

Report of the 54th Colloquium on the Law of Outer Space

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E.7.1: Nandasiri Jasentuliyana Keynote Lecture on Space Law & Young Scholars Session

Chairs: Ms. Tanja Masson-Zwaan and Prof. Ram S. Jakhu

Rapporteurs: Ms. Diane Howard and Dr. Edythe E. Weeks

A total of ten papers were presented in this session of the 54th Colloquium on the Law of Outer Space. The session opened with the keynote lecture delivered by the Honorable Dr. Abdul Koroma of the International Court of Justice. Justice Koroma's presentation provided the audience with a comprehensive overview of the development and scope of space law, which set the stage for the session.

Melissa Force presented the first paper following the keynote lecture, co-authored by Elena Carpanelli, entitled "The Protection of the Earth Natural Environment through Space Activities: A General Overview of Some Legal Issues". The paper analyzed the issue of whether international law requires a state to disclose information useful in the protection of the terrestrial natural environment and whether a state can be liable for not revealing such information. The speaker concluded that the current legal regime lacks a specific legal obligation of states to disclose information pertaining to potential threats to Earth of the environment. However, the paper highlighted various legal provisions that could be applied to

require states to disclose information regarding natural and/or man-made disasters.

Joyeeta Chatterjee presented the next paper on "Legal Aspects of Space Environment Sustainability". This paper addressed issues and concerns regarding the preservation of the outer space environment.

Tejal Thakore presented the next paper, co-authored by Andrew Bacon, entitled "Youth Involvement of NEO Working Project (Space Generation Advisory Council) in disaster response focusing on human and environmental security". Their paper stressed the urgency of addressing issues such as climate change, pollution, water scarcity and threats potentially posed by near Earth objects. The paper honed in on the need for a global strategy to collaborate and coordinate efforts regarding public outreach, emergency evacuation procedures, a unified database for tracking objects, and insurance legal and policy issues.

Jinyuan Su next presented a paper, co-authored with Lixin Zhu, entitled "The Environmental Dimension of Space Arms Control", which examined how environmental protection is often a neglected issue. The paper speaker argued that the proliferation of space debris is a pressing concern that needs serious attention and that customary principles of environmental law and the

“no-harm” principle should be applied to reduce space debris.

Guillermo Javier Duberti next delivered his paper, “The Legality of Space Weapons in International Law”, which provided a summary of contributions from space law and international humanitarian law literature on space security, space armaments and the importance of preventing a space arms race. The paper also provided an analysis to support the argument that the space treaties are limited in that they cannot prevent testing, deployment and use of space weapons other than those of mass destruction in outer space.

Dr. Michael Chatzipanagiotis’ paper, entitled “The Impact of Liability Rules on the Development of Private Commercial Human Spaceflight”, examined possible ways that liability rules can be shaped to help promote private human spaceflight. He discussed how liability rules and issues may impact the development of private commercial human spaceflight and analyzed how liability rules may be structured in order to promote and encourage the further development of the emerging private spaceflight industry. The paper suggests that concrete rules are needed which address the particular needs of newly emerging industries. This may include exclusion of liability for ordinary negligence, and a duty to inform spaceflight participants of the risks associated with spaceflight.

Irina Kerner delivered the seventh paper with the title “Supranational Space: Why the Powers of the EU are not Quite Parallel”. In her talk, Ms. Kerner made the argument that there is insufficient debate on “supranationalism” and the competence of the European Union. The author argued that Article 189 of the Lisbon Treaty on the Functioning of the European Union has “supranational features”. She highlighted

the historical development and basic legal principles of the EU space competence with the political and legal advantages of supranational features for European space law.

Du Rong next presented a paper entitled “Shaping legal framework for Compass---Regulating GNSS in Chinese Context”. This paper argued that China should set forth specific guidelines for the civil aspects of COMPASS, especially since China is entering a phase of space-sector development during which even greater emphasis is placed on the commercialization of space technology. The speaker concluded that China needs to create a national policy that specifically details the legal provisions for the civil and commercial uses of space technology.

Aditya Sharma then presented the paper “Protection of the Outer Space Environment: Need to Revisit the Law” in which he contended that imposing liability on states and strengthen the liability regime is crucial and in keeping with the vision of the drafters of the Outer Space Treaty. The speaker pointed out that as activities in space become more robust, this concern will need to be addressed in an effective manner to provide remedies for damage likely to occur as space exploration and travel become more common.

E.7.2: Legal Issues of Commercial Human Spaceflight

Chairs: Prof. Dr. Frans von der Dunk and Prof. Steven Freeland

Rapporteur: Ms. Joyeeta Chatterjee

A total of 13 papers were presented at the second IISL session on “Legal Issues of Commercial Human Spaceflight”. The presentations covered a range of issues related to commercial human spaceflight.

The first paper entitled “National Space Legislation - The Work of the Legal Subcommittee of UN COPUOS 2008-2011” was presented by Prof. Dr. Irmgard Marboe from the University of Vienna. In her presentation, she highlighted the significance of enactment of national space legislations and described the efforts of UN COPUOS in that regard. She pointed out some common factors behind the absence of domestic space legislation in many countries and analysed the definition of “national space activities” under international law and “space activities” under the domestic legislative framework. In her view, the key provisions in any national space legislation should clearly identify the competent national authorities and lay down regulations concerning transfer and limitation of liability. She concluded that there is a need for greater awareness for national space legislation and although there is yet no consensus, however, identification of “regulative categories” will be helpful. While responding to questions from the audience, she clarified that national space legislation should have a broad scope of application with not only territorial jurisdiction but also jurisdiction over nationals and companies registered or established under the national law, which will help to resolve the challenges associated with the Sea Launch project.

The second presentation by Daisuke Saisho was titled “Liability risk sharing regime of the bill of Japan’s Legislation on Space Activities and its Comparison with the U.S. and French Law”. He analysed the Japanese draft Space Activities Act from the perspective of risk-sharing and liability regime. With the help of a graph projecting the quantum of liability and the burden on the launch operator, he described the insurance requirements stipulated in the draft legislation. He also compared the provisions of the draft with the American

and French legal regimes with reference to strict liability and cross-waivers of liability.

Mr. Camilo Guzman Gomez gave the third presentation on “Space Procurement Regulation: The Colombian Procurement Act of 2010” about SatCol, the Colombian venture of procurement of space activities. In his opinion, the applicable law imposed far too stringent requirements, especially insurance regulations for the purchase of satellites.

Dr. Guoyu Wang next delivered his paper on “Analysis of the Applicable Law to a Private Spaceflight Contract under the Latest Chinese Conflict Rules Legislation”. His presentation contained a proposal to draft an international agreement for the development of a uniform conflict of law rules with respect to space activities. He substantiated it with the help of a hypothetical claim arising in China as a result of a launch by Virgin Galactic from the facility in Curaçao. He concluded that the regulatory legal system of private spaceflight calls for development of native administrative rules, introduction of uniformity in conflict rules and adjustment of application of those native conflict rules.

In the fifth presentation entitled “Legal Issues in Commercial Spaceflight Projects in Spain”, Mr. Rafael Harillo provided a brief overview of the existing general legal framework. He used the governance of the Lleida Aiguire, Aeroport of Ctalonia, which is governed by the regional authorities (Law 14/2009 of 22nd July), as a central example to emphasise the need to develop space transport and to promote space tourism. He also gave a brief description of the various technical, scientific, economic and legal challenges (ITAR restrictions) involved in it. His presentation attracted questions on the role of regional space law in the governance of international space activities.

Prof. Mark Sundahl from Cleveland State University presented the next paper entitled "NASA's Commercial Crew Transportation System Requirements and the FAA Human Spaceflight Regulations: A Study in Contrasts". His presentation focused on the balance of concerns regarding regulation of human spaceflight by FAA and commercial crew transportation by NASA. He compared the FAA requirements of 14 pages with the NASA requirements running into over 1000 pages. He analysed the three different sets of documents prescribed by NASA – strict compliance, type-2 documents and best practices. He recommended that reliability on track record will help in dealing with the complexity of the process. Prof. Henry Hertzfeld posed a question on the validity of the above comparison. Prof. Sundahl agreed that the FAA regulations and NASA requirements were of a different, although still comparable, nature. Prof. Hertzfeld also questioned the nature of NASA's role in relation to the private service providers which was clarified by Prof. Sundahl as being a "paying customer" for orbital deliveries.

The following paper entitled "Private Human Access to Space and Incentive Based Regulation in the United States" was delivered by Mr. P.J. Blount from the National Center for Remote Sensing, Air, and Space Law, University of Mississippi. He identified the goal to incentivise the business within the territory through regulations such as, grant of waivers. He argued that that the FAA informed consent balances safety and welfare with dangers of premature regulation. While comparing the monist and the dualist systems, he relied on the decision given in *Medellin v. Texas & Avena*. He pointed out that it amounts to short-sightedness to only target the high-profile space industry in this regard.

The next presentation was by Prof. Paul S. Dempsey who delivered his paper on "Liability, Insurance & Indemnification in National Space Law". His presentation reflected on the conflict between airspace regime and outer space regime, with respect to private versus state liability. He used examples of the recently developed aerospace-crafts and their legal status. He also discussed the three different types of indemnification statutes for recovery against commercial providers, recovery by citizen against State and third-party indemnification. As far as insurance requirements are concerned, he mentioned eight states in the United States that have capped the limits on liability through enactment of insurance statutes.

Dr. Fabio Tronchetti from the Harbin Institute of Technology gave the tenth presentation on "Regulating sub-orbital flights traffic: Using air traffic control as a model?". Some of the important issues discussed were the hybrid nature of the sub-orbital vehicle, management of the "flight time" of the vehicle, demarcation between airspace and outer space, the highly regulated nature of air traffic versus relative lack of regulation for space traffic. Borrowing concepts from the regime of air law, he made some innovative recommendations for the regulation of sub-orbital traffic - Functional Outer Space Blocks (FOSBs) modelled on functional airspace blocks, reservation of LEOs for sub-orbital flights on the same lines of ITU orbital management for allocation of frequencies and establishment of a coordinated mechanism to control sub-orbital flight traffic modelled on the EU Single European Sky (SES) initiative. Prof. Joanne Gabrynowicz inquired about the consistency of the proposed Functional Outer Space Blocks with the principle of non-appropriation in the Outer Space Treaty.

The next presentation was on “International Regularity Body: A key to space tourism success” by Mr. Ali Akbar Gholroo where he suggested the creation of an international body to regulate outer space activities especially for issues such as certification, standardization, safety requirements and liability of operators and service providers. His presentation discussed the establishment of such a body and its potential role in the promotion of private space tourism.

Prof. Yan Ling presented his paper on “Does the Rescue Agreement Apply to Space Tourists?”. He analysed the terms “astronaut”, “personnel” by referring to definitions from the Webster’s and the Oxford English Dictionary and drew a contrast between astronauts and the crew of a spaceship. He made references to the Italian version of the draft Convention and statement made by the French delegation in the *travaux preparatoire* to substantiate his contention.

The next paper entitled “A New International Convention to Govern Liability in Relation to Commercial Space Tourism - Is it Really Necessary?” was presented by Ms. Carol Ronan-Heath from the International Institute of Air and Space Law, Leiden University. She commented that Dennis Tito’s voyage and retirement of the Space Shuttle marked a new era in the age of commercial spaceflight. Her paper sought to determine if sub-orbital space tourism, essentially trips offered by Virgin Galactic, can be governed by the private regulatory mechanism of air law or the state regulatory framework of space law. In this regard, she analysed the relevance of the Warsaw Convention and the concept of liability enshrined in the space law conventions and recognised the key role played by insurance companies. Her conclusion noted that the United States approach is merely a “short-term fix” and a

new unified legal regime is necessary to deal with the issues of space tourism.

Mr. Declan O’Donnell delivered his paper on “The Sub-Orbital Private Space Flights may require a Law Suit to Escape Benefit Sharing”. His presentation was based on the argument that the commercial provider, as a trustee, is subject to the highest legal duty. His discussion of disgorgement as a remedy stimulated a debate in the audience with vehement disagreement from Prof. Joanne Gabrynowicz. She highlighted the interrelationship between U.S. business models and international law and argued that disgorgement is unsupported by both international law as well as American domestic law.

A very brief summary of the paper on “Japanese Perspective on Legal Issues of Commercial Human Spaceflight – Regulatory Thresholds and Potentials” was given at the end of all the presentations.

Following all the presentations, the floor was opened for discussion to the attendees. Prof. Dempsey commented on the concept of “flag of convenience” in a case where the State is procuring the launch and attendant liability issues. Prof. Ingard responded to it by reference to the relationship between Articles VI, VII and VIII of the Outer Space Treaty. Following Prof. von der Dunk’s observations on the licensing regime, Dr. Fabio Tronchetti emphasised the crux of his presentation by asserting that mission planning is necessary for sub-orbital flights.

In sum, the session provided a good opportunity for exchange of thought-provoking ideas and a spirited scholarly debate on the importance of space law in dealing with the legal issues relating to commercial spaceflight. The session was well-attended by IISL members and concluded at 17:30.

E.7.3: Africa: Space Law and Applications-Past, Present and Future

Chairs: Prof. Joanne Grabynowicz and Dr. Tare Brisibe

Rapporteur: Adv. Phetole P Sekhula

The Session attracted a good audience with many leading space law experts in attendance. The audience responded positively to the presentations and asked telling questions with a desire to assist Africa in its quest for space exploration and use.

Dr. Brisibe opened the Session by introducing the Session as one focusing on a number of legal issues arising in the African context but concentrating more on the practical and specific space applications.

The first Speaker was Dr. Annette Froehlich from the German Space Agency. Her Presentation was entitled "Space related Data: From Justice To Development". She illustrated how space data can be utilized positively in societal developmental as well as assisting judicial processes. Space data can be used as evidence in court in territorial disputes to illustrate boundaries, assist security in securing border boundaries and help vegetation control.

The second presentation was made by Adv Phetole Sekhula from the South African Council For Space Affairs (SACSA) titled "The right to satellite remote sense data: impact of multilateral cooperation on international space law". He stated that the presentation related to the legal authority of the UN Principles On Remote Sensing and international agreements and the persuasive influence such has on the evolving international legal framework governing access and rights to satellite remote sense data. The intention was to

outline the possibilities in the difficult process of harmonizing the myriad policies and expectations in the legal regime relating to acquisition of SRS.

Prof. Sundahl asked how and where the effort to harmonise these legal principles will manifest, and the answer was that the evolving practices and agreements in the various SRS organizations lay the basis for new thought and will inform the reformation process. Prof. Larsen inquired as to how SRS is used in Africa.

The third paper was delivered by Ms. Angeline Asangire Oprong from Bremen University titled "A glance at the earth observation policies and regulation and impact on developing countries focusing on the African Continent". The focus of her presentation was an examination and a comparative analysis of the African countries policies on earth observation data and how such policies impact on access to data. Ms. Oprong discussed how policy is used to regulate space data in space faring nations, and concluded that African countries must develop such policies to ensure access to EO data for its citizens.

Mr. Olusoji Nester John from the National Space Research and Development Agency in Nigeria presented a paper on "Legal Regime Of Remote Sensing And Geographic System In Nigeria". He informed the audience about the history of Remote Sensing in Nigeria and the establishment of the National Centre For Remote Sensing.

Dr. Fielho then presented Dr. Ospina's paper which titled "The Digital Divide and Space Activities in the Southern Hemisphere: A General Overview of Africa and South America." Dr, Fielho the presented another paper that was not on the initial list entitled "The Right of Self-Defense In Outer Space". He analysed the

UN General Assembly resolutions and Article 8 of the Outer Space Treaty. Ownership of objects was not affected by their presence in outer space. Therefore, the owner was entitled to take reasonable measures to ensure the safety of such.

Dr. Oladosu Olakunde from Obafemi Awolowo University presented a paper titled "Satellite Navigation and Location Based Services Training Course of African Regional Centre For Space Science and Technology Education in English (ARCSSTE-E)". He stated that the Center is preparing to offer training programs in Space Law and intensify its capacity-building in GNSS.

Ms. Joanne van Wyk from the South African Council For Space Affairs (SACSA) presented a Paper which co-authored with Adv Lulu Makapela titled "Legal Framework For South African Space Activities: An Analysis of the Legal rules governing the launching, operation of a satellite and applications by private actors". She outlined that the challenges include a review of the current Space Affairs Act since the Act was based on a Non-Proliferation regulatory model. Prof. Gabrynowicz asked who develops remote sensing applications. Ms. van Wyk responded that the former CSIR, now part of the South African Space Agency (SANSA) is responsible, including private entities who source data from SANSA.

Mr. Luthando S. Makumatela next presented a paper titled "Review of the South African regulatory framework in the context of UN space legal norms". The paper outlined the process of ratifying UN treaties and illustrated three fundamental challenges, viz, the militarization and weaponisation of outer space versus the peaceful uses of outer space, as well as international cooperation in space use. This presentation generated a great deal of audience responses and suggestions for

African participation in space were advanced. A consensus emerged regarding the importance of strengthening the policy and regulatory environment in Africa.

Ms. Timiebi Aganaba from McGill University next presented on "Nigerian Lawyers' Perspective on Space Law and Africa". Her paper was based on a survey conducted in Nigeria about space law awareness and participation. The survey revealed general apathy and lack of knowledge about space law and space activity in Nigeria. She explained that the need for cohesive African voices was of paramount importance. She suggested that an African Space Law Forum be established. A member of the audience from Iran opined that access to space is restricted as no African country possess launching capability and attempts to do so were viewed as hostile acts.

After this final paper, the chairpersons thanked the presenters and the audience and declared the Session closed. This was a lively Session and requires follow up in regard to suggestions made to coordinate capacity-building efforts in Space law on the African continent.

E.7.4: Environmental Aspects of Space Law and of Space Activities

Chairs: Dr. Bernhard Schmidt-Tedd & Dr. Ulrike M. Bohlmann
Rapporteur: Ms. Melissa Force

Session 4 convened on Wednesday, October 5 at 3:00 p.m. Four papers were presented during the session, which was well attended by over thirty persons throughout the session.

The first paper in this session was presented by Dr. Ulrike M. Bohlmann with the title, "Connecting the principles of international environmental law to space

activities,” which evaluated the impact of human activities on the outer space environment through three viewpoints in order to discern the evolution of international law on the exploration and use of outer space. Dr. Bohlmann first reviewed the interpretation of some basic space law provisions, such as the second sentence of Outer Space Treaty Article IX, and then spoke of development of specific instruments for space activities and their implementation on a national scale such as the Stockholm Declaration, Nuclear Power Sources Principles and COSPAR planetary protection guidelines. In addition, she noted that although neither the IADC nor the UN Space Debris Mitigation Guidelines is binding, they may nevertheless evidence a developing due-diligence standard by which reasonable conduct should be measured in a negligence context. Finally, Dr. Bohlmann discussed some of the underlying ethical considerations of sustainable development and the prevailing trend to turn to "soft law" instruments for voluntary compliance with "state of the art" operations.

Prof. Mahulena Hofmann was the next speaker, presenting a paper entitled: “The Role of COSPAR Guidelines in Interpreting Article IX OST.” Prof. Hofmann described the detailed set of guidelines and recommendations aimed at avoiding biological contamination of the Earth and outer space environment developed by COSPAR including their background and legal context of Article IX of the Outer Space Treaty. She outlined the composition of the committee and the character of COSPAR Recommendations. Considering these rules are broadly respected by space agencies but with non-enforceable character, Prof. Hofmann evaluated whether these rules might have crystallized into customary rules but concluded that they were, rather, an important tool for interpreting Article IX and a basis for State practice.

The third paper was presented by co-authors Prof. Steven Freeland and Donna Lawler, entitled, “Whose Mess is it Anyway? Regulating the Environmental Consequences of Commercial Launch Activities.” The presentations addressed both the public international law and private international law elements relevant to the environmental considerations of launching activities. Prof. Freeland led off the presentation with a discussion by explaining how the existing body of international space law does not provide a comprehensive legal framework for the protection of the environment of space, nor does it specify rigorous environmental standards and even those obligations relating to environmental aspects in the United Nations Space Treaties are not particularly appropriate to, or directed towards launch activities and it is not entirely clear how readily these principles can be applied to the unique characteristics of space activities. Ms. Lawler explained how, from her experience in private practice, many launches are now undertaken by non-governmental commercial entities, which are not bound by the treaties, but rather are subject to local laws and the provisions negotiated in commercial launch service contracts.

Prof. Maureen Williams presented the final paper, entitled: “Space debris as a single item for discussion.” Prof. Williams explored the state-of-the-art in light of the current space debris mitigation measures, including her evaluation of the effectiveness, over the span of four years, of the Resolution on Guidelines on Space Debris Mitigation which she pointed out were not adopted by consensus at the UNGA. The objective of Prof. Williams’ presentation was to determine whether, in the current world scenarios, it should be supplemented by more stringent rules on the governmental front. Her concern was that space debris, (including hundreds of

thousands of minute “second generation debris” fragment), the need to prevent an arms race in outer space, and the threat of natural near-Earth objects colliding with Earth are all major threats to space security and present a serious challenge from the legal standpoint. Dr. Williams noted the importance of this topic remaining on the agenda of the UNCOPUOS Legal Subcommittee and the efforts of some delegations to make the guidelines binding seem to indicate that this is a step forward towards clearer regulation.

E.7.5: Recent Developments in Space Law

Chairs: Prof. Lesley Jane Smith & Prof. Sang-Myon Rhee

Rapporteur: Ms. Angeline Asangire Oprong

The session began promptly at 9 a.m. and was opened by Lesley Jane Smith who welcomed the participants and introduced the co-chair and the rapporteur.

The first speaker, Ms. Nie Jingjing, presented a paper entitled “The Future of Uniform International Rules on GNSS Liability” which concerned the legal and liability issues of key GNSS service providers (i.e. GPS, GLONASS, GALILEO, COMPAS, IRNSS and QZSS). The paper addressed (third party) liability under the Outer Space Treaty, Liability Convention and other relevant treaties. She raised the issue of the liability in case of signal malfunction stating that there was no direct contractual link between the GNSS service provider and the end user. The main concern would be the application of the substantial and procedural rules. She concluded that (i) The Outer Space Treaty, the Liability Convention and other existing treaties do not treat GNSS liability adequately. There is a need to pass a specific Convention on GNSS services, (ii)

UNIDROIT has considered the issue and issued a paper in 2010, (iii) ICAO had made efforts in addressing GNSS liability issues and had suggested possible approaches to solve problems of liability relating to GNSS, (iii) there were regional positions on the GNSS liability issues (i.e. African states called for a binding and enforceable international convention, USA thinks current legal regime is enough and the EU has a contractual framework for short to medium term), and (iv) a future liability regime must take into consideration interests of the service providers as well as the interest of user. She stressed that it should be victim oriented while ensuring that the procedural and substantial rules are unified. After this presentation, Prof. Dr. Frans von der Dunk made a comment about a situation in which there was non-contractual liability. The speaker responded that liability between the augmentation system operator and end user is non-contractual. Another member of the audience then asked whether one legal framework would be sufficient to encompass the different applications of GNSS. The speaker stated that it is reasonable to have uniform rules applicable to all. She believed that it is feasible but there is a need to examine if it is practical. Prof. Lesley Jane Smith sought to clarify whether there was a timeframe with which developments beyond UNIDROIT could be expected. The speaker said she was not sure.

Dr. Ranjana Kaul next delivered a paper on the “Legal Regime for GNSS for CNS/ATM for India Application of Articles VI & VII Outer Space Treaty to the GAGAN SBAS.” Dr. Kaul’s presentation attracted a very lively and interesting discussion. Many participants from the audience were interested in contributing but were barred by time. The speaker discussed the position of GNSS under ICAO clarifying that the use of GNSS systems (GPS and GLONASS) had been approved by ICAO.

She mentioned that public International Air Law does not provide for liability regime while private International Air Law provides only for carrier liability regime. Under ICAO, accuracy, integrity, continuity, and availability were required for GNSS liability. Dr. Kaul cautioned that nothing has come of the ICAO. According to her presentation, the USA doesn't support international liability regime for GNSS and EU supports one. India has ratified the UN space laws and is the fourth largest civil aviation country in the world after USA, China and Japan. She explained about the GAGAN SBAS (Indian GPS interoperable Geo Augmentation Navigation Satellite) Space based Augmentation System (SBAS) which will be in full operation by 2013. GAGAN SBAS is a joint venture between Indian Space Research Organization (ISRO) Airports Authority of India (AAI) and the national air navigation service provider (ANSP). She discussed the application of Outer Space Treaty in the Indian law. The Indian Constitution calls for promotion of peace and confirms the provisions of Article VI and VII Outer Space Treaty. In terms of liability, she clarified that India has no specific space law. She explained that under the Indian constitution international treaties do not have force in municipal law. However certain provisions in the Indian Constitution do allow for the powers to enact laws. In her conclusion she recommended that the Indian Government should pass a national space law. At the end of the paper, Prof. von der Dunk clarified the USA and EU positions on GNSS liability. A participant from the audience sought clarification on the definition of "free without a charge" and inquired why the public does not receive returns for publicly-funded GNSS systems. The response was that there is a disconnect because the airlines purchase the GNSS services but what happens to end user as result of the lack of a direct contract between end user and the GNSS service provider is not clear. There was a

conclusion that private air law regime has to be harmonized in domestic law to protect the passengers. Prof. Ram Jakhu commented that even if the GNSS service it does not mean there is no liability. Prof. Smith commented that the lack of contractual liability has become a topic of discussion. Prof. Dr. Stephan Hobe asked if there is anything in terms of national space legislation. The speaker responded that she was not aware. Prof. von der Dunk suggested that waivers or disclaimers should be used a solution. He explained that the USA argues that there is no contract between the service provider and end user and that the GPS signal is free. However the USA has no control of who uses the GPS and therefore there is no liability unless you go back to the domestic law. The co-chair Prof. Sang-Myon Rhee commented that the question of liability is different from that of responsibility. There is liability only if there is an obligation. One cannot say unilaterally that they are not liable. The US is not liable because it exercised sovereign immunity. He added that issues arise where you have private system.

Dr. Marco Ferrazzani presented the next paper entitled "Recent Legal Developments of GNSS in Europe" in which he introduced the European GNSS initiatives namely EGNOS (regional augmentation system) and Galileo (long term strategic solution). The discussion was very lively and generated so many comments and questions that the discussion had to be cut short due to time constraints. Dr. Ferrazzani announced that the launch of the Galileo satellites had just started and 18 satellites were to be launched by 2014. He explained that the Galileo project is owned by EU and mainly financed through EU and ESA budget. He also mentioned that Galileo is not only civil but would also be used for security and defense. The presentation included the status of private operators related to EGNOS and

GALILEO. The speaker discussed issues of absence of uniform law under international law and difficulties with key definitions. The position under EU legal regime on third parties was discussed. He mentioned that as a solution, the EU publishes disclaimers e.g. EGNOS contains such a disclaimer. The speaker recommended that the EU should set up liability regime which should include limited, strict and fault based liability and insurance policies. Following this presentation, a participant from the audience asked how it would be possible to know whether a faulty GPS or GALILEO signal has caused a particular harm. The speaker responded that if the victim is receiving all signals it will be difficult to know. However, the law generally leaves the burden on the victim prove that it is either Galileo or GPS signal. He added that today the fact that GNSS providers are regionally oriented can be used as an indicator. Dr. Kaul commented that under common law even if there is a disclaimer the victim can bring a claim. She gave an example of the Indian law where the Common law states that if the government agent does something in good faith and in the process faults he cannot be sued. Dr. Kaul also inquired about the position of in EU and Civil law systems. The speaker responded that disclaimer is one of the solutions on the contract since air navigation is based on cost then the airline is offering services, there could be liability because it provides the signal but not from space. There was also a question as to whether the Galileo system would exempt the manufacturers from liability. The speaker responded that it is just an idea however the EU countries will address the space component and signal separately. The manufacturers will have to pass the existing standards required by liability law. Prof. von der Dunk made the observation that the upstream part of the space segment is easy to deal with, however as you go down there are different

regimes already existing, which indicates a potential need for harmonization of the different regimes. The speaker agreed to the comment, but added that harmonization could bring in a lot of confusion and can be complex.

The fourth speaker, Ms. Lydia Boureghda, delivered a paper titled "The GALILEO Procurement Framework." In her paper, she first provided the key dates related to the Galileo's procurement framework. She then defined the public-private partnership funding model, discussed how the Galileo project dropped out of the model, and explained the award of public contracts for the Galileo Project. She concluded that Galileo respects the EU procurement process and that competitive dialogue is important. After her paper, one member of the audience sought clarification on whether the contracts to procure the Galileo project had been awarded. The speaker responded that they had been awarded over the summer (2011).

Dr. Lesley Jane Smith next presented her paper "Mind the Gap: Legislating for Commercial Space Activities" regarding the notion of the bifurcation of space law. The speaker forecasted that space law would move to ultimate exploration of outer space and use in downstream services. She stated that the French and US legislations encourage commercial space activity. The speaker elaborated on the bifurcation in the twenty-first century and coherent approaches through public private partnerships. Lastly she gave an outlook on regulating for the commercial sector. When questions were sought from the audience Prof. Steven Freeland asked whether there was any move towards the harmonization after the EU's rejection of harmonization. According to the speaker, when dealing with procurement and markets related issues, states have considered harmonization. She added that difficulties in harmonization could be

related to issues of pride; however, she noted that there are also different cultural issues as reflected in the different legislations. Dr. Ferrazani added that there are already ESA procurement rules, however the issue of GMES regulation is not harmonization. Dr. Smith concluded by affirming that it was a situation where the EU was taking “two steps forward and one step back” and that it was moving towards EU space policy.

Prof. Dr. Kai-Uwe Schrögl next summarised a paper by Ms. Matxalen Sánchez Aranzamendi titled “Who is the Launching State? Looking for the Launching State in Current Business Models.” The presentation revolved around the definition of the launching states and challenges faced by the definition.

Prof. Frans von der Dunk presented the next paper on “The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?” The speaker’s message was that within the EU there was no factual control, but competence to legislate, adjudicate, and control. He gave an historical overview of the developments of national space legislation of the five states with national legislation within the EU: Sweden, France, Belgium, the United Kingdom, and the Netherlands. After the presentation, the speaker was asked whether harmonization is a good or bad approach. He responded that in order to create a viable global industry and to encourage private commercial aspects, key parameters should be harmonized, e.g. insurance should be made obligatory for third parties. In response to a question by Prof. Steven Freeland, the speaker discussed a recent case involving Virgin Galactic, a non-EU entity that wanted to operate in Sweden. He explained that although Sweden wanted the transaction to be governed under the American legal framework, the country later realized that

as a member of the EU, it had to abide by the EU legal system.

Mr. Stephan Kaiser spoke next on the topic of “The New Start Treaty as a Confidence Building Measure for the Peaceful Uses of Outer Space.” The presentation concerned the bilateral strategic arms reduction treaties between the U.S. and the Russian Federation. The presenter concluded that the conduct of Russia and the United States are of paramount importance with respect to in space activities. After the presentation, the speaker’s opinion was sought as to whether he would prefer to have such measures which are not obligatory and not binding. The speaker clarified that confidence-building measures are essential non-binding steps toward disarmament.

Ms. Elina Zaytseva next delivered a paper entitled “New Legal Dimensions of the Orbital Frequency Management: Conflict of Interests between a Group of Administrations and its Notifying Administration.” The speaker first described the Intersputnik International Organization of Space Communications established in 1971. She explained the nature of its membership and its objectives, which include expansion of economic, scientific, technological and cultural relations using satellite telecommunications, facilitation of video and audio broadcasting, and the support of cooperation and coordination efforts of the member States. The focus of the presentation was the current developments in the Intersputnik Notifying Administration which had been appointed in 1993 in accordance with the ITU Radio Regulations. The speaker explained that there were changes and the Notifying Administration had been replaced.

Prof. Dr. Souichirou Kozuka then delivered his paper “The Economic Assessment of the Space Assets Protocol to the Cape

Town Convention.” He gave a very interesting talk and amused the audience with his sense of humor and fascinating examples. The presentation concerned the proposed Space Assets Protocol to the Cape Town Convention. He asserted that it would play a significant role in enhancing commercial space activities. The speaker gave a comparison of the airlines and space industries discussing the differences between the two industries. He then touched on recent developments in the sector of communications satellite financing such as the leveraged buy out

(LBO). He noted that although the new protocol is promising, it should not be viewed as a panacea. Most of the audience sought clarification on how the funding systems mentioned by the speaker could work and he answered to the audience’s satisfaction.

Finally, Prof. Dr. Lesley Jane Smith gave a summary of Prof Christol’s paper “Current American Focus on Space Law and Activities” and urged the audience to read his paper. Dr. Smith then adjourned this very successful session at 12 o’clock.