

Report of the 60th Colloquium on the Law of Outer Space

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Session E7.1: 9th Nandasiri Jasentuliyana Keynote Lecture and Young Scholars Session

*Co-Chairs: Kai-Uwe Schrogl and Michael Davis
Rapporteur: Michael S. Dodge*

A total of eleven papers were presented in the 9th Nandasiri Jasentuliyana Keynote Lecture and Young Scholars Session, the first session of the 60th IISL Colloquium on the Law of Outer Space. The 2017 session opened with a keynote lecture by Peter Jankowitsch, on the topic of the 50th anniversary of the Outer Space Treaty. In his lecture, Dr. Jankowitsch discussed the origins, history, and meaning behind the Outer Space Treaty. He noted how early scientific efforts by luminaries such as Oberth and Tsiolkovsky helped to push the boundaries of Earth, and lead us to think about realistically getting to the stars. Efforts by other scholars to investigate what the law might look like in space started to be seen in universities, but it was the efforts of the Wright Brothers, with their mastery of aeronautics, that led to the creation of what would become a series of international aviation laws, such as the Paris Convention (1919), and later the Chicago Convention (1944). It was these kinds of treaties that gave a foundation to what would become the Outer Space Treaty of 1967. Dr. Jankowitsch noted that the OST created a new ethic, and an entirely new spirit for States. Unlike older international regimes, the OST showcased that space was a place for peaceful purposes, and exploration of that space should proceed according to this new ethic. No longer would States seek to conquer new land; in space, we find new principles, such as the notion of the common heritage of mankind – as evidenced by the later Moon Agreement.

Dr. Jankowitsch then proceeded to explain more about the beginnings of the Treaty, based in part on the foundations of other accords, such as the Nuclear Test Ban Treaty, and the Declaration of 1963 that served as a basis

for the OST. Given the age of the Treaty, Dr. Jankowitsch noted that many wonder whether it has outlived its usefulness, and is now obsolete. The answer, he said, is an emphatic no! The principles are as relevant today as they were when they were created. He mentioned in all the 50 years since its creation, no principles have been outright violated, although there have been some odd cases, as with the Bogota Declaration and the instance of China destroying its FY-1C satellite. Moreover, Dr. Jankowitsch noted that the Treaty was drafted such that its principles should extend far into the future; indeed, the treaty system even has some applicability to the controversy of the day – space mining. He noted that the Moon Agreement speaks to the issues, but has not been well adopted. However, Article II of the OST does seem to address “use” in space, without clearing up the issue of whether mining is permissible. He noted that it has become necessary to enact national laws to legally govern private activities in space. Sometimes this strengthens the international aspect to the law, and sometimes it challenges it (here, he is referencing certain efforts in the United States and parts of Europe to enable space mining). This fact, along with some other classical problems (such as what does “peaceful purposes” mean in the treaties?), means that of course the Outer Space Treaty, while effective, is far from perfect. He also noted that it is clear that issues like space traffic management, and space situational awareness in space, raise many questions that need to be addressed in the future. Finally, Dr. Jankowitsch noted that this is a good time to look to working on some of the unfinished business in space law, including space sustainability.

Dr. Jankowitsch then answered many questions posed from the audience. One question was to wonder at how the major space powers were able to come together for the purposes of the Outer Space Treaty, and during the Cold War no less. Dr. Jankowitsch noted that while this was not easy, they had an incentive to create the treaty – issues from the concept of mutually assured destruction, to the Antarctic Treaty, all helped pave the way. Another question was on the notion of peaceful purposes, and whether there was a role for military in outer space. Dr. Jankowitsch noted that here again there is much ambiguity, but did recognize that military activities have been numerous and ongoing in space, although it is uncertain how to interpret the potential presence of weapons in space.

The session was then devoted to young scholars, including recent graduates and new members of the IISL. First to present was Dmitra Stefoudi of Leiden University, who gave a talk on the notion of *Res sic stantibus* and international space law. Dmitra was looking at the future of space law over the next 50 years. She noted the way in which much outer space law was originally created – by consensus – and how Cold War realities made this the case. However, in the future, she believes regulatory issues will be more of a central concern. She was in part concerned with how States might react to space mining, arguing that withdrawing from the Treaty would produce no

real benefits, and trying to recreate it would likely produce a limited, general document. She noted that either way, the States would be looking for ways to govern space activities going forward.

The next paper was presented by Merve Erdem, from Turkey. This paper focused on the diversification of space activities and the “methodology test” with respect to the Outer Space Treaty. In particular, she looked at the problem of space mining, which has been established as a bit of a grey area in space law. She said the OST could be interpreted in different ways. For instance, it could be seen as unclear on the matter of mining, or it could be seen as forbidding mining. Further, treaties could be interpreted by different methodologies – static, where the treaty is interpreted for what it meant at its drafting; or dynamical, whereby the treaty could be interpreted in the light of the current day. The latter methodology could set us “free” from the predicament we currently have with space mining, as it can help adapt the interpretation of the treaty to the times.

The third paper was presented by Eloi Petros, who discussed definitional issues associated with the “launching State” in space law. In particular, there are concerns that may become pressing when States begin to think about, or engage in, launching from the surface of the Moon itself, rather than from the surface of the Earth. It was argued that it is unclear who is the launching State when State A launches from the Moon, especially if the launch was procured by State B. Are these both launching States? Are they joint launching States, even though the launch happens from the surface of the Moon? The lack of a clear definition here is a problem in need of a resolution, although it was argued that there is no need for a new space treaty. A question from the audience asked about the related issue of making objects in space, from space materials, and this too suffers from a clear definition to help States govern the matter.

Marshall Mckellar presented next, and his talk focused on the issue of International Traffic in Arms Regulations (ITARs) in the United States, and the negative impact this has had on international cooperation and the use of outer space. Part of the problem with ITAR is when a foreign national wishes to work on a project in the United States, because even if the national qualifies for an exemption under the law, they might still be blocked or hampered by other regulations. The situation makes it difficult too for U.S. entities that wish to hire or work with foreign nationals, due to the regulatory confusion. In particular, this can be problematic for research. Mr. Mckellar proposed that a clear-cut exemption for research could be a solution for people involved in this quandary. Questions from the audience focused on looking at specific extant exemptions, and asked about how Mr. Mckellar would propose to improve the current system.

Takuya Sugimura then addressed the issue of the use of ASAT weaponry in outer space, and asked whether soft laws norms could be used to ban such testing. There was discussion on why these kinds of weapons tests are not

simply forbidden by the law already, with the potential for disaster in outer space. The reason may be that ASAT weaponry may be the most inexpensive option available to States that could, at some point in the future, decide they need to use them against space assets. Creating a system for recording and reporting the use of such weaponry could help lead to less uses, and further, could help benefit sustainability and safety in outer space. Questions from the audience included whether the author had looked at the use of the MTCR regime, and he noted that there have been international agreements which focused on the use of reporting to make themselves effective.

Next, Milan Mijovic, from the Law School Union University in Serbia, presented on the nature of the Outer Space Treaty as written in 1967, as compared by its status in 2017. Mr. Mijovic noted that it seems we still have not embraced space with respect to many legal issues. He asked, when we say we've conquered space, does it mean all legal issues have been addressed? He also proceeded to discuss the Treaty from a historical background, including noting why it was important to the U.S.A. and U.S.S.R. However, questions remain, even in 2017. Do human rights extend to space? Why has the issue of property rights not been resolved? Further, the potential exploitation of resources in space is an unprecedented situation for humanity, but there has been no consensus on the matter. Finally, there have been some national laws that have been passed by States, but it cannot be permitted for these laws to conflict with international rules.

The following presentation was based on a paper by Valentina Nardone, from Italy, although it was presented by Simona Spassova. This talk centered on implementing TCBMs in outer space activities, looking at both the Outer Space Treaty, as well as international space governance actions. The benefits of TCBMs are their flexibility, that they are created by international diplomacy, and that they are non-legally binding on States. Some examples of transparency in the Outer Space Treaty include Articles V, IX, X, XI, and XII, and demonstrate that transparency and confidence building measures can be found in the current system. She also mentioned the role of the ITU in TCBMs, noting how one of that body's goals is to assist in transparency in outer space. Finally, it was noted that TCBMs are meant to help effectuate State security.

Next up was Huxiao Yang, from China, whose paper focused on rules for preventing collisions in outer space. This talk made use of the need to distinguish between civil, and State, space activities. This is especially important with respect to potential suborbital flights in the near future. There was mention of the great need for safety in space, and the author reminded the audience that similar rules have been put in place with other legal regimes in the past, also for safety reasons. Some examples given included the UNCLOS (high seas), the Chicago Convention (air), and the Montreal Convention. The talk ended with a video demonstration of the issues being discussed.

Claudiu Mihai Taiatu, from Leiden University, then gave a talk on space traffic management, noting its importance for safety operations in space. Before he could get far, Dr. Schrogl did announce that Claudiu had been selected as the winner of the prestigious Diederiks-Verschoor Award for the Best Paper by a Young Scholar, which was a pleasant surprise to Mr. Taiatu. Claudiu noted that space traffic management has not been regulated nationally or internationally, and that this simply must be done. He showcased a white paper that revealed the importance of space situational awareness, especially with regard to near earth objects and the low Earth orbits (LEO). Much of the reason we need an STM scheme relies on potential issues associated with fault based liability in space, and the problem of finding proof for the basis of potential claims. He also noted there is a need to clarify the notion of fault in the space regime.

The next presentation was prepared by Jie Long, from the University of Hong Kong. His paper was on developing draft guidelines for the long-term sustainability of outer space activities, and focused on the problems associated with orbital debris. He noted that debris could come in different classifications, in particular there is “recognizable” debris – where a State can tell the debris belongs to it; and “unrecognizable” debris, in which it is unclear which State owns the debris in question. He then made the argument that it is possible Article I of the Outer Space Treaty could be interpreted to permit the removal of debris in space, which would be due to the “benefit and interests” clause. Mr. Long then used UNCLOS as a model that States could use with the issue of space debris in the future.

Finally, Federico Bergamasco, from Italy, presented on the issue of environmental protection measures associated with potential space mining activities. He mentioned the value of Article IX, and its impact on potential space mining; however, he noted that by itself, Art. IX is insufficient to deal with potential problems. He advocated for a new legal instrument to address environmental impacts, and noted that we need to ask what it is we want to protect, and why. There is, then, an ethical component to our consideration on how to proceed with mining in space. He mentioned there have been some theories propounded to handle potential environmental situations in space, such as that of “astroenvironmentalism”, but that this theory in particular may ignore the human component to space exploration. Article IX, further, is too vague to apply to States in certain situations, and suffers from a lack of clear definitions. The Moon Agreement rectifies some of these concerns, but it is not widely adopted, nor is the protection of the commons a clearly binding rule of law. Finally, he discussed the notions of using “ecocentrism” and “anthropocentrism” as methodologies to be employed on environmental matters in space. He noted that the former may give rise to extremism, and so is undesirable. It is the latter, then, that should serve as the most rational guide for human activities in space, and serves the best interpretation of Article IX of the OST.

To summarize: the young scholars in this session had a wide variety of interests in the future of the law of space. Some focused on the nature and future of the Outer Space Treaty, which, in light of its recent 50th anniversary, demonstrated the interest of younger legal specialists on the future of a well-weathered space law regime. Others touched on perennial topics, such as space debris, or increasingly pressing issues, such as space traffic management. All of these scholars recognized the importance of the Outer Space Treaty, and they also reflected, in their individual talks, that notion expressed by Dr. Jankowitsch in the keynote presentation – that the Outer Space Treaty, despite its age, is still highly relevant for the future of human activities in outer space.

Session E7.2: ‘NewSpace’, New Laws/ How Governments Can Foster New Space Activities

Co-Chairs: Marco Ferrazzani and P.J. Blount
Rapporteur: Kamlesh Brocard

Session E7.2 consisted of various papers engaging with how governments can structure regulatory frameworks that foster NewSpace activities.

Ulrike Bohlmann presented a paper titled, “Newspace – putting an end to national prestige and accountability?”, which was on the general tenets of Newspace and the increasing involvement of private actors. Bohlmann questioned whether Newspace diminishes the importance of national prestige. She argued that national prestige in the era of Newspace remains relevant and becomes even more closely linked to accountability given the involvement of non-governmental actors. The impact of Newspace on the applicability of international law is still minimal since private activities are covered. However, through the application of national legislation, States must seek to strike a balance: a balance that sees the States remain appealing enough without condoning private activities which might unduly expose them to liability – or encourage a regulatory race to the bottom.

In his paper titled “Domestic authorization and supervision of private megaconstellations of satellites: pushing the boundaries of international space law?”, Fabio Tronchetti put forward a number of questions related to mega constellations to be owned and operated by private actors, and the risks and challenges these megaconstellations represent for national authorization and supervision regulations. The implementation of effective licensing and supervision mechanisms is crucial while ensuring that the interests of private entities are adequately protected. This is no easy feat, considering the number of challenges to be overcome.

Stefan Kaiser presented a paper titled “Legal Approaches to Network Driven Space Applications” that started with what the advent of and operation of

mega constellations could mean in terms of new functionalities for users as well as the social, political or economic leverage which the operators would in turn have. Given that the services would know no borders, a number of national laws stand to be infringed, such as privacy, intellectual property, and consumer rights. Some of the suggestions proposed include the notion that States should retain responsibility for their nationals' networks; that States should not establish national rules for business being carried out in other countries; and that misuse of dominant positions should be avoided.

Hamid Kazemi proposed that NewSpace is a good opportunity, since it acts as a stimulus for NewLaw, in a paper titled "The need to Regulate new space activities on exploration of Space Resources and off-earth mining." NewSpace enables both low-cost access to space as well as targeting near-Earth asteroids. It was proposed that off-Earth mining is ambiguously reflected in existing international space law. The presenter suggested that this should be corrected, probably through a space mining law elaborated by UNIDROIT, considering the needs of the international community for asteroid-based resources, the proprietary character of proprietary rights, and the lack of certainty in current space law.

Larry Martinez and Maria Pozza presented "Elon, Fly Me to the Moon! Legal Dimensions of Space Tourism beyond Earth Orbit." The presenters started by questioning if existing international space law is ready for lunar tourists announced for 2018. They looked at the existing framework applicable to commercial space transportation in the US and the one newly adopted in New Zealand. The three different scenarios used to illustrate applicability; protection of historical sites on the Moon, launch of a private rocket from the lunar surface and environmental protection of the Moon and Celestial bodies. It was concluded that although middle-aged, the OST is still very much fit when it comes to space tourism.

Jean-François Mayence, in "First Considerations for a Practical Handbook to New Space Activities Regulators," put forward that it is not overly complicated for space activities regulators to use the different existing Building Blocks to draft a national space legislation. However, it is the implementation mechanisms that are more complicated as it must be enshrined in the national legal order. He presented the concerns and challenges that arise from the conduct of the evolving space activities and invited national space regulators to create a network to share and exchange best practices on the actual implementation of national space law.

Taking the example of space mining, Maria Manoli explored why exploitation of space natural resources requires the attention of the international legal community in her paper, "Pondering the Legitimacy of the Outer Space Treaty from the Perspective of Space Natural Resources Exploitation: Is it time to Act instead of React?". In the face of exploitation of natural space resources, the absence of sovereignty in Outer Space could have undesirable implications. Striving for a sustainable future in space is an

ongoing concern internationally, as further highlighted by the UN 2030 Agenda for Sustainable Development. The OST remains applicable to the matter of the exploitation of natural space resources, with its provisions and the spirit of cooperation it contains. It is proposed that the optimal way forward is to proceed under the UN umbrella through the UNCOPUOS, without the need for additional regulation.

Dimitra Stefoudi presented “The Hague Space Resources Governance Working Group: Second Progress Report and the Way Forward.” The main purpose of the HSRG Working Group was presented, underlining that the formulation of building blocks for an international framework would only be initiated if the need to do so is established through the ongoing study. The Working Group is composed of stakeholders from various backgrounds, including academia, industry, international organisations, and has several entities with observer status, and functions in a transparent and inclusive manner.

Marina Gagliardi started by questioning whether Newspace necessarily means New Law in her paper entitled “New space activities and legislation: a general overview with a specific reference to the ongoing debate in Italy.” Authorisation and supervision of private activities are indeed covered by Art. VI OST. With the emergence of small satellites and sub-orbital activities and projects for large constellations and space resources mining, there are many issues that remain open from the regulator’s point of view. In Italy, there exist provisions addressing liability and registration, but no comprehensive space legislation. New private activities have contributed to intensified reflections on the elaboration of a possible comprehensive and coherent regulation on space activities. The new activities – and the new challenges – require national adequate regulation comprising of both binding and non-binding instruments, which complement the principles set by the space law treaties.

George Anthony Long presented “Statutory forfeiture of private property and the U.S. Space Resource Exploration and Utilization Act of 2015,” which was on the statutory forfeiture principle that gives the United States the right to seize any property acquired unlawfully as well as any associated equipment used to facilitate the said acquisition. Consequently, this could include not only space objects, but also space resources and ground stations. State practice, for instance when the USA gifted to a number of countries a small piece of lunar rock, shows that a State can own, possess and pass title of extracted lunar resource. The author submits that the legality resides in the purpose of the extraction: it cannot be done for commercial reasons.

The final paper, “Spaceplanes Operating in Airspace: In Search of a Regulatory Regime for Traffic Coordination,” by George Kyriakopoulos was presented in summary by Marco Ferrazzani. The separate world of spaceplanes, which can operate both as a plane (airspace) and as a spacecraft, is examined. The spaceplane raises numerous technical and legal questions,

not least like those pertaining to the definition and delimitation of airspace and outer space. The management of spaceplanes' flights do also raise a new set of questions, for instance whether the ICAO rules should be applicable or, if a segregation approach should be adopted like the FAA for the management of space flights within the airspace. It is concluded that there is a lack of clarity as to the legal regime which can be satisfactorily applied to these vehicles. It is proposed that solutions, namely with ideas of integrating ICAO rules, could be explored at UNCOPUOS.

Session E7.3: Refugees and the Role of Space Communications/Status and Practice of Charter for Man-Made Disasters

Co-Chairs: Ranjana Kaul and Kamlesh Brocard

Rapporteur: Andrea J. Harrington

After an introduction by chair Ranjana Kaul, PJ Blount presented the first paper of the session entitled "Seeing People: Using Satellites for the Benefit of All." With a particular case study on the Syrian refugee crisis, his presentation discussed the role of satellites in advancing humanitarian outcomes via legal frameworks for refugees. He argued that the "common interest of mankind" standard places an obligation on sensing States to respond to crises, including refugee crises, and cooperate in good faith to advance human security goals.

The second presentation was offered by Michael Dodge and was entitled "Assessing Refugee Crises via the Lens of the Outer Space Treaty." The examples used by Prof. Dodge were the European migrant crisis and the refugee and State security issues in Myanmar, which arguably rose to the level of an ethnic cleansing. He applied the Outer Space Treaty and Disaster Management Law to these crises, providing analysis of how they can be used in furtherance of space cooperation in managing them. In particular, global navigation satellite services, remote sensing technology, and telecommunications are all space assets that can be employed in securing humanitarian outcomes for these crises. Prof Dodge recommended modification of the Outer Space Treaty to adapt to new technology and needs and/or a revitalization of the International Relief Union or a similar entity to centralize responsive help in such crises.

The third presentation was provided on behalf of a co-authored paper by Mahulena Hofmann, Gerome Aloisio, and Loredana Rinaldis. The paper presented focused on the use of space data by the European Union in providing assistance in refugee crises. The ESA operates the Copernicus Program in order to access comprehensive information concerning security matters. Generally speaking, EU regulations regarding surveillance and processing personal data apply for the protection of individuals. This is a

particular concern with regard to location-based services, by which individuals must share their whereabouts with the service provider. The authors concluded that only launching and satellite operation qualify as space activities, while collection, processing, and use of space-based data are otherwise not space activities. This paper was intended to raise awareness about the issue of privacy protection for refugees.

The fourth presentation was also presented on behalf of the University of Luxembourg Faculty of Law, Economics, and Finance. This paper comprises a portion of the PhD research of the presenter, Sandra Cabrera Alvarado. Her presentation addressed whether there could be non-contractual liability for maps provided by the Copernicus Emergency Management Services. The EMS produces maps that are used in many crisis situations, but the process of preparing and analyzing the data opens the final products to both intentional and unintentional errors. In particular, there are issues regarding misinterpretation, misuse, and distribution of their map data. While the author reached the conclusion that there was no non-contractual liability on an international or European regional level, she expressed the possibility that domestic civil law could be employed in these disputes. In particular, she addressed two cases for failure to warn and the difficulty of proving fault when there are no international quality standards. The situation would be greatly improved if a best effort clause were present in the Copernicus Regulation and the EMS disclaimer. The author foresees courts using their discretion to fill legal gaps with regard to Earth observation activities.

The fifth paper presented, "Refugees in Distress: Protection of Safety Radiocommunication Signals against Harmful Interference" was the product of two authors, Simona Spassova and Valentina Nardone. The presenter reviewed the relevant definitions and elements of the ITU framework with regard to safety radiocommunications. The paper reached the conclusion that safety-of-life services have absolute priority and the requisite protection as compared to other services, and thus have priority over governmental and military communications and concluded that there exists a prohibition on emissions that cause or are capable of causing harmful interference to safety of life radiocommunication services.

The co-chair presented the sixth paper, by Sylvia Ospina, in the author's absence. The paper was entitled "Satellites and their Humanitarian Applications: Time to Highlight Their *Human* Aspects?" Dr. Ospina's paper focused on returning the humanity to humanitarian endeavors rather than focusing solely on removed high technology measures that have been developed through such means as the Disasters Charter and the Tampere Convention. She used the example of social media and the prevention or mitigation of disasters that has been possible due to the instantaneous availability of information from a dispersed population. She recommended using satellite technologies to personalize communications and ensure that radiofrequency spectrum is appropriately allocated for such endeavors, and

notes that government regulations and licensing are key factors in the success of the development and implementation of humanitarian assistance programs. In particular, availability of mobile telecommunications equipment and services to populations local to a disaster can be of great benefit as compared to the cost and difficulty of implementing such efforts.

The final presentation of the session was provided by Brendan Cohen, and was based on his paper entitled “Remote Sensing and the New European General Data Protection Regulation.” The author concluded that there is very little in the *Corpus Juris Spatialis* relating to the protection of privacy rights with regard to space activities. The General Data Protection Regulation that will come into effect in the EU in May 2018 provides significantly increased privacy safeguards for individuals’ personal data. The GDPR applies to companies established in the EU and non-EU companies controlling or processing personal data from monitoring subjects within the EU. The author stated that the GDPR will be interpreted broadly, and he walked the audience through the elements of the regulation applicable to the relevant entities. He recommended the implementation of codes of conduct, data protection plans, anonymization, and blurring. In particular with regard to refugees, while such data can be used for beneficial humanitarian purposes, it can also be used to track these vulnerable populations in a manner that could be discriminatory. The author concluded that data privacy was not an absolute right, but one that would be proportionally balanced against other fundamental rights.

Report of Session E7.4: Space Law Developments in Asia-Pacific: Diverging National Space Legislation with Regard to the Applicability of Space Law to Suborbital Flights

Co-Chairs: Steven Freeland and Frans G. von der Dunk

Rapporteur: Edwin Anderson

A total of ten papers were presented in the IISL session of the Space Law Developments in the Asia-Pacific region. The 2017 session opened with a keynote lecture by Professor Steven Freeland on the topic of accounting for new technology specifically relating to the Australian and Canadian experience. In his lecture, Steven spoke about how the significance of space regarding the operations of communication technology leads to potential vulnerabilities. Such vulnerabilities can be addressed through national laws of each country, which, in turn, help reduce the risk on behalf of the state. Prof. Freeland noted that even though liability for space activities rests on each government (a requirement through the Outer Space Treaty), this liability needs to be balanced with the benefits of technology. Recently, Prof. Freeland

was involved in the review for space activities on the Australian government, and he drew on these experiences when discussing the Australian position on regulating space activities. Similarly, Canada is also going through a review process of its space capabilities and activities. Importantly for both countries, these reviews both have the aims of future proofing space capabilities for the next 10-15 years.

Prof. Dr. Frans G. von der Dunk then presented on the experience of the New Zealand government when addressing space regulation. While Prof. von der Dunk noted that the New Zealand interpretation of their space law regulations was not ideal, the New Zealanders have a comprehensive approach to private space law – focussing on launching only. Unfortunately, there are several definitional issues with the New Zealand space legislation. Prof. von der Dunk noted three undefined terms of importance: ‘high altitude’, ‘outer space’ and ‘space object’. All these terms could have significant impact on the interpretation of any regulation. For instance, the difference between an aircraft and a space object could be extremely minimal yet there are different licenses for all sorts of aircraft.

Next, Yu Takeuchi presented on the legal challenges for realizing spaceflight in Japan. In 2008, Japan created space law regulations, however, there were several areas of space law lacking from the instrument. For instance, there are no instruments or regulations concerning suborbital flight in Japan. He then proceeded to contrast existing laws of other jurisdictions that may be applicable to Japan, for example, test-flight laws.

The fourth paper was presented by Fabio Tronchetti of Beihang University on the regulatory issues and the future for the Beidou global navigation satellite services. Mr Tronchetti first gave background that China is launching approximately 3 to 4 satellites per year, with 21 satellites already in orbit with ambitious plans for launching an even larger amount of satellites per year by the year 2020. He notes that while there are many launches, the regulatory aspect is falling behind. China seems to be trying to balance the technology advancements with the (currently lacking) framework. Presently, Chinese governance in space law remains uncertain with no clear structure. By contrast, the space law policy is mostly developed but slowly released with the most important Chinese policy document released being the 2016 White Paper for Defense. Finally, Mr. Tronchetti notes that the legal framework is the least developed aspect of space law in China – there exist only low level regulations. He notes that while the Chinese government has launched many satellites successfully, a legal space law framework is important both locally and internationally looking to the future. For instance, an accident in space depends on if the service was free or paid for – this is an area Mr Tronchetti contends should be regulated. Finally, he summarises his talk with specific reference to the Beidou satellite and how the future may look for navigation satellite services.

Next, Kumar Abhijeet gave a speech on the topic of the Indonesian Space Act. To begin, Mr Abhijeet provided background to the Indonesian government's aims for its space industry. Specifically, for space law, he notes that the Indonesian government wants to become a launching state. However, to become a launching state requires robust regulations and instruments in place so that whatever occurs during and after launch may be properly handled. Mr Abhijeet then continued to provide a holistic review of Indonesia's space law.

The sixth speaker was Ermanno Napolitano who presented on the leading role Australia could play in fostering uniform space legislation within the Asia-Pacific countries. Napolitano commenced his presentation by providing a review of the Outer Space Treaty and how these regulations could potentially apply to Australia.

Prof. Xiaodan Wu then presented on "NewSpace" in China and the need for new laws. Prof. Wu first noted that the current situation in China is that space activities are still state dominated, but, there is a will on behalf of the Chinese government to cooperate with other countries. This cooperation is demonstrated through China having memorandums of understanding with over 30 countries. However, according to Prof. Wu, while this seems like China is willing cooperating with other countries, China is in fact acting like 'barren flowers'. When looking at China's specific activities in space, they are increasingly launching commercial satellites – with ambitious communications and navigation goals for 2020. The regulatory framework does not support these goals, contends Prof Wu, as the current space law in China contains fragmented rules and numerous loopholes. Notably, the Chinese government does have laws for launch and is responsible for the funding of these launches. To finish, Prof Wu looked to the future of Chinese space law and mentioned that there is an official signal from the Chinese government that they need a national space law, with a revision hopefully arriving in 2018.

The eighth paper was presented by Prof Setsuko Aoki on Japan's two national space acts and the impact of 'New Space'. By way of introduction, Prof Aoki gives context to Japan's space activities by noting that there is no significant commercial space presence in Japan with most of Japan's space activities stemming from JAXA. While there are small Japanese remote sensing satellites, this activity is relatively minor within Japan's overall space activities. Regarding Japanese law, Prof. Aoki notes that suborbital objects are excluded from the act and launches, even of suborbital objects, require license approval. Additionally, the Japanese government will indemnify launches up to a certain amount but there will be no government support beyond that amount.

Next, Prof. Melissa de Zwart and Joel Lisk jointly presented on the regulation for a sustainable space future referring to both the Australian and New Zealand experience. The presentation began by providing context to the

mentalities of both governments: New Zealand, being agitated by a relatively small space company (Rocket Lab), was pressured into a government response; whereas Australia, being pressured by large companies, has not launched any space material in recent history. In terms of legislation, as contended by the presenters, Australian legislation is draconian and restrictive. On the other hand, New Zealand has more recent legislation that recognises the commercial nature of the space industry by specifically including an applicant character test when its government considers approving launch applications.

The final speech to conclude the session was delivered by Dr. Maria A. Pozza presenting on New Zealand entering the space race, a critique of the New Zealand legislation, and the influences of Australia. Firstly, Dr Pozza notes that the test for both launch licenses and payloads under New Zealand legislation are the same. The relevant section, section 9, allows the New Zealand Minister to grant a license if the applicant is technologically capable, the applicant has a debris management plan, all the while considering risks which include but are not limited to public safety. Prof Pozza notes that section 9 includes the phrase, "has taken all reasonable steps" which she contends may give leeway to some applicants as it is a flexible definition. Prof Pozza argues that companies may not have an incentive to apply for a license if the definition is not rigid. Next, Prof Pozza analyses section 2 of the same act, whereby the New Zealand Minister may decline launch if the launch is not in the public interest, or the applicant is not a fit and proper person. While it seems in the public interest for the government to have absolute discretion over launch activities, Prof Pozza contends that the combination of the cost of applying for a license likely being high and the Minister's discretion may scare off certain companies. However, it is noted that the Minister must apply a balancing process: they must look at each applicant one at a time and apply a 'permissive approach'. Prof Pozza contrasts this with the Australian approach to space law which is rather prescriptive concluding that Australia and New Zealand could learn off from each other and their approach to space law legislation.

At the conclusion of the speakers' presentations, the floor was opened for questions to any of the speakers who had presented throughout the session. What followed was rigorous, intellectual debate with speakers engaging with the audience and even each other. Finishing question time, the Co-Chairs thanked speakers and the audience, and adjourned the session with some concluding remarks. Overall there was a great interaction between the audience and authors. A great atmosphere was created for further debates and discussions on the topics presented.

Session E7.5: Current Developments in Space Law*Co-Chairs: Setsuko Aoki and Yun Zhao**Rapporteur: Olga Volynskaya*

Technical Session E7.5 “Current Developments in Space Law” comprised 9 oral presentations total.

Presentations on the topics “The Legal Status of Near Space” by Prof. Li Shouping (China) and “Lacunae and Silence in International Space Law – A Hypothetical Advisory Opinion from the International Court of Justice” by Dr. Michael Simpson (USA) were summarized by delegated representatives of main authors, Prof. Yun Zhao and Dr. Christopher Johnson respectively.

Three presentations focused on different aspects of sustainability of space activities. In particular, Mr. Yu Takeuchi (Japan) considering the legal implications of operational information for sustainable space activities stated that registration of space objects in accordance with the Registration Convention is one of the key elements of the long-term sustainability of space activities (LTS), argued the need to improve registration practice, and stressed the importance of dynamic space information.

Prof. Yun Zhao (Hong Kong) presented an insight into Chinese perspective on space and sustainable development, reminding the audience that developing countries must be allowed to enjoy the benefits of space activities, whereas all states must have equitable access to space and its resources, which constitutes a horizontal aspect of space activities. In the opinion of Prof. Zhao, fundamental principles of space law have become customary international law, with a special emphasis on the role of international cooperation in space activities. Further in his presentation Prof. Zhao shared the experience of China promoting international cooperation (with the example of China-Brazil relations in the framework of South-South cooperation), providing free online data distribution since 2006, developing national regulations on space activities. According to Prof. Zhao, regional cooperation can be used to balance the multilateral and bilateral aspects in outer space.

Mr. Gilles Doucet (Canada) shared his view regarding the use of space technology export controls as a bargaining solution for sustainability, claiming that major space powers are the only true players in outer space, and these states would be affected the most should the LTS in outer space be compromised. In the view of Mr. Doucet, international cooperation in space activities is essential, which brings to the forefront the need for specific rules to prevent domination in outer space of separate states and allow developing states to participate in space activities.

The problems of registration of space objects in the United Nations Registry, namely its accuracy, effectiveness and efficiency as new technology and new actors expand space operations, were highlighted by Dr. Henry Hertzfeld

(USA). In his presentation Dr. Hertzfeld reminded that registration issues are governed by the Registration Convention, that there is overlapping between registration, liability, and licensing in terms of space law, and that some registration-related issues have been addressed by the UN General Assembly resolutions, as well as by the Working Group on the Long-term Sustainability of Space Activities established under the auspices of the Scientific and technical Subcommittee of the UN COPUOS tasked to draft a comprehensive set of guidelines for the future LTS. Dr. Hertzfeld claimed that the UN is lacking resources to tackle all the emerging problems, and called for the establishment of a better system for registering space objects in the light of the variety of new problems such as on-orbit services, asteroid mining, etc.

Two presenters elaborated on legal issues of certain commercial space activities. First, Ms. Melissa Kemper Force (USA) identified perspectives on commercial spaceport insurance to minimize potential liability resulting from a catastrophic launch failure. In her presentation Ms. Kemper Force, *inter alia*, described how spaceports are established and operated, which licensing regime is applicable there, what are the responsibilities and liabilities of launch operators to obtain liability insurance, what role launch operators play in terms of responsibility and liability in case of an accident.

Ms. Audrey Allison analyzed new commercial space applications from the position of the existing global legal and regulatory framework, promoting an evolutionary approach to launching the new space revolution.

A presentation by Prof. Dale Stephens (Australia) was dedicated to the progress of an academic project entitled the Manual of International Law Applicable to Military Uses of Outer Space, or MILAMOS. According to Prof. Stephens, MILAMOS is a manual which tries to suggest what a law might be to govern military space activities, fill in the gaps in operation development and activities. Prof. Stephens reminded that though MILAMOS is a compilation of views of eminent scholars rather than a specific set of rules or principles, in the opinion of the presenter, this work is still expected to have normative effect as it will collect space practice and therefore will be useful in filling the gaps in the current space law regime.

The quality of all presentations was high, the variety of topics corresponded to the main title and essence of the Session.

Session E7.7-B3.8 – Joint IAF/IISL Session on Legal Framework for Collaborative Space Activities

Co-Chairs: Mark J. Sundahl and Elina Morozova

Rapporteur: Merve Erdem

This session, jointly organized by the IAF and the IISL, focused on the legal framework for international cooperation on the space activities. At the

session, ten abstracts had been approved and seven of them were delivered (other three either were withdrawn or were not confirmed). The speakers were geographically diverse and were drawn from industry, government, and academia.

Ms. Morozova opened the session with some introductory remarks and Prof. Sundahl followed her comments with a brief overview of the general legal framework regarding international cooperation and a description of some landmark cooperative ventures undertaken among states and private actors over the years. Ms. Morozova then called the first speaker to the podium.

The first speaker, Dr. Olga Volynskaya from ROSCOSMOS, presented a paper entitled “International Cooperation as the Main Focus of the Modernized Russian Space Industry.” The work focused on current Russian legislation and documents regarding Russian space activities with an emphasis on international cooperation. She mainly referred to recent changes in the national regulatory regime to address current international initiatives and new global trends in space activities during the evolution of the Russian space industry. After her presentation, she was asked about the Russian position on the recent development of private space activities. In her response, she mentioned Russia’s policy to encourage private actors to be involved in space activities more, but under the management and monitoring by states.

The second paper, entitled “International Cooperation in Space Activities in Europe, the Ariane 6 Project Example”, was authored and presented by Caroline Thro of the European Space Agency. The paper touched upon a new launcher project Ariane 6 as an example of European cooperation on space activities. She mentioned the latest developments on the project with respect to its launcher system, launch base, and the role of ESA to ensure the cooperation between the launch system and the launch base. However, she also discussed the lack of a clear allocation of responsibilities for the project between the actors. At the end of the presentation, Ms. Thro was asked to clarify the warranty options of the contracts for the future launch services of the project. She answered that design choice would be provided and two different warranty options could be included in the contracts.

The third paper entitled “FAA International Workshops on Commercial Space Transportation” was presented by John Sloan of Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST). The paper described the efforts of the FAA to encourage international cooperation through organizing workshops since 2009 in Washington, DC. As he mentioned at the presentation, the scope of these workshops was about sharing FAA experience about the regulation process of private space activities in the US as a model for other countries to promote the adoption of similar regulations globally. The presenter of the paper was asked how an international model law could be created for space mining and deep space exploration and what the role of FAA would be. Mr. Sloan stated that they

implement the policy of the US government in the regulation of private activities in cooperation with other government agencies and added that FAA was open to accommodate these new activities, as well. Apart from this question, he was asked about the fundamental concerns regarding the 2004 Commercial Space Launch Amendment Act. According to Mr. Sloan, CSLAA was enacted to facilitate the development of the industry. Its provisions were also the best legal tool to decrease potential lawsuits within the industry.

The fourth paper entitled “International Governance of the Danger from Near Objects” was submitted by Paul Larsen of Georgetown University Law Center and Christopher Johnson of Secure World Foundation. Because of the absence of Prof. Larsen and inability, for health reasons, of Mr. Johnson to deliver presentation, their paper was briefly presented by the Co-chair Prof. Sundahl.

The fifth paper was presented with the title as “Looking at A Global Plan to Monitor Emissions Using Satellite Technology: Institutions and Cooperation Mechanisms” by Timiebi Aganaba-Jeanty of the Center for International Governance Innovation. At her presentation, she talked about the Paris Agreement and New Delhi Declaration adopted by more than 60 space agencies in May 2016 to work on a global framework to establish an independent monitoring system for greenhouse gas (GHG) emissions. After introducing a recent need for international cooperation, she focused on the legal and policy challenges on the applicability of existing earth observation systems to monitor/quantifying greenhouse gas emissions. She furthermore stated that transparency and trust are the most fundamental things for the climate change regime. In addition to this, states’ compatibility with Paris Agreement is also essential for the matter.

The sixth paper, entitled “COSPAR’s Planetary Protection Policy: Updating a Consensus Standard” and authored by Prof. John D. Rummel from the SETI Institute and Mr. Gerhard Kminek from the European Space Agency, was presented by Prof. Rummel. The paper of Mr. Rummel addressed the current improvements on COSPAR communications and development on its policy in the face of increasing number of new national and private actors in the sector of planetary exploration. In this way, a new actor of the activity would benefit from the expertise of COSPAR in the field. In respect to the presentation, Mr. Rummel was asked a question concerning COSPAR’s view/policy on the cultural heritage of outer space. Mr. Rummel asserted that the cultural heritage of outer space is also under the attention of COSPAR. According to the policy of COSPAR on the cultural heritage, the several ways of uses of these objects have to be addressed. He also talked about the lack of policy of COSPAR regarding genetically modified organism taken to outer space and brought back to the Earth to answer the second question. Apart from these two questions, a comment was raised how this presentation revealed another form of international cooperation which is between scientists and lawyers.

The seventh and the last paper of the session entitled “An Examination of the Major Space Cooperation Agreements between States as Models for the Development of Similar Agreement for International Joint Ventures on Other Celestial Bodies” was written by Mr. Anton Alberts and Dr. Martinez and presented by Mr. Anton Alberts. The main focus of the paper was how existing agreements enacted for further cooperation among states would be applicable for the future joint missions to the Moon and Mars. They specifically referred to the future questions on the ownership of the establishments based on the celestial bodies, the legal status of the localities, use of resources, application of criminal law and civil law to the astronauts who are residents of the constructions. The first question addressed to Mr. Alberts, was his opinions about the future projects on the Moon and Mars from the perspective of developing countries. Furthermore, a comment-like question regarding the priority of the futuristic projects for developing countries was raised. In his response to the questions, he first stated that he was aware that these projects could not be the priority for developing countries, and they even could not compete with these activities. This is why these events should be held in cooperation with developing countries, as well and the benefits from the projects shall be allocated. According to him, the world does not need another period of colonization.