sup>rd</sup>, 2016, to the Workshop Organising Committee at [yp\\_workshop@iafastro.org](mailto:yp_workshop@iafastro.org).

The delegates for this workshop are asked to be physically present at the day of the workshop as well as the International Astronautical Congress and would fit the profile of a young professional. Young professionals are typically defined as being age 35 and under and having at least one to two years of experience on a project team and/or in the aerospace industry and work for an IAF affiliated organisation. A diversity of backgrounds (e.g., engineering, management, science, etc.) is encouraged in order to produce thoughtful and wellrounded observations and recommendations that will be presented to the IPMC.

The delegates will be working in teams on the workshop topics via skype, email, webex, etc. prior to the workshop with kickoff planned in June.

The topics for the workshop have been defined by the Workshop Organising Committee and IPMC:

Topic 1 – Agile, Lowcost and High-performance space projects (improvements to Project Management processes, methodology and tools)

Topic 2 – Knowledge management in the aerospace sector (ideas on intergenerational knowledge exchange and transfer)

Topic 3 – 5 years of IPMC Workshop: Practice and Aspirations ( updating and implementing past recommendations in practice)

Additional information on the IAF and the IPMC can be found at <http://www.iafastro.org/> as well as <http://www.iac2016.org/>. Questions on the the Young Professionals Workshop can be addressed to [ipmc.yp.workshop@gmail.com](mailto:ipmc.yp.workshop@gmail.com).



## GLIS 2016

The main purpose of the **Global Conference on Space and the Information Society – GLIS 2016** will be to examine and discuss the different means by which space allows people to connect worldwide. GLIS 2016 will analyze in detail the impact that space policies, space technologies and space applications have on the daily life of people, organizations and governments communicating and exchanging information around the world.

GLIS 2016 will take place in headquarters of the **International Telecommunication Union - ITU in Geneva, Switzerland**, on **6 and 7 June 2016** and will feature an intense programme, comprising an Opening Event, 5 Plenary Sessions and a Wrap-up Session.

### Plenary 1 – The ITU and its Impact on Space Activities

- Results of the WRC-15
- Protection of C-band for Space Communication
- Guarantee of Spectrum for Unmanned Aircraft Systems
- WRC Agreement on the Global Flight Tracking in Civil Aviation
- Issues open for next WRC

### Plenary 2 – Sustainable Development Goals (SDG) and the Contributions of Satellite Communications

- Disaster Management (Communication & Navigation)
- Climate Change
- Tele Health
- Tele Education
- Disaster Management (Earth Observation)

### Plenary 3 – Space Economy meets Information Economy

- Space and Internet
- Role of Operators
- Trade Issues/Markets for and Innovation in the Satellite Manufacturing Industry
- Status and Future of the Orbit/Spectrum Resource

### Plenary 4 – Space Services and Security

- Civil Security and satellite communication
- Developments in military satellite programmes
- Cyberspace security: protecting ground and space infrastructures
- Jamming and spoofing as a governance problem
- Space Traffic Management in the age of Mega-constellations

### Plenary 5 – Big data – Information Society

- The role of satellite communications in the information society
- Big Data and Satellite Remote Sensing
- Privacy
- Security



### Sponsors



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[CLICK HERE to Register for GLIS 2016](#)

## SpaceUp GLIS

### What is a SpaceUp?

A SpaceUp is a space-related ‘unconference’ in which the delegates themselves decide what is presented and talked about. Before the SpaceUp, a basic framework is decided on by the organisers. On the day of the SpaceUp, the participants arrive and propose talks, discussions and activities they think will be of interest and which will stimulate interaction and debate. SpaceUps usually feature intense use of social media and are frequently video-streamed live. SpaceUps are real-time, collaborative, engaging and innovative.



### What is SpaceUp GLIS?

SpaceUp GLIS is a SpaceUp being organised by the IAF the day before GLIS. Organised by the IAF Space Education and Outreach Committee (SEOC), the IAF Workforce Development/Young Professionals Programme Committee (WD/YPP) and the Space Generation Advisory Council (SGAC). The outcomes of SpaceUp GLIS will be reported to the main conference to inform the delegates there.

## Who should attend SpaceUp GLIS?

- Students and young professionals interested/active in either the space or information domains in areas such as technology, policy, science, regulation, security, development, etc.
- GLIS delegates who want to take part in an activity that not only actively bridges space and the information society, but is also a prime example of the synergy between the two.

Join SpaceUp GLIS 2016! • <https://www.youtube.com/watch?v=-Gta0M7YbgY>

## 2016 IAF World Space Award

### Dr. Y. N. Koptev

Having graduated from The Bauman Moscow State Technical University in 1965, Y. N. Koptev worked at different enterprises of the rocket-space industry at the Ministry of General Machine-Building Industry of the USSR (MOM), where he ran the gamut from senior engineer to Deputy Minister – leading civil- and science - oriented space programmes.

In February 1992 after the dissolution of the USSR, he became one of the initiators of the establishment of the Russian Space Agency -special central agency authorized for the rocket-space issues, in charge of which he had been for 12 years.

Outstanding organizing skills, deep scientific knowledge and persistence allowed Y. N. Koptev to save the entirety of the rocket-space industry during the reformation of the Soviet political and economic systems in the 1990-s and to prevent disorganisation of the scientific and technical potential and industrial system of this branch of industry.

Upon his initiative international large-scale projects were launched by the Russian Space Agency. The leading national enterprises and the Russian Academy of Science were deeply engaged in these projects.

Scientific and applied research of the near Earth space, implementation of

the man-in-space program on the on-orbit station “Mir” by foreign astronauts, and launching of foreign space vehicles scientific equipment by Russian carrier boosters gave an opportunity to raise funds for Russian industry at the amount of over 6 billion dollars in the period between 1994 and 2004.

Y. N. Koptev contributed greatly to the development of ideology, engineering solutions and international agreements for the International Space Station establishment projects and Russian rocket “Soyuz” launch from the Guiana Space Centre (The European Space Agency (ESA)).

During the period of transformation of the RSA into the Russian Aerospace Agency (RAA), Y.N.Koptev participated in the active management of promising aerospace complexes.

After the abolition of RAA in April 2004, Y.N.Koptev was transferred to a position of the Director of the Department in the Ministry of Industry and Energy of the Russian Federation. At this position he worked on the development of the strategy of aeronautical and shipping industries.

He initiated the industrial technology development programmes intended to the creation of the Prospective Airborne Complex of Frontline Aviation and transfer of plane IL-76 manufacturing to



Russia and its modernization.

Since May 2002 Y. N. Koptev has been working at the State Corporation “Rosstechnologii», as a chairman of the Science and Technical Board, taking part in elaboration of innovative development programmes of the corporation (he had to stop working at public service because of his age).

In February 2015 Y. N. Koptev was appointed to the Head of the Scientific and Technical Council of the new **Roscosmos State Corporation** (which united the experts from the previously existed) Roscosmos and The United Rocket and Space Corporation. During the only one year in this position Y. N. Koptev already started many new important initiatives including the elaboration of the programme of integration of robotic and manned lunar investigations, analysis of the effectivity of different space projects and space education.

## 2016 Allan D. Emil Memorial Award

### Dr. Charles Elachi

Charles Elachi has been the Director of the Jet Propulsion Laboratory since May, 2001. Professor of Electrical Engineering and Planetary Science at Caltech. Dr. Elachi received his B.Sc. ('68) in physics from University of Grenoble, France; the Dipl. Ing. ('68) in engineering from the Polytechnic Institute, Grenoble, and both a M.Sc. ('69) and Ph.D. ('71) degree in electrical sciences from the California Institute of Technology. He also has a M.Sc. ('83) degree in geology from the University of California, Los Angeles, and an MBA ('79) from the University of Southern California.

Dr. Elachi joined JPL in 1970. Prior to becoming Director, Dr. Elachi was JPL's Director for Space and Earth Science Programs (beginning in 1982) where he was responsible for the development of numerous flight missions and instruments for Earth observation, planetary exploration and astrophysics. He has been a principal investigator on a number of NASA-sponsored studies and flight projects including the Shuttle Imaging Radar series (Science Team Leader), the Magellan Imaging Radar (Team Member), and the Cassini Titan Radar (Team Leader). He is the author of over 230 publications in the

fields of active microwave remote sensing and electromagnetic theory, and he holds several patents in those fields.

In 1989 Dr. Elachi was elected to the National Academy of Engineering and has served on a number of academy committees. Dr. Elachi has received numerous awards, including the Aviation Week Lifetime Achievement Award (2016), 2016 National Space Trophy, an American University of Beirut Honorary Doctorate (2013), the Association of Space Explorers (ASE) Congress Crystal Helmet Award (2012), the Pasadena Arts Council Inaugural AxS (Arts & Sciences) Award (2012), Lebanese American University Honorary Doctorate (2012), National Academy of Engineering Arthur M. Bueche Award (2011), "Chevalier de la Légion d'Honneur, France" (2011), Space Foundation J.E. Hill Lifetime Space Achievement Award (2011), AIAA Carl Sagan Award (2011), Occidental College honorary Doctor of Science degree (2011), Sigma Xi William Procter Prize for Scientific Achievement (2008), International von Kármán Wings Award (2007), the America's Best Leaders by U.S. News & World Report and the Center for Public Leadership at



Harvard University's Kennedy School of Government (2006), the Royal Society of London Massey Award (2006), the Lebanon Order of Cedars (2006 and 2012), the Philip Habib Award for Distinguished Public Service (2006), the American Astronautical Society Space Flight Award (2005), the Bob Hope Distinguished Citizen Award (2005), NASA Outstanding Leadership Medal (2004, 2002, 1994), Takeda Award (2002), the Wernher von Braun Award (2002), UCLA Dept. of Earth and Science Distinguished Alumni Award (2002), Dryden Award (2000), NASA Distinguished Service Medal (1999), the COSPAR Nordberg Medal (1996), the NASA Outstanding Leadership Medal (1994), the IEEE Medal of Engineering Excellence (1992), the IEEE Geoscience and Remote Sensing Distinguished Achievement Award (1987) and the NASA Exceptional Scientific Achievement Medal (1982).

## IAF Hall of Fame



### Mr. Norman Crabill

"I was one of the cohort that was in the right place at the right time: NASA's evolution from Aeronautical Research to Space Exploration. I worked at NASA's Langley Research Center with the pioneers of our space program, from 1949 (NACA) to 1986 (NASA).

One of Langley's early space projects was ECHO I, a 100 foot diameter balloon to be the first communication satellite and an explorer of the upper atmosphere. My job was to put it 200 miles up over Wallops Island to test its inflation process before putting it into orbit. I designed the two-stage solid propellant SHOTPUT rocket, solving the dynamic roll-resonance problem of unguided sounding rockets with help from coworkers. The first one was launched on October 28, 1959. It took 5 launches to get the balloon to open properly. For ECHO II, the 135 foot diameter follow-on, I tested its deployment process by launching it on a one-stage Douglas THOR rocket from Canaveral, with a real-time down-linked TV and a recoverable film camera on front of the THOR which monitored the balloon's unfolding. Two launches were required in 1960 to get the balloon to open properly. Some of the astronauts at the Cape at that time came over to see our real-time TV downlink.

We used the same SHOTPUT rocket to test the Italian SAN MARCO satellite at Wallops two times, before its launch into its satellite orbit.

Following that was LUNAR ORBITER, the precursor to the APOLLO program. Langley was given the job of finding landing sites for APOLLO, and I became the Mission Design Manager in the LUNAR ORBITER Project Office. With 5 launches planned, we should be able to get enough photos for Apollo. My job was to get answers to: When do we launch, What are the trajectories, and Where do we take the pictures? NASA Headquarters told us to consult with the US Geological Survey in Flagstaff AZ to select the sites on the Moon to be photographed, so I and my assistant Tom Young visited Larry Rowan there and selected a number of promising sites. We changed the mission concept from shooting all 212 frames at one site on each mission, to doing 10 sites on each mission, causing extensive changes to the mission profile, and the operation of the on-board film-camera system, which we successfully developed with our Boeing contractor. Our first mission, August 1976, succeeded in getting the photos, including an un-planned first photo of the Earth from the Moon, and discovering the Lunar Gravity Field anomalies, which we had to account for in real time, and which influenced the APOLLO trajectories too.

After the third successful mission, APOLLO didn't need any more sites, and Project Manager Cliff Nelson asked me "What will we do with numbers 4 and 5?" I said "We'll map the Moon on number 4, and do other Science on number 5". And we did. All told, FIVE successful missions in 1966 -1967, a first for NASA Lunar missions at that time.

In 1968, many of the LUNAR ORBITER Team at NASA Langley went on to start the Viking Project to put two landers on MARS in 1973. In January 1970, HQ told us the launches were slipped to 1975 due to budget problems. I had to tell our Project Manager Jim Martin we could not get there in 1975 using the Titan launch vehicle like we planned for the 1973 launch due to the different positions of Earth and Mars in their orbits. He replied " Norman, you will find a way". And my Mission Design Team, which included Langley, and my contractors at Langley, and JPL, and some help from Houston, did, after a six month study. Using the same Titan launcher, we found we could get there launching in 1975 if we took an 11 month trajectory, instead of the 6 month trajectory that the Earth-Mars planetary positions allowed for in the 1973 opportunity. That 11 month trip around the Solar System type of interplanetary trajectory had never been done before, but we did it, launching twice in 1975, and getting to Mars in 1976, and landing number one successfully on July 20, 1976, and number two on September 3 1976. Our observations from orbit on both missions showed the preselected sites were NOT acceptable, so we went through an unplanned mission re-design process to find acceptable sites. And we did, TWO for TWO!

The interplanetary trajectory design solution was just the beginning of the development by JPL of many other innovative trajectory designs, including close fly-bys of other planets to get a 'gravity boost'.

After Viking, I worked on airplane problems, including Langley's "Storm Hazards Program", and after retirement, worked for the FAA as a contractor, advising them on the development of their new weather data systems. Later, I worked as a consultant to ViGYAN Inc of Hampton Virginia, developing the Pilot Weather Advisor System to put real-time weather data on the GPS moving map in aircraft using a satellite down-link, which is in general use today. We got the patent in 1993. I also put together a consortium that developed a technology for Lightning-Proofing composite aircraft, which also is in use today. In 2003, with ViGYAN, we put a digital Flight Recorder on Ken Hyde's 2003 replica of the 1903 Wright Flyer, and presented my results in a paper to the AIAA in 2006. I have authored and co-authored many other papers about the work I have done, to ensure that the results can be known by others. Also, I have mentored youngsters, of ages 5 to 25 about science and engineering, including interns at work, and others that have come into my life.

One of the things I pass along is that when you are trying to do something that has never been before, the unexpected frequently happens, and to succeed, you may have to deal with it in real time, without recourse to re-engineering the whole system.

I have been fortunate to have been in that CAN-DO environment in my whole career, working with like-minded people in government and industry who wanted to Make It Happen in spite of real obstacles."



**Dr. Manfred Fuchs** was born in 1938 in Latsch, South Tirol, Italy. At the age of 17 he became the youngest pilot in Italy. One year later he went to Germany. After his studies of Aeronautics in Munich and Hamburg he began his career in the newly created space company ERNO and became involved in projects like ARIANE-1, SPACELAB, and COLUMBUS.

Manfred Fuchs was one of the early Post World War II space pioneers in Germany. He started his industrial career in ERNO, Bremen, until he and his wife created their own space company OHB which was developed in less than 30 years to the number one national space enterprise in Germany with subsidiary companies in various European countries and almost 2500 employees.

OHB's success story is based on many things but in the center are innovative solutions and small satellites.

The early work in this field laid the basis for winning the SAR-Lupe constellation for the German Ministry of Defense with 5 radar reconnaissance satellites all launched and operated without a problem. Then, in 2007 a large ESA contract for the development of small geostationary satellites gave OHB the opportunity to further improve their capabilities in the field of telecommunications satellites. A major company highlight was the successful acquisition of the contract to develop and build 14 Galileo satellites in 2010. In the same year Thales-Alenia with OHB as subcontractor won 6 Meteosats from ESA/Eumetsat which created a dramatic increase of the order book. All along OHB acquired other companies in Europe. The most important ones were Carlo Gavazzi, MAN-Technologie AG in 2005 and Kayser-Threde in 2007. OHB has eventually become an "Aktiengesellschaft" and in 2015 a "Societe Europeen" (SE).



**Professor U R Rao** is an internationally renowned space scientist who has made original contributions to the development of space technology in India and its extensive application to communications and remote sensing of natural resources.

Prof. Rao was the Director of ISRO Satellite Centre at Bangalore during 1972-1984 and Chairman of the Indian Space Research Organisation and Secretary, Department of Space during 1984-1994. Presently he is the Chairman of the Governing Council of the Physical Research Laboratory at Ahmedabad, which is considered as the cradle of India's Space Program / Chairman, Karnataka Science & Technology Academy / Chairman, Advisory Committee for Space Science, ISRO / Chancellor, Indian Institute of Space Science and Technology.



**Professor Wang Xiji** has devoted his academic and professional career to the promotion of into China's space industry for over 65 years. He graduated from southwest combined university in machinery department in 1942 and studied in Virginia institute of technology in dynamic and fuel major in U.S. since 1948. In 1950, he came back to China and took up teaching in Dalian institute of technology and Shanghai Jiaotong University.

Since 1958, as one of the organizers of the early research on rocket technology of China, Professor Wang served as the technical leader of China's first liquid fuel rocket and follow-on meteorological rocket. Then he creatively combined sounding rocket technology with guided missile technology and put forward technical concept of first launch vehicle. He took charge of system design of longmarch-1 launch vehicle and the development of nuclear test sampling rocket series. He served successively as the director of

Beijing institute of space machinery and electricity institute, vice president and director of science and technology committee of CAST and chief engineer of the ministry of astronautics since 1965.

Professor Wang became the chief designer of recoverable satellite and took charge of development concept based upon domestic technological and industrial basis. The satellite return technology reached international advance level. In 1975, China's first recoverable satellite was successfully launched then and China became the third country in the world mastering this high technology. He won the national scientific and technological progress prize of special class for returnable satellite and dongfanghong-1 satellite in 1985. He was also the chief designer of double star programs which was significant international space cooperation with ESA in 21<sup>st</sup> century.

Under his leadership, a great number of new technologies were adopted and a series of critical technologies were broken through and thus the function of the satellites was enhanced and its lifetime lengthened. In 1987, he was elected as the member of International Academy of Astronautics (IAA). Due to his initiation and participation in the development of two new disciplines of uncontrolled rocket and space return technologies, Professor Wang was elected as the member of Chinese Academy of Science in 1993.

## 2016 Frank J. Malina Astronautics Medal

### Ms. Bénédicte Escudier

A graduate of SUPAERO (1979), passionate about Aerospace Engineering and Teaching, Bénédicte Escudier has been involved in the development of Space activities at SUPAERO after working for three years in the private

sector as Head of Mission Performances and Attitude Control Simulation for a military Earth observation satellite project.

First women as Professor at SUPAERO,

she reached rapidly the head of Space department of SUPAERO, and she has developed and supervised all Space-related courses in Space System Engineering and Space Science at ISAE-SUPAERO. She has also created



and managed Post-Graduate Programs (TAS Astro). She has also contributed to international programs (Erasmus Mundus, SEEDS...) through European and Worldwide Partnerships.

More broadly, Bénédicte, especially at the head of International Affairs, participated to the strengthen of the international influence of SUPAERO and ISAE, creating opportunities for students to access US universities, ESA and NASA Programs since the 80s, by increasing the number of exchange students (over 130 incoming and outgoing

students every year for engineering courses) through bilateral partnerships (especially double degree agreements). She also developed exchange programs and research opportunities with Canada, Brazil, Mexico, Argentina, China... And many other countries in the world.

Most of French Engineers, Managers and Experts in the field of Space Engineering have attended Bénédicte's Courses during the last 30 years. She is very well known and respected in the domain, and her network is highly



profitable for ISAE-SUPAERO and more especially students from the institution.

## 2016 Young Space Leaders Recognition Programme (YSL) winners

The YSL Recognition Programme is targeted at exceptional students and young professionals (age 21-35) who demonstrate leadership in their academic or early careers. The YSL winners are presented with their award during the Closing Ceremony of the annual International Astronautical Congress (IAC). Awardees also attend the IAC Gala Dinner as guests of the IAF President and enjoy free IAC registration. Congratulations to the 2016 winners:



**Jessica Culler,**  
NASA Ames Research Center



**Takashi Ohtani,**  
Japan Aerospace Exploration Agency  
(JAXA)



**Andrea Boyd,**  
European Space Agency  
(ESA)



**Amalio Monzon,**  
Airbus Group



**Victoria Alonsoperez,**  
Founder and CEO, Chipsafer

## 2016 IAF Emerging Space Leaders (ESL) Grant winners

Fourteen young people have been selected to participate in the 2016 IAF ESL Programme, and attend the 67<sup>th</sup> International Astronautical Congress in Guadalajara, Mexico from 26 – 30 September 2016. These participants will receive the following:

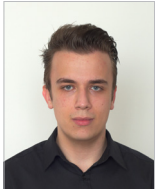
- Round trip air fare between the candidate's home country and Guadalajara, Mexico,
- Funding for transportation, lodging and meals during the candidate's stay in Guadalajara, Mexico,
- Free registration for the 67<sup>th</sup> International Astronautical Congress as well as the Space Generation Congress or the 2016 UN/IAF, Workshop, the Cross Cultural Presentation Workshop and other associated activities.
- Mentors will provide advice on presentations at the IAC and on activities before and during the IAC to help grant recipients benefit fully from the Congress and related meetings and meet with the grant recipient during the IAC.



**Mahek Thakuri**  
Nepal  
Tribhuvan University



**Geraldo Salazar Diaz**  
Cuba  
Universidad de Oriente



**Marek Novak**  
Czech Republic  
Czech Technical University



**Tijesu Ojumu**  
Nigeria  
National Space research and development agency



**Shatirsingh (Ishraj) Inderjeet**  
Mauritius  
International Space University



**Michaela Musilova**  
Slovakia  
Slovak Organisation for Space Activities (SOSA)



**Oniosun Temidayo**  
Nigeria  
The Federal University of Technology Akure



**Yuval Brodsky**  
Israel  
Freelancer



**Sinead O'Sullivan**  
Ireland  
Harvard University



**Manisha Dwa**  
Nepal  
Nepal Astronomical Society (NASO)



**Marta Rocha de Oliveira**  
Brazil  
International Space University



**Upasana Dasgupta**  
India  
Cyril Amarchand Mangaldas



**Jonathan Kolbeck**  
Costa Rica  
The George Washington University



**Lisa Stojanovski**  
Australia  
TMRO

## MEMBERS' CORNER

### Yuri's Night celebrations in Africa

The Space Association at the University of the Western Cape and Cape Peninsula University of Technology recently hosted one of three known Yuri's Night celebrations in Africa.

At lunchtime on World Cosmonautics Day, 12<sup>th</sup> April, they had a talk by Dr. Adriana Marias, one of the South Africans shortlisted by the Mars One Foundation to emigrate to Mars.

After sunset on the 13<sup>th</sup> of April, there was a star-gazing session through telescopes.

## INVITATION

### 'Innovation for Exploration! A Bridge for the future'

June 2<sup>nd</sup> 2016, 15:30-16:20

ILA Berlin 2016, Space hall (Raumfahrtthalle), Berlin EXPO Centre Airport

#### Panel Discussion

- ❖ **Brigitte Zypries** - Parliamentary State Secretary at the Federal Ministry for Economic Affairs and Energy, Coordinator of Germany's aviation and space policies
- ❖ **Simonetta Di Pippo** - Director of the Office for Outer Space Affairs - UNOOSA at United Nations Office at Vienna, founder of WIA
- ❖ **Prof. Pascale Ehrenfreund** - Chair of the DLR Executive Board
- ❖ **Claudia Kessler** - HE Space CEO and founder of WIA
- ❖ TBC **Dr. Dava Newman** - NASA Deputy Administrator

We are looking forward to see you in Berlin!

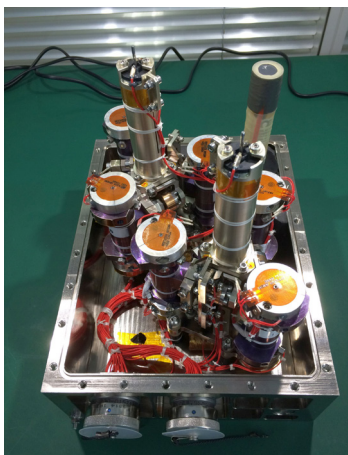
[Please register here for your participation](#)



## QinetiQ's microgravity oil experiment launched on board Chinese rocket



7 April 2016 – An experiment developed by QinetiQ for the European Space Agency (ESA), which could help scientists gain a better understanding of oil wells, has successfully launched into orbit.



The Soret Coefficients in Crude Oil (SCCO) experiment, launched on 6 April 2016, will orbit Earth for two weeks on board China's SJ-10 Shi Jian satellite.

Upon its return to Earth, the equipment will be retrieved and the data examined. The findings could help to improve oil extraction rates from reservoirs deep underground.

Ronald Kassel, Project Manager at QinetiQ, explains:

#### What is SCCO, and how does it work?

"SCCO is an experiment that measures the Soret effect, a phenomenon where fluids in a mixture react differently when exposed to heat or cold, causing them to separate.

"To understand how the experiment works, imagine a mixture of water and oil in a glass. On Earth, under the influence of gravity, the oil floats on the water due to the difference in buoyancy.

"The SCCO equipment does something similar, but removes gravity from the equation and examines the effect of temperature instead.

"If you fill a tube with a mixture of fluids and create a temperature difference between the two ends, the fluids will rearrange themselves, with some closer to the cold side and some closer to the hot side.

"An SCCO fluid cell is a tube with a hot end, a cold end, and a valve in between. We bring these tubes into microgravity and apply the temperature gradient. After sufficient time the valve is closed, allowing the separation to be studied." How will the findings of the experiment be used on Earth?

"The focus of the experiment is the impact of the Soret effect on crude oil. The oil industry uses complex computational models to exploit oil fields, so the results will be used to examine the impact of the Soret effect on their calculations. Refining these models and improving their accuracy could help to increase yields from reservoirs on Earth."

#### What is the format of the mission?

"SCCO will fly on the unmanned Chinese SJ-10 capsule, which will enter low earth orbit for 10 to 14 days before being forced back in to the atmosphere for controlled re-entry and recovery. The experiment is conducted fully automatically, although we do have the option to intervene from the ground if needed.

"The reasons for automation are mostly safety and cost. The pressure in the cells and the nature of the fluid inside mean additional safety reviews and complex analysis equipment would be needed for manned spaceflight. Automation greatly reduces the cost associated with these."

Why is this mission important for QinetiQ, and for the international space industry? "This cooperative project with China marks another step forward for international collaboration across an increasingly globalised space industry.

"QinetiQ's track record of defining complex mission requirements, integrating systems from multiple suppliers, and developing technology for manned and unmanned carriers, puts us in a strong position to capitalise on this trend.

"Adding this new platform will enable us to offer our customers an even more developed portfolio."

## HE Space is again No 1 Supplier at ESTEC



ESA's location ESTEC recently announced the results of its supplier evaluation for the period up to 2015. The Key Performance Indicators, which assess each company's ability to deliver good service, rank HE Space as Best Supplier out of 11 consortia. Our Best Supplier status covers the 6 domains of 'Research & Scientific Support', 'Education, Communication and Outreach', 'Control Systems', 'PA Engineering', 'Component Engineering' and 'Electromagnetics'.

These KPI results reflect our programme of continuous improvement where we critically assess all our processes including customer service and staff stability.

## CIDA-E CONVENE A MEETING WITH SPACE EXPERTS FROM VENEZUELA AND CHINA

On the occasion of the visit to Uruguay by the Venezuelan expert on space issues, MSc. Roberto Becerra, CIDA-E organized a meeting on April 14, at the headquarters of the National Directorate of Civil Aviation and Aeronautics Infrastructure (DINACIA), in which also participated as panelists, Mr. Guo Zhongxia and Ms. Cheng Xien from China, both belonging to the China Great Wall Industry Corporation (CGWIC).

Mr. Becerra referred to the basic concepts of space science and technology, their applications and benefits, mentioning in particular the space activities carried out in Venezuela: their background, space programs, benefits derived from them and the results obtained.

He also mentioned the cooperation of Venezuela with Uruguay, which occurred through the signing of an agreement in 2006, in which Uruguay ceded to Venezuela the 78 ° geostationary orbital position for the placement of the Venesat-1 satellite, setting in the agreement that the operational capacity of the satellite would be shared by both countries, although in different proportions.

Mr. Guo Zhongxia and Ms. Cheng Xien addressed the issue of international space cooperation, making special mention of space activities in China, in particular those developed by the CGWIC, pointing out the features and capabilities of the launching services offered by the Corporation.

The meeting was attended by representatives of several organizations: the Uruguayan Air Force; the Ministries of Transport, Livestock, Tourism and Foreign Affairs; the Faculties of Law and Engineering; the National Telecommunications Administration (ANTEL), the Regulatory Unit of Communications Services (URSEC), and other institutions.

## SpaceLand

Weightless biomed and pharmacological R&D, orbital debris clean-up technology testing and STEM education are among the key-disciplines for the public microgravity flight training which COSMO SpaceLand is organizing this Summer, preparing for new and unprecedented "open" microgravity R&D and educational flight campaigns in Africa, Asia and America.



In this respect, SpaceLand has also been requested by several international entrepreneurs and investors to adapt the SpaceLand Center's ground, underwater and free-fall/drop-tower facilities, preliminarily designed by the group's senior engineers for Italian resorts, to new establishments both in Africa and South-East Asia, also thanks to the support of local Ministers of Science, Technology and Innovation, given the extremely interesting "investment/returns" ratio of the SpaceLand Center business plan for the local communities.

Among the goals of the SpaceLand program, there is also the transfer of state-of-the-art technology and science results from the microgravity, spaceflight and satellite sectors into the everyday's life on planet Earth.

SpaceLand's final objective for all the above ground and flight activities is fully democratizing the access of the general public to Microgravity, to benefit from the new "Space-knowledge era" in terms of education, techno-science and social-economic innovation, maximising synergies among existing initiatives in the microgravity arena, co-funded by private investors, especially to ameliorate the quality of life and create high-tech, high-skill jobs in developing Countries.

Such being-developed Centers of Excellence for Microgravity will also provide new biomedical and pharmaceutical means and tools to enhance the quality of life of elderly, disabled, children and long-term bed-resting individuals, thanks to the unique microgravity R&D laboratory features on board special flight vehicles addressing gravity-related pathologies, while at the same time searching and developing, within such "flying labs", new therapies and medical drugs to extend life-expectancy for anybody.

Given all this work and initiatives, an international award has been granted to SpaceLand's CEO during a recent event near Singapore, in front of more than 1500 enthusiasts from 11 Asian Countries.

After the success of previous SpaceLand public outreach events endorsed by the V-President of the European Commission (e.g. <http://www.asi.it/it/eventi/convegni/spaceland-expo-congress>), due to the amount of requests to allow for more time to prepare science papers, technological reporting and Space Art exhibits, the fourth SpaceLand Congress has been moved to 2-4 November 2016, when all details about the upcoming activities will be provided and investors will be meeting with experts, students and space enthusiasts.

Join the Congress and get qualified for weightless, Lunar-gravity and Mars-gravity research, educational or aerospace tourism flights at our underwater training camp in the beautiful island of Mauritius, at any age!

Welcome to SpaceLand!

Applications on [www.SpaceLand.it](http://www.SpaceLand.it)

**WIA WOMEN IN AEROSPACE EUROPE**

## 'WIA-Europe Networking Breakfast'

**Monday, 6<sup>th</sup> June 2016, 08:30 - 10:00**

Global Conference on "Space and the Information Society - GLIS 2016",  
ITU Headquarters (ICT Discovery), Place des Nations 1211, Geneva 20 Switzerland

At the occasion of the Global Conference on "Space and the Information Society - GLIS 2016", co-organized by the IAF and ITU in Geneva 6-7 June 2016, Women in Aerospace Europe kindly invites interested men and women to attend a WIA-E Networking Breakfast featuring prominent speakers. This is an exclusive networking opportunity to meet and exchange with colleagues and friends and support WIA-Europe's Vision of

**"A European aerospace sector with an inclusive representation on all levels".**

### Programme

**Moderator:**  
Elena Feichtinger, WIA-Europe Executive Director

**08:30 - 08:50 Welcome:**  
Simonetta di Pippo, WIA-Europe President  
Houlin Zhao, Secretary General, ITU  
Kiyoshi Higuchi, President of the International Astronautical Federation

**08:50 - 09:30 Speakers:**  
Jennifer Warren, Lockheed Martin Corporation, Vice President, Technology Policy & Regulation  
Jean-Yves Le Gall, President, Centre National d'Etudes Spatiales CNES; IAF President Elect  
Roberto Battiston, President, Italian Space Agency ASI; IAF Vice-President

**09:30 - 10:00 Networking**

Global Conference on Space and the Information Society  
**6 - 7 June 2016**  
Geneva, Switzerland,  
ITU Headquarters  
Connecting the World via Space -  
Policies, Technologies, Applications  
[www.glis2016.org](http://www.glis2016.org)

With strong support by the WIA-E Geneva Local Group  
Access is free but registration obligatory!  
RSVP by **1 June 2016** to [executive\\_director@wia-europe.org](mailto:executive_director@wia-europe.org)

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- MINES Albi-Carmoux
- ESPI

## COMMITTEE BROADCAST

### Space Propulsion Committee

The IAF Space Propulsion Committee is in continuous evolution! At the Spring Meeting in Paris, March 2016, The IAF Space Propulsion Committee welcomed seven new members.

**Ms. Nicoletta Wagner** is Head of Power Products & Projects at Airbus DS GmbH (Friedrichshafen, Germany).

**Ms. Elizabeth Driscoll** is Business Development Manager at Aerojet Rocketdyne (Redmond, WA, USA).

**Mr. Akira Ogawara** is Upper Stage Engine Project Engineer at Mitsubishi Heavy Industries, Ltd. (Komaki, Japan).

**Dr. Yen-Sen Chen** is Senior Research Fellow and Suborbital Science Experiment Program Director at National Space Organization (Taiwan) and he is also an AIAA Associate Fellow.

**Dr. Elizabeth Jens** is Propulsion Engineer at Jet Propulsion Laboratory (Pasadena, USA).

**Dr. Elena Toson** is Program Manager at D-Orbit S.r.l. (Italy) and a member of the Women in Aerospace Association (WIA) and the Space Generation Advisory Council(SGAC).

**Mr. Arnau Pons Lorente** is a Visiting Scholar at School of Aeronautics and Astronautics, Purdue University (USA) and a Member of the Agrupación Astronáutica Española (Spanish Astronautical Association), SGAC, and AIAA.

The IAF Space Propulsion Committee – a truly dynamic international team with creative spirit, friendly atmosphere, supportive culture and cooperative tradition, will surely play a very active role in fulfilling the dream of the International Astronautical Federation.

## Educator Professional Development Workshop and Student Outreach at the 2016 IAC

The Space Education Outreach Committee (SEOC) and the International Space Education Board (ISEB) will partner to sponsor the Educator Professional Development Workshop at the 2016 International Astronautical Congress (IAC) in Guadalajara, Mexico. The Victorian Space Science Education Center (VSSEC) will again serve as the primary facilitators for this event, with support from SEOC and ISEB members, ISEB sponsored students, and the Local Organizing Committee. Approximately 60 - 80 teachers are expected to participate in this year's workshop. The ISEB is coordinating its "Outreach Day" for local elementary school students and plans to use "SCRATCH," a new programming language that makes it easy to create interactive stories, games, and animations and share the creations with others on the web. These lessons are designed to help students step by step through the process of building cartoon animations and games. Students will start with learning to create a simple sprite (a computer graphic that may be moved on-screen and otherwise manipulated as a single entity) and progressively acquire more advanced skills. In a collaborative effort, the SEOC and ISEB are working to include the use of "SCRATCH" into the Educator Professional Development Workshop, where teachers will be shown how to teach on the use of "SCRATCH" in the classroom, while students will learn skills at the Outreach Day Event that will be educational and fun. Please see a SCRATCH club in Mexico video: <http://scratched.gse.harvard.edu/stories/scratch-club-kids>.



## Interview with Houlin Zhao Secretary-General of ITU



Houlin Zhao was elected 19<sup>th</sup> Secretary-General of ITU at the Busan Plenipotentiary Conference in October 2014. He took up his post on 1 January, 2015.

Prior to his election, he served two terms as ITU Deputy Secretary-General (2007-2014), as well as two terms as the elected Director of ITU's Telecommunication Standardization Bureau (1999-2006).

He is committed to further streamlining ITU's efficiency, to strengthening its membership base through greater involvement of the academic community and of small- and medium-sized enterprises, and to broadening multi-stakeholder participation in ITU's work.

### ***1. Why are international space events such as GLIS 2016 important to discuss space policies, technologies, and applications?***

GLIS 2016 will bring together a unique audience of public and private sectors from emerging and developed markets throughout the world. Representatives from ITU's 193 Members States along some 700 Sectors Members and Academia will have the opportunity to meet with the top technology, science and research representatives, members of the International Astronautical Federation and learn about the latest development in the aerospace technology. Participants representing ITU would share with GLIS participants their knowledge, experience and best practice on the means by which space policy, technology and application will better connect the world.

### ***2. How can satellite communications contribute to the information society and the achievement of Sustainable Development Goals (SDG)?***

Satellite services are among the most efficient information and communication technologies for rapid and global connection to remote areas which lack a proper terrestrial ICT infrastructure. This means that particular attention should be paid to the long-term sustainability of space activities and sustainable development on Earth and to facilitate the prompt resolution of harmful radio-frequency interference.

### ***3. Why are the decisions of the 2015 World Radiocommunication Conference (WRC-15) so important for the new space-based technologies?***

The Radiocommunication Sector of ITU (ITU-R) ensures the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services globally, including those using the geostationary-satellite or other satellite orbits. It helps create the regulatory and technical bases for the sustainable development and effective operation of various satellite services by allocating the necessary radio frequency spectrum or satellite orbit resources, carrying out studies and developing international standards on the treaty status (Radio Regulations) and voluntary international standards (ITU-R Recommendations) for space-based and other telecommunication systems and networks worldwide.

The World Radiocommunication Conference (WRC-15), held over four weeks in November 2015, attracted 2780 participants from 162 ITU Member States and 795 observers representing 130 other entities, including the space industry and satellite operators. They reviewed terrestrial related issues as well as all key space radiocommunication services included in the ITU Radio Regulations (RR), the treaty that governs radiocommunications worldwide. With over 40 topics related to frequency allocation and frequency sharing, WRC-15 addressed the urgent needs for the efficient use of spectrum and orbital resources permitting the deployment of new space-based technologies in particular for GNSS, meteorological satellite service, fixed, mobile and broadcasting satellite service, climate monitoring and data dissemination systems along with new services, such as Global Flight Tracking (GFT), Unmanned Aircraft systems (UAS), space-based control and non-payload communications, earth stations in motion, non-GSO FSS – "MEGA constellation" satellite systems, Sub-orbital flights and electrical propulsion satellite systems.

I foresee that this will pave the way to improve satellite access to help connect the unconnected and make the world a better and safer place for all.