

JOURNAL OF SPACE LAW

A journal devoted to the legal problems arising
out of man's activities in outer space

VOLUME 12

SPRING 1984

NUMBER 1

CONTENTS

ARTICLES

- Sune Danielsson, *Examination of Proposals Relating to the Prevention of an Arms Race in Outer Space* 1
- Vladimir Kopal, *Evolution of the Main Principles of Space Law in the Institutional Framework of the United Nations* 12
- Martin A. Rothblatt, *Space Law and Practice in the 1980's and Beyond: A Practitioner's Perspective* 26
- James R. Myers, *Federal Government Regulation of Commercial Operations Using Expendable Launch Vehicles* 40

SPECIAL FEATURES

- Events of Interest 52
- A. Past Events 52

(a) Reports

1. Review of the Work of the Committee on the Peaceful Uses of Outer Space (*N. Jasentuliyana*) 52
2. Military and Civilian Space Issues Before the First Session of the 98th Congress—A Legislative Report (*Marcia S. Smith*) 61
3. The 26th Colloquium on the Law of Outer Space, Budapest, 10-15 October, 1983 (*I.H.Ph. Diederiks-Verschoor*) 68
4. Report on Symposium on "Conditions Essential for Maintaining Outer Space for Peaceful Uses," The Hague, March 12-15, 1984 (*Edward W. Ploman*) 70

(b) Short Accounts

5.	Session on Policy, Strategy, and Legal Aspects of Space, Colorado Springs, August 4, 1984 (<i>Steven J. Sloboda</i>)	74
6.	Legal Symposium Panel on Space Telecommunications Issues, International Telecommunication Union Forum 83, Geneva, Oct. 18, 1984 (<i>Martin A. Rothblatt</i>)	74
7.	Program on "Space Law and Practice," Association of American Law Schools, San Francisco, January 5, 1984 (<i>Stephen Gorove</i>)	76
8.	Toledo International Law Society Symposium on "Arms Control in Outer Space," February 18, 1984 (<i>Richard W. Edwards, Jr.</i>)	77
9.	Program on "Commercialization of Space: Incentives, Impediments, and Alternatives," American Society of International Law, Washington, D.C., April 11-14, 1984 (<i>Stephen Gorove</i>)	77
10.	Symposium on Military and Commercial Aspects of the Uses of Outer Space, May 9-10, Colorado Springs (<i>William B. Wirin</i>)	78
11.	FBA Session on Government Contracts and Space Commercialization, New Orleans, Louisiana, May 11, 1984 (<i>Chester D. Taylor</i>)	79
12.	Program on "Space Activities of Developing Nations: Overcoming the Barriers", International Centre, Vienna, June 14, 1984 (<i>Stephen Gorove</i>)	79
13.	Other Events	80
14.	Brief News	81
B.	Forthcoming Events	81
	Book Reviews/Notices	82
	Jân Azud, <i>Vedecko-technická revolúcia, mierové spoluzitie a medzinárodné právo</i> (<i>Scientific and Technological Revolution, Peaceful Co-existence and International Law</i>) (Vladimir Kopál) ..	82
	George Gerbner and Marsha Siefert (eds.), <i>World Communications: A Handbook</i>	83

Nicolas Mateesco Matte, <i>Aerospace Law: Telecommunications Satellites</i>	84
James D. Burke and April S. Whitt (eds.), <i>Space Manufacturing 1983</i>	85
Jeri W. Brown (ed.), <i>Space Safety and Rescue 1979-1981</i>	85
Andrew Adelman and Peter M. Bainum (eds.), <i>International Space Technical Applications</i>	86
Books Received	86
Recent Publications	87
Books	87
Articles	87
Reports	89
Book Reviews/Notices	89
Official Publications	90
Miscellaneous	93
Current Documents	98
I. Request for the Inclusion of a Supplementary Item in the Agenda of the Thirty-Eighth Session—Conclusion of a Treaty on the Prohibition of the Use of Force in Outer Space and From Space Against the Earth	98
II. Resolution Adopted by the General Assembly 37/89 (1983). International Cooperation in the Peaceful Uses of Outer space	102
III. Resolution Adopted by the General Assembly 37/90 (1983). Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space	105

EXAMINATION OF PROPOSALS RELATING TO THE PREVENTION OF AN ARMS RACE IN OUTER SPACE*

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1. *Introduction*

The prevention of an arms race in outer space is important not only because outer space is an area of human activity which has up to now been free from conflict and military confrontation, but also because the introduction of space weapons may affect the relative stability in the world.

Military use of outer space is not something new but has been going on since the early days of the Space Age. However, what is happening at this juncture is a new turn of developments. The space systems used for military purposes are in general of a passive nature. They are *inter alia* used for information gathering such as reconnaissance, communication and navigation. What we are facing now is the threat of specific weapons systems meant to be used in outer space, anti-satellite weapons and perhaps beam weapons for anti-ballistic warfare.

This development could have far-reaching implications for peace and security. Furthermore, the introduction of space weapons would have negative effects on civilian space programmes, national as well as international. Therefore, something has to be done to prevent a weaponization of outer space.

Certain measures have already been taken in this area. Some provisions of international law which are of importance in this field will be summarized below as a background to an examination of proposals relating to the prevention of an arms race in outer space.

2. *Existing rules of international law*

The existing provisions of international law relevant to the use of weapons in space are both of a general nature, such as the United Nations Charter, and of a specific nature, such as those provisions which apply to space activities. Specific rules can be found in multilateral instruments and in bilateral treaties between the Soviet Union and the United States.

Article 2, para. 4 of the Charter of the United Nations prohibits the use of force and the threat of use of force. An attack on a spacecraft belonging to another country must be forbidden according to this Article. This general ban on the use of force is worth noting, in particular since an attack on a spacecraft could be carried out by simply ramming it with another space object, *i.e.* without necessarily using a weapon.

Could an attack be justified as a measure of self-defense in accordance with Article 51 of the Charter? It is inconceivable that this Article could permit an attack on non-military space systems. As far as military systems are concerned some of them, *e.g.* surveillance satellites used for verification, are protected as national technical means of

*This article is an elaboration of the author's presentation at a Symposium on "Conditions Essential for Maintaining Outer Space for Peaceful Purposes" organized by the United Nations University and the International Institute of Space Law at The Hague, March 12-15, 1984. The views expressed herein are those of the author and do not necessarily reflect the views of the Swedish Government.

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verification under the SALT Agreements¹ and early warning satellites under the US-Soviet Accident Measures Agreement.² For other military space systems the situation might not be as clear. An attack on "force amplifiers", e.g. communication satellites, as a measure of self defense seems far-fetched.

The ban of the use of force in the Charter and the limitations in certain bilateral agreements between the Soviet Union and the United States, thus, provide an important sanctuary for satellites and exclude application of Article 51. However, the situation could be different as far as specific weapons systems are concerned.

Among specific multilateral treaties the 1963 Partial Test Ban Treaty³ was the first treaty to contain provisions relating to the use of weapons in outer space. This treaty bans the testing of nuclear weapons *inter alia* in outer space.

In 1967 the United Nations adopted the Outer Space Treaty⁴ which contains the fundamental principles for space activities. It also marked an important step in banning certain, but not all, arms from outer space.

Article 4 prohibits the placing of nuclear weapons and other kinds of weapons of mass destruction in earth orbits and on celestial bodies. This provision does, however, not impose restrictions on conventional weapons or on military space systems. The moon and other celestial bodies shall be used exclusively for peaceful purposes and all kinds of military activities are prohibited on those bodies.

The Treaty says that space activities shall be carried out for the benefit and in the interests of all countries,⁵ and in accordance with international law, including the UN Charter, and "in the interest of maintaining international peace and security and promoting international cooperation and understanding."⁶

The Outer Space Treaty also contains provisions on potentially harmful interference with peaceful space activities of other states. Other provisions are of interest for verification, but they do not contain any clear obligation to give information or about inspection.

Since radio communications are vital for space activities Article 35 of the International Telecommunication Convention⁷ is worth special mention. This Article prohibits harmful interference with radio services which are operated in accordance with the Radio Regulations of the ITU.

¹Interim Agreement Between the U.S. and U.S.S.R. on Certain Measures with Respect to the Limitation of Strategic Offensive Arms (hereinafter "SALT I Agreement"), May 26, 1972, 23 U.S.T. 3463, T.I.A.S. No. 7504 (effective Oct. 3, 1972) (expired but still applied). For details regarding the SALT II Agreements, see U.S. ARMS CONTROL AND DISARMAMENT AGENCY: ARMS CONTROL AND DISARMAMENT AGREEMENTS 128 ff.

²Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War, Sept. 30, 1971, [1972] 22 U.S.T. 1590, T.I.A.S. No. 7186, 807 U.N.T.S. 57 (effective Sept. 30, 1971).

³Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, Aug. 5, 1963, [1963] 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 430 (effective Oct. 10, 1963).

⁴Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter "Outer Space Treaty"), Jan. 27, 1967 [1967] 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967).

⁵*Id.*, art. I.

⁶*Id.*, art. III.

⁷International Telecommunications Convention (Malaga-Torremalinos), Oct. 25, 1973, 28 U.S.T. 2495, T.I.A.S. No. 8572 (effective April 7, 1976, for the United States). The 1973 Convention is still in force. (*Editor's comment:* The 1982 Nairobi Convention is not yet in force for the United States).

Notification to the UN is dealt with in the 1975 Registration Convention.⁸ However, the information supplied is so general that it can only be guessed what purpose a space mission has and sometimes considerable time passes between launch and notification.

The latest of the international space agreements which have been elaborated by the UN is the 1979 Moon Agreement⁹. This Agreement will soon enter into force like the four other UN space treaties. From its provisions it can be concluded that the Moon Agreement demilitarizes all of outer space except the proximity of the Earth, or more precisely orbits around the Earth.

Some provisions in the bilateral arms control agreements between the United States and the Soviet Union relate to space activities.

The two SALT Agreements (the Interim Agreement of 1972¹⁰ and the SALT II Agreement of 1979,¹¹ to which the Soviet Union and the United States abide unilaterally awaiting ratification or new negotiations) contain similar provisions about verification¹². According to these provisions the Contracting Parties shall use "national technical means of verification" to monitor the adherence to the provisions of the Agreements. These national "means of verification" must not be disturbed or "interfered with". It is assumed that surveillance satellites are among those "means".

The SALT II Agreement¹³ contains a relatively unnoticed expansion of the Outer Space Treaty by forbidding development, testing and deployment of systems for placing in orbit nuclear weapons etc. In addition, this Agreement prohibits testing, development and deployment of Fractional Orbital Bombardment Systems (FOBS).

According to the ABM Treaty of 1972¹⁴ "Each party undertakes not to develop, test or deploy ABM systems or components which are sea-based, air-based, space-based or mobile land-based".¹⁵ It is, thus, clear that the placing of ABM systems in outer space is prohibited, nor should such systems be developed, tested or deployed.

The Accident Measures Agreement of 1971¹⁶ and the Prevention of Nuclear War Agreement of 1974¹⁷ together oblige the Soviet Union and the United States to refrain from interfering with or attacking early warning systems of either side, which would include satellites that are components of such warning systems.

⁸Convention on Registration of Objects Launched into Outer Space (hereinafter "Registration Convention"), Jan. 14, 1975, [1978] U.S.T. 695, T.I.A.S. No. 8480 (effective Sept. 15, 1976).

⁹Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, U.N. GAOR, 34th Sess., Supp. No. 20 (Doc. A/34/20).

¹⁰See *supra* note 1.

¹¹See *supra* note 1.

¹²SALT I Agreement, *supra* note 1, art. V; see also SALT II Agreement, *supra* note 1, art. XV.

¹³SALT II Agreement, *supra* note 1, art. IX.

¹⁴Treaty on the Limitation of Anti-Ballistic Missile Systems, May 26, 1972, [1973] 23 U.S.T. 3435, T.I.A.S. No. 7503 (effective Oct. 3, 1972).

¹⁵*Id.*, art. V (1).

¹⁶See *supra* note 2.

¹⁷Agreement on the Prevention of Nuclear War, June 22, 1973, 24 U.S.T. 1478, T.I.A.S. No. 7654 (effective June 22, 1973).

From what has been said above it is clear that some important measures relating to the risks for an arms race in outer space have been taken. However, the existing body of international law contains too many loopholes to put a stop to the present trends towards an arms race in outer space. What has become known about tests and development of anti-satellite weapons confirms that additional measures need to be taken.

3. *Examination of proposals made*

Three proposals have been presented in intergovernmental fora containing draft agreements relating to the prevention of an arms race in outer space. The first was presented in 1979 by Italy in the Committee on Disarmament (now the Conference on Disarmament).¹⁸ The second one was put forward by the Soviet Union in 1981 in the UN General Assembly¹⁹ and the third proposal, also made by the Soviet Union, was presented to the General Assembly in 1983.²⁰

(a) *Italy's Proposal*

The proposal by Italy²¹ contains six articles of which the first three are the most important ones. The last three articles concern duration, entry into force, accession and similar provisions.

According to the first paragraph of Article I, outer space shall be used for peaceful purposes *only*. The Parties to the Protocol should also undertake to refrain from measures of a military or a hostile nature, such as the establishment of military bases or installations and the stationing of other devices having the same effect (presumably in outer space). Furthermore, the prohibition in the Outer Space Treaty of the placing of weapons of mass destruction in earth orbit is repeated with the addition of a prohibition of launching such weapons also beyond earth orbit. It furthermore contains a prohibition of the launch of other types of "devices designed for offensive purposes" which presumably refers to ASAT systems. Finally, testing of any type of weapon in outer space would be forbidden.

Paragraph 2 of Article I expands the Outer Space Treaty's permission to use military personnel for only scientific purposes to include also verification.

According to Article II the Parties should undertake to prohibit any activity which is contrary to the Protocol.

The complaints procedure foreseen in Article III in case of a breach of the provision of the Protocol refers the parties to present their complaints to the Security Council of the United Nations. The Security Council may initiate an investigation.

It seems natural that as a first proposal presented before the discussions had evolved further in the UN and the Committee on Disarmament the proposed Additional Protocol does not take into account many important aspects. Some of the weaknesses in the proposal will be mentioned below but before doing so it should be underlined that this in no way is attempted to belittle the efforts behind the Italian proposal. On the contrary, it

¹⁸Additional Protocol to the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies with a View to Preventing an Arms Race in Outer Space, Doc. CD/9, Mar. 26, 1979, reproduced in 8 J. SPACE L. 53-57 (1980).

¹⁹Draft Treaty on the Prohibition of the Stationing of Weapons of any Kind in Outer Space, U.N.G.A. A/RES/36/97 (Jan. 15, 1982), reproduced in 10 J. SPACE L. 27-30 (1982).

²⁰U.N. Doc. A/38/194 (1983), reproduced in 12 J. SPACE L. 92 (1984).

²¹See *supra* note 18.

was an important first proposal in the efforts by the international community to take measures to prevent an arms race in outer space.

Looking at some of the shortcomings of the Italian proposal it appears to be both too general and too specific. It proposes that outer space should be used for peaceful purposes only which seems to mean that all military space activities should be forbidden. This is a laudable aim but such a provision may cause problems because of military satellites used for verification and early warning. It may also be too general if some countries propose to say that their military space activities only have peaceful purposes.

The proposal concerning prohibition of stationing and testing in outer space of other types of weapons than weapons of mass destruction is, furthermore, too limited since, such a prohibition for example, would not forbid ASAT weapons to be deployed on the ground or in the atmosphere which is where these weapons would normally be kept until actually used. Thus, the proposed prohibition would unfortunately not ban the ASAT systems we know of today.

Finally, the proposal does not contain any provisions regarding verification and the complaints procedure in the Security Council would not be very effective since those two countries which today have the possibility to act in breach of the undertakings foreseen are also in a position to put an effective stop to any investigations by using their veto.

(b) The 1981 Soviet Proposal

The first proposal by the Soviet Union in 1981²² indicated a change in the attitude of the Soviet Union. Before this proposal the Soviet Union seemed to be of the opinion that this question should not be discussed in multilateral fora but bilaterally. The proposal by the Soviet Union could be seen as a response to the concern expressed in the United Nations by many countries about the militarization of outer space. It is to be welcomed that one of the major space powers took this action. This, however, does not mean that the 1981 proposal of the Soviet Union does not contain shortcomings. Indeed, some of them are as fundamental as those which were mentioned regarding the Italian proposal.

After a summary of the proposal of 1981 the provisions contained therein will be examined in more detail.

The proposal is a draft Treaty on the prohibition of the stationing of weapons of any kind in outer space²³. According to Article 1 the Parties would "undertake not to place in orbit around the Earth objects carrying weapons of any kind". They would also not "install such weapons on celestial bodies or station such weapons in outer space in any other manner, including on reusable manned space vehicles" of existing or future types. Parties would also undertake not to assist or encourage any state, group of states or international organization to carry out activities contrary to this prohibition.

Article 2 proclaims that the Parties shall use space objects in strict accordance with international law including the UN Charter in the interest of maintaining peace and security and promoting international cooperation and mutual understanding.

According to Article 3 the Parties would undertake "not to destroy, damage or disturb the normal functioning of space objects of other States Parties" on one condition, namely "if such objects were placed in orbit in strict accordance with" the first Article.

Article 4 concerns verification. It is only proposed that the verification of the compliance with the provisions of the treaty shall be made by using "national technical

²²See *supra* note 19.

²³See *supra* note 19.

monitoring facilities available". Parties would also undertake not to place obstacles in the way of the monitoring facilities of other states. Furthermore, the Parties shall when necessary consult each other, make inquiries and provide information in connection with such inquiries in order to promote the implementation of the purposes and provisions of the treaty. These proposals resemble the verification provisions of the SALT agreements.

Articles 5, 6, 8 and 9 contains provisions concerning amendments, unlimited duration, signature, accession, ratification, entry into force and authentic texts.

According to Article 7 each Party "shall in exercising its national sovereignty have the right to withdraw from the treaty if it decides that extraordinary events related to the subject-matter of (the) treaty have jeopardized its supreme interests". Notification of withdrawal shall be given to the Secretary-General six months in advance and include a statement of the extraordinary events which have jeopardized its supreme interests.

An examination of Article 1 shows that it suffers from a lack of definition or explanation of what is meant with the term "weapons of any kind". The lack of precision in this context presents a problem; *e.g.* almost any manoeuvrable space object - military or non-military - can be used to collide with another satellite in order to destroy it or incapacitate it in one way or the other. Thus, almost any such space object could be considered a weapon. This lack of precision becomes even more important in the context of Article 3 (see below).

Another shortcoming is that the proposed prohibition of weapons only relates to the placing or stationing of weapons in orbit around the earth. This means that the ASAT systems in existence or planned today would be covered only to a certain extent. Their deployment would not be forbidden and only the use of certain types of ASAT weapons would be prohibited. As has been pointed out above, the ASAT systems we know of today are operating from bases on the ground or from aircraft where they are kept until they are launched. This goes for the "co-orbiting" type of ASAT weapons which enter into orbit and hunt the target during a few orbits before they are close enough to be exploded in order to destroy the target. The proposed provision would cover the use of this kind of ASAT systems. As far as "direct-ascent" systems planned today are concerned they do not enter into earth orbit but attack the target at the end of a ballistic trajectory which starts from an aircraft in the atmosphere and ends by colliding with the target without exploding. The use of this latter type of ASAT weapons does not seem to be covered at all by the proposed prohibition to place or station weapons in earth orbit since it never enters into orbit.

The same problem relates to the stationing of weapons "in any other manner". Since the proposed prohibition is related to stationing it seems to imply that the object in question should have entered earth orbit which is not the case for an object flying in a ballistic trajectory.

It has been mentioned above that deployment of ASAT weapons would not be forbidden by this proposal. Furthermore, the proposal does not mention the prohibition of development and testing which are important ingredients in the efforts to prevent the use of arms in outer space.

The next question in Article 1 is whether there is any need to mention reusable space vehicles. Different kinds of weapons could be mounted on different kinds of space vehicles, reusable or disposable, manned or unmanned. It seems questionable to single out reusable space vehicles as more useful as platforms for weapons than disposable ones. The military implications of new space transportation systems are rather that an increased transportation capacity can be used for military purposes. Of greater importance seems to be if a space vehicle can be used for aggressive purposes. In this context maneuverability, *i.e.* capacity to get close to a target in space, appears to be more significant than whether a space vehicle is reusable or not. However, these questions are of the nature best to be solved during negotiations.

Turning to Article 2 of the proposal by the Soviet Union it shows many similarities with Article 3 of the Outer Space Treaty. One difference is that in the proposal by the Soviet Union the phrase "carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law . . ." has been changed to "*use space objects in strict accordance . . .*" (emphasis added here). What the implications of these differences are are not entirely clear. However, if the proposed Article 2 could be referred to in order to justify retaliatory actions against space vehicles which—in the opinion of one country—are not used in accordance with international law, in the interest of maintaining international peace and security and promoting international cooperation and mutual understanding, it would seem advisable to consider its implications further.

The proposed Article 3 presents a major problem in that it permits the use of force and interference against or the disturbance of space objects which one state considers to be a weapon. The Article states that "Each State Party undertakes not to destroy, damage, disturb the normal functioning . . . of space objects of other States Parties, *if such objects were placed in orbit in strict accordance with article 1, paragraph 1 of this treaty*" (emphasis added here). As has been pointed out above the lack of definition of "weapons of any kind" leaves it open to interpretation what is to be considered a weapon. This means that it is possible for one state to qualify another state's space object, which it for some reason or another does not like, as a weapon under the proposed treaty. The proposed Article 3 would then give it the right to intervene with force or in some other manner against that space object. This would make legal actions which are now forbidden. It would be contrary to Article 2:4 of the UN Charter which prohibits the use of force. It would have implications as regards the provisions of the Outer Space Treaty and it would undermine Article 35 of the International Telecommunication Convention which prohibits harmful interference of radio communications. Thus, as it has been formulated the proposed Article 3 contains limitations of the prohibition to use force *etc.* which would undermine fundamental provisions of international law. Because of these limitations this Article could well create international problems or lead to tension instead of solving problems and ease tension.

The proposed Article 4 on verification is an improvement compared to the Italian proposal in that it attempts to take care of the problem of verification. In addition it is an improvement of that proposal because it does not refer to the Security Council in the "complaints procedure" described in paragraph 3 and, thus, does not subject complaints to the possibility of a veto.

However, verification by national technical means does not seem to be sufficient because of the difficulties, *e.g.* in distinguishing what is a launcher for a non-military satellite and an ASAT weapon, or the monitoring of aircraft-borne ASAT missiles. International on-site inspection appears to be necessary for this.

The "complaints procedure" proposed contains an obligation to supply information and this should be welcomed. The absence of a mechanism which is more effective than consultations in solving disputes certainly seems to weaken the procedure to make the proposed provisions work.

Finally, the proposed Article 7 which makes it possible for a State to withdraw from the treaty if "extraordinary events . . . have jeopardized its supreme interests" suggests that the treaty may not be upheld in a situation of tension. Such a provision would be unfortunate since it is essential that a treaty on disarmament works also—or perhaps in particular—during periods of tension. A more strict approach which would rule out or at least limit to a much greater extent the possibilities of withdrawal would certainly be preferable.

(c) *The 1983 Soviet Proposal*

In August 1983 the Soviet Union presented a new proposal in a letter from Mr. Gromyko to the Secretary-General of the United Nations.²⁴ The proposal contains a draft Treaty on the Prohibition of the Use of Force in Outer Space and from Space against the Earth.

This proposal seems to be more comprehensive than the proposal of 1981.

The preambular part contains in its first paragraph a reference to the obligations of the Members of the United Nations to refrain from the use of force. This is of course a fundamental principle of the Charter of the United Nations and a reference to it seems most appropriate. The exact formulation of the reference should be subject of discussion so as to find the language which best reflects the obligation under the Charter of the United Nations not to use force.

According to Article 1 it should be prohibited to resort to the use or threat of force in outer space and the atmosphere and on the Earth by using space objects in orbit around the Earth, on celestial bodies or stationed in space in any other manner. Furthermore, the use or threat of force against space objects should be prohibited.

This general provision on the prohibition of the use of force contains a welcome improvement of Article 1 in the 1981 proposal in that the limitation of the ban of force—permitting force against objects which are considered as weapons—has disappeared.

However, it can be questioned why there should be a special article on this subject when the Charter of the United Nations—which is also applicable in outer space, as is explicitly stated in the Outer Space Treaty—already contains a clear ban on the use of force. Thus, the use of force is already banned from outer space. Since a new article may cause confusion it would seem more advisable to simply confirm the provision of the UN Charter in this context.

Article 2 contains the following proposed specific undertakings of states:

- (1) not to test or deploy space-based weapons for destruction of objects on the Earth, in the atmosphere or in outer space;
- (2) not to use space objects as a means to destroy targets on the Earth, in the atmosphere or in outer space;
- (3) not to destroy, damage or disturb the normal functioning or change the flight trajectory of space objects of other states;
- (4) not to test or create new anti-satellite systems and to destroy any existing anti-satellite systems, and
- (5) not to test or use manned spacecraft for military, including anti-satellite, purposes.

The proposed undertakings address a number of technical options and the testing, deployment and use of space weapons. To be more comprehensive it would be necessary to add a ban also on development of weapons for use in space. This aspect is not covered in the draft treaty with the possible exception of the proposed ban of the "creation" of new ASAT systems (see below concerning the fourth undertaking).

The first of these proposed undertakings addresses "space-based" weapons. To refer specifically to "space-based" causes the same problems as Article 1 of the 1981 proposal and implies a limitation which renders the undertaking irrelevant bearing in mind that the ASAT systems as conceived today are based on the ground or in the atmosphere. Thus, it would seem more appropriate to make such an undertaking apply to any weapon system which is meant for use in space.

²⁴See *supra* note 20.

The second undertaking draws the attention to the fact that space objects can be incapacitated by a simple ramming using an object which is not a weapon. This is certainly an aspect that should be covered. What is proposed in this undertaking touches on the ban on the use of force. It would, therefore, seem useful to consider it in the context of proposed Article 1 but also together with the third undertaking.

The third undertaking proposes a welcome expansion of Article 9 of the Outer Space Treaty and of Article 35 of the International Telecommunication Convention. Space activities can be disturbed by other means than direct attacks. Radio signals are vital for the command and control of space craft, for transmitting data to and from a satellite, *etc.* That is why such signals should be protected. It would have to be discussed whether the provisions of the International Telecommunication Convention are sufficient and should be confirmed or if they should be supplemented. A number of other actions could be taken against a satellite to make it useless or function less efficiently but without destroying it. New forms of disturbances, *e.g.* blinding of the sensor on board a space craft or a change of its attitude may be as effective as the complete destruction of a satellite. For this reason a ban of the proposed nature would be useful.

The most important new proposal in the draft treaty is contained in the fourth undertaking. This sub-paragraph proposes a ban on new ASAT systems and the destruction of existing ones. If accepted it would mean a significant step in preventing the weaponization of outer space. Compared to the 1981 proposal this proposal is a great improvement in that the ban comprises all ASAT weapons, ground-based, air-based or space-based, and not only space-based ones. Thus, ASAT systems known today would be covered by the ban. The proposed prohibition relates to testing and "creation" of new ASAT systems. What "create" means is somewhat unclear. It would seem better to use traditional terminology and ban development, testing and deployment of all ASAT weapons.

The fifth undertaking refers to the use of manned space craft for military purposes. As has been stated above with regard to the 1981 proposal it would, from a technical point of view, seem more relevant to take up maneuverable space vehicles, manned or unmanned, than to single out manned space craft. The capability to maneuver a space-craft can be used for docking but it can also be used *e.g.* for ramming another space-craft. But, again, these questions are of a nature best to be solved in negotiations.

Article 3 proposes that states parties do not encourage other states *etc.* to engage in activities prohibited by the Treaty.

Article 4 proposes verification by national technical means and that such means must not be interfered with. As with regard to the 1981 proposal this provision suffers from the fact that it would only be states like the Soviet Union and the United States that have the capacity to verify compliance with the Treaty. This could well be an obstacle when trying to convince other states to become parties to it. Again it would seem preferable to have a clause which provides for some kind of international on-site verification.

Article 5 is new compared to the 1981 proposal. It contains a proposal to establish a consultative committee for the solution of problems that may arise on the implementation of the Treaty. This is a model which has been used in the SALT agreements and the ABM Treaty. However, this committee is only one of the proposed avenues for solving problems in connection with the Treaty. Paragraph 1 proposes consultations between the parties and paragraph 2 envisages procedures within the UN. This could create a confusion as to which should be the right approach to follow in a given case. Would for instance actions in accordance with one of the procedures preclude the use of any of the others? The procedures within the UN would seem to imply recourse to the Security Council where action could be stopped with a veto. The proposed procedures do not envisage third party settlement which would guarantee that complaints would

be followed by action. Finally, compared with the 1981 proposal Article 5 does not contain a specific obligation to supply information in connection with inquiries.

From the above can be concluded that the proposed complaints procedure should be subject to detailed discussion and scrutiny.

Article 8 concerns the peaceful settlement of disputes and should be considered in the context of Article 5. As stated earlier a specific provision making third party settlement obligatory should be seriously considered.

It can be noted that it is proposed that the Treaty be of unlimited duration and that it does not contain any provision on withdrawal which is an improvement in comparison with the 1981 proposal.

To sum up, the 1983 proposal for a draft treaty banning the use of force in or from outer space is interesting and deserves close study in the Conference on Disarmament. It addresses a number of important issues that need to be solved to prevent the extension of the arms race into outer space. A number of clauses should, however, be further discussed before any final decision is taken.

The Soviet Union when presenting this new proposal to the United Nations undertook to observe a moratorium on ASAT weapons, *i.e.* not to launch any kind of anti-satellite weapons for as long as other states refrained from launching such weapons. This undertaking was repeated as late as in February 1984 in the Technical and Scientific Sub-Committee of the UN Committee on the Peaceful Uses of Outer Space.²⁵ At that time, no mention was made of the first test of the United States new ASAT system which was carried out on 21 January 1984.

4. Concluding remarks

It has stated above that further measures are needed to prevent an arms race in outer space. It is unlikely that all problems will be solved by the adoption of one single agreement. Rather, it seems necessary to initiate a process through which step after step could be taken to develop further measures progressively, in parallel with terrestrial disarmament measures, to reduce militarization of outer space and as a final goal put a halt to the possibility of an arms race in outer space. In this process it may well be necessary to elaborate more than one agreement.

It is not yet too late to preclude an extension of the arms race in outer space. However, time is running short. Therefore, certain measures should be taken as soon as possible before major investments have been made in space weapons systems and before such systems have been deployed on a larger scale.

These measures should be elaborated on a multilateral basis, but the United States and the Soviet Union should also resume bilateral talks to facilitate a solution of the most pressing problems, notably the prevention of anti-satellite warfare.

The measures to meet the most urgent needs should include a ban of certain activities. Article 2, para. 4 of the UN Charter and of Articles 1 and 3 of the Outer Space Treaty should be confirmed. Damage, disturbance and harmful interference of the normal functioning of space objects should be forbidden in order to strengthen Article 9 of the Outer Space Treaty and confirm Article 35 of the ITU convention.

Furthermore, weapons systems—in particular ASAT systems—meant to be used for activities mentioned above should be banned. This ban would have to include the development, testing and deployment of such systems on or under the ground, on or

²⁵U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Scientific and Technical Sub-Committee on the Work of its Twenty-First Session, Doc. A/AC.105/336 (1984).

under the surface of the sea, in the atmosphere or in outer space. Such a measure would be a complement to Article 4 of the Outer Space Treaty. This ban should also provide for the dismantling of existing systems.

The ban of the development, testing and deployment of space-based ABM systems in the 1972 ABM treaty between the Soviet Union and the United States should also be confirmed.

A prohibition of FOBS should likewise be included in line with SALT II.

Strict measures should be adopted regarding the verification of the compliance with such a treaty. The best method in this respect would be international on-site inspection of some kind.

Disputes should be solved by the International Court of Justice or by arbitration.

The measures mentioned above would not completely rule out the risk for an arms race in outer space. As mentioned above, they should rather be seen as the beginning of a *process* to achieve this objective. In such a process it could be discussed if certain military space systems have a particular destabilizing effect. It would be essential to recognize that certain military space systems have a stabilizing effect and can contribute to disarmament measures.

The international use of satellites for the monitoring of disarmament agreements and crises should be considered in line with the proposal to establish an International Satellite Monitoring Agency (ISMA). Furthermore, it should be discussed if there are any risks for expanding the arms race — not only in outer space but also on the earth — in the proliferation of such space technologies as those related to the launching of space vehicles. Also, measures should be undertaken to increase the openness as regards all kinds of space activities, both military and non-military. The notification procedures in the 1975 Registration Convention should be further developed. Such measures would facilitate the prevention of an arms race in outer space and lead to increased confidence.

As increased involvement by more countries in peaceful outer space activities would strengthen the interest to keep outer space free from armed conflicts. International cooperative efforts for this purpose should be stimulated.

EVOLUTION OF THE MAIN PRINCIPLES OF SPACE LAW IN THE INSTITUTIONAL FRAMEWORK OF THE UNITED NATIONS

*Dr. Vladimir Kopal**

More than a quarter of a century ago, the first man-made object was successfully launched in orbit around the earth and this very fact marked the beginning of a new era in the life of mankind that we usually call the space age. Only a few years later, man himself entered outer space and by the end of the same decade, the first astronaut landed on the moon and brought back samples of rock from this celestial body.

The rapid progress of space science and technology opened far-reaching prospects for human knowledge, experience and know-how. First of all, it enabled us to learn much more about the Universe, our solar system as a whole and particularly about our own planet. The condition of a high value of life has become one of the most important news that has come to us by up-to-date space accomplishments, for the Earth is probably the only body of our solar system where intelligence and civilization exist.

Recent years of space activities have gained us further experience. It has become evident that man can not only survive but also stay and work in outer space without any substantial harm to his organism. The sojourn of cosmonauts on orbital stations of long duration and activities performed by them therein indicate that life and health may even improve in outer space, because in this environment, man escapes the effects of earth gravity and is protected against terrestrial stresses.

The quest for space exploration does not only serve its own purpose. Progress in space science and technology has been soon accompanied by endeavours to use its results for practical aims. Thus, new industries have been developing, based on the use of satellites for telecommunication, meteorology, geodesy, and navigation. Satellite communications have even become a profitable application of space technology, with over 100 countries having established links with several international satellite systems such as Intelsat, Intersputnik or Inmarsat. An ever growing number of nations are now operating or planning their own satellite communications, or are considering the establishment of regional systems. Moreover, the advent of direct broadcasting satellites is imminent.

Systematical observation of the earth from space has also clearly proved its utility and remote sensing satellite systems are now passing from an experimental to an operational stage of their performance. More and more countries participate in such programmes and already have, or are building, their receiving stations.

Some of the new technologies, e.g. in the field of electronics, originated from urgent space requirements. However, their economic, technical and cultural impact has become much broader. Many specialized instruments and techniques that have made our life more comfortable would not have been invented without an impetus from space ventures. Another significant part of the new industrialization is being developed in the space environment itself. Space manufacturing and processing will be soon contributing to purposes of our everyday life.

Moreover, outer space deserves a great attention from the point of view of resource policy since the earth cannot be considered an inexhaustible storehouse of all resources. The ever growing need for resources, which is one of the consequences of the world's

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economic growth, will inevitably lead to a greater interest in the exploration and exploitation of space resources, including the great potential of energy from outer space.

Nevertheless, the latest period of space activities has been mostly characterized by an emphasis on applications of space science and technology. The question of what practical benefits may be derived from space activities occupies most of the interest of governments, be they governments of more or less developed countries, when they consider different projects of space exploration.

In the developing world, space science and technology is regarded as a tool which could be helpful in narrowing the gap between industrially advanced and less developed countries. However, this requires to build up, both nationally and internationally, mechanisms and create adequate financial bases for enabling all States to benefit from space, bearing in mind their various economic and technological levels and different capacities to absorb new technologies.

Such a development will lead to increasing the number of nations participating in space activities and augmenting the degree of their involvement in different space programmes. In this way a progressive shift to a more active role of an ever growing number of nations in this field of human endeavours should be secured.

In the light of this development of space science and technology, as well as its social and economic impact, let me now turn to the emergence of legal principles of international cooperation in space activities in the institutional framework of the United Nations.

United Nations and the first steps towards legal order for outer space

The item relating to the peaceful uses of outer space was first included in the agenda of the United Nations General Assembly at its thirteenth session in 1958. At that session, the Assembly established the *Ad Hoc* Committee on the Peaceful Uses of Outer Space, composed of 18 members, and requested the Committee to report to the Assembly on the activities and resources of the United Nations, of the specialized agencies and of other international bodies relating to the peaceful uses of outer space, on future organizational arrangements and also on the nature of legal problems which might arise in carrying out programmes to explore outer space (resolution 1348 (XIII) of 13 December 1958).

However, though a substantive report¹ came out from the session of the *Ad Hoc* Committee, including an assessment of legal aspects involved, it did not serve as a basis of further endeavours in this field, for the composition of this body was not considered balanced by some of its members who did not consequently participate in its work.

One year later, at its fourteenth session, the General Assembly by resolution 1472 A (XIV) of 12 December 1959, established a permanent body, the Committee on the Peaceful Uses of Outer Space (COPUOS). Its original membership was 24 States, but it was later expanded several times: to 28 members at the sixteenth session (resolution 1721 E (XVI) of 20 December 1961), to 37 members at the twenty-eighth session (resolution 3182 (XXVIII) of 18 December 1973), to 47 members at the thirty-second session (resolution 32/196 B of 20 December 1977) and to 53 at the thirty-fifth session (resolution 35/16 of 3 November 1980).

In resolution 1721 (XVI) of 20 December 1961, a comprehensive programme for multilateral cooperation of Member States of the world organization was unanimously adopted by the United Nations General Assembly, and in the first part of this document, two fundamental principles were commended for guidance of States in the exploration and use of outer space. They were as follows:

¹UN Doc A/4141 of 14 July 1959.

a) International law, including the Charter of the United Nations, applies to outer space and celestial bodies; and

b) Outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation.

Thus, the first basis for developing a legal order for space activities was laid down. It was emphasized by these principles that the law of outer space should be growing from valid norms of international law, particularly those inserted in the United Nations Charter. At the same time the leading principles of the new legal régime for outer space were declared - those of freedom of exploration and use of outer space and celestial bodies in conformity with international law, and non-appropriation of any part thereof by States.

In the same resolution, the United Nations General Assembly invited COPUOS to study and report on the legal problems which might arise from the exploration and use of outer space. In other parts of this resolution guidelines were provided for the development of international cooperation in several fields which were considered at that time as feasible. They included a request for prompt information by States launching objects into orbit or beyond for the registration of launchings and maintaining a public registry of the information furnished by the Secretary-General. COPUOS was requested to provide, in cooperation with the Secretary-General, for exchange of information supplied by governments on a voluntary basis, as well as assist in the study of measures for the promotion of international cooperation in outer space activities. Still other parts of resolution 1721 (XVI) dealt with international cooperation in two specific areas; that relating to improvement of meteorology in the light of developments in outer space and that concerning communications by means of satellites that should be available, as it was stressed, to the nations of the world on a global and non-discriminatory basis.

At the same time the organizational structure for international cooperation in space activities crystallized. COPUOS has become the focal point for all space-related cooperative programmes furthered by the United Nations and most of its Member States² have actively contributed to promoting effective programmes in this area. Two subcommittees, one legal, the other scientific and technical, each composed of the same members as the parent body, held their first sessions in the spring of 1962. Later on, in successive stages of its deliberations, COPUOS also established four working groups of the whole, on navigational satellites, broadcasting satellites, remote sensing satellites and the use of nuclear power sources in outer space. In accordance with their terms of reference, these groups were considering relevant problems and drafted reports including valuable guidelines and other conclusions on their respective topics. Within the United Nations Secretariat, an Outer Space Affairs Division was set up in the Department of Political and Security Council Affairs, in order to assist COPUOS, and its Sub-Committees and working groups, in their work.

In fulfilling its task, the United Nations as the universal organization of a general character can rely on the cooperation with, and assistance of, various organizations and bodies having responsibilities in special fields of interest. From among the specialized agencies the Food and Agriculture Organization of the United Nations (FAO), the World Meteorological Organization (WMO), the International Telecommunication Union (ITU), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the

²At present, COPUOS is composed of the following Member States: Albania, Argentina, Australia, Austria, Belgium, Benin, Brazil, Bulgaria, Canada, Chad, Chile, China, Colombia, Czechoslovakia, Ecuador, Egypt, France, German Democratic Republic, Federal Republic of Germany, Hungary, India, Indonesia, Iran, Iraq, Italy, Japan, Kenya, Lebanon, Mexico, Mongolia, Morocco, Netherlands, Niger, Nigeria, Pakistan, Philippines, Poland, Portugal, Romania, Sierra Leone, Sudan, Sweden, Syrian Arab Republic, Turkey, Union of Soviet Socialist Republics, United Kingdom of Great Britain and Northern Ireland, United Republic of Cameroon, United States of America, Upper Volta, Uruguay, Venezuela, Viet Nam and Yugoslavia.

International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO) and the International Bank for Reconstruction and Development (World Bank) have been particularly involved in space matters, some of them having special operational groups for space affairs of their particular concern. Other organizations and bodies within the United Nations system, such as the Natural Resources and Energy Division (NRED), the Office of the United Nations Disaster Relief Coordinator (UNDRO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) have also had active interests in space affairs, particularly in space technology and applications. Therefore, it is the United Nations system as a whole that has been stimulating international cooperation in space exploration and promoting a wide utilization of achievements reached in this vast field of human activities.

In order to harmonize the contributions of different organizations and bodies of the United Nations system and increase the effect of their common efforts, a special institutional arrangement was made upon the recommendation of COPUOS. A Sub-Committee on Outer Space Activities, established under the United Nations Administrative Committee on Coordination (ACC) and consisting of representatives of all units of the United Nations system interested in space matters, meets annually to coordinate activities in this field and suggest joint programmes.³

Moreover, a United Nations programme of space applications was initiated by COPUOS following the First United Nations Conference on the Exploration and Peaceful Uses of Outer Space held in Vienna in 1968. The main purpose of this programme has been the promotion of international cooperation by creating an awareness among the respective governmental agencies of the benefits from application of space technology. It also provides training and education for candidates from developing countries to gain experience in this field. Within the limits of its resources, the United Nations and other organizations and bodies of the United Nations system offer advisory and information services in the applications of space technology for development.⁴

In accordance with one of its purposes as spelled out in Art. 1 of the Charter, the United Nations has thus become a center for harmonizing the actions of nations in the attainment of their common ends in outer space. And the development of a solid legal basis for space activities has become an inseparable part of these efforts. For the first time in the history of international law, a set of written principles and norms governing different aspects of space flights have been developed rather quickly, almost simultaneously with the progress of space exploration itself. At the same time, efforts tending to the elaboration of the law of outer space have become a specific part of endeavours for the progressive development of international law and its codification in the sense of Art. 13 of the United Nations Charter.

³As to the present state of affairs, see *Coordination of Outer Space Activities Within the United Nations System: Programmes of Work for 1983 and 1984 and Future Years*. Report of the Secretary-General, UN Doc. A/AC.105/309, 18 November 1982. See also the latest report of the Inter-Agency Meeting on Outer Space Activities, UN Doc. ACC/1983/27, 25 October 1983.

⁴As to the present stage of this programme, see the latest reports of the United Nations Expert on Space Applications to the Scientific and Technical Sub-Committee, UN Doc. A/AC.105/310, 17 January 1983, and UN Doc. A/AC.105/330, 7 December 1983.

Principles of the present legal basis for space activities

Between the years of 1966 and 1979, the present multilateral legal basis for the exploration and peaceful uses of outer space was established by international agreements negotiated primarily by COPUOS and its Legal Sub-Committee. It consists of five treaties, four of which have already entered into force.

The first and fundamental instrument is the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which was commended by the United Nations General Assembly in its resolution 2222 (XXI) of 19 December 1966, opened for signature on 27 January 1967 and entered into force on 10 October of the same year.⁵ Up to now, this Treaty assembled 90 signatures and 82 ratifications, accessions or notifications of succession.⁶

According to the leading principle of the 1967 Space Treaty "the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind." This principle, together with other principles inserted in the first three Articles of the Treaty, are not only the basic provisions of this legal document; they have also created the basis for the whole international space law of our times.

From the language of these provisions the following legal elements can be derived:

(a) recognition of the common interest of all mankind in the progress of the exploration and use of outer space, including the moon and other celestial bodies for peaceful purposes;

(b) promise that the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development;

(c) declaration of outer space, including the moon and other celestial bodies, as a common area of all nations with a special international law status;

(d) declaration of the freedom in the exploration and uses of outer space, including the moon and other celestial bodies, and equal position of all States in such activities;

(e) declaration of the freedom of scientific investigation in outer space, including the moon and other celestial bodies, and promotion of international cooperation in such investigation;

(f) stipulation of free access to all areas of the moon and other celestial bodies;

(g) renunciation on national appropriation of outer space, including the moon and other celestial bodies, by any means;

(h) confirmation of applicability of international law, including the Charter of the United Nations with respect to space activities;

(i) stipulation of securing the maintenance of international peace and security, and promotion of international cooperation and understanding in the exercise of space activities.

⁵Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter "1967 Space Treaty"), Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967); see also Resolutions adopted by the General Assembly during its twenty-first session, 20 September-20 December 1966, GAOR: Twenty-first session, Supplement No. 16 (A/6316), at 13 ff.

⁶For these and other data relating to the signatures, ratifications and accessions to individual space legal instruments referred to in the text, see the document *Present Status of Outer Space Treaties*, March 1984, distributed at the twenty-third session of the Legal Sub-Committee of COPUOS held in Geneva, 1984.

At this juncture, one difference between the régime of outer space in its narrower sense and that of the moon and other celestial bodies should be observed. The principle of free access in Art. I relates explicitly to "all areas of celestial bodies", while neither the fundamental principles nor any other part of the Treaty deals with the problem of free access to outer space in general. Although outer space has been declared free for exploration and use by all States, such freedom does not automatically include the right of free access to outer space without regard to the sovereignty of States over the respective parts of airspace adjacent to their territories. Nor did the 1967 Space Treaty stipulate any general right of passage of space objects of one State or a group thereof through the territorial space of other States.

In Art. IV of the 1967 Space Treaty, the first legal basis for demilitarization of outer space was laid down, though only some specific limitations of military activities in the space environment were agreed upon at that time. States Parties to the Treaty have undertaken "not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner." In the second paragraph of the same article, more far-reaching limitations of military activities have been enshrined; however, they have concerned only the moon and other celestial bodies and not outer space itself. According to this provision "the moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes" and this general clause was accompanied by a number of specific prohibitions of different kinds of military activities.⁷

Several principles of the 1967 Space Treaty have been dedicated to furthering international cooperation and mutual assistance. A mechanism of international consultations has been provided, in order to ensure due regard to interests of all parties to the Treaty. An agreement on informing, "to the greatest extent feasible and practicable", of the nature, conduct, locations and results of activities in the peaceful exploration and use of outer space was reached in Art. XI, such information to be submitted to the United Nations Secretary-General as well as the public and the international scientific community.

In Art. V of the Space Treaty, basic principles concerning assistance to be rendered to astronauts in the event of accident, distress, or emergency landing on the territory of another State or on the high seas have been included. Furthermore, principles establishing two types of responsibility have been laid down. In Art. VI, international responsibility of States for national activities in outer space to be carried out in conformity with the provisions of the Space Treaty has been provided. This kind of responsibility belongs to the category of responsibility of States for wrongful acts violating norms of international law. The second type of responsibility, international liability for damage caused to another State or its nationals by launching an object into outer space, provided in Art. VII of the Space Treaty, belongs to the special category of international responsibility for activities that due to their hazardous nature may cause damage to be compensated if it really occurs, though such activities do not technically violate any norm of international law.

Finally, the principle of retaining jurisdiction of a State "on whose registry an object launched into outer space is carried" and control over such object, and over any personnel thereof, while in outer space or on a celestial body has been declared in Art. VIII. By analogy with air and maritime law, this principle has provided a basis for registration

⁷The writer of this paper dealt with the existing state of demilitarization of outer space in greater detail in his article *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, published in *Yearbook of Air and Space Law - Annuaire de droit aérien et spatial*, Vol. 1966, McGill University Press, Montreal, p. 471 ff.

of space objects and established a link between the registration and the exercise of jurisdiction of the State of registry over the respective object.

The principles inserted in Articles V - VIII became starting points for further steps in space legislation which led to the conclusion of three additional treaties dealing with specific subjects. They were as follows:

1. Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space. This treaty was commended by the United Nations General Assembly in its resolution 2345 (XXII) of 19 December 1967 and opened for signature on 22 April 1968; it entered into force on 3 December 1968.⁸ By March 1984, it had been signed by 79 States, while 76 States ratified it, acceded to it or notified their succession; one declaration of acceptance was also made by an international organization (ESA):

2. Convention on International Liability for Damage Caused by Space Objects, which was commended by the United Nations General Assembly in its resolution 2777 (XXVI) of 29 November 1971 and opened for signature on 29 March 1972; it entered into force on 1 September 1972.⁹ So far, this instrument has been signed by 72 States and ratified, acceded to or notified of succession by 63 States, also with one declaration of acceptance made by an international organization (ESA).

3. Convention on Registration of Objects Launched into Outer Space, which was commended by the United Nations General Assembly in its resolution 3235 (XXIX) of 12 November 1974, opened for signature on 14 January 1975 and entered into force on 15 September 1976.¹⁰ However, a relatively lower number of signatures (27) and ratifications, accessions or notifications of succession (32), also with one declaration of acceptance (ESA), have already signalized a certain slowdown in the growth of space law.

This has become still more outstanding in the case of the fifth space law instrument that was finished after eight years of negotiations in 1979. It is the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies which was commended by the United Nations General Assembly in its resolution 34/68 of 5 December 1979 and opened for signature on 18 December 1979.¹¹ This instrument has assembled so far but 11 signatures and 4 ratifications. Since at least five ratifications are requested for its entry into force, the Moon Agreement has not yet become a valid international treaty, though it is now fairly close to acquiring such a status. This Agreement too is a remarkable legal document in which the principles of the 1967 Space Treaty relating to the moon and other celestial bodies have been further developed.

Moreover, the Moon Agreement includes some new elements, particularly a principle declaring the moon and its natural resources as "the common heritage of mankind."

⁸Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, April 22, 1968, [1969] 19 U.S.T. 7570, T.I.A.S. 6599, 672 U.N.T.S. 119 (effective Dec. 3, 1968); *see also* Resolutions adopted by the General Assembly during its twenty-second session, Vol. I, 19 September-19 December 1968, GAOR: Twenty-second session, Supplement No. 16 (A/6716), at 6 *ff*.

⁹Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972 [1973] 24 U.S.T. 2389, T.I.A.S. 7762 (effective Oct. 9, 1973); *see also* Resolutions adopted by the General Assembly during its twenty-sixth session, 21 September-22 December 1971, GAOR: Twenty-sixth session, Supplement No. 29 (A/8429), at 25 *ff*.

¹⁰Convention on Registration of Objects Launched Into Outer Space, Jan. 14, 1975, [1976] T.I.A.S. 8480 (effective Sept. 15, 1976); *see also* Resolutions adopted by the General Assembly during its twenty-ninth session, Vol. I, 17 September-18 December 1974, GAOR: Twenty-ninth session, Supplement No. 31 (A/9631), at 16 *ff*.

¹¹Agreement Governing the Activities of States on the Moon and Other Celestial Bodies; *see* Resolutions and Decisions adopted by the General Assembly during its thirty-fourth session, 18 September 1979 - 7 January 1980, GAOR: Thirty-fourth session, Supplement No. 46 A/34/46, at 77 *ff*.

According to Art. 11, States shall have the right of exploration and use of the moon without discrimination of any kind, on the basis of equality and in accordance with international law and the provisions of the Agreement. As to the exploitation of the natural resources of the moon, however, States Parties to the Agreement will "undertake to establish an international régime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible." This principle shall be implemented by a review conference that will have to be convened, according to Art. 18, by the United Nations Secretary-General at the request of one third of the States Parties to the Agreement any time after the Agreement will have been in force for five years.

Though specific in its juridical meaning and having to be applied under the precise scope of provisions of the Moon Agreement, the principle of common heritage of mankind reflects similar ideas that were developed at the Third United Nations Conference on the Law of the Sea with regard to the legal régime of, and an international machinery for, the area of the sea-bed beyond the limits of national jurisdiction. And the future implementation of the common heritage principle of the Moon Agreement may face similar difficulties as were those concerning establishment of the system of exploration and exploitation of the sea-bed resources at the Sea-Law Conference.

The prospective value of the 1979 Moon Agreement is furthermore evident from its Art. 1 which states that the provisions of this Agreement relating to the moon shall also apply to other celestial bodies within the solar system, other than the earth, except insofar as specific legal norms enter into force with respect to any of these celestial bodies. Thus, the Moon Agreement has become not only instrumental in establishing the legal status for the Earth's only natural satellite, but it also contributes to building up the principles of interplanetary law that should specifically govern our solar system within the general framework of space law.

Due to the fact that the total number of contracting parties of all space law treaties, particularly of the two latter instruments, remains limited, the United Nations General Assembly recalled on several occasions its concern about further development of the rule of law in the exploration and use of outer space. In resolution 38/80 adopted on 15 December 1983, this principal organ of the United Nations, in which all Member States are represented, once again invited States that have not yet become parties to the international treaties governing the use of outer space to give consideration to ratifying or acceding to those treaties. Without any doubt, an increase of the number of States adhering to all space law instruments would not only enlarge the effect of the up-to-date space legislation, but it would also stimulate the law-making process which has now been passing a rather difficult period.

Areas of agreement and disagreement in elaboration of further principles

For almost a decade the topic of legal regulation of direct television broadcasting was on the agenda of COPUOS. Initiated by the Soviet Union, which submitted in 1973 a proposal of a Convention on Principles Governing the Use by States of Artificial Earth Satellites for Direct Television Broadcasting,¹² this item was under discussion of a Working Group established by the Legal Sub-Committee, which agreed on drafting of most of the principles involved. Still, some important issues, especially those relating to the principle of "State responsibility" and "Consultation and agreements between States",

¹²See UN Doc. A/AC.105/C.2/L.89, 19 April 1973, published in the Report of the Legal Sub-Committee on the work of its twelfth session (26 March-20 April 1973), UN Doc. A/AC.105/115, Annex III, at 1 ff.

remained unsettled, largely due to divergent philosophies underlying the positions of different groups of States. This disagreement reflected the gap between the views of those emphasizing the need for ensuring the free flow of ideas and information, and those requiring the respect for sovereign rights and an adequate protection of cultural identity of all nations. In specific terms of the principle of "Consultation and agreements" this contradiction was reflected in a dilemma, whether such an agreement would be necessary only to the extent required by the relevant technical regulations of the ITU, or broader agreements and/or arrangements between the States concerned should be required prior to the establishment of any direct television broadcasting.

In its resolution 36/35 of 3 December 1981 the General Assembly decided that further attempts to complete the elaboration of this draft set of principles should be made by COPUOS itself during its session in 1982 and that the adoption of such a set of principles would be considered at its thirty-seventh session. Finally, when several attempts to reach a compromise had failed, the United Nations General Assembly adopted resolution 37/92 of 10 December 1982 including in its Annex Principles governing the use by States of artificial earth satellites for international direct television broadcasting. The draft of this resolution was sponsored by a group of developing countries and the resolution was endorsed by a large majority of Member States.¹³ However, for the first time in the history of space law in the United Nations, this document was not adopted by consensus.

For several years, another item of similar magnitude has been under consideration in COPUOS and its Legal Sub-Committee, that concerning legal implications of remote sensing of the earth from space, with the aim of formulating draft principles. The Legal Sub-Committee started consideration of this subject already in 1972. Three years later, a Working Group was established and began to formulate the set of principles. Since that time a substantial progress has been reached and a number of principles have been drafted without major difficulties.

However, differences in some significant problems still persist. In 1983 a certain step forward seemed to be made when the Legal Sub-Committee considered a new text of principle XIII dealing with notification of the remote sensing programme.¹⁴ On the other hand, different positions have been maintained with regard to the dissemination of data or information on the natural resources of sensed States to third parties. As expressed at different stages of the discussion, some delegations, particularly the Western, industrially-advanced countries, feel that there should be no restrictions on the dissemination of data obtained from remote sensing of the earth or analyzed information derived therefrom, since a system of unrestricted dissemination would be in the best interest of all States and that prohibitions on dissemination would be impractical. Other delegations, however, mostly representing developing nations, are of the view that making the dissemination of certain data and information subject to the approval of the State whose territory is affected by the remote sensing activities is necessary, since this is a corollary to the principle of the sovereignty of States. Still other delegations, particularly the Eastern European Socialist States, while accepting in principle the required approval of the sensed State,

¹³Resolution 37/92 of 10 December 1982 was adopted by recorded vote of 107 votes in favour, 13 votes against and 13 abstentions; 23 Member States were absent during the vote but one of them later announced that it had intended to vote in favor. For its text see Resolutions and Decisions adopted by the General Assembly during its Thirty-seventh session, 21 September-21 December 1982, and 10-13 May 1983, GAOR: Thirty-seventh session, Supplement No. 51 (A/3751) at 98 ff.

¹⁴See Report of the Legal Sub-Committee on the work of its twenty-second session (21 March-8 April 1983), UN Doc. A/AC.105/320, 13 April 1983, Annex I, at 14-15, 21.

recommend the introduction of a certain spatial resolution as an objective criterion for the differentiation of data to be freely disseminated from data whose dissemination should be subject to consent.¹⁵

So far, no compromise solution for this complex issue could be found, though an attempt at approaching it from another stand-point was made.¹⁶

The present agenda of the Legal Sub-Committee also includes two other items, one of them involving an issue which has been known in the doctrine of space law for many years, the other of a recent origin.

The former is called "Matters relating to the definition and/or delimitation of outer space and other space activities, bearing in mind, *inter alia*, questions relating to the geostationary orbit." When approaching the problem of defining outer space and distinguishing it from air space, we should not forget that though relevant scientific and technical criteria have to be borne in mind, its substance remains primarily of a political and legal nature. For a delimitation between the scope of the principle of sovereignty of States, on which the legal régime of air space is based, and the scope of the freedom of outer space, which has been one of the fundamental principles of space law, is under consideration. This could be achieved by establishing a boundary between the two different spaces or at least by reaching an agreement on the lower limit of outer space.¹⁷ In specific terms, attention was recently attached to a distance not exceeding 110 kilometres above sea level. It was also indicated that the drawing of such a boundary should be supplemented by the recognition of the right of passage for space objects of another State for the purpose of reaching orbit or returning to earth, provided such passage caused no adverse effect in the territory of the State whose air space was crossed.¹⁸

This position, however, is opposed by some States which maintain the view that the establishing of a boundary at a particular altitude would be arbitrary and premature. Another view prefers to approach this problem by defining the term of space activities, rather than that of outer space.¹⁹

In recent years the problem of definition and/or delimitation of outer space has been widened by additional aspects, particularly those concerning the legal status of the geostationary orbit. A group of equatorial countries claim that due to their special physical relationship with the geostationary orbit they are entitled to a special protection of their interests in relation to this "limited natural resource." Other States, however, reject any national claims to such orbit or any part thereof, emphasizing that the geostationary orbit is an inseparable part of outer space. While recognizing not only the need to ensure access to the geostationary orbit for all States on an equitable, but also on an efficient and

¹⁵See Report of the Legal Sub-Committee on the work of its twentieth session (16 March-10 April 1981), UN Doc. A/AC.105/288, 20 April 1981, Annex I, at 4.

¹⁶See Working Paper of Brazil, Doc. WG/RS (1982)/WP.11 of 8 February 1982, Report of the Legal Sub-Committee on the work of its twenty-first session (1-19 February 1982) UN Doc. A/AC.105/305, 24 February 1982, Annex I, at 20.

¹⁷The writer explained his views on this subject in greater detail in his article *The Question of Defining Outer Space*, 8 J. Space L. 154 (1980).

¹⁸See Working Papers of USSR, Doc. A/AC.105/L.112, 20 June 1979 and Doc. A/AC.105/C.2/L.139, 4 April 1983. See also Report of the Legal Sub-Committee on the work of its twenty-second session, UN Doc. A/AC.105/320, 13 April 1983, para. 36 at 8.

¹⁹See Report of the Legal Sub-Committee on the work of its twenty-first session (1-19 February 1982), UN Doc. A/AC.105/305, 24 February 1982, at 7 ff. See also Report of the Legal Sub-Committee on the work of its twenty-second session, UN Doc. A/AC.105/320, 13 April 1983, paras. 37-39 at 8-9.

economical basis, these States are of the view that this orbit derives its special attributes from the planet Earth as a whole and that any regulation of its use should respect the principles of existing international space law, in particular the 1967 Space Treaty.²⁰

A new development in this particular problem was recorded during the discussions in the Special Political Committee to which the item "International cooperation in the peaceful uses of outer space" was assigned at the thirty-eighth session of the General Assembly. Its outcome has been reflected in resolution 38/80 adopted by a majority vote on 15 December 1983. In paragraph 5 of this resolution, the General Assembly decided that the Legal Sub-Committee at its twenty-third session, to be held in 1984, should "establish a working group to consider, on a priority basis, matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including the elaboration of general principles to govern the rational and equitable use of the geostationary orbit, a limited natural resource." To that end, Member States were requested to submit draft principles and the working group would have "to take account of different legal régimes governing airspace and outer space, respectively, and the need for technical planning and legal regulation of the geostationary orbit."²¹

Another new item, which is now under discussion of the Legal Sub-Committee, is entitled "Consideration of the possibility of supplementing the norms of international law relevant to the use of nuclear power sources in outer space." In this point a considerable gap exists between those who are convinced that the present provisions of outer space treaties need to be supplemented and those who believe that these provisions offer a sufficient basis for handling all situations arising from the use of nuclear power sources (NPS) in outer space.

It should be recalled in this connection that a Working Group established by COPUOS was considering the use of NPS in outer space during three sessions of the Scientific and Technical Sub-Committee. It reached the conclusion that NPS could be used safely in outer space, provided that all the necessary safety requirements were met. The same group formulated a number of recommendations, including those concerning the format of notification for re-entering space vehicles containing NPS which may give rise to radiological hazards.²² These recommendations also served as a basis for the deliberations of the Legal Sub-Committee at its twenty-second session held in 1983. A certain progress reached in these deliberations has been reflected in the report of the Working Group of the Legal Sub-Committee dealing with this item.²³ This progress was welcomed both by COPUOS at its twenty-sixth session held in 1983²⁴ and the General Assembly which noted in its resolution 38/80 with satisfaction "the successful efforts of the Legal Sub-Committee of the Committee on the Peaceful Uses of Outer Space in

²⁰See UN Doc. A/AC.105/305, 24 February 1982, at 10 *ff.* and UN Doc. A/AC.105/320, 13 April 1983, at 9 *ff.*

²¹See Resolutions and Decisions adopted by the General Assembly during the first part of its thirty-eighth session. From 20 September to 20 December 1983, Press Release GA/6935, 13 January 1984, at 195 *ff.*

²²See Report of the Scientific and Technical Sub-Committee on the work of its eighteenth session, UN Doc. A/AC.105/287, Annex II, particularly paras. 19 and 38 at 4-5, 9.

²³See Draft report of the chairman of the working group on agenda item 5 in U.N. Doc. A/AC.105/320, 13 April 1983, Annex II, at 22-23.

²⁴See Report of the Committee on the Peaceful Uses of Outer Space, GAOR: Thirty-Eighth Session, Supplement No. 20 (A/38/20), para. 71 at 12.

elaborating an agreed text concerning the format and the procedure for notification in case of malfunction of a spacecraft carrying a nuclear power source on board."²⁵

In the same resolution the General Assembly endorsed the recommendation of COPUOS that, during the twenty-first session of the Scientific and Technical Subcommittee, the Working Group on NPS should be reconvened to conduct additional work on the basis of the report of the Working Group on the work of its third session.²⁶

Prevention of arms race as an essential condition for international cooperation in outer space

At recent sessions of COPUOS, during the discussions of the thirty-sixth, thirty-seventh and thirty-eighth sessions of the General Assembly and also at the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, delegations of several Member States expressed their deep concern relating to the growing dangers of the military use of outer space, stressing the need for the early consideration by the international community of measures to prevent an arms race in outer space. The introducing of weapons into this environment and establishing of new weapon systems might have a serious negative effect on the development of international cooperation for the exploration and peaceful uses of outer space. It was therefore proposed by some delegations to COPUOS to include in the agenda of the Committee a new item entitled "Ensuring the use of outer space exclusively for peaceful purposes." The discussions on it could lead to a further elaboration of the principle of non-militarization of outer space, the first basis of which was already enshrined in Art. IV of the 1967 Space Treaty.²⁷

In the agenda of the thirty-sixth session of the General Assembly, an item called "Conclusion of a treaty on the prohibition of stationing of weapons of any kind in outer space" was also included. It was done so upon the initiative of the Soviet Union which also provided the text of a draft treaty on this subject to be negotiated as a separate instrument in addition to the existing space agreements.²⁸

In the discussions of the First Committee, to which this item was assigned together with other problems of disarmament, two main trends of opinions emerged. One of them supported the original idea, i.e. the prohibition of stationing in outer space of any kinds of weapons, even those which are not covered by the definition of weapons of mass destruction the placement of which in outer space had already been prohibited earlier. In this way, outer space should not become an arena for arms race or a source of aggravating relations between States.

The promoters of the other trend indicated that outer space could be involved in the arms race in different ways that are not yet prohibited by the existing agreements.

²⁵See Press Release GA/6935, 13 January 1984, para. 4 at 196.

²⁶*Id.*, para. 8 at 197.

²⁷See Report of the Committee on the Peaceful Uses of Outer Space, GAOR: Thirty-sixth session, Supplement No. 20 (A/36/20), para. 68 at 13.

²⁸See UN Doc A/36/192, 20 August 1981, Annex.

For the time being, they qualified as the greatest danger the development, testing and deployment of an anti-satellite weapon system.²⁹

At its thirty-seventh session the General Assembly succeeded in adopting a single resolution 37/83 of 9 December 1982, requesting the Geneva Committee on Disarmament to consider the question of preventing an arms race in outer space as a matter of priority.

However, in the course of its session in 1983 the Committee on Disarmament, though considering this subject both at its formal and informal meetings as well as through informal consultations, was not able to reach any substantial progress and did not even establish a working group on outer space due to disagreement on a mandate for it.

A new basis for the deliberations on this subject was created by the Draft Treaty on the Prohibition of the Use of Force in Outer Space and from Space against the Earth, submitted by the Soviet Union³⁰ and the discussion that followed the submission of this draft at the thirty-eighth session of the General Assembly. In its resolution 38/70 of 15 December 1983, the General Assembly, *inter alia*, emphasized that further effective measures to prevent an arms race in outer space should be adopted by the international community and reiterated that the Conference on Disarmament (as the Geneva Committee on Disarmament is to be known from the date of commencement of the annual session in 1984) had a primary role in the negotiation of an agreement or agreements on the prevention of an arms race in all its aspects in outer space.³¹

Furthermore, in its resolution 38/80 adopted on the same day with regard to International Cooperation in the Peaceful Uses of Outer Space, the United Nations General Assembly called upon all States, in particular those with major space capabilities, "to undertake prompt negotiations under the auspices of the United Nations with a view to reaching agreement or agreements designed to halt the militarization of outer space and to prevent an arms race in outer space, thus contributing to the achievement of the internationally accepted goal of ensuring the use of outer space exclusively for peaceful purposes." At the same time, the General Assembly requested COPUOS to consider, as a matter of priority, the questions relating to the militarization of outer space, taking into account the need to coordinate the efforts of COPUOS and the above-mentioned Conference on Disarmament.³²

In this connection it should be also recalled that at the first special session of the General Assembly devoted to disarmament, which was held in 1978, the delegation of France proposed the establishment of an international satellite monitoring agency (ISMA) by means of which the use of observation satellites within the framework of disarmament would be placed at the service of the international community.³³ In paragraph 125(d) of the Final Document from this special session, the General Assembly requested the

²⁹As to greater details on this subject see the paper of the writer on "Article IV of the 1967 Space Treaty. Its Present Meaning and Possibilities of Further Development", published in Proceedings of the twenty-fifth Colloquium on the Law of Outer Space, 27 September-2 October 1982, Paris, France, at 119 ff.

³⁰See UN Doc. A/38/194, 23 August 1983.

³¹See Press Release GA/6935, 13 January 1984, paras. 2 and 4 at 105 and 106.

³²*Id.*, paras. 14 and 15 at 197.

³³See the note verbale of France, Doc. A/S-10/AC.1/7, to which a memorandum dealing with the subject was attached.

Secretary-General to undertake, with the assistance of qualified governmental experts, a study on the technical, legal and financial implications of establishing an ISMA.³⁴

In the study, which resulted from intensive efforts of the said group of experts and was published on 6 August 1981,³⁵ the valuable contribution which monitoring by satellites could make to the verification of compliance with certain arms control and disarmament agreements was generally recognized. Moreover, the positive role that satellite monitoring could play in preventing or settling international crises and thus contribute to confidence building among nations was emphasized.³⁶ It was also made abundantly clear that from the legal point of view, there was no provision in international law, including space law, that would entail a prohibition for an international governmental organization such as ISMA to carry out monitoring activities by satellites.³⁷

A major contribution to further development of international space cooperation was made by the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82) held in Vienna, 1982, fourteen years after the first conference of this kind. The Second Conference focused on matters of a global nature and the utilization of space technology with respect to all participating countries. Furthermore, the Conference made an impetus towards an orderly growth of space activities favourable to socio-economic advancement of mankind and, in particular, of the peoples of the developing countries through creation and reinforcement of their national capacities. The Conference adopted by consensus a comprehensive report to the General Assembly on its work,³⁸ which included its recommendations pertaining to international cooperation in the exploration and peaceful uses of outer space. The General Assembly endorsed these recommendations in its resolution 37/90 adopted also by consensus on 10 December 1982 and in resolution 38/80 adopted on 15 December 1983, the General Assembly emphasized the urgency and importance to implement fully the recommendations of UNISPACE 82 as early as possible.

Though not discussing legal problems of outer space in great detail, the Conference stimulated further elaboration of the principles of international cooperation in space activities and enhanced the coordinating role of the United Nations in this field. According to a generally shared view of the participants in the Conference, as expressed in its report, "the maintenance of peace and security in outer space is of great importance for international peace and security. The prevention of an arms race and hostilities in outer space is an essential condition for the promotion and continuation of international cooperation in the exploration and use of outer space for peaceful purposes."^{39*}

³⁴See Final Document of the Tenth Special Session of the General Assembly, UN Doc. S-10/2, para. 125(d).

³⁵See Study on the implications of establishing an international satellite monitoring agency. Report of the Secretary-General, UN Doc. A/AC.206/14, 6 August 1981.

³⁶*Id.*, para. 16 at 14.

³⁷*Id.*, para. 18 at 14.

³⁸See Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982, UN Doc. A/CONF.101/10, 31 August 1982, and Corr. 1 and 2.

³⁹*Id.*, para. 14 at 5.

**Editor's note:* After this article went to press, the author requested inclusion of the following statement: "During the twenty-seventh session of COPUOS held in Vienna in June 1984 the delegation of Austria advised the Committee that Austria had deposited her instrument of ratification of the 1979 Moon Agreement which would thus enter into force 30 days later."

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The field of space law has evolved considerably since publication of early landmark treatises in the 1960's.¹ It is now possible to practice space law, and it is to this subject that the instant article is addressed.

This article categorizes space law into three substantive areas: space communications law, space transportation law and space property law. Any categorization of real-life phenomena is, to some extent, imprecise; yet categorization is an essential component of understanding. Hence this article speaks of "space law," and includes therein legal rules which pertain to outer space activity but which may also be found in scholarly works devoted to non-space subjects. A similar situation exists in almost every legal field—the well-known overlap of the law of torts and the law of contracts is but one example. The decision rule employed here is simple: if the rule or regulation applies by its express terms to outer space activity, then it is part of space law.

Three issues will be addressed for each of the three substantive divisions of space law (space communications, space transportation and space property) that presently or prospectively offer significant opportunities for private practice. First the nature of the underlying subject matter will be explained so that its relationship to outer space is clear. Next will come answers to the question which arises most frequently in this area—why are there legal issues? Finally the article provides a detailed exposition of the opportunities for practicing each division of space law—the opportunities for resolving conflicting legal rights and obligations pertaining to the limitless cosmic frontier.

I. SPACE COMMUNICATIONS LAW AND PRACTICE

A. What Is Space Communications?

Space communications is the transfer of information from beyond the earth's atmosphere to within it, or from within the earth's atmosphere to beyond it. Usually this process involves sending information from a transmitter at one location on the earth's surface (the "transmit earth station") to a relay facility with both transmit and receive capabilities some 22,300 miles above the equator in geostationary orbit (the "space station" or "satellite") and then back down to one or more receivers at other locations on the earth's

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¹A. HALEY, *SPACE LAW AND GOVERNMENT* (1963); M. McDUGAL, *LAW AND PUBLIC ORDER IN OUTER SPACE* (1965); C. CHRISTOL, *THE INTERNATIONAL LAW OF OUTER SPACE* (1966); L. LIPSON & KATZENBACK, *REPORT TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ON THE LAW OF OUTER SPACE* (1961); M. JENKS, *SPACE LAW* (1965); N. MATTE, *AEROSPACE LAW* (1969); S. GOROVE, *STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS* (1977).

surface (the "receive earth stations").² Because the information is sent as an altered or "modulated" band of electromagnetic energy, it moves at the speed of light (300,000 kilometers per second) and consequently takes less than a second to reach its destination via satellite.

Space communications is also effected in less well-known ways. For example information may be transferred between two objects in space, such as between the Space Shuttle and one or more of NASA's Tracking and Data Relay Satellites (TDRS). This is known as intersatellite service. Another important activity is the transfer to a receive earth station of electromagnetic energy received by a satellite from portions of the earth's land, water and air masses. This is known as earth exploration satellite service or "remote sensing". Perhaps the most significant information received from space is that which arises naturally from cosmic phenomena such as stellar fusion, novae and various atomic quantum physical processes. This information, the receipt of which is known as radio astronomy, allows scientists to determine the chemical make-up of the universe (including the existence in deep space of dozens of different organic and inorganic molecules), the ages of stars and galaxies, the velocity at which the fabric of space is expanding and the very extent of "time".³

Hence space communications is concerned with the movement of information outside of earth's atmosphere. It presently represents the most significant human activity in space. This should be expected because information has no mass and mankind is just beginning to learn how to get mass out of the deep gravity well provided by the earth. Space communications is, nevertheless, a truly remarkable achievement. The satellites which relay information are, in essence, sophisticated robots capable of operating farther from earth than anyone other than Apollo astronauts have travelled, and are capable of doing so for a decade or more without any hands-on maintenance whatsoever. They have permitted, for the first time ever, hundreds of millions of persons to witness the same televised events, individuals in remote locations to be diagnosed and treated by medical experts at distant hospitals and all forms of organizations to operate efficiently despite the fact that their members may be separated by many thousands of miles. Space communications is a space activity with terrestrial applications: what kinds of legal questions does such an activity create?

²See, C. JANSKY, COMMUNICATION SATELLITES IN THE GSO (1982). In 1945, Arthur C. Clarke first identified the key beneficial attribute of a communications satellite in geostationary orbit—it could, on a virtually continuous basis, relay signals between ground stations spread across 40% of the globe. Clarke, *Extra-Terrestrial Relays: Can Rocket Stations Give World-Wide Coverage?* WIRELESS WORLD, Oct. 1945, at 305-08.

The international legal definition for a geostationary satellite is: "A satellite, the circular orbit of which lies in the plane of the Earth's equator and which turns about the polar axis of the Earth in the same direction and with the same period as those of the Earth's rotation." Final Acts of the World Administrative Radio Conference for Space Telecommunications 47 (1971). The "geostationary satellite orbit" is the "orbit on which a satellite should be placed to be a geostationary satellite." *Id.* But space law and technology expert James Gehrig has observed that because satellites are subject to perturbing forces few, if any, geosynchronous satellites can meet the technical international legal definition. Gehrig, *Geostationary Orbit—Technology and Law* PROCEEDINGS OF THE NINETEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 267 n.4 (1977). Hence, as a matter of common acceptance, geosynchronous satellites in orbits with small inclinations to the plane of the equator, no more than 5°, are still considered "geostationary satellites." *Id.*

³J. KRAUS, RADIO ASTRONOMY (1976); Comments of the National Academy of Sciences in the Third Notice of Inquiry, Inquiry Relating to Preparation for an International Telecommunication Union World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit and the Planning of the Space Service Utilizing It, Dkt. No. 80-741, Dec. 15, 1983.

B. Why Are There Legal Questions?

Consider the following as a general rule: only one kind of information can be received on an electromagnetic channel, in one place, at one time. "Channel" means contiguous group or "band" of frequencies within the electromagnetic spectrum, and this is about as much electrical engineering as one needs to know to participate in space communications law. To affirm the sensibility of this general rule consider an analog: a person can only understand one person talking to him, in one place, at one time. Here, "talking" or sound waves is the channel and if two people talk simultaneously, in the same place, the listener is confused. (If one person talks while the other communicates with facial expressions we can understand both because the facial expressions are on another channel, a visual one). Similarly if two different types of information are transferred simultaneously, in the same place and on the same channel, the information becomes confused. In space communications this confusion is called "interference."

The need to avoid interference gives rise to most current space communications law questions. When three or more people meet to talk, social norms provide the rules for sharing a common auditory channel and for thereby avoiding "interference." When different American companies decide to launch and operate space communications systems, the U.S. Federal Communications Commission (FCC) must establish rules for sharing a common frequency channel. And when different nations and international organizations decide to launch and operate space communications systems, the International Telecommunication Union must adopt a regulatory framework for international sharing of space channels. These domestic and international rules for sharing frequencies and avoiding interference constitute the bulk of space communications law. They occupy dozens of pages of formally adopted FCC Orders⁴ and of the ITU Radio Regulations, an international treaty.⁵ Underlying this law are thousands of pages of legal advocacy in support of various approaches to sharing space communications channels.

The primary means of avoiding interference between different space communications systems is to have the channels they generate operate in different "places" from each other. Operating different systems at different times is not practical at present; operating different

⁴Establishment of Domestic Communications-Satellite Facilities by Non-Governmental Entities, *Report and Order*, (in Dkt. No. 16495), 22 FCC 2d 86 (1970); *Second Report and Order*, (in Dkt. No. 16495), 35 FCC 2d 844 (1972); Processing of Pending Space Stations Applications in the Domestic Fixed Satellite Service, *Memorandum Opinion and Order*, 77 FCC 2d 956 (1980); Assignment of Orbital Locations to Space Stations in the Domestic Fixed Satellite Service, *Memorandum Opinion and Order*, 84 FCC 2d 584 (1981); Applications for New Space Stations in the Domestic Fixed Satellite Service, *Memorandum Opinion and Order*, 93 FCC 2d 1260 (1983); Development of Regulatory Policy in Regard to Direct Broadcast Satellites, *Report and Order* (in Dkt. No. 80-603), 90 FCC 2d 676 (1982); Applications for Transborder Satellite Services, *Memorandum, Opinion, Order and Authorization*, File No. 1-FC-82-048, *et al.* (adopted 23 August, 1983).

⁵Final Acts of the World Administrative Radio Conference, Radio Regulations Relating to Space Telecommunications, Geneva, July 17, 1971, 23 UST 1527, T.I.A.S. No. 7435; Final Acts of the World Administrative Radio Conference (Geneva, 1979) *reprinted in* Nat'l Tech. Info. Serv., U.S. Dept. of Commerce.

The International Telecommunication Convention, December 9, 1932, 49 Stat. 2391, T.S. No. 867, created the International Telecommunication Union (ITU) of periodically convened "Plenipotentiary Conferences" to revise Convention provisions, "Administrative Conferences" to revise the detailed Radio Regulations appended to Conventions, separate "Consulting Committees" to study radio and telephony, and the "Berne Bureau" (now the International Frequency Registration Board) to keep track of the rapidly growing number of frequency assignments.

Since 1932, the ITU has agreed to several modified versions of an International Telecommunication Convention: International Telecommunication Convention, Oct. 2, 1947, 63 Stat. 1399, T.I.A.S. No. 1901; International Telecommunication Convention, *opened for signature* Nov. 12, 1965, 18 U.S.T. 575, T.I.A.S. No. 6267; International Telecommunication Convention, done Oct. 25, 1973, 28 U.S.T. 2497, T.I.A.S. No. 8572. The latest was adopted in Nairobi, Kenya in the late 1982.

systems on different channels is only a partial solution because there are important economic reasons to operate on one of two favored channels, the so-called "C-band"⁶ and "Ku-band."⁷ Satellite systems can operate at different "places" in one of two ways—they may operate from different orbital positions in the geostationary orbit and/or they may relay communications from different portions of the earth's surface. Hence space communications law involves making decisions as to which organizations within one country, and countries within the global community, are entitled to which orbital positions in an orbit some 100 times farther out into space than the Shuttle will ever travel! These are the space communications law decisions of today.

Space communications law questions also arise for reasons unrelated to sharing of a common frequency band. One such question involves the rights of countries to implement and/or use satellite communications systems other than the Intelsat system for international telecommunications. Over 100 countries are parties to the Intelsat Agreement,⁸ which establishes a worldwide satellite system operated by an international organization to provide international telecommunications service and aims to preclude other satellite systems which cause the Intelsat system significant technical or economic

⁶The frequencies used for Western Hemisphere public communications satellite service in these bands are 5.925-6.425 GHz uplink and 3.7-4.2 GHz downlink for the C band; 11.7-12.7 GHz downlink and 14.0-14.5 GHz uplink for the Ku band; and 17.7-21.1 GHz downlink and 27.5-31.0 GHz uplink for the Ka band. ITU Radio Regulations, Art. N7, §4; see also Jackson, *The Allocation of the Radio Spectrum*, SCIENTIFIC AMERICAN, Feb. 1980, at 34-39.

From a signal propagation standpoint, the C band is "ideal" and accounts for the great majority of satellite communications traffic. J. MARTIN, COMMUNICATIONS SATELLITE SYSTEMS 138 (1978). However, Ku-band conditions are also quite favorable and most new communications satellite systems will utilize this band. Rothblatt, *International Regulation of Digital Communications Satellite Systems*, 32 FED. COM. L.J. 403-11 (1980). Although Ka-band signals propagate better than those transmitted at some neighboring frequencies, further technology development is needed to handle the band's characteristic rain attenuation problems. J. MARTIN, COMMUNICATIONS SATELLITE SYSTEMS 139 (1978). NASA is developing this technology, and the satellite industry is depending upon the Ka band to satisfy mammoth satellite communications needs in the next decade.

⁷The acronyms "C" and "Ku" stem from the use of code words during the second World War.

Higher 14/12 GHz (14-14.5 GHz uplink; 11.7-11.2 GHz downlink) frequencies will bring ground stations to users' premises in urban centers—a move which could not be made with traditional, lower frequency 6/4 GHz satellite service because of interference by the terrestrial Bell System microwave links which blanket all high traffic areas—and have the further advantages of: (1) narrower beam width and, hence, room for more of these satellites in geostationary orbit without interference; (2) a more directional beam from an antenna of a given size than that obtainable at lower frequencies and, hence, more opportunity to reuse a frequency in multiple highly-directed beams; (3) higher antenna gain than that obtainable at lower frequencies, thus increasing effective satellite power and reducing ground station size and cost; and (4) less need to impose harsh limits on satellite radiated power, as at 4 GHz downlinks, to minimize interference with terrestrial microwave distribution systems. J. MARTIN, COMMUNICATIONS SATELLITE SYSTEMS 136-47 (1978).

As these high frequencies get as saturated as the 6/4 GHz band, technology will enable use of the still higher 30/20 GHz frequency band where the U.S. Government has reserved 2/3 of the available 1.5 GHz bandwidth. Jain, *Use of EHF Bands in Further Military Satellite Applications*, 2 IEEE 1979 International Conference on Communications 33.4.1. Commercial systems will operate in the remaining 500 MHz some time this decade. Ward, *NASA Advanced Communications Systems Analysis*, 1 IEEE 15.2.21 (1979). See also Establishment of Domestic Communications Satellite Facilities by Non-Governmental Entities, 35 F.C.C. 2d 844, 851 (1972).

⁸Agreement Relating to the International Telecommunications Satellite Organization, 23 U.S.T. 3813, T.I.A.S. No. 7532 (1973) (hereinafter cited as INTELSAT Agreement). See generally R. COLINO, THE INTELSAT DEFINITIVE ARRANGEMENTS: USHERING IN A NEW ERA IN SATELLITE TELECOMMUNICATIONS (1973); DOYLE, *Permanent Arrangements for the Global Commercial Communications Satellite System of Intelsat*, PROCEEDINGS OF THE 17TH COLLOQUIUM ON THE LAW OF OUTER SPACE 123 (1975); PELTON, *The Intelsat Global Satellite System and the Pacific: Past, Present and Future* PACIFIC TELECOMMUNICATIONS CONFERENCE 2E-23 (1979).

harm. Legal issues include what constitutes significant economic harm,⁹ what types of international communications fall within the purview of the Intelsat agreement and what are the legal options available to a country or group of countries if Intelsat advises that a satellite system they contemplate is inconsistent with their Intelsat obligations.

On a domestic level, space communications law issues relating to Intelsat arise because of laws which usually reserve to one organization an exclusive right to transmit information to Intelsat satellites and/or to participate in the Intelsat organization. Today, Intelsat satellites can interact with small earth stations, and new companies are seeking the privilege of transmitting information to, and receiving information from, these international space-based relays. Many issues exist in the U.S. and other countries as to whether such non-exclusive access to Intelsat should be permitted, and if so, how it should be regulated. There is a tie-in with transborder data flow issues since a new Intelsat International Business Service (IBS) offering would allow vast stores of data to be transmitted out of a country, from anywhere in the country, in a matter of seconds.

Another space communications law issue that is not directly related to orbital positions is that of international satellite broadcasting.¹⁰ Here the question is whether the intentional transmission of information from one or more countries to others via satellites in geostationary orbit should be subject to a legal regime of prior consent. This issue exemplifies nicely the "seamless web" of space communications law. In anticipation of future problems with regard to sharing of the geostationary orbit, the ITU, in 1977¹¹

⁹See, e.g., Reply of Communications Satellite Corporation to Opposition to Petition to Deny, In re International Satellite, Inc., file Nos. CSS-83-004-P(LA), I-P-C-83-073, Oct. 24, 1983, where Cosmat states: "ISI indicated in its Application, the framers of the INTELSAT Agreement amended a draft of Article XIV(d) to substitute 'significant' economic harm for 'substantial' economic harm. Contrary to ISI's interpretation, this word choice indicates an intent on the part of the members to refrain from causing lesser degrees of harm—that is, harm that would have only a 'significant,' albeit not a 'substantial,' effect on INTELSAT. Moreover, the very source relied on by ISI for the change in language indicates clearly that Article XIV(d) was intended only to provide the flexibility to enable members, in certain circumstances, to establish or use limited regional satellite systems, and that Article XIV(d) reflects a majority position, as advocated by the United States, 'that each Participating State obligate itself not to establish, or join in the establishment of, a space segment in competition with the space segment of the Organization.'"

¹⁰The term "international" is often reserved for the case where the satellite broadcast is *intentionally* aimed at a foreign country. However, satellite broadcasting transmissions may reach a foreign country also in the form of "spillover." Spillover occurs since it is impossible to tailor the satellite footprint so as exactly to match the borders of the transmitting country.

¹¹The 1977 Broadcasting-Satellite Conference marked a break with ITU tradition and signalled a new, deeper level of ITU involvement in satellite communications. Drawing strength from a preponderantly Third World membership and from a broad mandate of resolutions and recommendations from earlier ITU Conferences, the principles of efficient and equitable use of space service frequencies and orbital positions were interpreted to mean, at least for 12 GHz band broadcasting-satellite service, *a priori* assignment of the orbit/spectrum resource among all ITU members. The Secretary-General of the ITU, Richard Butler, noted that the broadcasting-satellite service "plan" contains "a collection of all the technical parameters necessary for the purpose of ensuring the optimum use of available resources." This list of "technical parameters" essentially assigns to specific countries the frequencies and orbital positions they may employ for satellite broadcasting. This assignment is accomplished by dividing the bandwidth, associating each group of channels with an orbital position, and then allocating to countries the right to specific channels at specific orbital positions. Countries have from two (Brunei) to sixty-five (Soviet Union) channel assignments; most countries receive four, depending on size, population and foreseeable communication needs.

The plan just described was executed for Regions 1 and 3, but, largely because of American opposition, the decision on an assignment plan for Region 2 (Western Hemisphere) was postponed for action at a 1983 regional conference. See Butler, *World Administrative Radio Conference for Planning Broadcasting Satellite Service*, 5 J. SPACE L. 93, 98 (1977); Milli, *World Administrative Radio Conference for the Planning of the Broadcasting-Satellite Service in Frequency Bands 11.7-12.2 GHz* (in Regions 2 and 3) and *11.7-12.5 GHz* (in Region 1), PROCEEDINGS OF THE 20TH COLLOQUIUM OF THE LAW OF OUTER SPACE 346 (1978).

and 1983, gave all countries specific orbital positions at a frequency band reserved for satellite broadcasting and required that these orbital positions be used only for transmissions centered on an orbital position assignee's own country.¹² While this minimized interference problems, it also left very little room for intentional international satellite broadcasting at the reserved frequency band. It is also possible, however, to broadcast from satellites to slightly larger receive earth stations in a frequency band within which such transmissions could be considered international telecommunications subject to the Intelsat Agreement. Were such transmissions to be effected from a country's own satellites, then signatories to the Intelsat Agreement which did not want their populace to receive such transmissions could oppose them on the ground that they were international satellite communications capable of causing economic harm to the Intelsat system. There is no shortage of space communications legal issues. Fortunately, there are many opportunities to practice space communications law as well.

C. What Are The Opportunities For Practicing Space Communications Law?

The largest opportunity for practicing space communications law is to represent private companies which desire authority to construct, launch and operate a satellite communications system.¹³ There are many such companies now, and there will certainly be many more in the years to come. The first companies to receive the necessary permission to operate a satellite communications system were Western Union, RCA Americom and Comsat General.¹⁴ They and all subsequent U.S. grantees of satellite communications operating authority applied to and received permission from the U.S. Federal Communications Commission.

Subsequently, in 1977, Satellite Business Systems received permission to operate an advanced Ku band network.¹⁵ In 1980 replacement and/or new satellites were granted, on application, to GTE Satellite, Southern Pacific Spacenet, Hughes Communications, Satellite Business Systems, Western Union, RCA Americom and Comsat General.¹⁶ Still more recently, applications to operate satellite systems were received from and granted to the above-listed companies as well as new applicants such as American Satellite

¹²In 1983 the U.S. was allotted 32 broadcasting satellite channels at eight different orbital positions. The eight companies authorized by the FCC in late 1982 to enter the direct broadcast satellite business have proposed building and launching 21 satellites to offer 43 channels of national service. For various technical and economic reasons, most of the DBS companies have requested orbital slots at 101 degrees west longitude to serve the eastern half of CONUS or the Eastern and Central time zones and at 148 degrees to serve the western half of CONUS or the Mountain and Western time zones. Five companies requested 34 channels at 101 degrees and eight asked for 46 at 148.

¹³Useful scholarly works dealing with space communications law are S. GOROVE, *U.S. SPACE LAW* (1983) and D. LEIVE, *INTERNATIONAL TELECOMMUNICATIONS AND INTERNATIONAL LAW: THE REGULATION OF THE RADIO SPECTRUM* (1971).

¹⁴Western Union Telegraph Company, 38 FCC 2d 1197 (1973); COMSAT General Corporation, 42 FCC 2d 677 (1973), 45 FCC 2d 444 (1974); RCA Global Communications, 56 FCC 2d 660 (1975).

¹⁵Satellite Business Systems, 62 FCC 2d 997 (1977).

¹⁶Replacement satellites and expansions of existing systems were authorized in COMSAT General Corporation, 84 FCC 2d 547 (1981); RCA American Communications, Inc., 84 FCC 2d 633 (1981); Western Union Telegraph Company, 86 FCC 2d 196 (1981); and Satellite Business Systems, 86 FCC 2d 180 (1981). Initial satellites for new system entrants were approved in Hughes Communications, Inc., 84 FCC 2d 578 (1981); Southern Pacific Communications Company, 84 FCC 2d 650 (1981) and GTE Satellite Corporation, 84 FCC 2d 562 (1981).

Company, United States Satellite Systems and Rainbow Satellite.¹⁷ As of February 1984 the FCC had yet more applications to operate satellites from Ford Aerospace, National Exchange, Systematics General, Federal Express, Martin Marietta and several other firms.

In all, there are presently 29 different companies with applications at the FCC for over ninety satellites. Most of these companies are seeking permission to operate traditional satellite communications systems, but others, such as Geostar Corporation, are applying for authority to implement new types of systems (satellite based position location and navigation satellites).¹⁸ Each of these companies has retained legal counsel to help prepare their applications to the FCC, to draft all manner of pleadings as required under the FCC's Rules and the Administrative Procedure Act (petitions to deny, oppositions, comments, reply comments and others) and to assist the company in obtaining the orbital positions they desire. Space communications counsel are somewhat like celestial gladiators fighting first for an opportunity to enjoy a perch in space and then over preferred orbital positions in the geostationary arc.

In addition, there are significant opportunities in space communications law practice to represent private companies which have rights to use a satellite of another company,¹⁹ which desire an opportunity to operate earth stations capable of transmitting directly to Intelsat satellites and thereby establishing a dedicated international message transfer network²⁰ or which are concerned with the claims of other countries in the Western Hemisphere to the orbital positions they desire. For example, between 1984 and 1988 the ITU will hold several meetings and conferences in Geneva for the purpose of establishing a regime that will guarantee in practice the rights of all countries to equitable access to the geostationary orbit and space service frequency bands. The conferences are called Space WARC's (World Administrative Radio Conferences) and the meetings are convened for preparatory purposes. The FCC has established a Space WARC Advisory Committee to serve as a focal point for non-government input into what U.S. policy should be with regard to equitable access to the geostationary orbit for satellite communications purposes. Dozens of private companies send legal representatives to the Advisory Committee's meetings to monitor, report on and participate in its proceedings.²¹ Even radio astronomers, whose interest in space communications was described above, retain legal counsel to ensure that satellites transmissions are not allowed to drown out reception of important cosmic radio waves.

In sum, there are a great many opportunities to practice space communications law. They center around representing private company interests before the Federal

¹⁷Memorandum Opinion and Order, Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, FCC 83-186 (August 12, 1983).

¹⁸See *Geostar*, POPULAR SCIENCE, March, 1984 and Petition of Geostar Corporation for Issuance of a Notice of Proposed Rulemaking to Allocate Frequencies to the Geostar Satellite System, RM-4426, March 31, 1983. (available in FCC Docket File, Wash. D.C.)

¹⁹See Domestic Fixed Satellite Transponder Sales, 90 FCC 2d 1238 (1982).

²⁰Regulatory Policies Concerning Direct Access to Intelsat Space Segment for the U.S. International Service Carriers, 90 FCC 2d 1446 (1982) Modification of Policy on Ownership and Operation of U.S. Earth Stations that Operate with the INTELSAT Global Communications Satellite System, 90 FCC 2d 1458 (1982).

²¹See Report of the Legal Implications Subcommittee, FCC Space WARC Advisory Committee, Dkt. No. 80-742 (Dec., 1983).

Communications Commission.²² These interests range from fervent desires for particular orbital positions in the geostationary arc to a driving motivation to provide new satellite services to millions of customers. The excitement clients feel for their efforts to help build a space-based "nervous system of mankind" cannot help but be felt by the counsel they retain, and help to make space communications law one of the most exhilarating fields of legal practice today.

II. SPACE TRANSPORTATION LAW AND PRACTICE

A. What Is Space Transportation?

Space transportation is the transfer of physical objects into or within the region beyond the earth's atmosphere, or from that region to the surface of the earth. The definition is similar to that provided above for space communication; the obvious difference is that matter rather than information is being transferred. Examples of space transportation include the Space Shuttle, expendable launch vehicles (Delta, Atlas, Titan, Ariane) and orbital transfer vehicle concepts for moving objects between various orbits about the earth.

The rate of worldwide space transportation activity has exceeded one launch per month and is expected to continue increasing. Much of this increase comes from heightened worldwide demand for additional communication satellites, which must be placed in orbit by an appropriate launch vehicle.²³ In the United States, the Space Shuttle²⁴

²²The authority requested in applications for satellite systems includes requests for construction permits pursuant to section 319 of the Communications Act, 47 U.S.C. §319. A recent amendment to the Act exempts common carrier stations from the construction permit requirement unless the Commission finds that the public interest would be served by such a requirement. See *Communications Amendments Act of 1982*, Public Law No. 97-259, Section 119. However, the Commission has decided to retain the present licensing procedure, including the construction permit requirement, until it can initiate a rulemaking proceeding to implement this amendment. See *Public Notice*, No. 740 (released November 10, 1982), and *Notice of Proposed Rulemaking*, FCC 83-140, adopted April 7, 1983.

²³"In the space sector, launch projects are superseding space exploration in importance. World space launches are virtually booked solid for the next five years because of the strong demand for civil and military satellites and space research projects. Although most launches currently are with expendable launch vehicles, the reusable Space Shuttle will carry a large share of future payloads. Plans call for the operation of four U.S. Space Shuttles by the end of 1984. Foreign manufacturers will continue to offer expendable vehicle services at competitive rates." "... The need for space launches for a forecasted 500 satellites worldwide by year 2000 will translate into a demand for more than \$50 billion-worth of space launch equipment." "1983 Industrial Outlook," U.S. Dept. of Commerce. Battelle's Columbus Laboratories under contract to NASA in its "Outside Users Payload Model" report dated July, 1982, projects a High Model 667 launches and a Low Model 413 launches through 1987. This model does not include NASA's own missions but does provide a level of activity of the civil market including estimates of new programs as well as continuation of existing programs. The growth in launch requirements is compounded to some extent because of the need to replace spacecraft at intervals of five to eight years. Replacement may be stimulated by malfunctions, projected end of life, or by technical obsolescence.

²⁴The Space Shuttle is the United States Government's primary spacecraft launch vehicle in the now established Space Transportation System (STS). With an approved fleet of four ships (variously projected at up to seven in earlier NASA budget requests), the Shuttle was intended to launch all military payloads, some particularly heavy or large spacecraft such as SPACELAB, scientific and commercial payloads, and, due to its unique capabilities, to provide a means for in-orbit operations including manufacturing and material processing, LEO spacecraft repair or retrieval, and then to return to a soft landing on earth. Designed to carry up to 65,000 pounds into LEO from Kennedy Space Center, Florida, the Shuttle, with spacecraft payloads having an additional upper stage, can launch in excess of 12,000 pounds from the Orbiter cargo bay into geosynchronous transfer orbit (GTO). This capability also allows as many as four separate Delta-class spacecraft to be launched into geostationary orbit. Although the Shuttle is presently utilized in large part for missions which could be performed

is garnering the preponderant share of launch contracts, although a market may exist for a revitalized expendable launch vehicle based on the Delta, Atlas or Titan rockets. There is also a good possibility that one or more of three new types of launch vehicles being developed with private capital (Space Service's Conestoga, Starstruck's Dolphin and TranSpace's Space Van) may see commercial service. Most European spacecraft will be launched via Arianespace's Ariane rocket from Kourou, French Guyana.²⁵ The Japanese will probably rely on their Delta-derived N and H rockets. The Soviets enjoy an ample supply of boosters and India and China have an active launch vehicle development program.

To maintain a viable space transportation program one normally requires an expensive launch facility, a clear flight path and a tracking and data relay network, in addition to an extensive support infrastructure for rocket design, testing and modification. Despite these formidable requirements there appear to be clear opportunities for private involvement in space transportation activity, and therein lie most of the current opportunities for practicing space transportation law. As President Reagan announced in his January 25, 1984 State of the Union Message:

"The market for space transportation could surpass our capacity to develop it. Companies interested in putting payloads into space must have ready access to private-sector launch services."

During the late 1980's and 1990's a significant transorbital transportation market may arise with important opportunities for private involvement. The existence of this market flows from the large energy difference between low earth orbits and the geostationary orbit into which most civil spacecraft are placed. When an appropriate support infrastructure exists, such as that which would be provided by one or more large space stations, high energy orbital transfer vehicles can help to ensure that spacecraft safely reach their destinations in higher orbits.

by ELV's such as the launching of communications satellites, it is anticipated that, eventually, heavy demand will be placed on the four ship fleet for the many unique and intended mission capabilities of the Space Shuttle. The construction cost of additional Shuttles is in excess of a billion dollars each.

NASA originally priced Space Shuttle launch services based on projected average cost of operations over a 12 year period. More recently, the agency has changed its pricing policy due to higher costs to reflect actual costs of operations. A Shuttle Delta-class spacecraft launch to GTO in 1986 is expected to cost between \$26.2 million and \$36.7 million, depending on the actual spacecraft weight.

²⁵Ariane was developed by the European Space Agency (ESA) to vest within its 11 member countries a launch capability independent of that of the United States. Ariane was developed as an ELV for earth launch of spacecraft to outer space, and specifically, to geostationary orbit. In recognition of the need to operate Ariane in a commercial enterprise in contrast to a governmental program, Arianespace was formed as a private company under French law. Production, launch and marketing responsibilities for Ariane transferred from ESA to Arianespace. Ariane is intended eventually to provide a range in lifting capability to GTO from about 3,870 pounds for the present Ariane I to over 9,000 pounds for Ariane IV scheduled for 1986 operations. Ariane launch facilities are at near-equatorial Kourou, French Guiana. In comparison with Kennedy Space Center, Kourou by virtue of geography offers an 8-10% payload weight advantage for launch to GTO. The Ariane design includes the capability of launching a single large spacecraft or two Delta-class spacecraft. Although Ariane has experienced two launch failures in its first five launches, it is expected that substantial effort will continue toward achieving commercial viability.

B. Why Are There Legal Questions?

Legal questions arise primarily because the rights of private entities to engage in space transportation activity, and the corresponding obligations of States to oversee this activity, have not yet been fully explicated. Article VI of the Outer Space Treaty provides, in relevant part, that:

"States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty."²⁶

The key concept in this article is that a State must authorize, be responsible for and exercise continuing supervision over space transportation activities of private entities within its jurisdiction.²⁷ Hence the prevailing legal considerations revolve about the form and requirements of space transportation "authorization," the limits and extent of State "responsibility" and the structure or framework for "continuing supervision." These are important legal questions because too strict an interpretation of the State requirements could stifle private space transportation activity; it may also be argued that too lax an interpretation exposes the State of jurisdiction to international liability for events beyond its control.

During the early 1980's there has been extensive debate in the executive and legislative branches of the U.S. government, and within the space transportation community, as to what form "authorization" of space transportation activity should take.²⁸ The current consensus appears to be that such activity should be licensed on a per-launch basis by the U.S. Department of Transportation. There has been relatively little discussion of how the requirement of "continuing supervision" should be implemented in practice, although submission of brief written reports and reliance upon existing Defense Department space object tracking facilities appear to be reasonable solutions.

In the next decade the fundamental principle of international State responsibility for private space activity is likely to engender complex legal questions with regard to far-flung transorbital transportation projects that may not clearly fall within the jurisdiction of any one State. Should such projects eventually achieve an entirely space-based character, and hence a large degree of independence from terrestrial resources and sovereignties, it may be difficult to assert rights of State control and, consequentially, it may be impossible

²⁶Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter cited as Outer Space Treaty].

²⁷For cogent analyses of this article, *See* Galloway, *Interpreting the Treaty on Outer Space*, PROCEEDINGS OF THE 10TH COLLOQUIUM ON THE LAW OF OUTER SPACE 143 (1967); Gorove, *Sovereign Rights in Outer Space*, PROCEEDINGS OF THE 20TH COLLOQUIUM ON THE LAW OF OUTER SPACE 244 (1978); Dekanov, *Juridical Nature of Outer Space, Including the Moon and Other Celestial Bodies*, PROCEEDINGS OF THE 17TH COLLOQUIUM ON THE LAW OF OUTER SPACE 200 (1975); Bocksteigel, *Legal Implications of Commercial Space Activities*, PROCEEDINGS OF THE 24TH COLLOQUIUM ON THE LAW OF OUTER SPACE 1 (1981).

²⁸*See* H.R. 1011, 98th Cong., 1st Sess. 129 CONG. REC. H200 (daily ed. Jan. 27, 1983) ("Space Commerce Act"); H.R. 3942, 98th Cong., 1st Sess. 129 CONG. REC. H7283 (daily ed. Sept. 21, 1983) ("Expendable Launch Vehicle Commercialization Act") S. 560, 98th Cong. 1st Sess., 129 CONG. REC. S1507 (daily ed. Feb. 23, 1983) ("Private Satellite Launching Authorization Act of 1983").

to identify State responsibility. If the underlying "linchpin" of State responsibility is problematic, the duties of authorization and continuing supervision may become moot.

The legal questions raised by space transportation activity are enticing because they require both the establishment of a framework for hundreds of private space launches and, at the same time, broach a perhaps inevitable scenario in which the very question of State responsibility may begin to lose meaning. It is, therefore, particularly pleasant to be able to report that opportunities to practice space transportation law do, in fact, exist.

C. Opportunities For Practice

It must be conceded at the outset that space transportation is still in its infancy and that detailed rules, such as those which abound in space communications, do not generally exist. As a result, there is much less opportunity, at the present time, to represent private clients than is the case in space communications law. The largest current opportunities are to (1) negotiate space transportation contracts and (2) to monitor, report on and help to influence the space transportation legislation and administrative rules now being developed.

There are about a dozen companies with a sufficiently strong interest in space transportation legislation now pending in Congress to retain legal counsel for monitoring and other related purposes. About half this number of companies retain legal counsel to help obtain the necessary permits (State Department munitions export authority for sending missiles outside the United States; FCC experimental radio licenses for launch vehicle telemetry and remote control) for conducting non-governmental launches. Over the next couple of years the Department of Transportation can be expected to initiate rulemaking activity to develop specific guidelines for the authorization of private launches. Satellite, launch vehicle and space insurance companies can all be expected to have a direct interest in this rulemaking activity.²⁹

The best opportunities for practicing space transportation law probably still exist within NASA, where Mr. Neil Hosenball, a dean of this field, is General Counsel. Nevertheless, as the rate of space transportation activity continues to increase, and as the number of players in this game continues to grow, the private opportunities to practice space transportation law will soon rival those described above for space communications.

III. SPACE PROPERTY LAW AND PRACTICE

A. What Is Space Property?

Space property is something natural or man-made located beyond the earth's atmosphere. Natural space property includes asteroids such as the Apollo-Amur group which are found within the earth's orbit about the sun, the moon and other celestial bodies. Also included in this category are the natural resources of such property. Man-made space property includes all types of communication satellites, future space stations and the thousands of pieces of fragments of space objects known as space debris. In the future, such property would include any processed form of natural space resources.

²⁹With regard to insurance industry interest, AFLA NEWS, Winter, 1983, reports: "Insurance premium volume for commercially launched satellites has not exactly skyrocketed in the last 15 years. During that time period, satellite insurance has generated only \$310 million in premiums. The potential for such business, is, however, about to erupt. Over the next 10 years, premiums are expected to total \$3 billion to cover insurable values of more than \$40 billion."

The amount of man-made space property is increasing rapidly and now includes hundreds of satellites and over 10,000 pieces of trackable space debris. The thirty ton payload capacity of the Shuttle will certainly increase significantly the amount of man-made property in space over the next several years. More importantly, however, will be the Space Shuttle's role in creating large space structures³⁰—a form of space property that will engender some of the most vexing questions encompassed by the field of space law.

B. Why Are There Legal Questions?

Two rather different legal questions arise from the subject of space property. First, there is the issue of liability for damage caused by or to space property. This issue exists because a concomitant of the right to own and control space property is the obligation to not allow such property to interfere with the health, safety or property of others. Second is the issue posed by a potential conflict between two fundamental tenets of space law—one such tenet holds that space cannot be appropriated by any nation³¹; the other mandates that States retain jurisdiction and control over the property they launch into outer space³². When space structures become very large, the exercise of jurisdiction and control over such objects and their adjacent spatial regions may very well constitute a form of national appropriation.

Rather specific rules have been developed for liability for damage caused by space objects. Simply stated, if an object launched into space causes damage within the atmosphere of the earth, the "launching state" is liable for any damage caused regardless of fault.³³ If such damage is caused to property in space, liability is based on fault.³⁴ "Launching state" is defined to include States which launch an object, which procure the launch of an object and from whose territory an object is launched.³⁵ Further legal issues exist however because of inexactitude in the definition of the liable party, because of the difficulty of establishing fault in space-based harm or damage and because determination of the amount of liability is left to diplomatic negotiations in the first instance and, if this process fails, to a Claims Commission tribunal the decision of which is not necessarily binding.³⁶ Furthermore, the above-stated rules do not apply if both

³⁰See, G. O'NEILL, *THE HIGH FRONTIER* (1976); R. Kline, *A Program to Develop Efficient Manned Operations in Space* SPACE MANUFACTURING 1983, 53 ADVANCES IN THE ASTRONAUTICAL SCIENCES 107 (1983).

³¹Outer Space Treaty, *supra* note 26, art. II.

³²*Id.* art. VIII.

³³Article II of the Convention of International Liability for Damage caused by Space Objects, *opened for signature* March 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 (entered into force for the United States on Oct. 9, 1973); S. Gorove, *Cosmos 954: Issues of Law and Policy*, 6 J. SPACE L. 141 (1978).

³⁴Liability Convention, art. III; Hosenball, *Space Law Liability and Insurable Risks*, 12 FORUM 141, 151 (1976).

³⁵Liability Convention, art. I.

³⁶*Id.*, arts. IX - XIX. See also C. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 59 (1982); Christol, *Liability for Damage Caused by Space Objects*, 74 AM. F. INT'L. LAW 1980. Foster, *The Convention on International Liability for Damage Caused by Space Objects*, 10 CANADIAN Y.B.I.L. 141-42 (1972); Cheng, *Convention on International Liability for Damage Caused by Space Objects*, 1 MANUAL OF SPACE LAW 83 (eds. Jasentuliyana & Lee 1979).

the tortfeasor and the victim are nationals of the same country—a not unlikely occurrence for a country such as the United States with many objects in space.³⁷

Consider a scenario in which several pieces of space property are joined together into an integrated multi-functional structure. It could grow to dimensions of hundreds of meters through use of modularity and dynamic control systems. Such structures are normally referred to as "space stations"; the United States is committed to building at least one before 1995. Just as privately-owned satellites appeared soon after government satellites proved the art, and as privately-owned launch vehicles are springing up in the wake of the Shuttle's success, one must certainly expect privately-owned space stations to take their rightful places in orbits about the earth. What legal questions arise?

One can certainly expect regulatory and legislative efforts to ensure that private space stations are "authorized" and under the "continuing supervision" of a State party to the Outer Space Treaty. But should this responsibility rest with the same entity that approves space transportation service—probably the Department of Transportation in the United States? What would be the terms of any authorization for a permanent privately-owned space station? And what of revocation of authority? Does a citizen of a country which believes in and practices freedom of movement, and which does not and constitutionally cannot restrict choice of residence, have to obtain a "license" to live and/or work in a space station?³⁸ If the answers to these questions imply much government restriction over privately-owned space station activities, then, in countries like the United States, these restrictions will be major legal issues and gradually will be whittled down. But if a very liberal regime prevails from the beginning, the international legal requirement for "authorization" and "continuing supervision" may be meaningless in practice. Without some means of State control, it is senseless to burden the State with international responsibility for non-governmental space activity. This leaves the space station owner with full responsibility for its own activities. It paves the way for the ultimate redefinition of property—the declaration of self-determination.³⁹

A somewhat more subtle legal issue involves the conflict between the right of a State to maintain jurisdiction and control over objects it launches into outer space and the mandate in Article II of the Outer Space Treaty that space, including the moon and other celestial bodies, "is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." This issue arises because large space structures may encompass large volumes of space or surface areas of the moon. Well before the end of this century space law jurists will have to address and resolve whether the exercise of jurisdiction and control over an enclosed portion of the lunar surface or over an enclosed or utilized portion of some well-defined orbital plane (at a given distance from the earth) constitutes national appropriation "by means of use or occupation."

³⁷See Rothblatt, *International Liability of the United States for Space Shuttle Operations*, 13 INT'L LAWYER 471 (1979).

³⁸Consider, for example, section 5 of H.R. 1011, which provides 5 of that "no person may launch a space object from territory of the United States, and no person who is a national of the United States may launch a space object from international waters or air space, except in accordance with a license issued under this section. Any person violating this subsection shall, upon conviction, be subject to a fine of up to \$1,000,000 per violation and up to five years in prison or both.

³⁹See generally in this regard Glazer, *Domicile and Industry in Outer Space*, 17 COLUMB. J. TRANS. L. 67 (1978). The treatises which provide helpful analyses of space station law and policy issues are S. GOROVE, *STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS* (1977) AND C. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* (1982).

C. Opportunities For Practice

The current opportunities for practicing space property law, as defined above, are quite small. The future opportunities, however, will almost certainly dwarf those for space communications and space transportation law. Indeed, it appears as if an inverse relationship exists between the present opportunities for practicing a particular division of space law and those which are likely to exist around the turn of the century.

Today, space property law counsel may be retained to provide expert advice to clients with long-term plans for building large space structures, for engaging in non-terrestrial mineral exploitation or for establishing solar power satellites. In the late 1980's there will probably be opportunities for representing clients interested in legislation dealing with space property rights, including non-government space stations—this is similar to the work space transportation lawyers perform today. During the 1990's and beyond a space property law practice might reasonably include (1) maximizing a private company's freedom of action over the construction and operation of large space structures within the context of regulatory application and rulemaking procedures, (2) obtaining government support for protective zones around space development areas, (3) negotiating clear rights to develop and transport non-terrestrial materials, and (4) generally using law as a tool to maximize a space development company's rate of return on space projects—that is, to help increase revenues, reduce costs and reduce perceived risks. This last point is important because raising private capital for large space development projects with long payback periods will not be easy.⁴⁰

IV. SUMMARY

Most current and prospective opportunities to practice space law fall into the areas of space communications law, space transportation law and space property law. Space communications law offers the best chances for a viable practice today. Over the next several years, however, space transportation and space property law will very likely come into their own as specialties with enough client interest to occupy several dozen attorneys in private practice on a full or part-time basis.

An underlying theme of this article is that space law issues arise because private activities in outer space have a significant potential for conflicting with each other and with governmental interests. While criticism is often levelled at attorneys, it should be remembered that, in simplest terms, lawyers are conflict resolvers. And, far more often than not, conflicts rationally resolved by law are conflicts *not* resolved by fist, by fiat, by fortuity or by chance. In space, where a narrow margin of human technological ingenuity can be all that separates life from death, mankind can afford to rely upon only the most rational mechanisms for conflict resolution. In other words, in space the rule of law and the laws of science and technology are inseparable companions in the quest for prosperity and in the search for peace.

⁴⁰For an excellent analysis of the relationship between law and space commerce, see M. Menter, "Legal Aspects of Commercial Space Activities," delivered at American Bar Association National Institute on Aviation Litigation and Space Law, Washington, D.C. (May 27-29, 1982).

FEDERAL GOVERNMENT REGULATION OF COMMERCIAL OPERATIONS USING EXPENDABLE LAUNCH VEHICLES

*James R. Myers**

For the first quarter century of outer space exploration, space transportation has been an exclusively government function in the United States and elsewhere. American entrepreneurs and traditional aerospace companies with the support and supervision of the Federal Government are now breaking that monopoly in a quest for profits and markets. While some companies are considering operation of manned and reusable space launch vehicles, in the near term commercial operations will be limited to using expendable launch vehicles.

American space transportation ventures using expendable launch vehicles are proceeding now and in response the Federal Government has developed policies and procedures to regulate their activities. While important government officials in both parties and in many agencies have strongly supported the emergence of American commercial space launch operations, these officials have exercised supervision over entrepreneurial activities to protect governmental interests and satisfy international obligations. These emerging procedures for supervision are time-consuming and costly and are sometimes based on creative interpretations of existing regulatory programs, *e.g.*, export licensing. Most importantly, however, these regulatory procedures have allowed proposed entrepreneurial activities to proceed.

I. Summary

Currently, national executive policy, enunciated in the Presidential Space Policy issued on July 4, 1982, is specifically designed to "provide a climate conducive to expanded private sector investment and involvement in space activities."¹

Private commercial ventures which conduct business activities in outer space are subject to the approval and supervision of agencies of the Federal Aviation Administration ("FAA"), the State Department ("State"), and the Federal Communications Commission ("FCC"). At present there is no single regulatory agency or comprehensive regulatory framework governing private entities doing business in outer space.

On February 24, 1984, President Reagan signed an Executive Order designating the Department of Transportation as the lead agency within the Federal Government for encouraging and facilitating commercial expendable launch vehicle activities by the United States private sector.²

Nationally, the FAA, State, and FCC are key regulatory agencies which have jurisdiction over different portions of current and proposed private space activities. Moreover, because of the lack of legislation delineating specific jurisdiction over launch operations, several additional agencies and institutions have influence over the approvals process. These agencies include the U.S. Congress, National Aeronautics and Space

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¹Presidential Directive/National Security Council NSC-42, July 4, 1982 (Subject: Civil and Further National Space Policy) [hereinafter cited as NSC-42-1982].

²Exec. Order No. 12,465, 49 Fed. Reg. 7211.

Administration ("NASA"), Department of Defense ("Defense"), National Security Council (and others in the intelligence community), Department of Commerce, Office of Management and Budget ("OMB"), Office of Science and Technology Policy ("OSTP"), Cabinet Council on Commerce and Trade, and Senior Interagency Group for Space ("SIG Space"). In current practice, an adverse position or decision from any of these agencies or institutions has the potential for halting any rocket launch program.

A number of bills have been introduced in the U.S. Congress (and more are expected) to regulate and promote private space activities.

The United States participates in a number of international organizations which attempt to execute and implement agreements among national governments concerning space activities.

II. Administration Policy

At the July 4, 1982 ceremonies following the return of the Space Shuttle Columbia, President Reagan announced his Administration's space policy. At the same time, he executed Presidential Directive, NSC-42-1982.³ In NSC-42-1982, the President established SIG Space, which is chaired by the National Security Advisor. SIG Space has the responsibility for formulating policy for the President's approval regarding outer space issues, particularly those of interest to the Defense Department. Regarding private sector involvement in space activities generally, the Presidential Directive states:

The United States Government will provide a climate conducive to expanded private sector investment and involvement in civil space activities, with due regard to public safety and national security. Private sector space activities will be authorized and supervised or regulated by the government to the extent required by treaty and national security.⁴

The Reagan Administration's policies are an extension of and are consistent with the policies of previous Administrations.⁵

On February 24, 1984, President Reagan signed Executive Order 12465 designating the Department of Transportation ("DOT") as the lead regulatory agency to encourage, facilitate and coordinate the development of commercial expendable launch vehicle ("ELV") operations by private United States enterprises.⁶ The responsibilities assigned by the Executive Order are to:

- (a) act as a focal point within the Federal government for private sector space launch contacts related to commercial ELV operations;
- (b) promote and encourage commercial ELV operations in the same manner that other private United States commercial enterprises are promoted by United States agencies;

³*Id.*

⁴*Id.*

⁵*See*, Presidential Directive/NSC-42, October 10, 1978 (Subject: Civil and Further National Space Policy); Presidential Directive/NSC-54, Nov. 20, 1979 (Subject: Civil Operational Remote Sensing).

⁶*See supra* note 2.

- (c) provide leadership in the establishment, within affected departments and agencies, of procedures that expedite the processing of private sector requests to obtain licenses necessary for commercial ELV launches and the establishment and operation of commercial launch ranges;
- (d) consult with other affected agencies to promote consistent application of ELV licensing requirements for the private sector and assure fair and equitable treatment for all private sector applicants;
- (e) serve as a single point of contact for collection and dissemination of documentation related to commercial ELV licensing applications;
- (f) make recommendations to affected agencies and, as appropriate, to the President, concerning administrative measures to streamline Federal Government procedures for licensing of commercial ELV activities;
- (g) identify Federal statutes, treaties, regulations and policies which may have an adverse impact on ELV commercialization efforts and recommend appropriate changes to affected agencies and, as appropriate, to the President; and
- (h) conduct appropriate planning regarding long-term effects of Federal activities related to ELV commercialization.⁷

An interagency group, chaired by the Secretary of Transportation and composed of representatives from State, Commerce, the FCC and NASA was established to advise and assist DOT in performing its responsibilities under the Executive Order. Other agencies were ordered to assist the Secretary of Transportation and to:

- (a) provide the Secretary of Transportation with information concerning agency regulatory actions which may affect development of commercial ELV operations;
- (b) review and revise their regulations and procedures to eliminate unnecessary regulatory obstacles to the development of commercial ELV operations and to ensure that those regulations and procedures found essential are administered as efficiently as possible; and
- (c) establish timetables for the expeditious handling of and response to applications for licenses and approvals for commercial ELV activities.⁸

The Executive Order specifically does not diminish or abrogate any statutory or operational authority by any other Federal agency.

III. Department of Transportation

A. Office of Commercial Space Transportation

At a meeting of the Cabinet Council for Commerce and Trade on November 16, 1983 President Reagan announced his intention to designate DOT as the agency with principal responsibility for fostering the commercial use of space. The Office of Commercial

⁷*Id.*

⁸*Id.* at 7212.

Space Transportation within the Office of the Secretary of Transportation was officially established on February 24, 1984, and operated unofficially between November 16, 1983 and February 24, 1984.

Starstruck, Inc. ("Starstruck"), formerly ARC Technologies, Inc., obtained the assistance of the Secretary of Transportation with the United States Materials Transportation Bureau to ease the clearance process and allow Starstruck, Inc.'s vehicle propellants to be handled in the Port of Los Angeles.⁹ When the initial Dolphin test rocket launch was scrubbed February 6, 1984, the Office of Commercial Space Transportation and the United States Navy have assisted Starstruck for its rescheduled March 1984 Dolphin test rocket launch.

The Office of Commercial Space Transportation has been meeting with representatives of interested commercial entities and government agencies to assess the wide range of regulatory and market issues associated with private ELV operations. Commercial enterprises using non-traditional government launch sites are expected to have the most significant contacts with the Office of Commercial Space Transportation to coordinate launch clearances.

B. Federal Aviation Administration (FAA).

The basic statutory authority of the FAA is contained in the Federal Aviation Act of 1958.¹⁰ The FAA's primary responsibility is to promote and control aircraft operations. Any commercial sub-orbital or orbital rocket must be launched through controlled airspace used by aircraft. While there is only an infinitesimally small chance that any particular rocket launch will damage an aircraft flying near the launch site, the FAA can (and did in the case of the September 9, 1982, Conestoga I rocket launch)¹¹ minimize the chances of such an occurrence by temporarily restricting from airplane use the airspace above the launch site and in the flight path of the rocket.

Part 101, Subpart C, of the Federal Aviation Regulations (FARs) contains the only regulations clearly applicable to rocket launches. Prior to filing a petition for exemption from those regulations, informal conversations with responsible FAA officials and attorneys suggested that the FAA regarded Part 101, Subpart C, to be the only FAR's governing the proposed launch of the Conestoga I, an unmanned rocket.¹²

Part 101, Subpart C, was adopted June 29, 1963 for the purpose of ensuring that small rockets launched by hobbyists and scientists would not interfere with aircraft

⁹See *Commercial Launch Effort Tied to Spacecraft Market*, AVIATION WEEK AND SPACE TECH., March 12, 1984, at 120.

¹⁰49 U.S.C. §§ 1341-1359 (1976 and Supp. V 1981). Pursuant to that authority, the FAA has issued Federal Aviation Regulations ("FAR's"), which are codified in Title 14 of the Code of Federal Regulations, Parts 1 through 199. 14 C.F.R. §§ 1-199 (1983).

¹¹The Conestoga I was originally a minuteman I rocket bought by Space Services, Inc. from the government and launched from Matagorda Island off the coast of Texas. *U.S. News and World Report* September 20, 1982, at 12.

¹²*Cf.* 27 Fed. Reg. 5402-5404 (1963). To the extent that any other FAR's could be deemed to restrict, limit or prohibit the proposed launch, *Space Services Incorporated of America* requested an exemption from such regulations, as well as Part 101, Subpart C. When the FAA granted an exemption for the launch, no mention was made of other regulations, so presumably the FAA determined that Part 101, Subpart C, contains the only FAR's governing unmanned rocket launches.

operations. The regulations were not designed to regulate commercial sub-orbital and orbital rocket launches.¹³

The FAR's substantive limitations on rocket launches are set forth in 14 C.F.R. Part 101. That regulation reads as follows:

No person may operate an unmanned rocket—

- (a) In a manner that creates a collision hazard with other aircraft;
- (b) In controlled airspace;
- (c) Within five miles of the boundary of any airport;
- (d) At any altitude where clouds or obscuring phenomena of more than five-tenths coverage prevails;
- (e) At any altitude where the horizontal visibility is less than five miles;
- (f) Into any cloud;
- (g) Within 1,500 feet of any person or property that is not associated with the operations; or
- (h) Between sunset and sunrise.¹⁴

A sub-orbital or orbital rocket launch from the Continental United States invariably involves an intrusion into controlled airspace and is therefore prohibited without a waiver or exemption from the FAA. A commercial operator's proposed launch may also be subject to the other limitations contained in Section 101.23.

Rocket launches from government ranges such as the Kennedy Space Center and the Vandenberg Air Force Base ("AFB") are not subject to these FAR's because the airspace above government ranges have been declared restricted airspace.¹⁵ Activities within that restricted airspace are subject to the supervision and control of the government agency, e.g., NASA, which operates the rocket range.

For any permanent, private launch site the FAA will probably require the processing of a request for restricted airspace. There are procedural rules for processing such a request by a private company.¹⁶ FAR's also govern the control and use of restricted airspace.¹⁷ The FAA will presumably have wide discretion to determine the conditions and limitations to be imposed on the first operation of a private, permanent launch site, because the FAR's provide no guidance as to what limitations and conditions are associated with a designation of restricted airspace.

For the anticipated Percheron launch in August 1981, Space Services requested and obtained a waiver of FAA regulations. Because the anticipated launch was the first such activity reviewed by the FAA, the FAA limited permission to a launch within the territorial waters of the United States.

For the Conestoga I rocket launch in September 1982, Space Services requested on March 16, 1982, and on September 1, 1983 it received an exemption from the FAR's

¹³See *id.* at 5403.

¹⁴14 C.F.R. § 101.23 (1983). See also 14 C.F.R. § 101.25 (1983) for the requirements associated with notification of a rocket launch to the nearest FAA Air Traffic Control facility.

¹⁵See 14 C.F.R. §§ 73.01-19, 73.81-85 (1983).

¹⁶14 C.F.R. § 11.61-75 (1983).

¹⁷See *supra* note 10.

permitting a sub-orbital launch to an altitude of approximately 169 nautical miles high and 279 nautical miles downrange with "splash-down" in the international waters of the Gulf of Mexico. The exemption was granted after interagency consultation and coordination and after public comments were solicited in two *Federal Register* notices.¹⁸ The FAA also issued an order designating temporary restricted airspace and appropriate notices to airmen ("NOTAM's"), concerning launch. The strengths of the FAA approval process included:

- (a) Regular communication between Space Services and the FAA through designated liaison personnel;
- (b) Attention to policy and technical issues by senior FAA personnel;
- (c) Familiarity with technical issues;
- (d) Willingness by FAA to accommodate "last minute" changes by Space Services without delaying launch;
- (e) Coordination with Coast Guard responsibilities, U.S. Navy air training exercises and United States Air Force responsibilities; and
- (f) Notification of launch to government agencies, the public and airspace users.

Overall, FAA personnel displayed an extraordinarily professional and supportive role in both authorizing and supervising the launch.

Starstruck did not apply to the FAA for an exemption from the FAR's, because its proposed Dolphin rocket launch will be outside the territorial waters of the United States. Nevertheless, the FAA did decide which of the company's preferred launch windows would be used for the Dolphin test. FAA involvement and review has been coordinated through the State Department's export licensing procedures and the Office of Commercial Space Transportation coordination procedures.

IV. National Aeronautics and Space Administration

NASA has no direct authority to regulate private space activities, although the broad statutory authority conferred by the National Aeronautics and Space Act¹⁹ might arguably be construed to regulate private space ventures. NASA's present policy appears to be that NASA has no interest, responsibility or authority to regulate private commercial space activities.

While the author applauds NASA's policy on this issue as both a correct interpretation of law and good public policy, NASA will inevitably exercise an important role in shaping government regulatory policy concerning private space ventures. First, NASA has considerably more technical expertise concerning the operation of launch vehicles and spacecraft than any other government agency in the United States with the possible exception of the Defense Department. As a consequence, on factual and technical questions which are often important components in policy decisions, NASA will be consulted and will play a role in making decisions on these questions. Second, NASA has control of much of the equipment, technology and facilities that will be an important part of the commercialization of the American space program. The process of making that equipment, technology and facilities available for use for private space ventures means that NASA

¹⁸47 Fed. Reg. 16243-44, 47 Fed. Reg. 32229 (1982).

¹⁹42 U.S.C. §§ 2451-2477, 2481-2484 (1976 and Supp. V 1981).

will dictate terms and conditions in addition to price. In effect, those terms and conditions for the sale and use of NASA derived technology will inevitably reflect the Federal Government's regulatory policies. Several examples will serve to illustrate these two points.

Two private rocket companies in the United States, Space Services and Starstruck have applied for various licenses to permit private rocket launches. While NASA has not been directly involved in any of the licensing procedures which either of the two companies have pursued, NASA has reviewed both companies' plans and in addition made substantial recommendations regarding the technical aspects of each company's proposed program. Because the actual licensing agencies did not feel especially technically competent, they have by their own admission relied heavily on NASA's evaluations and recommendations.²⁰

While NASA did not exercise any regulatory authority over the Conestoga I rocket launch by Space Services, NASA did agree to provide a Minuteman I M56A-1 rocket motor which powered the Conestoga I rocket. As part of the process of deciding whether and how to permit the use of the M56A-1 rocket motor, NASA carefully reviewed the technical and safety aspects of the proposed Conestoga I launch. In addition, the agreement with NASA for use of the rocket motors, at its insistence, included provisions on insurance and indemnification of the United States, its agencies, employees and contractors.

NASA operates and controls the Space Shuttle, which has the most advanced space launch capability in the world today. NASA is attempting aggressively to market and exploit this vehicle to the commercial market. Because of NASA's ability to set the rules of the game for such a substantial portion of the commercial spacecraft launch business through its operation and control of the Space Shuttle, NASA's policies will inevitably affect other aspects of the launch business.

In addition to NASA's control and operation of the Space Shuttle, NASA is presently the only source of expendable launch vehicles in the United States. NASA is presently turning over the operational control of expendable launch vehicles to commercial entities. The process of making NASA facilities, equipment and personnel available for use by private commercial space ventures necessarily means that NASA sets the terms and conditions associated with their use. In response to NASA's requests for proposals to commercialize expendable launch vehicles, three proposals were received (1) bid by General Dynamics Convair Division to operate the Atlas-Centaur, (2) bid by Transpace Carriers, Inc. to operate the Delta, and (3) request by Cyprus Corp. to use Delta facilities, tools and equipment to develop a Space Shuttle upper stage from the Delta's second stage rocket motor. NASA has accepted the proposals of General Dynamics Convair Division and Transpace Carriers, Inc. and negotiations to establish the details of the takeovers are underway. NASA has not yet accepted the proposal of Cyprus Corp., although informal comments by NASA officials indicate that Cyprus Corp.'s request will be accommodated and coordinated with the proposal of Transpace Carriers, Inc. In the process of commercializing expendable launch vehicles NASA is making important policy decisions concerning the provision and cost of support services, access to government launch sites, liability insurance provisions, payload inspection and public safety. In short, although NASA will technically be in the role of a lessor of facilities rather than as a regulator of private space activities, in function NASA as owner and operator of the Kennedy Space Center will actually regulate many important private space activities. Of course, this observation applies to the use of government launch facilities which are controlled by the United States Air Force ("USAF") at Patrick AFB, Edwards AFB and Vandenberg AFB.

²⁰See, e.g., discussion of State's export licensing procedures, *infra* pt. V.

V. State Department

The United States is a signatory to several treaties which establish principles regarding the use and exploration of outer space. State is the agency generally responsible for negotiating and executing such agreements. In addition, State is generally responsible for dealing with foreign governments concerning administration of and compliance with the terms of international treaties.

The most important general international obligation associated with private commercial space activities is contained in what is commonly known as the Outer Space Treaty.²¹ Article VI of that treaty reads as follows:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the State Parties to the Treaty participating in such organization. (Emphasis added.)²²

The Outer Space Treaty also includes provisions which make the Federal Government liable for damage to foreign countries, citizens and corporations resulting from launch activities from United States territory by private companies. Article VII reads as follows:

Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the moon and other celestial bodies.²³

More specific provisions which impose similar liability on governments for damages caused by space objects launched by non-governmental entities are contained in the "Convention on International Liability for Damage Caused by Space Objects".²⁴

General international treaty obligations of the United States which apply to activities in outer space also exist with respect to peaceful uses, nuclear weapons, weapons of mass

²¹Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410; T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter cited as Outer Space Treaty].

²²*Id.*, Art. VI.

²³*Id.*, Art. VII.

²⁴Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762.

destruction, and environmental modification techniques having widespread, long-lasting or severe effects.²⁵

The Federal Government has also agreed to register all space objects launched from United States territory on an international registry.²⁶ State is responsible for complying with this registration obligation.

These treaties and international agreements impose obligations on the Federal Government, but not directly on United States individuals and corporations. If United States individuals and corporations cause damage to foreign interests, State would be responsible for responding at a governmental level to foreign claims. As a consequence, in connection with the Conestoga I launch, State sought to exercise its responsibilities under the treaties by requiring Space Services to obtain an export license. Space Services sought and received approval through State's export licensing procedures for the Conestoga I rocket launch. Starstruck has received approval through State's export licensing procedures for a proposed Dolphin rocket launch from a vessel outside the territorial waters of the United States. While there are substantial questions as to the legal basis for imposing an export licensing requirement on private rocket launches from a United States site, private space entrepreneurs may continue to elect to comply with State's assertion of jurisdiction to avoid a costly, lengthy challenge to that asserted authority.

State's statutory authority for control and licensing of arms exports is contained in the Arms Export Control Act.²⁷ Pursuant to statute, State has issued the United States munitions list which contains a list of designated arms, ammunition and implements of war that includes rockets and launch vehicles.²⁸ Category IV of the U.S. munitions list reads as follows:

Category IV—Launch Vehicles, Guided Missiles, Ballistic Missiles, Rockets, Torpedoes, Bombs and Mines

(a) *Rockets* (except meteorological sounding rockets), bombs, grenades, torpedoes, depth charges, land and naval mines, and demolition blocks and blasting caps.

(b) *Launch vehicles*, guided missiles, and ballistic missiles, tactical and strategic.

(c) Apparatus, devices, and materials for the handling, control, activation, detection, protection, discharge, or detonation of the articles in paragraphs (a) and (b) of this category.

* * * *

(g) All specifically designed components, parts, accessories, attachments, and associated equipment for the articles in this category. [N. omitted, emphasis added.]²⁹

²⁵See, Outer Space Treaty, *supra* note 16, arts III, IV; Charter of the United Nations and Statute of the International Court of Justice, June 26, 1945, 59 Stat. 1031, T.S. No. 993, 1 U.N.T.S. xvi; Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, May 18, 1977, 31 U.S.T. 333, T.I.A.S. No. 9614.

²⁶Convention on the Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. No. 8480.

²⁷22 U.S.C. §§ 2751-2796 (1976 and Supp. V 1981).

²⁸22 C.F.R. § 121.01 (1982).

²⁹22 C.F.R. § 121.01, Category IV (1982). See also *id.* Categories V(a), VIII, XI and XII.

On April 16, 1982, Space Services requested any authorization necessary from State as a precondition to the Conestoga I rocket launch. On September 7, 1982, State issued a letter approving the launch under the Arms Export Control Act subject to the following conditions and limitations:

1. This authorization is confined to the proposed prototype launch only. Subsequent launches of this type will require a separate review and approval.
2. The authorization is based on the understanding that [Space Services] has agreed to comply with certain safety requirements imposed by NASA and the FAA on the Conestoga launch.
3. This authorization is subject to the understanding that [Space Services] has obtained insurance in the amount of \$100 million for any damages that may arise in connection with the launch.
4. [Space Services] agrees to indemnify the United States Government for any damages and expenses that might arise in connection with the Conestoga launching, including any payments for which the United States may be responsible under any treaty.³⁰

Because of the absence of NASA and FAA imposed safety requirements due to the proposed launch from international waters, approval in January 1984 by State of Starstruck's request for its proposed Dolphin rocket launch included details of range safety requirements.

VI. Federal Communications Commission

The only large profitable and thriving space business in existence now is satellite communications. The FCC is responsible for establishing appropriate frequencies for satellite communications in its table of frequency allocations and issues individual licenses for each satellite in operation. Because communication satellites have been launched on NASA-owned and operated vehicles, FCC review and approval has been the only significant regulatory constraint on the burgeoning space communications business. For private space activities outside the field of satellite communications, entrepreneurs must obtain an FCC license as only one of several government approvals.

In connection with private rocket launches from a private site, communications frequencies are necessary for several support functions, *i.e.*, monitoring telemetry, radar tracking and an abort/destroy capability. The operation of any satellite launched by a private space venture requires FCC approval of necessary frequencies and licensing of the radio operator to permit command and control of the satellites and data transmission. There are no frequencies that have been designated by the FCC for uses associated with private commercial rocket launches. FCC regulations do provide for issuance of an experimental radio license (for other than broadcast services) for communications essential to research programs. For the Conestoga I rocket launch, Space Services requested and received an experimental radio license granting the right to use frequencies on a non-

³⁰Letter from William B. Robinson, Director, Office of Munitions Control, Department of State, to James R. Myers (Sept. 7, 1982) (granting requested approval of Conestoga I launch).

exclusive basis for essential communications. Starstruck applied for and was issued an experimental radio license for its proposed Dolphin rocket launch from international waters.

Because private space activities outside the field of satellite communications are subject to extensive interagency government review and approval, FCC regulation should be limited to a review of communications issues, *e.g.*, interference, allocation of scarce spectrum, rather than include issues best left to other agencies. This seems to be the present view of the FCC given its processing for the Conestoga I rocket launch in 1982, although for the proposed Percheron rocket launch in 1981 the FCC questioned whether a destruct capability was in the public interest.

In order for a private space venture to establish a permanent, private launch site and commence launches from that site on a regular, frequent basis, it will be necessary for the communications facilities to be permanently licensed by the FCC.

VII. Department of Defense

Defense, especially through the United States Air Force ("USAF"), exercises important authority over private space ventures in several respects. First, Defense through interagency review processes comments on national security (and sometimes public safety) aspects of proposed private space activities. A negative evaluation by Defense will profoundly reduce, if not eliminate, the chances of favorable action by the licensing agency, *e.g.*, State, FAA.

Second, Defense, especially the USAF, controls and operates important government rocket ranges at White Sands, Patrick AFB, Vandenberg AFB and Edwards AFB. For example, the Titan launch facilities are controlled by the USAF. The Atlas-Centaur launch pads are operated by NASA on USAF property. As a consequence of the desire to use government facilities and equipment, private space ventures will be subject to Defense limitations.³¹

Third, the USAF, through North American Air Defense ("NORAD")/Space Command, is responsible for space traffic monitoring.³² For example, for the Conestoga I rocket launch NORAD performed its computation of miss between orbits ("COMBO") to avoid a collision with orbiting satellites. In addition, NORAD has the responsibility of advising the Soviets in the event that a rocket strays off course toward areas of Soviet interest.

VIII. Congressional Actions

The Congress influences the emerging regulation of private space entrepreneurs in two important ways. First, the Congress, through its committees or individual Congressmen, sometimes submits comments prior to agency action. For example, before NASA agreed to provide a rocket motor to power the Conestoga I rocket launch NASA's oversight committees were consulted. If comments are not solicited from Congress, occasionally a bill will be passed to require prior Congressional approval of agency action.³³

³¹See discussion of NASA's commercialization of expendable launch vehicles, *supra* pt. IV.

³²See Covault, *Center Set for Soviet Space Monitoring*, AVIATION WEEK AND SPACE TECH., March 28, 1983, at 56.

³³See, *e.g.*, 129 Cong. Rec. H1693 (daily ed. March 24, 1983); H.R. 2065, 98th Cong., 1st Sess. 1983. See also Act of Oct. 15, 1982, Pub. L. No. 97-324, 96 Stat. 1597, 1601 (1982).

Second, the Congress acting as a body creates the statutes which are and will be used to regulate private space activities. Several bills have been introduced which promote and regulate various private space launch activities. In general, those bills are designed to streamline the approval process with the hope of reducing time, cost and uncertainty to the applicant. Fortunately, both Congress and the agencies have been willing to approve private space launch ventures using the procedures discussed above without passage and implementation of legislation specifically directed to private space launch ventures. Because there are not yet a large number of private space launch activities the agencies can handle approvals on a case-by-case basis. Legislation will only be needed once private space launch activities are a regular frequent occurrence.

Senator Hollings (D-S.C.), with other sponsors, has introduced a bill³⁴ to authorize and regulate the launch of space objects by private entities which designates the FAA as the "lead regulatory agency." The bill was originally introduced in the last session by former Senator Cannon (D-Nev.). Representative Akaka (D-Haw.), with other sponsors, has reintroduced a similar bill³⁵ from the last session which would designate Commerce as the "lead regulatory agency" for private rocket launch activities. The author has been informally advised that a bill may soon be introduced which would designate the Department of Transportation as the "lead regulatory agency" for commercial operation of expendable launch vehicles.

IX. International Organizations

The United States is a member of a number of international agencies and institutions which establish and implement international policy associated with space activities. For example, the United States is a member of the International Telecommunications Satellite Organization ("INTELSAT"), the International Maritime Satellite Organization ("INMARSAT"), the International Telecommunications Union ("ITU"), the World Administrative Radio Conference ("WARC"), and the United Nations Committee on the Peaceful Uses of Outer Space ("COPUOS"). Each of these institutions or agencies develops general international policies on space activities which are not necessarily binding on the Federal Government. Nevertheless, the United States has consistently complied with the policies enunciated in those organizations and as a consequence the decisions and actions of those organizations could have a significant impact on private space activities.

³⁴S. 560, 98th Cong., 1st Sess. (1983).

³⁵H.R. 1011, 98th Cong., 1st Sess. (1983).

A. Past Events

*(a) Reports**1. Review of the Work of the Committee on the Peaceful Uses of Outer Space**

The Scientific and Technical Sub-Committee held its twenty-first session from 13 to 24 February 1984, in New York. The Legal Sub-Committee's twenty-third session was held from 19 March to 6 April 1984, in Geneva. The reports of both bodies—which consider most of the same subjects, but from different perspectives—were reviewed at the annual session of the Committee on the Peaceful Uses of Outer Space (COPUOS) held in Vienna from 12 to 21 June 1984.

Both sub-committees dealt with aspects of remote sensing, the safe use of nuclear power sources in space and the use of the geostationary orbit. The Scientific and Technical Sub-Committee also examined the United Nations Programme on Space Applications and implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82). The Legal Sub-Committee considered the definition and delimitation of outer space. Although not on the agenda of either sub-committee, there was also discussion on the use of space for military purposes and the need to control it.

Arms Race in Outer Space

The most important and controversial topic before the COPUOS involved the question relating to the militarization of outer space. Most of the thirty-seven Member States which participated in the general debate in the COPUOS spoke on this issue and expressed concern over the possible extension of an arms race in outer space. However, there was a sharp disagreement among the membership as to how to approach this issue. Generally speaking, the countries belonging to the Group of 77 and socialist countries supported General Assembly resolution 38/80 by which the Assembly introduced in the agenda of the Committee the questions relating to the militarization of outer space as a priority item. Western countries held the view that the Committee was not the appropriate forum to discuss disarmament questions and that it was a serious mistake to introduce disarmament in the Committee's work. This difference remained unsolved throughout the debate on this specific agenda item, which took place without the participation of the U.S. delegation. The General Assembly 1983, in its resolution 38/80, requested the Committee to consider, as a matter of priority, the questions relating to militarization of outer space and expressed grave concern at the extension of an arms race into outer space. The General Assembly, in asking the Outer Space Committee to give high priority, said it also should take into account that the Conference on Disarmament was to consider as a matter of priority the prevention of an arms race in outer space, and the need to coordinate the efforts of the two bodies. While 124 countries voted for it, the United States was among 12 countries voting against the resolution.

During debate in the COPUOS and the subcommittees, the United States said the 1983 Assembly had made a "fundamental departure" from the principle of consensus

*The views contained in the review are those of the author and do not necessarily represent those of the United Nations.

that had historically governed the consideration of outer space matters. The placing of a disarmament item on the Outer Space Committee's agenda was a "profoundly regrettable mistake", the full effects of which had not yet been felt. Such matters were far too significant to be discussed anywhere but in disarmament fora by disarmament experts. It would not participate in consideration of such matters in the Outer Space Committee, it concluded.

Other countries, during the debates, spoke of the need for action to prevent an arms race in space.

The Soviet Union, for example, said an "atmosphere of hostility and confrontation," which would unavoidably be brought about by an arms race in outer space, would raise barriers difficult to overcome. Many States would thus be barred, partially or completely, from access to new space technology, important scientific data and advanced engineering. Unprecedented military expenditures would burden space powers and affect other countries as well. The Outer Space Committee could not be indifferent to these dangerous prospects and could make a substantial contribution to solving the problem. The most urgent and pressing problem of the arms race in outer space and the militarization of space had not found a place on the Legal Sub-Committee's agenda. The Soviet Union drew attention to its proposals for treaties to ban the use of force in outer space and from outer space with regard to Earth (A/36/192), and to ban anti-satellite systems (A/38/194).

The German Democratic Republic said extension of the arms race to outer space was fraught with great dangers to all nations and to peace on earth. Due to its specific features, the development and deployment of space-based weapons of any type in orbit would complicate verification procedures and impede agreement on their limitation and elimination. No matter what kind of allegedly defensive concepts were employed to justify the deployment of space-based weapons, they were still designed for waging nuclear war on earth, which would inevitably bring destruction to mankind.

Mongolia said the unprecedented plans to extend the space arms race had the aim of achieving military and strategic superiority and first strike capacity. Turning space into a military testing ground was of great concern to the world community, which wanted peaceful uses of outer space to benefit all States.

China said fierce rivalry and the arms race had cast a shadow over the calm of outer space and engendered serious concern among peoples the world over. The international community demanded that rules be formulated to serve the purpose of peaceful uses of outer space.

Nigeria said the development of anti-satellite ballistic missile systems by one super power and the threat by the other to develop laser beam weapons within the prospect of the conduct of "space wars" made outer space an area of confrontation rather than cooperation and was an invasion of man's last frontier.

Argentina condemned not only the deployment of weapons in space, but also any use of satellites for other than solely peaceful purposes. All States should refrain from using space for non-peaceful purposes.

Chile said there should be no ambiguous distinction made between military uses and non-peaceful uses of outer space, both of which juridically had to be condemned.

Turkey said reconfirmation was needed of the commitment of all States to the use of outer space exclusively for peaceful purposes, as enshrined in the 1967 Outer Space Treaty.

Although extensive efforts were made during the session of the COPUOS, including through a group of "Friends of the Chairman," to find a compromise to deal with the impasse, the only agreement was to disagree and thus the Committee agreed to record

in its report (A/39/20) the differing views of various groups of countries. Thus, the General Assembly at its next session in the fall of 1984 will have to decide how to proceed on the matter and its decision on this question which is related to the important procedural issue dealt with in the final section of this note will very well determine the future of the COPUOS itself.

Remote Sensing

The term "remote sensing" refers to the detection and analysis of the earth's resources and phenomena by sensors carried in aircraft and spacecraft.

The Scientific and Technical Sub-Committee reaffirmed that remote sensing from outer space should be carried out with the greatest possible international cooperation and participation, and that developing countries should receive aid to meet their needs in this area. It wanted continued updating of the list of remote sensing applications to be made available to all interested nations. The expanded role of the Food and Agriculture Organization of the United Nations (FAO) in training activities in remote sensing at the national, regional and inter-regional levels was noted.

The Legal Sub-Committee has been working for several years on legal principles relating to remote sensing, in part to meet concerns of States about being "sensed" without their permission, and about whether, and on what basis, the data so obtained would be made available to them and to other States.

Its remote sensing working group devoted most of its time this year to consideration of draft principles on international responsibility for remote sensing activities, access by sensed States to primary data and approval by sensed States of dissemination to third States, international organizations or public or private entities (Draft Principles XI, XII and XV). The working group stressed that work on the draft principles should continue on a priority basis next year. Texts of draft principles submitted by Brazil in 1982 (WG/RS(1982)/WP.11) and two new proposals by Chile (WG/RS(1984)/WP.1) and France (A/AC.105/C.2/L.144) were considered during the session.

In the debate, several States spoke regarding access to data. The Federal Republic of Germany supported the principle of non-discriminatory access, on reasonable terms, of a sensed State to the primary data concerning its territory, and to analyzed data on the basis of mutual agreement, on reasonable terms, to the extent that proprietary rights were not affected. It did not agree with the claim of some countries for a right of primary access for the sensed States, and for restrictions with regard to the transfer of data, particularly on natural resources.

Sweden said certain States with satellites would always have data from all countries, with or without restriction to access. International cooperation should be promoted, and all countries should have the opportunity to participate in remote-sensing activities. Remote sensing data should be as freely accessible as possible for all countries. Adequate aid should be given developing countries to permit them to interpret and use data provided.

Nigeria, Turkey and Viet Nam were among the States stressing that the sovereign rights of States had to be protected in the matter of remote sensing.

Brazil felt a compromise could and should have been reached on the basis of assigning responsibility for the ill-advised dissemination of data. Although delegations agreed on the need for respect for sovereignty, rights and interests, they were unable to translate the ways and means with which such principles and values should be specifically dealt with within the total scope of remote sensing activities.

The Soviet Union said a regime for dissemination of the data and information obtained from the remote sensing of foreign territory, under consideration for more than 10 years, should be based on objective criteria. In particular, it should be agreed that with a spatial resolution finer than 50 metres, data could be disseminated only with the consent of the State concerned. The Soviet Union was willing to examine the Brazilian compromise proposal regarding an obligation for the State conducting remote sensing activities not to use the data thus obtained in a manner harmful to other States, since the State conducting those activities was internationally responsible for any damage it might cause to another State by disseminating such data.

Although a text based on the Brazilian proposal, which was considered to be a compromise, emerged, it did not lead to any agreement. During the debate in the COPUOS, developing countries and socialist countries expressed disappointment about the lack of progress in the Legal Sub-Committee and expressed support for the Brazilian proposal. The Committee recommended that the work on the draft principles should continue on a priority basis at the next session of the Legal Sub-Committee.

Nuclear Power Sources

The safe use of space vehicles and objects powered by nuclear sources are of concern to both sub-committees. Accidents in space, with radioactive debris falling on areas of countries not involved in the launching or orbit of the defective spacecraft, have already occurred. Last year, the Legal Sub-Committee had agreed on a text concerning the format and procedure for notification in case of malfunction of a spacecraft carrying a nuclear power source, but no decision was made as to the legal form of the document into which it might eventually be incorporated.

The Scientific and Technical body's working group on nuclear power sources reported this year on concerns in this area. Some States, it stated in its report, wanted internationally agreed criteria for design and operation aspects in order to achieve a high degree of reliability, the prevention of accidents and minimization of the consequences in case of accident. Formulation of adequate legal instruments to ensure observance of safety regulations was also desirable. Other nations maintained such legal considerations went beyond the mandate of the working group.

The working group discussed mainly safety aspects, monitoring and intervention in case of releases of radioactive material and notification, and reported on its work to the Sub-Committee in its report A/AC.105/C.1/L.139. The working group also identified subjects relating to radiological risks and environmental impact, safety and reliability, information and emergency planning for further study at its next session.

In the Legal Sub-Committee's working group on nuclear power sources, some delegations urged the speedy elaboration of a set of principles on the use of nuclear power sources in outer space. Others said international law already covered norms in that connection. Still others wanted the working group, during the session, to identify a specific area where progress might be possible and to agree on concepts which might be considered in useful and productive discussions, rather than considering actual texts.

A working paper dealing with precautionary measures and actions to be taken before and after re-entry of a nuclear power source and what assistance should be rendered in case of re-entry was submitted by Canada, China, the Netherlands and Sweden (WG/NPS(1984)/WP.4) and the Federal Republic of Germany submitted a working paper

(A/AC.105/C.2/L.146) specifying the need for continued and updated notifications required in the event of re-entry of such a source.

In the debate, the Netherlands favored a legally binding safety regime for nuclear power sources. Sweden, supported by the Federal Republic of Germany, said internationally accepted safety regulations should be adopted urgently for use of such power sources in space. Regulations for use of such power sources on earth could provide a minimum standard. These rules should provide for information both before launch and before re-entry so that countries could act to protect their populations and environments from damage. Ways to provide aid in cases of accident should be developed so that countries which did not have the capability for such protection could get aid on request.

Canada favored the consideration by the Sub-Committee of information concerning use of nuclear power sources; safety measures regarding radiological protection; notification prior to re-entry; assistance to States; State responsibility; and safety measures regarding radiological protection.

The German Democratic Republic said some States felt binding international legal provisions were inadequate or insufficient and needed to be supplemented. Still, nuclear power units were more economical than other energy sources and were capable of providing systems on board spacecraft with electrical energy over a long period of time. Nuclear power plants had been used in space for many years and their condemnation was not justified. States launching spacecraft were responsible for all their activities in outer space. It disagreed with Canada's proposal to levy fines for damages caused by landing of spacecrafts. As landings did not violate international law, authorities of landing States could not restrict such lawful actions, it said.

In the COPUOS, western countries in particular expressed the hope that work could be expedited by designating this item as a priority item for the Legal Sub-Committee and by allocating more time for it. But there was no agreement on this proposal and therefore, it was left to the General Assembly to decide as to how to proceed on the subject next year.

Geostationary Orbit

Both sub-committees continued consideration of aspects of the geostationary orbit — the orbit 22,300 miles directly above the equator, where satellites circle at the same speed as the earth rotates. It is the only orbit capable of providing continuous contact with ground satellites via a single satellite. Satellites in this orbit appear to be stationary in the sky because they circle the earth at the same speed as the earth rotates. Because of problems of interference among radio frequencies the orbit can be occupied by a limited number of satellites at any one time. So far, with less than 150 satellites occupying the orbit, there have been few problems in finding space. However, experts feel if its use continues to grow at the present rate of 18 per cent annually, there may be congestion in the future.

The Scientific and Technical Sub-Committee noted work being done by the International Telecommunication Union (ITU) to establish scientific and technical criteria for using the geostationary orbit in preparation for the World Administrative Radio Conference, to be held from 8 August to 13 September 1985, with a second session in June/August 1988.

In the debate, Colombia suggested a study outlining how countries had used orbital positions since the first launching of a satellite into the geostationary orbit in 1963, including details on which countries used the orbit, frequency bands used, period of operations and national or regional nature of the satellite service.

The Legal Sub-Committee, in pursuing a General Assembly mandate regarding the elaboration of draft principles regarding governing the rational and equitable use of the orbit, is to take account of the different legal regimes governing airspace and outer space and the need for technical planning and legal regulation of the geostationary orbit.

Some delegations stated that a special legal regime should be established for the orbit, as it was a limited natural resource, as recognized by the UNISPACE 82 Conference and in article 33 of the ITU Convention.

The equatorial countries emphasized that because of location, they had a special relationship to the orbit, with special rights and responsibilities as to segments of the geostationary orbit superjacent to their territories and that placement of a space object in a segment of the geostationary orbit superjacent to an equatorial country should require prior authorization by that country.

Colombia, Ecuador, Indonesia and Kenya submitted a working paper (A/AC.105/C.2/L.147) on draft general principles governing the orbit, which states that it should be used exclusively for peaceful purposes and for the benefit of all mankind; that it was a limited natural resource which should be preserved in the interest of all States, taking into account the needs of the developing countries and the rights of the equatorial States; and that it should be governed by a specific legal regime.

China said developing countries were dissatisfied with the present situation regarding the use of the orbit and the radio frequency spectrum. Measures should be taken so that the legitimate needs and interests of all countries were considered, especially those of the developing countries including the equatorial States. The only way to ensure the equitable, economic and efficient use of the orbit and spectrum was to elaborate a comprehensive plan to standardize the technical parameters of satellite systems in the orbit, reduce the inhomogeneity and make optimum use of the positions in the orbit, in order to avoid waste.

Some States did not agree that equatorial countries had special rights with respect to the segments of the geostationary orbit superjacent to their territories.

They said certain principles should underline the legal regime, including: the part of outer space in which the orbits of geostationary satellites were placed was inseparable from outer space as a whole and in that sense the provisions of the 1967 Outer Space Treaty would apply; it could not be the subject of national appropriation; it was a limited natural resource which should be used effectively in order to ensure equal access of different States or groups of States depending on their needs and technical capabilities; all States had equal rights for utilization of outer space with respect to placing geostationary satellites; States should cooperate in such placement, taking into account ITU regulations; and the needs of developing States as well as the geographical situation of certain States should be taken into account.

Others stated that the formulation of a special legal regime for the geostationary orbit was not a necessary or appropriate course.

The Netherlands said the ITU was the most appropriate body to consider problems of overcrowding the geostationary orbit, competing frequency requirements and debris in the orbit.

The Federal Republic of Germany said the granting of special rights to certain countries would be an obstacle to the rational use of the orbit. It supported the concept of neutral coordination and did not approve of a reservation on orbit positions. Such positions should preferably be granted whenever needed depending on demand, without blocking an access to other countries.

The United States regarded the decision to schedule negotiations in the Legal Sub-Committee on new legal principles on the geostationary orbit as "an unjustified encroachment" on the responsibilities given to the ITU.

Definition and Delimitation of Outer Space

Where does outer space begin? Does it have a physical boundary by which States could stake claim to areas above them? What problems would ensue from establishing legal definitions and boundaries in this regard?

The Legal Sub-Committee established a working group to deal with the problems of definition and delimitation of outer space and the character and use of the geostationary orbit. The working group, on a proposal of its Chairman, agreed on separate considerations of the two subjects.

Some countries maintained that a definition and delimitation of outer space was necessary and wanted a multilateral agreement, open to all States, to establish a specific altitude as the upper limit of air space. Related questions are whether outer space should be considered as beginning where air space ends, and at what altitude air space should be regarded as ending.

A number of nations favoring a "spatial definition" supported the Soviet proposal that the boundary between outer space and air space be at an altitude not exceeding 100 kms above sea level. Provision could be made for that to be changed in the future, by international agreement, should circumstances make it necessary, according to the proposal.

In the debate, the Soviet Union, which had previously submitted a working paper (A/AC.105/C.2/L.139), said delimitation and definition of outer space was needed to guarantee effectively a reliable legal basis for new spheres of space activity and to guarantee that the study and use of space would be carried out in the interest of all States. The problem of defining the boundary between the two types of space was important. That boundary was the limit of the height of the application of State sovereignty. Definition of the boundary was a means of establishing the area for applying international air and space law.

Bulgaria said the absence of a boundary between air and outer space opened the door to countless violations of State sovereignty. The absence of a clearly defined limit would compel States whose security would be threatened to enact measures to prevent such violation.

India said outer space should be defined and delimited because of the existence of different legal regimes for air and outer space. There was a need to provide a clear area for applying existing outer space law and facilitating the further development of that law to determine the upper limit of State sovereignty, to safeguard the security of national air space and to prevent disputes between States.

Some States, while favoring the "spatial definition" approach, did not agree with the proposed altitude for the demarcation between air space and outer space. Kenya, for

example, had some reservations regarding setting a specific distance in terms of delimiting outer space, as it seemed arbitrary. A definition of air space would be possible only after outer space had been defined.

Other delegations stated that: there was no present scientific basis for defining and delimiting outer space or for placing the boundary at any particular altitude; the development and application of the law of outer space had proceeded satisfactorily without such a definition or delimitation; and it would be unreasonable to adopt an arbitrary definition or delimitation which could give rise to difficulties and impede the development of space technology.

The United States said the establishment of a demarcation between outer space and air space in advance of a genuine and practical need for doing so would be an inherently arbitrary exercise having unforeseeable and almost certainly detrimental consequences for future outer space activities.

The United Kingdom said it was premature to define outer space, and was not convinced of the need for such a definition. The Netherlands said to draw a boundary between outer space and air space at a certain altitude was not only unnecessary but undesirable, as it could create problems that did not now exist.

Some delegations considered that as the positions of delegations had not moved closer over many years, the Sub-Committee should, without prejudice to its future work on the question of the definition and delimitation of outer space, concern itself with such matters as the definition of "space objects" and "space activities." Others felt a consensus on the definition of "space object" would be more difficult to achieve than on a definition and delimitation of outer space.

As to the questions of definition as well as the geostationary orbit, the same views of States were restated in the COPUOS and the Committee could not agree on how to proceed on the item—whether on a priority basis and/or through a working group in the Legal Sub-Committee—and therefore left the matter to the General Assembly.

Other Matters

The Scientific and Technical Sub-Committee noted that the United Nations Programme on Space Applications had been carried out satisfactorily in 1983 and commended the work of the United Nations Space Applications Programme. The Committee was informed that under the Programme, 148 persons from 59 developing countries had participated in space-related seminars and training courses in 1983. The status of the 1984 Programme was noted and the 1985 proposed programme was approved. It noted with appreciation financial contributions for the Programme from Austria, Cameroon, China and Pakistan.

The Scientific and Technical Sub-Committee discussed the progress that had been made in the development of programmes related to space transportation systems and noted in particular the launch vehicles and transportation systems being developed by China, India, Japan, the Soviet Union and the United States.

The Scientific and Technical Sub-Committee also discussed three studies proposed by UNISPACE 82 on: assistance to countries in studying their remote-sensing needs and assessing appropriate systems for meeting such needs; feasibility of using direct broadcasting satellites for educational purposes and of internationally or regionally-owned space segments; and feasibility of obtaining closer spacing of satellites in the geostationary orbit and their satisfactory co-existence, including a closer examination of techno-economic

implications, particularly for developing countries. These three studies were carried out by three Groups of Experts appointed by the Secretary-General and their reports would be submitted in 1985 to the Scientific and Technical Sub-Committee for review and to the COPUOS for approval.

A Procedural Issue of Importance

Another topic which figured prominently this year, albeit not an official agenda item, was the concern about the lack of progress made in the Committee's and the Sub-Committees' recent sessions. The words such as "impasse," "crisis," and "crossroads" were used by many delegations. In this connection, the Netherlands made a formal proposal (A/AC.105/L.148) to discuss the working methods of the Committee and its subsidiary bodies, saying that such an organizational reform may not cure the ailments of the Committee, but it can make their solution easier. The reception of this proposal was, however, not good since many other delegations believed that organizational reform was not the answer to whatever the problem the Committee may have. By far the more controversial question raised in connection with the working method of the Committee was the rule of decision-making by consensus. Western countries expressed their concern about the failure to maintain the rule on outer space matters at the 38th session of the General Assembly and emphasized that it was essential to restore the rule to resume a fruitful deliberation of outer space matters at the United Nations. Speaking on this topic, the U.S. emphasized that it had been the valuable tradition in the handling of outer space matters at the UN to cleverly avoid such areas where the views of some Member States are such that forcing the Committee to officially take up items in these areas is doomed from the beginning. The U.S. repeated its earlier declaration that it would not participate in any deliberations on the questions relating to the militarization of outer space. Other countries generally agreed to the extent that the rule of decision-making by consensus should be upheld in the Committee and its two Sub-Committees, but they expressed the view that this rule should not grant a veto power particularly in the General Assembly.

The Committee concluded its session without recording any view on this vital question which has an important implication for the future viability of the Committee itself. The forthcoming session of the General Assembly, which would have to answer this and other difficult questions one way or the other, may well be the most crucial one in terms of outer space matters at the United Nations in recent years.

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*2. Military and Civilian Space Issues Before the First Session of the 98th Congress—A Legislative Report**

A broad range of military and civilian space issues were addressed in the first session of the 98th Congress. For the sake of brevity, only two will be discussed in detail here: the debate over the need to negotiate a treaty to ban weapons from space, and issues involved in the commercialization of space (specifically regulation of commercial space launches, and the proposed sale of Landsat and the weather satellites to the private sector). Information in this article is current through November 18, 1983, the end of the first session.

Briefly, other issues which were debated included: whether or not NASA should build a space station as its next major space initiative; how to encourage the commercialization of space in general (as opposed to the specifics of remote sensing and launch vehicles); and the usual funding debates over NASA and DOD space activities. All of these will still be on the agenda when Congress reconvenes in January 1984.

a. Weapons In Space

Certainly one of the most controversial issues in the space field today is whether or not the United States should continue its development of an antisatellite (ASAT) weapon, and to expand efforts in the space weapons area to ballistic missile defense (BMD).

The issue of space arms control had been discussed during the 97th Congress, with hearings held before the Senate Foreign Relations Committee on September 20, 1982. President Reagan's March 23, 1983 "Star Wars" speech stimulated greater interest in this issue, however.

The President's Speech

Although it has been widely dubbed the "Star Wars" speech, President Reagan's March 23 nationally televised speech, which ended with a call for the Nation's scientists to put their efforts into developing a defensive system against ballistic missiles for the United States, never mentioned space at all. Presidential advisers briefing the press prior to the speech responded to a question about the types of weapons the President had in mind by stating that he was interested in a broad-based assessment of all possible weapons, including those that could be based in space (but not excluding terrestrial basing). The press picked up on the space theme, and "Star Wars" was born.

The Administration subsequently established several advisory groups to study what technologies, space and terrestrial, were available now and those which might become available in the future. Preliminary results of these studies, including that by the Fletcher Commission which was headed by former NASA Administrator James Fletcher, are described at the end of this section.

Soviet Response

The Soviet response to President Reagan's speech was immediate and negative. Initially, Soviet President Andropov called on scientists from both countries to sit down and try to determine how to prevent the weaponization of outer space. Later, he expanded these efforts by presenting a new draft treaty to the United Nations to ban weapons from

*This article does not necessarily represent the views of the Congressional Research Service, any Member or Committee of Congress, or staff thereof.

space. The new draft is significantly different from the one submitted to the U.N. by the Soviets in 1981. First, the 1981 text had called for a ban only on stationing weapons in space, which would have permitted continued development and use of the Soviet ASAT system (which is based on the ground) and the U.S. system (which is based on an F-15 aircraft.) The new text would ban the use of force in space, a much broader definition that would include both the Soviet and U.S. ASAT system, as well as BMD activities.

Another significant change is that the 1983 text calls for dismantlement of existing systems. Importantly, however, the Soviets still have not admitted to having such a system; they simply provide for dismantlement of any that *may* exist. A third difference is a provision that would ban the use of any manned spacecraft for military uses. Since this would prohibit the United States from using the space shuttle to launch even a communications satellite for DOD, it is very likely to be a major stumbling block if negotiations are held.

The language concerning verification of the treaty is different, but not much of an improvement over the 1981 text. Essentially, verification would rely on national technical means (as in the 1981 text), but language has been added about steps and remedies to be taken if one party is convinced that another party is not abiding by the treaty.

Andropov outlined the basic terms of the treaty at an August meeting in Moscow with nine U.S. Senators, and simultaneously offered a "unilateral moratorium" on ASAT launches, although there is considerable ambiguity about exactly what has been promised or proposed. The original message said that the Soviets would not be the first to place weapons in space (again avoiding admission of the fact that they have already conducted 20 tests of their ASAT device) and would refrain from any such launches as long as other nations would not station weapons in outer space. The word "station" is critical here, since the United States does not plan to station any weapons in space at this time, and according to the Andropov statement, the Soviets would refrain from any ASAT launches, including tests, while the United States could test and deploy its F-15 based ASAT. Reports in the Soviet press following the initial announcement of this moratorium changed the "station" to either "launch" or "place into space," but it remains unclear exactly what Andropov meant. In any case, the Soviets have not conducted an ASAT test since June 1982.

Congressional Response

Prior to the President's speech, resolutions had already been introduced in the House and Senate to encourage the President to negotiate a treaty with the Soviets banning weapons from space. Rep. Moakley had introduced H. J. Res. 120 with 76 co-sponsors on February 2, and Rep. Kastenmeier had introduced H. J. Res. 87 on January 25 (he is also a co-sponsor of the Moakley resolution). On the Senate side, Senator Tsongas and 2 co-sponsors introduced S. J. Res. 28 on February 3, while Senator Pressler, who had chaired the September 1982 Senate Foreign Relations hearings on this issue, introduced S. Res. 43 on February 2 with 6 co-sponsors.

All of these resolutions called for some sort of negotiations to ban either all space weapons, or just antisatellite weapons. Conversely, Senators Wallop and Laxalt introduced S. Res. 100 on March 24, the day after Reagan's speech, calling for accelerated development of space-based lasers. Rep. Kramer and 11 co-sponsors introduced H. R. 3073, the People Protection Act, on May 19, to establish an organizational approach to implement what they interpreted as Reagan's far reaching plan for military space activities. A companion measure was introduced in the Senate by Senator Armstrong on October 28.

Resolutions were also introduced in the House and Senate proposing increased emphasis on international cooperation in space as an alternative to putting weapons in

space, especially an international space station. S. Con. Res. 16 was introduced by Senators Matsunaga and Pell on March 10 and its companion measure, H. Con. Res. 140, was introduced by Rep. Levine and six co-sponsors on June 30.

Hearings were held by several committees on the foregoing legislation or on the general issue of military space activities. The House Appropriations Committee devoted one day of its deliberations on the FY84 DOD appropriations bill to the role of the military in space. The hearing was held on March 23, coincidentally the day of the President's speech. The House Armed Services Committee held one day of hearings on the Kramer bill on November 10, and the House Foreign Affairs Committee held hearings on the Moakley resolution that same day.

The Senate Foreign Relations Committee held two days of hearings on space arms control on April 14 and May 19. On July 19, the committee ordered S. J. Res. 129, a compromise between the Pressler and Tsongas resolutions, favorably reported. The Senate Armed Services Committee devoted one day of hearings to this issue on May 2.

None of the bills or resolutions introduced during the first session reached the floor of either House, but debate was heard on this issue in both the House and the Senate during consideration of the DOD authorization bill. Two amendments were offered in the House. The first, by Rep. George Brown, would have deleted the \$19.4 million requested for procurement of the U.S. ASAT, while approving the more than \$200 million for research and development, on the basis that Congress had not fully considered the implications of proceeding with the procurement of the ASAT system, and more time was needed to assess the need for and cost of such a program. The amendment was defeated on June 14. Rep. Seiberling introduced an amendment to prohibit testing of the U.S. ASAT system until expressly authorized by Congress, and it also was defeated (on July 21).

During Senate consideration of the bill on July 18, an amendment offered by Sen. Tsongas was unanimously adopted which provides that "none of the funds in the Act may be obligated or expended to test any explosive or inert anti-satellite warheads against objects in space unless the President determines and certifies to the Congress that (a) the United States is endeavoring, in good faith, to negotiate with the Soviet Union a mutual and verifiable ban on anti-satellite weapons, and (b) pending agreement on such a ban, testing of explosive or inert anti-satellite warheads against objects in space by the United States is necessary to avert clear and irrevocable harm to the national security." Three days after the Senate adopted this amendment, it defeated an amendment sponsored by Senator Wallop to accelerate development of space-based laser weapons.

As noted earlier, the House failed to pass an amendment similar to the Tsongas amendment, but the Senate language was retained during conference on the bill, which became law on September 24 (P.L. 98-94).

During mark-up of the FY84 DOD appropriations bill, the House Appropriations Committee deleted the \$19.4 million requested for procurement of the U.S. ASAT system, and required the President to submit to Congress an unclassified report on his plans and policies regarding space arms control. There was no attempt to change this provision during House consideration of the bill and it passed, but the Senate did not include a similar provision in its version of the bill. During conference, the two sides agreed to "fence" the \$19.4 million so that it may not be obligated or expended "until 45 days following submission to the Congress of a comprehensive report on U.S. policy on arms control plans and objectives in the field of ASAT systems." The report must be submitted by March 31, 1984 and "should be unclassified, with classified addenda as required, and suitable for general release."

The conference report on the DOD appropriation bill (H. Rept. 98-567) passed Congress on November 18, but the President had not signed it by the time this article was written (although he is expected to do so).

Summary

Congress has demonstrated its strong interest in the issue of weapons in space both through legislation and during debate on funding measures for these programs. Both those who favor space weapons and those who favor arms control in space have been vocal in the past session of Congress. The language in the DOD appropriations bill conference report also reflects growing frustration on the part of some members over the classification restrictions on the information relative to ASATs, and the desire for published reports that can be publicly debated.

The space weapons issue seems likely to be at least as controversial in 1984 as it was in 1983 since the President is now required both to submit a report to Congress in accordance with the DOD appropriation bill, and must certify to Congress that he is endeavoring in good faith to discuss these issues with the Soviets in conformance with the DOD authorization act. Also, the FY85 budget request from the President should reflect the results of the studies that were conducted following the President's March 23 speech. Although it has not yet been officially released, preliminary results of an interagency study which melds the recommendations of the Fletcher Commission (formally known as the Defensive Technologies Study Team), and the Future Security Strategy Study, headed by Fred Hoffman of Pan Heuristics, were published in October by the trade magazine *Aviation Week and Space Technology*. According to that magazine, the interagency group concluded that the United States should embark on early demonstrations of credible ballistic missile defense technologies, adding that the potential for BMD can be demonstrated by the early 1990's. The report listed a broad range of BMD technologies, both space and ground based, that need to be studied, and offered four different funding levels for the President to consider, ranging from \$18 billion to \$27 billion total for fiscal years 1985-1989.

At the November 10 hearings on Rep. Kramer's bill (H.R. 3073), Dr. Richard DeLauer, Undersecretary of Defense for Research and Engineering, outlined DOD's recommendations to the President for BMD (now renamed DABM—Defense Against Ballistic Missiles). He stated that DOD wants to continue research and development into a wide variety of options, and plans to increase BMD funding by 25-50 percent in the next year. Since the current level of BMD funding is only approximately \$1.5 billion, such an increase is not as dramatic as the figures in *Aviation Week* suggest.

The level of funding that will be requested for the BMD program for FY85 will not be known until the budget is submitted to Congress by the President in January, 1984. Congress will undoubtedly give the request considerable scrutiny during the next session.

b. Space Commercialization

The "commercialization" of space is a broad term referring to methods of stimulating private sector investment in space. Hearings on the general subject of commercialization were held by the House Science and Technology Committee on May 3 and 4, 1983. In addition, this author and Daniel Zafren, also of CRS, prepared a report entitled "Policy and Legal Issues Involved in Space Commercialization" which was published in the fall of 1983 by the Senate Committee on Commerce, Science, and Transportation.

Two subsets of this issue were of particular note in the past year: commercialization of expendable launch vehicles, and of remote sensing satellites.

Expendable Launch Vehicles

Since the early 1970's, U.S. Government policy has been that once the space shuttle is operational, the Government will no longer use expendable launch vehicles (ELVs). Now that the shuttle is available, the question of what to do about the ELVs has reached a critical juncture. There are some companies, including those that manufacture ELVs, who believe that there is a market for both the shuttle and ELVs, and have indicated an interest in taking over existing ELVs and marketing them commercially. In addition, two companies are developing new ELVs of their own for commercial use.

Government involvement is required for such an endeavor for many reasons. For example, private launches have to be conducted in a manner consistent with U.S. treaty obligations and national security objectives, have to meet safety requirements for the launch vehicle and payload, and ELV operators need to obtain clearance of the airspace around the launch site and frequency assignments for communicating with the vehicle.

Furthermore, the launch pads for existing ELVs are owned by the Air Force (although NASA leases the Delta and Atlas-Centaur pads), which also provides range safety services. Private ELV operators would either need to make arrangements with the Government to use the pads, or build their own. Finally, the existing ELVs were developed under Government contracts, thus requiring Government approval for the private sector to take over their production.

Legislation was introduced in the 97th Congress by Rep. Akaka and Sen. Cannon to facilitate Government involvement in the commercialization of ELVs by designating a lead agency to act as a single point of contact for prospective private ELV operators. These bills were reintroduced in the 98th Congress. The Akaka bill (H.R. 1011, reintroduced on September 21 with changes as H.R. 3942) would make the Department of Commerce the lead agency. The Senate bill, S. 560 (introduced by Senator Hollings and identical to the Cannon bill from the 97th Congress), would give that responsibility to the Federal Aviation Administration in the Department of Transportation.

Prompted by congressional interest in the issue, the Administration's Senior Interagency Group/Space (SIG/Space) was charged with developing a Reagan Administration policy on commercialization of ELVs. In May, the White House issued its policy, which stated in effect that the Administration favored commercialization of ELVs, but postponed a recommendation of which agency should serve the regulatory role.

Meanwhile, the House Science and Technology Committee held hearings on May 17 and 18 on this issue, and began markup of H.R. 1011 on August 3. Committee members were divided over what agency should serve the regulatory function. Further consideration of the measure was postponed pending hearings by the committee and/or a recommendation by the SIG/Space. On November 16, SIG/Space decided by consensus that the Department of Transportation should serve as lead agency, and on November 18, the House committee held a short hearing at which Transportation Secretary Dole explained how her agency intended to implement its new role. It is unclear whether Congress will accept the Administration's decision, and further action may occur when Congress reconvenes.

Meanwhile, NASA issued a request for proposals (RFP) for companies interested in operating ELVs commercially. Despite vocal interest by several companies prior to the RFP, only two responded: General Dynamics, which manufactures the Atlas-Centaur, and TranSpace Carriers, Inc. which would like to market the Delta (which is manufactured by McDonnell Douglas). Martin Marietta is also known to be interested in commercially marketing its Titan launch vehicle, but it would not have responded to the NASA RFP since Titan is an Air Force vehicle. The two companies which are developing their own launch vehicles (Space Services, Inc. and Starstruck) did not need to respond to the RFP either since they are developing their own systems and launch sites.

Remote Sensing Satellites

The saga of the sale of Landsat land remote sensing satellites to the private sector began as long ago as 1973, the year after Landsat 1 (then called ERTS 1) was launched. Although NASA had expected that eventually the private sector would take over this activity, there was no plan to accomplish this until November 1979 when President Carter announced that the Landsat program would be transferred from NASA to the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce after the launch of Landsat D (now Landsat 4). Transfer from NOAA to the private sector was expected to take about a decade.

When President Reagan took office, he decided to speed up the timetable for transfer of Landsat to the private sector, and announced that the Government would not launch any additional Landsat satellites after Landsat D prime (the fifth in the series), then scheduled for launch in 1985. With a three-year design lifetime for these satellites, that would mean that the Government would phase out of the land remote sensing business in 1988, by which time the private sector would have had to have taken over the program, or there would be no program.

The issues involved in the sale of Landsat to the private sector became further complicated in 1981 when COMSAT (the Communications Satellite Corporation) proposed to take over *all* remote sensing satellite activities—land, ocean, and weather. The United States does not have any ocean sensing satellites at this time, and the civilian weather satellites are currently operated by NOAA. (DOD has its own weather satellites, and their transfer to the private sector was never considered, but DOD does use data from NOAA weather satellites as well.)

The reasoning behind this proposal was that the market for Landsat is not yet well developed, and a company taking over only that system would have no guarantee of a profit. Weather satellites, however, have a clear market in the Government itself, which uses 95 percent of the data. Thus, a private operator of the weather satellites would be assured of selling 95 percent of the data and thus would have a greater expectation of financial success.

The issues involved in allowing the private sector to operate the land and weather satellites were debated in the Cabinet Council on Commerce and Trade in 1981 and 1982, and although it was reported in the media that a decision had been made in April 1982 opposing the sale of weather satellites (primarily on the basis of national security needs for that data), the final decision announced by the President on March 8, 1983 was that he would support the transfer of all remote sensing satellite activities, including weather, to the private sector.

The decision set off a storm of controversy in Congress, which immediately acted to prevent the President from unilaterally imposing this decision by adding a provision to the Emergency Jobs Bill (P.L. 98-8) requiring congressional approval of such an action. A similar provision was added to the NASA authorization bill (P.L. 98-52).

The House Science and Technology Committee held several days of hearings on the issue of commercialization of remote sensing satellites (June 28, July 14, July 21, November 8-9), and the House Government Operations Committee held hearings on September 28. During the Science and Technology Committee hearings, Secretary of Commerce Baldrige revealed that the Deputy Secretary of Commerce, Guy Fiske, who had been chiefly responsible for the Department's consideration of the remote sensing satellite proposal, had been removed from further decisions in this area because of a possible conflict of interest. Apparently Fiske had discussed future job opportunities with COMSAT, and while he denied that any specific job offer had been made, he eventually resigned.

The Fiske incident simply added more drama to an already emotional issue, which was further exacerbated when NASA and NOAA announced in the summer of 1983 that Landsat 4, the only operating Landsat satellite in orbit, was failing prematurely because of a failure in the cable connecting the solar panels to the spacecraft. As a result, Landsat D prime will be launched in March 1984 instead of 1985, thus accelerating the end of the Government's involvement in the program unless that policy is reversed. A bill was introduced by Senator Pressler on September 20 (S. 1861) to provide for development of a new generation of land remote sensing satellites, and Senator Hollings introduced S. 1855 that same day to authorize the operation of U.S. land remote sensing satellite systems and encourage private follow-on systems after Landsat D prime. No action was taken on either bill this year.

The Administration established a Source Evaluation Board (SEB) in May 1983 to prepare a request for proposals (RFP), and that effort is continuing. Interested companies would be allowed to bid on Landsat and/or the weather satellites, or parts of the systems only (i.e. the space segment or the ground segment). Whether or not the weather satellites will be included in the final RFP remains to be seen, however, because both the House and Senate have passed resolutions (H. Con. Res. 168 and S. Con. Res. 67, respectively) expressing the sense of Congress that it is not appropriate to transfer ownership or management of the civil weather satellites and associated ground systems to the private sector. Although the resolutions do not have the force of law, they do clearly demonstrate to the President that any legislative proposal he might make in this regard would not be warmly received by Congress. In addition, Congress denied a request by the Department of Commerce to reprogram \$1 million to support the SEB's work because of concern that the SEB would, in effect, be setting Government policy on commercialization. The action was taken in the Commerce, Justice, State Department appropriation bill (H.R. 3222) which has passed Congress, but has not been signed into law yet.

Summary

Space commercialization issues are likely to continue to be extremely controversial in the second session of the 98th Congress. This will be particularly true in the case of Landsat, where time pressures are mounting to either reverse the Government decision not to build any satellites beyond Landsat D prime, or significantly accelerate private sector take-over of the system so there is no gap in data flow from these types of satellites. Two private companies (Space America and Sparx) have announced plans to launch their own land remote sensing satellite systems, but their satellites would be aimed at particular customers and there is some indication that the data might be considered proprietary and thus would not be distributed under the U.S. "open skies" policy. The potential conflict between U.S. Government policy and the policies of private companies in the United States might very well be debated in Congress next year.

Commercialization of ELVs may also continue to be controversial, depending on whether action is taken to overturn the Administration's choice of the Department of Transportation as lead agency.

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3. *The 26th Colloquium on the Law of Outer Space, Budapest, 10-15 October 1983*

The Colloquium took place during the XXXIV Congress of the International Astronautical Federation. The sessions of the Colloquium were held in the prestigious and historical building of the Academy of Sciences. To the delight of the participants, a marvellous photo exposition of the Colloquia during the last 25 years had been carefully prepared by *Dr. Gál*, who had a big part in the organization of the Congress in general and especially in that of the Colloquium. It was due to his efficient preparation that the sessions of the Colloquia went very smoothly and in a harmonious atmosphere.

The Colloquium was well attended by lawyers from all parts of the world and also by some pioneers of space law, such as Judge *M. Lachs* of the International Court of Justice and Prince *Heinrich Welf von Hannover*, who wrote the first thesis on space law. Also two representatives of the United Nations *Dr. Kopal* and *Dr. Jasentuliyana* assisted at the sessions as well as our Honorary President *Prof. Pépin*.

Among the active participants were a satisfying number of young lawyers. This was very much appreciated as well as the fact that their papers and presentations during the Colloquium were of a high level.

The four official subjects were the following:

1. Telecommunications and the geostationary orbit;
2. Interrelationship between air and space law;
3. Responsibility for space activities;
4. Legal aspects of international cooperation in space.

After the opening remarks of the President of the International Institute of Space Law, *Dr. Gál* chaired the first session, assisted by one of his students. The subject "Telecommunications and the Geostationary Orbit" aroused a lot of interest. Some speakers stressed the special character of the geostationary orbit. One of them mentioned that the geostationary orbit was 3 miles wide and 5 miles deep. It seems that in a technical sense, the problems are less than the lawyers tend to think. *Prof. Christol* made observations about the application of the *jus cogens* principle based on the Vienna Convention. *Ms. Popescu* commented also on this subject later on. In the discussion *Prof. Lachs* made a very important contribution to this topic, the more important because he has been acquainted with the subject right from the beginning. Ambassador *Finch* stressed the importance of space as a key to world peace.* *Prof. Gorove* mentioned the equitable division of the new resources, in which also the developing countries should have a part, a view backed by *Dr. Okolie*. The frequency spectrum of the geostationary orbit is also of interest for developing countries according to the principle of the free flow of information, which was also mentioned at the Unispace Conference.

The second session on the subject, "Interrelationship Between Air and Space Law," was chaired by *Dr. Vereshchetin*, assisted by *Ms. Sterns* because of the illness of the appointed chairman, *Dr. Kolosov*. Very different topics were treated in this session. The delimitation of air and outer space was discussed, among others by *Dr. Gál*, and as a consequence also the passage of space craft through national airspace. Moreover, an analysis was made of the air-crew and the space-crew. After the session, a discussion followed focussing particularly on the delimitation of air and outer space.

*Editorial note: Mr. Finch requested inclusion of his stated views that outer space is inherently international by nature; that it offers important solutions to the needs of all nations; that it is a key factor for world information, world trade, national development and national security, including command, control, communications and intelligence (C³I); and that for development of outer space to be successful, long-range, consistent policy planning is required. He also stressed that maximum participation by nations in space policy will advance space progress; that a balance of power in outer space is necessary for the peace of all nations; and that space stations on the moon, or elsewhere in outer space, are the economic and scientific steps to the future of outer space for the true benefit for all nations.

Because the fourth session on "Legal Aspects of International Cooperation in Space" was overloaded (a great number of participants had chosen this subject), *Dr. Vereshchetin* and the Chairman of the third session, *Prof. Gorove*, assisted by *Mrs. van Traa*, kindly allowed some papers to be taken up in their meetings. The subject of the third session was the "Responsibility for Space Activities," covering a lot of different aspects such as state responsibility, a system of sanctions—always a very important subject—the legal status of intercosmos, activities of non-governmental entities, intellectual property, etc. *Mr. Patermann* had made in his lecture a difference between operational use, commercial use and use for profit. During the discussion that followed, the permissibility of private enterprises arose. *Dr. Vereshchetin* was of the opinion that the use that the States make should have priority. The general opinion was that for private enterprises, authorization and supervision by the states should be necessary. *Dr. Zhukov* observed that commercial use was possible but not for profit. As an example the weather-forecast was cited, which is available for all States.

The last session on International Cooperation was chaired by *Prof. Cocca*, who handled the many papers in such a very efficient but nevertheless relaxed way that even after this session, time for discussion was left. *Prof. Cocca* was assisted by *Mrs. Hóskova*. Among the interesting topics that were treated by two Hungarian participants were the legal character of the Intercosmos Programme of 1978. An issue discussed was whether Intercosmos was an international or an intergovernmental organization. According to *Dr. Vereshchetin* it was the latter.

Among other topics falling under international cooperation were remote sensing systems and search and rescue. *Dr. Menter* addressed the topic "Legal Responsibility for Outer Space Activities" urging members of the IISL in their efforts for further space law development to remember and apply the basic policy concept of the 1967 Outer Space Treaty of international cooperation and mutual assistance, rather than national rivalry, in the exploration and use of outer space. With particular reference to United States space activities, he discussed responsibilities under the space law and other treaties, national legislation and implementing agency regulations of governmental and nongovernmental entities activities relating to outer space. He urged members to work for obtaining international joint space undertakings as a path to lessen present international tensions and avoidance of conflict. In his view, for example, such working together of East and West to bring space collected solar energy to Earth for the benefit of all mankind should lead to mutual understanding and reliance. There was general consensus over the great importance of international cooperation in accordance with the general theme of the Congress. Quite another aspect was the excellent paper of *Mrs. Parragh* on patent law aspects of space exploration, a topic that was explained further in the discussion.

The President of the International Institute of Space Law closed the Colloquium thanking the Chairmen of the sessions, *Dr. Gál*, *Dr. Vereshchetin*, *Prof. Gorove* and *Dr. Cocca* and their assistants *Ms. Sterns*, *Mrs. van Traa* and *Mrs. Hóskova*. She thanked also the speakers on the different subjects, the participants in the discussion and all participants for their kind attention and attendance. She mentioned that the sessions of the Colloquium had truly taken place in an atmosphere of cooperation and in an effort to reach a mutual understanding, a good tradition and the fundamental goal of our Institute.

I.H.Ph. Diederiks-Verschoor
President, International Institute
of Space Law (IAF)

4. *Report on Symposium on "Conditions Essential for Maintaining Outer Space for Peaceful Uses," The Hague, March 12-15, 1984*

Military activities in outer space have appeared shrouded in ambiguity, in fact and in law. Recent developments though have brought about a focus on what is perceived as a clear threat whatever way expressed: the increasing militarization of outer space, the possibility of a new arms race and of outer space becoming a new arena for military confrontations, and the fear of new star war type weapons moving from science fiction to reality.

Mounting concern about these developments has been expressed in different international fora and by various national authorities and organizations which in the United States range from the Senate to the Union of Concerned Scientists. There is also increasing pressure for action to alleviate the perceived risks and dangers. Required action is seen in terms of two interlinked sets of measures: political negotiation involving, in particular, the two major space powers and also the international community at large; and equally urgent steps to strengthen the international legal framework designed to safeguard outer space for peaceful uses.

It was in order to respond to the second set of requirements that the United Nations University and the International Institute of Space Law organized, in cooperation with the Peace Palace, the seat of the International Court of Justice, and the Hague Carnegie Foundation, a symposium under the title "Conditions essential for maintaining outer space for peaceful uses", 12-15 March 1984. Participants invited to this meeting in their personal capacity were drawn from various regions of the world and from the major concerned countries; they represented technical and legal expertise in national institutions and international organizations. The symposium focussed on the international legal aspects; information on technical and related developments is collected and analyzed by various organizations in different parts of the world and was used as a background to the discussions of legal measures designed to control present and foreseeable non-peaceful uses of outer space.

In keeping with its objectives, the symposium was organized so as to give an opportunity of reviewing the concerns expressed in different fora, particularly the United Nations, but at the center of attention was an overview of relevant international law and an analysis of all space-related treaties applicable to the subject matter before the symposium. In particular, the symposium considered ways of strengthening the agreements that make up space law, from the 1963 Test Ban Treaty and the 1967 Outer Space Treaty to the Moon Agreement and the International Telecommunication Convention. Included in the analysis was also the less well-known Convention on the Prohibition of Military or Any Other Hostile Uses of the Environment (1977) and other instruments such as the so-called ABM Treaty between the USA and the USSR. This seems to have been the first time such an overview and analysis of relevant law has been attempted in the light of the specific perspective adopted by the symposium; it is therefore expected that the forthcoming publication of the contributions to the symposium and the thematic account of the major points in the discussion might prove valuable in the continued legal work in this area.

The symposium also considered the proposals for new treaty texts submitted to the United Nations General Assembly, as well as proposals prepared in other contexts or made by participants at the symposium. Other subjects discussed included proposals for settlement of disputes in outer space and the international institutional framework for ensuring the peaceful uses of outer space.

The work of the symposium proved successful enough for the adoption of an agreed statement that went beyond what either the organizers or the participants would have

thought possible. This statement in the Appendix which is reprinted below has already been brought to the attention of the Legal Subcommittee of the UN Outer Space Committee and will be used in a similar manner in other relevant fora. A list of the participants is included in the Appendix.

Appendix

Statements on "Conditions Essential for Maintaining Outer Space for Peaceful Uses" at Symposium organized by the International Institute of Space Law and the United Nations University in cooperation with the Peace Palace and The Hague Carnegie Foundation. The Hague, March 12-15, 1984.

The participants in the Symposium agreed to the following summary of their work; it was understood that the United Nations University will publish the written contributions and an account of the discussions where the details of the analysis and proposals made by participants will be found.

I. General Conclusions

The basic common view shared by participants was a sense of risk and danger: the danger of an extension of the arms race into outer space and the risk of armed conflict in outer space; the direction of armament development might jeopardize existing international agreements designed to limit and control the military uses of outer space.

The symposium recalled the expressions of concern over current developments in international fora such as Unispace 82 and the United Nations General Assembly as well as by groups of concerned citizens in different parts of the world.

The meeting recognized the importance of renewed efforts at all relevant levels in developing the appropriate political climate and, at the same time, underlined the important role of international law in these efforts to safeguard outer space for peaceful uses.

In respect of legal measures designed to safeguard outer space for peaceful uses, the participants recalled the applicability of general international law, in particular the Charter of the United Nations and the body of law specifically dealing with outer space and emphasized the need to strengthen and supplement existing rules in response to new situations brought about by technological developments and changing circumstances. The meeting analyzed the proposals for new legal instruments submitted to the United Nations General Assembly and noted that these proposals were presented as drafts in the sense that they were negotiable.

Consequently, the meeting emphasized the urgent need to move towards actual negotiation, in good faith involving all concerned parties and, in particular, the two major space powers.

The objective of developing international agreement and international law for the purpose of maintaining outer space for peaceful uses should be seen in the larger context of working towards the creation of an appropriate legal environment for the future.

Within the framework of general international law, two special bodies of law are relevant: international law specifically related to disarmament and international law specifically governing outer space activities. Efforts in each of these areas should be mutually reinforcing.

In both scientific and legal terms outer space represents with land, sea and air the fourth realm of earth's environment. Within this general framework, the special body

of law which has developed in response to the specific characteristics of outer space activities needs to be strengthened and developed. The meeting stressed the desirability of all countries becoming parties to existing treaties in this area. Further efforts should build on existing agreements and the preferred approach would be to supplement, as required, existing treaties by new legal instruments in appropriate form.

The urgency of new agreements had been expressed by the United Nations General Assembly in resolution 38/70 of 1983 concerning the prevention of an arms race in outer space: the Assembly had also requested the Conference on Disarmament to deal with this matter on a priority basis. In keeping with the primary role thus entrusted to the Conference on Disarmament, the meeting emphasized the urgent need for action by the Conference: in addition, the meeting pointed to the important role of other fora such as the Committee on the Peaceful Uses of Outer Space.

II. Specific Issues and Proposals

The symposium also discussed a number of specific issues and proposals which could assist the task of elaborating new agreements designed to safeguard outer space for peaceful uses. In particular, the symposium wishes to draw attention to the following:

1. In terms of the method of approach, consideration should be given to the advantages of focusing on activities in outer space by strengthening and extending the system of permitted, prohibited and desirable activities. In fact, desirable activities in the form of international cooperation in outer space would be an important aspect of confidence building in this area;
2. While recognizing the obvious requirement of agreement by the two major space powers, participants stressed the importance of involving the international community of states so as to gain wide acceptance for new agreements. Also, while recognizing the value of unilateral declarations of intent, the meeting pointed to the importance of unilateral constraint by those countries possessing technological capability for outer space activities;
3. Participants felt that in the work on new legal texts designed to maintain outer space for peaceful uses, the control provisions in the Moon Agreement would be a viable alternative for early inclusion in a separate agreement;
4. In relation to verification, the meeting discussed monitoring by satellites as an instrument for confidence building. Participants recognized the problems associated with the proposals for the establishment of an international satellite monitoring agency but felt that this matter should be kept under review and that consideration might be given to the possibility of establishing regional monitoring agencies;
5. A special point was made to the effect that new agreements should be formulated so as to ensure the prohibition of antisatellite activities (ASATs);
6. The participants also discussed certain issues connected with the interpretation of existing treaties and the divergences of interpretation. In this connection attention was drawn to the desirability of considering the terminology used in relevant instruments and, as far as possible, providing for a coherent use of definitions and terms;
7. In discussing applicable agreements, participants identified areas where a strengthening of existing rules would be required. Among these areas figured the desirability of strengthening and updating rules concerning information to be provided in connection with registration of space objects, the need for better communications in relation to settlement of disputes. Attention was also drawn to the need for including appropriate procedures for adjustment of rules in keeping with technological developments, scientific research and international cooperation in this field.

*III. List of Participants**

Professor Priyatna Abdurrasyid, Air & Space Law Research Center 15, Jalan Banyumas, Jakarta, Indonesia; Ambassador Abdel Abdel-Ghani, Former Deputy Secretary-General of UNISPACE Conference and Former Director of Outer Space Affairs Division, Sh. Osoris, Tagher Bldg., P.O. Box 262, Cairo, Egypt; Mr. Abderrazak Berrada, Member, International Frequency Registration Board, International Telecommunication Union, Palais des Nations, 1211 Geneva 20, Switzerland; Professor Dr. Karl-Heinz Böckstiegel, Director, Institut für Luft- und Weltraumrecht der Universität Köln, Albertus-Magnus-Platz 5, Köln 41, F.R. Germany; Ambassador Robert Buchheim, Former Head of U.S. Delegation to US-USSR Negotiations on Anti-Satellite Systems and Activities, 312 East State Avenue Phoenix, Arizona 85020 U.S.A.; Dr. Alexandre Carnelutti, Legal Adviser, French Embassy 58 Knightsbridge, London SW1X 7JT, United Kingdom; Dr. Carl Q. Christol, Professor of International Law and Political Science, University of Southern California, 1041 Anoka Place, Pacific Palissades, CA 90272 U.S.A.; Professor Dr. Aldo Armando Cocca, Ambassador-at-large, Juan Francisco Segui 4444, Buenos Aires 25, Argentina; Mr. Sune Danielson, Permanent Mission of Sweden to the United Nations, 825 Third Avenue, 39th Floor, New York, N.Y. 10022 U.S.A.; Professor Dr. I.H.Ph. Diederiks-Verschoor, President, International Institute of Space Law, Institute of Public International Law, University of Utrecht, Janskerkhof 3, 3512 BK Utrecht, The Netherlands; Professor Gyula Gál, Legal Adviser, Lecturer in Air and Space Law, University of Budapest, Varga J.U.P./8 11.10, 1161 Budapest XVI, Hungary; Mrs. Eilene Galloway, Honorary Director, International Astronautical Federation's International Institute of Space Law, 4612, 29th Place N.W., Washington, D.C. 20008 U.S.A.; Professor D. Goedhuis, Chairman, ILA Committee on Space Law, Flat 37, Cadogan Square, London SW1, United Kingdom; Professor Stephen Gorove, School of Law, The University of Mississippi Law Center, University, MS 38677; Mr. He Qizhi, Counsellor, Legal Advisor, Department of Treaty and Law, Ministry of Foreign Affairs, Beijing, People's Republic of China; Ambassador Peter Jankowitsch, Chairman, UN Outer Space Committee, Franziskanerplatz 5, Z-1010, Vienna, Austria; Dr. Bhupendra Jasani, Stockholm International Peace Research Institute, Bergshamra, S-171, 73 Solna, Sweden; Mr. N. Jasentuliyana, Deputy Director, Outer Space Affairs Division, United Nations, New York, N.Y. 10017 U.S.A.; Dr. Vladimir Kopal, Director, Outer Space Affairs Division, United Nations, New York, N.Y. 10017, U.S.A.; Judge Manfred Lachs, International Court of Justice, Peace Palace, 2517 KJ The Hague, The Netherlands; Dr. Nicholas Matte, Director, Institute of Air and Space Law, McGill University, 3690 Peel Street, Montreal, P.Q. Canada H3A 1W9; Mr. B. G. Mayorski, Legal and Treaty Division, Ministry of Foreign Affairs, Smolenskaya-Sennaya Square 32/34, Moscow 121200, U.S.S.R.; Dr. Ogunsola Ogunbanwo, Coordinator, United Nations Disarmament Fellowship Programme, Department for Disarmament Affairs, Rm. D612, Palais des Nations, Geneva, Switzerland; Mr. G.S. Raju, Deputy Director, Legal and Treaties Division, Ministry of External Affairs, Patiala House, New Delhi-11 00 01, India; Mr. Richard Saint-Martin, Counsellor, Permanent Mission of Canada to the United Nations, 866 United Nations Plaza, New York, N.Y. 10017 U.S.A.; Dr. Paul Stares, Lecturer, University of Lancaster, U.K., Presently at Brookings Institute, 1775 Mass. Avenue, N.W., Washington, D.C. 20036, U.S.A.; Mr. Ronald Stowe, Vice-President, Satellite Business System, 8283 Greensboro Drive, McLean, Va 22101, U.S.A.; Professor Hubert Thierry,

*Participants were present in their personal capacity only.

Deputy Director, United Nations Institute for Disarmament Research, Palais des Nations, Geneva, Switzerland; Mr. Edward W. Ploman, Vice-Rector, Global Learning Division, The United Nations University, 2-15-1 Shibuya, Shibuya-ku, Tokyo, Japan.

Edward W. Ploman
Vice-Rector, Global Learning
Division, The United Nations University

(b) Short Accounts

5. Session on Policy, Strategy, and Legal Aspects of Space, Colorado Springs, August 4, 1983

A session on "Policy, Strategy and Legal Aspects of Space" was held on August, 4 1983 during the 1983 Symposium on Military Space Communications and Operations in Colorado Springs, Colorado. The Symposium was jointly sponsored by the United States Air Force Academy and the Air Forces Communication Electronics Association. The intent of the symposium was to provide a forum where the military and industry could gather to discuss the latest developments emerging in military space communications and operations.

The session on "Policy, Strategy and Legal Aspects of Space" was chaired by Colonel Robert B. Giffen, head of the U.S. Air Force Academy's Astronautics Department. The key paper, "Peaceful Use and Self Defense in Outer Space" was presented by Lieutenant Colonel A. Jerry Butler, Office of the Judge Advocate General, International Law Division, Headquarters, U.S. Air Force. Lt. Col. Butler's presentation concerned international legal restrictions on the military use of outer space. Subsequent discussion turned to a comparison, in terms of application and fragility, between treaties negotiated by individual states and treaties negotiated through the United Nations.

Copies of the Symposium Proceedings can be ordered from USAFA/DFEE, United States Air Force Academy, Colorado Springs, Colorado 80840.

Steven J. Sloboda
Major, USAF

6. Legal Symposium Panel on Space Telecommunications Issues, International Telecommunication Union Forum 83, Geneva, Oct. 18, 1983

On October 28, 1983 the International Telecommunication Union (ITU) convened in Geneva a panel on space telecommunications legal issues as part of its Forum 83 Symposium, a week-long educational program attended by several hundred policy makers, engineers, economists and attorneys from throughout the world. The Symposium occurred in conjunction with the ITU's fourth quadrennial Telecom Exhibition.

A Legal Session of the Forum 83 Symposium was chaired by Mr. Michael Goldey of AT&T and was introduced by the *Honorable F. Molina Negro*, Chairman of the ITU Administrative Council. Mr. A. M. Rutkowski, International Advisor to the Chief Scientist of the U.S. Federal Communications Commission, organized and moderated the panel within this session that concentrated on questions of space telecommunications law. Major issues addressed by this panel were equitable access to the geostationary orbit and the

roles of international organizations such as Intelsat, Intersputnik, Eutelsat, Arabsat and Inmarsat.

The first panelist was *Mrs. L. Garcia de Davis*, Costa Rica's leading communications lawyer and the chairperson of her country's WARC-79 delegation. *Mrs. Davis* emphasized that developing countries in particular feel "the urgency of a legal system to ensure that countries or groups of countries may have equitable access to both radio frequencies and geostationary satellite orbit as stated by Article 33 of the ITU Convention after the Nairobi Plenipotentiary." She presented a comprehensive description of the socio-technical factors underlying this sentiment and concluded, with considerable eloquence, that because "the developed world has the knowledge and we have the votes, we should work together to find flexible regulations that blend the need for profit which will encourage technological development with the need for equitable access to frequency bands and to geostationary satellite orbital positions."

Speaking next were *Messrs. Charles Morrow* and *David Leive*, Legal Advisers to Eutelsat and Intelsat, respectively. *Mr. Morrow* described the Eutelsat Agreement as well as the economic coordination process—required under Article XIV(d) of the Intelsat Agreement—that had recently been concluded. *Mr. Morrow* expressed some concern that Intelsat had coordinated Eutelsat's digital business services between European countries only through 1988. This was done because Intelsat is still assessing its role as a provider of digital business services and thus could not definitively determine for a longer period that Eutelsat posed no potential for economic harm. *Mr. Leive* highlighted the importance of economic coordination to the continued viability of the Intelsat global system and to, in particular, Intelsat's ability to provide reasonably priced service to developing countries. He also noted the important role Intelsat plays in making efficient and economic use of the geostationary orbit. Intelsat foresees providing domestic satellite service to dozens of countries during the 1980's and this is an important means of meeting the ITU's mandate to provide equitable access to all countries to the geostationary satellite orbit and space service frequency bands.

The panel also included *Messrs. R. Naslund*, Head of Sweden's International Telecommunications Cooperation Office and *Mr. C. Jansen van Rosendaal*, Director of Information Markets for the Commission of the European Communities. *Mr. Naslund* provided the audience with an instructive overview of Sweden's space communications activities, including new concepts for a direct broadcast satellite service. *Mr. Rosendaal* expressed considerable consternation over the fact that the information market is not growing at the rate that it should in Europe and that, if nothing is done soon, it will fall increasingly behind its two major competitors—the U.S. and Japan. He attributed this problem to the diversity of perspectives in Europe regarding liberalization or "deregulation" policies; the solution lies in greater cooperation and recognition of the importance of telecommunications.

Mr. Rothblatt, an attorney in private practice in Washington D.C., concluded the formal presentations by speaking to the question of whether the current regulatory framework for space communications is capable of keeping up with the rate at which the technology of space communications is evolving. He noted that definitional distinctions important for space law purposes, such as broadcasting as opposed to fixed satellite service, are being blurred into substantive irrelevance by recent technological advances. He also noted that the periodicity of international conferences charged with organizing cooperative international use of the geostationary orbit is substantially less than the periodicity of generational advances in satellite technology. Accordingly, he contended, the treaties which result from international space communications conferences become quickly outmoded and thereby constrain equitable access to the geostationary orbit. One remedy according to *Mr. Rothblatt* is to state the rules relating to the cooperative international use the

geostationary orbit as CCIR Recommendations (which can be changed every four years) rather than as ITU Radio Regulations (which can be changed only at major conferences held more than a decade apart and which must be ratified by each country).

Mr. Rutkowski moderated a question and answer period after the formal presentations. *Mr. Molina Negro* opined that criticisms of the ITU for not making orbital position and other related provisions for international organizations such as Intelsat were not well-founded. He noted that these international organizations operate only through the concurrence of their member states, each of which is a member of the ITU, and that the ITU can assign orbital positions only to national administrations. *Mr. Leive* was asked whether it was still appropriate for Intelsat to enjoy a monopoly status as a provider of international satellite service. He replied that it is a basic misconception that Intelsat is a monopoly concerned only with maintaining high charges. Instead *Mr. Leive* observed that "the single global system is not a monopoly but an unusual concept, freely agreed to by its members, and deliberately designed to make international satellite communications services available on an efficient, economic and non-discriminatory basis to all countries. Monopolies usually raise charges: Intelsat has consistently lowered its charges so that the 1983 charges are about 1/18 of the 1965 charges, allowing for inflation.

Mr. Rutkowski concluded the session by thanking all participants and the International Telecommunication Union. He expressed special gratitude to Secretary General *Richard Butler* for his personal support for Forum 83. *Mr. Rutkowski* noted that a common theme emanating from his panel is that "if the law of international organizations is to continue to be useful in the 1980's and beyond, it must accomodate ever more rapidly to changing conditions; the central problem is to provide for flexibility and adaptation to an exponentially changing environment." This is a theme space lawyers have grappled with for many years. The challenge it provides fills space and other high technology law fields with fascinating dilemmas for both recent graduates and experienced practitioners.

Martin A. Rothblatt
Attorney-at-Law
Washington, D.C.

7. Program on "Space Law and Practice," Association of American Law Schools, San Francisco, January 5, 1983

The Aviation and Space Law section of the Association of American Law Schools sponsored a program on "Space Law and Practice" at the annual meeting of the Association in San Francisco January 5, 1983. A cross-section of attorneys presented the status today and their views on the future of the practice of space law.

The program was organized and chaired by Professor *Stephen Gorove* of the University of Mississippi Law Center. Presentations based on their own experiences as space law practitioners were made by: *Daniel E. Cassidy*, vice president and director of Marsh & McLennan of Washington, D.C., who discussed insurance aspects of space law practice; *John A. Cavanagh*, Senior Vice President and General Counsel of Lockheed Corp., who touched upon the relevant role of a corporate legal executive, *Art Dula*, an attorney in private practice in Houston who related a private practitioner's view; *S. Neil Hosenball*, general counsel for NASA in Washington, D.C., and *Gerald J. Mossinghoff*, commissioner of Patents and Trademarks in Washington, D.C., who discussed their roles as government

attorneys in the practice of space law; and *Martin A. Rothblatt*, a Washington, D.C., private practitioner whose presentation centered on space law practice as it relates to the developing area of space communications.

Stephen Gorove
Chairman, Aviation and Space Law Section,
Association of American Law Schools

*8. Toledo International Law Society Symposium on "Arms Control in Outer Space,"
February 18, 1984*

The International Law Society of the University of Toledo College of Law presented a symposium on "Arms Control in Outer Space," in Toledo, Ohio, on February 18, 1984. The program was divided into three sessions. The principal speakers at the first session were *Stephen Gorove*, Professor of Law, University of Mississippi, who provided legal-institutional background in a talk entitled "The 1967 Outer Space Treaty and the 1979 Moon Treaty: Interpretations and Ramifications." *David Williamson, Jr.*, Senior Fellow in Science and Technology Policy, Center for Strategic and International Studies, Georgetown University, spoke and answered questions on "Present and Future Space Weaponry Capabilities of the United States and the Soviet Union: Implications for National and International Security."

Eugeniy Kochetkov, Counselor and Head of the Disarmament Section, Embassy of the Soviet Union in Washington, and *Olivier de la Baume*, Counselor, French Mission to the United Nations, presented their respective country's positions at the second session. *Mr. Kochetkov's* discussion of the Soviet proposal to ban conventional and nuclear weaponry in outer space stimulated a very active debate among the participants.

President *Reagan's* High Frontier Defense Strategy was debated in the final substantive session of the symposium by *William E. Furniss*, Special Assistant to the Assistant Secretary of Defense for International Security Policy, and *Alan B. Sherr*, President, Lawyers' Alliance for Nuclear Arms Control.

The papers presented at the symposium will be published in the *University of Toledo Law Review*, vol. 15, no. 4 (summer 1984). Copies can be ordered from the Law Review, University of Toledo College of Law, Toledo, Ohio 43606, for \$3.50 per issue. The program was organized with the assistance of *John A. Ghazoul*, a student of the College of Law and President of the International Law Society. It was supported by grants from the Dana Fund for International and Comparative Legal Studies and the Dana Corporation Foundation.

Richard W. Edwards, Jr.
Professor of Law, University of Toledo

9. Program on "Commercialization of Space: Incentives, Impediments and Alternatives," American Society of International Law, Washington, D.C., April 11-14, 1984

A program on "Commercialization of Space: Incentives, Impediments and Alternatives" was held April 13, 1984 in Washington, D.C., during the annual meeting of the American Society of International Law and cosponsored by the Association of United States Members of the International Institute of Space Law, International Astronautical Federation. Presentations by program panelists centered on existing regulations and treaties

regarding the commercialization of space, proposed and expected changes and how they might help facilitate or impede the development of commerce in space internationally and among United States firms.

The program was organized and chaired by Professor *Stephen Gorove*, of the University of Mississippi Law Center. Panelists from the governmental sector included: *L. J. Evans*, Director of NASA's Commercialization Task Force, *S. Neil Hosenball*, General Counsel for NASA, *Harry R. Marshall Jr.*, Principal Deputy Assistant Secretary of the Bureau of Oceans and International Environmental and Scientific Affairs of the Department of State and *Jeffrey N. Shane*, Deputy Assistant Secretary for Policy and International Affairs of the Department of Transportation in Washington, D.C. Panelists from the private sector were: *James R. Myers*, attorney in private practice with Andrews and Kurth in Washington, D.C. and *Robert I. Newman*, general counsel, and *James T. Rose*, director, Earth Observation Systems, of McDonnell-Douglas Aerospace Company of St. Louis, Mo. *Edward R. Finch, Jr.* Attorney at Law, New York City was commentator and *Katherine M. Gorove*, a law student at Columbia University, served as rapporteur.

The program drew a large audience and evoked a number of questions and discussions.

The Session on "Commercialization of Space" was recorded and the tapes may be ordered through the American Society of International Law, 2223 Massachusetts Ave., N.W., Washington, D.C. 20008. The presentations and discussions are also expected to be published in the annual Proceedings of the American Society of International Law.

Stephen Gorove
Session Chairman, American Society
of International Law
1984 Annual Meeting

*10. Symposium on Military and Commercial Aspects of the Uses of Outer Space,
May 9-10, Colorado Springs*

The Association of U.S. Members of the International Institute of Space Law and the American Bar Association, Aerospace Law Committee, International Law Practice Section co-sponsored a conference on the future commercial and military uses of space on 9-10 May 1984 in Colorado Springs, Colorado.

Speakers in the commercial area included *Art Dula*, Attorney at Law, Houston, TX; *John O'Brien*, Deputy General Counsel, NASA; *Peter D. Nesgos*, Johnson & Higgins, New York, NY; *Eilene M. Galloway*, Honorary Director, IISL, Washington, D.C.; *Edward R. Finch, Jr.*, Finch and Schaefer, New York, NY; and *Jay Steptoe*, Office of the General Counsel, Department of Transportation, Washington, D.C.

Military presentations were made by Brigadier General *Earl S. VanInwegen*, Deputy Chief of Staff for Intelligence, HQ Space Command; Colonel *William E. McGarrity*, Director of Space Operations, HQ North American Aerospace Defense Command; John Darrah, Senior Scientist, HQ Space Command; and Lieutenant Colonel *George Gibson*, Deputy Chief, Commander's Group, HQ Space Command.

Moderators were Brigadier General *Martin Menter* (USAF, ret.), Washington, D.C., Colonel *William B. Wirin* and Professor *Stephen Gorove* of the University of Mississippi Law Center.

There was a good interchange and exchange of information between the military operators and commercial attendees. The need for better coordination between commercial users and military operators was a primary goal of the Symposium. All in all, it was a very successful Symposium.

William B. Wirin
Colonel, USAF
Staff Judge Advocate

11. *FBA Session on Government Contracts and Space Commercialization*, New Orleans, Louisiana, May 11, 1984

As a part of the program of the Federal Bar Association, at its 1984 Mid-Year Meeting in New Orleans, the Association's Section on Government Contracts presented a panel discussion on the topic of government contracts and the commercialization of space activities. The program was one of the earliest, if not the first, presentation and analysis of space commercialization as facilitated and governed by the law and practices of the United States pertaining to government contracts.

The panel included representatives of the United States Government, American corporations entering into and engaged in space activities and the academic community. The moderator was *Chester D. Taylor, Jr.*, a partner in the Washington, D.C. law firm of Hogan & Hartson.

Professor *Stephen Gorove*, of the University of Mississippi Law Center, set the stage for the panel that followed with a presentation on issues and policies in the commercialization of space activities. *Richard L. Dunn*, Senior Attorney in the Office of General Counsel, National Aeronautics and Space Administration, followed Dr. Gorove with a review of contractual arrangements between NASA and United States companies in early space programs. *James R. Myers*, associated with the Washington, D.C. law firm of Andrews, & Kurth, discussed current NASA contracting methods and documents from the standpoint of counsel for the space entrepreneur. The viewpoint of a non-aerospace company, newly committed to activities in space, was presented by *Merritt R. Marquardt*, Associate Counsel, Minnesota Mining and Manufacturing Company (3M). The panel also included *Robert I. Ross*, a Senior Attorney in the Office of the General Counsel, United States Department of Transportation, who concluded the program by a discussion of the Department of Transportation's efforts to commercialize the operation of expendable launch vehicles.

The written materials utilized in the program are available from the Federal Bar Association, 1815 H Street, N.W., Washington, D.C. 20005 for \$20. (\$15 for members).

Chester D. Taylor, Jr.
Partner, Hogan & Hartson
Washington, D.C.

12. *Program on "Space Activities of Developing Nations: Overcoming the Barriers"*, International Centre, Vienna, June 14, 1984

The Association of the United States Members of the International Institute of Space Law (IISL) under the auspices of the International Astronautical Federation (IAF) sponsored a program on "Space Activities of Developing Nations: Overcoming the Barriers" in the International Centre of Vienna, June 14, 1984 for attendees of the UNCOPUOS session.

The program was organized and introduced by Professor *Stephen Gorove* of the University of Mississippi Law Center who acted as moderator. In his introduction he conveyed the good wishes of IAF President, *Roger Chevalier*, and IISL President, Professor *I.H.Ph.Diederiks-Verschoor*, for a successful program and stressed the growing importance of the subject matter which centered on the crucial question raised by UNISPACE 82, namely, how the developing nations should engage in and maximize the benefits from space activities and, at the same time, minimize any harmful effects. Within this broad framework the first speaker *Mr. K. S. Karnik*, Director of the Development and Educational Communication Unit of the Space Applications Centre, ISRO, addressed India's participation in space activities and its achievements especially in relation to satellite instructional television experiments. He was followed by *Dr. Johannes Ortner*, Director of the Austrian Solar and Space Agency, who spoke on the useful role played by the Committee on Space Research (COSPAR) in providing assistance to developing nations. The last speaker, *Dr. R. Sunaryo*, Head of the National Institute of Aeronautics and Space (LAPAN) of Indonesia pointed out the crucial contribution that the use of space technology has made in Indonesia to the field of telecommunications. All three speakers pointed to several ways in which developing nations may take advantage of space technological developments without incurring great financial burden. The program was well received by UNCOPUOS delegates, evoking many pertinent questions and answers.

Stephen Gorove
President, Ass'n of the
U.S. Members of the IISL

13. Other Events

A symposium on space industrialization was sponsored by the Mississippi-Alabama Section of the American Institute of Aeronautics and Astronautics, the University of Alabama and the NASA Marshall Space Flight Center on February 12-15, 1984 in Huntsville, Ala. Apart from scientific topics of space communications and materials processing, there was a session on the policy, legal and economic aspects of space commercialization, including NASA's policy (*P.E. Culbertson*), non-U.S. approaches (*P.G. Smith*), legal considerations and cooperative opportunities (*S.N. Hosenball*), economic and financial issues (*J. Egan*) and the American perspective (*Dr. V. Reis*).

The Forum Committee on Air and Space Law of the American Bar Association held a series of sessions, and a Cape Canaveral tour, in Orlando, Fla., on February 23-25, 1984. Among the presentations were many on diverse space law themes, including the meaning of space commercialization to lawyers (*Edward R. Finch, Jr.*), the roles of NASA and private enterprise (*S. N. Hosenball* and *G. J. Kovach*), the allocation of liability for space mishaps (*Prof. Stephen Gorove*), insuring space ventures (*R. F. Stowe*), contracting problems (*P. Visser*), legal implications of remote sensing (*D. J. Burnett* and *F. B. Henderson III*) and legal issues facing the space commercialization entrepreneur (*J. R. Myers*). General chairman was *William F. Maready*.

The American Society of International Law held a regional conference on "The Industrialization of Space: The New Frontier on the Horizon" on March 24, 1984 at the University of Bridgeport (Conn.) School of Law. Moderator for the session was *Prof. Myres S. McDougal* of Yale Law School and New York Law School. Presentations were made on the legal implications of remote sensing (*Prof. Ivan A. Vlasic*), space stations (*Delbert D. Smith*), issues of responsibility and liability (*Prof. Stephen Gorove*), regulation of private space transportation (*J. C. Bennett*), business opportunities (*L. H. Hemmerdinger*), space as the new world (*K. E. Drexler*) and DBS (*S. M. Lopatkiewicz*).

Bankers, venture capitalists, aerospace executives, engineers, entrepreneurs, lawyers and accountants were assembled in Arlington, Va., March 26-27, 1984 for a conference entitled "Financing Business in Space." Panel discussion topics were federal policy in stimulating space commerce, financing options, insurance and regulation, corporate planning, capital formation and perspectives of the investment community.

The Space Contracts Institute hosted a conference on NASA's new Space Station Initiative April 26-27, 1984 in Washington, D.C. Sessions centered on contracting with NASA, regulatory issues, insurance, financing alternatives and space station applications.

"Aerospace 1984: Policies and Programs in Space, Civil Aviation and National Defense" was the theme of the annual meeting of the American Institute of Aeronautics and Astronautics in Washington, D.C. on May 1-3, 1984. Among sessions were panel presentations and discussions of aerospace law generally (*Delbert D. Smith*, chairman: *W. D. English*, *S. N. Hosenball*, *S. M. Lopatkiewicz* and *G. J. Mossinghoff*), space applications and commercialization (*A. Wheelon*, chairman: *W. Wood*, *J. McElroy* and *C. Helms*), and international competition and cooperation (*J. Swihart*, chairman: *R. Boffaccio* and *K. Hasegawa*). There were also sessions on commercial technology transfer (*J. M. Logsdon*, chairman) and aerospace education issues (*J. L. Kerrebrock*, chairman). *D. S. Lewis*, chairman and chief executive officer of General Dynamics Corp. was general chairman of the annual meeting.

BizNet and the National Chamber Foundation sponsored a national videoconference on June 7, 1984, which originated live via satellite from studios at the U.S. Chamber of Commerce in Washington, D.C. The presentations dealt with the financing of space enterprise, the promotional role of government and a discussion on how to succeed in space.

14. Brief News

The second operational launch of the Ariane satellite launch vehicle on June 16, 1983 was a complete success as two telecommunications satellites were placed into orbit. . . The Department of Transportation has been designated as the lead agency to oversee commercial space vehicle launchings. . . Reportedly the FCC will soon consider whether to streamline regulations governing DOMSAT resellers and carriers, and other common carriers. . . In his latest State of the Union address, President Reagan indicated that a permanently-manned space station should be developed within the next decade. . . Two American astronauts were the first to ever become "human satellites" and venture into space without a lifeline during Challenger's mission in February, 1984.

B. Forthcoming Events

The 1984 IISL Colloquium will be held in Lausanne, Switzerland; October 8-13, 1984, during the IAF Congress, the theme of which will be "Space Benefits For All Nations." The Colloquium subjects to be discussed in four sessions include a newly added category listed under 4, and are the following: 1. Space Law and Domestic Law; 2a. Space Activities and Intellectual Property Including Industrial Property; 2b. Nuclear Power Sources in Outer Space; 3. Legal Aspects of Large Space Structures; 4. Conditions Essential for Maintaining Outer Space for Peaceful Uses.

The 1985 Colloquium will be held in Stockholm (Sweden) from 7-13 October 1985. Already proposed topics are: 1. Law of Outer Space and Law of the Sea Analogies; and 2. Registration (or International Registration) of Space Objects.

Vedecko-technická revolúcia, mierové spoluzitíe a medzinárodné právo (Scientific and Technological Revolution, Peaceful Co-existence and International Law), by Ján Azud (Veda, the publishing house of the Slovak Academy of Sciences, Bratislava, 1983), pp. 324.

Though many essays on different aspects of this topic have been published in recent years the reviewed book of Professor Ján Azud, who is head of the international law division in the Institute of Law of the Slovak Academy of Sciences located in Bratislava, Czechoslovakia, is different: its author attempts to grasp this exciting subject as a whole and to explore it in correlation with major problems of our times. As he emphasizes at the very beginning of his work, the scientific and technological revolution (STR) is a worldwide process having an impact on internal and external policies of states, their international positions and the whole system of present international relations. These relations develop under the conditions of peaceful co-existence between states belonging to different social, economic and political systems but, at the same time, the results of STR can serve the interests of the whole international community and the well-being of mankind.

While the correlations of peaceful co-existence and STR are dealt with in greater detail in the first part of the book, its second part concentrates on the impact of STR on international law. As the author correctly observes, the influence of scientific and technological progress on international law will become obvious if we compare the multilateral treaties existing before the start of STR with those concluded during this process. While in the 19th century international agreements were dealing mostly with territorial issues, problems of neutrality, recognition of states, rules and customs of war, etc., in the 20th century an ever growing number of treaties have arisen from the need to govern mutual relations of states connected to their uses of recent achievements of science and technology (*cf.* p. 168). The author explores how the content of international law of our times has been enriched and to what degree its effectiveness has been strengthened by these formidable achievements. On the other hand, he detects that the present development of international law aids the advance of science and technology by protecting their achievements against misuse. This conclusion is evidenced in several spheres of present international law to which specific chapters of the book are devoted in which the author deals with the emergence of disarmament and nuclear law, space law, law of the sea, environmental law and integration law.

From among these subjects those concerning the law governing the exploration and uses of outer space are within the terms of reference of this journal and chapters II and III of the second part of the reviewed book are particularly dedicated to them. Professor Azud discusses first some fundamental problems of space law, such as conditions and needs for legal regulation of outer space. He attaches great significance to the principle of international cooperation in the exploration and peaceful uses of outer space as reflected in relevant international instruments drafted under the aegis of the United Nations. When considering the notion "peaceful uses of outer space," he observes that the existing space technology does not enable us to draw an easy and sharp distinction between "military" and "non-military," "peaceful" and "non-peaceful," "scientific" and "non-scientific" activities in space. Most of the present space objects may fulfill different functions and it is also difficult to ascertain what kind of activities a space object is performing. The proper way of solving this problem can be found only through the development of international cooperation, and international agreements of a universal character offering appropriate means on how to ensure the peaceful uses of outer space. In this respect,

the author recalls the interrelationship between the development of principles and norms governing activities in outer space and the efforts to elaborate principles and norms governing friendly relations among states, which should, also apply to outer space. He concludes this analysis by saying that while Article IV of the 1967 Outer Space Treaty reflects a compromise concerning the peaceful uses of outer space, a strict interpretation of Article 2, para. 4 of the United Nations Charter forbids military uses of outer space because this type of space activity represents a permanent threat to peace and contravenes the purposes of the Charter, and the principles of international law in general (*cf.* pp. 210-211).

Special attention is paid by the author to the problems of exploration and future uses of the moon and other celestial bodies in the light of the 1979 Moon Agreement. In particular, he analyzes the legal status of natural resources of the moon and planets, taking into account Article 11 of the 1979 Agreement. He concludes that this instrument offers a good basis for answering many of the theoretical and practical questions involved, but ensuring the peaceful uses of these vast areas will very much depend on actual practice of states (*cf.* pp. 224-225).

From among the conclusions reached by the author in his analysis the following ones should be recalled as relevant to the law of outer space.

While the creation of new principles and rules of international law often lags behind the emergence and utilization of an invention, outer space represents the field in which legal regulation started almost simultaneously with the first scientific and technological achievements. The legal regulation of space activities offers an example of how the development of a new branch of international law has been initiated by the results of scientific and technological revolution. The sphere of application of international law has thus been significantly enlarged. As a result of negative effects of STR, including some consequences of space activities, environmental protection has become necessary, including that of outer space.

In a certain sense, Professor *Azud's* book represents an essay on key problems of contemporary international law in general, as viewed from the particular standpoint of STR. Special reference is also given in this book to endeavors of socialist countries, including Czechoslovakia, in contributing to the rule of law in new fields of human activities.

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World Communications: A Handbook, edited by George Gerbner and Marsha Siefert (Annenberg/Longman Communication Books, Longman, New York and London, 1984), pp. 527.

This handbook is a compilation of articles which deal with various aspects of world communications. It is "intended to be a guide for governments, corporations, scholars, students, and policy makers." The book is divided into five sections: "Global Perspectives on Information," "Transnational Communications: The Flow of News and Images," "Telecommunications: Satellites and Computers," "Mass Communications: Development Within National Contexts," and "Intergovernmental Systems: Toward International Policies."

The first section contains articles dealing with the policy aspects of international information, the new world information order, and the right to international communication. The second part of the book identifies various types of devices which are being used to convey information. The coverage of news by television, newspapers, and films are all discussed in this section. The transporting of data is the main focus of the third section. The utilization of remote sensing by satellite and direct satellite broadcasting for international communication is explored in the articles in this part of the text. The articles in the fourth section set forth ways communication can be used to effect social and/or political change. The use of satellite instructional television and mass line communication are examples given of ways communication can be used to cause change in a country. The last part of the handbook is comprised of articles (*e.g.*, those of Prof. S. Gorove and N. A. Bowie) which discuss the important issues raised at the 1979 World Administrative Radio Conference, as well as articles on the International Telecommunications Satellite Consortium (INTELSAT), the MacBride Report and the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

In sum, each section of the handbook contains contributions written by experts from various parts of the world. These articles are not heavily footnoted, but they are well-written and often offer unique insights into the problems of world communications. They tend to stress the conception that the Western world can no longer profess to represent the entire world in the communication field. The need for all countries to communicate with each other is a major theme of the book.

Aerospace Law: Telecommunications Satellites, by Nicolas Mateesco Matte. Published in conjunction with the Institute and Centre of Air and Space Law, McGill University (Butterworths, 1982), pp. 354.

This book deals with telecommunications satellites and their role in the aerospace field today. While tension and conflict may be present between the United States and the U.S.S.R. in most space activities, telecommunications by satellite have been marked by international cooperation and success. By implication, if the international community can cooperate in all aerospace endeavors the way it has in the telecommunications projects, then the world will be an easier place to live in.

The author divides his book into eight chapters, dealing with such topics as international cooperation between non-governmental organizations, interaction between inter-governmental bodies, telecommunications satellites and international law, the International Telecommunications Union (ITU), commercial use of satellites, direct broadcast satellites (DBS), and unauthorized distribution of satellite signals.

The last chapter offers a few remarks by the author on the establishment of a world order for coordinating space activities and technology transfers. As an example of the problems facing nations using telecommunications satellites today, the author points to the incident involving the Pioneer II satellite (where the U.S. failed to receive a signal due to the fact that it had forgot to request that the U.S.S.R. turn off a satellite transmitter on the same frequency). A new legal order needs to be established, Matte asserts, to prevent such a problem from happening again.

Of special interest to the space lawyer is the section in the first chapter that deals with the legal implications of satellite regulation. The legal issues presented initially (the satellite signal and property rights, the equitable right to a frequency, etc.) are developed more fully throughout the book, so discussion is by no means limited to a few comments.

The space lawyer will also find this book to have a large appendix, where extracts of a number of major space law documents are reproduced. Included are the Outer Space Treaty, the ITU Convention, agreements for INTELSAT, INTERSPUTNIK, INMARSAT, ARABSAT, and EUTELSAT (interim). While it is unfortunate that the book has no subject index, the volume is a welcome addition to the growing literature in its field.

Space Manufacturing 1983, edited by James D. Burke and April S. Whitt (Advances in the Astronautical Sciences, vol. 53, San Diego, Univelt, 1983), pp. 478.

This book is a compilation of the papers presented at the Sixth Princeton/Space Studies Institute Conference on Space Manufacturing, May 9-12, 1983.

The editors have divided the thirty-seven papers presented into seven subject areas. These subject areas are: biomedical/social sciences, space stations, manufacturing, international/legal considerations, materials processing, asteroids and accelerators, and economics.

Of special interest to space lawyers is the section dealing with "International/Legal Considerations" which *inter alia* contains presentations by *S. Neil Hosenball* on "Space Law: Current Status and Issues," by *Stephen Gorove* on "Major Concerns of Private Enterprise Regarding Recent Developments in Space Law", by *Kenneth S. Pedersen*, "International Aspects of Commercial Space Activities", and by *Martin A. Rothblatt* on "A Legal Charter for Non-governmental Space Industrialization."

The development and the success of the space shuttle lends to the above subjects a sense of urgency and immediate practicality. For though man has the ability to transport himself into space, he must now learn how to most beneficially manipulate this achievement. These papers lay a blueprint for that manipulation.

Space Safety and Rescue 1979-1981, edited by Jeri W. Brown (American Astronautical Society, Science and Technology Series, Vol. 54, San Diego, Univelt, 1983), pp. 439.

This volume is a compilation of selected papers which were presented at the Symposia of the International Academy of Astronautics held in conjunction with the 30th, 31st and 32nd International Astronautical Congresses during a three year period (1979-1981). The papers contain an in-depth study of the problems of maintaining safety in space and a discussion of the ability of the international community to effectively rescue astronauts in emergency situations.

Among the various topics discussed are space debris, nuclear waste disposal in space, space station safety design, satellite alert warning systems, psychological flight training, special considerations in regard to female crewmembers, and protective clothing textile research. Many of the essays, in addition to discussing space safety, also concern the use of space technology to help prevent natural disasters. Of greatest interest to lawyers is the paper by *John T. Stewart* entitled, "Satellite Alert Warning - Catalyst for an International Disaster Response Legal Regime?"

International Space Technical Applications, edited by Andrew Adelman and Peter M. Bainum (American Astronautical Society, Science and Technology Series, Vol. 52, San Diego, Univelt 1981), pp. 176.

This volume is a collection of papers which were presented at the Nineteenth Goddard Memorial Symposium, sponsored by the American Astronautical Society in March, 1981. Separated into nine categories, the papers cover such areas as Industry in Space, Communications, Weather and Climate, and Space Based Earth Science Applications. Each paper offers a prospective view of recent technological developments and relates them to the advent of an operational space transportation system in the future.

The Introduction sets the tone for the volume by discussing the Global 2000 Report and its implications for the area of space science. With this framework in mind, one paper considers the demand and capacity of U.S. domestic communications satellites to the year 2000. Other papers follow this lead, by discussing the future in terms of the role of satellite remote sensing in climate, and in terms of private sector involvement with space transportation. In regard to the latter subject, one essay on Space Transportation in the Private Sector discusses the legal issues which must be considered prior to such investment.

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 1983, Budapest, Hungary (Am. Inst. of Aeronautics and Astronautics, New York,
 N.Y., 1984). Included in the proceedings are:

<i>IISL Board of Directors, Members of the Board, and Honorary Directors</i>	vii
<i>Introduction</i>	
Professor Dr. I. H. Ph. Diederiks-Verschoor	ix

Telecommunications and the Geostationary Orbit

<i>The Jus Cogens Principle and International Space Law</i>	
Carl Q. Christol	1
<i>The Magna Charta of Outer Space</i>	
Edward R. Finch	11
<i>Principles of Equity in International Space Law</i>	
Stephen Gorove	17
<i>The Principle of Non-Appropriation of Outer Space and the Geostationary Satellite Orbit</i>	
Ram S. Jakhu	21
<i>The Geostationary Orbit: A Limited Natural Resource or a Precious Part of Outer Space</i>	
Vladimir Kopal	27
<i>Telecommunications and the Geostationary Orbit: The Missing Regulation</i>	
Lubos Perek	33
<i>Criteria of Equitable Access to Geostationary Orbit and Frequency Spectrum</i>	
Subrata K. Sarkar	39
<i>The Growing Momentum of Satellite Broadcasting and the Geostationary Orbit</i>	
Maureen Williams	45
<i>Applicability of International Law to Telecommunication Satellites in Geostationary Orbit and the Interest of the Developing Countries</i>	
Charles C. Okolie	49
<i>Space Telecommunications—Issues and Policies: Role of the United Nations</i>	
N. Jasentuliyana	59
<i>Freedom of Space Activities and Telecommunications from the Geostationary Orbit</i>	
I. Szilágyi	63

Interrelationship Between Air and Space Law

<i>Return of Reusable Manned Space Vehicles to Earth: Legal Aspects</i>	
Vitaliy D. Bordunov	67
<i>The Boundary Between Air Space and Outer Space in Modern International Law; Delimitation on the Basis of Customary Law</i>	
Gennady M. Danilenko	71
<i>Fundamental Links and Conflicts Between Legal Rules of Air and Space Flights</i>	
G. Gál	77
<i>Some Aspects of the Spacial and Functional Delimitation Between International Air and Space Law</i>	
Emil Konstantinov	81
<i>Interrelation Between German Air Law and Space Regarding the Passage of Spacecraft Through National Air Space</i>	
Jurgen E. Reifarth	89

<i>Some Thoughts on the Distinction Between Air Space and Outer Space</i>	
Stanley B. Rosenfield	93
<i>Air-Crew and Space-Crew—A Modest Analysis of Analogies from Air and Space Law Rules</i>	
J. Szabó	97
<i>The Importance of the Delimitation for Air and Space Law</i>	
Era Vassilevskaya	101

Responsibility for Space Activities

<i>The Space Activities from the Viewpoint of General Rules of State Responsibility</i>	
J. Bruhacs	105
<i>Responsibility for Space Activities</i>	
I. H. Ph. Diederiks-Verschoor	111
<i>The "Intercosmos" Program: On the Problem of the Representation in International Organizations</i>	
E. Kamenetskaya	117
<i>Legal Responsibilities for Outer Space Activities</i>	
Martin Menter	121
<i>Catch That Falling Star: State Responsibility and the Media in the Demise of Space Objects</i>	
Amanda L. Moore and Jerry V. Leaphart	129
<i>State Jurisdiction and Control in Outer Space</i>	
Martin A. Rothblatt	135
<i>Problems of State Responsibility in International Space Law</i>	
H. L. van Traa-Engelman	139
<i>The Law Applicable to the Use of Space for Commercial Activities</i>	
S. Neil Hosenball	143
<i>U.S. Private Enterprise Enters the Space Arena—The Beginning</i>	
John T. Stewart Jr.	149
<i>From Full Compensation to Total Responsibility</i>	
Aldo Armando Cocca	157
<i>Intellectual Property and Space Activities</i>	
R. Oosterlinck	161
<i>Legal Status of Astronauts and Other Personnel on the Moon</i>	
Ryszard Hara	165
<i>Obligations of States in the Corpus Juris Spatialis: Fathoming Uncharted Waters</i>	
Patricia M. Sterns and Leslie I. Tennen	169

Legal Aspects of International Cooperation in Space

<i>Convention on the Settlement of Space Law Disputes</i>	
Karl-Heinz Böckstiegel	179
<i>Theoretical Problems of the International Cooperation in Space Exploration and Uses of Outer Space</i>	
H. Bokor-Szegö	191
<i>EMETSAT—A New European Space Organization for Cooperation in the Field of Meteorology</i>	
M. G. Bourély	195
<i>Legal Aspects of International Cooperation in Space: Area and Functional Concepts in Defining Outer Space</i>	
Eilene Galloway	197

<i>Non-Use of Force in Outer Space</i>	
Youri M. Kolossov	205
<i>Contribution of "Intercosmos" Cooperation to the Progressive Development of International Space Law</i>	
K. Kótai	211
<i>Space Technology: From National Development to International Cooperation</i>	
Valnora Leister	217
<i>How To Avoid the Militarization of Outer Space?</i>	
Pompeo Magno	221
<i>The Orbit/Spectrum Resources and Regime As Collective Goods: Perspective for Cooperation</i>	
Larry F. Martinez	225
<i>International Cooperation—A Legal Obligation in the Law of Outer Space?</i>	
M. Miklódy	231
<i>The Legal Character of the "Intercosmos" Programme</i>	
B. Nagy	235
<i>Some Remarks on the Patent Law Aspects of Space Exploration</i>	
E. Parragh	243
<i>Basic Principles of International Cooperation in the Peaceful Uses of Outer Space</i>	
He Qizhi	251
<i>Legal Aspects of International Cooperation in Space</i>	
Hassan Safavi	255
<i>Remote Sensing Systems—The International Dimension</i>	
Olivier de Saint Lager	259
<i>Space Activities of "Nongovernmental Entities": Issues of International and Domestic Law</i>	
V. S. Vereshchetin	261
<i>Search and Rescue Satellite Aided System (COSPAS—SARAT System)</i>	
G. P. Zhukov	267
<i>Toward Shared Interpretations of the Critical Policy Dimensions of Space Law</i>	
Harry H. Almond Jr.	271
<i>NASA: Twenty-Five Years of International Cooperation</i>	
Burton I. Edelson, Helen S. Kupperman, and Kenneth S. Pedersen	287
<i>Suggestions About the Institutional Improvement of International Cooperation in Space</i>	
Andrzej Gorbiel	291
<i>International Cooperation and Orbital Manned Space Stations</i>	
Hamilton DeSaussure	295
<i>International Cooperation in Space: An Uruguayan Point of View</i>	
Eduardo D. Gaggero	303
<i>Aspects of the New Soviet Initiative for Concluding an Agreement on the Nonuse of Force in Outer Space and from Outer Space to Earth</i>	
Christo Karakashev	307
<i>The People of the USA and the USSR Must Work Together to Establish Space Industry</i>	
Arthur M. Dula	309
<i>Roundtable Discussion</i>	327
<i>Addendum</i>	333

<i>The State of Space in the Year 2000</i>	
George E. Mueller	335
<i>Space Law Problems at the Turn of the Century</i>	
Karl-Heinz Böckstiegel	339
<i>Space Law Problems at the Turn of the Century: An Overview of Some Warning Trends in Public International Law</i>	
Bozidar Bakotic	343
Statutes of the IISL	349

REQUEST FOR THE INCLUSION OF A SUPPLEMENTARY ITEM
IN THE AGENDA OF THE THIRTY-EIGHTH SESSION*

CONCLUSION OF A TREATY ON THE PROHIBITION OF THE USE OF FORCE IN
OUTER SPACE AND FROM SPACE AGAINST THE EARTH

Letter dated 19 August 1983 from the First Vice-Chairman of
the Council of Ministers of the Union of Soviet Socialist
Republics, Minister for Foreign Affairs of the USSR,
to the Secretary-General

The Soviet Union requests the inclusion in the agenda of the thirty-eighth session of the General Assembly of an item entitled "Conclusion of a treaty on the prohibition of the use of force in outer space and from space against the Earth".

In proposing this item, the Soviet Union is seeking to avoid the militarization of outer space. Of particular danger in this respect are the plans to create and deploy various space-weapons systems capable of destroying targets both in space and on the Earth.

The Soviet Union considers it most imperative to have a reliable means of counteracting these plans to make space a source of mortal danger to all mankind, by taking urgent and effective measures to prevent the arms race from spreading to outer space, which it has not yet penetrated.

To this end, in 1981 at the United Nations the Soviet Union submitted a proposal concerning the conclusion of a treaty on the prohibition of the stationing of weapons of any kind in outer space. That proposal was approved by the General Assembly. However, for well-known reasons, the drafting of that treaty has not yet actually begun.

But time is running out, and now the Soviet Union is proposing that a further step should be taken forthwith in the form of an agreement on the general prohibition of the use of force both in outer space and from space against the Earth. It is submitting the relevant draft treaty for consideration at the current session.

The most important feature of the draft treaty is the combining of the political-legal obligations of States not to allow the use of force in their relations with each other in space and from space with measures of a material nature aimed at banning the militarization of outer space.

More precisely, the Soviet Union is advocating a complete ban on the testing and deployment in space of any space-based weapon for the destruction of objects on the Earth, in the atmosphere and in outer space.

It is also proposing a radical solution to the question of anti-satellite weapons: the unconditional pledge of States not to create new anti-satellite systems and to destroy any anti-satellite systems that they may already have.

* Reissued for technical reasons. Taken from U.N.G.A. A/38/194 (1983).
For text of an earlier Soviet proposal (Draft Treaty on the Prohibition of the Stationing of Weapons of any kind in Outer Space), see U.N. Doc. A/RES/36/97 (15 Jan. 1982, pp. 3-5), reproduced in 10 J. Space L. 27 ff. (1982).

The parties to the treaty would also undertake to refrain in every way from destroying, damaging, disturbing the normal functioning or changing the flight trajectory of space objects of other States.

In addition, the treaty would ban the testing and use for military, including anti-satellite, purposes of manned spacecraft, which should be used solely to solve scientific, technical and economic problems of various kinds.

Action on the series of far-reaching measures proposed by the Soviet Union would be a major and truly tangible contribution towards the attainment of the goal approved earlier by the United Nations, namely, ensuring that space is used exclusively for peaceful purposes.

I request you to consider this letter as an explanatory memorandum under the rules of procedure of the General Assembly and to circulate it, together with the enclosed draft treaty, as an official document of the General Assembly.

A. GROMYKO
First Vice-Chairman
of the Council of Ministers of the USSR,
Minister for Foreign Affairs of the USSR

ANNEX

TREATY ON THE PROHIBITION OF THE USE OF FORCE IN OUTER SPACE AND FROM SPACE AGAINST THE EARTH

The States Parties to this Treaty,

Guided by the principle whereby Members of the United Nations shall refrain in their international relations from the threat or use of force in any manner inconsistent with the purposes of the United Nations,

Seeking to avert an arms race in outer space and thus to lessen the danger to mankind of the threat of nuclear war,

Desiring to contribute towards attainment of the goal whereby the exploration and utilization of outer space, including the Moon and other celestial bodies, would be carried out exclusively for peaceful purposes,

Have agreed on the following:

Article 1

It is prohibited to resort to the use or threat of force in outer space and the atmosphere and on the Earth through the utilization, as instruments of destruction, of space objects in orbit around the Earth, on celestial bodies or stationed in space in any other manner.

It is further prohibited to resort to the use or threat of force against space objects in orbit around the Earth, on celestial bodies or stationed in outer space in any other manner.

Article 2

In accordance with the provisions of article 1, States Parties to this Treaty undertakes:

1. Not to test or deploy by placing in orbit around the Earth or stationing on celestial bodies or in any other manner any space-based weapons for the destruction of objects on the Earth, in the atmosphere or in outer space.

2. Not to utilize space objects in orbit around the Earth, on celestial bodies or stationed in outer space in any other manner as means to destroy any targets on the Earth, in the atmosphere or in outer space.

3. Not to destroy, damage, disturb the normal functioning or change the flight trajectory of space objects of other States.

4. Not to test or create new anti-satellite systems and to destroy any anti-satellite systems that they may already have.

5. Not to test or use manned spacecraft for military, including anti-satellite, purposes.

Article 3

The State Parties to this Treaty agree not to assist, encourage or induce any State, group of States, international organization or natural or legal person to engage in activities prohibited by this Treaty.

Article 4

1. For the purpose of providing assurance of compliance with the provisions of this Treaty, each State Party shall use the national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.

2. Each State Party undertakes not to interfere with the national technical means of verification of other States Parties operating in accordance with paragraph 1 of this article.

Article 5

1. The States Parties to this Treaty undertake to consult and co-operate with each other in solving any problems that may arise in connection with the objectives of the Treaty or its implementation.

2. Consultations and co-operation as provided in paragraph 1 of this article may also be undertaken by having recourse to appropriate international procedures within the United Nations and in accordance with its Charter. Such recourse may include utilization of the services of the Consultative Committee of States Parties to the Treaty.

3. The Consultative Committee of States Parties to the Treaty shall be convened by the depositary within one month after the receipt of a request from any State Party to this Treaty. Any State Party may nominate a representative to serve on the Committee.

Article 6

Each State Party to this Treaty undertakes to adopt such internal measures as it may deem necessary to fulfil its constitutional requirements in order to prohibit or prevent the carrying out of any activity contrary to the provisions of this Treaty in any place whatever under its jurisdiction or control.

Article 7

Nothing in this Treaty shall affect the rights and obligations of States under the Charter of the United Nations.

Article 8

Any dispute which may arise in connection with the implementation of this Treaty shall be settled exclusively by peaceful means through recourse to the procedures provided for in the Charter of the United Nations.

Article 9

This Treaty shall be of unlimited duration.

Article 10

1. This Treaty shall be open to all States for signature at United Nations Headquarters in New York. Any State which does not sign this treaty before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and accession shall be deposited with the Secretary-General of the United Nations.

3. This Treaty shall enter into force between the States which have deposited instruments of ratification upon the deposit with the Secretary-General of the United Nations of the fifth instrument of ratification, provided that such instruments have been deposited by the Union of Soviet Socialist Republics and the United States of America.

4. For States whose instruments of ratification or accession are deposited after the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Secretary-General of the United Nations shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification or accession, the date of entry into force of this Treaty as well as other notices.

Article 11

This Treaty, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations, who shall send duly certified copies thereof to the Governments of the signatory and acceding States.

II

RESOLUTION ADOPTED BY THE GENERAL ASSEMBLY*

[on the report of the Special Political Committee (A/37/646)]

37/89. International co-operation in the peaceful uses of outer space

The General Assembly,

Recalling its resolution 36/35 of 18 November 1981,

Bearing in mind the fact that twenty-five years have passed since the beginning of international co-operation in the peaceful uses of outer space in the United Nations,

Deeply convinced of the common interest of mankind in promoting the exploration and use of outer space for peaceful purposes and in continuing efforts to extend to all States the benefits derived therefrom, and of the importance of international co-operation in this field, for which the United Nations should continue to provide a focal point,

Reaffirming the importance of international co-operation in developing the rule of law for the advancement and preservation of the exploration and peaceful uses of outer space,

Taking note with satisfaction of the progress achieved in the further development of peaceful space exploration and application as well as in various national and co-operative space projects, which contribute to international co-operation in this field,

Having considered the report of the Committee on the Peaceful Uses of Outer Space on the work of its twenty-fifth session, 1/

1. Endorses the report of the Committee on the Peaceful Uses of Outer Space;
2. Invites States that have not yet become parties to the international treaties governing the use of outer space 2/ to give consideration to ratifying or acceding to those treaties;
3. Takes note with appreciation of the successful conclusion of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, held at Vienna from 9 to 21 August 1982; 3/

* Taken from U.N.G.A. A/RES/37/89 (1983).

1/ Official Records of the General Assembly, Thirty-seventh session, Supplement No. 20 (A/37/20).

2/ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI), annex); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (General Assembly resolution 2345 (XXII), annex); Convention on International Liability for Damage Caused by Space Objects (General Assembly resolution 2777 (XXVI), annex); Convention on Registration of Objects Launched into Outer Space (General Assembly resolution 3235 (XXIX), annex); Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (General Assembly resolution 34/68, annex).

3/ See A/CONF.101/10 and Corr.1 and 2.

4. Notes that the Legal Sub-Committee of the Committee on the Peaceful Uses of Outer Space at its twenty-first session:

(a) Continued its efforts to formulate draft principles relating to the legal implications of remote sensing of the earth from space;

(b) Considered the possibility of supplementing the norms of international law relevant to the use of nuclear power sources in outer space through its working group;

(c) Continued its discussion of matters relating to the definition and/or delimitation of outer space and outer space activities, bearing in mind, inter alia, questions relating to the geostationary orbit;

5. Decides that the Legal Sub-Committee on the Peaceful Uses of Outer Space at its twenty-second session should:

(a) Continue on a priority basis its detailed consideration of the legal implications of remote sensing of the earth from space, with the aim of formulating draft principles relating to remote sensing;

(b) Continue its consideration of:

(i) The possibility of supplementing the norms of international law relevant to the use of nuclear power sources in outer space through its working group;

(ii) Matters relating to the definition and/or delimitation of outer space and outer space activities, bearing in mind, inter alia, questions relating to the geostationary orbit, and devote adequate time for a deeper consideration of this question;

6. Notes that the Scientific and Technical Sub-Committee of the Committee on the Peaceful Uses of Outer Space at its nineteenth session continued:

(a) Its consideration of questions relating to remote sensing of the earth by satellites;

(b) Its consideration of the United Nations Programme on Space Applications and the co-ordination of space activities within the United Nations system;

(c) Its examination of the physical nature and technical attributes of the geostationary orbit;

(d) Its consideration of technical aspects of and safety measures relating to the use of nuclear power sources in outer space;

(e) Its consideration of questions relating to space transportation systems and their implications for future activities in space;

(f) Preparations for the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space in its capacity as Advisory Committee to the Preparatory Committee;

7. Endorses the recommendation of the Committee on the Peaceful Uses of Outer Space that the Scientific and Technical Sub-Committee at its twentieth session should:

(a) Consider the following items on a priority basis:

(i) Consideration of the United Nations Programme on Space Applications and the co-ordination of outer space activities within the United Nations system;

- (ii) Questions relating to remote sensing of the earth by satellites;
- (iii) Use of nuclear power sources in outer space;
- (b) Consider the following items:
 - (i) Questions relating to space transportation systems and their implications for future activities in space;
 - (ii) Examination of the physical nature and technical attributes of the geostationary orbit;

8. Endorses the United Nations Programme on Space Applications for 1983, as proposed to the Committee on the Peaceful Uses of Outer Space by the Expert on Space Applications, 4/ and the recommendations by the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space relating to the Programme; 5/

9. Requests the Committee on the Peaceful Uses of Outer Space, with the benefit of possible advice of both its Sub-Committees in their next sessions, to consider the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, in particular the order of priorities and the carrying out of the studies recommended by the Conference;

10. Expresses its appreciation to all Governments as well as specialized agencies and other international organizations which acted as hosts to, offered fellowships for, or otherwise assisted in the holding of, international training seminars and workshops on space applications, particularly for the benefit of developing countries;

11. Requests the specialized agencies and other international organizations to continue and, where appropriate, enhance their co-operation with the Committee on the Peaceful Uses of Outer Space and to provide it with progress reports on their work relating to the peaceful uses of outer space;

12. Requests the Committee on the Peaceful Uses of Outer Space to continue its work, in accordance with the present resolution and previous resolutions of the General Assembly, to consider, as appropriate, new projects in outer space activities and to submit a report to the Assembly at its thirty-eighth session, including its views on which subjects should be studied in the future.

100th plenary meeting
10 December 1982

4/ A/AC.105/302, sect. III.

5/ A/CONF.101/10 and Corr.1 and 2, paras. 429 and 430.

III.

RESOLUTION ADOPTED BY THE GENERAL ASSEMBLY *

[on the report of the Special Political Committee (A/37/646)]

37/90. Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space

The General Assembly,

Recalling its resolutions 33/16 of 10 November 1978, 34/67 of 5 December 1979, 35/15 of 3 November 1980 and 36/36 of 18 November 1981 concerning the convening as well as the preparation of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, held at Vienna from 9 to 21 August 1982,

Reaffirming the importance of international co-operation in the exploration and peaceful uses of outer space,

Reaffirming the importance of international co-operation in developing the rule of law for the advancement and preservation of the exploration and peaceful uses of outer space,

Gravely concerned at the extension of an arms race into outer space,

Aware of the need to increase the benefits of space technology and its applications and to contribute to an orderly growth of space activities favourable to the socio-economic advancement of mankind, in particular the peoples of developing countries,

Taking into account new developments in space science and technology which are being projected and envisaged in the coming decade as well as the new applications emerging therefrom and their potential benefits and possible implications for national development and international co-operation,

Conscious of the need further to increase the awareness of the general public with regard to space technology and its applications,

Desiring to enhance the effectiveness of the co-ordinating role of the United Nations, which is eminently suited to bring about increased international co-operation and assistance to the developing countries in the field of exploration and peaceful uses of outer space,

Expressing its satisfaction with the successful preparation of the Conference through the Committee on the Peaceful Uses of Outer Space, as the Preparatory Committee, and its Scientific and Technical Sub-Committee, as the Advisory Committee, as well as through the Conference secretariat,

Taking note of the report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, 1/

1. Expresses its appreciation and thanks to the Government and people of Austria for the excellent facilities and generous hospitality provided for the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space;

*Taken from U.N.G.A. A/RES/37/90 (1983).

1/ A/CONF.101/10 and Corr.1 and 2.

2. Endorses the recommendations pertaining to international co-operation in the exploration and peaceful uses of outer space, as contained in the report of the Conference; ^{2/}

3. Invites all Governments to take effective action for the implementation of the recommendations of the Conference;

4. Invites all Member States, in particular those with major space capabilities, to contribute actively to the goal of preventing an arms race in outer space, as an essential condition for the promotion of international co-operation in the exploration and uses of outer space for peaceful purposes;

5. Requests all organs, organizations and bodies of the United Nations system and other intergovernmental organizations which are working in the field of outer space or space-related matters to co-operate in the implementation of the recommendations of the Conference;

6. Takes note of the recommendations of the Conference regarding study projects ^{3/} and invites all specialized agencies and other intergovernmental organizations concerned to contribute within their field of competence to the elaboration of these studies;

7. Decides, upon the recommendations of the Conference, ^{4/} that the United Nations Programme on Space Applications should be directed towards the following objectives:

(a) Promotion of greater exchange of actual experiences with specific applications;

(b) Promotion of greater co-operation in space science and technology between developed and developing countries as well as among developing countries;

(c) Development of a fellowship programme for in-depth training of space technologists and applications specialists, with the help of Member States and relevant international organizations and establishment and regular up-dating of lists containing available fellowships in all States and relevant international organizations;

(d) Organization of regular seminars on advanced space applications and new system developments for managers and leaders of space application and technology development activities as well as seminars for users in specific applications for durations, as appropriate;

(e) Stimulation of the growth of indigenous nuclei and an autonomous technological base, to the extent possible, in space technology in developing countries with the co-operation of other United Nations organizations and/or States Members of the United Nations or members of the specialized agencies;

(f) Dissemination, through panel meetings and seminars, of information on new and advanced technology and applications, with emphasis on their relevance and implications for developing countries;

(g) Provision or arrangements for provision of technical advisory services on space applications projects, upon request by Member States or any of the specialized agencies;

^{2/} Ibid., para 361.

^{3/} Ibid., para. 428.

^{4/} Ibid., para. 430.

8. Decides to establish an International Space Information Service, initially consisting of a directory of sources of information and data services to provide direction upon request to accessible data banks and information sources;

9. Requests the Secretary-General to strengthen the Outer Space Affairs Division of the Secretariat with an appropriate augmentation of technical personnel and decides, upon the recommendation of the Conference, 5/ that all new or expanded activities contained in the present resolution are to be funded mainly through voluntary contributions of States in money or in kind, as well as through the rearrangement of priorities within the next regular budget of the United Nations;

10. Appeals to all Governments to make voluntary contributions, either in money or in kind, towards carrying out the recommendations of the Conference;

11. Approves the recommendations of the Conference regarding the establishment and strengthening of regional mechanisms of co-operation and their promotion and creation through the United Nations system; 6/

12. Emphasizes the need for close co-operation between all United Nations bodies engaging in space or space-related activities, as well as the desirability of close co-operation with international funding agencies and subsidiary bodies, such as the United Nations Development Programme;

13. Requests the Secretary-General to assure the availability and appropriate dissemination of the report of the Conference;

14. Further requests the Secretary-General to report to the General Assembly at its thirty-eighth session on the implementation of the present resolution.

100th plenary meeting
10 December 1982

5/ Ibid., para. 423.

6/ Ibid., para. 353.