

GLAC 2018 Global Snace

Global Space Applications Conference





WELCOME MESSAGE

← LAC 2018 was a successful IAF Global Conference held on 21-23 May in Montevideo, Uruguay together with Centro de Investigación y Difusión Aeronáutico Espacial (CIDA-E). It was the first time that the IAF took one of its Global Conferences to South America and also the first time that the IAF organized an event in Uruguay. GLAC 2018 was the seventh IAF Global Conference and the second one with a theme on Space Applications, following GLAC 2014 in Paris.

For three days, experts gathered in Montevideo to discuss space applications with a specific focus on emerging space nations and Latin America. The impacts space applications have on agriculture, climate change and natural resources were examined in details. Other topics that were discussed included the use of space data and the role of space applications in the socio-economic growth of countries in the Latin American region, as well as the importance of space assets in advance risk management.

It is with pleasure that we present you this booklet documenting the highlights of GLAC 2018. We sincerely hope you will enjoy it and we hope to see you at future Global Conferences!



Jean-Yves Le Gall President. International Astronautical Federation



Pascale Ehrenfreund Incoming President & VP Communications, Publications and Global Conferences, International Astronautical Federation



GLAC 2018 IN NUMBERS

179 Delegates

24 Countries

3 DAYS

6 Keynotes

6 Plenaries

1 SGAC/IAF Seminar

1 IAF IDEA "3G" Diversity Luncheon



71%





SGAC/IAF SEMINAR: SPACE APPLICATIONS

n the framework of their partnership, SGAC and the IAF organized a joint Seminar on Space Applications as launching event of GLAC 2018. During this very successful event, over 80 students and young professionals from 14 different countries gathered to discuss, together with experts and distinguished speakers, different aspects of space applications and how these applications can positively impact our daily life.

After several Keynote speeches and presentations on important topics such as the contribution of Space Applications to the UN Sustainable Development Goals, Capacity Building, Earth Observation and Data Accessibility, the delegates were divided in four Working Groups to discuss in depth the following topics:

- 1. Internet of Things and Space Applications
- 2. Legal and Policy Challenges of Space Applications
- 3. Technology Development and Space Applications
- 4. Regional Collaboration in Space Applications

After some interesting and stimulating discussions, the outcomes of each Working Group were presented to the audience, with a strong echo put by all four Working Groups on the increasing need of regional events like the SGAC/IAF Seminar to help raise awareness on space activities in the region. The results and recommendations of this first Seminar were subsequently presented at the UN COPUOS Session in Vienna, in June 2018.















OPENING CEREMONY

The GLAC 2018 Conference kicked off on 21 May with an opening ceremony moderated by the IAF Executive Director, Christian Feichtinger, with the presence of the following prominent speakers:

- Jean-Yves Le Gall, President of the International Astronautical Federation (IAF)
- Pascale Ehrenfreund, VP for Global Conferences of the International Astronautical Federation (IAF)
- Marta Gaggero, Chief Counsel of the Centro de Investigación y Difusión Aeronáutico Espacial (CIDA-E)
- Amalia Alvarez, Ministry of Livestock, Agriculture and Fisheries of Uruguay
- Jorge Menéndez, Minister of Defense of Uruguay









1. STRATEGIC PARTNERSHIPS AND SPACE APPLICA-TIONS FOR SOCIO-ECONOMIC GROWTH

The first part of GLAC focused on socio-economic development. Fernando Brum from the National Research and Innovation Agency (ANII), started off with a keynote addressing strategic partnership for socio-economic growth and the importance of open innovation. This insightful keynote was followed by a two-parts high level panel on Space Applications for Socio-Economic Growth.

During the panel, representatives from different space agencies shared their strategies in regard to space applications and the projects that are currently being undertaken. They exchanged on how space is contributing to socio-economic growth worldwide and the key drivers of space applications in both developed and emerging economies, with a focus on Latin America. Important questions were also raised, such as how to increase the awareness of the value of space and how to build a common strategy among countries.



"Innovation means thinking differently by adopting new working methods, developing new technology, spin-off with other sectors, promoting more efficient production and simplifying standardization of procedures and interfaces"







Jean-Yves Le Gall

2. SPACE FOR MORE EFFECTIVE AGRICULTURE **AND MARITIME**

The second day focused on how space can contribute to a more effective agriculture and maritime, especially since the world's growing population continuously demands an increasing supply of food. The world's population is expected to grow to 9.8 billion people on Earth by 2050, which means that there is a great need to produce much more food than what we currently are. Gerardo Richarte from the Argentinian start-up Satellogic held a keynote explaining how his company uses satellite imagery for a more effective management of agriculture.



During the second plenary, moderated by Victoria Alonsopérez from Airbus Defense and Space, speakers from diverse backgrounds presented their views on how space applications can be used to improve the agriculture and maritime sector. For Uruguay, agriculture is an especially important sector, as 93 % of the whole land is used for agriculture and farming. Many people are not aware to what a large extent space applications are being used in Uruguay and that the country is even manufacturing its own satellites. Christina Giannopapa from the European Space Agency (ESA), gave several examples on how ESA is focusing its use of space applications in a variety of sectors. She also mentioned that space should be used as an enabler.

"Space as an enabler for expanding the frontier of knowledge, assisting the decision and policy makers, boost entreprenurship and stimulate economic growth." - Christina Giannopapa

Jairo Becerra from the Catholic University of Colombia, presented the legal framework and underlined the importance for decision and policy makers within developing countries, to be aware about the different uses of space applications. Gustavo Crespi from the Inter-American Development Bank, represented the investment side. His organization has funded 15 million dollars in the region to build two satellites, Satcom 1 and 2, as well as two agricultural platforms ISAGRO and SIRIS, the latter is still under work and will be operational in 2019. Guadalupe Tiscornia from the National Institute of Agriculture and Research in Uruguay, illustrated how space applications are currently being used in Uruguay within the agriculture sector, for example to monitor crop and grass growth.



3. SPACE FOR INTEGRATED RISK MANAGEMENT

How can space technologies contribute to risk analysis and help out in decision-making? Julio Castillo from the Mexican Space Agency (AEM), gave a keynote speech on how the Mexican Space Agency as an emerging space agency is involved in Mexico's risk management sector and contributing to its national security. AEM was established in 2010 and is now, eight years later, close to producing its own satellites, serving as an example for other emerging space agencies or for countries planning to create their own agency. He also raised the importance of working together on an international level with other government agencies.

"If you ignore international cooperation, you have little to no way to succeed."

- Julio Castillo

The plenary following the keynote was moderated by Roberta Mugellesi-Dow from the European Space Agency (ESA), who together with interesting speakers, discussed both how space applications are currently being used in risk management and their further potential. In case of a major disaster, terrestrial phones will most likely either be overloaded or completely shut down, meaning that satellite communications will be the only reliable way to transmit data and

therefore plays an essential role in risk management.



Beatrice Barresi from the European Space Agency (ESA), gave an overview on how ESA is applying space technology in different sectors. For example, satellite communications are even being used in preventing breast cancer. Since X-rays are very heavy data files that are difficult and often time consuming to transfer, by using satellite communications to transfer the files, the doctor can have close to live transmission of the information and it is also very easy to deploy. Oleg Ventskovsky from Yuzhnoye SDO, discussed how space applications are being used in regard to earthquakes, not only to measure the aftermaths but he also explained how it could be used to prevent earthquakes. John Horack from the Ohio State University – College of Engineering, held a visionary talk encouraging everyone to get involved and use space data. He explained that nowadays anyone can build a Satellite Application by using space data which often are free of charge. Vance Hum from I.M. System Group Inc. (IMSG), discussed the impact weather has on aviation and how space applications can be part of the solution. In fact, over 50 % of flight delays in the US are weather-related, which contributes to a great financial cost for airlines. To help solve this problem and decrease weather related fligth delays, IMSG has developed a weather forecast system called eIAWS. This system aims at ensuring that pilots and air traffic control officials have the most accurate and up to date aviation weather information to improve quicker decision making.





4. SPACE TECHNOLOGIES FOR THE DETECTION AND STUDY OF CLIMATE CHANGE

Tackling the climate change is a great challenge that sees the necessity of international cooperation and the usage of space technology. Satellites are a vital tool to help understand the mechanisms of climate change, in order to mitigate its effects and help societies devise coping strategies. Salem Al Marri from the Mohammed Bin Rashid Space Centre (MBRSC), started off with a keynote address highlighting the key areas of the United Arab Emirates Space Programme. They are currently developing DM Sat-1, the first nanosatellite manufactured in the UAE for the purposes of environmental monitoring. It is designed to mainly monitor two factors: the levels of air pollutants harmful to human health and measuring greenhouse gas emissions. The latter which the Dubai municipality is committed to reducing to the lowest possible levels by 2025.





The following panel was moderated by Jean-Pascal Le Franc from the Centre National d'Études Spatiales (CNES), and the discussion addressed some key examples on how space technologies are useful to tackle the impacts of climate change from institutional, academic and private actors. Otto Koudelka from Graz University of Technology (TU GRAZ), introduced the "Pretty" concept and the Austrian 3U CubeSat that will be able to help out in research and investigation. A second satellite is currently being developed and will use passive reflectomy to measure sea level and ice height, two important factors in measuring climate change.

Sias Mostert from the SCS Aerospace Group, explained how small satellites sensors are being used to monitor climate change in South Africa. Maria del Lujan Flores from the Ministry of Foreign Affairs of Uruguay, presented a comprehensive view of the legal international framework on which climate change is tackled. The concept of Climatonomy was introduced by Gustavo Necco from the University

of the Republic in Uruguay. Climatonomy can be compared to the more traditional Climatology, and is based on a holistic approach on long term interactions between the different spheres of the Earth. Javier Preciozzi from the University of the Republic in Uruguay, presented data processing techniques which have been applied to extract useful information from space data. Image processing can also be used to restore degraded images.





5. THE PRESERVATION OF NATURAL RESOURCES THROUGH SPACE

Gunter Schreier from the German Aerospace Center (DLR), started out with a keynote focused on the exploitation of the different renewable resources: food, water, air and energy. He explained how space data can be used to better monitor the exploitation of resources but also to improve how we allocate the different resources. Schreier finished by saying that: "Earth observation is great, but in achieving sustainable development goals and managing our renewable resources we have to be very careful and also take other measures."

"More death due to polluted water than any war in the world."







The panel moderated by Beatrice Barresi from the European Space Agency (ESA), focused on the added value of spacebased data to support a sustainable use and management of natural resources. Adnan Alrais from the Mohammed Bin Rashid Space Centre (MBRSC), explained how they are working to preserve the natural resources in the United Arab Emirates through involving the use of space data. He stressed the importance of integrating the data and have a system to generate knowledge that can be used by decision makers. Professor Alejandro de Fuentes Talice from the Aeronautic Military School (EMA) in Uruguay, gave a legal perspective on natural resources. The Outer Space Treaty is over 50 years old and it is of great necessity to be updated.

Andy Lucas from Property Assure, explained how his company in the United Kingdom has implemented the use of space data to solve the issue of houses cracking in due to movement of the ground. Isao Katani from the Japan Aerospace Exploration Agency (JAXA), discussed the role of satellite earth observations in environmental problem solving, with a focus on governance. Katani concluded that a transition is necessary with a new awareness of the need for governance in the use of satellite observations to help in solving environmental problems in a range of issuespecific regimes.





6. DEMOCRATIZING SPACE DATA

A keynote was held by Catherine Doldirina from the International Institute of Space Law (IISL), focusing on the legal and policy aspects of democratizing space data. She highlighted the current open data trend happening worldwide and its importance in the light of the necessity to access data from various sources and to be able to work in an unrestricted way, in order to develop products that are suitable for a specific activity. She mentioned Global Earth Observation System of Systems (GEOSS) as an example that went from promoting open data to establish it as a principle. But she also pointed out that everything does not have to be made open and some restrictions might still be necessary.



"If you do not have the right to use the data, the access is not giving you anything."

- Catherine Doldirina

The panel was moderated by Otto Koudelka from Graz University of Technology (TU Graz), and discussed the issues with space applications and big data as well as the associated challenges both in the legal framework and from the technical point of view. Pablo Brenner founder of Collokia, focused on how space data can be useful for entrepreneurs. He gave examples on how relatively simple data such as parking lot spaces and oil reserves can in fact be very interesting information for hedgefunds and investors. He also discussed the current change with nanosatellites and open data making the access to space more affordable which opens up new opportunities for entrepreneurs. The privacy issue is a great concern that should not be disregarded. Brenner recommended to always design by assuming that your server one day will be hacked, not if.

Jean-Pascal Le Franc from the Centre National d'Études Spatiales (CNES), started his presentation with referring to a Jeff Bezos' statement: "We are living in day one of the Space Age", and explained that we are currently in a period of tremendous change with lots of new technological developments. While space used to be expensive and only available for the very rich and big companies, space is now becoming more affordable and accessible for everyone. But how does this complete paradigm shift affect the traditional actors such as space agencies? Le Franc explained how CNES as a space agency approaches this change. In addition to the more traditional programmes, they are now trying to experience more disruptive ideas, with new types of programmes and partnerships, while also contributing to fostering and encouraging entrepreneurship.

"The free data policy has completely changed our environment."

Martin Rodriguez de los Santos from Antel, explained how Uruguay's telecommunications company Antel works with big data as a service. He pointed out that data protection laws are an issue. Krystal Wilson from the Secure World Foundation (SWF), discussed some key issues with democratizing space data. She mentioned that the awareness of earth observation is increasing but is still slow due to lack of technical knowledge, government skepticism, costs and integration concerns. Wilson identified a need for an increase of collaboration and better engagement with media.







- Jean-Pascal Le Franc



















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International Astronautical Federation

100 Avenue de Suffren 75015 Paris, France T: +33 (0)1 45 67 42 60 E: info@iafastro.org www.iafastro.org

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