

SESSION REPORTS OF THE COLLOQUIUM IN BREMEN

**Philippe Achilleas, Martha Mejia-Kaiser, Liara Covert,
Ulrike Bohlmann, Gerardine Goh**
(edited by *Tanja Masson-Zwaan*)

A) SESSION 1 - LEGAL ASPECTS OF APPLICATIONS AND PRIVATE SPACE ACTIVITIES

Chairmen: Prof. Maurice N. Andem
(Finland) and Mr. Hermann Ersfeld
(Germany)

Rapporteur: Prof. Philippe Achilleas
(France)

*(Due to unforeseen circumstances
beyond our control, the report of session
1 could not be published in this volume –
our apologies to all concerned).*

B) SESSION 2 - SPACE TREATIES, LAW AND POLICIES AND TELECOMMUNICATIONS ISSUES

Chairmen: Dr. Peter van Fenema
(Netherlands) and Mrs. Lesley Jane
Smith (UK)

Rapporteur: Martha Mejia-Kaiser
(Mexico)

Mr. Tare Brisibe (U.K.) presented the paper "Broadcasting-Satellite Services in Airspace of the High Seas: Some Legal and Regulatory Considerations". This paper addressed the legal issues arising from the direct broadcast satellite service (DBS) offered to airborne passengers, primarily on long range aircraft, while traversing the airspace of the high seas, including relevant polar regions. In the search of comprehensive regulation for this new service on board aircraft, Mr. Brisibe revised the UN Convention of the Law of the Sea (1982), the Chicago Convention on International Civil Aviation (1944) and the ITU

Constitution, Convention and Radio Regulations. Mr. Brisibe concluded that there is no international regulation on this issue, and that it is necessary to establish clear, consistent, predictable and enforceable legislation, before the introduction of this technology may raise unforeseen social and ethical issues.

The paper "The Crystallization of General Assembly Space Declarations into Customary International Law" written by *Mr. Ricky Lee* (Australia) and *Mr. Steven Freeland* (Australia), addressed the results of an empirical exercise. They applied the "custom test" to specific provisions of the declarations concerning remote sensing, direct television broadcast, nuclear power sources and cooperation, in order to see if these General Assembly (GA) resolutions have crystallized into customary law. Taking into account the basic elements in establishing a principle of custom, as considered by important authors, *opinio juris* of the International Court of Justice and the International Law Commission, Lee and Freeland divided the General Assembly declaration provisions into three groups: repeating provisions, applying provisions and new provisions. They concluded that the GA provisions have, with exception of the Cooperation Declaration, substantially crystallized into custom.

In the paper "The Concept of 'Peaceful Purposes'/'Peaceful Uses' in the

Exploration and Use of Outer Space. Some Practical Examples” *Mr. John Gantt* (USA), examined the concepts “peaceful purposes” and “peaceful uses” of the space treaties under some relevant provisions of international law. He commented that United States pressed to have these concepts in the form of a binding treaty. Nevertheless, US later adopted the approach to consider them as “non aggressive”, making them fit with Art. 51 of the United Nations Charter (right to self defense). He mentioned that Art. 51 gives implicitly the right to establish defensive measures prior to any armed attack, and this may include space-based defensive objects. He concluded that in the Intelsat, Eutelsat and Inmarsat agreements, the drafters interpreted “non-aggressive” uses as being consistent with the concepts of “peaceful purposes/uses”.

In his presentation “More Peaceful Use and International Cooperation in Outer Space Activities” *Prof. Toshio Kosuge* (Japan) stressed the existence of a wide technological gap. Although the communications technology using satellite networks has increased in the recent years, in some countries there is a lack of basic infrastructure for accessing telecommunications means. He commented that the efforts of the ITU in respect to “The New Missing Link” should lead to a new role of effective and practical management of limited resources, which could be regarded as common heritage of mankind. Mr. Kosuge made reference to two Japanese satellite experiments to develop satellite communication networks systems.

Ms. P.M. Sterns & Mr. L.I. Tennen (USA) presented “Space Law in the 21st Century: The Outer Space Treaties

Revisited”. The paper focuses on commercial uses, and issues like:

- (1) Which is “appropriate State” for continuing jurisdiction?
- (2) What is “launching State”?
- (3) Harmonisation of various national legislation
- (4) Liability can be determined through bilateral and multilateral agreement.

A level of consistency between licensing practices important; these should be harmonised and implemented by States on a case-by-case basis. Existing Treaties should not be amended. The Registration Convention should be made more detailed, and uniform for various national registration legislations. Dispute resolution mechanisms should be established. States have not agreed that the dispute resolution mechanisms would be binding – this is a major issue inhibiting commercial use of outer space. A broad sweeping set of changes is proposed to the Moon Agreement. There is a proposed inference to leave moratorium out of the Agreement. More realistic rules would be necessary. The most controversial would be the “Common Heritage of Mankind” phrase. The proposal is to delete and replace with “Province of Mankind”.

With the paper “Article I of the Outer Space Treaty and the International Telecommunications Union” *Prof. Francis Lyall* (U.K.) elaborated that the ITU has recently faced a reduction in the contributions of its members that may indicate a level of dissatisfaction with ITU. He noted that some events, like the “World Summit on the Information Society”, may not have a impact on the needs of many countries. Prof. Lyall commented that the “digital divide” between countries which are analogue-based in their telecommunications and

countries using digital technologies, is a major concern ITU needs to address. ITU has shortcomings, being slow for starting new initiatives or being timid when there is the need to refuse registration of certain frequencies and orbits in favor of general world interests. Nevertheless, Prof. Lyall concluded that the ITU has gone a good way of meeting the requirements of Art. I of the OST, in the sense that outer space should be used for the betterment of all.

The paper "Snapshot: the Process of Change in International Space Law Politics", by *Mrs. Edythe Weeks* (USA) focused on the question to what extent international space law prohibits or permits private for-profit space tourism. Mrs. Weeks pointed out that usually this question is linked to private property rights on outer space. She commented that many space lawyers state that international space law permits private property rights because there is no explicit prohibition, but at the same time consider space tourism to be prohibited. She proposes to separate the two issues. Mrs. Weeks concluded that there is an interpretation gap between space entrepreneurs linked to particular industries and space lawyers linked to industry, academia, government, etc. The time would have come to bridge this gap, in order to clarify what is permitted or prohibited in outer space.

Mr. Golrounia and *Mr. Bahrami* (Iran) presented the paper "Legal Principles of Exploration and Use of Outer Space: Past Achievements and Future Challenges". The authors outlined the change of the drivers for space activities, from prestige and security to economic reasons. The growing presence of the private sector in outer space triggered

space legislation for protecting economic interests, instead of strengthening the benefit of all the countries referred to in the OST. The authors concluded that space technology can improve, among others, education and health services, making it necessary to develop space law into the direction of the common interest. They also commented that new problems, like environmental control, space debris, space navigation, etc., require the setting of standards and recommended practices for technical aspects.

Mr. Gyula Gál (Hungary) examined in his paper "Some Remarks to General Clauses of Treaty Space Law," three characteristic general clauses of Space Law: province of mankind, envoys of mankind and common heritage of mankind. "Mankind" being the nucleus of all three general clauses, Mr. Gál revised the meaning of this concept which commonly comprises only human beings, independently of politically motivated States. Although some authors assert that "Mankind" is a subject of international law, Mr. Gál is of the opinion that it does not yet meet all the requirements to fall under this label. In respect to the "Common Heritage of Mankind" concept, Mr. Gál considered this more a philosophical and political concept than a legal one.

In the paper "Interpreting Article II of the Outer Space Treaty" *Mr. Wayne White* (USA) discussed the interpretation of Art. II of the OST on the "prohibition of appropriation" of outer space, the Moon and other celestial bodies. Mr. White reported of the increasing sale of deeds to real property on the Moon and other celestial bodies by private organizations. Several private internet

web sites are used to register claims of property in outer space or to promote legal initiatives for the award of property rights in outer space. He stressed that the absence of national laws to the public in general that clarify Art. II of the OST has resulted in the current confusion and controversy. He concluded that there is need to clarify the law and to implement national legislation and international consultations in this respect.

The paper of *Ms. Isabel Pessoa-Lopes* (Portugal), "Space Policy Perspectives of the Space Generation" outlined the work of the Space Generation Forum (SGF), which is to consolidate the views of young space professionals regarding Space Policy issues and strategic plans and to help solving key questions of the international space workforce. As a response to the European Union Green Paper "European Space Policy", the SGF attempts to set up a formal mechanism for representing the input of young people in the European Union. A conference organized by the EU on European Space Policy will be held in Lisbon, Portugal, next year.

Mr. Xiaofeng Mo (China) presented the paper "National Liability for Damage Outside Territory Caused by Space Objects and Suggestion to China's Legislation". Mr. Xiaofeng mentioned that the Chinese government is working on national space legislation. One of the domestic legal instruments will be the "Interim provisions on the management of civil space launch". Mr. Xiaofeng suggested that issues like liability aspects, licensing systems, third party insurance should be taken into account. He underlined that the Chinese government is also working on a

comprehensive national action plan on research and monitoring of space debris.

Mr. Philippe Achilleas (France) presented the paper "Planetary Protection-Legal Issues". He informed about the works done by COSPAR and NASA on planetary protection standards, for missions conducted in outer space. He expressed the need for certain clarifications, e.g. for the expression "harmful contamination". COSPAR restricts this term to biological contamination. He found desirable that States exchange their contamination prevention technologies, potentially leading to an international cooperation program. Mr. Achilleas referred to a ruling of the International Court of Justice in 1977 calling for the absolute need to prevent environment damage, to avoid irreversible effects. In his opinion, this "prevention principle" gave birth to certain obligations of States and shall be regarded as the legal basis not only of our planet, but for planetary protection in general including the Moon and other celestial bodies.

Mr. Ricky Lee (Australia) and *Prof. Fernandez-Brital* (Argentina) presented the paper "Proposal for a Standard Curriculum and a General Course on Space Law". As a result of a proposal made during previous IISL colloquia and the "UN Workshop on Capacity Building in Space Law" (The Hague), the authors drafted the curriculum of a standard course of space law, that may provide guidance to educators in countries with limited practice and experience in space law. Taking into account other suggestions of the UN Workshop on a general course in space law to be conducted periodically by the IISL, they suggested some mechanisms

for the selection of teachers, legal materials, related treatises, articles, and the possibility to archive courses on videotape.

Discussion:

In respect to Art. II of the OST related to the prohibition of national appropriation of outer space, including the Moon and other celestial bodies, *Mr. Gal* asked *Mrs. Weeks* about her opinion on the prohibition "...by means of use or occupation, or by any other means".

Mrs. Weeks replied that Article II addresses "national" appropriation and thus binds States only, but not private persons. She commented that the absence of law in this respect, makes private property legal and permissible in this area. She also said that some concepts like "freedom of exploration" and "benefit of Mankind" are very diffuse and should be made clear. She stated that "space law" does not exist as "law" but as "space policy".

Judge Vereshchetin disagreed and stated that the existing legal instruments on space law are the basis to be taken into account in a dispute settlement, and the International Court of Justice could not consider mere political reasons. Some scientists seem to consider that "space law" does not exist. But definitely the introduction of national space legislations provides proof that space law is existing law. Despite the lack of clarity of many space law provisions, he was of the opinion that the existing legal instruments, general statements and principles are to be applied and interpreted by lawyers in an adequate form.

C) SESSION 3 - SPACE LAW AND INTERNATIONAL SECURITY

Chairmen: Mr. John B. Gantt (USA) and Dr. Yuri Kolossov (Russia)

Rapporteur: Dr. Liara Covert, (Canada)

The first intervention was by *Prof. Paul Larsen* (USA). From the perspective of an international working group, he summarized the restrictions and legal obstacles to trade based on the activities of UNIDROIT. He noted that a number of UNIDROIT conferences took place in 2002 and 2003, and also how a number of revisions to the draft space protocols leave the state of negotiations with States rather open-ended. *Prof. Larsen* distinguished between restrictions which are /aren't related to national security, and concluded that the absence of a widely-accepted international regulation for parties financing space-related contracts means actors are subject to existing national and international laws and regulations restricting trade in space assets. The draft protocol under negotiation offers new options.

Prof. Yasuaki Hashimoto (Japan), addressed how remote-sensing satellites and non-binding resolutions are useful tools in the promotion of regional security in a post-Cold War environment. *Mr. Hashimoto* explained that China, India, South Korea, Japan and other Asian countries have solely or jointly developed remote-sensing technology to promote peace and help monitor environmental threats not covered by past international security systems and laws. He recognized the need for a regional satellite centre, but also questioned the feasibility of creating such a multilateral organization for the purpose of strengthening regional security that touches on national defense.

He referred to the functioning of entities like the WEU, EU, NATO, the Asian Regional Forum (ARF) to support consensus-building.

Prof. Peter Van Fenema, (Netherlands), drew from the U.S. Arms Export Control Act and its implementing International Traffic in Arms Regulations (ITARs) to outline serious political and legal obstacles to international cooperation in satellite launches. He noted the serious problems encountered by U.S. and non-U.S. companies that wish to participate in international satellite launches and related activities with regard to space assets, which are regulated by the Office of Defense Trade Controls in the U.S. State Department. Since these assets are associated with national security, they're set forth in the Munitions List which complicates access to, movement of and specific use of any object for international trade.

Mr. Laurent Crapart (France) examined the history of export control laws from a European Community perspective. He emphasized the need to seek a balance between sovereignty and regional security, as well as to rethink the impact of export controls on commercial matters. Mr. Crapart recognized the existence of a European Code of Conduct in export control regimes for EC member states, as well as drawbacks to and lack of legal value of European export controls for non-EC states.

Prof. Maurice Andem (Finland) reflected on the 1963 Treaty Banning Nuclear Weapons Tests in the Atmosphere, Outer Space and Under Water. He summarized the highlights of 51 years of legal resolutions, treaties and events between the first nuclear test on 16 July 1945 to

the adoption of the Comprehensive Test Ban Treaty (CTBT) on 24 September 1996. He stressed moral, ethical and humanitarian reasons for redirecting energy and resources from the weapon development to alleviating world suffering. He stressed that interpretation of legal duties should follow this idea.

Prof. Kolossov summarized the paper by *Dr. Gennady P. Zhukov* (Russia), "Russia-MTCR Participant". Russia has been participating fully in the MTCR from October 1995. The national approach of Russia to implementing MTCR provisions has attracted attention. It is expected to reduce the probability that missile technologies would be exported without the knowledge of the Russian government. There has been a development of a code of conduct with respect to ballistic missiles – there is also a suggestion that the June 26 2003 CD review should consider a ground control system. This suggestion is based on the existing bilateral agreements in the area of missile applications with a data exchange centre to be established in Moscow. So the MTCR participating states consider this code to be the more advanced and promising of the present initiatives. There is a long list of rules and regulations for international trade.

Prof. Galloway read *Prof. Christol's* (USA) paper about the hybrid (commercial and military) character of remote-sensing (RS) and legal agreements which have evolved in the United States to guide exchanges of information and images obtained from outer space. On the one hand, the Department of Defense (DOD) operates agencies that engage in security-based

RS activities and guide the development of security policy. On the other hand, commercial imagery is obtained and controlled based on market interest and State sovereign rights to privacy. The security aspects of RS should be understood alongside foreign policy commitments and the state of international relations between the U.S. and other countries.

Mr. Gantt read *Mr. Skip Smith's* paper (USA) about safety and liability issues regarding the 2003 Columbia Shuttle disaster. Overlapping legal considerations are addressed under the Liability Convention, substantive U.S. laws such as the Federal Tort Claims Act (FECA) and Federal Employees Compensation Act (FECA). The Columbia Accident Investigation Board Report, examples of civilian contracts to defense and reference to international space law instruments help to guide an analysis of remedies under U.S. law.

"Peace in Space", a paper by the *SGC Working Group* was summarized by Liara Covert. This paper is a summary of specific work group of the Space Generation Advisory Council. It is based on the demise of the ABM, the problems with the MTCR etc. The main proposal is to establish a network, and have conferences on peace in space, thereby promoting a campaign to unify support for a treaty for the non-militarisation of space. In turn, it is hoped that this will contribute to

- (1) Prohibiting primary conventional weapons in space; and
- (2) Reporting evaluation, public examination and the passing of appropriate recommendations to people in charge.

Dr. Liara Covert (Canada), examined precursors to a treaty concerning planetary defense from large Near Earth Object (NEO) collisions. Dr. Covert emphasized how trans-border crises are such that before individual countries and other actors can effectively act on both policy and technical levels, diverse actors need to define the nature of terms like threat, risk, harm, environmental security, self-preservation, right and duty along different points in time (before, during and after awareness of the threat) in relation to individual roles in mitigation and response strategy. Lawyers, engineers, policy-makers, disaster managers, technical and other practitioners interpret situations according to personal information needs and roles or functions in preparation for and ground-level disaster response. Lawyers need to develop an intra-professional mindset and contribute in different ways to facilitate information exchange, distribution and practical disaster response.

Prof. Kolossov read *Mr. Alexey Krasnov's* paper (Russia) which offered a history of the space activities undertaken by the Russian Federation in order to portray Russia's approaches to and promotion of international cooperation and non-proliferation at present day. Mr. Krasnov explained the role of Russian export controls and state security, and how they are interpreted in Russian national law. He acknowledged the challenges associated with continuing to promote international cooperation while strengthening protection of sensitive State technologies.

Ms. Gerardine Goh (Singapore) emphasized how the history and respect

of outer space law provides a solid foundation for the development of multilateral frameworks and enforcement of global peace and security. Ms. Goh emphasized that the interdisciplinary dialogue and consensus-building which characterize space fora can lead to more effective mechanisms and enforcement of security using other forms of international law on Earth.

D) SESSION 4 - SPACE TRAFFIC MANAGEMENT AND NAVIGATION

Chairmen: Prof. José Monserrat Filho (Brazil) and Dr. Lubos Perek (Czech Rep.)

Rapporteur: Ms. Ulrike Bohlmann, ESA

The first presentation was given by *Prof. V. Kopal* (Czech Rep.) He concentrated on the question “Is the present international space law sufficiently armed for the protection of astronauts, functional space objects, and space environment against space debris, or should a legal regulatory system relating to this issue be established soon?” After giving a short overview of the current legal regime applicable to space debris, he underlined the desirability of a special legal document on this subject in the UN and cited the ILA Draft International Instrument on the Protection of the Environment from Damage caused by Space Debris as possible model.

Dr. Kai-Uwe Schrogl (Germany) presented a report on the “Status of the IAA Study Group on ‘Traffic Management Rules for Space Operations’”, written together with *Corinne Contant* and *Petr Lala*. The scope of the study reflects the definition

of space traffic management as comprising technical and regulatory provisions for guaranteeing safe interference-free access to outer space, operations in outer space and return from outer space to Earth. He stressed the interdisciplinary approach of the study and prospected a synthesis of the findings and recommendations of the study group as a model for space traffic management in the year 2010.

Prof. Monserrat summarised the paper written by *Prof. Maureen Williams* (Argentina) “On the need to Regulate Space Traffic Management”, in which she stressed the urgent need to delimit and define outer space.

In her presentation, entitled “Creating an International Regime for Space Traffic Management – Moving from General Principles towards Enforceable Rules”, *Ms. Lotta Viikari* (Finland), after taking as a starting point the convention-protocol approach, detailed the traditional Treaty-making process and emphasized that also the gains connected to a Treaty should be borne in mind and not only the corresponding obligations. Furthermore, she advised not to underestimate non-binding regulations.

Subsequently, *Mr. Ken Hodgkins* (USA) gave a short overview of the current US practice with regard to the registration of space objects. He explained that the procedures had been sped up and that an on-line registry had been established. Since the practice of States in this context was uneven, he was of opinion that the Legal Subcommittee of COPUOS should have a close look at these practices.

Dr. Lubos Perek (Czech Rep.), in his paper entitled “Basic Problems in Space Traffic” first raised the issue of terminology, namely that the meaning of technical terms depending on the context and the field under consideration, for example, whether an expression is used in common language or with an ITU background. The next issue he highlighted was, that only a technical definition of “space debris” exists, but a legal definition still was missing. In this context, he was of opinion that an official up-to-date and complete knowledge of the functional status of spacecraft is essential for dealing with matters of space traffic. As a solution he proposed an international agreement on completeness, detailed content and format of the registration announcements of launchings.

Mr. Alvaro Fabricio Dos Santos (Brazil) concentrated his presentation on the subject “Sovereignty and the Space Traffic Management” mainly on the differences in the legal regimes applicable to airspace on the one hand and to outer space on the other hand. He stressed that – due to these structural differences – a delimitation of outer space was of utmost importance.

The presentation by *Mr. Jacob Zissu* (USA), entitled “ASTROREGS: The ‘Rules of the Road’ In Outer Space” offered some far-sighted views on the establishment of standard evasive manoeuvres in the case of collision courses between spacecrafts. In establishing his proposals he based himself mainly on the existing rules and regulations regarding maritime and air traffic.

Also the paper “Rules of the Road for Space Traffic” presented by *Mr. Stefan Kaiser* (Germany) concerned itself with the subject of traffic management with regard to spacecraft. Specifically, provisions of the Convention on International Civil Aviation and standards and recommended practices of ICAO Annex 2 were analysed. Furthermore, the use of GNSS for the navigation of space vehicles was addressed. By drawing analyses to the existing air law principles some prototype standards and recommended practices for space traffic and navigation were developed.

The paper by *Dr. Frans von der Dunk* (The Netherlands), “*Quis vadit cum vobis, Galileo?*” described in detail the institutional structure of the joint ESA/EU project Galileo, moving from the Galileo Interim Support Structure, GISS, to the Galileo Joint Undertaking, JU. He put special emphasis on the Private-Public-Partnership concept encompassing a public supervisor and a private operator tied together by a kind of Concession Agreement and drew parallels to the example of INMARSAT after privatisation.

Dr. Mahulena Hofmann (Germany) concentrated her presentation with the subject “GNSS and their International Legal Implications” mainly on the international telecommunication legal order and the need to guarantee the harmonisation of particular frequency requirements of the current systems and their potential successors.

Ms. Yuri Takaya (Japan) presented in her paper “Quasi-Zenith Satellites for Commercial Uses and State Responsibility” a Japanese project due to

be launched in 2008. After explaining Article IX of the Constitution of Japan, which prohibits Japan from using outer space for aggressive purposes, she recommended the consideration of an enhanced international cooperation in the Asia-Pacific region with regard to the project.

The last speaker, *Mr. Phillip R. Bower* (USA) presented a paper co-authored with Prof. P. Larsen, on "Current legal issues relating to GNSS". He put special emphasis on the US point of view regarding liability for malfunction of signal, namely, that there could not be a liability as long as the service was provided free of charge. Furthermore, he underlined the necessity of interoperability of the co-existing systems and of a continuing dialogue between the different providers.

During the discussion, *Mr. Dos Santos* raised the question whether ICAO's mandate should be enlarged to include also regulations with regard to aerospace objects, which might carry out operations in airspace as well as in outer space.

Dr. Schrogl was of the opinion that in the long-term perspective, from 2020 onwards, ICAO could serve as a model for an international body that was to integrate also the activities of UNCOPUOS in the context of space traffic management.

Judge Vereshchetin put forward the idea to also consider the space-elevator-project in the IAA Study Group on "Traffic Management Rules for Space Operations".

Dr. Schrogl agreed that this project was of high relevance for the study, as well as the issue of aerospace objects and tethers. He underlined that additional

input and ideas with regard to new technical features was very welcome.

Concerning the tethers project, *Dr. Perek* gave to consider that neither the material nor the techniques existed at present. In his opinion, the subject of space traffic management should content itself with dealing with the current problems.

E) SESSION 5 - NEW ISSUES RELATING TO NUCLEAR POWER SOURCES

Chairmen: Prof. Stephan Hobe (Germany) and Ms. Marcia Smith (USA)
Rapporteur: Gerardine Goh (Singapore)

In his paper "Nuclear and Radioisotopic Power in Space: the Cumulative Content and Effect of the United Nations Space Treaties and Declarations", *Dr. Ricky J. Lee* (Australia) deals with the legal issues concerning nuclear and radioisotopic power sources in outer space. This paper concerned the reasons as to the utilisation of nuclear and radioisotopic power sources in outer space and the legal principles applicable to such usage. It also enumerates the steps necessary to improve the existing legal regime with respect to nuclear and radioisotopic power sources in outer space. The paper notes that the Use of Nuclear and Radioisotopic Power Sources in Outer Space is restricted to earth orbit. In particular, it relates to high electric power applications. It notes also that it was recognised early on that there was a need to use such power sources in outer space. There is a perception that radioisotopic sources are more dangerous and risky than nuclear sources. The UN Declaration on Nuclear Power Sources is only a UN General Assembly Declaration. The question is

whether the principles enshrined in that Declaration form customary international law. The controversy remains today as to whether they are binding international law.

In the paper "Discussion on Extending / Modifying the 1992 Nuclear Power Source Principles to Broader Space Operations", *Mr. Yun Zhao* (Hong Kong) states that Nuclear power sources provide electric power for spacecraft and operations of equipment on board. The 1978 disaster with *Cosmos 954* served as an impetus for the 1992 UN General Assembly Resolution. It was to have been open for revision no later than 2 years after its adoption but no revisions have been made. This paper moots that it is time to think whether the NPS should be revised. It briefly reviews the 1992 Principles, gives its reasons for revision, and points out areas that would be suitable for revision.

Ms. Viviana Iavicoli (Italy) presented "The Concept of "Launching State" in the NPS Principles". This paper makes particular reference to the NPS Principles. It moots that the NPS is characterised by the applicability of norms pertaining not only to space law, but also that applicable to the nuclear power. Nuclear power sources and their use in outer space were the subject of a series of documents of the legal regime providing the use of nuclear powers in different sets of laws, including the Conventions. The scientific community also applies rules of environment. Thus international environmental law is also important. This can be earth- or space-oriented. However, there is a need to qualify the concepts, especially the traditional concept of launching State.

The paper "Nuclear Propulsion Systems" was written by *Mr. Robert M. Stephens & Mr. Steven A. Mirmina* (USA). The mission statement of NASA contains three premises. NASA is required to keep developing technology for the benefit of peoples. NASA depended on chemical propulsion for early launch capability. Although this has worked, it does present limitations. In order to overcome these, new evolution is required. Project Prometheus was developed to increase the capacity of these missions. This program is managed by NASA and supported by industry and academia. It will allow electricity to be generated by the NPS. This electricity is then used to power spacecraft's electric propulsion and communication systems. This paper argues for support for the development of technically accurate safety standards, and that this must precede any initiative to consider drafting legal standards. After technical studies are completed, the UN General Assembly could endorse these studies to create technically accurate safety standards for NPS.