UNITED NATIONS
Office for Outer Space Affairs

10TH UNITED NATIONS WORKSHOP ON SPACE LAW

Contribution of Space Law and Policy to Space Governance and Space Security in the 21st Century

COMPILATION OF BIOS AND ABSTRACTS

BACKGROUND AND OBJECTIVE

Outer space is a fragile environment where the steps taken by one actor might have an impact on others, including users of space services on Earth. In that sense, the broader application of space operations and the increased strategic value of space has resulted in a growing need to enhance the safety of space operations, the security of the space environment and space assets, and the sustainability of outer space activities. Given the growing number of benefits derived from space science and technology applications, the conduct of space activities by States, intergovernmental and non-governmental entities as well as private sector continues to expand. In developing international and regional space cooperation States should assure that all actors conducting space activities comply with requirements of international space law.

International and regional cooperation for the peaceful uses of outer space helps to bring the benefits of space technology applications to a wide circle of stake-holders, both governmental and non-governmental, and to intensify and diversify national space programmes. Policy and regulatory frameworks at the national, regional and international level are of paramount importance to provide the necessary basis for States, particularly developing countries, to meet development goals and addressing challenges to humanity and sustainable development. In this process, it is necessary to continue to strengthen the inter-linkages between international space law and the conduct of space activities.

The 10th Workshop on Space Law forms part of a series of workshops under the space law capacity-building programme of the Office for Outer Space Affairs (UNOOSA). The Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, at its fifty-fifth session in 2016, noted with appreciation that the tenth United Nations Workshop on Space Law would be held at the United Nations Office at Vienna from 5 to 8 September 2016 and that the Workshop would address space law, and cover transparency and confidence-building measures in outer space activities.

The United Nations General Assembly, in its resolution on international cooperation in the peaceful uses of outer space, each year (latest 70/82) reaffirms the importance of international cooperation in developing the rule of law, including the relevant norms of space law and their important role in international cooperation for the exploration and use of outer space for peaceful purposes, and of the widest possible adherence to international treaties that promote the peaceful uses of outer space in order to meet emerging new challenges, especially for developing countries. The Assembly also recognizes that all States, in particular those with major space capabilities, should contribute actively to the prevention of an arms race in outer space with a view to promoting and strengthening international cooperation in the exploration and use of outer space for peaceful purposes.

The Assembly, in its resolution 70/82, further requests the Committee on the Peaceful Uses of Outer Space to continue to consider, as a matter of priority, ways and means of maintaining outer space for peaceful purposes, and agrees that the Committee should continue to consider the broader perspective of space security and associated matters that would be instrumental in ensuring the safe and responsible conduct of space activities, including ways to promote international, regional and interregional cooperation to that end. The Assembly encourages the Office for Outer Space Affairs to conduct capacity-building and outreach

activities associated with space security and transparency and confidence-building measures in outer space activities, as appropriate, and within the context of the long-term sustainability of outer space activities. Assembly resolutions on transparency and confidence-building measures in outer space activities (resolutions 68/50, 69/38, 70/53) encourage relevant entities and organizations of the United Nations system to coordinate, as appropriate, on matters related to the recommendations contained in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189). This call is taken into account in meeting the objectives of the Workshop.

The Workshop will provide an overview of the legal regime governing the peaceful uses of outer space, will examine and compare various aspects of the broader perspective of space security in global space governance, including on transparency and confidence-building measures in outer space activities, and will address space law and policy in the context of UNISPACE+50 (see box below) with the following objectives:

(a) To promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space;

(b) To address space governance and the broader perspective of space security, including on norms of behaviour and space policy development;

(c) To consider space law and policy in the context of space economy, space society, space accessibility and space diplomacy;

(d) To study trends and challenges to the progressive development of space law; and

(e) To assess further needs for capacity-building, assistance and outreach in space law and policy.

Participation in the Workshop will be by invitation only. The working language of the Workshop will be English. The Workshop report will be issued in all official languages of the United Nations to the fifty-sixth session of the Legal Subcommittee in 2017.

UNISPACE+50

The year 2018 will mark the 50th anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space - UNISPACE+50. The Committee on the Peaceful Uses of Outer Space (COPUOS) at its fifty-eighth session in June 2015 endorsed the plan of work for UNISPACE+50. UNISPACE+50 will review the contributions that the three UNISPACE conferences (UNISPACE I, held in 1968, UNISPACE II, held in 1982, and UNISPACE III, held in 1999) have made to global space governance. In line with the 2030 Agenda for Development and sustainable development goals, UNISPACE+50 aims to chart the future role of COPUOS, its subsidiary bodies and the United Nations Office of Outer Space Affairs, at a time of an evolving and more complex space agenda when more participants, both governmental and non-governmental, are increasingly involved in ventures to explore space and carry out space activities. The activities of the Office are an integral part of the UNISPACE+50 thematic cycle and are aimed at contributing to outputs under the four pillars space economy, space society, space accessibility and space diplomacy. For additional information see:

http://www.unoosa.org/oosa/en/ourwork/hlf/hlf.html.

OPENING AND KEYNOTE SPEECHES

Ms. Simonetta Di Pippo

Director of the United Nations Office for Outer Space Affairs

Simonetta Di Pippo joined the UN Office for Outer Space Affairs on 23 March 2014. After having graduated with a Masters degree in Astrophysics and Space Physics from the University "La Sapienza" in Rome, Italy in 1984, Ms. Di Pippo joined the Italian Space Agency (ASI) in 1986. Her responsibilities ranged from Earth Observation to Automation & Robotics, Science and Human Spaceflight. From 2002 to 2008, she served as the Director of the ASI's Observation of the Universe, since when in 2008 she got appointed Director of Human Space Flight at the European Space Agency (ESA), where she served in this role until 2001, before returning to ASI to lead the European Space Policy Observatory at ASI-Brussels until March 2014. Ms. Di Pippo co-founded, in June 2009, Women in Aerospace Europe (WIA-E) and has acted as President since then. WIA-E, with a legal base in the Netherlands, aims to expand the representation and leadership of women in the aerospace sector. Since April 2013 she has been a member of the Global Board Ready Women (GBRW), the list of potential top managers created by European Business Schools in the framework of the Women on Board initiative. Appointed Academician of the International Academy of Astronautics (IAA) in July 2013, she has been appointed in the Board of Trustees of the Academy in 2015. In May 2013 she received an Honoris Causa Degree in Environmental Studies from the St. John University in Vinovo (TO). She has been invited to teach at various Universities, including the George Washington University in Washington D.C. and the LUISS-Business School in Rome. From Nov. 1st, 2013 she is Visiting Scholar at CalPoly, CA. Ms. Di Pippo was knighted by the President of the Italian Republic in 2006 and, in 2008, the International Astronomical Union assigned the name "dipippo" to asteroid 21887, in recognition of her effort in space exploration.

Mr. Sergio Marchisio

Full Professor of International and Airspace Law at the University Sapienza of Rome

Since 2007, Chairman of the European Centre for Space Law within the European Space Agency. Member of the Italian delegation to the UN Committee on the peaceful uses of outer space, where he served as Chairman of the Legal Subcommittee (2004-2006). In 2010, elected co-chair of the Expert Group D of the LTSSA Working Group of the STSC. Italian Delegate to the European Union's CODUN Space and Member of the Task Force of the EEAS-EU for the International Draft International Code of Conduct on Space Activities. In 2012, appointed by the UN Secretary general member of the Group of Governmental Experts (GGE) on Outer Space Transparency and Confidence- Building Measures (TCBMs) established by General Assembly resolution 65/68 Between 2001-

2011, chair of the Committee of Governmental Experts for the UNIDROIT Space Assets Protocol to the Cape Town Convention. In 2012 Chair of the Commission of the Whole of the Berlin Diplomatic Conference which adopted the Protocol. Member of the Specialized Panel of Arbitrators of the Permanent Court of Arbitration established pursuant to the Optional Rules for Arbitration of disputes related to space matters. Member of the Board of the International Institute of Space Law (IISL), Full Member of the International Academy of Astronautics (IAA), Member of the Académie de l'air et l'espace (ANAE). Since 2014, Member of the Managing Board of the Italian Space Agency. Author of more than 100 publications in International Law, Law, European Union Law and Space Law.

Mr. Paul Meyer

Adjunct Professor of International Studies, Fellow in International Security, Simon Fraser University and Senior Fellow, The Simons Foundation

Paul Meyer is Fellow in International Security and Adjunct Professor of International Studies at Simon Fraser University and a Senior Fellow with The Simons Foundation. Prior to assuming his current appointments in 2011, Mr Meyer had a 35-year career with the Canadian Foreign Service. Mr Meyer had diplomatic assignments in Oslo, Moscow, Brussels (NATO), Washington, Tokyo and from 2003- 2007 in Geneva where he served as Canada's Ambassador and Permanent Representative to the United Nations and to the Conference on Disarmament. At the Department of Foreign Affairs and International Trade's HQ, Meyer held a variety of positions including Director General for International Security (1998-2001) and Director General for Security and Intelligence (2007-2010). Throughout his work, Meyer has sought to promote international security by means of creative diplomacy. He currently teaches a course on diplomacy at SFU's School for International Studies and is engaged in research and writing on issues of nuclear non-proliferation and disarmament, outer space security and international cyber security. He also is a member of the Governance Group for "Space Security Index" (www.spacesecurityindex.org) an annual publication tracking developments in outer space relevant to the security and sustainability of that environment.

Putting cooperation back into space security

In the influential US policy document "National Security Space Strategy" of 2011, outer space was characterized as "congested, contested and competitive". What the alliteration-devoted authors of this document overlooked was "cooperation" and the role that it might play in ensuring space security. On the eve of the golden anniversary of the Outer Space Treaty it is crucial that the international community renew the spirit of cooperation enshrined in that accord and which has informed much of what has been undertaken subsequently in space. The core principles of the Outer Space Treaty have to be continuously reaffirmed in practice however if the benign normative regime for outer space is to be sustained. Positive developments such as the 2013 consensus report of the UN Group of Governmental Experts on Transparency and Confidence-building measures in outer space and the June 2016 approval by COPUOS of several guidelines for the

long-term sustainability of outer space have been overshadowed by on-going negative trends. These latter have included the continued impasse in the Conference on Disarmament on how to deal with its "Prevention of an Arms Race in Outer Space" agenda item; a breakdown of consensus on the space-related resolutions of UNGA; the failure to finalize an International Code of Conduct for outer space activities and escalating threat perceptions and rhetoric on the part of leading space powers. The inherent vulnerability of the "global commons" of outer space, requires an active promotion of cooperative security approaches and the exercise of restraint on the part of all stakeholders. There is a need for a positive agenda of cooperation to ensure that the remarkable legacy of the Outer Space Treaty is preserved for the future well-being of humanity.

PANEL 1: INTERNATIONAL SPACE LAW AND POLICY DEVELOPMENT

As the first substantive panel of the Workshop, topically, it should act as an introduction to the most topical issues in the development of space law, not necessarily directly linked to the overarching theme of the Workshop: Contribution of Space Law and Policy to Space Governance and Space Security in the 21st Century. Nevertheless, it serves an important introductory function and acts as a general academic forum to discuss cutting-edge space law and policy most topical problems. In the context of the objectives of the Workshop, the panel will mainly focus on objective (d) (to study trends and challenges to the progressive development of space law) and the intersectional issues between objective (d) and other objectives. Outside of topical issues in the legal field, such as regulation of small-satellite activities and space traffic management, the panel will also discuss the influence of external factors on the legal field, such as the effects of scientific and technical advances or the emergence of new space actors (including, developing nations, IGOs and non-state actors, such as corporations and NGOs) on space law and policy. It would also be appropriate to examine the mentioned topics. Particular attention should also be paid on what the development of space law and policy requires in order to assess "relevant needs for capacity-building, assistance and outreach in space law and policy" (objective (e)).

Mr. Kuan-Wei Chen

Institute of Air and Space Law, McGill University

Kuan-Wei (David) Chen holds an undergraduate degree in Law and Politics from the School of Oriental and African Studies (SOAS), University of London, an LLM (cum laude) in Public International Law from Leiden University and an LLM in Air and Space Law from the Institute of Air and Space Law, McGill University, where he was also the Boeing Fellow in Air and Space Law. He was previously a Teaching and Research Assistant at the Van Vollenhoven Institute for Law, Governance and Development, Leiden University; and the Co-ordinator of the Telders International Law Moot Court at

the Grotius Centre for International Legal Studies. Since 2009, he has been working as a Research Assistant at the Institute of Air and Space Law, and where he was the Editor of the Annals of Air and Space Law (2012-2015). In 2014, he became a Sessional Lecturer at the Faculty of Law of McGill University, and he is currently the Deputy Project Manager of the Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS) Project.

Breaking the traditional orbit: Alternatives means of shaping law and policy in outer space

In an age of the burgeoning number of activities and actors in the outer space domain, 'space governance' has become a heated topic of discussion. It is generally agreed that space activities must be conducted with due regard of the interests and security of all States and that space must be used "peaceful purposes". However, humanity's endeavours in outer space have advanced considerably since the space law treaties were first drafted and adopted to govern, and to some extent restrain, the activities and ambitions of the handful of space-faring nations back then. The strategic and economic importance of outer space has made it challenging for States to reach agreements on clear and binding rules and principles to guide outer space activities, even more so in today's multipolar world where commercial interests are becoming increasingly influential. As such, in recent years, States and interested stakeholders have been more inclined to use alternative venues and means, some of which have proven more successful than others, in an effort to produce codes of conduct, "rules of the road" and even binding laws to shape the direction and content of space governance. It follows that this presentation will attempt to define and contextualize the concept of 'governance' in the setting of outer space and, more specifically, focus on how two ground breaking projects, the Global Space Governance Study and the project to draft the Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS), are shaping policy, law and order in the final frontier.

Ms. Irmgard Marboe

Professor of International Law at the Department of European, International and Comparative Law, University of Vienna

Irmgard Marboe is the head of the National Point of Contact for Space Law (NPOC) of the European Centre for Space Law (ECSL). Between 2008 and 2013 she chaired the Working Group on National Space Legislation of the Legal Subcommittee of the UN Committee for the Peaceful Uses of Outer Space which led to the adoption of General Assembly Resolution 68/74 of 2013. She was a speaker at several UN workshops and at numerous other international conferences relating to space law. Between 2009 and 2015, she was involved in the development of the Austrian Outer Space Act (2011) and the Austrian Outer Space Regulation (2015) counselling the Austrian Ministry for Transport, Innovation and Technology. Her numerous publications on space law include the edited volumes on *Soft Law in Outer Space – The Importance of Non-Binding Norms*

in International Space Law (Böhlau 2012) and *Small Satellites: Regulatory Challenges and Chances* (Brill/Nijhoff 2016). From September 2014 to March 2015 and in February 2016, she was a visiting scholar at Stanford University (USA), where she undertook a comparative research of Earth observation data policies in the US and in Europe and on the U.S. Commercial Space Launch Competitiveness Act (2015). She is a member of the Directorate of Studies of the International Institute of Space Law (IISL), the International Academy of Astronautics (IAA) and the Committee on Space Law of the International Law Association (ILA). Other memberships include the German Society of International Law, the European Society of International Law (ESIL), and the American Society of International Law (ASIL). Further research interests of Ms. Marboe are international investment law and arbitration, where she focuses on the issue of damages and compensation, and international law and Islamic law.

International law perspectives on small satellite activities

The raising number of small satellite activities is one of the characteristic features of the peaceful exploration and use of outer space in our time. More than 300 small satellites have been launched since 2003, and there are plans for several hundreds of them in the next few years. While there is no internationally agreed definition of "small satellites", practice largely follows the IAA proposal to classify satellites up to a mass of 1000 kg as "small". This includes another category, the "very small satellites" or "nano satellites" with a mass of less than 10 kg, of which the CubeSat standard, defined by its size of 10x10x10 cm, has become particularly popular. This new development raises a number of challenges to international space law, which was designed at a time when mainly governments conducted space activities and had control over them. Who controls small satellite activities today? Can everybody launch his or her satellite in the backyard, or more practically, contract with commercial launch service providers that seem to mushroom in the wake of the small satellite boom? Small satellites have a relatively short life time, a rather high failure rate, and are often not maneuverable so that they cannot avoid collisions. Are small satellites a threat to the long-term sustainability of outer space activities?

Mr. Alexander Soucek

Legal Officer, International Law Division, European Space Agency

Alexander Soucek is a legal officer for public international law and space law at the European Space Agency (ESA). He previously held the position of a programme coordinator in ESA's Directorate of Earth Observation Programmes. He is the legal adviser of ESA's International Relations Committee and of ESA's Directorate of Telecommunications and Integrated Applications. He represents ESA at the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and is responsible for the drafting and negotiation of international agreements concluded by ESA. Mr. Soucek earned a master's degree in law from the University of Salzburg, Austria, where he also worked as a research associate in public international law, and a master's degree in space studies from the International Space University in Strasbourg,

France. He is visiting lecturer for space law at universities in Europe, regularly speaks at space law conferences and has published books, commentaries and articles on the subject, including “Outer Space in Society, Politics and Law” (2011; co-edited with Christian Brünner and awarded the Social Science Book Award of the International Academy of Astronautics) and “Space Law Essentials Vol.1” (2015), an introduction to space law for law students and space practitioners. He is a member of the European Centre for Space Law (ECSL) and of the International Institute of Space Law (IISL) and was a founding member, as well as for many years deputy head, of the ECSL National Point Of Contact (NPOC) Austria.

Perspectives on future space traffic management

Space Traffic Management (STM) has been defined as the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space to Earth free from physical or radio-frequency interference – a definition used in the first study on STM by the International Academy of Astronautics (IAA) in 2006. While the very idea dates back to the 1980s, the concept is gaining momentum against the background of the increasing congestion and complexity of the space environment, the growing number of space objects and the diversification of space actors. Earlier this year, the Legal Subcommittee of COPUOS, at its 55th session, discussed STM for the first time as a single issue / item, marking an important step in the nascent international debate on the topic. The presentation will provide an introduction to the notion and content of STM, discuss its novel approach and potential value against the background of the existing corpus iuris spatialis, contrast technical and regulatory approaches and requirements and, last but not least, will attempt to sketch development directions STM may take in the years to come.

Mr. Christopher Johnson

Project Manager, Secure World Foundation

Chris Johnson is a Project Manager for Secure World Foundation and entered the space field in 2010 as an intern at the United Nations Office for Outer Space Affairs (OOSA) in Vienna, Austria during the 53rd Committee on the Peaceful Uses of Outer Space. He has also served as an intern in the Office of International and Interagency Relations (OIIR) at NASA Headquarters in Washington, DC, and as a legal stagiaire in the International Law and EU Legal Affairs division at the European Space Agency’s Legal Department at ESA Headquarters in Paris, France. Mr Johnson was admitted to practice law in New York State in 2005, in England and Wales in 2008, and to the bar of the District of Columbia in 2016. This summer, he will serve as the Space Policy, Economics, and Law (PEL) Department Chair at the International Space University’s Space Studies Program in Haifa, Israel.

Ms. Magda Cocco

Vieira de Almeida & Associados , Portugal, mpc@vda.pt

Magda Cocco is a portuguese lawyer, partner at *Vieira de Almeida & Associados* (VdA). Currently the partner responsible for the Aerospace practice; one of the partners in charge of the TMT – Telecoms, Media & IT practice; Partner responsible for the Privacy, Data Protection & Cybersecurity practice group. She has extensive experience in the aerospace area, where she has drafted space policies and strategies especially for African countries and advised on satellite contracts (including of construction and lease capacity) and installation of ground stations, as well as on partnership agreements in the sector. She holds a vast experience in the telecommunications sector in a variety of jurisdictions, with a special focus on Portuguese speaking countries, namely Angola, Mozambique, Cape Verde and East Timor, where she has led multidisciplinary teams working on projects with some of the main electronic communications operators. She has also advised Governments and Regulators in the definition of regulatory policies, in the drafting of legislation and in several other specific projects. Recent academic experience comprises teacher on the Summer Course on Space Law, organized by Católica Global School of Law, ELSA (European Law Students'Association) and VdAcademia, Lisbon; lecturer in Telecommunications Law and Regulation as well as in the Post-graduate course in Privacy and Data Protection at the Católica University of Lisbon; and lecturer in the Electronic Communications course at the Nova University of Lisbon. Ms. Magda Cocco is also the author/co-author of several articles published in national and international specialized publications, including on telecommunications, privacy & data protection and space law. Among other, she is co-author of an article on "International Laws Regulating Satellite Communications and their Intentional Disruption in Times of Peace and Conflict ", Annals of Air and Space Law" Volume XL, Institute of Air and Space Law of McGill University. She is VdA's representative in the International Astronautically Federation and in the Alliance for Affordable Internet (A4AI), Member of the Portuguese Working Group on Aviation, Space and Defence of the Portuguese Institute of Quality, Coordinating Member of the Permanent Group for the Information Society Security of the Portuguese Association for the Development of an Information Society (*Grupo Permanente de Segurança na Sociedade de Informação, da Associação Portuguesa para o Desenvolvimento da Sociedade da Informação* – APDSI):

Ms. Helena Correia Mendonça

Vieira de Almeida & Associados, Portugal, hcm@vda.pt

Helena Correia Mendonça is a Portuguese lawyer, Consultant at *Vieira de Almeida & Associados* (VdA). She is currently a Consultant integrated in the Aerospace Practice Area as well as in the TMT – Telecoms, Media & IT Practice and in the Privacy, Data Protection & Cybersecurity Practice. She has extensive experience in the aerospace area, where she has drafted space policies and strategies especially for African countries and advised on satellite contracts and installation of ground stations, as well as on partnership, supply and service agreements. She further actively works with UAS and in the ICT field, including on information and emerging technologies, e-commerce, media,

cybercrime, cybersecurity and fintech. Ms. Helena Correia Mendonça is also the author/co-author of several articles published in national and international specialized publications including on technology, intellectual property, media and space law matters. Among other, she is co-author of an article on "International Laws Regulating Satellite Communications and their Intentional Disruption in Times of Peace and Conflict ", Annals of Air and Space Law" Volume XL, Institute of Air and Space Law of McGill University. Recent academic experience comprises teacher on the Summer Course on Space Law, organized by Católica Global School of Law, ELSA (European Law Students'Association) and VdAcademia, Lisbon.

Designing space policies in emerging countries: main challenges

The important role of space products, services and applications for the social and economic development of countries has been increasingly recognised and, with it, new countries are giving their first steps in outer space. The growing number of emerging countries investing in space activities is a sign that the long held principle of the Outer Space Treaty that "*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*" is at last being fulfilled. But launching space activities in a country shall not be done without an appropriate policy, strategic and legal framework. Indeed, countries will be better equipped to take full advantage of the benefits of outer space and to deal with its challenges if they structure their vision and main goals for space activities in a central document or set of documents that bring together all measures required for the development of space activities in the country. This, in addition, will also help to send a clear sign that the country is effectively committed to the development of space activities. Drafting such a document – a policy and a strategy for the outer space area – is however especially challenging when dealing with emerging countries. Indeed, despite being aware of the need of space technology to tackle their own national challenges, these countries require substantial assistance and support with a view to guarantee that their path to space is sustainable and successful. Challenges in this scope are related with the following main areas: awareness (as many countries lack a clear structured view of the space sector, including of the international, continental and regional frameworks); approach (as countries may not have a structured vision on how to use outer space to respond to the country's general and sectorial development goals); coordination (as there is often a lack of an effective cooperation / dialogue among the different public stakeholders with a role in space activities or that benefit from space activities); capacity (of both the public stakeholders that are responsible for implementing projects and using space technology and data, and of the final users); and financing. Dealing with these challenges requires a holistic approach that guarantees that the country is able to seize all of the benefits of outer space for its sustainable socioeconomic development.

PANEL 2: SAFETY OF SPACE OPERATIONS AND SECURITY OF SPACE SYSTEMS

This panel plays a central role in terms of objective (b) (to address space governance and the broader perspective of space security, including on norms of behaviour and space policy development). This, however, does not mean that this is the only objective which the panel will address. There is a broad perspective of issues and concerns that could be addressed, such as emerging threats and challenges posed to space operations and space assets by space debris and other hazards. Military issues, cyber security concerns, but also perspectives of the prevention of an arms race in outer space are of high relevance to this panel. The connection to transparency and confidence-building measures is obvious, and serves to bridge this panel with the next one where TCBM implementation, particularly from the international organization perspective. The role of space middle powers in space governance and space security gives the discussions a rather new element for consideration since this group of space actors is often not visibly targeted in contemporary deliberations. Attention may also be paid to the way space law and policy could develop in order to accommodate aims relating to peaceful exploration and use of outer space in a responsible manner (objective (d)). The aim of the panel should not be merely an exploration of existing problems and discovered solution relating to space security and space safety, but could also include discussion on potential future challenges to the safety, security and sustainability of outer space activities, along with formulation of novel solutions to both current and possible future challenges.

Mr. Jean-Jaques Tortora

Director of the European Space Policy Institute

Since June 1, 2016 Jean-Jacques Tortora serves as the Director of the European Space Policy Institute. From 2007 to mid-2016 he was the Secretary General of ASD-Eurospace, which is the trade association of the European Space Industry. From 2004 to mid-2007, he was head of ohe French Space Agency (CNES) office in North America and the Attaché for Space and Aeronautics at the Embassy of France in Washington, D.C. Previously he was Deputy Director for Strategy and Programs, responsible for the Industrial Strategy of CNES, the French Space Agency. Prior to that position, he was France's representative in the ESA Industrial Policy Committee and Joint Communication Board. From 1998 to 2000, Mr. Tortora was adviser to the French Ministry of Research for Industrial Policy Funds management, aiming at industry competitiveness support and new space applications and services development and promotion. From 1996 to 1998, he was appointed by Arianespace in Evry, France, to lead a risk mitigation and cost reduction plan covering to the end of operational life of the Ariane 4 launcher. From 1990 to 1996, Mr. Tortora was based in Kourou, French Guiana, as Head of Arianespace Operations Quality Department. There, he led the Quality Management of the Ariane 4 launchers final integration and of the launch pad operations and maintenance. He supervised the industrialization and the implementation of the

associated control plans. Mr. Tortora started his career in 1984 at the French military procurement agency, DGA, as a naval weapons integration and test engineer, expert in signal processing and warships acoustic discretion.

Mr. Bhupendra Jasani

Visiting Professor, Department of War Studies, King's College London

Doctor Bhupendra Jasani worked for the British Medical Research Council between 1958 and 1972 after which he joined the Stockholm International Peace Research Institute (SIPRI) in Sweden in 1972. In 1987, he joined the Royal United Services Institute for Defence Studies, and in 1984 he conceptualized the Western European Union Satellite Centre, now known as the European Union Satellite Centre. In 1990, he joined the Department of War Studies, King's College London, where he developed the use of commercial remote sensing satellites for applications to monitor multilateral arms control treaties, confidence building measures and peacekeeping operations. Subsequently he produced several reports for the International Atomic Energy Agency (IAEA) on behalf of the UK and German Governments on the use of commercial observation satellites to enhance the Agency's safeguards procedures (1996 -2000), and in 2003 the European Commission (EC) established the Global Monitoring for Security and Stability (GMOSS) study through which he coordinated treaty monitoring and early warning of conflicts and natural disasters projects using commercial remote sensing satellites. Doctor Jasani was actively involved in the Palme Commission on Disarmament and Security, contributing to the final report Our Common Future in 1987. Currently, he is an Adjunct Professor, Faculty of the International Strategic and Security Studies Programme, National Institute of Advanced Studies, Bangalore, India and at ISU.

Space assets and emerging threats

There are numerous spacecraft orbiting the near and far earth orbits performing different military functions that include reconnaissance, early-warning, communications, navigation, meteorology and weather forecasting. Not only this, but the number of nations are either developing or participating in such developments is increasing. Many of these are potentially able to orbit very capable civilian/commercial satellites. By 1967, outer space became a heavily militarised environment and the civil and defence space assets are now an important element of terrestrial security making them targets during any earth-bound conflicts. The latter consideration has been a result of a perception that during any terrestrial conflict a state may feel the need to deny the adversary the use of his space assets. Moreover, active protection of one's own space assets has become necessary leading to the development, testing and to some extent the deployment of anti-satellite (ASAT) weapons. Of course, the testing of some ASATs have caused debris in space already in addition to those generated from natural sources and other human activities in space posing an additional threat to space assets. In this presentation, the civil and military uses of space are briefly identified and threats to them from debris and anti-

satellite weapons are discussed. Some of the legal issues arising are also discussed and a possible ASAT Treaty is proposed.

Ms. Deborah Housen-Couriel

Senior Research Fellow, Interdisciplinary Cyber Research Center, Tel Aviv University and Law Faculty, University of Haifa

Deborah Housen-Couriel is an Israeli attorney specializing in four major aspects of legal and policy areas of Israeli and global cybersecurity and regulation: cyber defense, critical infrastructure, cyber terrorism and internet governance. She researches, writes and speaks frequently on these issues at academic and professional conferences. Deborah is a senior research fellow at the Interdisciplinary Cyber Research Center at Tel Aviv University, the Herzliya Institute for Counter-Terrorism, and the Minerva Center at Haifa University's Law Faculty. She teaches courses on cybersecurity law and regulation at the former two, with a focus on the interaction among public international law, domestic legal systems and contemporary technological developments in cyberspace. She has an independent legal practice specializing in Israeli and global cybersecurity law, also serving as Special Counsel to the New York law firm Zeichner, Ellman and Krause. Deborah is currently serving on the Advisory Board for the Global Forum on Cyber Expertise and the Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS) Project. She was a member of the International Group of Experts that drafted the Tallin 2 manual on state activity in cyberspace; and of the ILA's Study Group on Cybersecurity, Terrorism and International Law. In 2010-11, she co-chaired the National Cyber Initiative's Policy and Regulation Committee, under the aegis of the Prime Minister's Office; and served as a member of Israel's National Cyber Bureau's public committee on the cyber professions. Between 2007-2014, Deborah was Director of the Wexner Foundation's Israel Fellowship Program, which develops public leadership at the highest levels in Israel and the US together with the Harvard Kennedy School. Prior to these positions, Deborah was Director of the Department of Regulation and International Treaties and served in the Director-General's Bureau of the Israeli Ministry of Communications (1994-2005). While at the Ministry she served on delegations to the WTO, the ITU, the Oslo Accords negotiations, and those for the peace treaty with Jordan. She received her B.A. in History and Anthropology summa cum laude from Wellesley College and the Ècole de Sciences Politiques in Paris; her LL.B. and LL.M (cum laude) from Hebrew University; and an MC-MPA from Harvard's Kennedy School of Government as a Wexner Foundation Fellow in 2000-2001.

Space security and cyber security: intersecting challenges

Recent military and civilian developments are deeply affecting our understanding of the scope, depth and criticality of new strategic threats to countries both in outer space and in cyber space. These "fourth and fifth domains" have until now largely been treated as separate realms by states and by intergovernmental organizations that are working to promote governance, policy and legal issues in each context. Yet outer space and

cyberspace are better characterized as interdependent elements of a complex and continually-evolving nexus of activity for state and non-state actors. In particular, satellite communications are overwhelmingly carried out through cyberspace, and as such are subject to the vulnerabilities and strategic threats prevalent in both realms. A number of multilateral initiatives have addressed issues that have ramifications in both the outer space context and the cybersecurity context: of particular concern are issues related to the UN collective security regime, state responsibility and liability for activities causing harm in both outer space and cyberspace. It is proposed in this presentation that ongoing efforts at the international level to elucidate and develop normative guidance regarding both outer space and cyberspace can benefit from overlapping state interests and insights. Above all, the approach of states and intergovernmental organizations should reflect the interwoven and interdependent realities of the present militarization and commercialization of both realms.

Mr. Hellmut Lagos Koller

Chair of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, former member of the UN Group of Governmental Experts on Space TCBMs

Chairman of the UN COPUOS Legal Subcommittee since 4 April 2016. He studied Diplomacy at the Diplomatic Academy of Chile, Security and Defence at the National Academy for Political and Strategic Studies and holds a Master's degree in International Law and International Relations of the Ortega y Gasset Institute, Madrid. Mr. Lagos Koller joined the Ministry of Foreign Affairs of Chile in 1995 and has served as Alternate Representative to the Seabed Authority in Kingston, Jamaica (1999-2000), Alternate Representative to the International Organizations in Rome (2001-2004), Alternate Representative to the IAEA and other International Organizations in Vienna, including UNOOSA (2005-2008), Programme Director at the Asia Pacific Economic Cooperation (APEC) Secretariat in Singapore (2009-2010) and Deputy Head for International Security in the Ministry of Foreign Affairs in Santiago (2011-2013). In 2012 he was appointed by the United Nations General Assembly in the United Nations Governmental Expert Group on Transparency and Confidence Building Measures in Outer Space Activities. He has been delegate to a large number of international meetings and multilateral fora, including the United Nations First Committee, the IAEA Board of Governors, the Comprehensive Test Ban Treaty PrepCom, the International Conference on Cluster Munitions, the 2010 Review Conference PrepCom, the Oslo Conference on the Humanitarian Impact of the Use of Nuclear Weapons, the Arms Trade Treaty, among others. Mr. Lagos Koller was the head of delegation of Chile in the process of consultations of the International Code of Contact for Space Activities. He is actively involved in academic activities, and is a regular participant in the Wilton Park Conferences inthe United Kingdom and in the Vienna Center for Disarmament and Non Proliferation (VCDNP), among others. He is currently posted at the Permanent Mission of Chile to the International Organizations in Geneva.

Ms. Natália Archinard

Federal Department of Foreign Affairs, Switzerland

Doctor Natália Archinard was seconded by the State of Geneva to the Space Programme Office of the World Meteorological Organization (WMO) in 2005. In 2006, she joined the Swiss Federal Department of Foreign Affairs in Berne where she has since dealt with science and space policy with a focus on international relations. Her responsibilities include leading the Swiss delegation at the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) as well as representing Switzerland in the process led by the European Union (EU) with regards a proposal for an International Code of Conduct on space activities. As a Swiss delegate to the European Space Agency (ESA) and to the ESA-EU High-Level Space Policy Group, she has developed a cross-cutting view on European and global space policies. She is involved in the Swiss space policy and contributes to the national positions on outer space in the disarmament fora. Dr. Archinard was educated in mathematics at the University of Geneva and at the Swiss Federal Institute of Technology in Zurich (ETHZ) where she obtained her PhD in 2000.

Space security and governance – the role of space middle powers

The forums of global governance have traditionally addressed space matters in a disjoint manner, differentiating between peaceful purposes and arms control. In the more recent years however, consciousness has grown that issues related to space security at large need to be addressed in a cross-cutting way. As a consequence of the report of the Group of Governmental Experts submitted to the UN General Assembly in 2013 (under reference A/68/189), the 1st and the 4th Committees of the UN General Assembly held a common meeting at the 70th session in 2015. Furthermore, the UN entities in charge respectively of space and disarmament affairs have started to work more closely together. But the approaches proposed by the major space-faring nations remain different, if not antagonistic. Their dialogue on space security issues seems not to offer much more room for progress. As a result, fresh ideas and new initiatives appear to be needed in order to overcome the present difficulties and to reinforce the global governance of space activities with a view to ensuring the security, the safety and the long-term sustainability of the latter ones. New actors, such as so-called space middle powers, could play a beneficial role in this respect.

PANEL 3: TCBM IMPLEMENTATION AND THE ROLE OF INTERNATIONAL ENTITIES: INSTITUTIONAL AND REGULATORY PERSPECTIVES

This panel continues the theme of panel 2 in terms of objective (b) (to address space governance and the broader perspective of space security, including on norms of behaviour and space policy development). Whilst panel 2 focuses chiefly on the "hard law" solutions to space security and safety challenges, and the "soft law" diplomatic approaches to deal with such challenges, panel 3 demonstrates how a number of particularly representative international entities deal with TCBMs at the operational and

practical level. Particular attention is given to the implementation of the recommendations of the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189), where the recent special report of UN-Space on that topic (A/AC.105/1116) provides the main background and frame for consideration of this panel. The UN-Space report under reference addresses TCBM from the broader perspective of societal needs, including capacity-building efforts and outreach. The panel, therefore, may also touch upon other objectives such as (c) (to consider space law and policy in the context of space economy, space society, space accessibility and space diplomacy), most predominantly focusing on space diplomacy. TCBM implementation and development builds partly on the establishment of cooperation and coordination mechanisms, and therefore panel 4 follows immediately thereafter. Both panel 2 and 3 are relevant to UNISPACE+50 thematic priority number 3 (A/71/20, para 296 (3) "Enhanced information exchange on space objects and events").

Mr. Jarmo Sareva

Director of the United Nations Institute for Disarmament Research

Jarmo Sareva was appointed as Director of the United Nations Institute for Disarmament Research (UNIDIR) effective 1 January 2015. He brings to the Institute a wealth of experience from United Nations and disarmament affairs. Until the end of 2014 he served as Deputy Secretary-General of the Conference on Disarmament and Director of the Geneva Branch of the UN Office for Disarmament Affairs. Prior to that he was Chief of the Disarmament and Peace Affairs Branch at the Department for General Assembly and Conference Management of the UN Secretariat in New York, serving also as Secretary of the First Committee of the General Assembly. Prior to joining DGACM, Mr. Sareva was Ambassador and Deputy Permanent Representative of Finland to the UN in New York, during which time he served, inter alia, as Chairman of the First Committee. Mr. Sareva's diplomatic experience also includes tours of duty in Moscow, Washington and Vienna. He has also served as Director of Disarmament, Arms Control and Non-proliferation at the Ministry for Foreign Affairs in Helsinki.

Mr. Niklas Hedman

Chief of Committee, Policy and Legal Affairs Section of the United Nations Office for Outer Space Affairs

Niklas Hedman serves as Secretary of the Committee on the Peaceful Uses of Outer Space (COPUOS) and its Scientific and Technical Subcommittee and Legal Subcommittee. He is also Secretary of the United Nations Inter-Agency Meeting on Outer Space Activities (UN-Space), which is the central coordination mechanism for space related activities in the United Nations system. He is responsible for OOSA capacity-building activities in space law and policy. Before joining the United Nations in

2006, he worked in the Swedish Ministry for Foreign Affairs, particularly in the areas of ocean affairs and law of the sea; space law and space policy; as well as disarmament and non-proliferation, including PAROS and the Hague Code of Conduct Against Ballistic Missile Proliferation (HCOC). He represented Sweden to COPUOS for 10 years and held various positions, including Chair of the UNISPACE III+5 report A/59/174. Mr. Hedman represented Sweden to the final rounds of negotiations on the International Space Station Intergovernmental Agreement (ISS-IGA), and was chief negotiator to the governmental framework agreement on space cooperation between Sweden and the United States of America. He is a member of the International Space Law Committee of the International Law Association (ILA), International Institute of Space Law (IISL) and International Academy of Astronautics (IAA).

UNOOSA supporting member states in the implementation of TCBMs in outer space activities

The presentation will address the role of UNOOSA in facilitating the implementation of transparency and confidence-building measures in outer space activities. The starting point will be the report of the Group of Governmental Experts on Transparency and Confidence-building Measures in Outer Space Activities (A/68/189) and the special report of UN-Space (A/AC.105/1116), coordinated under the leadership of UNOOSA and in close cooperation with UNODA. The office for Outer Space Affairs performs a major function as a facilitator and repository of key information for States and international intergovernmental organizations to ensure trust and confidence in space operations. UNOOSA additionally provides administrative, logistical, legal and capacity-building activities in this field in support of information exchange and notification procedures under the responsibility of the Secretary-General. Despite all the functions currently performed by the Office, the potential of the Office is higher and thus the role of UNOOSA can be expanded.

Mr. Valere Mantels

Acting Chief, WMD Branch, ODA NYHQ

Prior to joining the United Nations, Mr Mantels served as a professional F 16 pilot in the Belgian Airforce, qualifying in both conventional and nuclear roles. From 1992 till 1997, he represented Belgium on nuclear issues in various fora, including NATO. After a stint as Military Advisor in New York, he joined the WMD Branch in New York, followed by the assumption of responsibilities in the ODA Office in Geneva before returning back to WMD in New York.

Mr. Jorge Alberto Ciccorossi

Space Services Department , International Telecommunication Union

Jorge Alberto Ciccorossi is a senior engineer at the Space Services Department of ITU Headquarters in Geneva- Switzerland , where he works since 2002 and is responsible for technical-regulatory examinations of satellite projects submitted to the Radiocommunication Bureau, as well as the analysis of cases of harmful interference to satellite systems, and participating at ITU-R Study Groups. He was Counsellor of the Working Group 6C at the World Radiocommunication Conference in Geneva 2012, Liaison Officer at Plenaries WRC-15, ITU World Telecomm 2009, 2011 and Acting Head of the Space Systems Coordination Division. Currently, he is also an alternate member of the ITU Appeal Board. He has represented ITU and given lectures at several International Fora. Among the most recent ones can be mentioned ITU International Satellite Communication Symposium on Interference to Space Services (Geneva, June 2016). 17th. International Space Radio Monitoring Meeting-ISRMM, (Washington, September 2015). European Center for Space Law (ECSL-ESA) course (Geneva, September 2014). ITU World and Regional Radiocommunication Seminars held at Geneva and Latin American countries (2008- 2015). CABSAT-Global VSAT Forum (Dubai, March 2014). ITU Workshop on Preventing Harmful Interference to Satellite Systems (Geneva, June 2013). Arab Satellite Broadcasting Union-ASBU (Tunisia, November 2013). International Institute of Space Commerce-IISC/International Space University –ISU (Douglas, United Kingdom, May 2012). CITEL PCCII Meeting at Puerto Rico, October 2011. Before joining ITU, Jorge accumulated experience in telecommunications and satellite coordination for more than 10 years working at the National Communications Commission (CNC) and private sectors in Argentina. Jorge holds a degree of engineer in electronics from the National University of Technology (UTN) Buenos Aires.

ITU role, regulations and actions to prevent and resolve harmful interference to Space Services

The presentation will start by introducing the Radiocommunication Sector of ITU and providing an overview of the Radio Regulations and main provisions and procedures governing the use of space services by Member States to ensure an interference-free environment. Latest key decisions and resolutions from Plenipotentiary and World Radiocommunication Conferences will also be addressed. During the session, statistical information and typical cases of harmful interference to satellite systems reported to the Radiocommunication Bureau will be described. Actions taken by ITU to contribute to the Transparency and Confidence Building Measures and the prevention and resolution of cases of harmful interference will be presented, including Cooperation Agreements with Member States on International Monitoring to Space Services, Development of an International Registry of Harmful Interference to Space Services and promoting the exchange of experiences among satellite systems stake-holders. Finally, some key messages will be delivered to the audience with the aim to continue the synergistic actions being performed by all sectors of the space community as the only way to guarantee that a minimum level of interference is kept.

Ms. Julia Peitl

HCoC - Immediate Central Contact (Executive Secretariat), Federal Ministry for Europe, Integration and Foreign Affairs of Austria, Department of Disarmament, Arms Control and Non-Proliferation

Julia Peitl is a trainee at the Department of Disarmament, Arms Control and Non-Proliferation of the Federal Ministry for Europe, Integration and Foreign Affairs of Austria and represents the Immediate Central Contact (Executive Secretariat) of the Hague Code of Conduct against Ballistic Missile Proliferation (HCoC). As agreed by the conference in The Hague in 2002, Austria serves as the Immediate Central Contact (Executive Secretariat) of the Code. In this capacity Ms. Peitl coordinates the information exchange within the HCoC framework. The Executive Secretariat assists the Chair of the HCoC, which rotates on a yearly basis, in outreach activities. Ms. Peitl has previously served as a Comprehensive Nuclear-Test-Ban Treaty (CTBT) Desk Officer at the Permanent Mission of Japan to the International Organisations in Vienna. She holds a holds a B.A. (2009) in Japanese Studies and an M.A. (2015) in East Asian Economy and Society from the University of Vienna.

HCOC

The Hague Code of Conduct against Ballistic Missile Proliferation (HCoC) is the result of concerted efforts of the international community to regulate ballistic missiles capable of carrying weapons of mass destruction and is the only multilateral transparency and confidence building instrument concerning the spread of ballistic missiles. The HCoC aims to contribute to the process of strengthening existing national and international security arrangements and disarmament and non-proliferation objectives and mechanisms. In this regard, it complements the important, ongoing work of the Missile Technology Control Regime (MTCR). The voluntary Code is a set of principles, modest commitments, incentives, and limited confidence-building measures, including transparency of missile policy and stockpiles. It does not prohibit States from possessing ballistic missiles or benefitting from the peaceful uses of outer space, nor does it call for the destruction of any missiles. Since the signing and entering into force of the HCoC on 25 November 2002 in The Hague (Netherlands) the number of signatories has increased from 96 to 138.

PANEL 4: INTERNATIONAL MODELS AND MECHANISMS FOR SPACE COOPERATION AND COORDINATION

This panel is central for discussions regarding objective (a) of the Workshop (to promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space). Additionally, particular attention should be payed to objective (b) (to address space governance and the broader perspective of space security, including on norms of behaviour and space policy development). Whilst the previous three panels have a clearly defined normative focus, the emphasis of this panel should lie

on the procedural steps in ensuring both successful cooperation and coordination in the process of collective space cooperation. Considering the challenging nature of space exploration and the benefits which space provides to nations both individually and collectively, the importance of coordination cannot be underestimated. To meet the objectives and themes of the previous panels 1, 2 and 3, this present panel is aimed at studying existing mechanisms addressing core issues at the intergovernmental level of global space governance. The international Committee on Global Navigation Satellite Systems (ICG) and the Inter-Agency Space Debris Coordination Committee (IADC) represent successful mechanisms for dedicated common objectives. Regional and interregional cooperation and coordination mechanisms have proven important for strengthening overall space cooperation among countries, both space faring nations, emerging space nations, as well as space middle powers. Other models are represented by bilateral and multilateral agreements to manifest and deepen space cooperation. Agreements of this nature also serve as indicators for the implementation and application of treaty obligations. The present Working Group of the Legal Subcommittee on International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space is central in this connection. The panel may also look into areas where coordination and cooperation mechanisms are to be defined at the intergovernmental level. The field of space exploration and innovation is therefore selected considering the recently established UNISPACE+50 thematic priority number 1 on that theme (see A/71/20, para 296 (1) "Global partnership in space exploration and innovation").

Mr. Kenneth Hodgkins

Director for the Office of Space and Advanced Technology, Department of State, United States of America

Ken Hodgkins has been with the Department of State since 1987 and presently is the Director for the Office of Space and Advanced Technology in the Bureau of Oceans, Environment and Science. The office is responsible for bilateral and multilateral cooperation in civil and commercial space and high technology activities, including the International Space Station, collaboration in global navigation satellite systems, the International Thermonuclear Experimental Reactor (ITER), and nanotechnology, and represents the Department in national space policy review and development. Mr. Hodgkins serves as the U.S. Representative to the UN Committee on the Peaceful Uses of Outer Space (COPUOS), where he has played a leadership role in a wide range of space policy initiatives, to include the development of new international guidelines on emerging issues such as minimizing the generation of orbital debris and ensuring safe space operations and sustainable access to space. Mr. Hodgkins has been the State representative for major Presidential policy reviews on remote sensing, the Global Positioning Satellite (GPS) system, orbital debris, space weather and the use of space nuclear power sources in space. Before coming to the State Department, he was the Director for International Affairs at the National Environmental Satellite Data and Information Service (NESDIS) of the Department of Commerce. In 2010 he was the first Department of State recipient of the American Institute of Aeronautics and Astronautics'

International Cooperation Award and was named by GPS World as a "GNSS Leader to Watch in 2009-2010". Mr. Hodgkins holds a BA in Political Science (1978) and an MPA (1980) from the University of Maine at Orono. He joined the Federal government in 1980 as a Presidential Management Fellow.

Mr. Holger Krag

Head of ESA's Space Debris Office, and current (2016-2017) chairperson of the IADC (Inter Agency Debris Coordination Committee), Ground Segment Engineering Department, ESA/ESOC, Darmstadt Germany

Dr. Holger Krag has been a Space Debris Analyst in the Space Debris Office of ESA/ESOC located in Darmstadt, Germany, since 2006. He has worked on the operational conjunction event analysis for various ESA missions, debris risk assessment, mitigation analysis and the Surveillance and Tracking Segment of the European SSA system. Since 2014, he is head of the Space Debris Office. He represents ESA in the IADC (Inter Agency Debris Coordination Committee) and is the current chairperson of this forum. He is involved in the COPUOS STSC working group on long term sustainability of space activities. His office is responsible for operational conjunction and re-entry event prediction and analysis. It develops space debris environment models and studies the effectiveness of mitigation measure and is involved in the development of an ESA mission for the active removal of a non-cooperative space objects from orbit. Dr. Holger Krag is co-leading the SST segment of ESA's SSA program since 2014. He has also become ESA's lead engineer for the implementation of the telescope network for the Spanish Surveillance System that will form part of the EU SST system. From 2002 – 2006, Dr. Holger Krag has served as a System Engineer in the Navigation Business Unit of Thales ATM, responsible for development of a test bed for the ground mission segment of Galileo with permanent collocation in Toulouse, France. From 1998 – 2002, Dr. Holger Krag was a project scientist at the Technical University of Braunschweig, Germany and conducted more than 4 years of detailed research in the area of space debris environment and observation modelling.

The inter-agency space debris coordination committee – an overview

The Inter-Agency Space Debris Coordination Committee (IADC) is an international forum of space agencies, formally established in 1993. The primary purpose of the IADC is to exchange information on space debris research activities between member space agencies, to facilitate opportunities for cooperation in space debris research, to review the progress of ongoing cooperative activities and to identify debris mitigation options. As of 2016, 13 space agencies were members of the IADC. The IADC members share a number of common interests in space debris research which may be developed into a variety of cooperative research activities. Such ventures are likely to increase in frequency and scope in the future. It is highly desirable to exchange information on current research activities so as to identify future cooperative activities.

Therefore, the IADC is established to identify, plan, and assist in the implementation of joint cooperative activities that are of mutual interest and benefit. Any specific cooperative activities endorsed by the IADC are implemented through arrangements negotiated between member organisations. Members should exchange data resulting from national orbital debris programs as appropriate. In 2002, the Inter-Agency Space Debris Coordination Committee (IADC) has produced a set of mitigation guidelines, which also served as input to a set of seven Space Debris Mitigation Guidelines adopted by the United Nations Committee on the Peaceful Uses of Outer Space, now further used to develop standards at the level of the International Standardisation Organisation.

Ms. Romina Acevedo

Consultant for international space project management, Venezuela

Romina Acevedo Galindo worked as Chief Coordinator of the Office of International Affairs, at the Bolivarian Agency for Space Activities of Venezuela ABAE (2008 - May 2016). She holds degrees in Biology (Central University of Venezuela), Environmental Sciences (Beijing University, China) and Space Management (International Space University, France). She was member of the Venezuelan delegation at COPUOS (2009-2014) and the managerial team of VENESAT-1, VRSS-1 and VRSS-2 space programs. Also, she had participated at national and international conferences, and published articles related to the development of space activities in the Bolivarian Republic of Venezuela. She has specialized knowledge in Space Mission Architecture, Space Product Assurance, Integrated Risk Management, Space Insurance, Space Policy and International Space Law, Space Outreach, and management of Satellite Ground Stations. Also, she has proficiency in Chinese (Mandarin) and English languages, and has been involved during negotiations of bilateral space cooperation agreements with Argentina, Bolivia, Brazil, Cuba, China, Ecuador, France and Russia, among others. Currently she is an independent consultant in project management and international cooperation.

Mechanisms for regional and interregional cooperation and coordination

Almost any activity on Earth is direct or indirectly influenced by outer space. Some examples include the satellite telecommunications, Earth Observation imagery, Global Positioning services, as well as the use of space data to enhance scientific research and knowledge. On this scenario, the international cooperation has played a key role on promoting collaborative space programs, bringing welfare and improving the living standards of people worldwide. This presentation preliminary assesses the mechanisms for regional and interregional cooperation and coordination in the space sector. At regional level, there are 5 main multilateral cooperation mechanisms that had effectively improve the space capabilities, knowledge and expertise within each region, which are: The Asia-Pacific Regional Space Agency Forum (APRSAF); the Asia-Pacific Space Cooperation Organization (APSCO); the European Space Agency (ESA); the Space Conference of the Americas (SCA); the African Leadership Conference (ALC); and the

UN Regional Centers for space science and technology education. These organizations and mechanisms have successfully implemented space cooperation programs among Member States in the areas of remote sensing, telecommunications, navigation, human space flight, space science and exploration, access to space, space engineering & technology, and space operations. All their space programs include data sharing, space segment and ground infrastructure networking, capacity building, and industrial development. However, at inter-regional level space cooperation and coordination seems to be less developed, and it is mainly reported among advanced space actors. The potential reasons for this include the availability of information, weak interest on inter-regional alliances, weak promotion of space infrastructure and capabilities installed at the different regions, as well as political and cultural issues. In this context, UNCOPUOS and Diplomatic Missions play a key role in building interregional alliances, which are potential scenarios to promote peaceful uses of outer space, to build transparency measures, to increase space security and governance (more coordination), to strength space law and space policy development, and to ensure long term sustainability of outer space activities.

Ms. Setsuko Aoki

Professor of Law, Keio University Law School

Setsuko Aoki is Professor of Law, Keio University Law School, Japan (since April 2016). She had been Professor of Law (2004-2016) and Associate Professor of Law (1999-2004), Faculty of Policy Management, Keio University; Associate Professor (1995-1999) and Assistant Professor (1994-1995), School of Social Science, National Defense Academy of Japan; Assistant, Faculty of Law, Rikkyo University, Japan (1991-1993). She completed her doctoral course in the Institute of Air and Space Law, Faculty of Law, McGill University, Canada, and obtained Doctor of Civil Law (D.C.L.) in June 1993. She studied Graduate School of Law, Keio University, Japan (LL.M., March, 1985) and Faculty of Law, Keio University, Japan (LL.B., March, 1983). She has been a member of the Committee on National Space Policy (Cabinet Office) since July 2012 and legal advisor of the Ministry of Foreign Affairs (MOFA) of Japan to the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) since March 2002. She belongs to the International Institute of Space Law (IISL) (board member), International Law Association (ILA) (Space Law Committee), International Academy of Astronautics (IAA), American Society of International Law, etc.

Models for coordination and cooperation: bilateral and multilateral agreements

Review of international mechanisms for cooperation in the peaceful exploration and use of outer space" was adopted as a new agenda item under a five-year workplan in the 2012 Legal Subcommittee (LSC) of the COPUOS. The LSC has been tasked with categorizing various mechanisms employed by member States and international entities to conduct international collaboration with a view to identifying common legal issues addressed and a more favorable mechanism utilized in a certain circumstance over other mechanisms. The Secretariat's Note (2015) and a draft report (2016) which categorize

cooperative mechanisms are made pursuant to the workplan based on submissions by States and international entities as well as the additional research conducted by the Secretariat. While there are several ways to categorize international cooperative projects, from the legal point of view, international mechanisms are categorized into bilateral and multilateral as well as legally-binding and non-legally binding mechanisms. One category of successful bilateral cooperation is characterized by a legally-binding Framework Agreement (FA) and non-legally binding implementing agreements/arrangements (IA). This presentation will present a model FA and IA with some alternative provisions, for different provisions would be more appropriate for different kinds of cooperative projects (e.g., science mission, space application, or commercial joint endeavor). As for multilateral legally-binding projects, the 2016 Secretariat's draft report focuses on their most famous example, or the International Space Station (ISS) project. This is constructed by the three-tier cooperative mechanism, and the top layer, an intergovernmental legally-binding agreement (ISS/IGA) (1988, 1998) seems to play a similar role of the IA without a specific FA while the UN treaties on outer space could be regarded as a hidden FA in this case. As the ISS operation is one type of a mission among many possible multilateral exploration projects, this ISS/IGA contains specially tailored provisions for this specific mission, showing a deviation from the UN space treaties with an example of the exclusion of the Liability Convention in a certain case. This shows a difficulty in making a model treaty for a multilateral space cooperation project. While the ISS/IGA could be a model in a future multilateral space exploration project, a different type of the exploration project and different membership would require different provisions for its IGA. Which provisions in the present ISS/IGA are likely to be intact and which could be flexibly modified would be considered in this presentation, taking note of the next exploration project to be discussed in the second International Space Exploration Forum (ISEF) planned in 2017.

PANEL 5: COOPERATION AND CAPACITY-BUILDING IN SPACE LAW AND POLICY FOR THE BENEFIT OF DEVELOPING COUNTRIES

This panel is the main fora of the Workshop on the discussion of objective (e) (to assess further needs for capacity-building, assistance and outreach in space law and policy). Additionally, particular importance should be place on outcome (c) (to consider space law and policy in the context of space economy, space society, space accessibility and space diplomacy), focusing on the space economy, space society and space accessibility aspects. Following from the theme of panel 4, the appropriate legal and diplomatic mechanisms to promote cooperation in outer space will remain inaccessible to developing countries without specialists with thorough understanding of such mechanisms, and the building of institutional capacity at the national level. It is thus the appropriate panel to study capacity-building models to promote those objectives. Sharing of experience in this field would be of high interest to the Workshop. Activities of different stakeholders, such as institutions and centres for space law and policy education 5 and training are welcome. At the same time there is a particular interest in this panel to look into cross-sectorial capacity-building efforts in the technical and legal fields. Equally

importantly, the panel could discuss the possible ways to enhance the current frameworks of educational opportunities in space law for the ultimate purpose of developing national space policies and domestic regulatory frameworks. Particular attention could also be paid to what the development of space law and policy requires in order to assess "relevant needs for capacity-building, assistance and outreach in space law and policy" (objective (e)). As stated above a strong element of this panel is the emphasis on integrated education and training where scientific, technical, legal and policy needs and challenges are addressed for cross-sectorial capacity-building. The UNISPACE+50 thematic priority number 7 (A/71/20, para. 296 (7)) "Capacity-building for the twenty-first century") provides an opportunity to discuss means for promoting capacity-building efforts to that end.

Mr. Christian Bruenner

Professor Emeritus of Public Law, University of Graz

Christian Brünner is professor emeritus of Public Law at the Institute of Public Law and Political Science at the University of Graz and visiting lecturer at several colleges and universities. From 1983 to 1985 he was dean of the Faculty of Law, from 1985 to 1989 rector of the Karl-Franzens-University of Graz and from 1987 to 1989 chairman of the Austrian Rectors' Conference. He also held various political functions. Inter alia he was member of the Austrian National Parliament from 1990 to 1994 and member of the Styrian Regional Parliament from 1996 to 2000 as well as chief whip and chairman of the party "Liberales Forum (LIF)". As chairman of the Austrian Rectors' Conference and as a member of the National Parliament, he pursued the establishment of universities of applied sciences in Austria. For more comprehensive information concerning career, list of publications, main fields of research and list of functions see two libri amicorum (Festschriften), the most recent one with the title "Bildung, Wissenschaft, Politik – Instrumente zur Gestaltung der Gesellschaft". Wien-Köln 2014, edited by Werner Hauser and Andreas Thomasser. In 2001 he founded the Austrian National Point of Contact (NPOC), European Centre for Space Law (ECSL) within the European Space Agency (ESA), which he chaired until 2009. He has been a member of the ECSL-Board since 2003. Since 2006, he has also been member of the International Institute of Space Law (IISL) and since 2012 member of Section 4 "Social Sciences" of the International Academy of Astronautics (IAA). He has been a member of the IISL election committee since 2012. Since 2001, he has regularly been serving as a member of the Austrian delegation to the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). On the basis of an agreement with the Austrian foreign ministry, it is possible for students to take part in the sessions of the Legal Subcommittee. Space law related publications include co-editor of the book "Raumfahrt und Recht. Faszination Weltraum – Regeln zwischen Himmel und Erde". Wien-Köln-Graz 2007. (with Edith Walter and Alexander Soucek); Co-editor of the book "Nationales Weltraumrecht/National Space Law. Development in Europe – Challenges for Small Countries." Wien-Köln-Graz 2008. (with Edith Walter); Co-editor of the book "Outer Space in Society, Politics and Law". WienNewYork 2011. (with Alexander Soucek); Co-

author of the book “Space Law Essentials – Casebook”. Wien 2015. (with Anita Rinner, Hannes Mayer and Yvonne Karimi-Schmidt). In addition, he has written several articles on space law. Space law teaching include: He teaches space law at the University of Graz and is a guest lecturer at the ECSL summer courses as well as the International Space University. It is important for him to raise public awareness of space, space law and space policy through presentations, especially interviews, in the media, in educational institutions, societal associations and politics. Space law related honours and awards include Social Sciences Book Award 2012, International Academy of Astronautics, for the book “Outer Space in Society, Politics and Law”. WienNewYork 2011. (co-edited with Alexander Soucek); Polarstern-Award 2015, awarded by the Austrian Space Forum.

Mr. Roberto Becerra

Venezuela

Roberto Carlos Becerra, born in Caracas, holds a Bachelor’s Degree on International Studies and a Master’s Degree in International Relations of the Central University of Venezuela. He wrote his the-sis on the topic “Venezuela and its participation in the international scenarios regarding the exploration and peaceful uses of outer space”. His career spans over 13 years in the field of space activities and he has participated as lecturer and consultant in international affairs for space agencies in Latin America and for international companies. He authored the book “Space Science and Technology for the development of Venezuela” published by the Bolivarian Agency for Space Activities (ABAE) in 2013, as well as articles released in international publications. Mr. Becerra participated as the technical representative of the delegation of the Bolivarian Republic of Venezuela to the Committee on the Peaceful Uses of Outer Space (COPUOS) 2005–2015. He is a founding member of the Venezuelan Space Center (CEV, 2005–2007) and a founding member of the Bolivarian Agency for Space Activities (ABAE 2008–2015). He cofounded the course Management of Space Projects of the ABAE (aimed at Venezuelan professionals and space institutions from Argentina, Bolivia, México and Uruguay). He was facilitator of the extension course and the elective subject: Venezuela and the international cooperation scenarios for the peaceful use of outer space from the postgraduate program of International and Global Relations of the Universidad Central de Venezuela in Caracas, 2010. Additional information: Diploma in Technological Innovations from the Los Andes University (Venezuela) in cooperation with the World Intellectual Property Organization wipo-Geneva (2003) as well as a Diploma in Public International Law from the Complutense University of Madrid, Spain (2005); Representative of the Ministry of Science and Technology in the Inter-ministerial Committee regarding the peaceful uses of outer space of Venezuela in 2004 and representative of the Ministry of Science and Technology in the Executive Secretariat of the Venezuelan Presidential Commission on the peaceful uses of outer space in 2005; Member of the Venezuelan delegation responsible for the international negotiation of the space programs VENESAT-1 “Simón Bolívar Satellite”, VRSS-1 “Miranda Satellite”, VRSS-2 “Satellite Sucre” and the Space Research and Development Center of the ABAE, as well as training programs, technology transfer and satellite insurance; and

Director of the Department of International Affairs of the Venezuelan Space Center and ABAE the 2005-2015.

Cooperation models and capacity-building for emerging space nations

Governments invest millions on space programs, acquisition of technology, building capacities, promoting the training of human talent, among other aspects. Space technology, its applications and the peaceful use of outer space are a key tool to boost socioproductive processes in countries, to encourage strategic sectors (academic, industrial and scientific) and to improve the quality of life of people. Space activities imply risks and they require a high investment and specialized knowledge. Therefore, space nations have designed cooperation models which facilitate their presence in space. Within this context, this presentation seeks to comment (according to international investment statistics of governments on space affairs) on the increase of the new emerging space nations. Furthermore, this work analyses the cooperation models (bilateral and multilateral) based on the needs of those space actors and with the aim to create scientific and technological capabilities in this strategic sector. In order to identify these needs, consultations were conducted (using surveys as measurement tool) with several space agencies in Latin America. Finally, it will be discussed the topic of space law, its relation with the technological development of space actors, international cooperation and the role of the UNOOSA and its links with the objectives of the 10th Workshop on Space Law.

Mr. Md. Tanveer Ahmad

Institute of Air and Space Law, McGill University

Dr. Md. Tanveer Ahmad is currently an Erin J.C. Arsenault Postdoctoral Fellow in the Institute of Air and Space Law, McGill University, an Assistant Professor at the Department of Law, North South University, Bangladesh, and the Editor of the Annals of Air and Space Law, a peer-reviewed journal published by McGill University's Centre for Research in Air and Space Law. He has earned his Doctor of Civil Law (DCL) and Master of Laws (LLM) degrees from the Institute of Air and Space Law, McGill University in 2016 and 2010, respectively. While pursuing his doctoral studies, he held the Assad Kotaite Fellowship of the International Civil Aviation Organization and the Boeing Fellowship in Air and Space Law. He obtained his Bachelor of Laws (LLB) (Honors) degree from the University of London, UK, in 2006. He has been published in various peer-reviewed law journals, has written a book, several book chapters, and policy papers, has presented papers in various conferences, and has assisted with the editing of Space Monograph Series I, II & III, and Routledge Handbook of Space Law. Previously, he worked on the National Space Legislation Book project as a Research Assistant for Professor Dr. Ram S. Jakhu, Director, Institute of Air and Space Law, McGill University. Dr. Ahmad coached McGill University Air Law Moot team twice, served as a Lecturer at

BRAC University School of Law, and was a Research Assistant at the Faculty of Law, McGill University.

Promotion for Development of National Space Legislation in Developing States to Ensure Global Space Governance

At the national level, States readily resort to national legislation as the main means of governance mechanisms. However, a different picture can be seen in global space governance. At the start of the space age in mid-20th Century, space activities were chiefly conducted by developed States – traditionally involving mainly the United States and the Russian Federation – through government authorities and/or public bodies. Thus, recourse to national legislation to discharge States' treaty obligations was not necessary and national space legislation did not preliminarily become an integral part of global space governance. The scenario has substantially changed today. The number of space-faring nations as well as commercial entities that engage in space activities is increasing. This growing commercialization and privatization of space activities by both developed and developing States have provided the necessary impetus for States to adopt national space legislation and enable themselves to authorize and supervise space activities of various actors (both private and public) according to their treaty obligations. Therefore, the importance of national space legislation in global space governance is rising. In response to this change of circumstances, many space-faring nations are enacting national space legislation. To ensure effective global space governance, the development of national space legislation in developing States needs to be promoted.

Mr. Tare Brisibe

Independent Legal Consultant, Barrister & Solicitor of the Supreme Court, Nigeria

Doctor Brisibe is currently in private practice and was former Chairperson of the Legal Subcommittee - United Nations Committee on the Peaceful Uses of Outer Space, for the biennium 2012 to 2014. He began a career in 1991 practicing in civil litigation, general commercial law, mergers and acquisitions with two leading Nigerian law firms. A former Legal Adviser to the National Space Research and Development Agency of Nigeria, he has also served with mobile communications satellite operator Inmarsat Global, as well as aeronautical communications consortium SITA. He previously held an appointment with a Luxembourg based law firm focused on space and communications. He has been involved with multiple expert working groups, notably as: member of the Hague Space Resources Governance Working Group; peer reviewer for the NATO CCD COE Tallinn Manual (version 2.0) on International Law Applicable to Cyber Warfare; member of the Permanent Court of Arbitration, Advisory Group on Optional Rules for Arbitration of Disputes Relating to Outer Space Activities; member of the UNIDROIT Committee of Governmental Experts for preparation of a Space Protocol to the 2000 Cape Town Convention; and Vice Rapporteur of the International Telecommunication Union Development Sector (ITU-D) Study Group Question on Satellite Regulation for Developing Countries. Doctor Brisibe has lectured at universities in Beijing, Leiden, Mississippi, Lapland, Strasbourg and Montreal. He is widely published and has been a:

Visiting Fellow, Graduate Institute of International and Development Studies, Geneva (2011); Zhang Yong Fellow, Chinese Journal of International Law Research Group (2008); Recipient of the First Prize, Pacific Telecommunications Council Research Essay Contest (1999). He obtained a Master's degree in Space Studies (1999) from International Space University, Strasbourg and a Doctorate in International Law (2006) from Leiden University.

Cross-sectorial perspectives for capacity-building in space law and policy

Knowledge of the legal framework within which space activities are conducted complements national, regional and international efforts aimed at developing practical aspects of space science and technology. Knowledgeable professionals encompass lawyers, political scientists, economists, amongst others, who are involved in various aspects of space law and policy. This ranges from participating in international codification efforts, to ensuring the domestic legislative implementation of relevant principles or practicing the law. Likewise, whilst some are required to explain why things happen. Specifically why nations behave or comply with international law, others are concerned with the methods, rules and institutions through which nations perform their compliance. This presentation highlights cross-sectorial perspectives of various participants and players involved in law and policy impacting on and applicable to the conduct of space activities. As a means of identifying needs for capacity building, assistance and outreach in space law and policy.

Mr. Lorant Czaran

Programme Officer, Space Applications Section, United Nations Office for Outer Space Affairs

Lorant Czaran is since 2012 a Programme Officer in the Space Applications Section of the United Nations Office for Outer Space Affairs, supporting both the Programme on Space Applications (where he leads the Environmental Monitoring, Natural Resources Management and Biodiversity related thematic areas) and UN-SPIDER (focal point for Africa and the Regional Support Offices network); he is well known across the UN community for his commitment towards innovative geospatial solutions in support of the UN system work. During a long UN-related career since 1996, Mr. Czaran has worked at UNEP/GRID-Arendal in Norway, at the UN Headquarters (Cartographic Section) on UNGIWG coordination and Security Council affairs, and later at the Department for Peacekeeping Operations where he helped produce the first in-house digital satellite imagery-based topographic maps at large scale for the UN Disengagement Observer Force (UNDOF) in the Golan Heights, Syria and worked on international boundary demarcation mapping projects (such as Cameroon-Nigeria or Eritrea-Ethiopia). Mr. Czaran also served as the Map Centre Manager for ReliefWeb/UNOCHA before joining UNOOSA in 2008, first as the Head of the OOSA/UN-SPIDER Bonn Office where he was also a key person in facilitating support with space technologies during the response to the major Haiti earthquake in 2010. Mr Czaran is an acting representative of the United Nations in specialized international

bodies such as the Committee on Earth Observation Satellites (CEOS), ISO/TC211 and the Open Geospatial Consortium (OGC). Mr. Czaran holds the equivalent of a Master degree in Geography and Russian Language from the Babes-Bolyai University of Cluj, Romania, and was a research fellow at Collegium Budapest Institute for Advanced Studies during the beginning of his PhD studies.

Mr. Guozhu Gao

Professor of International Law, Beihang University

Gao Guozhu is currently a professor of international law and Director of the Institute of Space Law at Beihang University. He is also the Legal Expert of Regional Centre for Space Science and Technology Education in Asia and the Pacific(China).He obtained his Doctor of Civil Law (D.C.L.) from Tsinghua University(July, 2007), Master of Laws (LLM) degree from Jilin University(July, 1999), Bachelor of Laws(B.C.L) degree from Southwest University of Political science and Law(July, 1996). He taught International Law, especially Space Law and International private Law at Beihang University since 1999. He published more than 20 papers related to space law in the Chinese journals. His representative papers include " A Study on Legal Issues Related to Space Debris", " A Review and outlook on China's Space Legislation", " Legal Issues Relating to the Implementation of the Registration Convention", " The Harmonization Between Aviation Law and Outer Space Law", " State Responsibilities in Space Activities", "Comments on the EU's Draft Code of Conduct for Outer Space Activities", " A Study on the Legal Issues of Space Assets Security: an International Law Perspective", " On the Legal Regulation of Manned space Activities: a Comparative Perspective", "The principle of Common-but-differentiated Responsibilities and Space Debris Mitigation," " The UN Space Treaties and National Space Legislation", " Past, Present and Future of Space Law", etc. It is worth noting that Ms Caixia Yang and Mr. Gao Guozhu Jointly published a paper titled " Current Situation and Improvement of Chinese Space Legislation" at the Annals of Air and Space Law, Vol. XXXVIII, 2013. In 2012, Mr. Gao Guozhu published an academic monograph-Frontier issues on Space Law in 2012(Law Press, China). As one of members of Chinese Delegation, he also attended the 58th session of UNCOPUOS and the 55th Session of LSC of UNCOPUOS in 2015 and 2016. As the Legal Expert of RCSSTEAP, he is the coordinator of the short term program on Space law and policy co-organized by RCSSTEAP and APSCO in September 2015 and the upcoming Master Program on Space Law which will be hosted by RCSSTEAP this year.

Role of Regional Centres: a Perspective of Space Law and Policy

Capacity-building, training and education in space law helps to promote international development and cooperation in space activities and provides the means for a deeper understanding of the interdependent roles of science, technology and law in this area. Regional Centre for Space Science and Technology Education in Asia and the Pacific(China) (affiliated to the United Nations) attaches great importance to the capacity-building of space law and policy. Under the support of UNOOSA, the

RCSSTEAP,APSCO and Beihang University co-organized a short-term training program on space law and policy in Beijing from 17-25 September 2015. Thus the RCSSTEAP is the first regional centre to host the short term training class on space law among six regional centres. Based on this, the RCSSTEAP decided to add a new major titled" Space Law and Policy" under MASTA since 2016 so as to promote the educational and training activities of space law at the regional and global level. The opening ceremony of Master program on Space Law and Policy will be held in Beihang University in September 2016.

PANEL 6: LEGAL REGIME OF OUTER SPACE AND GLOBAL SPACE GOVERNANCE: CURRENT AND FUTURE PERSPECTIVES

Considering that the theme of this panel corresponds directly to the UNISPACE+50 thematic priority number 2 (A/71/20, para. 296 (2)), it would be appropriate to discuss cross-discipline perspectives, as appropriate, study innovative solutions and address possible ways and means for the progressive development of space law. The panel connects specifically to objective (a) of the Workshop (to promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space) and objective (d) (study trends and challenges to the progressive development of space law). There is a close connection between panel 6 and panel 1 in that regard. There are indeed close inter-linkages with the other panels of the workshop. Future regulatory perspectives; assessment the status of the legal regime and potential gaps, as appropriate; studying mechanisms for cooperation and coordination; addressing challenges to safety, security and sustainability of outer space activities; capacity-building needs for the benefit of developing countries; and perspectives of the common output of the Committee and its Subcommittees, are the main themes that connects directly to the mandated work under the UNISPACE+50 thematic priority under consideration. It should be noted that under the mechanism for thematic priority number 2, there will be coordination with the STSC Working Group on the Long-Term Sustainability of Outer Space Activities in the coming period until 2018. In this regard it should also be noted that a first set of guidelines has been agreed and is contained in the annex to A/71/20, and that there will be continued work on a preambular text and remaining draft guidelines. The broad themes of each of the presentation slots in this panel correspond to the elements enshrined in the thematic priority number 2.

Mr. Bernhard Schmidt-Tedd

German Aerospace Center (DLR), Head Legal Support, Space Administration

Dr. Bernhard Schmidt-Tedd studied law in Cologne and Geneva and holds a doctorate of the University of Cologne. He joined the German Aerospace Center (DLR) in 1987 and is currently Head of the Legal Support for DLR Space Agency Affairs. In this capacity he was involved in contract negotiations of different international space programmes. As an author of a number of articles, he lectures space law at the Institute of

Space Systems at the University Stuttgart . With the Institute of Air and Space Law of the University of Cologne he realized several legal space projects and mentors practice-oriented doctoral theses. He is co-editor of the Cologne Commentary on Space Law (CoCoSL). Membership: IAA, Corresponding Member of the Russian Academy for Cosmonautics, IISL, ECSL and DGLR.

Ms. Tanja Masson-Zwaan

Deputy Director of the International Institute of Air and Space Law, Leiden University

Tanja Masson-Zwaan is Asst. Professor and Deputy Director of the International Institute of Air and Space Law at Leiden University, The Netherlands. Since 2007, she is the elected President of the International Institute of Space Law (IISL). Tanja advises various bodies on space law issues, teaches and supervises students at Bachelors, Masters and PhD level, carries out research and publishes on a broad range of space law topics. She lectured at many universities worldwide, set up courses in air and space law at the National University of Singapore and worked as a consultant for a space insurance broker in France and in her own company in the Netherlands. Each year, she attends the sessions of the UN Committee on the Peaceful Uses of Outer Space as an official observer for IISL. Tanja is an elected member of various professional associations such as the International Academy of Astronautics (IAA, Full Member), the Académie de l'Air et de l'Espace (AAE, Membre Titulaire) the International Law Association (ILA, including its Space Law Committee), and the European Centre for Space Law (ECSL, including as Member of the first Board, 1989-1996). She serves as advisor to various organizations including Space Generation Advisory Council (SGAC), Secure World Foundation (SWF), Mars One, and the China Institute of Space Law (CISL). She is a member of the Board of Editors of the journal Air and Space Law (Kluwer). She served as Vice Chairman of the Netherlands Space Society (NVR, 2010-2016), and was a Member of the Founding Board of Women in Aerospace-Europe (2009-2012). The EU appointed Tanja as a member of the Commission Expert Group H2020/Advisory Group Space and of the Commission Expert Group H2020/Advisory Group on Gender in 2015. The Dutch Government appointed her as an arbitrator for space related disputes at the Permanent Court of Arbitration in 2012, and as a member of the Space Learning Group of ICAO in 2014. She is a co-founder and member of the Hague Space Resources Governance Working Group, established in 2015. Since 2008 she is part of a team of experts advising the Dutch government on the implementation of the Netherlands Space Activities Act, resulting in the issuance of several licenses to private entities, and the adoption of an administrative decree expanding the scope of the law to include unguided satellites. Tanja is a recipient of the Distinguished Service Award of the IISL (2001), the Social Sciences Award of the IAA (2008) and the IAF Distinguished Service Award (2015).

Treaties, resolutions, principles, guidelines: the relevance of hard law and soft law in the further development of space law

This presentation will address the relevance of and relations between various forms of space law making that have emerged in the past decades. Even though the current geopolitical climate as well as the growing membership of COPUOS and its tradition of decision-making by consensus do not seem favourable to the adoption of new legally binding instruments, i.e. agreements between states to voluntarily limit their sovereignty in the interest of agreed common purposes and objectives, states realise that certain issues do require some form of international regulation. Examples are the avoidance of space debris, the sustainable use of outer space, or the use of space resources. The presentation will argue that the adoption of non-legally binding instruments, such as resolutions, principles and guidelines, but also the growing body of national space legislation and even self-imposed best practices within the industry, present a valuable alternative to the ideal, but perhaps utopian format of an international legally binding international treaty. Such instruments not only present a way out of the dilemma of 'treaty-fatigue', they can also be seen as a step-wise approach towards binding law, either by inclusion into the national legal order via national law, or by attaining the status of customary international law. The presentation will however also highlight that this practice may result in diverging national legislation, which is not desirable in terms of legal certainty, and that the lack of international jurisprudence in the field of space activities may stand in the way of a positive finding of an international rule of customary law by the International Court of Justice. This then leads to the conclusion that continued efforts are needed to 'aim high', i.e. to strive for the adoption of new treaties, albeit with the acknowledgement that 'soft law' can serve as a stepping stone in the process towards that ultimate goal.

Mr. Armel Kerrest

Professor of public law, Institute of Law of International Spaces; UMR AMURE; Faculty of Law, University of Brittany (France), Vice chairman of the European Centre for Space Law (European Space Agency) (ECSL/ESA)

Armel Kerrest studied in Saarbrucken and Paris; he is a “Docteur d'État” from the University of Paris I - Pantheon-Sorbonne, (1985 thesis award of the Universities of Paris,). Professor of Public Law in the French Universities, he teaches Public Law, especially International Space Law and Law of the Sea at the Universities of Western Brittany and Paris XI. He taught in other French and foreign universities on many occasions, published books and articles on European, and International Law especially Space Law and Law of the Sea. He conducts his research activities within the “Unité mixte de recherche” (UMR) Ifremer/University of Western Brittany, AMURE, Brest, France. He advised and advises for Space Law the French Space Agency (CNES), the French Ministry of Foreign Affairs (Legal Department), the French Senate Commission for Economy, the European Union, the United Nations Office for Outer Space, Eutelsat International Organisation and other Governments and International Organisations. Since 1997, he is a member and legal adviser of the French delegation to the UN COPUOS

legal subcommittee. He has been the alternate head of this delegation. He was a member of the Working Group of the French ”Conseil d’Etat” advising the Prime Minister of France on the elaboration of the space legislation adopted by the French Parliament in 2008. He takes part in many Institutions acting in the field of Space Law. He is the Vice chairman of the European Center for Space Law of the European Space Agency (ECSL/ESA), the President of the Association for the Development of Space Law in France, the Chairman of the Institute of Law of International Spaces and Telecommunications; a Member of the Space Law Committee of the International Law Association. (ILA); a Member of the board of the European Centre for Space Law (ECSL) and of the Société francaise de droit aérien et spatial (SFDAS); a member of the International Institute of Space Law (IISL) and of the scientific board of the Institut de Droit de l’Espace et des Télécommunications (University of Paris-South). He is a member of the editorial board of the Zeitschrift für Lulf und Weltraumrecht (ZLW, Cologne, Germany) and of the Chinese review of Space Law He is a member of the International Academy of Astronautics and a corresponding member of the Académie de l'Air et de l'Espace.

Effectiveness of legal regime for responsibility and liability of national space activities – assessment of gaps

Since the entry into force of the Outer Space Treaty article VI and article VII rule the responsibility and liability of States for national activities and for situations when States may be considered as a launching State for a space object. Since the beginning some difficulties arose because of the time at which each rule applies. Responsibility for national activities in Outer Space at any time according of article VI and liability of the launching States at the time of the launch and for ever afterwards. The evolution of space activities especially the importance of private activities challenges both responsibility under article VI and liability under article VII and the liability convention. Instead of modifying the whole system and taking the risk to endanger it, it is necessary to find solutions to ease the functioning of the current rules. Possible solutions will be proposed. Among them the possibility of agreements between responsible and liable States will be considered.

Ms. Olga Volynskaya

Chief International Law Counsel, State Space Corporation “Roscosmos”, Russian Federation

Olga Volynskaya has been legal adviser of ROSCOSMOS since 2009, specializes in international law, space law, international security, EU Law. Permanent member of the Russian delegation to the UN COPUOS, its Scientific and Technical Subcommittee and Legal Subcommittee. Holds a PhD in space law defended in the Russian Foreign Trade Academy (supervisor – Prof. Gennady Zhukov) and a Master degree in EU law of the Moscow State Institute of International Relations of the Ministry of Foreign Affairs of the Russian Federation (MGIMO). Grant scholar of the President of the Russian Federation for distinctive scientific research and achievement. Author of 33 scientific

publications on various issues of space law in the leading Russian and foreign journals in the area of international law, space law and foreign trade. Co-author of the Russian treatise "*Space Law*" (edited by Prof. G. Zhukov, published in 2014), "*Small Satellites – Regulatory Challenges and Chances*" (Vol. 11 of the series *Studies in Space Law*, edited by Prof. I. Marboe, published in 2016). Member of the International Institute of Space Law and the Russian Academy of Cosmonautics.

Legal perspectives of space operations and sustainability of outer space activities

The main task of international space law since its inception was to ensure free, unimpeded and non-discriminatory access of mankind to outer space in order to maintain peace, which substantiated the leading role of sovereign states in the exploration and exploitation of space. However, economic instability resulted in a sharp reduction in government funding of space programs and brought to the fore, on the one hand, the need to elaborate new mechanisms to encourage growth of the space industry, and on the other – the urgent necessity to ensure safety and unhindered performance of activities in outer space to preserve outer space accessible for mankind. International space law does not directly address the problem of the long-term sustainability of space operations, but its general principles form a solid basis for further elaborations. Since 2008 the UN COPUOS has been developing a highly challenging topic – long-term sustainability of outer space activities (LTS) – by addressing thematic areas including sustainable space utilization supporting sustainable development on Earth; space debris, space operations and tools to support collaborative space situational awareness; space weather; and regulatory regimes and guidance for actors in the space arena with the aim to identify areas of concern for the long-term sustainability of outer space activities, propose measures that could enhance sustainability, and produce voluntary guidelines to reduce risks to long-term sustainability. The work on the guidelines revealed major legal and political problems to be solved by the international space community towards the creation of a global and transparent legal regime to ensure safety of space operations and sustainability of outer space activities with a long-term perspective.

Ms. Teresita Alvarez

Permanent Mission of Chile, Vienna

Teresita Alvarez is a Chilean Diplomat in charge of COPUOS/UNOOSA matters and Crime/UNODC matters in Permanent Mission of Chile in Vienna. She has been part of the Chilean Foreign Service since 2008 where she has worked in the Directorate of Multilateral Affairs, as Head of OAS Department (2009-2011) and in the Permanent Mission of Chile to the UNOV and International Organisms in Vienna (January 2012-today). For the last four years she has been elected by the Group of Latin-American and Caribbean Countries (GRULAC) in Vienna as chair of the Task Force on COPUOS and UNOOSA matters. During this period she represented the regional Group to the COPUOS and its subcommittees. In 2015, she was appointed as the G77+China Task Force Leader on COPUOS matters. Before joining the Foreign Service, she worked as a Philosophy teacher and researcher on Applied Ethics (Universidad de Chile, Universidad

Austral de Chile). Alvarez is graduated of Philosophy from the Universidad de Chile (Santiago de Chile, 2001-2006), graduated of the Chilean Diplomat Academy "Academia Diplomática Andrés Bello" (2008-2009). She speaks Spanish, English and German.

CONCLUSIONS, OBSERVATIONS, RECOMMENDATIONS

Ms. Simonetta Di Pippo

UNISPACE+50 and High-Level Forum "Space for socio-economic sustainable development"

In 2016, the Committee on the Peaceful Uses of Outer Space endorsed 7 thematic priorities of UNISPACE+50, which in 2018 will culminate in marking the 50th anniversary of the first global UN conference on outer space – UNISPACE I, held in 1968 in Vienna. UNISPACE+50 in 2018 will consider the current status and chart the future role of the Committee, its subsidiary bodies and UNOOSA as well as consider ways and means for strengthening their role within the United Nations system and the global space community at a time when the space agenda is becoming increasingly complex and more actors, both governmental and non-governmental, are involved in ventures to explore space and carry out space activities. The 7 UNISPACE+50 thematic priorities, as outlined below, will provide the basis for the Committee's and UNOOSA work for the future - leading towards Space2030, with its underpinnings in the global development agenda: 1. Global partnership in space exploration and innovation; 2. Legal regime of outer space and global space governance: current and future perspectives ; 3. Enhanced information exchange on space objects and events; 4. International framework for space weather services; 5. Strengthened space cooperation for global health; 6. International cooperation towards low-emission and resilient societies; and 7. Capacity-building for the 21st Century. As part of UNOOSA's efforts to promote a dialogue on the role of space science and technology in fostering global development, a series of three High Level Fora: "Space as a driver for socioeconomic sustainable development" will be organized in the lead up to UNISPACE+50 in 2018, with the first HLF to be held in Dubai, UAE, from 20-24 November 2016. The Forum aims to become a platform for providing updates and recommendations on the potential of space innovations to address new and emerging sustainable development challenges. In addition, the Forum seeks to address the cross-sectoral impact of integrating economic, environmental, social, policy and regulatory dimensions of space in pursuance of global development. As such, the Forum represents a unique opportunity for the collective space community to address the future global space governance leading up to UNISPACE+50 in 2018. The High-level Forum will structure its set of recommendations under the four pillars of space economy, space society, space accessibility and space diplomacy, which will serve as inputs for UNISPACE+50 to further shape and position space activities as drivers for innovation, socio-economic development and diplomacy for a sustainable future.