

Report of the 36th Colloquium on the Law of Outer Space
Graz, Austria, 18 - 22 October 1993

The 36th Colloquium on the Law of Outer Space was opened by the Acting President, *Prof. Dr. I.H.Ph. Diederiks-Verschoor*, on Tuesday 19 October 1993. She commemorated the late IISL President *Judge Manfred Lachs* who had passed away in January 1993. She recalled his impressive career in international law and his special devotion to the law of outer space as former COPUOS chairman and drafter of the 1967 Outer Space Treaty. She stressed that Judge Lachs will be sorely missed by the Institute which had deeply appreciated his innovative ideas and plans for the IISL since he was elected as its President in 1990. The audience respected a moment of silence in his memory.

The colloquium was attended by some sixty persons throughout the week, and the overall quality of the papers was impressive. Also, each session allowed ample time for discussions, and the limited number of papers enabled authors to present their papers in some detail. This was particularly appreciated by the participants. An important feature of this colloquium was that it hosted the finals of the second "Manfred Lachs Space Law Moot Court Competition" (the competition was named after Judge Lachs after his death, as he was a strong supporter of this initiative). This was the first time that preliminary competitions had been organized in Europe (by the European Centre for Space Law, ECSL) and in the US (by the AUSMIISL), whose winners met in the final round in Graz. The University of Leiden and George Washington University competed in a case concerning the commercial exploitation of the Moon, opposing two states, Xavage and Adastra. The court was composed of Dr. N. Jasentuliyana, Prof. Dr. N.M. Matte and Prof. F. Lyall (the only remaining Judge of the ICJ who was to chair the bench, Judge Guillaume, had to be missed because of French airline strikes...). The team of the University of Leiden won the competition. Its members were *Ernst Boucher* and *Geoffrey van Leeuwen*. The members of the George Washington University team were *Guy Christiansen*, *Eric Edmondson* and *Charles Hildebrandt*. The case and the written briefs will be published in the IISL Proceedings. Each team also served as rapporteur for one of the sessions of the IISL Colloquium. The Competition will be held for the third time in Israel, October 1994, after preliminaries in Europe and the US. The case has already been distributed to numerous universities and deals with an international space station, intellectual property rights and liability for damage.

The topic of the first session of the Colloquium was "Legal Aspects of Activities of Organizations of the UN System and Other International Organizations". *Dr. E. Fasan* was the Chairman (replacing Dr. Jankowitsch who could not come), and *E. Boucher* and *G. van Leeuwen* (Netherlands) acted as Rapporteur.

Dr. A.M. Balsano (France/Italy) presented her paper on "Intellectual Property in Public Research International Organizations; the Example of ESA". Discussing patent protection, copyright protection and trademark protection, she emphasised the important promotional and innovative functions of Intellectual Property Management as well as its protection of space investment. Taking ESA - as a research and development organization - for an example, it was concluded that government organizations are not very active in protecting intellectual property, and that technical and economic feasibility studies should be carried out before protecting intellectual property.

Dr. S. Hobe (Germany) and *Dr. P.H. Tuinder* (The Netherlands) spoke about the "Corpus Iuris Europeanus". The title of their paper was "Space Law related to European Space Activities: the Corpus Iuris Europeanus". An assessment of the necessity of regional cooperation shows the importance of regional legal developments. The authors believe that European Space Law has already developed and that ongoing commercialization will influence its further development. The authors propose that a Framework of Sources of Space Law be made including European made law, and domestic space legislation.

"The Contribution of the International Astronautical Federation to International Cooperation in Outer Space and the IAF Constitution" was the title of the paper presented by *Dr. V. Kopal* (Czech Republic). Describing the history of the establishment of the IAF constitution and its preparation, the main goals were noted: to point out the purpose of the organization, the rules concerning membership, and the division of powers between a Bureau and the General Assembly in order to ensure effectiveness. Two amendments have been adopted to the original instrument. One was adopted in 1982 when the Principle of Consensus was adopted in order to surmount differences between voting and non-voting members, and the other in 1986 when a single class of membership was established, which widened membership from 10 to 128 members. The author concluded that the 1961 Constitution serves international cooperation, and that the IAF has played and will continue to play an important role.

Next, *Prof. F. Lyall* (Scotland) presented his paper: "The International Telecommunication Union Reconstructed". As a reaction to the dissatisfaction that had gradually arisen about the ITU's structural and organizational abilities to cope with modern requirements, a revision was made in 1992. Three sections were established: the Telecommunication Development Sector, the Telecommunications Standardisation Sector, and the Radiocommunication Sector. Prof. Lyall regretted that membership to the ITU remains open only to states, and not to major telecommunication organizations like INTELSAT, INMARSAT, and INTERSPUTNIK. While expressing reservations about the shift in qualification requirements for board members from technical to administrative, and the current system of contributions, the author does recognize the great potential of the recent restructuring.

Dr. J. Monserrat Filho (Brazil) discussed "The Place of the Missile Technology Control Regime (MTCR) in International Space Law". His paper aims to establish the legal relation between the principle of ballistic missile non-proliferation as fixed in the MTCR, and the principles concerning the free exploration, use and non-appropriation of outer space. An attempt is made to establish a hierarchy between these principles, and the author concludes that the place of the MTCR in International Space Law should be defined and qualified, and that it should be pointed out how its lawfulness and effectiveness can be optimized.

Prof. D. Popescu (Romania) addressed the "Historical and Legal Arguments for Setting up a World Space Organization". Prof. Popescu referred to the many different international space organizations such as Intelsat, FAO and UNCOPUOS. There are 9 UN committees, 11 UN organizations and 8 intergovernmental organizations active dealing with space activities. In the author's view the Outer Space Treaty and the Moon Agreement (especially art. 11) also call for a "World Space Organization". Finally Prof. Popescu addressed the question what form the World Space Organization should have.

The next paper, presented by *Dr. Soon-Kil Hong* (Korea), concerned the "Legal Aspects of Space Activities of the International Civil Aviation Organization (ICAO) in Implementing Future Air Navigation Systems (FANS)". Dr. Soon-Kil Hong discussed the various activities of ICAO, especially the legislative and managing role in assuring a safe international air navigation system. The speaker underlined the importance of space activities of ICAO being in consistency with international air and space law.

The eighth paper was presented by *Dr. W. Stoffel* (Germany) who addressed the same issue as the previous speaker under the title "Legal Aspects of Aeronautical Mobile Satellite Services: the ICAO FANS Concept". The speaker made some additional comments to those made by Dr. Soon-Kil Hong. Dr. Stoffel believes that the problem with the ICAO FANS concept lies with the principle of state responsibility and liability. It might be very difficult to determine the liable state. Another obstacle may arise from the fact that the regulatory regime established by the ITU is applicable. In fact, the problem is that a sovereign state has the right to regulate telecommunications services within his sovereign territory including the airspace above that territory.

Two papers were represented by others than the authors in view of their absence. The paper by *Dr. S. Courteix* (France), "Is it Necessary to Create a World Space Organization?", was

presented by Dr. M. Bourély. In view of growing cooperation between states with regard to space activities, the author recommends the creation of a "World Space Organization". The paper describes the tasks and the form of the organization to be.

The paper by *Prof. P.B. Larsen* (USA), "Navigation by Global Positioning Satellites (GPS): Legal Issues", was presented by Prof. Lyall and tackled the different legal issues with regard to GPS. The question presented in this paper is whether it is possible and necessary to regulate navigation by GPS in one legal regime. Problems arise with the Outer Space Treaty and the Liability Convention with regard to liability.

In the *discussions* that followed the presentation of the papers, *Amb. E. Finch* (USA) asked Dr. Kopal about the relationship between the IISL and the IAF. *Dr. Kopal* elaborated on the importance of The Hague as a legal city; the first Colloquium was held there. The second was held in London and the third in Stockholm. The IISL was founded there. Although the IISL and the IAF work together, the IISL is relatively independent. *Prof. C.Q. Christol* (USA) mentioned that he wrote an article about the early history of the IAF and the IISL. After a question from *Mr. M. Orrico* (Mexico) concerning the character of the IAF, Dr. Kopal elaborated on the importance of the status of IAF as an observer to UNCOPUOS.

Commenting on Prof. Lyall's paper concerning the ITU, *Prof. C.Q. Christol* asked Prof. Lyall whether there was an analogy between the financing problems of the ITU and those of the UN. *Prof. Lyall* held that the discrepancy between the amount paid to ITU and the number of votes which developed countries have in return is too big. *Dr. W. Stoffel* noted that the financing system of the ITU will be changed.

Mr. A.A. Golrounia (Iran) stated with regard to the paper by Dr. Balsano that developing countries should have free access to information from satellites. Dr. Balsano commented that protection does not mean that free access is impossible. It only means that access may be refused to some states or users. But access for developing countries remains often free.

Dr. S. Hobe (Germany), in commenting on the papers by Dr. Popescu and Dr. Courteix, wondered whether the proposed World Space Organization would be similar to the Deep Seabed Authority which has not been a success, to say the least. *Dr. Bourély* replied that the main idea is a flexible and independent UN space division. *Amb. E. Finch* argued that the world Space Organization is not a new idea. He also stressed that the Law of the Sea should be detached from the Law of Space and that comparisons cannot be made between the two. *Dr. H. Safavi* (Iran) countered that the Law of the Sea, Air Law and Space Law cannot be disconnected. *Dr. Popescu* elaborated on the different conditions of any World Space Organization; all or many nations should participate and the World Space Organization must be in accordance with Art. I of the Outer Space Treaty. Finally, *Prof. K.H. Böckstiegel* (Germany) came back to the remark made by Dr. Hobe and agreed with him that a World Space organization should not resemble the Deep Seabed Authority because that was a failure. The Moon Agreement, especially because of Art. 11, must also be regarded as a failure. A technical organization would work, an international regime would certainly not.

Hereafter the chairman ended the discussion and closed the first session.

The second session of the Colloquium was held on Wednesday 20 October and dealt with "Adjudication and Arbitration of Disputes Regarding Space Activities". *Dr. W.B. Wirin* (USA) was Chairman, and *E. Edmondson* and *Ch. Hildebrandt* (USA) were the session's rapporteurs. The chairman proposed a different approach for this session by providing opportunity for discussion after each presented paper instead of at the end of the session.

The first paper was presented by *Prof. Dr. K.H. Böckstiegel* (Germany) and was entitled "Arbitration of Disputes regarding Space Activities". The author pointed out that arbitration has advantages over court litigation because it is more predictable, cheaper, confidential and more enforceable. Arbitration is the preferred method of dispute resolution in international disputes, particularly in the private sector. Prof. Böckstiegel foresaw that while the rules for settlement of disputes are codified, these rules are not sufficiently detailed to meet the likely expanding needs of the foreseeable future.

The Chairman *Dr. W.B. Wirin* (USA) asked in what circumstances a judicial resolution would be preferable to arbitration, and *Dr. Böckstiegel* responded that this could be the case when enforcement of the arbitral award is not ensured, e.g. in a state that has not ratified the New York Convention.

Amb. E. Finch (USA) asked the author's comment on the rules of evidence and how they may affect arbitration. *Dr. Böckstiegel* remarked that the rules of evidence are left to the discretion of the arbitrators, and that all parties must know and agree to the rules in advance.

Finally, *Mr. L. Bencock* (????) asked whether or not arbitration proceedings establish precedent. *Dr. Böckstiegel* replied that the confidentiality of most proceedings prevent their use as precedent, although abstract descriptions of decisions may have some persuasive value.

Dr. M. Bourély (France) presented the next paper, "The Creation of an Aerospace Court of Arbitration", which presented the creation of a new court of arbitration that has been proposed by the Association Française de Droit Aérien et Spatial, to deal specifically with aerospace disputes. This arbitral court is intended to provide the expertise not found in existing courts of arbitration. The court would be seated in France and established in accordance with French law. Arbitrators would be selected on the basis of their expertise in the aerospace field, and the court's rules would be designed to accommodate the kind of disputes submitted to it.

Prof. I.H.Ph. Diederiks-Verschoor (Netherlands) noted during the *discussion* that an international court of justice and an international court of arbitration already exist, and that both have many judges who are competent and experienced in space related disputes. She further stated that the justifications presented by *Dr. Bourély* for the creation of a new court of arbitration did not seem sufficiently convincing to her. *Dr. Bourély* responded that the new court of arbitration would not conflict with the ICJ because it would not hear inter-state disputes.

Ms. T. Masson-Zwaan (France) asked about the status of the ILA Draft Convention on the settlement of disputes, and *Dr. Böckstiegel* indicated that the draft convention has been put on the "back burner" as COPUOS is currently occupied with the issue of space debris.

Prof. C.Q. Christol (USA) asked whether public intergovernmental organizations could submit their disputes to the proposed court. *Dr. Bourély* replied that while the new court will not have competence to hear inter-state disputes, it *might* be able to address disputes involving intergovernmental organizations.

Dr. D. Popescu (Romania) asked if this new court would require a new international convention, and the author answered that the proposal is for a voluntary administrative and judicial body, and does not require a new international convention.

The question of the financing of the court was raised by *Mr. J. Pelton*, and *Dr. Bourély* indicated that funding would be provided by the parties submitting their disputes to the court.

Prof. S. Gorove (USA) then asked whether one could use the proposed court to enjoin a launch in the US, and *Dr. Bourély* said that the court lacks competence to do so.

Ms. T. Masson-Zwaan (France) asked *Dr. Bourély* whether the ESA Convention provides for binding arbitration, which was confirmed by the author, who also indicated that no disputes had been arbitrated so far.

Mr. S. Hobe (Germany) wondered whether the changing environment in the space industry, from predominantly governmental activity to increased private activity, will increase the demand for dispute resolution. *Dr. Böckstiegel* replied that this was certainly true. The breakdown of the court system in Eastern Europe combined with the diminished clout of government agencies has led contractors to demand more arbitration. This was confirmed by *Prof. Christol* who noted that more private activities in space will create more controversies and more arbitration. *Prof. Gorove* however remarked that some national laws will require disputes to go to court instead of arbitration, because of the more binding character of a court decision.

The third paper in this session was written by *P. Sterns and L. Tennen* (USA) and was presented by *Mr. Tennen*. The paper gave an extensive overview of "Resolution of Disputes in the Corpus Iuris Spatialis: Domestic Law Considerations". It examines traditional litigation in the US

and compares it to Alternative Dispute Resolution (ADR) Mechanisms, in particular arbitration. Mr. Tennen noted that traditional litigation is extremely costly and time-consuming in the US, particularly because of the expensive discovery provisions in American law. ADR provides a cheaper, more predictable and quicker way to resolve conflicts.

In the *discussion* around this paper, *Dr. E. Fasan* (Austria) asked about the possibility of appealing an arbitrary decision. Mr. Tennen responded that both the FAA and the UAA provide for appeal in such cases, and *Dr. Böckstiegel* confirmed that there are limited grounds for challenging the enforcement of arbitral awards in international agreements such as the New York Convention.

Mr. D. Brown (engineer at Estec, the Netherlands) asked whether arbitrators can issue injunctions. Mr. Tennen said yes, but that the party seeking the injunction must show a likelihood of winning on the merits, a likelihood of irreparable harm, and must post a substantial bond.

Dr. Christol noted that arbitrators with the proper technical expertise can be found by word of mouth, through lists provided by Bar Associations and through "Rent-a-Judge" services.

Finally, *Dr. Böckstiegel* reported that the Board of Directors of the IISL has decided to establish a Committee on dispute resolution and cases regarding space activities with the goal of publishing a loose-leaf series, and invited interested persons to contact the Secretary, Ms. T. Masson-Zwaan.

Since *Prof. S. Gorove* (USA) had to leave the Colloquium earlier, the Chairman allowed him to present his paper in this session. It dealt with "Recent Litigation involving the Launch of a Spacecraft with NPS on Board" and reported on two recent US cases in which environmental groups attempted to enjoin the launch of the Galileo and Ulysses spacecraft on the grounds that the Environmental Impact Statements (EIS) filed by NASA did not properly assess the risks of a release of radioactive material of an accident occurred at launch. *Prof. Gorove* stated that the US courts refused to issue injunctions stating that the immense cost-overruns associated with a delay in launch would be against the public interest. The author then stated that it would be interesting to compare the safety assessment required by the NPS Principles to the EIS required by US law.

Mr. D. Reibel (USA) noted regarding this last paper that the National Environmental Policy Act (NEPA) is a procedural law and the NPS Principles are primarily substantive, so no real comparison could be made. *Prof. Gorove* noted that Principle 5 of the NPS Principles requires a safety assessment to be made, and Chairman *Dr. Wirin* added that the NPS Principles will become part of the NEPA process if they become a treaty to which the US was a party.

An additional paper on "Adjudication and Arbitration of Disputes Regarding Space Activities" was presented by *Dr. H. Safavi* (Iran). He noted that with the increase of human presence in space, more disputes will arise. Increased disputes will require substantive laws to deal with criminal and civil conflicts in space.

Finally, the invited paper by *Mr. M. Potter* (USA) who could not come was presented by the Chairman. The subject of the paper was "European Regulation of Competitive Satellite Services: Battling the Cartel and the Monopolies". The European satellite services market, including television broadcasting, private business networks and voice telecommunications, has been hurt by cartel-like practices and pricing of telephone monopolies. Today's business needs, technological developments and regulatory changes are threatening these cartel and monopoly structures. By examining these developments, the author is able to find several strategies for bypassing the barriers presented by the Eutelsat cartel and monopolies. Hereupon the Chairman closed the session.

The subject of the third session of 21 October 1993 was "Legal aspects of space insurance". The session was chaired by *Prof. T. Kosuge* (Japan) and *Ms. K. Gorove* (USA) was the Rapporteur.

Dr. G. Catalano Sgrosso (Italy) presented the first paper entitled "Insurance Implications about Commercial and Industrial Activities in Outer Space". The paper discussed the evolution of the insurance market, analyzed the clauses found in insurance contracts including those limiting liability and the cross waiver of liability clauses, pointed out the various kinds of policies available, i.e., pre-launch, launch, and life in orbit, examined the different treatment by the Americans and Europeans of third party liability insurance, and then finally surveyed the treatment of liability and insurance issues within the framework of European Community Law. With respect to the latter, she

analyzed the concept of great risk that was dealt with in EEC Directive, No. 357 of June 22, 1988, concluding that the greater liberalization permitted by that directive will allow insurance companies to offer globally more products suitable to clients' needs. She then continued with a discussion of EEC Directive 92/49, June 18, 1992, suggesting that the resulting increased competition among insurance companies will benefit clients.

The next paper "Development of Space Activities and Insurance" was prepared by *Dr. Y. Kitano* (Japan). The paper noted that currently the space insurance market has a capacity of approximately 500 million dollars for liability insurance and 200 to 350 million dollars for single or dual launching of satellites. It stressed that the space insurance market will have to respond with extended capacity, but that could only be done by developing ideas on how to leverage the capacity without jeopardizing the market's well-being. In demonstrating his thesis, the paper gave an overview of the history of the space insurance market. It was pointed out that in recent years, insurance companies have begun to have enough information at their disposal to be able to charge different rates for different launch vehicles, but that it was hard to know, for example with the Soviet Proton, whether its reliability would continue. Moreover, with so few launches a year, it was difficult to have true accuracy as to the risks.

Dr. D. Reibel (USA) presented a paper on "Space Insurance and the Legal Aspects of Allocating Risk and Liability Among State and Private Entities". His paper examined the relationship of space insurance to the allocation of risk and liability among state and private entities in the U.S. He gave an overview of the nature of the space insurance market and analyzed in detail the implication of two recent federal appeals court cases: Martin Marietta Corp. v. INTELSAT, 978 F.2d 140 (4th Cir. 1992) and Hughes Communications Galaxy, Inc. v. United States, 998 F.2d 953 (Fed. Cir. 1993). For the former, he pointed out that the court's holding means that sophisticated contracting parties will normally be precluded from making claims of negligent misrepresentation and tort and will be held to the duties that were imposed by the contract, except that liability for gross negligence can never be waived by contract. For the latter case, he noted that the Court placed costs of governmental policy changes with the government and not on its private contracting parties. In conclusion, he offered several recommendations to facilitate the efficient operation of the space insurance market.

The paper of *Dr. H. Yoshida* (Japan) on "Accidents of Space Activities and Insurance" addressed the nature of launch-related losses, pointing out that the highest incidence of failure has occurred during the transfer phase from LEO to GEO. He focused his paper particularly on the nature of satellite failures and the main cause of failures. Of particular interest was the fact that nearly 34 % of all known failures occurred on the first satellite of a series, which appears to have twice the likelihood of failing as the second unit. His paper also addressed alternatives to the insurance market, noting that some firms have begun to ask the satellite manufacturers to become the risk manager for the entire satellite program, through on-orbit check-out and delivery, with the costs of risk management built into the contract price. In addition, his paper offered an overview of the evolution of Japanese and American space transportation architecture.

Dr. F. Yamazaki (Japan) gave a paper on "Space Debris and Space Insurance". He noted that damage to satellites from debris is covered by insurance, but that currently insurance costs are not affected by debris risk. In the future, however, he hypothesized that if debris continues to grow at its current rate, insurance may be affected.

Dr. T. Wright (U.K) and *Dr. J. Masson* (France) presented a paper on "Space and Satellite Insurance". The paper summarized completely insurance in the space industry, addressing reasons for insuring, the Superbird case, commercial communication satellite launches, risk and exposure identification process, risk timeline for satellite project exposures, insuring against risk, contractual aspects, insurance policy, claim handling, and the broker's role. Of particular interest are the risks covered by each type of insurance policy during each phase of a launch. Pre-launch coverage indemnifies the insured against satellite damage during the manufacture, storage, transit and on-site assembly phases and usually terminates at the intentional ignition of a launch vehicle. Normally this

risk is assumed by the spacecraft manufacturer. Insurance can be for loss of revenue and/or extra expenses incurred due to launch delay. Launch coverage indemnifies the insured for the cost of replacing the spacecraft, re-launch services and the loss of related revenues. It normally begins with the intentional ignition of the launch vehicle and extends through in-orbit delivery which can be up to 180 days. Premiums are currently around 17-18% of the sum insured. Satellite In-Orbit Coverage is around 1-2% of the insured sum. Launch Risk Guarantees are provided by some launching agencies such as Arianespace and provide for either a replacement launch and associated extra-expenses or a re-fund in the event of a failure. Coverage ends when the launcher reaches LEO. For liability insurance, U.S. launching companies are required to procure up to \$500 million for their customers and Arianespace provides 400 million Francs coverage. Both the U.S. and France agree to bear the costs above the coverage amount. Insurance is also available to the satellite user for transponder failure.

Dr. P. O'Connor (USA) concluded the session with a presentation on "Liability Risks for Commercial Launch Services in the CIS". He outlined the launch services available in the CIS, the liability risks, the responsibility, and risk management responses. He focused much of his analysis on LKE launch services, an arrangement between Lockheed Corporation, Khrunichev Enterprises (Russia), and NPO Energia (Russia). He analyzed the interesting results with respect to responsibility and liability that arise, particularly since one of the launching facilities is in Kazakhstan. He also addressed the consequences of application of the Commercial Launch Services Act, US, to LKE launch services.

Prof. Priyatna (Indonesia) commenced the *discussion* asking for further specification as to the factors that raise the costs of space insurance and for the insurance agents' views of the scope of arbitration. With respect to the first question, *Dr. Wright* responded that the costs of insured space-related accidents affect the costs of insurance. After further questioning by *Prof. Lyall*, he also admitted that the space insurance market can become affected by the world-wide disaster market. *Dr. Wright* noted that with respect to the question relating to arbitration, he had not seen any long-running disputes between insurer and insured. *Prof. Böckstiegel* pointed out that insurance-related arbitrations would often involve an injured third party. An engineer from the ITU, *Dr. Meyerhoff*, asked for clarification as to the term "market capacity". *Dr. Wright* responded that the market capacity for an event is all of the amount of money that can be put towards insuring a particular event. Currently, 370 million is available for insuring any one launch.

Dr. W. Wirin asked whether engineers were currently involved in assessing risk, because they had not been involved in the early days of space launchings. *Dr. Wright* acknowledged that they were indeed involved. *Dr. O'Connor* pointed out that a large number of losses of the space industry have not been insured. Therefore, the insurance premiums are lower than would be the case had, for example, the U.S. losses of more than 2.5 billion been insured.

Prof. Christol asked the manner in which insurance companies provide for the needs of the procurer of a launch. The response was that a number of insurance options were available to cover risks that were not provided for in the launching contract. For example, insurance could be purchased by the launch procurer for a launch delay or for a launch failure.

The last session of the Colloquium was held on Friday 22 October 1993 and dealt with "Recent Developments in Space Law with Special Emphasis on Nuclear Power Sources". The session was chaired by *Prof. F. Lyall*(UK). *Ms. C. Smith* (France) was the Rapporteur.

The first part of the session dealt with Nuclear Power Sources. *Prof. C. Christol* (USA), in his paper "Nuclear Power Sources for Space Objects: a New Challenge for International Law", analyzed four aspects of the UN Nuclear Power Sources principles: the positive provisions of these principles are the restricted use of NPS and the safety assessments. The second aspect is negative: the principles are, in most cases, quite vague and general. The main issues described are how to identify the procuring State and the launching State. The neutral aspects related to the final form for the principles, since they cannot claim the status of customary international law. Finally, some principles appear to be uncertain, considering their geographical applicability.

Next, *Prof. A. Cocca* (Argentina) dealt with the question "Are the Principles on the Use of Nuclear Power Sources in Outer Space a progress in space law ?" He criticized the UN Resolution, its unprecise drafting and the lack of moral fundament of technology on which they are based. In his view, the principles should be reformulated and moreover new principles should be added towards a binding instrument, as happened with Resolution 1962 (XVIII) and the Outer Space Treaty. *Amb. Cocca* also presented the conclusions of the paper by *M. de la Mercedes Esquirel de Cocca* (Argentina) on "Nuclear Power Sources Principles, Space Contamination and Human Space Settlement".

Dr G. Hacket (Austria) presented a very complete study and analysis on "The Legal Regime for Nuclear Power Sources in Outer Space". After having exposed the technical aspects, he focussed on existing international law relating to NPS, other than the UN principles on the use of NPS in outer space. This includes treaty law referring to the private operator, to the launching State and customary law. The third part of the paper analyses the UN principles with emphasis on notification, responsibility and liability. The author mentioned the conflicting interests which may arise when negotiating principles on a subject where only two countries have the technical and financial means to engage in a form of technology which benefits only them as opposed to the rest of the community of states.

Next, Dr. N. Jasentuliyana (UN) provided "An Assessment of the UN Principles on the Use of Nuclear Power Sources in Outer Space". He adressed the possible ways in which the principles may be strengthened during the mandated review process. He also discussed the mechanism for that process and recalled that the goal of the Principles is not to limit the use of NPS systems in any way, but merely to determine the best ways in which they can be utilized.

In his presentation on "UN, US, CIS Space Debris Position, Heavenly junk", *Amb. E. Finch* (USA) presented the views at the United Nations of their positions. He stressed the importance of concluding an international treaty on Nuclear Power Sources and one on space debris. He also proposed an amendment to the Registration Convention: two hours before launching, information about the object and whether or not it carries an NPS should be sent to the Secretary General and should be confirmed after the successful launch. This proposal met a favorable audience

After these presentations, a *discussion* was engaged. *Dr D. Reibel* (USA) requested a precision concerning one of *Amb. E. Finch'* ideas. He noted that the American Bar Association urges the preparation of an international convention that would provide for the prevention of the creation of space debris and the pollution of outer space in any manner whatsoever "to the greatest extent feasible and practical and consistent with each nation's national security". He wondered about the use of this principle in case space debris must be created for national security purposes. *Amb. Finch* answered that the idea is to try *not* to create space debris, at all times. Then *Prof. C. Christol* agreed with *Amb. A. Cocca* on the point that there is definitively a problem with the UN NPS principles especially regarding the definition and identification of the Launching State and the Procuring State. He stressed that this raises substantial legal issues concerning liability. *Dr. N. Jassentuliyana* (UN) confirmed that the question of the identification of the launching State and the procuring State in the NPS Principles is a very important issue which needs to be studied. The UNCOPUOS has not yet gone that far in their discussions.

After this discussion on the papers dealing with NPS, the other papers in this session were presented. *Dr. G. Gàl* (Hungary) spoke on "Air Crew and Space Crew - Comparative Observations De Lege Ferenda". From April 1961 until today, 299 persons from 26 nations participated in manned space flights. The author stressed the lacks and uncertainties in the legal framework for manned flights and focussed on the National Aeronautics and Space Act of 1958 as well as the very recent Law of the Russian Federation on space activities of 20 August 1993. There is a strong will among authors to "initiate and promote international discussion in the hope that eventually they will lead to negotiation between interested states". Dr. Gàl then compared the legal regime of air crew and space crew and pointed out that the recent emergence of space passengers may lead to futher developments of space law concerning manned flights.

This was followed by a paper on "The Space Agency Forum (SAF) and International Cooperation", written by *Dr. Eilene Galloway* (USA). She presented the Space Agency Forum, which emerged from the successful experience of the SAF for the international space year (SAFISY). She stressed that the existing world space system badly needs coordination. This worldwide organization, which was created this year, will enhance international space cooperation. The Forum has a coordinating role as well as an implementing role, and it should become a place where information is available. Dr. Galloway concluded by recommending the creation of a computerized data bank within the SAF.

Prof. T. Kosuge (Japan) talked about "Satellite Broadcasting and Communication Services Provided by Private Sectors and Space Law". One of the most developing applications of satellite communication systems has been used in the TV broadcasting area. Various transborder TV broadcasting systems via satellite exist: in the Asia-Pacific region (Asiasat, Palapa), and in the the European region (Astra and Eutelsat). The author presented the legal and policy issues of these systems and proposed the elaboration of new rules for transborder TV broadcasting via satellite. In his view, international recognition of transborder TV broadcasting and an international regime are required.

Dr. M. Mejia-Kaiser (Mexico/Germany) discussed the interesting question: "An International Remote Sensing Cartel?". Since marketing of remote sensing data is performed by a limited number of participants (Landsat, Spot, IRS, Bhaskara, MOS, JERS, ERS) and since most of them are private companies with strong state participation, a coordination among them is evolving in order to develop the current incipient market. The author believes that the form of a Cartel could help "to increase the output and to reduce the price to a competitive price". It would fix prices and result in geographical allocation and coordination of markets.

Dr. S. Sanz Fernández de Córdoba (Spain) presented "Changing Basic Space Laws: Popularity, Pragmatism and Historical Lessons". In his view, since 1969, when the first man walked on the Moon, no significant progress was made in the conquest of space. The reasons are price and technology related. The author believes that the Outer Space Treaty of 1967 is one of the main reasons for the present situation, since it stated that outer space cannot be appropriated or exploited for private benefit. If these principles are maintained, sooner or later people will disregard the law and will be confronted with a "de facto" lawless colonization and appropriation of outer space. To prevent this, a more pragmatic set of enforceable rules is needed, to limit the rights of States and private entities willing to engage in space colonization.

This paper was followed by the presentation of "The Illogical Link: Launching, Liability and Leasing" by *Dr. F. von der Dunk* (The Netherlands). He noted that more private entities tend to become involved in space activities, which raises the problem of leasing spacecraft. Questions arising in this regard focus on such issues as ownership, whether state or private, in view of the registration obligation, and liability. After analyzing the relevant provisions of the Outer Space Treaty, he concluded that those provisions create a link between launching and liability which in some respect is illogical. A study of the ways in which the US and France cope with this illogical link, through national provisions concerning liability, is provided. The author concluded by stressing the necessity of amending - or at least re-interpreting - the relevant parts of space law.

The last paper was presented by *Dr. K. Gorove* (USA) and concerned "Responsibility and Liability under the NPS Principles: Can Customary Law Fill the Gap?" She examined Principle 8 pertaining to responsibility and Principle 9 pertaining to liability and compensation in light of the distinction drawn by the International Law Commission. The author observed that there are some situations which cannot fall under these principles, and which therefore create a gap. For instance a State can be responsible for damage under Principle 8, but cannot be held liable under Principle 9 because it is not the launching State. Dr. Gorove concluded that some gaps can be filled by customary law or by the draft article on state responsibility as set forth by the ILC.

In the *discussion* which followed these last presentations of the session, *Dr. Yturriaga* (Spain) stressed that a new position on the colonization of space is required. The seabed regime is

still not implemented, because when States invest in the exploitation of the seabed, they wish to secure compensation for their investment. A compromise must therefore be reached in order to make it profitable for the explorer while maintaining the principle of *res communis*.

Referring to the paper by *Dr. F. von der Dunk*, *Prof. K. H. Böckstiegel* stressed the gap of the liability convention which does not apply to the second or third State in the row, if it is not implied in the launching. He mentioned that in present launching contracts, cross-waivers of liability are included, also in contracts with a third state, because otherwise it could become liable. He also noted, referring to *Dr. K. Gorove's* paper, that the draft of the ILC on responsibility is not yet customary international law, but if it were, it could become a complement to the liability convention.

Hereafter, the IISL Acting President *Prof. Dr. I.H.Ph. Diederiks-Verschoor* closed the 36th Colloquium on the Law of Outer Space. The 37th Colloquium will be held during the International Astronautical Congress in Jerusalem, Israel, 9 - 14 October 1994.*

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* Information about the Colloquium, the session topics and the procedure for the submission of papers can be obtained from the IISL Secretariat, 3-5 rue Mario Nikis, 75015 Paris, France, tel. 33-1-4567 4260, fax 33-1-4273 2120.

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