SPACE EXPLORATION AND TECHNOLOGY

Space and Humankind

Space Law

Legal Framework for Space Activities

Coordinated by
Thomas Leclerc

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Space Law

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Introduction

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Outer space, as it is known and exploited by humans, is far from being a lawless area. The tiny portion of outer space, whose access is within the reach of human technology, is indeed subject to a legal framework. There is a set of rules, both from public and private law, specifically dedicated to outer space and to the activities carried out there.

Nevertheless, many steps separate us from the context that surrounded the launch, on October 4, 1957, of the first artificial Earth satellite, a launch followed by the adoption by the General Assembly of the United Nations, on December 20, 1961, of a principle that has become the normative and legal cornerstone of space activities: outer space shall be free for exploration and use by all States.

To understand the current state of this legal corpus, it seems necessary to analyze the changes that have affected the technology used and the actors involved, as well as the domains concerned by the exploration and the use, by humanity, of outer space.

This volume thus proposes to bear witness to the progressive densification of the legal framework applicable to outer space and to the activities that are carried out there.

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Without claiming to be exhaustive, the structure of this volume has been designed to facilitate the discovery of this legal environment by presenting the main sources of space law (Part 1), its main principles (Part 2), the diversity of its fields of application (Part 3) and the challenges and issues that the development of space activities inevitably raises (Part 4).

First of all, space law can only be understood as a composite universe whose sources are to be found both in international law (Chapter 1) and in the diversity of national legal orders (Chapter 2).

The common framework for all these rules is a treaty drawn up under the aegis of the United Nations: the Treaty 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 on January 27, 1967. Among the main principles that it lays down – and whose understanding and analysis will enable us to understand the normative architecture of space law – are the principle of freedom of use and exploration of outer space (Chapter 3), the principle of exploration and use of outer space for the benefit and in the interest of all countries (Chapter 4), the non-appropriation principle of outer space (Chapter 5), the principle of the peaceful use of outer space (Chapter 6), or the widely discussed principle of State responsibility and liability for space activities (Chapter 7).

All of these principles have made it possible to provide a framework for the emergence, development and deployment of space technologies that are largely dedicated to the placement in orbit and operation of artificial Earth satellites. The legal framework established by the major United Nations treaties dedicated to outer space could not, however, meet the growing need for specific rules governing space activities. These activities, and the challenges and legal issues relating to their development, explained the development of multiple branches of space law that are explored in this volume.

The circulation of objects placed in orbit appeared to be one of the first challenges linked to the occupation of the Earth's orbital environment. Today, analyzed from the point of view of the law of space traffic management (Chapter 8), the control of this circulation implies an allocation and a coordinated management of the spectrum of frequencies and associated orbits (Chapter 9). The allocation of these frequencies is indispensable to the numerous fields of application that space technology offers human society today. This volume could not do without a legal examination, in the current context of *New Space*, of some of these fields of application: satellite radio communication (Chapter 10), navigation satellite systems (Chapter 11) and space teledetection (Chapter 12). The legal issues related to the

development of small satellites (Chapter 13) and to projects for the exploitation of material resources of celestial bodies (Chapter 14) also needed to be analyzed, especially in view of the commercial interest of an ever-increasing number of private actors.

Behind the development of technologies and activities also lies a series of legal issues and challenges. Projects for the exploration of the universe near and far from Earth raise a certain number of questions, which the law must apprehend and sometimes anticipate (Chapter 15), including the legal framework dedicated to the risks of contamination of the explored planets (Chapter 16). Our growing dependence on space technologies, in both civil and military domains, finally explains a new perception of the space environment and of the activities carried out in it, sometimes far from an outer space that some people hoped would be exclusively reserved for peace and science. A volume dedicated to space law should therefore address the issues of conflict and the responses that international law provides today to the development of a new type of threat to international security (Chapters 17 and 18). As for the increasingly pressing issue of space debris, the choice was made not to devote a specific chapter to it. Raised indirectly in different chapters of this volume, the technicality of this issue will certainly justify, in the future, the publication of a specialized volume.

This volume of space law is intended for a wide audience, from students to specialists and experts, as well as citizens who are curious to learn from reliable sources. It owes its existence to the enthusiastic investment of a large number of people, whom we wish to thank.

First of all, it benefited from the precious supervision of Jean-Luc Lefebvre, director of the editorial domain “Spatiology” of the “Sciences” encyclopedia and coordinator of the spatiology collection at ISTE editions. My deepest gratitude also goes to Professor Armel Kerrest, to whom the inspiration for this project belongs and who was its first architect. Armel thought up this volume and brought together a large number of its contributors before entrusting me with its direction. He has never ceased to participate in this project providing his advice and expertise.

I also would like to thank all the contributors to this volume, academics and practitioners belonging to various French and international institutions all recognized for their expertise in the field of space law. The enthusiastic welcome they have given to this project has been the driving force behind it. I would like to thank them for having agreed to make this effort to transmit and make their expertise accessible, thus providing everyone with the knowledge needed to understand the many issues raised by the development of space activities.

I would also like to thank the editorial team of ISTE Group for their competence and efficiency in the design and material development of this volume.

This volume would not have seen the light of day without the friendly support of my colleagues and friends at the Université de Bretagne Occidentale, starting with Professor Valère Ndior, whose advice and experience were an invaluable support throughout this project. I address to them my most sincere and warm thanks.

Part 1

The Main Sources of Space Law

1

History, the Treaties, the Resolutions

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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).

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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