1

History, the Treaties, the Resolutions

Sergio MARCHISIO
Sapienza University of Rome, Italy

1.1. Notion and evolution of international space law

International space law can be described as the special branch of international law that governs human activities in outer space, including the Moon and other celestial bodies (Kerrest 2007). It comprises, much like international law at large, a variety of international agreements, treaties, conventions and United Nations (UN) General Assembly (GA) resolutions, as well as rules of customary international law. The term "international space law" is most often associated with the rules and principles contained in the five international treaties and five sets of declarations of principles on space matters, which have been developed since the 1960s under the auspices of the UN.

Moreover, the notion of space law also encompasses the rules of other international organizations of universal or regional character, which carry on space-related activities, such as the International Telecommunication Union (ITU), the European Space Agency (ESA) and the European Union (EU). According to Article 2.1 (*j*) of the Convention on the Law of Treaties between States and International Organizations or between International Organizations of March 21, 1986, not yet in force, these rules mean "the constituent instruments, decisions and resolutions adopted in accordance with them, and the established practice of the organizations" (Marchisio 1986).

Space Law,
coordinated by Thomas LECLERC.

In addition to these international instruments, many States have adopted national legislation governing space activities, mainly to implement their international obligations. A well-established rule of general international law, codified in Articles 26 and 27 of the Vienna Convention on the Law of Treaties of 23 May 1969, entered into force on 27 January 1980 (VCLT), establishes that States must perform in good faith treaties in force binding upon them and that they may not invoke the provisions of their internal law as justification for their failure to perform them. Although the way in which international law applies within a State is a matter regulated by the law of that State, the outcome affects the State's position in international law. International law requires that States fulfill their obligations and they will be held responsible if they do not. Furthermore, often international treaties are not fully self-executing and they may require implementing national legislation.

Thus, in a broader sense, the notion of "space law" means a specialized body of law, both of international and national nature, which is aimed at maintaining order and co-ordinating relations among the subjects involved in space activities, States and private persons. Every entity carrying out activities in outer space must generally behave in a fashion that does not breach legal rules or hamper the rights of other subjects. Transgressions of legal rules would provoke social disruption, reactions and disputes to be solved in accordance with applicable legal norms.

Space law is a relatively new branch of international law. This body of law has grown from the necessity of creating norms to govern the expanding uses of outer space science and technology in improving functions and providing new services on the Earth. When the space age began in 1957 with the Soviet launch of Sputnik 1, the first man-made satellite, the international community immediately realized that it was essential to formulate international norms for the conduct of human activities in outer space. Then, space law has developed over time and will continue to develop as new challenges arise.

At the beginning, it was natural that the responsibility to regulate the activities of States in outer space would fall upon the UN that had been established after the Second World War to maintain international peace and security and charged with the task of encouraging the codification of international law and its progressive development.

The process began in 1958, in a climate of intense rivalry between the United States and the Soviet Union (USSR) within the Cold War. Shortly after the launching of the first artificial satellite, the Permanent Representative of the United States to the UN requested the Secretary General (SG) that an item called "Programme for International Cooperation in the Field of Outer Space" be placed on

the agenda of the GA. This letter called for the Assembly to establish an ad hoc committee "to make the necessary detailed studies and recommendations as to what specific steps the Assembly might take to further man's progress" in outer space and "to assure that outer space (would) be used solely for the benefit of all mankind".

At the beginning, in the context of the Cold War, the concern of the UN was in preventing an extension of the arms race into outer space. Between 1959 and 1962, the major space faring nations made a series of proposals for banning the weaponization of outer space. An important step was reached with the conclusion in Moscow of the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water of August 5, 1963, entered into force on October 10, 1963, by the United States, United Kingdom and the USSR.

By an imaginative effort at international legislation within the UN, and through the arduous work painstakingly carried out over a relatively short period of time, the UNGA elaborated a set of multilateral treaties and legal principles, which provide the framework of international law that governs space activities (Kopal 2011). The UN become the focal point for international cooperation in outer space and for the development of international space law. The UNGA resolution 1348 (XIII) of 1958 established the Committee on the Peaceful Uses of Outer Space (COPUOS), first as an ad hoc body with 18 Member States; one year later, on December 12, 1959, UNGA resolution 1472 (XIV) gave it the status of permanent body and reaffirmed its mandate. From the legal point of view, the COPUOS was established as a subsidiary organ of the GA, based on Articles 7, paragraph 2, and 22 of the UN Charter, following which "the General Assembly may establish such subsidiary organs as it deems necessary for the performance of its functions". Thus, the Committee was not established as an independent intergovernmental organization founded on a multilateral treaty.

According to the founding resolutions, the main task of the Committee was to facilitate international cooperation in the field of outer space within the framework of the UN. Moreover, letter (*d*) of UNGA resolution 1472 (XIV) of 1959 opened also the way for consideration of the "legal problems which might arise in programs to explore outer space". In 1961, UNGA resolution 1721(XVI) mandated the COPUOS to assist in the study of measures for the promotion of international cooperation in outer space activities and requested the SG to maintain a public registry based on information supplied by States launching objects into orbit or beyond. It called also upon launching States to "furnish information promptly" to the COPUOS, through the SG, for the registration of launchings. This recommendation has not been superseded by the subsequent Convention on Registration of Objects Launched into Outer Space of January 14, 1975, entered into

force on September 15, 1976 (Registration Convention) and is still utilized by some States that have not yet ratified the Convention for registering on a voluntary basis their objects launched in outer space.

Like many other subsidiary organs of the UN, the COPUOS has its own internal structure, composed by two Subcommittees: the Scientific and Technical Subcommittee (STSC) and the Legal Subcommittee (LSC), created at the second session of COPUOS in 1962. Each subcommittee is composed of the same member States that comprise the parent body and is mandated to assist the COPUOS in the study of the specific proposals concerning, on the one hand, the scientific and technical aspects of space activities, and, on the other hand, the legal matters raised by member States for the development of international cooperation in space exploration for peaceful purposes. The STSC held its first session from May 28 to June 13, 1962, and the LSC first convened in Geneva on May 28, 1962. This latter date may be considered as the starting point of the evolutionary stages of the COPUOS.

1.2. Space law as a fruit of the United Nations

By examining the accomplishments of the COPUOS and its LSC in the field of international space law, it is possible to identify three main evolutionary phases (Marchisio 2005). The first corresponds to the law-making phase, when the five UN Space Treaties were concluded, which began just after LSC's creation, and ended in the 1980s. The second phase was the soft law phase, characterized by the adoption of four sets of non-legally binding principles until the middle half of the 1990s. During the third and current phase, efforts have been made in order to broaden the acceptance of the UN Space Treaties and improve their application through the adoption of UNGA resolutions, technical norms and international standard called "guidelines". Each of these stages presents its specific features and results.

Right in the beginning of COPUOS deliberations, an important decision was made which since then has defined the working methods of this part: the conclusions to be adopted by the Committee and both its subcommittees should be subject to agreement without need for voting. Thus, the COPUOS became the first UN body that started applying in its proceedings a decision-making principle later known as the rule of consensus and expanded in the practice of the UN and other international organizations.

The application of this procedure went on together with the method of a progressive elaboration of appropriate normative instruments. The rule of law in outer space was thus established not by a single, all embracing international treaty,

but step-by-step, by several legal instruments dealing with the most urgent problems of space activities. In the first stage, the UNGA felt it necessary to give urgently some guidance to member States conducting space activities in order to avoid the development of practices dictated exclusively by national interests. Moreover, the initial debate in the LSC led to the conclusion that the basis for space activities should be conceived rather in principles than in detailed norms in order to reach the necessary agreement relatively soon.

This was realized thanks to a declaration of principles, belonging to the genus of Assembly recommendations, which are endowed, in legal terms, with a merely hortatory value, as the UNGA does not have a legislative function. However, the Assembly's "Declaration of Principles" or "Principles" tout court, are considered important tools in the process of evolving international law. In this sense, the adoption of a *corpus* of general principles, to be translated later into a binding treaty, was the best way to dictate the rules of the road for the emerging space activities of the space faring nations.

The Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, as adopted by UNGA resolution 1962 (XVIII) of 1963 (Legal Principles Declaration), had in origin only a recommendatory value, but afterwards some of these principles acquired binding legal nature when they were restated in the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of January 27, 1967, entered into force on October 10, 1967 (OST). Furthermore, the universal acceptance of several of these principles has consolidated their customary value, which can hardly be questioned even by the stricter test of legal effectiveness. International custom is generally considered to be the product of two constitutive elements: *diuturnitas* and *opinio iuris*. The first element refers to general and consistent conduct by States, while the second element means that the practice stems from a belief of legal obligation. This definition helps us immediately underline the importance, in establishing the customary value of the principles, the conduct of States, international organizations and private entities acting under the States' control and supervision according to international space law.

In this regard, the practice of States has consolidated the customary value of several principles contained in the declaration, such as the exploration and use of outer space for the benefit and in the interests of all mankind; the freedom of exploration and use of outer space and celestial bodies by all States on a basis of equality and in accordance with international law; the prohibition of national appropriation of outer space and celestial bodies; the applicability of international law, including the UN Charter, to the exploration and use of outer space; the international responsibility for

national activities in space and the authorization of the private entities activities by the State concerned; the principles of co-operation and mutual assistance, as well as of due regard for the corresponding interests of other States; the avoidance of harmful interference; the protection of the astronauts as envoys of mankind.

1.3. The outer space treaty of 1967: Legal past, legal future

While the adoption of an instrument not legally binding was the first step toward a new legal regime for outer space, soon after the time seemed mature for entering multilateral treaties to clarify and progressively develop the rules applicable to space activities.

The LSC become the most appropriate forum for reaching consensus on the major issues involved and transforming the principles on mandatory norms of international law. On June 16, 1966, both the United States and the USSR submitted draft treaties. The US draft dealt only with celestial bodies; the Soviet draft covered the whole outer space environment. The United States accepted the Soviet position on the scope of the Treaty, and by September agreement had been reached on most Treaty provisions. Differences on the few remaining issues – chiefly involving access to facilities on celestial bodies, reporting on space activities and the use of military equipment and personnel in space exploration – were satisfactorily resolved in private consultations during the UNGA session by December.

These were the origins of the OST which became one of the outstanding law-making treaties of contemporary international law (Lachs 2010). It significantly contributed to the progressive development and codification of international law in the meaning of Article 13 of the UN Charter. By the OST, an attempt was made at finding a balanced compromise between the common interests of all nations, the aims of humankind and the interests of individual States as subjects of international law.

Article I of the OST solemnly declares that "[t]he 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". The Treaty develops the principles of the freedom in the exploration and use of outer space for all; the freedom of scientific investigation in outer space through international cooperation; and the prohibition of appropriation of outer space, no exception being admitted. Thus, space and celestial bodies belong to the category of *res communes*

omnium, free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law.

The OST is a foundational instrument, a law-making Treaty of universal character. It lies at the top of the chain of normative instruments containing the rules governing space activities, whatever their nature and source, international, regional or national. The Treaty is also one of the most significant law-making treaties concluded in the second half of the 20th century. Law-making treaties are international multilateral agreements concluded with the intent of establishing, in the general interest, a set of rules universally valid, representing the only international regime applicable to a certain situation. The OST sets a legal regime of permanent character that make rules applicable to space activities relevant not only for the States parties, but also for States that are not parties to it. Evidently, not all the principles of the OST have acquired customary nature in international law, but some of them have certainly acquired a status that go beyond the conventional nature of the instrument in which they are contained. Some are even of peremptory nature and cannot be derogated through subsequent agreements. An agreement between two States aimed to appropriate a celestial body in contrast with Article II of the OST would be null and void in line with Article 53 of the 1969 VCLT.

The OST has enjoyed the widest acceptance by the international community from among all the UN space treaties. It has received, as of January 1, 2022, 112 ratifications. Although the number of States parties to the Treaty has now been increasing rather slowly, the fact that its status has reached more than 100 States parties demonstrates that it belongs to a category of international instruments that have been endorsed by a great majority of the international community.

As said, the main achievement of the OST has been the translation into treaty language of a series of legal principles governing the activities of States in the exploration and use of space. These principles are normative prescriptions of a general character, fundamental for the sector object of regulation and open-ended for further implementation.

Furthermore, the link between the Treaty and the objective of preserving peace in outer space is another structural feature that cannot be altered without disrupting the orderly development of outer space activities of public and private actors. From the outset, the very nature of the OST was to establish a legal regime to maintain peace and security in outer space. While freedom of access, exploration and use of outer space are recognized only for peaceful purposes, Article IV of the Treaty confirms the undertaking 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 them in outer space in any other manner. Yet, the use of the Moon and other celestial bodies is allowed exclusively for peaceful purposes, while the establishment of military bases, installations or fortifications; the test of weapons of any kind or the conduct of military maneuvers are prohibited.

At the same time, the content of the OST per principles has allowed a certain flexibility and permitted the adaptation of its legal framework to the evolution of space activities. Moreover, the Treaty also sets out restraints on States in two different ways: by requiring compliance with its provisions and imposing conditions on their outer space activities. Thanks to the OST, the conduct of States and private entities in space is "ruled by law", that is, by a level of normativity sufficiently certain and predictable. The development of national space legislation to implement Article VI of the Treaty is the most eloquent factor of stability of the legal regime governing activities in outer space.

1.3.1. *The relevance of the OST for private actors*

A special significance presents the principle that States parties shall bear international responsibility for national activities in outer space 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 of the Treaty. The plain language of Article VI of the OST requires authorization and supervision of the activities of a country's commercial space actors in order to assure their conformity with the provisions of the Treaty.

The first sentence providing that States Parties bear international responsibility for their private entities' activities is quite unique in international law. Normally, a government is not responsible for purely private conduct in the absence of a strong link such as the government exercising direction or effective control over the private activity. This provision was part of the trade-off in the negotiation of the OST in which the original Soviet proposal was to ban private actors from space altogether (Dembling and Arons 1967). The OST clearly allows for and anticipates commercial space activity but makes State parties internationally responsible for such activity. The last clause of the first sentence of Article VI of the OST also provides that States parties must assure that national activities (including those by its commercial actors) are carried out in conformity with the OST. The second sentence then requires the appropriate State to undertake authorization and give official permission and continuing supervision of its non-governmental activities. In the current age of expanding private activity in space, Article VI of the OST preserves law and order in space by requiring countries to take steps to ensure that their nationals act in

accordance with international law. Now that private operators outnumber government operators, Article VI has become critical to prevent a chaotic environment in space.

After having listed the many merits of the OST, we should also be aware that the Treaty would and could not regulate all existing and foreseeable aspects of space activities. Already on the 30th anniversary of the OST, it was noted that the Treaty provides only rudimentary protection of the space environment, in a single sentence contained in Article IX (Lafferranderie and Crowther 1997). There are certainly aspects of the OST that need clarification. But, from a general point of view, the Treaty seems to be sufficiently adaptable to absorb new challenges and face new issues.

The Treaty is an open-ended instrument, so that the lack of some specific provisions can be filled referring to international law at large. It is a leaving instrument because of its Article III, which establishes that States parties to the Treaty shall carry out on activities in the exploration and use of outer space including the Moon and other celestial bodies in accordance with international law, including the UN Charter, in the interest of maintaining international peace and security and promoting international cooperation and understanding.

Along the last decades, space activities have rapidly evolved. New emerging space nations have appeared on the one side and new private actors are engaged in space with innovative, flexible organizations focused on new technologies. New projects are developing, such as those regarding the mega constellations of small satellites that want to facilitate access to space through the reduction of costs and the acceleration of production. Similarly, there are initiatives for rendering repair services to satellites in-orbit and proximity operations.

But, as the other face of the same coin, there are also growing concerns relating to emerging challenges, such as the handling of space debris, the possible effects of large constellations deployments on the current and future orbital debris environment, the possible risks imposed on space missions by the new applications, the emerging threats to the security and resiliency of orbital infrastructures.

Considering these two related aspects, the question has been raised whether the Treaty could provide an adequate framework to address the complex relations resulting from the rapid growth of commercial activities in outer space and the increasing number of concerns related to the safety, security and sustainability of space activities. As we shall see later, the international community is trying to face these challenges mainly through the adoption of non-legally binding instruments.

1.4. The other UN treaties on space activities

1.4.1. *The Rescue and Return Agreement*

The general legal framework set up by the OST has been complemented by four other treaties, all negotiated within the LSC during the 1960s/1970s, following a method of progressive elaboration of appropriate space law instruments. They are in chronological order: the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of April 22, 1968, entered into force on December 3, 1968 (Rescue and Return Agreement); the Convention on International Liability for Damage Caused by Space Objects of March 29, 1972, entered into force on September 1, 1972 (Liability Convention); the Registration Convention and, finally, the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of December 18, 1979, entered into force on July 11, 1984 (Moon Agreement). Under the legal framework of these treaties, space exploration by nations, international organizations and private entities has flourished. As a result, space technology and services might better contribute to economic growth and improvements in the quality of life around the world.

Building upon Article V of the OST, which qualifies astronauts as "envoys of mankind" the 1968 Agreement was the first in the series of UN space treaties that followed the 1967 Treaty. The negotiating process initiated on May 1962, when two proposals were presented for discussion by the USSR and the United States. Later, a draft compromise text was submitted by Australia and Canada. The main outstanding issues were whether a general obligation existed to assist and return astronauts and space objects and whether this obligation applied to the high seas and beyond the national jurisdiction of States (Kopal 1969). A compromise text was after all submitted to the GA, while the successful entry into force of the OST hastened the negotiations of the Rescue and Return Agreement. On December 19, 1967, the UNGA adopted unanimously its resolution 2345 (XXII) commending the Agreement, which entered into force on December 3, 1968, after the deposit of the fifth instrument of ratification.

The shortest among the UN space treaties, the Rescue and Return Agreement contains on the one side provisions, based on humanitarian considerations, on the assistance to astronauts in distress and their return in case of emergency or unintended landing, and, on the other side, on recovery and return of space objects. The Agreement stipulated that States should render to astronauts all possible assistance in the event of accident, distress or emergency landing on the territory of another State Party or on the high seas. In the event of a landing, astronauts should be safely and promptly returned to the State of registry of their space vehicles.

Furthermore, the Rescue and Return Agreement included a provision concerning the return of objects launched into outer space or their component parts found beyond the limits of the Party on whose registry they would be carried on. The duty to return a recovered space object was a logical consequence of the principle inserted in Article VIII of the OST. According to it, ownership of objects launched into outer space and of their component parts is not affected by their presence in outer space or on a celestial body or by their return to Earth.

The legal framework of the Rescue and Return Agreement has been complemented by other international agreements, regulating more specific aspects through a detailed discipline. These agreements have been completed by regulations enacted by national space agencies. Among the international instruments, mention should be made of the Intergovernmental Agreement (IGA) between Canada, the States members of the ESA, Japan, the Russian Federation, and the United States concerning cooperation on the civil International Space Station (ISS), and of the Memorandum of Understanding between ESA and NASA (MOU), signed in Washington on January 29, 1998 (von der Dunk and Brus 2006; Marchisio 2011).

A Code of Conduct for the ISS crew was approved on September 15, 2000 by the Multilateral Coordination Board (MCB), the highest level cooperative body established by the MOU. It defines the crew as one integrated team with one Commander, responsible for the mission program implementation and crew safety guarantee aboard the Space Station. It specifies that ISS crewmember means "any person approved for flight to the ISS, including both ISS expedition crew and visiting crew, beginning upon assignment to the crew for a specific and ending upon completion of the post flight activities related to the mission". After the conclusion of the IGA, the ESA's Council adopted, on March 25, 1998, a resolution on the development of a single European astronaut corps, which recalls the provisions of various legal instruments relevant to astronaut activity adopted under the auspices of the UN and ratified by the ESA Member States, and in particular the Astronauts Agreement.

It is still an open issue whether the expressions "astronauts" – with its variants the Russian "cosmonauts" and the Chinese "taikonauts" – remain appropriate to cover new categories of individuals, such as flight participants, scientists members of multinational crews, temporary visitors and tourists, flying in outer space. Other legal texts have offered a clearer distinction between professional astronauts, space flight participants and visiting crew members, or space tourists. On December 23, 2004, the Commercial Space Launch Amendments Act (CSLAA) was signed as law in the United States. It establishes, inter alia, an "experimental permit" regime to

allow reusable suborbital (passenger carrying) launch vehicle developers to build and test their vehicles without undue regulatory constraints.

1.4.2. *The Liability Convention*

Discussions on liability for damage caused by space objects continued as from 1962 within the LSC with a focus on three drafts submitted by the United States, Belgium and Hungary, in 1962, 1963 and 1964, respectively. A later proposal from France was submitted as of 1968. The *travaux préparatoires* compiled over the period of 6 years during which it took to achieve agreement on the Liability Convention of 1972, adopted by the UNGA in its resolution 2777 (XXVI).

The Convention was drafted with a view to achieving a victim orientated and unlimited system of liability (Kerrest 2017). The preamble to the Liability Convention reflects the overriding objective "to establish a uniform rule of liability and a simple and expeditious procedure governing financial compensation for damage". The Convention clearly builds upon Article VII of the OST, which establishes that a State that launches or procures the launching of an object into outer space, including the Moon and other celestial bodies, and from whose territory or facility an object is launched, is internationally liable for damage to another State 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.

Accordingly, the requirements for international liability are damage, launching State and space object (Kerrest 2005). The definition of damage within the Convention is very broad. The type of damage for which a launching State can become liable to provide compensation are "loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international governmental organisations". It includes environmental damage. The same provision confirms that the launching States that can become liable for damages made by their space objects are those mentioned in Article VII of the OST. They include a State which launches the object, as well a State which procure the launch (a State placing an order for a launch) and a State from whose territory or facility a space object is launched. Finally, the term space object includes component parts of a space object as well as its launch vehicle and parts thereof.

The Convention establishes two different regimes of liability depending on the place where the damage occurs. Following Article II, a launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft in flight. This non-fault based, absolute liability

system providing compensation for victims better corresponds to the ultra-hazardous nature of space activities and to the immense risk posed by space technology.

Liability for collisions in outer space was to remain with the launching State, but only on proof of fault. In the event of damage being caused elsewhere than on the surface of the Earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible (Liability Convention, Art. III). In case of joint launches or cooperation programmes, States should consider the conclusion of agreements in accordance with the Liability Convention.

A State which suffers damage, or whose natural or juridical persons suffer damage, may present to a launching State a claim for compensation for such damage. The Convention does not impose an obligation, but a discretionary faculty and, for that, if the State of nationality has not presented a claim, another State may, in respect of damage sustained in its territory by any natural or juridical person, present a claim to a launching State. The claim shall be presented to a launching State through diplomatic channels or the SG of the UN, provided the claimant State and the launching State are both Members of the Organization.

The compensation which the launching State shall be liable to pay for damage under the Convention shall be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage as will restore the person, natural or juridical, State or international organization on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred. If no settlement of a claim is arrived at through diplomatic negotiations, within 1 year from the date on which the claimant State notifies the launching State that it has submitted the documentation of its claim, the parties concerned shall establish a Claims Commission at the request of either party. This Commission shall decide the merits of the claim for compensation and determine the amount of compensation payable, if any. The decision of the Commission shall be final and binding if the parties have so agreed; otherwise, the Commission shall render a final and recommendatory award, which the parties shall consider in good faith.

1.4.3. *The Registration Convention*

The Registration Convention was annexed to UNGA resolution 3235 (XXIX), adopted on November 12, 1974 and opened for signature on January 14, 1975. As already mentioned, UNGA resolution 1721B (XVI) of 1961 asked the SG to

establish a public registry of objects launched into outer space to promote international cooperation in the exploration and use of outer space. Later in 1967, Article VIII of the OST codified the principle that a State of registry shall "retain jurisdiction and control over such object". Then, after the Registration Convention, UNGA resolution 62/101 of 2007 recommended means for States to improve registration practices.

Thus, there are at the UN levels, two complementary registers of objects launched into outer space maintained by the SG: Resolution Register and Convention Register. After the entry into force of the latter, States began providing information on space objects under the Registration Convention instead of resolution 1721B (XVI). Some States, like France, have re-registered all their space objects under the Convention.

The Registration Convention aims at providing a mandatory system of registering objects launched into outer space and additional means and procedures to assist States parties in the identification of space objects. When a space object is launched into Earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain. Each launching State shall inform the SG of the establishment of such a registry. Where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object. There shall be full and open access to the information in the Register maintained by the SG on the basis of the information furnished by States.

The Convention establishes the types of information to be provided "as soon as practicable", including the date of the launch, the territory or location of launch, the basic orbital parameters and the general function. States parties may submit, if they wish, any additional information, such as the re-entry of a space objects, the notification when a space object is no longer in Earth orbit, or when a space object is marked with the designator or registration number prior to launch. States, particularly those with tracking capabilities, are required to respond to the greatest extent feasible to requests in the identification of a space object which has caused damage to it or to any of its natural or juridical persons, or which may be of a hazardous or deleterious nature.

According to the UN Office for Outer Space Affairs (OOSA), since the establishment of the first UN Register in 1961, 89% of functional space objects that are presently in Earth orbit or beyond have been registered; 96% of functional space objects that were in Earth orbit were registered; 87% of functional space objects that are/were in geostationary orbit (GSO) have been registered; and 90% of functional

space objects that are in low and medium orbits (LEO/MEO) have been registered. Space objects on deep space/planetary missions have been registered, as well as space objects carrying nuclear power sources and crewed spacecraft. Space station flight elements (including modules and robotic arms) are registered. Only 8% of functional space objects have not been registered since 1957 to present (Di Pippo 2016).

With the adoption of UNGA resolution 62/101 "Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects", there have been substantial changes to registration practices of States of registry. A growing number of States have begun using the model registration form developed in accordance with the resolution. More States are providing information on transfer of ownership/supervision, mission termination, in-orbit disposal and re-entry of space objects. Only 23% of all space objects presently being tracked in Earth orbit are satellites, manned spacecraft or space station flight elements. Approximately 2,100 objects are rocket-stages and related. The remaining approximately 11,400 objects are non-functional objects: "space debris".

1.4.4. *The Moon Agreement*

The 1979 Moon Agreement is a case apart. It has been accepted but by 18 States, failing to collect support, notwithstanding that, like the other UN space treaties, it was adopted in the UNGA by consensus. There are many reasons for the hesitation shown by a great number of States to adhere to this Agreement, but the most evident is perhaps the contradiction between the legal qualification of the Moon and other celestial bodies as *res communes omnium* under the OST, and the legal regime of the Moon and its resources provided for by the 1979 Treaty. The latter utilizes in Article 11 the concept of common heritage of humankind, which in principle excludes any other type of exploitation but collective through an international authority. The notion of the common heritage of humankind has been adopted by the UN Convention on the Law of the Sea of December 10, 1982, entered into force on 16 November 1994 (Montego Bay Convention) for qualifying the sea bed and ocean floor and subsoil thereof beyond national jurisdiction (the Area) and for setting up the International Sea Bed Authority, the body through which States parties are to organize and control the activities concerned with sea-bed minerals. The Moon Agreement requires also the exploitation of the natural resources of the Moon to be governed by a future "international legal regime", and its full establishment has been postponed until such exploitation is about to become feasible (Tronchetti 2009).

In this sense, it is a matter of fact that at the end of the 1970s the LSC concluded its law-making era with one of the most controversial legal regime of international space law. As many non-space faring States have not yet accepted the core UN treaties, including some Members of COPUOS, one of the main functions of the LSC consists presently in acting for broadening their universal acceptance, inviting States to consider the reasons why their ratification should be considered highly beneficial. At the same time, the LSC should also encourage States that have accepted these conventions to look at the sufficiency of their national laws to implement them.

Furthermore, there is still a noticeable variable geometry among the UN five space treaties in terms of ratifications. Each one of the five UN treaties is indeed an independent multilateral treaty, with different content and a variable sphere of application, as shown by the range of State parties in 2022: OST 112, Rescue and Return Agreement 99, Liability Convention 98, Registration Convention 72, Moon Agreement 18.

This situation leads to a great degree of divergence, first depending on the fact that each State is bound only by those treaties that has accepted and that a treaty does not create either obligations or rights for a third State without its consent. Second, in international law, the rights and obligations of States parties to treaties successive in time relating to the same subject matter are normally governed by the principle *lex posterior derogat priori*, unless the earlier treaty contains peremptory rules, which is normally not the case in space law, or unless the treaty specifies that it is subject to, or that it is not to be considered as incompatible with an earlier or later treaty. In this case, the provisions of that other treaty prevail (so-called priority clause). Now, no one of the UN treaties regulates the issue of their reciprocal relations, apart the Liability Convention which in its Article XXIII establishes that its provisions shall not affect other international agreements in force insofar as relations between the States parties to such agreements are concerned. This clause makes the OST prevail in case of inconsistency.

Furthermore, as the UN space treaties were negotiated and concluded in different times and among different States, the only subjects competent to interpret them are the respective States parties in the exercise of their sovereignty. However, there is no institutionalized body created by these treaties that can interpret, nor does this competence fall within the powers of the COPUOS, as delegations rather firmly restate at every opportunity during the COPUOS sessions.

1.5. The declarations of principles

We should turn now to the instruments of soft law which have been adopted after the end of the 1970s. These instruments, while non-legally binding, can be considered as subsequent practice to the treaties developed to address new issues and challenges without recurring to legally binding instruments. During the second and third evolutionary phases of the COPUOS, international space law has developed mainly through such instruments, whose utility is without doubt (Marboe 2012).

Though the elaboration of further UN space treaties was discontinued after 1979, the work of the LSC in the progressive development of the juridical regime of outer space was not interrupted. The five main UN treaties exhausted the basic issues on which States would consent to undertake international legal obligations. During the following period, sets of UN Principles adopted by the UNGA became a suitable form for regulating specific categories of space activities for which the international community was not yet prepared to negotiate legally binding instruments. A new phase began, which witnessed the adoption of "declarations of principles" as the viable solution.

Four sets of Principles were negotiated by the LSC and then approved, through the main Committee, by the GA: the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, adopted by UNGA in its resolution 37/92 of 1982; the Principles Relating to Remote Sensing of the Earth from Outer Space, adopted by the UNGA in its resolution 41/65 of 1986 (Remote Sensing Principles); the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, adopted by the UNGA in its resolution 47/68 of 1992 completed by the Safety Framework for Nuclear Power Source Applications in Outer Space, as endorsed by UNGA resolution 64/86 of 2010; and the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, as adopted by UNGA resolution 51/122 of 1996 (Space benefits Declaration).

With regard to the legal status of these Principles, although being merely recommendations, they have played a role in the consolidation of customary rules of international law. In this perspective, the decisive element comes from the analysis of the practice of States prior to, concomitant with, and following the UN declarations. Therefore, some of them are more firmly established in law, like the freedom of Earth's observation from space, while others seem to be less

consolidated, and still in the process of gaining complete legal relevance. Some of them appear frankly outdated.

If we look at the Principles Relating to Remote Sensing of the Earth from Outer Space, they were a successful achievement in which a fair compromise was found between the interests of the sensing States and the needs of the sensed States, including most of the developing countries. At the time of their adoption, the principles did not prohibit activities that had been going on for a long time: on the contrary, they accepted the fact that sensing States were committed to the view that their activity required no consent, including no preliminary consent from sensed States. Therefore, the principles merely codified well-established conduct of States prior to 1986; the UNGA resolution created no new law, but simply gave greater legitimacy to the already existing practices.

Besides, the practice seems to have confirmed the general and main aspects of this legal regime set forth in 1986. A cursory look at the practice of States and international organizations shows a situation in which the core tenets of the UN Principles have maintained their importance, even in an emerging commercialized remote sensing system of service. Indeed, the principles appear relevant to the expansion of those very services and have been consistently reaffirmed. The basic international regime of remote sensing is recognized, promoting the broadest possible use of data (Marchisio 2004; Achilleas 2011).

On the other hand, some of the most prominent issues connected to ongoing developments in the field of remote sensing, mainly societal demands and technological developments, are not fully regulated by the UN declaration on remote sensing. The principles do not provide clear and specific regulations for new issues, such as the focus on global systems, the access to data by the sensing States and the legal protection of data, which is increasingly necessary to promote the costly investments required by remote sensing activities and the expansion of the related market. Nor do they provide an adequate discipline with regard to the production, use and treatment of highly sophisticated and detailed imagery, especially in relation to their potential implications for national security and individual privacy.

The set of Principles Relevant to the Use of Nuclear Power Sources in Outer Space, briefly called the NPS Principles, was but a limited achievement in space legislation. Some innovatory elements were brought into the regulation of this kind of activities, such as the storing of NPS objects in sufficiently high orbits after the operational part of their missions, the safety assessment and notification of re-entry. The NPS Principles, however, apply only to nuclear power sources devoted to the generation of electric power on board space objects for non-propulsive purposes,

which have characteristics generally comparable to those of systems used and missions performed at the time of the adoption of the principles.

Therefore, the principles are not applicable to the NPS serving other purposes, including nuclear propulsion for long-distance flights into interplanetary space and to the celestial bodies of our solar system. The expected reopening of these principles no later than 2 years after their adoption has been delayed several times. In 2010, the Safety Framework for Nuclear Power Source Applications in Outer Space, complementary to the NPS, was endorsed by COPUOS and then by UNGA resolution 64/86 of 2010.

The final document of this series, the so-called 1996 Benefit Principles, mostly reflects the existing practice of international space cooperation and does not include new regulatory principles.

1.6. Other UN resolutions

Recently, the COPUOS is mainly engaged in the assessment of the existing legal regimes and oriented toward the formulation of non-binding documents that work upon the rights and obligations as provided by the treaties already in force. After the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), held in Vienna from July 19–30, 1999, some objectives for further development of legal matters to be initiated through the LSC were agreed upon. In the absence of a conference of States parties (COP) to the OST, the COPUOS and its Subcommittees have often carried out a vicarious role in this field, interpreting the treaties through the adoption of resolutions by the UNGA. While not constituting "authoritative interpretations" of the treaties, these resolutions are nonetheless important tools to assist States in better abiding by their international obligations.

In this perspective, the LSC has moved toward the assessment of several topic of relevance, starting with the concept of the "launching State". The purpose of this work was to clarify all aspects of this concept as contained in the Liability Convention and in the Registration Convention, and as applied by States and international organizations, in the light of new and expected practices in space activities. A resolution on the "Application of the concept of the 'launching State'" was finally approved by the UNGA resolution 59/115 of 2004. The resolution recommends that States consider enacting national legislation on authorization and supervision of space activities by private entities and the conclusion of agreements with respect to joint launches.

Thereafter, the Subcommittee considered the practice of States and international organizations in registering space objects, an issue characterized by new aspects not covered by the Registration Convention, mainly related to the commercial uses of outer space as well as to the privatization of space activities. The assessment of this practice by States revealed strong disparities touching at the information concerning the time of launch, the territory of launch, the basic orbital parameters and the general function of a spacecraft. Moreover, it showed that several space objects were not registered or even registered by more than one State. These points were considered by UNGA resolution 62/101 of 2007, titled "Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects". Finally, UNGA resolution 68/74 of 2013 adopted "Recommendations on national legislation relevant to the peaceful exploration and use of outer space".

Soft law seems better able to accommodate the ongoing evolution in the field of technology and landscape. As the experience of the UN specialized institutions shows, a real drive in this sense can come by technical norms. Specialized agencies have truly contributed, and continue to do so, to the evolution of law, by means of regulatory standards and recommended practices. Some of them have binding effectiveness, some others must be implemented by States through domestic acts. The COPUOS is considering its possible role in the elaboration of technical norms on space matters. Thus, it has been involved with the elaboration of "guidelines" related to the sustainability, safety and security of space activities.

In fact, threats in outer space are already a reality: space debris, fragmentations in space, frequencies overlapping, collisions among space objects, intentional and unintentional harmful interferences and deliberate destruction of satellites. No one denies that accidents in outer space must be avoided in order to prevent loss of life and creation of damaging orbital debris. Technical rules on fundamental mitigation and safety measures, such as management, design and operational measures, to limit debris released during normal operations and minimize potential for break-ups during operational phases, have already been adopted. The Space Debris Mitigation Guidelines approved by the COPUOS in 2007 and endorsed by UNGA resolution 62/217 of 2007 have defined the notion of space debris as "all man-made objects, including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional". New initiatives are now considered toward active space debris remediation/removal and development of related technologies for services in orbit and ground-based lasers. A compendium of space debris mitigation standards adopted by States and international organizations has been published as a contribution of Canada, the Czech Republic and Germany to the COPUOS, in reference to the agenda item of its LSC on "General exchange of

information and views on legal mechanisms relating to space debris mitigation measures, taking into account the work of the STSC".

In 2010, the STSC began considering as an agenda item the long-term sustainability of outer space activities (LTS). Core thematic areas were the sustainable space utilization supporting sustainable development on Earth; space debris mitigation, safety of space operations, tools to support space situational awareness; space weather: regulatory regimes and guidance for actors in the space arena. This process interacted also with the Group of Governmental Experts on Transparency and Confidence-building Measures in Outer Space Activities (TCBMs), which released in 2013 a report containing several recommendations in matters related to the predictability and security of space activities. In June 2019, the COPUOS reached a further step, adopting the preamble and 21 guidelines on the long-term sustainability of outer space activities. It decided to establish a 5-year working group under the agenda item on LTS of its STSC for continued institutionalized dialogue on issues related to the implementation and review of the guidelines.

Space sustainability is about ensuring that all humanity can continue to use space for peaceful purposes and socioeconomic benefit. It means the use of outer space in a way that maintains its potential to meet the needs and aspirations of present and future generations, ensuring that all humanity continue to use it for peaceful purposes, scientific and technological advancements and socioeconomic benefits (Marchisio 2012).

1.7. References

Achilleas, P. (ed.) (2009). *Droit de l'espace : télécommunications, observation, navigation, défense, exploration*. Larcier, Brussels.

Achilleas, P. (2011). Le cadre juridique international de la collecte et de la distribution des données de télédétection [Online]. Available at: http://www.afri-ct.org/wp-content/uploads/2015/03/68-_Article_Achilleas.pdf [Accessed 21 January 2020].

Couston, M. (2014). *Droit Spatial.* Ellipses, Paris.

Dembling, P.G. and Arons, D.M. (1967). The evolution of the outer space treaty. *Journal of Air Law and Commerce*, 33, 419–456.

Di Pippo, S. (2016). Registration of space objects with the United Nations Secretary-General. *Zeitschrift für Luft- und Weltraumrecht*, 65, 364–374.

von der Dunk, F. (ed.) (2011). *National Space Legislation in Europe: Issues of Authorization of Private Space in the Light of Developments in European Space Cooperation*. Martinus Nijhoff, Leiden.

von der Dunk, F. and Brus, M. (eds) (2006). *The International Space Station: Commercial Utilisation from a European Legal Perspective*. Martinus Nijhoff, Leiden.

von der Dunk, F. and Tronchetti, F. (eds) (2015). *Handbook of Space Law*. Edward Elgar Publishing, Cheltenham.

Hobe, S. (ed.) (2013). *Pioneers of Space Law*. Martinus Nijhoff, Leiden-Boston.

Hobe, S. (2019). *Space Law*. Hart Publishing, Oxford.

Hobe, S., Schmidtt Tedd, B., Schrogl, K.U., Goh, G.M. (eds) (2009–2015). *Cologne Commentary on Space Law: In Three Volumes.* Carl Heymanns Verlag, Cologne.

Jakhu, R. and Freeland, S. (2014). The sources of international space law. In *Proceedings of the International Institute of Space Law 2013*, Jorgenson, C.M. (ed.). Eleven International Publishing, The Hague.

Kerrest, A. (2005). Liability for damage caused by outer space activities. In *Space Law: Current Problems and Perspectives for Future Regulation*, Benkö, M. and Schrogl, K.U. (eds). Eleven International Publishing, The Hague.

Kerrest, A. (2007). Droit de l'espace. Droit des activités spatiales. Quelques définitions et remarques sur une approche pluridisciplinaire [Online]. Available at: https://www.unoosa.org/pdf/pres/lsc2007/symp-02-1F.pdf [Accessed 21 January 2020].

Kerrest, A. (2009). Actualités du droit de l'espace : la responsabilité des États du fait de la destruction de satellites dans l'espace. *Annuaire français de droit international*, LV, 615–626.

Kerrest, A. (2017). The concept of the "launching state" in commercial launch ventures. In *Commercial Uses of Space and Space Tourism*, Wouters, J., De Man, P., Hansen, R. (eds). Edward Elgar Publishing, Cheltenham.

Kerrest, A. and Thro, C. (2017). Liability for damage caused by space activities. In *Routledge Handbook of Space Law*, Jakhu, R. and Dempsey P.S. (eds). Routledge, New York.

Kiss, A.C. (1968). L'accord sur le retour et le sauvetage des astronautes et la restitution des objets lancés dans l'espace extra-atmosphérique. *Annuaire français de droit international*, 14, 736–746.

Kopal, V. (1969). The agreement on rescue of astronauts and return of space objects. In *New Frontiers in Space Law*, McWhinney, E., Martin, A., Bradley, A.W. (eds). Sijthoff, Leiden.

Kopal, V. (2011). Origins of space law and the role of the United Nations. In *Outer Space in Society, Politics and Law*, Brunner, C. and Soucek, A. (eds). Springer Verlag, Vienna.

Kopal, V. and Diederiks-Verschoor, I.H.P. (2008). *An Introduction to Space Law*, 3rd edition. Kluwer Law International, The Hague.

Kyriakopoulos, G.D. and Manoli, M. (eds) (2019). *The Space Treaties at Crossroads: Considerations de Lege Ferenda*. Springer International Publishing, Cham.

Lachs, M. (2010). *The Law of Outer Space: An Experience in Contemporary Law-Making*, *Reissued on the Occasion of the 50th Anniversary of the International Institute of Space Law*. Martinus Nijhoff Publishers, The Hague.

Lafferranderie, G. and Crowther, D. (eds) (1997). *Outlook on Space Law over the Next 30 Years*. Kluwer Law International, The Hague/London/Boston.

Lyall, F. and Larsen, P.B. (2018). *Space Law: A Treatise*, 2nd edition. Routledge, London.

Marboe, I. (ed.) (2012). *Soft Law in Outer Space. The Function of Non-binding Norms in International Space Law*. Böhlau Verlag, Vienna/Cologne/Graz.

Marchisio, S. (1986). Accords de financement multibilatéral : règles et pratiques des organisations internationales. In *Le droit international à l'heure de sa codification/Études en l'honneur*, vol. 2, Ago, R. (ed.). Giuffré, Milan.

Marchisio, S. (2004). The 1986 United Nations principles on remote sensing: A critical assessment. In *Scritti in onore*, Arangio-Ruiz, G. (ed.). Editoriale Scientifica, Naples.

Marchisio, S. (2005). The evolutionary stages of the legal subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). *Journal of Space Law*, 31(1), 219–242.

Marchisio, S. (2009). Le régime juridique de la télédétection. In *Droit de l'espace : télécommunications, observation, navigation, défense, exploration*, Achilleas, P. (ed.). Larcier, Brussels.

Marchisio, S. (2011). Reviewing the astronauts agreement: The role of COPUOS. In *Astronauts and Rescue Agreement: Lessons Learned*, Marchisio, S. and Lafferranderie, G. (eds). ESA, Paris.

Marchisio, S. (2012). The legal dimension of the sustainability of space activities. In *Current Problems of Modern International Law. Studies in Memory of Professor Igor Pavlovich Blishchenko*, Abashidze, A., Zhukov, G.P., Solntsev, A.M. (eds). IPK-RUDN, Moscow.

Marchisio, S. (2018). Il Trattato sullo spazio: passato, presente e futuro. *Rivista di diritto internazionale*, 1, 205–213.

Marchisio, S. (2022). *The Law of Outer Space Activities*. Edizioni Nuova Cultura, Rome.

McDougal, M.S., Lasswell, H.D., Vlasic, I.A. (eds) (1963). *Law and Public Order in Space*. Yale University Press, New Haven.

Purdy, R. and Leung, D. (eds) (2013). *Evidence from Earth Observation Satellites: Emerging Legal Issues*. Martinus Nijhoff, Leiden.

Ravillon, L. (2004). *Droit des activités spatiales. Adaptation aux phénomènes de commercialisation et de privatisations*. Litec Lexis Nexis, Paris.

Tronchetti, F. (2009). *The Exploitation of Natural Resources of the Moon and other Celestial Bodies: A Proposal for a Legal Regime*. Martinus Nijhoff, Leiden.

Zukhov, G. and Kolosov, Y. (2014). *International Space Law*, 2nd edition. Translated by B. Belitzky. Statut Publishing House, Moscow.