

30th IAA/IISL Scientific-Legal Roundtable

Universities as Actors in Space

15. October 2015, 66th IAC Jerusalem/Israel

Chairpersons: Kai-Uwe Schrogl, ESA, France, Herman Steyn, Stellenbosch University, South Africa,
Acting Rapporteur: Christiane Lechtenböcker, Co-Rapporteur Nicola Rohner-Willsch, both DLR.

In the past years universities all over the world have become new players in space activities. They got involved in various ways, especially by cube-satellite missions, but also by experiments in the ISS or other missions on a cost-effective and less complex level to gain access to space. These constellations allow new cooperation between academia and industry, fostering spin-off effects and triggering innovation. University space projects often enjoy higher participation of women, thus allowing an early engagement with the space industry, which may trigger future career changes.

Generally there is potential to enlarge and enhance the involvement of universities in space activities. The 30th IAA/IISL Scientific-Legal Roundtable addressed questions with technical issues such as standardization, legal boundary conditions, operation of cube-satellites and associated lessons learned or secondary payloads from an interdisciplinary perspective.

More than 20 participants joined the session, welcomed by the chairpersons Kai-Uwe Schrogl and Herman Steyn. The session was opened by the President of the IISL, Tanja Masson-Zwaan and the Secretary General of the IAA, Jean-Michel Contant. Both highlighted the 30 anniversary of the series of IAA/IISL Scientific-Legal Roundtables and stressed the timeliness of the present topic. After a short introduction in the procedures by the chairs they also stressed the priority of the theme due to accelerated developments in that area. One presenter cancelled his attendance. One author uploaded a full paper. The paper will be published in the IAA/IISL proceedings.

The keynote speech of Sir Martin Sweeting of Surrey Satellite Technology LTD opened the presentational part of the Roundtable. Alongside the example of the University of Surrey Space Centre he developed his thesis of universities as a stimulus for change in the economics of space. In parallel to the growing role of universities as a source of well-trained young academics the impact of small satellites has changed in time: starting as interesting scientific projects they developed to relevant and operational instruments. In conjunction with the shifting from the so-called “traditional ‘vicious’ circle” to the so-called “SmallSat ‘virtuous’ circle” the populations of small satellites exploded in the past and especially since 2005. Klaus Schilling, Julius-Maximilians-University Würzburg complemented this prelude with introducing a variety of projects under the umbrella of interacting “Space Exploration – Industry – Education”:

- Series of UWE – University Würzburg Experimental Satellites
- Erasmus Mundus with European Partner Universities
- Space Master – joint European Master in Space Science and Technology with international Partners
- Technology Spin-offs like advanced developments for modular satellite system designs or advanced manufacturing at example of small satellite system integration and many others.

Matteo Emanuelli, UPJV – INSSET, then proceeded with “Lesson learned from a satellite project – obstacles and accelerators”. He introduced QB50, a framework for In-Orbit Demonstration, Facilitat-

ing Access to Space, Scientific Research and Education. Elaborating on the 5 project steps Planning, Funding, Satellite Design, Test Campaign and Operations he carved out obstacles and problems in the satellite project. The insight views in the lessons learned are very valuable for future projects. Selected keywords are: realistic budgeting, open collaborations with other institutions, relation between project activities and academic cycle.

Abe Bonnema, ISIS – Innovative Solutions in Space BV, introduced the companies’ core area: vertically integrated small satellites. He offered routines and services also for university projects since ISIS can support them during all phases. The last speaker, Yvon Henri from ITU, focused on “Frequency Management and Universities”. After a brief historical overview, relevant policies and guidelines, he explained the steps of the notification procedure. The presentation explained typical frequency allocations for small satellites and provided hints to online help.

The concluding discussion focused on the following issues:

- challenges for frequency management through the expected upcoming mega constellations
- amateur band requests vs. professional band requests: ITU does not distinguish between amateurs, commercial or military requests, clear procedures are established.
- Since several years problems exist with interferences from ground based stations, mainly military bases. ITU is aware of this problem and strongly recommends holding on existing procedures.
- Increasing costs for insurance and formal procedures can become a future constraint for small satellites and university projects.
- Especially for so-called small space nations like NLD, BEL, AUT small satellite constellations are of special interest and national space laws are already in some countries amended to this new development.
- “license shopping” and the phenomenon of so-called “flag states” are established instruments for those states which have not yet ratified the outer space treaty. The abundance of regulations opens the door for a self-regulative market upon offer and request. It is strongly recommended to execute existing ITU procedures and regulations.

The lively exchange always touched relevant issues for university projects. In summary this roundtable was very valuable since it pointed out the indispensable role of universities in the cycle of developing and operating small satellites (constellations). The event helped to clarify several open issues especially with respect to ITU regulations and the notification procedure.

Table of Speakers:

Sir Martin Sweeting	Surrey Space Centre, University of Surrey	Universities as a stimulus for change in the economics of space
Klaus Schilling	Julius-Maximilians-University Würzburg	A University in Space – A Case Study
Matteo Emanuelli	Institut Supérieur des Sciences Et Techniques (INSSET)	Lessons Learned from a Satellite Project – Obstacles and Accelerators
Abe Bonnema	ISIS – Innovative Solutions In Space BV	Flight opportunities for university payloads
Yvon Henri	ITU	Frequency Management and Universities – ITU Radio Regulations related to Small Satellites