



# Austrian Space Law Newsletter

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## PREFACE

Irmgard Marboe



This issue of the Austrian Space Law Newsletter looks back at the Austrian EU Presidency in the second half of 2018 as an occasion to put the importance of the space sector for the economic and social development in Europe in focus. It recalls some milestones, such as the event #EUSPACE for Business in Graz, the progress in the formula-

tion of the Regulation establishing the space programme of the EU as well as the revival of the European Space Council as a forum of cooperation between the EU and ESA. The active role of the Federal Ministry for Transport, Innovation and Technology in promoting space activities in Austria and beyond is further explained in an overview of the Austrian Space Applications Programme ASAP in this Newsletter.

Another highlight of the year 2018 was the celebration of the 50th anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE) in 1968. The UN Office for Outer Space Affairs (UNOOSA) had prepared UNISPACE+50 for several years in order to use this commemoration for the formulation of the future role and tasks of the United Nations in the peaceful exploration and use of outer space. The event in June during the annual session of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) culminated in a Resolution of the UN General Assembly with a mandate to formulate the Space2030 Agenda until June 2020. Niklas Hedman from UNOOSA gave us an interview and shared some personal insights and expectations with us. David Kendall, the outgoing chair of UNCOUOS, sent us the text of his insightful final address to UNCOUOS at the beginning of UNISPACE+50 in June 2018. The UN/Austria Symposium in Graz and the High Level Forum in Bonn in November were dedicated as a follow-up to this event and set certain steps for the implementation of the UNISPACE+50 process. Another UN space initiative relates to the mitigation of threats caused by asteroids. Gerhard Drolshagen gave us an interview on this topic and explained the work of the Space Mission Planning Advisory Group (SMPAG) and the International Asteroid Warning Network (IAWN).

A still prevalent topic is the exploration and exploitation of

natural resources on the Moon and other celestial bodies. Even though not all projects and programmes progress successfully, the legal aspects continue to occupy the minds of legal scholars and practitioners. The NPOC Space Law Austria organized an event on the 19 Building Blocks developed by the Hague International Space Resources Governance Working Group which will finalise its work by the end of 2019. At the occasion of the 60th birthday of Professor Stephan Hobe from the University of Cologne a symposium on the topic of "Resources" was organised in Ladenburg (Germany) to compare the different regimes for the exploration and use of natural resources under international law. Also at the IAC in Bremen, several presentations on this topic were made which triggered interesting discussions.

This Newsletter also offers an overview of the various activities of the Subpoints Space Law at the Universities of Graz and Salzburg. In particular, the publication of the book "Satellite-Based Earth Observation - Trends and Challenges for Economy and Society" edited by Christian Brünner, Georg Königsberger, Hannes Mayer, and Anita Rinner, all collaborators at the Subpoint in Graz, needs to be highlighted. Finally, the support and participation in ECSL activities by the NPOC Space Law Austria is reflected in contributions about the ECSL Summer Course on Space Law and Policy in Helsinki, Finland and the participation of an Austrian student team in the European Rounds of the Manfred Lachs Space Law Moot Court in Lisbon, Portugal. I hope you will again enjoy delving into such a large variety of space related news in this edition of the Austrian Space Law Newsletter.

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Josef Aschbacher, Director Earth Observation Programmes, ESA, at the #EUSPACE for Business Conference in Graz



## The Austrian Presidency of the Council of the European Union – Three Milestones in Space

Victoria Schebek

Austria, for the third time since 1998 and 2006, held the Presidency of the Council of the European Union (EU) in the second half of 2018. During these six months, Austria chaired and prepared many space related meetings dealing with the proposal of the European Commission for the Regulation establishing the space programme of the EU, organised the conference #EUSPACE for Business, and engaged in the revival of the European Space Council for the future cooperation between the EU and the European Space Agency (ESA).

### **The Space Programme of the European Union**

The Regulation establishing the space programme of the EU for the period 2021-2027 was proposed by the European Commission in June 2018. It aims to ensure high-quality, up-to-date and secure space-related data and services, greater socio-economic benefits from the use of such data and services, enhanced security and strategic autonomy of the EU as well as a stronger role for the EU as a leading actor in the space sector. During the Austrian Presidency negotiations on the draft Regulation took place in order to reach a Council

position, i.e. a political agreement to facilitate a common understanding between the Council and European Parliament to speed up the legislative procedure.

The new space programme is a cornerstone for the future of the EU space policy and Europe's industry as it reaffirms the EU's ambitions in space. It focuses on the continuity and evolution of the existing flagship space programmes Galileo and EGNOS (European Geostationary Navigation Overlay Service), the EU global navigation satellite system, as well as Copernicus, the EU Earth observation system. The space programme also includes the monitoring of space hazards under the Space Situational Awareness (SSA) programme and foresees a new space activity: the delivery of access to secure satellite communications for EU and national authorities (Govsatcom). A crucial element of the space programme is a unified and simplified system of governance with the Commission keeping the responsibility of managing the overall programme. The European Space Agency (ESA), given its unmatched expertise, is a major partner in the technical and operational implementation of the space programme. The European Global Navigation Satellite Systems Agency, located in Prague, will be renamed the "EU Agency for the Space Programme" and



Panel on Business needs at the #EUSPACE for Business Conference in Graz

increasingly support the market uptake of EU space activities. The overall budget recommended for the space programme within the next Multiannual Financial Framework (2021 to 2027) amounts to 16 billion Euro.

An agreement on a Council position regarding the space programme was reached on 19 December 2018. The Romanian Presidency, which took over in January 2019, started the negotiations with the European Parliament and aims at a rapid adoption of the Regulation in the first half of 2019 before the elections to the European Parliament.

### #EUSPACE for Business Conference

The #EUSPACE for Business high-level conference that was held in November 2018 brought together major stakeholders from the public and private sectors to shed light on current opportunities and challenges of the European space sector at political and business levels and to join efforts to support its transformation and development. Contributions from prominent European and non-European speakers initiated thought-provoking discussions about the future of the space industry and the way forward for public actors to support it.

Throughout the event, speakers emphasized that the European space sector must be supported by public investment. Participants welcomed recent initiatives of the European Commission in cooperation with the European Investment Fund and European Investment Bank as well as the budget of 16 billion Euro proposed for the EU space programme. Regarding the emergence of a new space ecosystem, speakers shared the opinion that current trends and changes must be reflected in



the European space policy to seize new opportunities offered by "New Space". Future adaptations should aim at optimising the current European framework by developing a more open, speedy and less risk adverse public policy and by reinforcing cooperation between public institutions and private actors. In addition, new instruments to support entrepreneurship and private investment are needed to achieve a more innovation- and business-oriented European ecosystem.

After two days of intensive discussions, it was quite clear that Europe has made substantial steps forward in its space sector but is now confronted with new challenges. An adequate policy response driven by a long-term vision, beyond immediate financial and political concerns, is needed to guarantee Europe in space and space in Europe.

### Revival of the Space Council

The Austrian Presidency, together with the Spanish Presidency of the ESA Council at ministerial level, issued a joint position paper called "Europe in Space: Roadmap towards a coordinated space policy in Europe", which was approved by the ESA Council in October 2018. Its focus lies on the revival of the so-called Space Council, a coordination mechanism that was originally established in 2004 by a framework agreement between the EU and ESA. It is a clear signal that building up a strong European space sector and the increasing global influence of Europe goes hand in hand with a strengthened cooperation between the EU and ESA. Romania already announced that it will organise a Space Council meeting during its Presidency of the EU Council.

The Austrian Presidency could thus contribute in various ways to the future of the European space policy. In only six months substantial progress was made regarding the draft Regulation establishing the space programme of the EU. In addition, a basis for an intensified cooperation between the EU and ESA was created. It can be said that the Austrian Presidency used its opportunity and highlighted the importance of the space sector for a successful common European future.

## Interview

# Interview with Niklas Hedman: “Space Law Plays a Major Role in Our Work”

Cordula Steinkogler



**Niklas Hedman is Chief of the Committee, Policy and Legal Affairs Section (CPLA) of the United Nations Office for Outer Space Affairs (UNOO-SA). We met him in his office at the Vienna International Centre to ask him about the role space law plays in his work, why he chose to work**

**in the space field, and what are currently the most important challenges in the space field that should be tackled at the international level.**

### **Could you briefly describe the work of the Committee, Policy and Legal Affairs Section?**

The Committee, Policy and Legal Affairs Section is one of the main structures of the Office for Outer Space Affairs.

The core responsibility of my Section is to service the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and its two Subcommittees, the Legal Subcommittee and the Scientific and Technical Subcommittee. We provide the full secretariat services to those intergovernmental bodies, both substantively and administratively.

In addition to that, we are also responsible for the capacity-building programme on space law and policy of the Office, in close cooperation with other functions of the Office. Over the past decade, we organized a series of ten Workshops on space law in different countries. Last year we stepped beyond the concept of workshops and organized the first Conference on space law and policy together with the Russian Federation. This year's Conference will be co-organized with Turkey and APSCO.

Another of our activities is research in the area of space law.

We regularly receive a variety of space law related questions from member states, research institutions and the general public. As part of our capacity-building activities we respond to these questions and thus also fulfil an advocacy function. I want to emphasise here that the Office is now initiating a project on targeted capacity-building and advisory services in space law and policy.

Furthermore, our legal officers give legal advice to the other functions of the Office on a variety of topics, including Host Country Agreements and memoranda of understanding with external partners.

We are also responsible for UN-Space, which is the interagency coordination mechanism in the UN system on the use of space technology.

In addition to that, there are also other roles of the Section. For example, one of my colleagues serves as Secretary of the Space Mission Planning Advisory Group (SMPAG) concerning Near-Earth Objects and planetary defence.

### **What role does space law play in your work and in the work of UNOOSA?**

Space law plays a major role in our work and we will increase our focus on this area in the future. In particular in the area of capacity building, we are moving into more targeted space law and policy capacity building for governments.

For instance, if a university endeavours to build and launch a CubeSat, the state of the university could be considered a launching state. The government therefore needs to be aware of its rights and obligations under international space law, in particular regarding responsibility, liability and registration. This is an area where we need to increase targeted advice to governments.

In addition, under the international legal regime of outer space there are obligations vested with the UN Secretary-General.



*The United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) is serviced by the United Nations Office for Outer Space Affairs*



*UNCOPUOS meets annually in Vienna, Austria, to discuss questions relating to current and future activities in space*

Those responsibilities of the Secretary-General are delegated to the Office for Outer Space Affairs. So, the Office maintains the central UN register on objects launched into outer space and ensures the dissemination of registration information as required.

**Why did you choose to work in the space field? What do you like most about your job?**

My background is primarily in the area of the law of the sea. After finishing my studies, I started working in the legal department of the Swedish Foreign Ministry, where I was in charge of the preparations for the ratification of the UN Convention on the Law of the Sea. After that, I was put in charge of space law in addition to the law of the sea, since these are two closely related disciplines of public international law. As responsible for space affairs, I was also representing Sweden in UNCOPUOS. I had been a delegate of Sweden to UNCOPUOS and its two Subcommittees for ten years, when the position I hold now became vacant and I moved from being a delegate to being part of the Secretariat of UNCOPUOS.

What I like most about my work is the interaction with delegations during the sessions. So, the time of the sessions of the Committee and the Subcommittees is for me the highlight of my work. In addition, what I also enjoy very much is conducting research in the field of space law. This is why it is very exciting for me to see several interesting new topics on the agenda of the Legal Subcommittee that allow us to discuss new challenges in the area of space law.

**In your view, what are currently the most important challenges regarding the use and exploration of outer space that should be tackled by the international community?**

I would say that the main challenge is the technological advancement and the globalization of space activities. There are many new actors in the space field, new state actors but also private actors that are becoming more and more important. This is a challenge to governments that need to deal with their rapidly increasing national space activities, for instance by establishing national space policies and regulatory frameworks and by ratifying the space treaties. It is important for governments to be able to control national space activities and to create a predictable national regulatory framework to give legal certainty to their non-governmental actors that enables long-term investments in space activities.

Moreover, in the Legal Subcommittee we currently have very engaging new items on the agenda that allow us to discuss current challenges in the space field. One of these items is the agenda item on international law applicable to small satellite activities. Small satellite technology enables an increasing development of global space activities for the benefit of developing countries. To encourage further assessment of several legal issue pertaining to small satellite activities, a questionnaire regarding the international legal framework for small satellites was developed in the Legal Subcommittee. Another new item on the agenda of the Legal Subcommittee is space traffic management which allows us to discuss what is needed to ensure a safe conduct of space activities in the

**The United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS)** was set up by the United Nations General Assembly in 1959 and is the Assembly's only committee dealing exclusively with international cooperation in the peaceful uses of outer space. The mandate of the Committee and its two Subcommittees (the Legal Subcommittee and the Scientific and Technical Subcommittee) aims at strengthening the international legal regime governing outer space activities as well as at supporting efforts to maximize the benefits of the use of space science and technology and their applications. The Committee is serviced by the United Nations Office for Outer Space Affairs (UNOOSA) and meets annually in Vienna, Austria, to discuss questions relating to current and future activities in space, such as space debris, space weather, the threat from asteroids, the safe use of nuclear power in outer space, climate change and questions concerning space law and national space legislation. More information on [www.unoosa.org](http://www.unoosa.org)

future. However, this is new territory in space diplomacy as we do currently not have an internationally agreed definition of space traffic management. In addition, the exploration, exploitation and utilization of space resources is also a new topic in the Legal Subcommittee. Here we discuss for instance what is the main link to the fundamental provisions of the Outer Space Treaty. These are all very engaging new topics and there are different proposals on the table on how to deal with these issues from an international space law perspective.

**One of the most important events for UNCOPUOS during the last years was UNISPACE+50 which took place in Vienna in June 2018 and marked the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE) which was held in Vienna in 1968. Could you describe the process leading up to UNISPACE+50 as well as its main outcome, in particular from a space law perspective?**

During the preparations for UNISPACE+50 we first assessed the past, present and future role of the Committee and defined five cross-cutting areas, where UNCOPUOS has made its ma-

major contributions over the past fifty years: Space governance, Capacity-building, Resiliency, Interoperability, and Space for sustainable development. Out of this process seven thematic priorities were developed that cover scientific, technical, policy and legal aspects: Global partnership in space exploration and innovation, Legal regime of outer space and global space governance, Enhanced information exchange on space objects and events, International framework for space weather services, Strengthened space cooperation for global health, International cooperation towards low-emission and resilient societies, and Capacity-building for the 21st Century.

Important from a legal perspective is in particular the thematic priority on the "Legal regime of outer space and global space governance". Under this thematic priority a working group of the Legal Subcommittee is now preparing a guidance document that is aimed at serving as a tool for states, in particular for newcomers in the space arena. It will provide a summary of what needs to be observed by states from an international space law perspective and looks at how the international regime on outer space is applicable to space activities from an operational point of view. It compiles the work of past working groups of the Legal Subcommittee, including the working groups on the concept of the launching state, on registration practice, on national space legislation, and on international mechanisms for space cooperation. The aim is to make this guidance document together with background information and resources available on a dedicated capacity building webpage on the website of the Office in order to have one single tool that is easily accessible for policy- and decision-makers and gives them an overview of the rights and obligations under the international regime on outer space. Enhanced capacity-building activities, including by offering targeted training as I described earlier, would be of significant importance in this overall context.

During the UNISPACE+50 high level segment in June last year, a resolution on space as a driver for sustainable development was agreed and then adopted by consensus by the UN General Assembly in October 2018. The resolution tasked UNCOPUOS to develop a "Space2030" agenda and implementation plan which is to be presented to the General Assembly in 2020.

What Member States have made clear throughout this process is that the Committee and its two Subcommittees together with the Office form a unique platform, the only intergovernmental structure in the United Nations that is dealing with the broad perspective of space activities including science, technology, law and policy.

## Remarks by the Outgoing Chairperson of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) – David Kendall

David Kendall

Dr David Kendall was the chairperson of UNCOPUOS from June 2016 to June 2018. Before retiring from the Canadian Space Agency in 2016, he was the Senior Executive Advisor to the President of the Canadian Space Agency, former Director General of the Space Science and Technology and Space Science branches of the Agency, and a faculty member of the International Space University. From 2008 to 2012, he was a Vice-President of the International Astronautical Federation (IAF) and chairperson of the IAF Finance Committee.

At the end of his chairmanship of UNCOPUOS and at the occasion of the UNISPACE+50 opening ceremony at the Vienna International Centre on 20 June 2018, Dr Kendall addressed the audience by some recapitulatory and hortatory words. He highlighted a number of achievements of UNCOPUOS in the past years and shared some ideas and concerns about its future:

Ministers, Ambassadors, Distinguished Representatives

Before I pass the chairpersonship of this Committee for 2018 to the incoming chair representing GRULAC, please allow me to express a few personal observations.

The **United Nations Committee on the Peaceful Uses of Outer Space** is a remarkable construct. It is the **only functional and functioning universal body** considering the broad and challenging issues relating to the **global governance of outer space activities**, and the **safety, security and especially the sustainability of outer space** for current and future generations. Furthermore, its work is essential with respect to the successful delivery of many of the 17 UN Sustainable Development Goals, the Sendai Framework for Global Risk Reduction and the 2015 Paris Climate Agreement. With currently 87 States as committee members, 37 inter-governmental and non-governmental organisations as permanent observers, and with an increasing number of applications

for membership, it is **one of the larger committees of the UN and certainly one of the most productive in terms of critical topics discussed and resolutions and outputs advanced**. To those States represented in the room today that are not currently members of the Committee, I would like to take this opportunity to strongly encourage a serious consideration to join this dynamic forum, fully participate in the important deliberations relating to the peaceful utilization of outer space for the benefit of citizens of your country as well as all humankind, and actively join in developing directions and agreements in relation to the future work of the Committee.

The Committee is fortunate to be served by an exceptional Secretariat provided by the **Office for Outer Space Affairs**, notably through its Director, Ms. Simonetta di Pippo, and outstandingly by Mr. Niklas Hedman, and his team. I would also like to mention the broader UN services assisting the Committee including the friendly and efficient document distribution team and the excellent translators, both written and oral, the latter of whom unfailingly deliver accurate and precise versions of our often rapid, technical and accent-laden pronouncements in the six official languages of the UN – bravo!

**Working by consensus**, the committee occasionally challenges the chair, the Secretariat and itself with periods of passion, strong opinion and contrasting direction; however, in the end, it is **this requirement to compromise** whenever possible that is perhaps the **Committee's greatest strength since outputs have the full weight of all members**. In predictable instances of geopolitical tension, once statements and positions have been duly recorded and the Committee returns to its substantive work, it is my observation that every individual in the room returns to her or his central belief in the importance of the Committee's work and their **commitment to ensuring that the Committee moves forward with the pressing issues before it relating to its unique role as the prime intergovernmental body for international**



*David Kendall was the chairperson of UNCOPUOS from June 2016 to June 2018*

**cooperation in outer space activities;** it is this overriding spirit of **open and transparent discussion and cooperation** that is truly remarkable in today's highly charged world. However, the past success of the Committee should not blind us to **current challenges** that need to be addressed if the Committee is to retain its position as the global authority on space governance. **First and foremost**, in my mind is a need to find a way to ensure that **both the Legal and Scientific and Technical Subcommittees** share equally in the development of **cross-cutting issues**, that frankly includes almost all of the agenda items before the Committee. **Secondly**, the Committee needs to actively find ways to **quicken its pace** of deliberations and decisions and **become more efficient**; the current speed in the advancement of global space activities, especially those being led by the private sector, lacks synchro-

nization with UNCOPUOS that usually takes many years to set direction in important areas that need its wisdom and global reach. **And thirdly**, in reference to the last point, UNCOPUOS needs to **more actively engage** with and listen to leaders in **both the private and academic space sectors** where most new developments are taking place; the High Level Forums are a good start, however, it is also important that these voices be heard during the actual Committee and Subcommittee meetings in order to help frame actions and decisions.

Distinguished Representatives

It has been an honour and privilege to have been able to work with you all over the past two years in helping **move forward the ambitious agenda of the Committee** focussing on the successful delivery of the report from the **Working Group on the long-term sustainability** of outer space activities as well as the positive and fruitful conclusion to the arrangements and resolution pertaining to the **UNISPACE+50** exercise. I would like to thank you all for the support that you have shown me and to Canada on behalf of WEOG during this period.

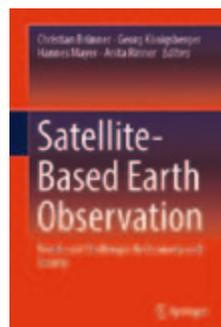
I now have the great pleasure in inviting Señora Rosa Maria Ramirez de Arellano y Haro to the podium to take over the chair of the Committee for the next year, knowing that you will provide the same strong support for her leadership of the Committee as you have shown towards me.

Un grand merci à tous.

## Satellite-Based Earth Observation – Trends and Challenges for Economy and Society

Christian Brünner, Georg Königsberger, Hannes Mayer, Anita Rinner (Eds.), Springer (2018)

The symposium "Trends and Challenges of Satellite-Based Earth Observation for Economy and Society" was held in Graz in 2017. This book reflects the presentations and discussions of the participants in the symposium and also includes contributions by selected additional authors. It focuses on trends and challenges with regard to satellite-based Earth observation in various fields



of application including civilian and military uses, agriculture, navigation, and disaster management. It also addresses legal issues with respect to data protection. Contributors include legal experts in the field and representatives from institutions, such as the European Space Agency, the European Space Policy Institute, academia and the private sector.

*The theme of the IAC 2018 was "Involving Everyone"*



Credit: IAF (3)

## 69th International Astronautical Congress Bremen 2018

Irmgard Marboe

Between 1 and 5 October 2018, the 69th International Astronautical Congress (IAC) took place in Bremen, the historic Hanseatic city in the North of Germany. Bremen is not only known for its remarkable history and culture but also as one of the most innovative cities in Germany and in Europe. It hosts many institutions and companies active in space-related research and industry. Hosting the IAC for the second time made Bremen again the "Capital of Spaceflight".

The combination of culture and technology was remarkably present also at the opening ceremony. The Deutsche Kammerphilharmonie Bremen - a full symphonic orchestra of international reputation - played Beethoven, Bach - and Bernstein. The 100th birthday of the American conductor and composer was celebrated by a performance of his Candido overture to which the several thousand listeners in the audience were invited to participate in a choreography. Even if not all of the more than 6,500 participants made it to the opening, it was a successful start. With this high number of participants the IAC in Bremen was the largest

in history since it was first organised in 1950.

The general theme of the IAC in Bremen was "Involving Everyone". The organisers placed 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 the promotion of space science to new user groups. The highlight of the extensive outreach program was the public day on 3 October, Germany's national day, which opened the doors of the Congress to the people of Bremen. 13,000 visitors followed the invitation, listened to presentations, and visited the exhibition with its 144 exhibitors from science, economy, and governments. Highlights of the plenary programme included a live broadcast to the International Space Station (ISS) with its commander, the German ESA astronaut Alexander Gerst. The discussion among the heads of space agencies, including of NASA, ESA, Roscosmos, ISRO, JAXA, and CNSA, was also attended by thousands of participants in the plenary hall, the so-called ÖVB Arena.

The IISL Colloquium on the Law of Outer Space formed part of the technical programme. The Nandasiri Jasentuliyana Key-

note Lecture on the topic of “Space Law and International Organisations” was given by Marco Ferrazzani, Head of the Legal Services Department of ESA. The Young Scholars Session which followed included intriguing talks conveying unconventional and innovative ideas on emerging problems of space law. A highlight was the presentation by Andrea Capurso on the “Non-Appropriation Principle in Outer Space: A Roman Interpretation” who proposed a new categorisation of “celestial bodies” based on the classification of “planets”, “dwarf planets” and “small solar system bodies” by the International Astronomical Union (IAU) which could lead to a solution to legal problems related to space resource mining. Other topics of the Colloquium included “Financing space: Procurement, competition and regulatory approach”, “Integrated space applications, EO telecoms navigation”, and “Space Law at Unispace+50: consequences and future perspectives”. “The Relationship between space law and cyber law” was combined with the traditional session on “Recent developments in space law”. The latter provided, amongst others, a platform to discuss legal issues of space resource mining, including further analysis on the pertinent problem of the definition of “celestial bodies” and “space resources” by the present author and Michael Friedl of the University of Vienna. A status report of the work of the Hague International Space Resources Governance Working Group was prepared by Tanja Masson-Zwaan.

The Joint IAA/IISL Round Table was dedicated to the topic of “Global Cooperation in Planetary Defence”. After a brief overview of technical means to protect the Earth from dangers posed by asteroids, legal aspects of the deflection of so-called Near-Earth Objects (NEOs) were discussed. Sergio Marchisio of the University of La Sapienza in Rome provided a general analysis of planetary defence under international law. Masahiki Sato from the Japanese Space Agency JAXA complemented this analysis with some practical examples. The author of the present text gave a talk on the work of the SMPAG Ad-Hoc Working Group on Legal Issues with its mandate to study the legal questions relating to the various existing technical options. SMPAG stands for “Space Mission Planning Advisory Group” and aims for an international cooperative approach to mitigate the dangers and consequences from asteroid impacts on Earth. In so doing it complements the work of IAWN, the “International Asteroid Warning Network”, with its regular exchange of information about potential threats to the Earth by NEOs. Both groups work together and meet on a regular basis. They are endorsed by the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and regularly report to the Scientific and Technical Subcommittee of UNCOPUOS.



*The 69th International Astronautical Congress took place from 1-5 October 2018 in Bremen*

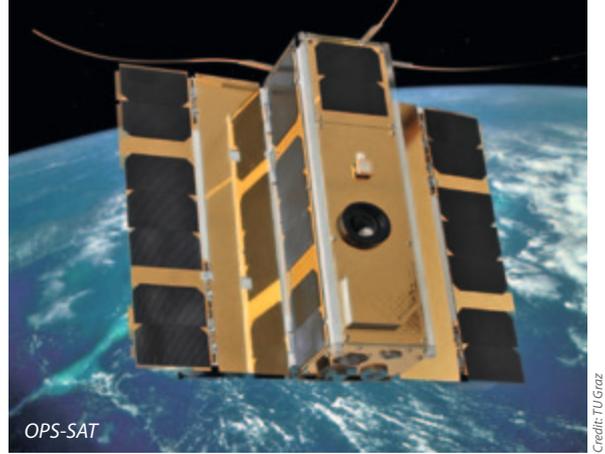
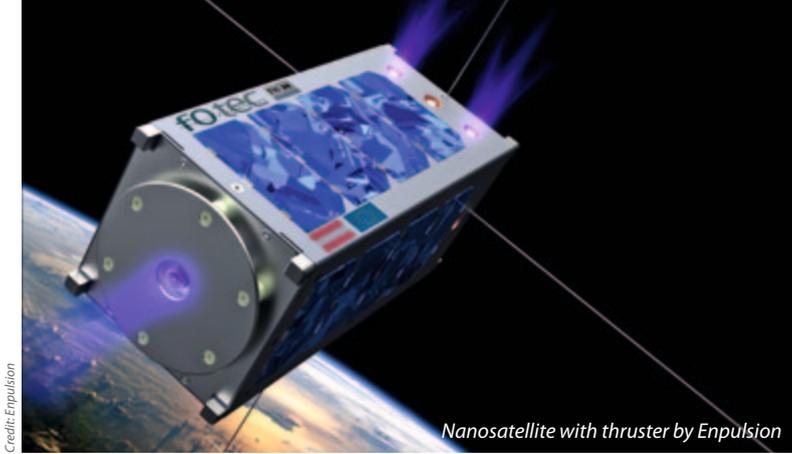


*IAC 2018 opening ceremony*



*The Deutsche Kammerphilharmonie Bremen playing at the opening ceremony*

The IAC in Bremen has certainly provided ample opportunity to get up to speed with the latest developments, foray into new fields and emerging topics, and network with colleagues to strengthen partnerships and foster collaboration, as Professor Otto Koudelka of the Graz University of Technology in his function as the Vice-President for Technical Activities of the International Astronautical Federation (IAF) has formulated the goals of the IAC in Bremen. The next IAC will take place in Washington, D.C., in October 2019. It will provide the opportunity to celebrate the 70th edition of the IAC and the 40th anniversary of the first man on the Moon.



# The Austrian Space Applications Programme – A National Space Programme to Leverage International Cooperation

Christian Fuchs

2019 is a significant year for space as it marks the 50th anniversary of the first man on the Moon. The space sector is booming and we are entering a space renaissance as numerous missions are scheduled to launch this year. This also includes the launch of “OPS-SAT”, a nanosatellite developed under the lead of the Graz University of Technology in Austria.

The ESA satellite OPS-SAT aims at demonstrating improved mission control capabilities and contains an experimental on-board computer that is significantly more powerful than current on-board computers. Vital for this project was the Austrian Space Applications Programme (ASAP) which was initiated in 2002 by the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT) and is managed by the Austrian Research Promotion Agency (FFG). It supports Austrian stakeholders in positioning themselves in specific areas in order to maintain and enhance their international competitiveness in space. Therefore, the BMVIT provides a total budget of EUR 7,100,000 for the 15th call of the Austrian Space Applications Programme in 2018/2019 to fund space projects in the domains of space science, space technologies and applications of satellite-based technologies (Earth observation and navigation). A special focus is on the participation of new organisations and on the promotion of international cooperation. The next ASAP call will start in autumn 2019, by inviting Austrian space organisations for an information day.

The Austrian Space Applications Programme played a crucial role in enabling and facilitating some of Austria's most important space milestones. The first field emission electric propulsion (FEEP) activities were developed through ASAP projects in 2005, reached market readiness in 2018 and are now sold internationally by ENPULSION, an Austrian start-up located in Wiener Neustadt. In 2006 the first space quantum com-

munication project was funded. The launch of the three Austrian satellites “TUGSAT-1/BRITE-Austria” and “UniBRITE” in 2013 and “PEGASUS” in 2017 were also enabled through ASAP. Thus, ASAP has been able to contribute to the advancement of Austria's expertise in space technologies, applications of satellite data and space science.

## **ASAP as an engine for the internationalisation of Austrian space activities and the future of the Austrian Space Strategy**

Space endeavours are important, but they are expensive as well. This is why especially smaller countries like Austria have to rely on cooperation in order to promote progress and prosperity and increase competitiveness. As a member of the European Union and the European Space Agency Austria has been an integral part of European space milestones and will continue to contribute to Europe's leadership, competitiveness, sustainability and autonomy in this strategic domain. In addition to the current ESA and EU programmes, the Austrian Space Applications Programme will place greater emphasis on supporting international bilateral space projects. ASAP 15 aims to provide opportunity for Austrian companies and research institutes to network with international research centres and start-ups.

In 2019 an evaluation of Austria's Space Strategy will take place and initiate first discussions about the directions of a new Austrian Space Strategy and the guidelines for Austrian space activities from 2020 onwards. The evaluation of the Austrian Space Strategy will therefore also have an impact on the priorities for future ASAP calls. Whether Austria will focus on activities aimed to reach the Moon and later on Mars or add value to projects for instance on Earth observation remains to be seen. In any case, international cooperation will be essential.

## Interview

# Interview with Gerhard Drolshagen: “It is not enough to know that you are going to be hit by an asteroid, you also need to know what to do about it”

Cordula Steinkogler



Dr Gerhard Drolshagen is the current Chair of the Space Mission Planning Advisory Group (SMPAG). We had the chance to speak with him about the background, importance and outcome of the Group’s work as well as the recently established Ad-hoc Working Group on Legal Issues.

### **Could you briefly explain what SMPAG is: What is the background of the Group’s establishment? What are its main tasks and objectives? Who participates in the Group?**

SMPAG is an international group dealing with the risk posed by asteroids that could potentially impact Earth and assessing what could be done to mitigate this risk.

The potential risk from asteroids is demonstrated by many visible craters for instance on the Moon and Mars. It received increased attention around 20 years ago due to the impact of the comet Shoemaker-Levy 9 on Jupiter. It became clear that this risk needs to be discussed and assessed not only at the national level, but also at the international level. Therefore, the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) decided to establish a Working Group on Near-Earth Objects. After several years of intensive work and discussions, the recommendation was made that two groups should be created: One group to detect and warn about potential asteroid impacts on Earth; this group was called International Asteroid Warning Network – IAWN. And a second

group to assess what could be done in case a real threat is identified; this group was called Space Mission Planning Advisory Group – SMPAG. Both groups were officially initiated in 2014.

SMPAG currently has 19 members, but membership is constantly increasing. Only space agencies or space offices which could potentially contribute to a space mission to mitigate an asteroid impact threat can become members of SMPAG. These currently include the space agencies of Austria, Belgium, China, Czech Republic, France, Germany, Israel, Italy, Japan, Mexico, Pakistan, Romania, Russia, South Korea, Ukraine, UK and USA as well as the European Space Agency (ESA). IAWN is a member ex officio. SMPAG also has several observers, including the Association of Space Explorers (ASE), the Committee on Space Research (COSPAR), the European Southern Observatory (ESO), the International Academy of Astronautics (IAA), the International Astronomical Union (IAU), and the United Nations Office for Outer Space Affairs (UNOOSA) which also acts as the Secretariat of SMPAG.

### **Why was it important to establish SMPAG?**

Efforts are undertaken to find Near-Earth Objects that could be dangerous to Earth and to calculate the potential impact risk. If more and more asteroids are being discovered that bear a potential risk to hit Earth, then the next logical step is to ask what can be done against this risk. It is not enough to know that you are going to be hit by an asteroid, you also need to know what to do about it. Today, the technology has advanced enough that we have different options to mitigate this risk. It was therefore important to establish SMPAG to look at these options.

**Gerhard Drolshagen** studied physics and mathematics at the Universities of Giessen and Göttingen in Germany where he received his PhD in 1981 in the area of quantum mechanical scattering theory. From 1982 to 1984 he was Post-Doc at the Los Alamos National Laboratory in the United States. In April 1987, he joined the European Space Agency (ESA) at its main technical establishment, ESTEC, in the Netherlands. At ESA he worked in the area of Space Environments and Effects. The main emphasis of his work was the study of meteoroids and space debris and their effects on orbiting spacecraft. In 2009 he became the co-manager of the Near-Earth Object (NEO) segment of ESA's Space Situational Awareness Programme. Since its formation in 2014, he has been the Chair of the Space Mission Planning Advisory Group (SMPAG). After his retirement in 2016 he has continued to support ESA as a consultant and also became affiliated with the University of Oldenburg. In January 2015, the International Astronomical Union honored him as a driving force of the European NEO Programme by naming asteroid 332733 "Drolshagen" after him.

#### Could you briefly describe some of these options?

The most suitable option depends on the size of the hazardous asteroid and the time you have to deflect it before it will actually hit Earth. It is in general most efficient to push the threatening object forward or to slow it down, rather than trying to move it sideways or to change the orbit completely. It is similar to crossing streets. To avoid a collision, cars should not be at the same position at the same time, but it is not necessary to move the streets.

In cases where the asteroid is rather large and there is only limited time available, the so-called "impulsive methods", such as a kinetic impactor, can be used. This means that you push the asteroid either by slamming a big object like a spacecraft into it, or by creating an explosion, potentially even a nuclear explosion, on or near the surface of the asteroid so that part of the surface evaporates which pushes the asteroid backwards or forward.

If more time is available to mitigate an impact so-called "slow push or pull methods" can be used. In this case, part of the as-



*Gerhard Drolshagen presents the status report of SMPAG at the Scientific and Technical Subcommittee of UNCOPUOS*



*Gerhard Drolshagen with members of SMPAG, Detlef Koschny, Rüdiger Jehn (both ESA), Lindley Johnson and Rob Landis (both NASA), at the Scientific and Technical Subcommittee*

teroid's surface is evaporated with a laser or pushed by an ion beam, or a spacecraft is positioned close to the asteroid and by the gravitational pull of the asteroid and the spacecraft the asteroid is slowly pulled away from its orbit. These methods can be applied in a very controlled way, but they work only over a long period of time, which means that they have to be employed for several months or even several years to move the asteroid out of its collision orbit.

Which method is most effective will always depend on the individual situation. Since this is still work in progress, further options for the deflection of asteroids will probably be developed in the future.

#### What has been the main outcome of the Group's work so far? What are your expectations for the final results of the Group and what is the timeframe for the Group's future work?

SMPAG has established a workplan containing eleven items that should be discussed by the members of the Group. One of these items, for instance, consists in establishing a threshold and criteria to determine when action is required in response to an asteroid impact threat. The main result on this item is that, if there is an asteroid that has a chance larger than one percent to hit the Earth within the next 50 years and it is bigger than 50 meters, SMPAG should start to think about how to cope with this risk, potentially also with a space mission.

The other work items deal with diverse topics, such as refer-



Two asteroids passing by Earth

Credit: ESA (2)



The Asteroid Impact & Deflection Assessment (AIDA) mission: ESA's Asteroid Impact Mission (AIM) observes the impact of NASA's DART (Double Asteroid Redirection Test) probe on the secondary body of the asteroid Didymos

ence missions, payload requirements, or the elaboration of a roadmap for the development of new technologies. Work on these items is still ongoing and we expect to have further results soon. SMPAG gives regular status reports at the annual meeting of the Scientific and Technical Subcommittee of UN-COPUOS in Vienna.

There is no fixed deadline to terminate the Group's work. However, at some point we will decide that we have assessed all the technical options that are currently available and that we can close our work for now. It will certainly take several years more until we have a clear picture of all the technical options that can be used to counter an asteroid impact threat. However, the Group's work is limited to assessing potential technical options and giving advice in this regard, it does not take decisions for the actual launch of missions to deflect hazardous asteroids.

**Could you tell us a little bit about the rationale behind the establishment of the SMPAG Ad-hoc Working Group on Legal Issues? In your opinion, how can the results produced by this Working Group help the work of SMPAG?**

During our discussions in SMPAG, questions regularly arose that have legal implications, such as: if something goes wrong during a deflection mission, for instance, if you push the asteroid only a little bit, but not completely away from Earth so that it hits a different location, who would be responsible for this?

The **Space Missions Planning Advisory Group (SMPAG)** is a UN-mandated group of international experts in the field of Planetary Defence. It was officially established in 2014 after formal endorsement by the United Nations Committee on the Peaceful Uses of Outer Space and the United Nations General Assembly. The primary purpose of SMPAG is to prepare for an international response to a Near-Earth Object threat through the exchange of information and the development of options for collaborative research and mission opportunities and to conduct Near-Earth Object threat mitigation planning activities.

If you detect an asteroid that bears the risk to impact Earth, are you obliged to take action to mitigate this risk? If the hazardous asteroid is very large and there is not much time until it will impact Earth, would you be allowed to use a nuclear device, which is the most powerful option, to deflect this asteroid? We realized that it was important for our work in SMPAG to answer those legal questions. However, since SMPAG is composed of technical and scientific experts, not of legal experts, it was decided to establish within SMPAG a subgroup called the Ad-hoc Working Group on Legal Issues to address the legal questions.

The Legal Working Group started its work in autumn of 2016. It consists of approximately 15 legal experts who were nominated by different SMPAG members, including the Austrian Research Promotion Agency (FFG), the European Space Agency (ESA), the German Aerospace Center (DLR), the Mexican Space Agency (AEM) and the National Aeronautics and Space Administration (NASA). The Working Group is currently finalizing a first report, in which it assesses the existing international law context applicable to the work of SMPAG, while also identifying legal issues that require further clarification.

In my view, it was very important to establish the Legal Working Group. The Group has compiled very valuable information that allows us in SMPAG to assess the technical options with their legal implications. When following the work of the Legal Working Group we also learned about a lot of interesting legal issues relating to what we do in SMPAG. Some of these issues were discussed quite intensively by the legal experts. As its work progresses, SMPAG will certainly have more questions for the Legal Working Group in the future.



*From 2-3 March 2018 the Symposium on natural resources under public international law took place in Ladenburg, Germany*

## Symposium on Natural Resources under Public International Law in Ladenburg

Irmgard Marboe

On 2 and 3 March 2018, Stephan Hobe from the Institute of Air Law, Space Law and Cyber Law of the University of Cologne organised a Symposium on natural resources under public international law in Ladenburg, Germany, the seat of the German Daimler and Benz foundation. An illustrious group of renowned professors, mainly from Germany and Austria, followed the invitation, also to celebrate the 60th birthday of the Director of the internationally recognised Institute and co-editor of the Cologne Commentary on Space Law. Yet, space resources only represented a small part of the programme which aimed at discussing international legal aspects of natural resources in a broader perspective.

The first group of speakers dealt with “Economic questions”. Christian Tietje from the University of Halle emphasised in his presentation on “Resources and Trade Law” that the WTO originally was producer-oriented, while more recently the Western countries as consumers of raw materials have become the focus of attention. Hans-Georg Dederer of the University of Passau highlighted some peculiarities of natural resources, in particular their uneven distribution and their externalities, mainly environmental problems, as well as that state activities and interventions are frequent and important. In the WTO context several legal definitions are difficult and controversial, such as whether natural resources are “goods” or “products”. In respect to the most-favoured nation (MFN)-clause, the definition of “like products” is often contentious. As an example, he

mentioned “seal products” – hunted by commercial hunters or indigenous people.

With respect to “Resources and Investment Law” August Reinisch of the University of Vienna recalled the recent controversies about investment protection in the Comprehensive Economic and Trade Agreement (CETA) between Canada and the EU and the Transatlantic Trade and Investment Partnership (TTIP) between the USA and the EU. He raised the question whether the area of investment law is the appropriate forum to deal with investors’ obligations with respect to public interest issues, such as environmental protection. Traditionally it is the obligation of states in their national laws and regulations to ensure that public interests are upheld. By contrast, the purpose of investment law is to ensure that the respective state regulations and actions are not arbitrary and discriminatory. In view of the ongoing debates it is currently not clear how the balance between investors’ interest and public interest will be accommodated in an effective and meaningful manner in the future.

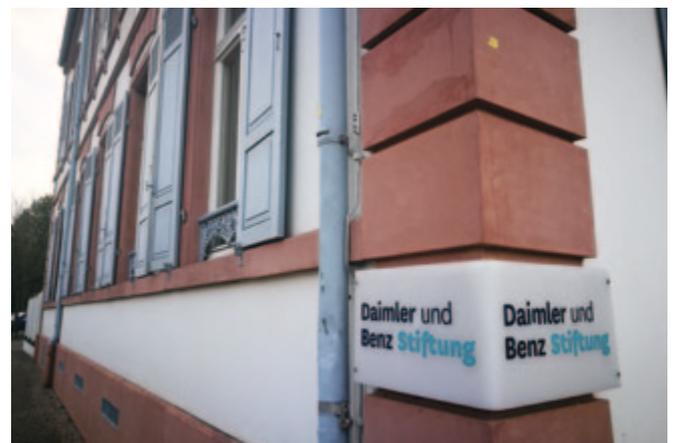
Marc Bungenberg of the University of Saarbrücken pointed out that 50 percent of the cases in investment arbitration are related to natural resources. In a brief historic overview he described the evolving character and contents of investor-state contracts. While at the beginning of the 20th century the contracts were very favourable to investors, this changed after World War II, in particular with the resolution of the UN General Assembly on the “Permanent Sovereignty over Natural Resources” of 1963. More recently, investor-state contracts have evolved into “product sharing agreements” and “service contracts” and foresee new types of distribution of ownership rights. The traditional “stabilisation clauses” have been replaced by “adaptation clauses” which take into account changing societal needs and ensuing legislation.

Chi Manjiao from Xiamen University (China) highlighted the exhaustibility of natural resources, their uneven distribution, their geographical fixation, their environmental sensitiveness, and the community impacts of long duration contracts. The gap of technology between developed and developing countries makes international trade and investment law necessary. He identified a triangular relationship with respect to natural resources. First, the states which have economic needs, second, the investors which are exposed to considerable political and economic risk, and, third, the communities which are the most vulnerable group and usually have weak political and legal positions. He sees the need to include community interests in international investment agreements to grant them international protection.

Under the title “Resource Mining as Means of Development” Charlotte Kreuter-Kirchhoff of the University of Düsseldorf gave an overview about the role of natural resources in the 17 UN Sustainable Development Goals (SDGs). In a case study she showed how SDG 7 – Energy for all – is important for projects in Africa. Leopold von Carlowitz of the University of Bonn focused on possible ways of governance for natural resources. He came to the conclusion that there are numerous soft-law instruments which are highly relevant for resource governance and development cooperation.

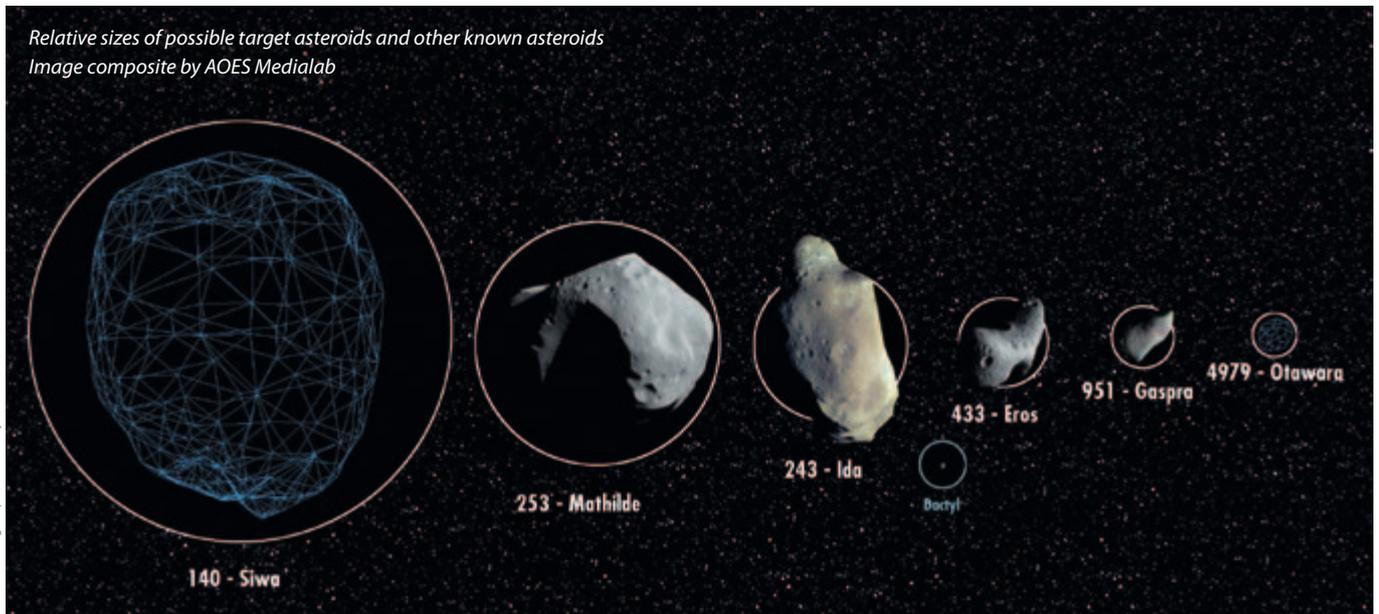
The second group of speakers was invited to talk about “Resource Mining: Questions of Human Rights, Environmental Protection, Law of the Sea and Law of Outer Space”. Michael Lysander Fremuth of the University of Cologne presented his thoughts on “Resource Mining and Human Rights”, Nico Schrijver from Leiden University (the Netherlands) talked about “Resource Mining and the Protection of the Environment”, and Bimal Patel of the University of Gujarat (India) provided insights into legal issues of “Resource Mining and the Law of the Sea”. On the topic of “Resource Mining and the Law of Outer Space” the author of the present article and Steven Freeland of Western Sydney University split roles and presented arguments in favour of a “unilateral” approach and a “multilateral” approach by states in the regulation of space resource mining respectively. The first presentation under the title of “Unilateral Regulation of Space Resource Mining by States” highlighted that Article I of the Outer Space Treaty provides for the freedom of exploration and use and that space activities shall be carried out for the benefit and in the interests of all countries. It argued that, if nobody carries out space activities, including space resource activities, this would be for the benefit and in the interest of no country. Furthermore, Article II of the Outer

*The Symposium was organised at the seat of the German Daimler and Benz Foundation*



Relative sizes of possible target asteroids and other known asteroids  
Image composite by AOES Medialab

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**Convinced that a Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, will further the purposes and principles of the Charter of the United Nations, Have agreed on the following:**

**Article I**

**The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.**

Article I, Outer Space Treaty 1967

Space Treaty prohibits national appropriation of celestial bodies, but does not prohibit the appropriation of their resources. Moreover, Article VI requires authorisation and continuous supervision of non-governmental space activities so that governments need to act when such activities by commercial companies are planned. Governments have also the right and possibility to do so because Article VIII provides for jurisdiction over space objects of its state of registry. With respect to the desired international regime over space resources it can be deplored that only very few states have ratified the Moon Agreement so that, on this basis, broad international consensus cannot be reached.

The second presentation entitled "Multilateral Regulation of Space Resource Mining by States", by Steven Freeland, underlined that Article I of the Outer Space Treaty provides for exploration and use of outer space for the benefit and in the interests of all countries, without discrimination of any kind and on a basis of equality. This excludes a "first come-first serve"-approach which privileges technologically highly developed countries. In addition, Article I of the Outer Space Treaty makes clear that there shall be free access to all areas of celestial bodies which represents an obstacle against areas on celestial bodies for exclusive use. Article II of the Outer Space Treaty

prohibits national appropriation of celestial bodies not only by explicit claims of sovereignty, but also by means of use or occupation, or by any other means. While the concept of "common heritage of mankind" contained in the Moon Agreement is yet to be developed and defined, the Outer Space Treaty already contains the concept of "province of all mankind" which implies that the benefit of space activities for humanity as a whole needs to be taken into consideration. Even more clearly Article IX contains the principle of "due regard" of the interests of other States and explicitly talks about the need to avoid harmful contamination of the environment of celestial bodies. Against this background, cooperative efforts are needed to avoid injustices and conflicts. While such a framework must be developed by States in order to grant legal certainty, cooperative efforts which include also other stakeholders may pave the way for an evolving understanding of the needs and problems, rights and obligations of all actors concerned.

The third group of speakers dealt with "A War of Resources? The Example of Water". The host, Stephan Hobe, together with Thilo Maraun of the University of Gießen discussed whether and under which conditions the securing of resources has been or would be a legitimate reason for using force. Steven Freeland talked about natural resources in times of occupation and argued in favour of a new international crime, a "crime against the environment", which could be adjudicated by the International Criminal Court.

At the end of the Symposium, Stephan Hobe and Christian Tams of the University of Glasgow summarised the presentations and discussions and addressed the question whether a common legal approach to resource mining could be envisaged. According to them, the main focus of such a common approach would need to contain fair conditions and opportunities for the sharing and securing of natural resources on Earth as well as in outer space.



Participants of the UN/Austria Symposium in Graz



High-level panel during the welcome ceremony of the Symposium

Credits: Rindler (2)

## United Nations/Austria Symposium on “Space for the Sustainable Development Goals”

Katharina Zollner

**From 17 to 19 September 2018, the United Nations/Austria Symposium entitled “Space for the Sustainable Development Goals: Stronger partnerships and strengthened cooperation for 2030 and beyond” took place at the Graz University of Technology.**

The Symposium was co-organised by the United Nations Office for Outer Space Affairs (UNOOSA) and the Government of Austria, with the support of the Ministry for Transport, Innovation and Technology, Joanneum Research, Graz University of Technology, the European Space Agency (ESA), the City of Graz, the State of Styria, the German Aerospace Center (DLR), and the National Point of Contact for Space Law Austria. The organisers were once again able to put together a highly interesting programme as well as compelling social events.

The Symposium took place shortly after UNISPACE+50, where the international community considered the future of global space cooperation for the benefit of all, in particular the contribution of space to sustainable development. It therefore focused on the possible contributions from space-related activities to the achievement and monitoring of the Sustainable Development Goals (SDGs). The core objective of the Symposium was to present different initiatives and to elaborate roadmaps and deliverables that demonstrate the role of space in the 2030 Agenda for Sustainable Development.

The Symposium provided panel discussions and interactive working groups on topics such as “Space Contributing to the 2030 Agenda for Sustainable Development”, “User Needs”, “Space Technologies Supporting the Sustainable Development Goals”, “Facilitate Access to Data and Services”, “How to Engage the Space Community Views into Policy Discussions”, and “Space Capacity-Building Initiatives Supporting the SDGs”. In addition, the Symposium included poster presentations by participants from all over the world on how they realise the SDGs in their countries with the help of space science and technology.

Based on the success of the previous year, the 2018 Symposium considered again not only technical but also legal and policy aspects, providing a holistic view on how space can contribute to sustainable development. Actors from universities and the private sector as well as representatives from space agencies and governments attended the conference. The Symposium therefore offered an interactive forum to exchange on scientific, technical, and legal matters and to promote a closer cooperation between governmental and non-governmental entities.

Overall, the United Nations/Austria Symposium in Graz was very successful and interesting, and we are looking forward to the next edition which shall take place from 2 to 4 September 2019.



A group picture of HLF participants

Credit: DLR (4)

## The UN/Germany High Level Forum in Bonn – Kicking Off the Development of the “Space2030” Agenda

Maximilian Betmann

2018 was a special year for outer space affairs at the United Nations. In June, the Committee on the Peaceful Uses of Outer Space (UNCOPUOS) celebrated the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE). Dubbed UNISPACE+50, the event was more than just a celebration of past achievements: during a three-year preparatory process, member states of UNCOPUOS, together with the United Nations Office for Outer Space Affairs (UNOOSA), considered the future role of the Committee as well as the contributions of space activities to support sustainable development on Earth.

The preparatory process of UNISPACE+50, which was organised under seven thematic priorities as well as four pillars, culminated in the adoption of a General Assembly resolution

which invited UNCOPUOS to develop a “Space2030” agenda. While the development of the “Space2030” agenda will be driven by the member states of UNCOPUOS, the nature of modern space activities necessitates the considerations of a broader range of stakeholders, especially from the non-governmental sector. In this regard, UNOOSA and the German government, through the German Aerospace Center (DLR), jointly hosted a High Level Forum (HLF) on the way forward after UNISPACE+50 and on Space2030 in Bonn from 13-16 November 2018.

The HLF was the first opportunity for the international space community to discuss the outcomes of UNISPACE+50 and consider their implementation, in particular the development of the “Space2030” agenda. The HLF brought together 307 participants from 58 countries, representing not only governments and space agencies, but also intergovernmental and non-governmental organisations. A total of 66 of these lat-

ter categories were represented, showing the wide range of stakeholders that engaged in the discussion.

Over four days, participants presented on a broad variety of topics and provided specific recommendations for the development of the “Space2030” agenda. The first two days of the HLF were structured around the seven thematic priorities and focused on an exchange between experts and practitioners in the space community. The second two days put the four pillars - space economy, space society, space accessibility and space diplomacy - into focus and gathered senior government officials and policymakers to provide their perspectives on the future of global space activities. The observations and recommendations were then compiled into a report, for presentation to UNCOPUOS and its subcommittees in 2019 as a contribution to the development of the “Space2030” agenda. One important element of the “Space2030” agenda will be the involvement of the next generation, a demand that was also voiced by several participants at the HLF. Beyond existing youth organisations, such as the Space Generation Advisory Council (SGAC), UNCOPUOS needs to consider and incorporate the views of the many young and bright minds that are currently at the beginning of their careers in the space field. In this regard, the HLF featured a dedicated Young Professional programme that included support for young professionals to attend the HLF, network with established community figures and present their ideas to them. Many of them could showcase their views and ideas during a poster session, which attracted high attention from the HLF participants.

Taking place at the UN premises in Bonn, the HLF also used the opportunity of the proximity of the Bonn office of the UN Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER). Itself being born out of recommendations of UNISPACE III, UN-SPIDER featured prominently throughout the HLF and hosted an expert meeting prior to the event. In 2018, Germany reaffirmed its commitment to the UN-SPIDER office in Bonn and assured its support to the next phase of implementation thanks to its close cooperation with the University of Bonn. At the HLF, UN-SPIDER and the University of Bonn jointly presented their cooperation efforts, which focus on enhancing the use of space-based information in Africa, to the international space community.

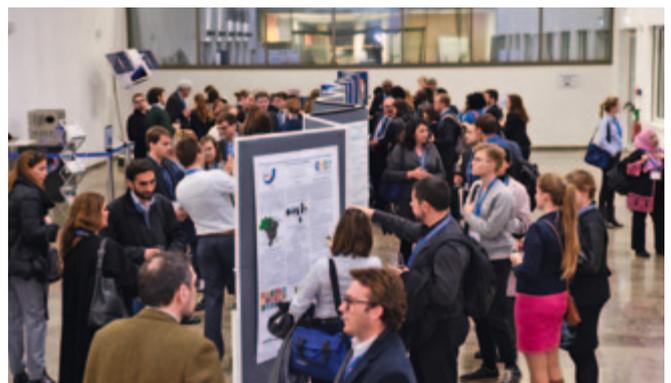
Overall, the HLF was the first opportunity for the broader international space community to come together and discuss the contents of the “Space2030” agenda. Intended to become an overarching, strategic vision to guide UNCOPUOS, its subcommittees and UNOOSA in the next decade, the “Space2030”



*Alexander Gerst addressing the HLF participants from the International Space Station. He stressed the importance of international cooperation and reminded participants of their responsibility to develop a visionary strategy for future space activities.*



*The HLF featured many interesting panel discussions. Here, former, current and incoming chairs of COPUOS, its subcommittees and working groups provide their perspectives on the future role of the Committee.*



*The poster session was a great opportunity for young professionals to present their work to members of the international space community.*

agenda will put forward a path to increase international cooperation in the peaceful uses of outer space and to strengthen the contributions of space activities to the achievement of the global agendas of the UN. The HLF aimed to build bridges and provide opportunities for exchange between the governmental sector and the broader stakeholders of the space community. It is now up to UNCOPUOS to carry this work forward.

## NPOC Space Law Austria Event “The Hague International Space Resources Governance Working Group - Discussion on the 19 Draft Building Blocks”

Cordula Steinkogler

On 13 April 2018, the National Point of Contact (NPOC) for Space Law Austria organised an event entitled “The Hague International Space Resources Governance Working Group - Discussion on the 19 Draft Building Blocks”. It took place at the margins of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) at the Vienna International Centre.

After an introduction by Irmgard Marboe, professor at the University of Vienna and head of the NPOC Space Law Austria, Giuseppe Reibaldi, executive secretary of The Hague International Space Resources Governance Working Group, gave a general overview of the main objectives, structure, and activities of the Working Group. The Working Group was created in 2016 as a forum to discuss legal questions regarding the use of space resources and to prepare the ground for future negotiations of an international instrument for the governance of space resource activities. It is hosted by the University of Leiden and a consortium of organisations from each continent. Members are representatives from governments, industry, international organisations, academia and NGOs. The Working Group also has observers, mostly experts and professionals involved in space resources issues. In a first phase (January 2016 – December 2017), the Working Group formulated 19 Draft Building Blocks for the governance of space resource activities as a basis for negotiations on a future international framework. During a second phase (January 2018 – December 2019), the Draft Building Blocks are further developed and discussed and inclusive consultations are held.

Olavo de Oliveira Bittencourt Neto, professor at the Catholic University of Santos in Brazil and vice-chair of the Working Group, presented some important features of the 19 Draft Building Blocks. They include definitions of key terms and describe the potential objective and scope of a possible future international framework on space resource activities. They also suggest provisions regarding international responsibility



for space resource activities and jurisdiction over space products, access to and utilisation of space resources, technical standards for space resource activities, the sharing of benefits arising out of the utilisation of space resources, the avoidance of harmful impacts resulting from space resource activities, registration and notification requirements as well as liability and the settlement of disputes.

Sagi Kfir, general counsel and co-founder of Deep Space Industries, presented the industry perspective. He pointed out that, for the second phase of the Working Group’s activities, a Technical Panel was created consisting of university, space agency and industry representatives. The Panel focuses on technical questions related to the governance of space resource activities. Its input to the Working Group will allow to verify the technical viability of the Building Blocks under discussion. A valuable aspect of industry involvement is that experts with specific technical knowledge in the field of resource mining can contribute directly to the work of the Technical Panel.

The presentations were followed by a lively discussion with the audience consisting of delegations of UNCOPUOS members and observers which also included experts from academia and industry representatives.

# Conference “21st Century Challenges in Space” at the University of Salzburg

Julia Pleiel

On 11 April 2018, the University of Salzburg organised a conference dedicated to the topic “21st Century Challenges in Space”. The conference took place in the historic gallery of maps at the law library of the University. It formed part of a seminar on space law, which was held in the summer semester 2018 for the first time. During the conference, four experts from politics, practice and academia presented selected issues of space law to interested students and the general public.

Professor Kirsten Schmalenbach, professor of international and European law at the University of Salzburg, opened the conference on behalf of the Department of International Law. In her welcoming address, she drew particular attention to the historical maps from the 16th century, a symbol of the human thrive for research and discovery, which provided an extremely suitable backdrop for the conference.

As the first speaker, Margit Mischkulnig, head of the Department for Outer Space Affairs at the Austrian Federal Ministry for Transport, Innovation and Technology, presented the cornerstones of the Austrian Space Policy. The main focus was on funding and research programmes which Austria supported with financial and technical resources. Ms Mischkulnig also highlighted the authorisation of space activities under the Austrian Outer Space Act and the respective prerequisites. In addition, she made comparisons with the legal situation in other countries.

Afterwards, Dr Marco Ferrazzani, legal counsel and head of the Legal Department of the European Space Agency (ESA), gave interesting insights into the structure and administrative practice of ESA. In his presentation and in the subsequent discussion, he did not only present various synergy models for enabling joint space activities (cooperation, integration), but also dared to look into the future of European space research and industry and its relevance for ESA.

Alexander Soucek, legal officer at ESA, presented a wide range of legal issues that accompany a space programme from its

initiation until the end of the mission. He focused in particular on the legal complexity of the environment in which ESA, as an intergovernmental organisation, and its member states operate. As Mr Soucek himself had studied law at the University of Salzburg, it was a particular pleasure for the organisers of the conference to welcome him as a speaker.

The conference programme was rounded off with a presentation by Professor Irmgard Marboe, professor at the University of Vienna and head of the National Point of Contact for Space Law Austria, on a very topical issue: the exploitation of resources in outer space. In the presentation and the subsequent discussion legal limits and uncertainties in the handling of space resources by state and private actors were discussed. In order to demonstrate the problem, Professor Marboe referred in particular to diverging lines of development in national space laws.



*Irmgard Marboe, Professor at the University of Vienna and Head of the NPOC Space Law Austria, speaks about the exploitation of resources in outer space*



*Margit Mischkulnig, Head of the Department of Space Affairs at the Austrian Ministry for Transport, Innovation and Technology, presents the Austrian space policy*

## The Summer University “Graz in Space” 2018

Hannes Mayer

The summer university “Graz in Space” took place from 6 to 7 September 2018, in a cooperation of the Austrian Academy of Science’s Space Research Institute, the Graz University of Technology, the Karl-Franzens-University Graz, the University of Vienna and several other institutions. It provided an opportunity for students, high school pupils, and teaching personnel to gain new knowledge on space research at first hand.

“Graz in Space” is a long-established summer university for all who are interested in aerospace, space research, and space exploration as well as astronomy and astrophysics. The 2018 edition focused on extra solar planets, the Sun and space weather as well as the Rosetta mission and offered the opportunity to attend guided tours of the University’s astronomical facilities. The topic space law was covered through a lecture by NPOC Subpoint Graz collaborator Anita Rinner.

Day one began with presentations on planetary science. Lectures provided insights on topics such as the Space Research Institute’s participation in planetary science spacecraft missions, the exploration of Saturn, Jupiter or Pluto, and research in near Earth space. After the lunch break and guided tours of the University’s solar observatory and the University museum’s collection of astronomical instruments, the session reconvened to present highlights of the Rosetta mission, solar astronomy, remote sensing by small satellites, and an overview of the Austrian Pegasus satellite.

Anita Rinner’s lecture highlighted the sustainable use of space, elaborating inter alia on the legal challenges posed by the rising number of small satellites being launched. Another focus was set on mega-constellations. Ms Rinner further underlined the advancement of the “democratisation of space” by lower costs and greater participation in spaceflight activities, but also specified the associated challenges – mainly the potential problems concerning orbital slots and frequency allocation as well as the problem of space debris. The issues concerned were discussed under international, European and national law perspectives. The day ended with a presentation by Gernot Grömer, administrative director of the Austrian Space Forum, on the Amadee-18 Mars analog mission that had been carried out in Oman in February 2018.



Günter Kargl presenting highlights of the Rosetta mission

Credit: G. Fischer IWF, Graz (2)



Anita Rinner’s talk on the sustainable use of space

The first session on the next morning focused on sun-like stars and solar winds. The following session provided information on satellite communications, the evolution of Earth’s and Venus’s atmospheres, and space research in Styria. The afternoon continued with presentations on space-based Earth observation and the monitoring of alpine landscapes using unmanned aerial vehicles. Further lectures dealt with cryogenic rocket propulsion, red dwarfs, and the Europlanet project – an international project to coordinate and exchange information on planetary science and space research between several European research institutions. The afternoon ended with a presentation by Michaela Gitsch from the Austrian Research Promotion Agency on career opportunities in the space sector in Austria as well as through Austrian participation in the European Space Agency.

“Graz in Space” has become an important part of the agenda of the Styrian space community. It can already be called a small success story – and it is hoped that this story will continue.

## Manfred Lachs Space Law Moot Court 2018

Clara Baumgartner, Jodie White

Should it be legal to mine resources on the surface of a celestial body, such as Mars, and use them for your own purposes? What if, by these methods, the planet's environment changes? Or if spacecraft of other states become unusable? Can a cyber-attack be considered as a lawful countermeasure against such an "intervention"? To these and other questions we tried to find answers – or at least some good arguments – in the course of the Manfred Lachs Space Law Moot Court 2018.

Last year's case harboured a couple of much discussed contemporary issues. Two states try to overcome problems caused by overpopulation and lack of resources on Earth in 2050 and start programmes to extract resources from Mars. Unfortunately, their methods are incompatible: while one state warms up the planetary surface to get access to frozen water, the other state's mining vehicles cannot work in the warmer conditions. The only logical solution? Blocking the warming-up devices by a cyber-attack against the control system. Of course, it is hard to capture the whole complexity and legal importance of these somehow futuristic facts. Even after months of research, you would be surprised how many different points of views have to be considered in events like this. Every year, Professor Marboe and her team of coaches, mostly former Moot Court participants themselves, supervise a team of two or three students to prepare for this space law competition. They split up into two groups, one representing the applicant and the other the respondent. From October to March, the Moot Court team works on the written memorials for each side. After the submission of the memorials at the beginning of March, the training for the oral pleading starts. Our team this year consisted of Alexej Arnautovic, Clara Baumgartner and Jodie White.

The first semester which was dedicated to the preparation of the written memorials was very intense in terms of researching and writing. None of us had any prior knowledge of space law, and not all of us had much knowledge of international law. Especially during the last month of the semester, we had so much work to do that we often ended up doing all-nighters in the library and drinking ridiculous amounts of coffee to



finish the claims. There was an obvious sense of relief when the memorials were finally submitted.

However, we had not finished yet. We then spent hours every week of the second semester preparing for the oral rounds. We were thrown in at the deep end, as none of us had any previous mooting experience. At the outset it seemed like we would never be able to perfect our public speaking. There were language issues, issues of memorizing our speeches, and at times we thought that we could not even get through the speech without laughing or interrupting ourselves.

Yet, after all the preparation during the months leading up to the competition it seemed like we finally became ready. We had to have the ability to think on our feet and to answer any question of relevance that the judges might ask us. This was therefore much more nerve-wracking than the written part of the competition. However, after all the training we were prepared for a large number of questions we could have been asked. During the actual competition, which took place from 22 to 25 May 2018 in Lisbon, Portugal, it was therefore very fulfilling to be asked questions we had a good response to. During the preparation we also managed to learn how to answer in a way to redirect the question, if we did not have a response. It was also enjoyable to think up some last-minute arguments when counsel for the applicant presented their claims, if we were arguing for the respondent.

Overall, even though we did not make it to the semi-finals, it was an experience unlike any other which taught us a number of valuable life lessons. We all noticed improvements of our competences, including our English-speaking skills, confidence in public speaking, and being able to work as a team, which are all important in any legal career.

## ECSL Summer Course on Space Law and Policy 2018

Michael Friedl

The 27th Summer Course on Space Law and Policy of the European Centre for Space Law (ECSL) took place in Helsinki, Finland from 27 August to 7 September 2018. One day, the “Digital Day”, took place in Tallinn, Estonia on 31 August. The participants included 43 students and four tutors representing 25 countries. Austria was represented by four students and a tutor.

The topic of this year’s course was “The Arctic and New Space”, a topic of genuine interest not only to Finland, but to other states with small space sector companies and international commerce as well. In roughly 50 lectures delivered by about 40 different lecturers, the participants learned about the basics of space and telecommunications law and current space policy from a European, US, and Russian perspective. Other lectures were devoted more specifically to the Finnish case of enacting a new national space act and recent space operations monitoring the Arctic ice shelf. Especially the technical presentations proved to be a challenge for the participating law students, but provided a basic factual knowledge, invaluable for a real-life legal assessment of space operations. Part of the second week of the course was dedicated to work in small project groups with the support of the tutors and Professor Achilleas, the ECSL Summer Course coordinator. The task was to present a summary of legal and regulatory issues to ESA to be taken into account for a small satellite mis-



*The participants of the ECSL Summer Course 2018*

Credit: ECSL (2)



*Summer Course participants listen to a lecture by Professor Martti Koskenniemi*

sion to provide either remote sensing or telecommunications services in the Arctic region by a Finnish operator in cooperation with ESA. After the participants had concluded their written parts, they started to prepare their oral presentations, not without taking a short break to attend a Finnish Sauna of course. On Friday, the groups presented their legal arguments in front of a distinguished panel of judges from the ECSL and the Finnish partners. In the afternoon of the final day the newly elected ECSL student representative, Ms Morgane Royer, was announced.

The course this year was held at a record number of eight different sites. Owing to the flawless organization by the Finnish partners and the ECSL everything went smoothly. This wonderful instalment of the summer course would not have been possible without the dedicated and tireless work by Mari Eldholm, the former ECSL Executive Secretary.

## Events

29 April-3 May 2019	IAA Planetary Defense Conference, Washington, D.C. area, USA
21-24 May 2019	European Rounds of the Manfred Lachs Space Law Moot Court, Paris, France
12-21 June 2019	62nd Session of the United Nations Committee on the Peaceful Uses of Outer Space, United Nations, Vienna, Austria
16-25 July 2019	Summer School Alpbach 2019 "Geophysics from Space using Micro- or Nano-Satellite Constellations", Alpbach, Tyrol, Austria
2-4 September 2019	UN/Austria Symposium "Space: A tool for Accessibility, Diplomacy and Cooperation", Graz, Austria
2-13 September 2019	28th ECSL Summer Course on Space Law and Policy, Messina, Italy
18-19 September 2019	13th ESPI Autumn Conference "European Space Diplomacy", Vienna, Austria
21-25 October 2019	70th International Astronautical Congress, Washington, D.C., USA
18-22 November 2019	UN/Austria World Space Forum "Access to Space4all", Vienna, Austria
26-30 April 2021	IAA Planetary Defense Conference, United Nations, Vienna, Austria

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