

REPORT OF THE IISL SPACE LAW COLLOQUIUM IN VALENCIA, SPAIN, OCTOBER 2006

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SESSION 1- LEGAL ASPECTS OF SPACE TRANSPORTATION AND LAUNCHING

Chairmen: Peter van Fenema (Netherlands)
and Alvaro Azcarraga (Spain)

Rapporteur: Petra Vorwig (USA)

The first paper presented was "The US 'Vision for Space Exploration', Legal Issues Presented by Innovative Commercial Initiatives" by Mr. Michael Wholley, General Counsel of NASA (USA). Mr. Wholley began his presentation by outlining the elements of the President's 2004 Vision for Space Exploration, which include involvement of international partners and increasing commercial opportunities for space transportation and exploration. In support of the second element, NASA has announced seven prize competitions for a total purse value of US\$14 million. Mr. Wholley explained that NASA also has begun investing in cutting edge technology through a venture capital fund. The goal of these and other NASA projects, such as the Commercial Orbital Transportation Services ("COTS") Demonstrations project, according to Mr. Wholley, is to involve commercial entities in the delivery of cargo and crew to outer space, as well as in NASA's vision for the moon, Mars, and beyond. Mr. Wholley expressed hope that commercial transport solutions will reach the demonstration phase in the next 2-4 years. Mr. Wholley noted that the COTS Demonstration agreements between NASA and commercial providers are designed to minimize NASA requirements and oversight of the commercial ventures. For example, NASA waived many of its rights to control IP developed under the agreements, and it

has agreed to refrain from using the technology to give the commercial venture an opportunity to commercialize it. Because the US government remains responsible for supervising launches under the Outer Space Treaty, Mr. Wholley noted that the COTS Demonstration launch activities must be licensed by the FAA.

Dr. Frans von der Dunk (Netherlands) presented his paper "Legal Aspects of Private Spaceflight for Tourist Purposes." Given the nature of space tourism, Dr. von der Dunk explained that the bulk of current treaty law would not apply because it focuses on the use of space for political and scientific purposes. He opined that the treaties, particularly the Rescue Agreement, should apply to space tourists so that they would be entitled to some protection in the event of an accident. At the very least, according to Dr. von der Dunk, the Rescue Agreement should apply to the flight crew of a private spacecraft conveying tourists because they should be considered "personnel" under the Agreement. Dr. von der Dunk noted a flaw in this analysis: the crew would be private employees rather than government personnel, and so not clearly covered by the Agreement. Dr. von der Dunk identified a separate problem created by sub-orbital space craft. Under current legal constructs, a sub-orbital craft would not necessarily qualify as a "space object" covered by any of the current outer space law. This could have serious implications with respect to the Registration Convention; however, Dr. von der Dunk noted that sub-orbital vehicles could be registered as aircraft. The author recommended further action to clarify the application of current space law to space tourism activities, but

also stressed that national laws need particular attention.

Ms. Axelle Cartier (Netherlands) and Ms. Ioana Cristoiu (Belgium) presented their paper entitled "Space Tourism: Regulatory Framework of the Private Initiatives and Projects with a Special Interest on RLV Regulations." According to Ms. Cartier, the typical customer seeking financing for its space endeavor is a startup with no assets or credit history. Ms. Cartier asserted that reusable launch vehicles (RLVs) may provide an overall lower cost alternative to expendable launch vehicles that will better support the commercialization of space, where the cost of raising capital and developing the transport means are high. Ms. Cartier proceeded to describe the benefits of RLVs, including the lower cost derived for low earth orbit tourist trips and the ability to amortize the cost of the endeavor over numerous launches. She did note that RLVs face serious technical challenges, and the industry's lack of experience with RLVs may mean that the cost has been underestimated. Ms. Cartier explained that the Commercial Space Launch Act of 1984 (CSLA) focused on expendable launch vehicles (ELV), and established the Department of Transportation as the lead agency to coordinate space launch activities. In 2000, the FAA issued final rules defining a licensing process for RLV launch and reentry, but did not address hybrid systems that combined both traditional aircraft technology and operations with spacecraft characteristics and capabilities. Ms. Cartier described the FAA's current experimental licensing process, which has fewer requirements, shorter review periods and involves a different approach to public risk analysis than the process used for conventional launch licenses. The experimental licenses are, however, restricted to certain circumstances, including research.

Ms. Cristoiu discussed the financial challenges that face many private companies attempting to develop private space

activities, including market access restrictions, restrictive procurement policies and export controls. Ms. Cristoiu opined that the Space Protocol under development in the International Institute for the Unification of Private Law (UNIDROIT) could support increased funding for smaller space activities.

Mr. Kenneth M. Weidaw's (USA) paper "Commercial Spaceport Development: The Role of Domestic and International Space Law and Regulations" was summarized for the panel. In his paper, Mr. Weidaw predicted that the need for coordinated international space and air traffic management system must become operational to accommodate the growing commercial space launch industry. Mr. Weidaw noted that commercial spaceports are now under development in nine countries, and in the United States alone, six spaceports have been licensed. He noted that government-owned spaceports will also look to the commercial launch industry to fund continued operations, such as transporting cargo and passengers from one spaceport to another or into orbit. Given the state of the commercial space launch industry, Mr. Weidaw recommended that a general convention be convened to devise a space and air traffic management system. In the alternative, the United Nations should take the lead in devising a new international traffic management system.

The paper "Advertising of Private Commercial Space Services in the European Community" was written and presented by Ms. Zeldine O'Brien (Ireland). Ms. O'Brien began her presentation by explaining how European Community (EC) law on advertising may apply to the space tourism/hospitality industry. Specifically, she posited that space tourism could be considered a "service" under the Treaty of Rome, and therefore subject to Directive 84/450/EC. According to the author, 84/450 protects the economic welfare of potential private space tourists by reducing misleading advertising in a high-risk endeavor. Ms. O'Brien noted

that 84/450 establishes a regulatory floor upon which Member States may impose more stringent consumer protection requirements. Ms. O'Brien went on to explain that 84/450 was subsequently amended by Directive 97/55/EC to include restrictions on comparative advertising. Under 97/55, an advertiser generally may provide price comparisons, but if a known brand name exists, it should be included in the comparison. Again, Member States may impose stricter requirements on comparative advertising. Ms. O'Brien explained that misleading advertising may be challenged in national courts, which may order the cessation of the advertising. Advertisers, on the other hand, may challenge strict Member State laws under Articles 28, which protects the free movement of goods between Member States, and 49, which protects the freedom to provide services.

Ms. Rachel Yates (USA) followed with her paper "Minimizing Regulation of Space Tourism to Stimulate Commercial, Private Launch Capabilities." Ms. Yates explained that the primary purpose of the CSLA, as amended, was safety, but it recognized the need for regulatory standards to evolve as the industry matures. In February 2005, the FAA issued draft guidelines for both crew and participants in commercial, suborbital RLVs. It subsequently drafted regulations as required by CSLA and received public comment on them, but the final rules have not been published. The rules were subsequently published on December 15, 2006. Ms. Yates described the various competing interests that must be balanced in the regulations and how that balance was achieved. One competing interest is the tension between the desire to impose specific requirements to improve safety, while allowing for flexibility in design and operation of the spacecraft. The US Congress addressed this conflict by limiting the FAA's authority to regulate design and operations before 2012, with the exception that the FAA may intercede with regulations if serious injury or death results from a spacecraft design. The FAA regulations, in

turn, balance the interests by allowing operators to determine the best method for achieving the safety requirements. A second conflict of interest develops between the duty of the government to protect participants and crew and the government's duty to respect an individual's right to choose his/her level of risk. To strike a balance, the regulations focus on making sure the crew and participants are sufficiently trained and that space flight participants receive clear information describing the known hazards, including statistics. Ms. Yates noted that the consent form that must be signed by all space flight participants may not be sufficient to protect the operator from liability, so it may have to obtain a contractual waiver from participants. The regulations also require operators to make their safety records available to participants, but operators are reluctant to do this because the information could benefit competitors. The final competing interests that arise under the FAA's regulatory regime is government regulation versus industry self-regulation. Ms. Yates stated that each company is too focused on survival and every program is too different to assume industry standards can be established. Ms. Yates opined that the FAA's hands-off approach to regulating the industry is appropriate.

The final paper, "US Law Governing Commercial Space Launches," was presented by Prof. Paul Dempsey (Canada). Prof. Dempsey opened his remarks by noting that the market for commercial space travel will continue even as the market for tourism declines because the market for transportation will boom. He explained that the CSLA authorized the FAA to regulate the commercial space transportation industry to the extent necessary to ensure compliance with international law; to protect public safety, property and national security; and to promote space launches and reentries by the private sector. Prof. Dempsey stated that because launches conducted within the US or by US citizens requires FAA authorization, other states with fewer

regulations may become states of convenience. The final rules proposed by the FAA established a launch application review process that consists of seven steps: pre-application consultation; policy review and approval; safety review and approval; payload review and determination; financial responsibility determination; environmental review; and compliance monitoring. The author also described the review process for the FAA's experimental permits allowed under the 2004 amendments to the CSLA and used to research and develop operating techniques or for crew training. This process requires the applicant to submit: a program description, a flight test plan, and operational safety documents. Prof. Dempsey opined that space flight passengers may be covered by the Warsaw Convention for aircraft if they are not covered by the Liability Convention. Prof. Dempsey further suggested that the International Civil Aviation Organization may act as an international body capable of harmonizing aviation and space law, particularly for hybrid vehicles that act as both an aircraft and a space craft.

Notes on the discussion:

On the issue of NASA's efforts to encourage commercial development:

- *Mr. Wholley* noted that the COTS Demonstration public announcements indicated that NASA could enter into agreements with commercial participants to share NASA workforce and facilities, including for testing and evaluation purposes.
- *Mr. O'Donnell* noted that waivers issued to NASA contractors may constitute soft law because the Outer Space Treaty holds governments liable for the space activities of their citizens.
- *Prof. Gabrynowycz* responded that waivers are not soft law. They have been a part of the International Space Station Agreement and launch activity since NASA launched the first satellites.

On the issue of regulating comparative advertising in an industry with one participant:

- In response to a question from *Dr. Ospina*, *Ms. O'Brien* noted that such regulation is not possible right now, but after the industry develops, more providers will be available. *Ms. O'Brien* also noted that space companies may attempt to compare the safety of their services to other transportation services.

On the issue of customer consent and company liability under the new US launch regulations:

- *Prof. Christol* noted that if all of the space tourism companies met and agreed on language for an informed consent notice, their actions may be considered anticompetitive.
- *Ms. Yates* responded that companies have asked the FAA to provide language for an informed consent notice, but the FAA has not done so. She opined that each company likely will develop its own consent based on the notices used by extreme sports service providers. She did not perceive a problem with companies getting together to improve safety because such an agreement would not restrain trade.
- *Ms. Yates* was asked if the FAA has established rules to protect commercial ventures from overzealous lawyers. *Ms. Yates* responded that, initially, the FAA appeared to moving toward requiring passengers to submit more medical information, but commercial ventures rejected the proposal under the notion that each new regulatory obligation could lead to increased liability. The companies' concerns led the FAA to back away from requiring increased medical information.
- *Ms. Yates* was asked if providing informed consent notices to foreign citizens would qualify as an export under ITAR. She responded that such disclosure was probably not an export because the notices do not contain

technical information. She noted, however, that providing safety logs to foreign citizens may constitute an export because the logs often describe how a safety problem was fixed.

- In response to a question on liability, *Prof. Dempsey* explained that in 1920 there was a lot of concern over liability in commercial aviation and how such liability would be impacted by conflicts of law. The legal community produced conventions that resolved these issues. In the space tourism context, insurance companies will respond to catastrophe by driving up rates leading to international consensus on liability.

On the issue of public reaction to and simplification of the FAA's regulations:

- In response to a question from *Prof. Jakhu, Ms. Yates* noted that the FAA estimates that five to six companies will join the space tourism industry over the next ten years. During the comment period, the FAA received comments from approximately 25 companies and private citizens.
- *Prof. Dempsey* noted in response to a question that the US has attempted to use more common language in its regulations to ensure operators and consumers can understand them.

On the issue of international operations under the FAA's rules:

- *Dr. Azcarraga* noted that many other countries have looked to the FAA's certification rules to create their own launch certification rules. While the US will lead the way in regulating space activities, there is a conflict of interest with other nations that may not impose such strict requirements on operators.
- *Prof. Dempsey* responded that there likely will be states of convenience despite Article 6 of the Outer Space Treaty. He suggested that the next step in space transportation will require EU and FAA rules to apply to all space operators.

- In response to a question regarding how the FAA's decision to certify Virgin Galactic's service as an aircraft intersects with the USA's obligations under Article 6 of the Outer Space Treaty, *Dr. von der Dunk* responded that US legislation on space activities refers to "flight participants," not "passengers" so that the aircraft treaties and space law treaties are not confused.

On the static nature of space law in the face of a developing space tourism industry:

- *Prof. Zhukov* noted that space law is static, and asked about the future of international space law in the space tourism sphere.
- *Dr. van Fenema* argued that when national laws create conflicts between countries, international regulations must be implemented.
- *Prof. Andem* commented that private international law for space activities must be developed.
- *Dr. Azcarraga* noted that international space law was written in a different political climate and the law may need to be adapted.
- *Dr. Dempsey* responded that the space treaties were written with the objective to maintain outer space military-free. The drafters were not looking at commercial development of space. The conventions were not designed to deal with tourism or exploitation.

SESSION 2A - LEGAL ASPECTS OF DISASTER MANAGEMENT

SESSION 2B - PROPERTY RIGHTS ON THE MOON AND LEGAL ISSUES

Chairmen: Prof. Sergio Marchisio (Italy), Prof. Juan Faramiñán (Spain)
Rapporteur: Dr. Sylvia Ospina (Colombia)

This session was divided in two parts: the first one dealt with the legal aspects of disaster management, and the second with property rights on the Moon and Legal

Issues. A total of 10 papers were presented, two of which were summarized.

Dr. S. Ospina's paper dealt with the role of satellites, both remote sensing and telecommunication spacecraft, in times of disaster. The author presented a summary of the Disasters Charter and the Tampere Convention, their differences and similarities. The author highlighted recommendations made by groups involved in disaster and rescue operations, the principal one being the need to relax some of the regulatory and licensing requirements, and / or expedite these procedures; the need to harmonize type approvals for equipment being taken into the territory to provide emergency or relief communications. Lastly, she recommended the need for cooperation between operators of both kinds of satellites, as well as between the different agencies (UN, ITU, and regional organizations, such as CITEL, CTU, etc.) involved in disaster relief efforts, whether prior, during or after the event. More effective assistance could be provided, and greater harmony achieved, by joining the Disasters Charter, and also ratifying the Tampere Convention.

Prof. Hashimoto presented a "case study" of the Asia Satellite Centre, on Tsunami Disaster relief, stressing the importance of information at all levels. He mentioned that after the December 2004 tsunami, the government was essentially wiped out in the Aceh province, and that communications and information are fundamental in disaster relief. He set forth a hierarchy of information systems, based on geography: beginning with regional, then national, and down to the local. The Asia Centre will become a database archive for disaster relief activities, thus playing an essential role even during emergencies.

Dr. O. Ribbelink spoke on the Disasters Charter and GMES, posing a series of important questions, such as: who selects what territory or event is to be monitored by GMES? What to do with all the data that is going to be collected, and who will decide

who gets to see and / or use the data? He stated that these are worrisome items, as it is impossible to find out who will be making these decisions. At the European level, several of the space agencies, as well as departments or directorates of the European Commission will be involved, also putting into question the privacy of data and individual privacy. He concluded that there is some responsibility to provide some protection, especially when the State does not react or respond, and where there may be a humanitarian crisis, such as in Darfur.

The second part of the session dealt with property rights on the Moon, and legal issues.

Dr. von der Dunk summarized Prof. G. Gal's paper on the "Interpretation of Article II of the Outer Space Treaty", concluding that Art. II is "self-executing." He also stressed that this Article does not allow for any claims of national sovereign property rights over any part of outer space.

Prof. Pospisil, a physicist from the Czech Republic stated that he would "try to convince" the audience that the Moon is something special, and is a "precious natural resource," with special characteristics which need to be respected. Therefore, the Moon Treaty should be updated, as specified in his paper. In addition to citing several articles of the Moon Treaty to support his arguments, he stated that there is a need for new rules for the Moon, taking into account its special characteristics. Thus, only the near side of the Moon should be exploited or exploited, but for a limited time. The dark side of the Moon (which is never seen from Earth) should be used only for scientific purposes. Even though his paper is entitled "Update of the Lunar [Moon] Treaty".

Ms. C. Jimenez-Monroy spoke on the creation of a legal framework for sustainable development of the Moon, and the need to have "in-situ resource utilization" (ISRU) policies. While observing that there is no life on the Moon, she also stated that any change

to the Moon would have some impact on it. As to considering the Moon as part of the “common heritage of mankind”, she stated that it was not clear whether appropriation of natural resources would be allowed or not. To conclude, she stressed that the Moon Agreement is not a “dead document”. (The author did not provide a hard copy of her paper, making it difficult to follow her arguments at all times.)

Dr. L. Martinez co-authored a paper with Dr. U. Bohlman, “Fly Me to the Moon,” which discussed some of the legal and political considerations of long-term space exploration initiatives. The authors are of the opinion that there seems to be more “watching” of space exploration (as in films and TV shows), than actually engaging in it, although different space powers are looking at each other, to see what the other is doing in terms of space exploration. There also seems to be a resurgence of government involvement in the outer space arena, although the USA is still the most commercial, particularly in regard to space tourism.

Prof. P. Larsen’s paper, an update on the Status of the UNIDROIT Space Protocol, was summarized by P. Vorwig. While the Aircraft Protocol has come into effect, and ICAO is the Supervising Authority thereof, not much progress has been made on the Space Protocol. The main obstacles have to do with assets and liability, and their meaning under different legal systems. However, the proponents of the Space Protocol consider that working on it should continue, as in the long run it will be beneficial.

Dr. J. Pearce spoke on the “Application of Free Trade Zone Concepts to Space Development.” He stated at the outset that he would “discard the Moon Treaty, and look at the Outer Space Treaty instead, what it allows, and what it does not allow. Activities in space are still under State supervision, and responsibility (Art. VI and VII, OST). He suggests using a “Free Trade

Zone” concept, particularly in regard to the Moon. The question, however, is whether private parties would be willing to invest under this kind of legal regime.

Dr. Yun Zhao presented good arguments for the creation of a special patent / legal regime for outer space inventions. He noted that there are several key elements to intellectual property, one being the novelty of the invention, and another important factor is the time when the invention was made. In regard to the International Space Station (ISS), only States, not individuals can be owners of the IPRs, but he suggests a special patent regime, that would provide international and national protection to the inventor.

(Dr. Zhao’s paper was the winner of the 2006 Diederiks Award.)

SESSION 3 - INTERNATIONAL COOPERATION IN SPACE ACTIVITIES, WITH SPECIAL FOCUS ON REMOTE SENSING

Chairmen: Dr. Joanne I. Gabrynowicz (USA) and Dr. José Monserrat-Filho (Brazil)

Rapporteur: Dr. Martha Mejia-Kaiser (Mexico)

Session 3 started with the presentation of the paper ‘European Transformation Countries on their Path to ESA’ by Dr. Mahulena Hofmann (Czech Rep.). She commented that some years ago, Hungary, the Czech Republic and Romania participated in various programs of Intercosmos, but without any influence in the decision making. Financial shortages in national space programs at the end of the cold war motivated these States to request for participation in ESA. Dr. Hofmann examined the cooperation agreements with ESA and presented the pros and cons of the different forms of participation forms (full membership, associate membership, participation in ESA programs). The author is of the opinion that by introducing the

Intercosmos know-how into ESA, those States could terminate the anomaly of the cold-war era in space activities.

The second paper presented was 'Eumetsat International Cooperation Activities', authored by Dr. Werner Balogh and P. Valabrega (Germany). This paper outlined the growing and complex data distribution network between Eumetsat, its counterparts and users. The authors were of the opinion that this clear and unproblematic mode of meteorological data distribution should serve as a model for an integral international cooperation in the generation and dissemination of satellite remote sensing data.

Prof. Juan Manuel Faramiñán and Ms. Ma. del Carmen Muñoz authored the paper 'The Cooperation Between ESA and EU Regarding the Earth Observation'. The authors noted that the EU together with ESA are defining a space policy and space programs for Europe, as space activities become an important aspect of European integration. On this basis, the Global Monitoring for Environment and Security (GMES) is supported. Prof. Faramiñán and Ms. Muñoz addressed the legal and institutional instruments to implement the GMES system.

Ms. Masami Onoda (Japan) presented the paper 'Monitoring Greenhouse Gases from Space and the Kyoto Protocol'. Ms. Onoda commented that the Kyoto Protocol obliges State parties to cooperate with self-information about gas emissions in their territory. She was of the opinion that, in addition, other sources of information are required to ensure control and compliance. She raised the possibility of satellite remote sensing serving as a central monitoring tool in order to overcome the sensitiveness of States. But Ms. Onoda underlined that the Kyoto Protocol obligations only address the monitoring of anthropogenic (man-made) emissions. She regretted that it is not possible to perform anthropogenic emissions analysis by satellite remote sensing images

only, because the last ones can not be used to distinguish between man-made and natural emissions. The author concluded that, at present, spatial teleobservation for environmental treaty compliance can only play a complementary role in a monitoring system.

The paper 'Global Spatial Data Infrastructure: Issues for Space Law and International Cooperation' was authored by Satya Sagar and Debarupa Banerjee (India). The authors examined several issues arising from the concept of a Global Spatial Data Infrastructure (GSDI), which is the widespread sharing of geographic information on a global level. They commented on the growth of the GSDI and its market orientation. They examined various legal and policy issues of GSDI, such as privacy, copyright and liability. The authors commented on the concern that raw data and other remote sensing products can not be protected under copyright, which is a hurdle for the development of GSDI. As only one of several complex legal questions, the authors identified the legal issues of damages arising from mistakes in the data analysis and presentation. They concluded that there is a need to bring such issues to a single forum for solving the emerging problems of GSDI.

The paper 'The Importance of International Cooperation in Building National Space Data Infrastructure in All Countries' was presented by Prof. José Monserrat Filho (Brazil). With this paper, the author underlined the promotion of economic and social progress, in particular of the developing countries, as a goal stated in several relevant United Nations documents. He commented that this legitimate right could be supported through the access and exploitation of geospatial data by developing countries. Prof. Monserrat referred to the Brazilian delegation, which introduced a corresponding new item to the COPUOS agenda this year. The topic 'International Cooperation in Promoting the Use of Geospatial Data for Sustainable

Development' will be addressed in the next three sessions of COPUOS, with the purpose of fostering international cooperation for remote sensing data gathering, process, analysis and application. He is of the opinion that each country must have the required capacity to work with remote sensing data.

Mr. K. Mukhija and Y. Goyal (India) submitted the paper 'An Analysis of Issues Arising from the Commercialization of Remote Sensing Activities'. The authors of this paper presented an analysis of the copyright and other intellectual property formulas for the legal protection of remote sensing images. They addressed the Indian copyright legislation (as amended in 1994) which requires an 'author' to be the person who creates the work. The authors considered this definition also to apply to remote sensing satellite owners. Nevertheless, Mukhija and Goyal are of the opinion that at present there are no adequate legal international instruments to protect all products. They commented that international cooperation is needed for the creation of proper legal protection. They considered discussions in WIPO about intellectual property rights for space products as a good starting point for the drafting of a convention about remote sensing. Such a convention could provide conditions for "...the exercise of specific copyright" relating to satellite imagery.

The paper 'Remote Sensing Data: Some Critical Comments on the Current State of Regulation and Reflections on Reform' was presented by Dr. Lesley Smith and Ms. C. Doldyrina (Germany). The authors provided an overview of several aspects of the legal protection of satellite remote sensing images. After referring to some national legislations and space policies for remote sensing distribution of spatial systems (US, Russian Fed., Canada, EU, India), the authors addressed the different legal protection formulas used in distribution agreements (copyright, EU Database Protection, classified information, etc.). Dr.

Smith and Ms. Doldyrina questioned the applicability of the copyright formula to automatically generated data. In respect to EU Database Protection, the authors referred to several decisions of the European Court of Justice, which held that "...a right cannot be derived from the mere creation of a database". The authors found highly questionable that under those Court decisions such protection applies to remote sensing operators, who only invest in creating a database. They proposed to create precise and clear definitions of remote sensing products, to identify proper legal protection for each of those products and to internationally harmonize the different licensing approaches. For this task, they suggested UNIDROIT as the forum to draft a model law.

The paper by Dr. Maureen Williams (Argentina) on 'The Registration Convention Thirty Years On' was summarised in her absence. Dr. Williams stated that the Registration Convention is insufficient in the current scenario, resulting in the difficulty to determine the link between spacecraft damage and the liable State. She suggested to up-date the Registration Convention through UN Resolutions or other international instruments. She also proposed efforts at national level for appropriate legislation on registration.

Dr. Marianna Morelli (Italy) submitted the paper 'Public and Private Interest in Remote Sensing Activities: the Need for an Effective Legal Environment'. In her presentation, Dr. Morelli identified the balance between public and private interests in remote sensing data as the central political and legal question. She considered that State interests in the protection of data of their own territory have decreased, while the freedom of using remote sensing data from any part of the world has become stronger in recent years. But the tendency to privatize remote sensing activities may produce a distribution problem. She proposed a synergy between public and private interests, in light of the

present effort of protecting the world environment.

Mr. Bruce Mann (Canada) presented the paper 'Drafting Legislation to Regulate Commercial Remote Sensing Satellites: A How-to Guide from Canada'. Mr. Mann participated in the drafting of the Canadian Remote Sensing Space Systems Act. The Act was already approved by the Canadian Parliament (Nov. 2005) and soon will enter into force. He provided background information about several important provisions of the Act, like licensing, shutter control, government data priority access, liability, inspections and audits. Under the new Act, non-governmental and governmental institutions (like the Canadian Space Agency) will require a license for the operation of remote sensing systems. Mr. Mann pointed out that UN Principle XII on Remote Sensing will become a mandatory licensing condition in Canada, i.e. it will be compulsory for the licensee to offer raw data to sensed States on a timely base and at reasonable costs.

Dr. Kai-Uwe Schrögl (Germany) presented the position paper of the International Academy of Astronautics named 'Cosmic Study on Space Traffic Management' with contributions of several researchers in the legal and technical field. This study focuses on the growing problems of space debris and launching activities. The authors are of the opinion that space traffic management is necessary for avoiding physical or radio-frequency interference during access, operation in outer space and return to Earth. Although the authors acknowledged that such traffic management will reduce the freedom of space activities, they concluded that legal and technical mechanisms must be explored in order to outline a comprehensive space traffic management with economic benefits for all countries.

SESSION 4 – SPACE LAW AT TIMES OF ARMED CONFLICT

Chairmen: Prof. Jonathan Galloway (USA) and Dr. Ram Jakhu (Canada); *Rapporteur:* Kelly Gable (USA)

Prof. Maurice Andem (Finland) presented his paper "The question of legitimacy of threat or use of force in and from Outer Space: a reflection on the sanctity and legal binding force of the Charter of the United Nations and the 1967 Outer Space Treaty." Prof. Andem recalled the vision of peace among nations held by the founders of outer space law, and discussed the sanctity of outer space. He analogized the UN Charter, the "Bible of International Law," to a contract, and said that the sanctity of contracts is common law in itself. Prof. Andem concluded that states' compliance with the Charter is what will bring peace to the world. Regarding the question whether the use of remote sensing satellites for military purposes is illegal, he argued that it is not right to use force whatsoever, and that there is no equality or morality to using satellite for non-peaceful purposes because developing nations do not have the resources to do so.

The next paper, "Contemporary doctrine of self-defense in Outer Space" by Prof. S. Bhatt (India) was summarized by Ms. K. Gable. Prof. Bhatt analyzed the contemporary law on individual and collective self-defense. In doing so, he took into consideration the UN Charter, the Chicago Convention of 1944, and the Outer Space Treaty of 1967. Prof. Bhatt then applied the analysis to current international events, including acts of global terrorism such as the September 11, 2001 attack on the United States, and discussed how these events have impacted global security and self-defense.

The third paper, "Military applications and Space Law" by Prof. Gabriella Catalano Sgrosso (Italy), was also summarized by Ms. Gable. In the first part of the paper, the author analyzed the effects of technological process on the relationship between war and space within the context of current national

and international regulations, as well as space militarization and the limits put upon it in order to safeguard outer space. In the second part of the paper, the author analyzed the security and defense concepts of individual States, including the Strategic Defense Initiative (SDI), the Russian Defense Initiative (SSDP), SALT I, SALT II, the Limited Test Ban Treaty, the Non-Proliferation Treaty, START I and START II. In the third part of the paper, the author focused on the European Union's concern with the increasing militarization of outer space and the resulting Green Paper and White Paper.

"The Ambit of the Law of Neutrality and Space Security" by Mr. Michel Bourbonniere (Canada), was presented by Mr. Ricky Lee. Mr. Bourbonniere examined the origins and effects of the law of neutrality and its application to the US doctrine of space control, and argued that neutral rights and duties in space are a corollary of the theory of space control promoted by the US doctrine. First, the author argued that the law of neutrality confers on neutral states protection from belligerent acts such as those either expressed or implied by the doctrine of space control. Second, the author argued that the international community is at a diplomatic stalemate on the question of weaponisation of space. The author concluded that the law of neutrality remains a primary normative structure in regulating the practical effects of the doctrine of space control.

Prof. Steven Freeland (Australia) presented his paper "The applicability of the Jus in Bello rules of international humanitarian law to the Use of Outer Space." Prof. Freeland discussed how the development of technology has led to outer space being used more frequently during armed conflict, and that this mandates an understanding of the extent to which international humanitarian law applies to outer space activities. He stated that the existing treaties do not cover every eventuality in outer space and that,

therefore, recourse must be made to other sources of applicable legal principles, such as international humanitarian law. Prof. Freeland concluded that: (1) there is an increasing danger that outer space will become a theater of war; (2) the development of more technological uses of outer space heightens that danger; (3) virtually all countries are dependent on space technology, including satellites, that may be considered military targets; (4) some fundamental principles of international humanitarian law would apply to military action in outer space, but the enormity of the consequences of a space war is such that one cannot be sure how these principles would apply; (5) it is necessary to develop specific rules and standards that categorically sanction the weaponization of outer space and the engagement in any form of conflict in outer space and against space assets; and (6) in developing new rules and standards, the "collective humanity" principles of outer space law must be strictly adhered to.

There were a number of questions for Prof. Freeland.

- First, *Prof. Mark Sundahl* (USA) asked whether a state would be able to protect assets from being attacked. Prof. Freeland responded that the right to self-defense, with its attendant principles of necessity and proportionality, would apply to this situation.
- Next, *Mr. Phil Meek* of the US Air Force disagreed with the idea that activities against space assets are illegal and stated that the principles of proportionality and discrimination are not difficult to apply in practice. Prof. Freeland disputed the idea that application is easy and clarified that the point of his paper was that, although international humanitarian law principles do apply in outer space, they are not sufficiently directed to future unknown consequences in outer space.
- Finally, *Mr. William Marte* of the Space Policy Institute in Washington, DC asked whether the International Court of

Justice might give an advisory opinion on the use of space weapons similar to that regarding nuclear weapons, or whether there might be a UN Resolution regarding this issue. Prof. Freeland responded that the UNGA passes a resolution on the prevention of an arms race in outer space every year, and that a treaty on the subject would be difficult to realise.

Prof. Gennady P. Zhukov (Russia) presented his paper entitled "Legal status of dual-uses satellite systems." Prof. Zhukov analysed the legal status of double-use satellite systems and outlined the need to strengthen the immunity of satellite systems due to the threat of international terrorism. He emphasised the need for a multilateral treaty granting immunity to all satellite systems, including purely peaceful satellite systems and dual-use satellite systems. He discussed how bilateral treaties might be turned into multilateral treaties, and described how that would further the goal of granting immunity to these systems.

Next, Prof. Mark Sundahl (USA) presented his paper entitled "Information Warfare: the legal aspects of using satellites and jamming technologies in propaganda battles." Prof. Sundahl addressed the hypothetical question of whether a state may use DBS technology to broadcast a commercial news program into an enemy state in time of war as part of a campaign to win the support of the civilian population. He argued that such commercial news programs do not rise to the level of illegal war propaganda and would not be prohibited by the requirement that outer space be used purely for peaceful purposes, and therefore the prior consent of the receiving state is the only restriction on the broadcasting of such a program. Prof. Sundahl concluded that the prior consent doctrine may be threatened by the United States' recent relaxation of self-defense theory. Finally, the author touched briefly on the right of states to use jamming technology to block illegal satellite transmissions.

There also were a number of questions for Prof. Sundahl.

- First, *Mr. William Marte* asked whether a state being invaded would give consent to such propaganda broadcasts and, therefore, whether the law discussed would be applicable. Prof. Sundahl agreed that a State would probably not give such permission.
- Second, *Prof. Gabrynowicz* stated that she found it curious that Prof. Sundahl put CNN and Voice of America in the same pot, so to speak, as one is a commercial enterprise that could be biased depending on one's viewpoint and the other is straight propaganda. Prof. Sundahl recognized that this was a legitimate concern, but that he had assumed for the sake of discussion that these are content-neutral disseminations - however he acknowledged this may not be so.
- Third, *Dr. Mareni Pichler die Ortega* asked whether, in times of peace, it is necessary to have prior consent. Prof. Sundahl said that yes, prior consent is necessary.
- Finally, *Dr. Frans von der Dunk* said that Prof. Sundahl overlooked *opinio juris* as the other aspect of customary international law and asked whether Prof. Sundahl suggested that states come out in the open about jamming as, if they did so, that might be customary international law. Prof. Sundahl responded that a proper response to this question would require research, but that he believes that states would say it is their right to jam under customary international law.

Ms. Amal Rakibi (France) presented her paper entitled "Galileo's Public Regulated Service: from security to military applications?" Ms. Rakibi described that Galileo is meant for civil purposes and will bring together the European political and space institutions. She argued that nothing

prohibits the Public Regulated Service, one of the five service groups of Galileo, from being used for military purposes, but that there are a number of impediments to such use. The chief impediments are the lack of unanimous European will, the overlay of signals, and the access to the encrypted codes and data. Ms. Rakibi concluded that Galileo will not be fully justified without a “dual-use” dimension, and that the barriers to such dual use are more political than legal.

There were several questions for Ms. Rakibi.

- First, *Dr. von der Dunk* asked how the system would deal with the issue that the private operator of the system will want to sell services to anyone who can pay for them. Ms. Rakibi responded that the paper does not analyze commercial issues, but focuses on public international law issues.
- Next, *Mr. Ian Gibson* of the British National Space Center commented that he believes Ms. Rakibi slightly misinterpreted the term “dual use” and suggested looking at Skynet 5 where the civil systems are separate from the military applications. Ms. Rakibi responded that different professions seem to have different definitions of “dual use” and that her definition is to distinguish between civil and military applications because civil applications always have commercial applications.

Prof. Carl Christol (USA) presented his paper entitled “Hurricanes and Remote Sensing.” Prof. Christol discussed the applications of the Remote Sensing Principles of 1986 to current environmental issues and described the great effectiveness that satellites have had in capturing environmental data. Prof. Christol discussed the science behind hurricanes in particular, including global warming, and the research and monitoring activities that various national and international governments and organizations, such as the WMO, UNEP and EUMETSAT, have undertaken in studying

this and other environmental issues. Prof. Christol stressed that we need to achieve a higher degree of prevention of environmental problems and that satellites can be instrumental in doing so.

In a reaction to this paper, *Mr. Roger Leonard* argued that the connection between carbon dioxide production and global warming is not certain, and that global warming may not be the cause of stronger hurricanes. Prof. Christol responded that the information in his paper comes from regularly conducted scientific polls, and that the science in this area is advancing quickly.

Notes on the discussion:

On the issue of the interpretation of international law:

- *Dr. Ali Akbar Golrounia* (Iran) told about how, when he first started studying outer space law, Prof. Velazquez said that international law is the law of the jungle. This sounded strange to him at the time, but it seems true today, especially in reference to international humanitarian law. The outer space treaties state that outer space is only for peaceful uses, and this does not mean that States may use technology in the way they are now discussing. He argued that the treaties are being interpreted in this way because it is in the interest of those that currently have power to do so.

On whether the Outer Space Treaty is valid during times of armed conflict:

- *Prof. Gabrynowicz* called the session’s attention to a paper just published in the *Journal of Space Law* authored by Latoya Tate, regarding the status of the Outer Space Treaty during war and measures short of war. This paper found that the Outer Space Treaty is a lawmaking treaty, which means that it stays in effect during times of war, and found that, since World War II, the trend

in public international law has been to not suspend or terminate treaties in times of war – that is, there is a growing presumption that treaties stay in force during times of war, as this is when the treaties are most needed.

- *Dr. Jakhu* agreed; the consideration that the Outer Space Treaty is valid during armed conflict and the matter of the hierarchy of legal norms, especially contemplating the UN Charter, international humanitarian law, and the outer space treaties are of prime importance
- *Prof. Andem* responded that the real question is “what is international law.” He noted that the drafters had to look to other laws, maritime law for example, to make outer space law. He said that we, too, need to look to multiple sources of law in order to interpret outer space law, and that we need to read the laws in context, knowing the whole before we can know a part.
- *Mr. Ricky Lee* responded that, to the extent that the discussion is about international law, we must remember the special status of the UN Charter. Article 103 of the Charter says that if anything conflicts with the Charter, the Charter prevails. Accordingly, states are required to not follow the Outer Space Treaty if an obligation arises under the Charter, such as a General Assembly Resolution. He concluded that the Outer Space Treaty would continue to remain in force during war to the extent that it is not overridden.
- *Prof. Freeland* also agreed that the Outer Space Treaty would continue to apply during time of armed conflict, but that this is not necessarily the entire answer. He said that the Outer Space Treaty has fundamental gaps and is open to multiple interpretations. Accordingly, one must find legal principles to apply, and must recognize that a whole other body of law may also apply.
- *Prof. Yasuaki Hashimoto* (Japan) stated that we must remember that

international law includes the law of war.

- *Prof. Gabrynowicz* tied the last few comments together and clarified that no treaty stands in a vacuum, and that part of international law is the law of war, but that these can be tied together. She stated that the neutrality principle (not to harm non-belligerents) and the non-appropriation principle (space is available to all) have in common that they are intended to protect particular persons or things. She stated that what underlies the entire debate is whether to reopen the Outer Space Treaty for amendment, and that in her view it should not be so reopened because not only is it the underpinning of other treaties, but there are parts of it that one could not achieve today given the political administrations of various States.
- *Mr. Lee* agreed that the Outer Space Treaty cannot exist in a vacuum and that one needs to refer to other laws, but stated that one needs to resist the idea of looking too far away from the specifics of treaties that are specific. He said that article 103 of the Charter applies to obligations, not rights, and that article 51 of the Charter involves rights. Therefore, he would not think that the conduct of self-defense would override the Outer Space Treaty. In addition, article 51 applies to territorial sovereignty, and one cannot have territorial sovereignty in outer space, so there cannot be self-defense in outer space.
- *Prof. Andem* stated that the intent of the law must be complied with, and drew an analogy to civil law countries, which have a code that sets forth the law.
- *Prof. Christol* distinguished the two schools of law – the civil law system and the common law system. He recognized that the Charter states that words should be construed in the ordinary sense, but inquired as to what exactly that means. He stated that we

must look at the values underlying the words and that, when one does so, it seems that the literal interpretation of those words may not be the most correct; we must know the purpose and intent behind the words that are drafted.

SESSION 5 - OTHER LEGAL MATTERS, INCLUDING THE RELATIONSHIP BETWEEN GOVERNMENT AND PRIVATE SECTOR IN SPACE ACTIVITIES

Chairmen: Dr. Frans von der Dunk (Netherlands) and Dr. M^a del Carmen Muñoz Rodriguez (Spain)

Rapporteur: Ricky Lee (Australia)

The first paper was entitled “International Space Law in its First Half Century” by Prof. Stephan Hobe (Germany). Prof. Hobe described three phases of space law development: the first being the adoption of the United Nations space treaties, the second being the adoption of General Assembly declarations and the third being the interpretation of the adopted space law instruments. He suggested that there is need to find the motivation to develop new principles and, in particular, the need to revise and reform the Registration Convention and the Moon Agreement.

The second paper was entitled “Small States and Space” by Prof. Francis Lyall (United Kingdom). In his paper, Prof. Lyall reminded us that all States are juridically equal and there is a potential for the use of flags of convenience for spacecrafts. The same problems in maritime law, the competition for location of spaceports and the use of shell companies to avoid legal regulation are all relevant concerns. Prof. Lyall preferred for the International Telecommunication Union to play a more active role in the regulation of private space activities.

The next paper was entitled “The Future of Planetary Protection: Is There Reason for

Optimism?” by Dr. Leslie I. Tennen and Dr. Patricia Sterns (United States). In their paper, Dr. Tennen and Dr. Sterns raised significant concerns for forward contamination of other planets in human exploration efforts. They noted that steps are being taken to ensure that the forward contamination of Mars is quarantined and minimised and that this is a source for much optimism.

The fourth paper was entitled “For a Charter on Space as a Common Good” by Ms. Mélanie Vincent (France). In her paper, Ms. Vincent warned that emerging space powers may choose to challenge the existing space powers and become a potential source of conflicts. She suggested that vigilance is need to preserve peace in space for generations to come. She also suggested that attempts to privately appropriate land on celestial bodies must be condemned.

The fifth paper was entitled “Satellite Telecommunications as a Tool for Bridging the Digital Divide – Public International Law Implications” by Ms. Julia Neumann (Germany). In her paper, Ms. Neumann considered the impact of satellite telecommunications on the socio-economic development of a country and the scope and content of space law in relation to such a “right” to benefit from satellite communications.

The sixth paper was entitled “Reflection on Chinese Future Space Legislation” by Prof. Haifeng Zhao (China). Prof. Zhao provided a detailed insight into the space activities presently conducted by China and how such activities may be regulated by future domestic space legislation.

The paper “Lack of National Law in Iran, the Main Obstacle for Private Sector in Space Activities” was presented by Dr. Ali Akbar Golrounia (Iran). In their paper, the authors discussed potential space activities that may be conducted by the private sector, along with a compelling case for the need

for domestic legislation to regulate such activities in Iran.

The paper entitled “The Flight of Brazil’s First Astronaut” by Dr. Alvaro Fabricio Dos Santos (Brazil) provided us with an in-depth insight into the exploits of the first Brazilian astronaut and the impact of his flight on the development of space law in Brazil.

The paper “GNSS Third Party Liability: The European Experience of Galileo” was written by Ms. Chiara Lucchini Gilera (Italy). She suggested that the main problem with the consideration of liability issues with Galileo is the lack of precedent in the area, even with reference to the NAVSTAR global positioning system. She opined that liability is best limited in order to enable insurance cover or the establishment of an international compensation fund.

The next paper was entitled “Taking Garbage Outside: The Geostationary Orbit and Graveyard Orbits” by Dr. Martha Mejia-Kaiser (Germany). In her insightful paper, Dr. Mejia-Kaiser discussed the problem of congestion in orbits around the Earth, especially the geostationary orbit, and provided some interesting suggestions for the future legal regulation of such orbits with a view to reduce the debris left behind.

The beforelast paper, “In Defence of Advertising in Space”, was presented by Dr. J. H. Hubert and Mr. Walter Block (United States). Dr. Hubert and Mr. Block made a case for the freedom to advertise in outer space, though with reference only to United States domestic legal norms and not to any international law.

The last paper was entitled “Applying International Space Law Precedent to Space Tourism, Mining and Settlement” by Prof. Edythe Weeks (United States). The paper provided an interesting approach to the formulation of the law concerning future human space activities.

Notes on the discussion:

During the discussion that followed, the following comments and points were made:

- *Dr. Lubos Perek* proposed an award for the worst use of space and suggested the billboard in space as a strong contender.
- *Prof. Joanne Gabrynowicz* warned of the dangers of implementing the *Homestead Act* and other US domestic law to outer space. In any event, the *Homestead Act* had significant problems in implementation in the medium to long term.
- *Dr. Sylvia Ospina* reacted to Prof. Hobe’s suggestion of amending the Registration Convention and said that it is required to make it more enforceable, such as to deal with insurance aspects.
- *Dr. Roger Bernard* asked about the application of domestic and international space law and the various priorities that may be given by lawyers to them. *Dr. Frans von der Dunk* clarified this by emphasising the delineation between domestic law and international law, such as that of the *Homestead Act*. Dr. Bernard asked why the IISL felt a need to clarify private property rights on the Moon; Dr. von der Dunk stated that the reason was to clarify for those who bought Moon plots that they are worthless as property titles.
- *Dr. Hubert* said that private property rights is the best way of regulating activities in space.
- *Mr. Lee* then pointed out that the issue of billboards in space may have some cover in relation to international law rather than reference only to domestic law and a study along such lines would be better framed.
- *Prof. Gabrynowicz* discussed the legislative development of the domestic law on remote sensing in the US which was done with a view for the commercialisation of the remote sensing industry and, in its failure, ended up to remove Landsat from commercial practice and place it in the public sector and operate it as a public asset.