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# DISSERTATION

**of Argyri Theodora Liameti**
Student's Registration Number: 7340022102012

## *Acquisition of rights and dispute settlement with regard to international transactions involving artificial satellites.*

**Examination Board:**

a) George D. Kyriakopoulos, Assistant Professor (Supervisor)
b) Fotini Pazartzi, Associate Professor
c) Anastasios Gourgourinis, Assistant Professor

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*To my family & best friends*
*for their unconditional love, true patience and support and for always believing in me and encouraging me to pursue my dreams.*

*Special thanks to my Professor, George D. Kyriakopoulos, for instilling in me a passion for learning and for introducing me to the fascinating world of space law.*

*I will be forever grateful to you all.*

**Contents**

**Abstract**

The increased commercialization and privatization of space activities in light of the NewSpace era threatens to destabilize the foundations of international space law. The present study aims at identifying the main legal challenges presented in view of the emerging international transactions involving artificial satellites and the growing participation of the private space actors. In Chapter A, the author focuses on the cases of in-orbit transfer of ownership and leasing of satellites (and the subsequent shift of operational control) and the legal implications that arise from an international law perspective. Specifically, it is argued that modern spatial transactions have given rise to many questions regarding our traditional understanding of international space law and policy. The analysis mainly centers around the inherent fallacies of the registration and liability regimes, as established under the current international legal realm. Reference is also made to potential regulatory hurdles that private operators may have to deal with in case they wish to acquire a satellite from another State, such as export control limitations and other authorization requirements aiming to ensure that States are protected both in terms of security but also regarding potential liability claims etc. An effort is made to propose viable solutions to recalibrate the current space law regime so as to avoid complex contractual relationships and provide for more legal certainty. Moreover, in Chapter B the author provides a short overview of the available mechanisms under the current international legal framework for resolving legal disputes, arising from commercial spatial transactions, ranging from contractual disputes to investment disputes, and disputes over harmful frequency interference. Overall, it is concluded that international arbitration seems to be the most suitable available tool for the resolution of such disputes.

## Introduction; the dawn of the Commercial Space Age

Over the past 15 years, commercial activity in space has more than tripled; the global space economy has reached $469 billion in 2021 and the vast majority of revenue derives from products and services delivered by private space companies.[1] The space sector is no longer dominated by the monopoly of a few space-faring nations, as numerous firms are entering the space market, especially in the satellite industry.[2] A short time ago, space exploration was reserved only for the states with the massive resources necessary for the expensive endeavor of leaving the earth's atmosphere. However, present day financial developments and technological advancements, such as reusable rockets and nanosatellites, have revolutionized access to Outer Space. Especially in the telecommunications sector, the surge of private-public partnerships (PPPs) and investments on robust technology and infrastructure have boosted competition and lowered the costs, enabling more players to enter into the market. In light of this increasing pace of commercialization and privatization of space activities in the so-called "New Space" era, business transactions involving artificial satellites have also increased in number.[3]

Nevertheless, international space law, at its origins, was intended to regulate the relations between states and public entities only, as Outer Space was generally not considered an area suitable for commercial ventures, especially due to its ultra-hazardous nature.[4] Therefore, although the participation of private actors had been envisaged to a certain extent by the drafters of the space treaties,[5] modern commercial practices and complex business transactions with regard to space objects had neither been conceptualized nor regulated. Nowadays, modern spatial transactions include, but are not limited to, purchase of satellites in orbit, transfer of ownership by means of acquisition of a company or by the change of an entity's status, lease of transponder capacity, lease of operation and control of the space objects *per se* or possession rights by secured creditors upon the debtor's default. Of course, these new developments threaten to destabilize the foundations of the *corpus juris spatialis*, ringing the bell for coordinated global action so as to bridge the legal gaps of the current system and boost economic development. This is most evident by the practice of in-orbit transfer of ownership of satellites, and generally by the shift of control over their operation from one entity to another, especially when those entities are located in different states. Moreover, as the private space sector is rapidly growing, many novel dilemmas arise; increased activity comes with

[1] Space Report 2022 Q2 released by the Space Foundation, showing a 6.4% growth in the commercial space sector.
[2] According to the Satellite Industry Report published by the Satellite Industry Association, the satellite industry produced global revenues of US$271 billion in 2020 (amounting to 74% of the global revenues of the entire space economy).
[3] Bohlmann U. M., Burger M., NewSpace: Putting an End to National Prestige and Accountability, 60 Proc. Int'l Inst. Space L., pp. 199-214, p. 199.
[4] Report of the International Law Commission, 53rd Session, U.N. Doc. A/56/10 (2001), p. 150.
[5] Gerhard M., *Article VI* in: S. Hobe / B. Schmidt-Tedd / Schrogl Kai-Uwe (eds), Cologne Commentary on Space Law, Volume 1, Carl Haymanns Verlag, Cologne, 2009, p. 105.

heightened risk of disputes. However, when it comes to settling those disputes, fundamental *lacunae* exist. As it will be argued, the existence of limitations in the personal and material scope of the traditional dispute resolution machinery, threatens to render international space law vague. The emergence of complex business transactions in the private space industry necessitates a rather new approach, focusing on the special needs and characteristics of the sector, when it comes to dispute resolution.

## The applicable international regulatory framework; the UN Space Treaties

To begin with, satellites qualify as space objects[6] and are thus governed by international space law. Their use and operation is subject to the general principles provided under the main Space Treaties,[7] which cover all kinds of operations that aim to make use of outer space in one way or another even if conducted from the Earth's surface.[8] The International Law Association (ILA) has also defined the term "space activity" as including the operation and guidance of space objects in Outer Space.[9] Notably, under the said regime, States bear certain rights and obligations linked with the operation of satellites due to the fact that international space law is state-centric and does not address individuals directly.

Further to the above, and before entering into the main discussion concerning business transactions, a short overview of the applicable international space law regime shall be provided. The regulation of the exploration and use of Outer Space is primarily based upon a series of five United Nations Treaties. The main rules are reflected in the 1967 Outer Space Treaty,[10] the 1968 Rescue Agreement,[11] the 1972 Liability Convention,[12] the 1975 Registration

[6] B. Cheng, Spacecraft, Satellites and Space Objects, in Encyclopedia of Public International Law in: R. Bernhardt (eds.), 1989, p. 309. The REG and the LIAB merely state in Article I (d) and I(b) respectively, that the term includes "component parts of a space object as well as its launch vehicle and parts thereof". However, according to literature, the notion should be taken to include any artificial man-made object launched into space or attempted to be launched, including *inter alia* space vehicles, satellites and other similar constructions.

[7] A. Williams & Rotola G., Regulatory Context of Conflicting Uses of Outer Space: Astronomy and Satellite Constellations, 46 Air and Space Law 4 (2021), pp. 545-568, p. 555.

[8] Hobe S., Article I in: S. Hobe, B. Schmidt-Tedd, K. U. Schrogl (Eds.), Cologne Commentary on Space Law, Volume 1, Carl Haymanns Verlag, Cologne, 2009, p. 30.

[9] COPUOS, Draft Model Law on National Space Legislation and Explanatory Notes, A/AC.105/C.2/2013/ CRP.6 (2013)

[10] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, London/Moscow/Washington, signed 27 January 1967, entered into force 10 October 1967; 610 U.N.T.S. 205; 18 U.S.T. 2410; 610 U.N.T.S. 205; 61 I.L.M. 386 (1967) [hereinafter, OST]

[11] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, London/Moscow/Washington, signed 22 April 1968, entered into force 3 December 1968; 9 U.S.T. 7570, 672 U.N.T.S. 119, 7 I.L.M. 149 (1968) [hereinafter, ARRA].

[12] Convention on International Liability for Damage Caused by Space Objects, London/Moscow/Washington, signed 29 March 1972, entered into force 1 September 1972; 24 U.S.T. 2389, 861 U.N.T.S. 187, 10 I.L.M. 965 (1972). [hereinafter, LIAB].

Convention[13] and the 1979 Moon Agreement.[14] They all encompass rules of customary nature and general principles of law, while further introducing provisions of substantive law.

For the purposes of this analysis, attention shall be drawn to the special responsibility and liability regime created by Articles VI and VII OST and elaborated in more detail in the REG and the LIAB, respectively, and to the concept of jurisdiction and control as per Article VIII OST. Generally, it shall be stressed that the drafters of the treaties aimed at establishing a triangular correlation between these provisions. In light of this, a brief introduction to the relevant concepts shall follow:

The Outer Space Treaty provides the legal foundation for all space activities, and all current spacefaring States are parties to it.[15] It is the magna carta of international space law[16] and regulates the conduct of subjects of public international law, underlying the main principles[17] and establishing rights and obligations of states in the exploration and use of Outer Space.[18] What is most interesting, however, is that the traditional concept of state responsibility is widened in the realm of space law. Under general public international law responsibility applies only directly to acts or omissions that are in violation of a state's international legal obligations towards another state and that can be attributed to that state.[19] Nevertheless, Article VI OST introduces a general international responsibility for "national activities" in Outer Space, whether they are carried out by governmental or non-governmental entities. The term "national" must be deemed to encompass both activities carried out by nationals and activities undertaken from within the territory of the state in question, to the extent that those activities fall under its jurisdiction.[20] In addition, as private parties are not bound by the OST, Article VI goes on to establish a duty for states to authorize and supervise all private activities and ensure that they are carried out in conformity with the provisions of the OST, making them responsible to that effect.[21]

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[13] Convention on Registration of Objects Launched Into Outer Space, New York, signed 14 January 1975, entered into force 15 September 1976; 28 U.S.T. 695, 1023 U.N.T.S. 15, 14 I.L.M. 43 (1975) [the REG].

[14] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, New York, signed 18 December 1979, entered into force 11 July 1984; 1363 U.N.T.S. 22, 18 I.L.M. 1434 (1979) [the MOON].

[15] The OST counts 112 States Parties; Status of International Agreements relating to activities in outer space as at 1 January 2022 A/AC.105/C.2/2022/CRP.10

[16] Dunk F., International Satellite Law, University of Nebraska Faculty Publications, 2019, p. 3

[17] It is proclaimed, *inter alia*, that the exploration and use of Outer Space shall be carried out for the benefit and in the interests of all and shall be the province of all mankind. The freedom of exploration and use is also enshrined as long as there is no appropriation and any activities are carried out for peaceful purposes only.

[18] Apart from the five UN space treaties there are also other sources of public international law, such as treaties in other areas of international law, as well as customary international law and general principles of law which have to be respected in the exploration and use of Outer Space. See the 'catalogue' of sources of public international law in Article 38, Statute of the ICJ, San Francisco, done 26 June 1945, *entered into force* 24 October 1945; 156 UNTS 77; USTS 993; 59 Stat. 1031; UKTS 1946 No. 67; ATS 1945 No. 1.

[19] G.A. Res. 56/83, Articles on States Responsibility for Internationally Wrongful Acts, U.N. GAOR, 56th Sess., Annex, A/RES/56/83 (2002) [hereinafter ARSIWA].

[20] Dunk F., Liability versus Responsibility in Space Law: Misconception or Misconstruction? University of Nebraska– Lincoln, Space and Telecommunications Law Program Faculty Publications 21 (1992), p. 367.

[21] This is done by means of enacting national space legislation. See Greek Law 4508/2017 (GG 200/A/22.12.2017).

In this context, although trade activities involving space objects are of purely commercial character, the above indirect state responsibility established under Article VI OST, raises the issue into a matter of public law and policy. Acquiring rights and obligations over artificial satellites, enabling the parties involved to participate in their operation for the exploration and use of Outer Space opens the door for the application of international space law. What is more, commercial contracts shall be in line with the general obligations imposed under the current corpus juris spatialis and States shall make sure that the general principles and limitations are respected and complied with.

Moreover, the OST and the LIAB introduce a special regime of liability for damages caused by space objects, which once again is vested upon States, and more specifically concerns "launching States". According to Articles I(b) and I(c) LIAB, the term "launching" includes attempted launching and refers to: i) a State which launches or procures the launching and ii) a State from whose territory or facility a space object is launched.[22] Procurement can be viewed as referring to the existence of political and/or financial interests in the launching process on behalf of a State, which for example triggers or controls the launch by placing a contract.[23] If one of these criteria applies, the State in question is considered liable with respect to a specific space object, even if built and operated exclusively by private entities.[24] In space law, liability is not linked to ownership, operation or effective control[25] and as required by the maxim "*once a launching state, always a launching state*", liability remains forever with the States involved in the launch. In practice, states usually avoid paying compensation by requiring private parties to exhibit an insurance policy as a common condition for the grant of licences.[26] These points are important to keep in mind since they also affect the content of commercial contracts and necessitate separate agreements in order to apportion and limit liabilities, as will be discussed in chapter A below.

In addition, Article VIII is very critical for our discussion as it refers to registration of space objects[27] and to concepts such as jurisdiction, control and ownership. To be more precise, the wording of the provision is as follows: "*A state party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space … is not affected by their presence in outer space*". The REG provides more concrete rules concerning registration and obliges a launching State to

[22] Liameti T., Responsibility and Liability in the Context of International Space Law at The Safia Blog, 27 Nov. 2020, https://thesafiablog.com/2020/11/27/state-responsibility-intnl-liability-in-space-law/

[23] Garner B. A., Black's Law Dictionary, 9th ed., Thomson Reuters (2009), p. 1327; Martin R.J., Legal Ramifications of the Uncontrolled Return of Space Objects to Earth, 45 J. Air L. & Comm. (1980), pp. 458, 471; Rothblatt M.A., International Liability of the United States for Space Shuttle Operations, 13 The International Lawyer 3 (1979), pp. 471-484.

[24] Under Article XII LIAB, States found liable have to pay full compensation for the damage suffered, so as to restore the claimant to the condition which would have existed if the damage had not occurred. Such provision is in line with the consequence of international liability as traditionally defined by general international law.

[25] Soucek A., Space Law Essentials, Volume I: Textbook, NWW 2016, p. 34.

[26] Lyall F. & Larsen P. B., Space Law: A Treatise, 2nd ed., Routledge, New York, USA 2018, p. 104.

[27] It shall be seen as a concretization of the UN General Assembly Resolution 1721 B (XVI) of 20 Dec. 1961, which functions as a legal basis for registering space objects for those States that have not yet ratified the REG.

register a space object in "*an appropriate registry which it shall maintain*" and to supply the UN Secretary General (SG) with information concerning the space object "*as soon as practicable*".

## Chapter A: Acquisition of rights with regard to international transactions involving artificial satellites.

The present Chapter will focus on the acquisition of rights over artificial satellites by means of entering into commercial transactions with a cross-border element. After providing a short overview of the relevant commercial rights, focusing on ownership and leasing, the author shall discuss the legal implications that arise from an international law perspective. Emphasis will be placed to international responsibility, liability for damages caused by space objects and jurisdiction and control over the operation of satellites. Specifically, it will be showcased that practices such as in-orbit transfers of ownership and leasing of spacecraft [28] have given rise to many questions regarding our traditional understanding of international space law and policy. The analysis will mainly center around the inherent fallacies of the registration and liability regimes, as established under the current international legal realm. Reference will also be made to potential regulatory hurdles that private operators may have to deal with in case they wish to acquire a satellite from another State, such as export control limitations and other authorization requirements aiming to ensure that States are protected both in terms of security but also regarding potential liability claims etc.

An effort will be made to propose possible and viable solutions to recalibrate the current space law regime so as to avoid complex contractual relationships and provide for more legal certainty. Establishing a clear regulatory framework would allow the commercial space sector to flourish via securing the rights, especially of private entities, in tangible space objects and allowing their respective States to perform their international obligations effectively.

### 1. Satellites as transferable goods

To begin with, artificial satellites are man-made machines that are launched into space and placed in orbit around the Earth or other celestial bodies.[29] Satellite systems are generally divided into space and terrestrial segments, the former usually having a payload and a so-called platform. The payload component is constituted of the technical equipment, performing the core objectives of the satellite, as well as of the transponders, the antenna and other subsystems critical for its operation. The platform, on the other hand, hosts elements that secure and support

[28] e.g. the sale of Canada's Anik CI and CII satellites to Argentina, in order for the latter to establish a temporary satellite system to comply with ITU timelines. The previous owner, Telesat Canada and the acquirer Argentinian corporation Paracom S.A. formed a joint venture put in charge of the operation of the Anik satellites. Paracomsat further leased transponder capacity to other regional and foreign enterprises. The satellites remained registered in Canada. Hermida J., Argentine Space Law and Policy XXI-II Ann. Air & Sp. L. (1996), p. 177.

[29] NASA website https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-a-satellite-k4.html

the operational component such as thermal control, electric power and propulsion.[30] The ground segment is used for the remote operation and control of the space component via telemetry and telecommand mechanisms, which operate via radio frequencies.[31] Man-made satellites come in many shapes and sizes and have different pieces of instruments on them to perform different functions and deliver a number of services (i.e. broadcasting, remote sensing, navigation, communications etc.). They are objects of monetary value, mainly deployed for profit and are widely used in modern business transactions.

As a matter of practice, satellites are usually purchased in the pre-construction stage. This means that satellite manufacturers often enter into contractual agreements with interested operators, whether public or private entities (or even international organizations), relating to the manufacture, testing and ground delivery of the said objects. The interested parties acquire property rights over the finished product usually before its launch for a number of practical reasons. In particular, payloads placed on satellites are custom-made to serve a specific purpose and may be efficient in performing only those functions.[32] Moreover, in order to transmit and receive signals, satellites need to use specific radio frequencies which are allocated at an international level by the ITU.[33] A particular orbital position is often closely linked with the functioning and commercial value of a satellite and has to be assigned and registered in advance by the competent national administration through a licensing procedure,[34] already at the pre-launch stage. It is expensive and, generally, commercially non-viable to relocate a satellite after it has been launched and placed into orbit so that it can provide different services.

Purchase and sale or lease and use of operational satellites in orbit are slowly becoming popular in the commercial space industry. In this case, the buyer purchases an already operational satellite, which meets their requirements. Undeniably, on-orbit transfer of satellites are possible when the successor intends to provide the exact same services as the previous operator, or when they intend to use the same orbital position and frequencies. The rapid growth of cross-border spatial transactions is expected to be further enhanced by the adoption of the Space Assets Protocol to the Cape Town Convention,[35] which facilitates asset-based financing

[30] Smith D.D. & Rothblatt M.A., Geostationary Platforms: Legal Estates in Space, 10 J. of Sp. L., 1 (1982), pp. 31-40.

[31] Satellites are equipped with radio stations i.e transmitters or receivers, including the accessory equipment necessary for carrying on a radiocommunication service, or a radio astronomy service. See the ITU Radio Regulations, 2020 ed contains the complete texts of the RR adopted by the World Radiocommunication Conference of 1995 (WRC-95) and reviewed by the subsequent World Radiocommunication Conferences: WRC-97 (Geneva, 1997), WRC-2000 (Istanbul, 2000), WRC-03 (Geneva, 2003), WRC-07 (Geneva, 2007), WRC-12 (Geneva, 2012), WRC-15 (Geneva, 2015) and WRC-19 (Sharm el-Sheik, 2019).

[32] Dasgupta U., On-Orbit Transfer of Satellites between States -Legal Issues- With Special Emphasis on Liability and Registration, 59 Proc. Int'l Inst. Space L. (2016), p. 641.

[33] According to Article 1 par. 2(a) of the Constitution and Convention of the International Telecommunications Union, *entered into force* Jul. 1, 1994, U.N.T.S. 1825, 1826.

[34] Dunk F., Legal Aspects of Satellite Communications, Mini Handbook, Space, Cyber, and Telecommunications Law Program Faculty Publications, J. Telecommunications and Broadcasting L. (2015) p. 14.

[35] Convention on International Interests in Mobile Equipment, 16 Nov. 2001, Senate Treaty Doc No 108-10, (Cape Town Convention); Protocol to The Convention On International Interests In Mobile Equipment On Matters Specific To Space Assets, signed Mar. 9, 2012 [hereinafter, Space Assets Protocol]

of high value mobile equipment[36] based on the registration of interests and the prioritization, protection and enforcement of rights over space-assets.[37] Sales and leases, repossession and assumption of control over satellite components under the Convention are expected to rise after launch, taking place in the form of remedies pursued by secured creditors.[38]

This study will focus on these exact cases whereby property rights are acquired in functional satellites while in-orbit and how such commercial agreements can be in line with the existing international space legal framework.[39]

## 2. Contractual agreements concerning property rights over satellites

According to the well-recognized principles of freedom of contract and the rights inherent in private property (i.e., the rights to enter freely into enforceable contracts on terms agreed to by the parties and to transfer property to whomever the owner wishes, on terms of his choosing), the parties involved in an international transaction wishing to transfer / acquire rights over artificial satellites shall enter into agreements that will be governed by any laws they may choose, or in lack thereof, by the law of the place of the habitual residence of the party that is required to effect the characteristic performance under the contract.[40] To clarify, the present analysis will not refer to the substantial rules that are used in contracts for the sales of goods and the transfer of associated rights. From an international private law perspective, the UN Convention on Contracts for the International Sale of Goods (CISG) aims to reduce obstacles to international trade, particularly those associated with choice of law issues, by creating modern substantive rules governing the rights and obligations of parties involved in cross-border sales.[41]

As stated above, Chapter A of this study will focus on the acquisition of proprietary rights over satellites, and more specifically on the transfer of ownership and leasing. To begin with, the said concepts are not a matter of public international law and this may very well

[36] Private investors are providing capital to companies that offer assets as collateral to guarantee repayment to the creditor. Luinaud M., The Case for Asset-Based Financing for the Space Sector, Via Satellite, Available at: https://interactive.satellitetoday.com/via/october-2021/the-case-for-asset-based-financing-for-the-space-sector/ [last accessed 30.10.2022].

[37] McPhillips R. et al., Comparative analysis of aircraft, rail and space international registries and their regulatory provisions, 5 Cape Town Convention Journal 29-67 (2016), p. 29.

[38] Note that, under the Protocol, space assets are not only satellites or parts thereof but also payloads such as transponders. The term also covers the tracking, telemetry and control (TT&C) including the encryption keys giving control over a satellite, allowing for their transfer to a creditor who may establish control and possess the space asset upon payment default. The broad definition illustrates the complexity of ownership schemes and other rights in space systems.

[39] See also Larsen P.B., Critical Issues in the UNIDROIT Draft Space Protocol, 46 Proc. on L. Outer Space 2, 4 (2003) explaining that the Space Assets Protocol is concerned with private law and with the protections of financiers who enter into private law contracts, whereas existing space law is primarily public law.

[40] Harmonised European conflict of laws rule set out in Article 4(2) of Regulation No. 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I).

[41] If we consider that several parties may own discrete parts of the satellite or different types of rights to one and single satellite or in case payloads belonging to one entity established in one jurisdiction are hosted on board a satellite owned by an entity established in another country, the situation becomes even more complex with regard to the applicable laws etc.

explain the reasons why the Space Treaties remain silent on this topic. How property is transferred and how private rights are established appears to have relevance in domestic legislation and therefore will not be discussed in this study. On the contrary, what is worth reviewing are the legal complexities that are induced by the state-centric approach of international space law and how such inconsistencies can be finely corrected to accommodate commercial developments.

In any case, the uniform conception of ownership in municipal law systems indicates that ownership mainly constitutes the owner's exclusive authority over its property.[42] From a civil law point of view, ownership denotes the bundle of rights allowing a legal or natural person to use (*usus*), manage, and enjoy property, including the right to convey it to others, collect its products (*fructus*) and dispose of it (*abusus*). Ownership implies the right to possess a thing, regardless of any actual or constructive control.

On the other hand, a lease agreement shall mean a contract by which the owner of a specific object grants to another the right to possess, use and enjoy the property for a specified period of time in exchange for periodic payment of a stipulated price."[43] Leases of capacity such as the lease of onboard transponders of satellites for the provision of telecommunication services are also possible and convey the right to control the use of the subsystem in question. The above proprietary rights entail above all the right to use and operate a satellite (or a subsystem) and are accompanied by specific obligations, too.[44]

### 3. The practice of in-orbit transfer of proprietary rights over satellites

As already stated, at the time the Space Treaties were drafted, the engagement of private companies in space activities was closer to fiction than reality. Satellites were mainly items of political prestige used for military purposes, owned and operated by governments. Therefore, practices like in-orbit transfers of ownership or leasing of satellites or parts thereof had neither been conceptualized nor regulated. In modern times though, satellites may serve as transferable assets. They may be owned and operated either by private entities or governmental authorities or even by international organizations.[45]

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[42] e.g. see Article 209 of the Russian Federation Civil Code: The Content of the Right of Ownership 1. The owner shall be entitled to the rights of possession, use and disposal of his property; Article 477 of Quebec's Civil Code: Ownership is the right that confers on a person direct, immediate, and exclusive authority over a thing. The owner of a thing may use, enjoy, and dispose of it within the limits and under the conditions established by the law.

[43] B.A. Garner, Black's Law Dictionary, 10th ed, Thomson Reuters (2014), p. 800.

[44] For example, owners and/or operators are responsible to ensure that the satellite is used for peaceful purposes, does not cause damage to another satellite in Space, does not generate debris etc.

[45] ESA owns a number of satellites providing different types of services ranging from telecommunications to earth observation, navigation services etc. ESA frequently contracts with private operators for the execution of its activities and programmes under its rigorous procurement regulations and in line with its industrial policy objectives set out in Article VII of its Convention and Annex V thereto. Article IV, Annex III of its Convention provides that: "the agency, acting on behalf of the participating states, shall be the owner of the satellites, space systems and other items produced under its programmes [..] Any transfer of ownership shall be decided on by the Council". See more information on ESA's missions here https://www.esa.int/ESA/Our_Missions

Although the existing legal framework makes no explicit reference to these concepts, it is generally accepted that transfer of ownership and/or leasing of space objects is permitted in view of the *"freedom of use of Outer Space"* principle, enshrined in Article I OST. The said principle encompasses activities of commercial nature that aim at the exploration and use of Outer Space whether conducted by governmental or private entities.[46] Besides, already since 2004, by means of Resolution 59/115,[47] there have been relevant discussions in the UNCOPUOS, and States have been called upon to voluntarily provide information related to their transfer of ownership practices,[48] thus recognizing them as legitimate and in line with the applicable framework.

Nevertheless, when ownership and/or operational control over a satellite is transferred to another entity, it becomes particularly difficult to associate treaty and statutory obligations with specific entities and accommodate such changes under the current legal realm.[49]

### *A. Transfer of operation and use between launching States*

From an international law perspective, the in-orbit transfer of ownership between "launching States"[50] presents no obstacles - at least with respect to registration and liability. Most prominently, only a launching State shall register a space object launched into Earth orbit or beyond, according to Article II(1) REG. Moreover, under Articles VII OST and II, III LIAB only the launching States shall bear liability for damages caused by space objects, as stated.

It follows that, since *"de-registration*" is not explicitly prohibited, the acquiring state may become a State of Registry,[51] as long as it qualifies as a launching State. As evidenced by the Hong Kong paradigm, this would not offer major difficulties. Indicatively, when Hong Kong reverted from the UK to China in 1997, satellites AsiaSat-1 and AsiaSat-2 were de-registered from the UK Registry and subsequently registered in the latter. China's status as an original launching State made the process easier and consequently, both states remained jointly and severally liable.[52] This example was a case of transfer of nationality of the owner from one country to another, but still serves as an important precedent showcasing that cross-border

[46] Marboe I., National space law in: F. Dunk, F. Tronchetti (Eds.), Handbook of Space Law, Edward Elgar Publishing, Cheltenham, UK, Northampton, MA, USA, 2015, p. 127 *et seq*.
[47] Application of the concept of the "launching State", UNGA A/RES/59/115, 59th session (2004).
[48] K. U. Schrogl, UN General Assembly Resolution Application of the Concept of the Launching State UNGA Res. 59/115 of 10 Dec. 2004 - Background and Main Features, 48 Proc. on L. Outer Space 347 (2005) p. 350.
[49] The majority of the views expressed under this section concerning the legal implications of on-orbit transfer of proprietary rights over satellites have been developed by the author in the context of her research for the presentation of the paper titled "Transfer of Ownership In-Orbit: Shaking the Status Quo and Recalibrating the Registration and Liability Regimes" 64 Proc. Int'l Inst. Space L. )2021(.
[50] Any reference to States shall also include natural or legal persons under their jurisdiction for the activities of which they qualify as responsible States under Article VI OST.
[51] Sundahl M. J., Legal status of spacecraft in: Jakhu R. S., Dempsey P. S. (Eds.), Routledge Handbook of Space Law, Routledge, New York, 2017, p. 46.
[52] Hermida J., Legal Basis for a National Space Legislation, Kluwer Academic Publishers, New York, Boston, Dordrecht, London, Moscow, 2004, p. 65.

transactions between launching States do not offer any major difficulties from an international space law point of view.

*B. Transfer to non-launching States; inconsistent state practice & implications*

Similarly, the space conventions do not preclude any state or private entity from purchasing and owning a space object which they did not launch.[53] As stated, the freedoms established under the OST allow space actors to engage in international transactions and acquire rights over space objects as soon as they comply with the general principles set out by the main treaties.

Contrary to what some scholars argue, state practice has shown that registration can also be performed by non-launching States, when the said States or their nationals assume ownership and the rights to control the operation of a satellite following a relevant transaction. This was exactly the case with respect to the former BSkyB satellite, Marcopolo-1, renamed Sirius-1, which was purchased by a Swedish entity from the UK in 1996. Although Sweden was not a launching State, it did register the satellite in its national registry in 1999 and notified the UNSG accordingly.[54] The UK on its part moved the satellite to its supplementary registry, but omitted to inform the UN of such change. When the satellite was moved to another orbit, the necessary additional information was furnished by Sweden, acting in its capacity as a new State of Registry.[55] However, oddly enough, when it was ultimately removed to a graveyard orbit, it was the UK that notified the UN instead.[56] Although this example showcases that registration can also be performed by a non-launching State as long as it has acquired a new satellite or perceives itself responsible for its operation, it is also evident that, ultimately, there is a degree of uncertainty with respect to other associated duties such as the obligation to notify the UNSG.

A number of other critical questions arise from the above practice such as the following: Does the fact that the UK, although it removed the satellite from its primary registry established under the REG, continued to provide critical information to the UNSG imply that it considers itself still responsible for its operation? And if so, would the UK be in fact capable of exercising supervision over the object considering that there is no factual connection whatsoever with the same? It is highly doubtful. It follows that when proprietary rights are transferred, certain

[53] Horl K. U., Gungaphul K., Problems related to "change of ownership" with respect to registration - The Industry View in: Hobe S., Schmidt-Tedd B., Schrogl K.U. (Eds.), Proc. of the Project 2001 Plus Workshop Current Issues in the Registration of Space Objects, Berlin, Germany, 2005, p. 75.

[54] ST/SG/SER.E/352: *Note Verbale* on behalf of Sweden, presenting a list of its registered objects since 1999, containing the satellite renamed Sirius-1, with a footnote stating that it was bought in-orbit in 1996. Notably, the initial name and owner of the satellite are not mentioned in the document nor is the UK.

[55] ST/SG/SER.E/377: *Note Verbale* on behalf of Sweden, notifying the UNSG of its relocation from one geostationary position to another. Notably, under Article IV (2) REG, each State of Registry "may, from time to time, provide the SG with additional information concerning the space object".

[56] ST/SG/SER.E/518: *Note Verbale* of 15 June 2007 from the UK as to the re-orbiting of the satellite Marcopolo-1. Although the UK had moved the satellite to its supplementary registry (meaning it did not consider itself to be a State of Registry under the REG anymore), it furnished relevant information in conformity with the REG.

obligations connected with it and the responsibility for the activity carried out by the satellite are transferred as well.[57]

Another interesting, yet alarming example of an in-orbit transfer of ownership was when Spot-7, a satellite launched in 2014 by a French company on an Indian launch vehicle, was shortly after handed over to Azerbaijan. Whichever state could have qualified as the appropriate *"launching State"* at the initial operation phase, no registration was ever made at the time.[58] This is mainly because Article VIII OST does not specify the consequences of non-registration nor does the REG. So, the question arises here whether in the complete absence of registration no state can be considered as retaining jurisdiction and control over the object and thus, being responsible for its operation? This is yet another argument why registration cannot constitute the sole factor for attributing responsibility to a certain State.

It becomes obvious that, due to the legal and practical flaws of the current registration system, there is a lack of uniformity in state practice. It remains unclear whether changes of supervision over space objects shall be communicated to the UNSG at all and, if so, by which State. This way, many satellites remain unregistered or critical information regarding their operation goes forever unnoticed, thus compromising the transparency the UN Registry is trying to achieve.[59] Not to mention also that a proper registration of space objects is a key factor in the safety and the long-term sustainability of space activities, and may serve as a stepping stone for the drafting and establishment of traffic rules that will facilitate collision avoidance and safe operation planning.

In response to this problem, there is a sophisticated tool, namely Resolution 62/101[60], which underlines *inter alia*, the importance of the responsible State under Article VI OST[61] in furnishing said additional information. For example, it is clearly stated in Recommendation No. 4 that in case of change of supervision over the activity undertaken by a certain object in orbit, the details of the new operator and/or owner shall be passed to the UNSG by the State of Registry in cooperation with the appropriate State. Similarly, any associated change of function and/or orbital position shall also be communicated. This statement makes it obvious that the actual information regarding the satellite is held by the State under whose jurisdiction the operation rights have been transferred. However, oddly enough, it is suggested that the said information shall be furnished by the State of the transferor (or else, the initial launching State in whose registry the space object is carried). However, the above recommendation does

[57] Kerrest A., Legal Aspects of Transfer of Ownership and Transfer of Activities, in: in: M. Hofmann, A. Loukakis (Eds.), Ownership of Satellites: 4th Luxembourg Workshop on Space and Satellite Communication Law, Nomos Verlagsgesellschaft and Hart Publishing, Germany)2017( pp .29–43 ,p .70.

[58] A/AC.105/INF/428, ST/SG/SER.E/797: Although the transfer took place in 2014, France registered the object in 2016, only to de-register it a few months later, when Azerbaijan became its State of Registry.

[59] According to the UNOOSA Online Index of Objects Launched into Outer Space, 10% of space objects are unregistered whereas 72 objects are currently registered in two states.

[60] Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects, 62nd session, 2007.

[61] The author submits that in cases of transfer of ownership, the responsible state is the state of the satellite owner and not necessarily the state that has registered the object.

underline the importance of the transferee State and could serve as an important point for the author's argument here below that the appropriate state to register a space object should be the one having *de facto* control over it. Considering also that such transfers are not communicated to the ITU either, furnishing additional information on a voluntary basis to the UNSG could also be used by the ITU to investigate whether the appropriate administration complies with the Radio Regulations (RR)[62] concerning a given satellite network.[63]

Moreover, the Space Assets Protocol also covers the registration of sales. By allowing such transactions to be recorded and made publicly available when the specific satellite is registered in the international registry it establishes (because there has been an interest on it), it provides for a certain level of international transparency[64] that might be lacking from the UN Registry, as per the above.

## 4. Reviewing and re-adjusting the registration regime

At this point, in order to better illustrate the complex legal problems that arise with respect to registration, jurisdiction and control, the following fictional example will be utilized. Supposing that Company A, which is incorporated in State B, has launched satellite X from the territory of State C. Both states are parties to the OST, the REG and the LIAB and maintain national registries of their space objects. State B has registered satellite X both on its national registry and with the UNSG. Three years after the launch, satellite X is purchased by Company D, incorporated in State E, which is also a party to the space treaties, but had no involvement in the satellite's launch. Based on the above, State E cannot register the object, thus resulting in the following paradox; the State of Registry, despite having *de jure* jurisdiction over the object, will not be the one having *de facto* control over it, and *vice versa*.

While unravelling the aforementioned paradox, the author will attempt to distinguish jurisdiction from registration and answer the question of who should be the *"appropriate State"* to register a satellite following a cross-border transfer of operations. As a general note, the appropriate state shall be determined on the basis of the generally accepted principles of international law, namely the state of incorporation of a private company and in whose territory it has its registered office[65] or the state of nationality of the natural person that has acquired rights over it.

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[62] Radio Regulations, 2020 ed contains the complete texts of the RR adopted by the World Radiocommunication Conference of 1995 (WRC-95) and reviewed by the subsequent World Radiocommunication Conferences: WRC-97 (Geneva, 1997), WRC-2000 (Istanbul, 2000), WRC-03 (Geneva, 2003), WRC-07 (Geneva, 2007), WRC-12 (Geneva, 2012), WRC-15 (Geneva, 2015) and WRC-19 (Sharm el-Sheik, 2019).

[63] Hofmann M., Dispute Settlement in the Area of Space Communication, 2nd Luxembourg Workshop on Space and Satellite Communication Law, Volume II, Nomos Publications and Hart Publishing (2015), p. 181. Notably, when ESA transferred Artemis satellite to Avanti, further info relevant to changes of orbital positions were also communicated to the ITU; see Note by the Secretariat of the COPUOS LS 46th session (Vienna 3-13 April 2006), practice of states and international organizations in registering space objects (A/AC.104/867)

[64] Exarchou G. E., Vastaroucha Y., Ageridou P. I., Griva I., Real-Time Challenges for the Registration Regime: Where to?, IAC-18,E7,IP,18,x46633, 69th IAC, 1-5 October, Bremen, Germany (2018), p. 4.

[65] Barcelona Traction, Light and Power Company (Belgium v Spain), 2nd Phase, ICJ Reports 1970, para. 70.

*A. Is registration the exclusive legal basis for jurisdiction?*

The prevailing view in legal literature supports that registration constitutes the sole criterion for determining international responsibility *via* - supposedly – generating jurisdiction and control.[66] Control, in the sense of Article VIII OST, refers both to a State's capability and right to adopt technical means in order to direct and monitor the operation of the space object and its mission[67] and shall be based on legitimate jurisdiction.[68] Control of the satellite's activity pertains to ensuring conformity with the rules established under the space law treaties but also with the ITU regime on allocation, allotment and assignment of radio frequencies and orbital slots.

Adding a slight twist in the aforesaid fictional scenario, suppose that satellite X has not been registered by either State and that the new owner has granted an international interest in the satellite to obtain a loan by Bank F. Following a collision in orbit, Company D goes bankrupt and defaults on the repayment of the loan. For the dispute arising between the debtor and the creditor emanating from the failure to repay and the disposal of the asset, it has been proposed that - when in orbit - the *lex domicilii debitoris* (i.e. the law of the country of the debtor, namely State E, which *de facto* controls the operation of the object) would apply.[69] This is an approach which links the issues related to the asset with the entities that have actual control over it and not with the original launching State which may not have anything to do with it anymore. On the other hand, from a public international law perspective - as it currently stands - State E would evade any international responsibility and liability for the damages incurred towards any other State following a collision just because it does not qualify as a launching State. Consequently, the two different situations regarding one and the same object would be treated differently.

On the other side, considering that the State of Registry would *in casu* remain unchanged, State B would continue being held responsible, despite not being in a position to issue or revoke a license, determine its requirements etc. In other words, State B would still be required to authorize and supervise the operation of the satellite, while lacking both jurisaction[70] over the operator and physical control over the object. However, pursuant to the

[66] Hobe S., Die rechtlichen Rahmenbedingungen der wirtschaftlichen Nutzung des Weltraums, Dunker & Humblot, Berlin, Germany, 1992, p. 158; Kayser V., An achievement of domestic law, XVII Annals of Air and Space Law 1991, p. 341.

[67] These technical measures include but are not limited to monitoring the activity, the position in orbit, the return to earth of the satellite, the receiving and sending of data, through ground (or space) based control stations, Lafferranderie G., Jurisdiction and Control of Space Objects and the Case of an International Intergovernmental Organisation (ESA), 54 German J. Air and Space L., pp. 228-242, pp.230-1.

[68] Tedd B. S., Mick S., Article VIII in: Hobe S., Schmidt-Tedd B., Schrogl K. U. (Eds.), Cologne Commentary on Space Law, Volume 1, Carl Haymanns Verlag, Cologne, 2009, p. 157.

[69] For the objects that are registered, and since special private international law rules for proprietary issues relating to space assets are absent, the *lex libri siti* (the law of the country where the asset is registered) may apply. This proposition seems to work for the assets that have been registered under the State that exercises the jurisdiction and control over them and can actually enforce its legislation.

[70] Prof. Bin Cheng has subdivided national jurisdiction in two elements; jurisfaction, which represents the normative element, denoting the power of a state to adopt valid and binding legal documents and jurisaction which

principle *impossibilium nulla obligatio est,*[71] this assertion would be considered absurd, as no state can be obliged to perform the impossible.

On the other hand, this in-orbit transfer of ownership entails the subsequent shift of factual control to the private operator incorporated in State E. Pursuant to Article VI OST *"States Parties shall bear international responsibility for national activities in Outer Space, whether such activities are carried on by governmental agencies or non-governmental entities"* and for assuring their conformity with the provisions set forth in the Treaty. Space law, which constitutes *lex specialis,*[72] exceptionally establishes direct responsibility for private space activities. What constitutes a national activity, though, shall be determined under the general principles of public international law,[73] which apply in space activities pursuant to Article III OST. Specifically, a state shall bear international responsibility for activities over which it exercises effective control, in light of the doctrine of jurisdiction.[74] Based on the principle of nationality, such activities also include those performed by its nationals.[75] Article VI OST should be read in conjunction with Article IX OST, which seems to support the interpretation of the term as *"activities carried out by nationals"*, evidently including private companies.[76] Accordingly, the operation of satellite X will constitute a *"national activity"* of State E. International responsibility will be vested with State E, in the sense of ensuring compliance with international law. Consequently, State E will be required to authorize and supervise the operation of the satellite and exercise legal control over it. Thus, in cases of transfer of proprietary rights there is a subsequent change in supervision requirements and this is one of the main reasons why commercial practices necessarily have an impact in the international rights and obligations of the States involved.

Overall, in a case like this, the link between the State of Registry and the responsible State, which is supposedly established by the REG, would be nullified.[77] That is why ownership and actual control shall function as stronger links between the object and the responsible State,

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enables a state to implement and enforce its laws and decisions; Cheng B., Studies in International Space Law, Oxford University Press Inc., New York (1997), p. 480 .

[71] Case concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay) (Judgement) 2010 I.C.J. 254 (Apr. 1), Judge Torres Bernandez dissenting opinion; 12 (2009); Fellmeth A., Hoewitz M., Guide to Latin in International Law, Oxford University Press, New York, USA, 2009, p. 122.

[72] Fragmentation of International Law: Difficulties arising from the diversification and expansion of international law, Report of the Study Group of the I.L.C, 58th Sess., A/CN.4/L.682, 68 (2006).

[73] Gerhard M., Article VI in: Hobe S., Schmidt-Tedd B., Schrogl K. U. (Eds.), Cologne Commentary on Space Law, Volume 1, Carl Haymanns Verlag, Cologne, 2009, p. 112.

[74] Dunk F., Public Space Law and Private Enterprise: The Fitness of International Space Law Instruments for Private Space Activities, Proceedings of the Project 2001 Workshop on Legal Issues of Privatizing Space Activities, IISL 4 (1998).

[75] Wirin W. B., Practical Implications of Launching State-Appropriate State Definitions, 37 Proc. on L. Outer Space 109, 1994; S. Gorove, Annals of Air and Space Law VIII (1984) p. 377.

[76] Dunk F., The Origins of Authorisation: Article VI of the Outer Space Treaty and International Space Law, Space, Cyber, and Telecommunications Law Program Faculty Publications 69 (2011), pp. 5-6.

[77] *Preamble* of the REG: "*Recalling* that 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 27 January 1967 affirms that States shall bear international responsibility for their national activities in Outer Space and refers to the State on whose registry an object launched into Outer Space is carried".

and should be used to identify the state exercising jurisdiction.[78] This is also confirmed by the use of the pronoun *"their"* in Article 12 of the MOON, which constitutes subsequent state practice and introduces the criterion of "ownership" as a legal link to exercise jurisdiction. This position is further supported by the wording *"shall retain jurisdiction and control"* of Article VIII OST, as it presupposes that the State of Registry *a fortiori* has jurisdiction over its spacecraft. Hence, registration shall constitute *prima facie* evidence of jurisdiction,[79] which derives from ownership and effective control,[80] and generates responsibility.

Lastly, registration has other purposes such as helping in the identification of the State to which a space object shall be returned. Article 5(3) ARRA observes that space objects found beyond the territorial limits of their launching authority shall be returned to or held at the disposal of its representatives. According to Article 6 ARRA, the term *"launching authority"* refers to the State responsible. Responsibility for the element rests with the State having jurisdiction and control over it.[81] As per the above analysis, the prevailing view is that jurisdiction is vested with the State of Registry. Therefore, in case there has been a transfer of ownership and the satellite for some reason is found in another state's territory, said object will have to be returned to the initial State of Registry, which will obviously not have any interest in obtaining possession of an object that does not belong to it. On the other hand, it would make more sense to hand it over to the State or private company which has obtained proprietary rights over it by means of a private contract. This is another example why permitting the transfer of registration will solve practical issues that will favor commercial transactions and lead into fair results.

### *B. The "appropriate state" to register the space object*

It follows that in case of transfer of operation rights, the State of the new owner (i.e. responsible State under VI OST) shall be the logical first candidate to register the object and subsequently, *"retain"* jurisdiction and control.[82] This is further supported by a closer look into Article II(2) REG, which in case of joint launches provides the possibility for separate agreements regarding jurisdiction and control and allows the States concerned to freely determine which one shall carry the object into their national registry.[83] As the wording of the provision suggests, registration is separated from jurisdiction and control[84] and cannot be considered the sole connecting factor with the responsible State.

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[78] Aoki S., In Search of the Current Legal Status of the Registration of Space Objects, IAC-10-E7.4.4, 61st International Astronautical Congress, 27 September - 1 October, 2010, Prague, Czech Republic, p. 11.

[79] Csabafi I. A., The Concept of State Jurisdiction in International Space Law: A Study in the Progressive Development of Space Law in the United Nations, Martinus Nijhoff, The Hague, Netherlands (1971), p. 109.

[80] Cheng B., The Commercial Development of Space: The Need for New Treaties, 19 J. Space L. 17 (1991) pp. 17-44, p. 35.

[81] Jenks C. W., Space Law, Stevens, London (1965), p. 236.

[82] Dunk F., The Illogical Line: Launching, Liability and Leasing, IISL.4.-93-845, 36 Proc. on L. Outer Space 349 (1993), p. 351.

[83] The most significant example being the 1998 Intergovernmental Agreement for the International Space Station, which in Article 22 establishes an exceptional criminal jurisdictional framework.

[84] Cheng B., Article VI of the 1967 Space Treaty Revisited: International Responsibility, National Activities and the Appropriate State, 26 J. Sp. L. 1 (1998), pp. 7-32, p. 28.

Likewise, an often-cited example that showcases that the act of registration is not necessarily the sole constitutive factor for jurisdiction and that states rather seem to exert jurisdiction based on effective control, is the in-orbit transfer of four INTELSAT satellites to New Skies Satellites, a company incorporated in the Netherlands. Interestingly, in a *note verbale* sent to the UNSG, the Netherlands asserted that it bears international responsibility for the operation of the four satellites under Article VI OST and has jurisdiction and control as per Article VIII OST,[85] as it is the national State of their new owner, recognizing at the same time that it does not qualify as a launching state. Notably, both the Netherlands and the UK maintain two national registries; one for the objects for which they are launching states and one for the objects over which they have jurisdiction and control without, however, qualifying as launching states.[86] By insisting on the idea that non-launching States cannot become states of registry at least under the REG[87] creates confusion and leads to practices such as the ones described above (i.e. creation of multiple registries) that complicates the situation and undermines the original purpose of the REG, which is no other than identifying the responsible state and creating a system of transparency that would provide for safety and security in Outer Space activities.

At the moment the space treaties were drafted, the act of launching a satellite in Outer Space was seen as the sole significant event justifying the creation of a legal link between a State and a space object.[88] This explains why it is only the launching States that can be considered as potential candidates for registering a space object. However, as showcased above, it is also through authorization and supervision of the operator that a State can potentially acquire a link to the space object. It is important that the REG evolves so as to accommodate this reality.

### *C. The need to establish a "genuine link"*

What is more, Article II REG unintentionally opens the door to the possibility of having the equivalent of *"flags of convenience"* in space.[89] The process of registration is of particular importance and is thoroughly designated not only in space law but also in other legal regimes, such as the law of the sea and air law. The purpose of registration remains the same for all three regimes; to identify the States which exercise effective jurisdiction and control over the vessels, aircrafts and space objects with regard to a higher degree of transparency and to enable the

[85] A/AC105/806, A/AC.105/824: Notes Verbales from The Netherlands; the UNOOSA registry displayed information in square brackets and highlighted them in green, the method OOSA uses to indicate that the data has not been officially provided under the REG.

[86] UK Space Agency, UK Registry of Outer Space Objects (May 2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/988206/UK_Registry_of_Space_Objects_May_2021.pdf; UK Supplementary Registry of Outer Space Objects (Oct. 2020), https://assets.Publishing.service.gov.uk/government/uploads/systEm/uploads/attAcHment_data/file/925089/UK_Supplementary_Registry_of_Space_Objects_-_October_2020.pdf (accessed: 25/09/2021).

[87] States can still register space objects under the General Assembly resolution 1721 B (XVI)

[88] A. Yokaris, International Law of Airspace and of Outer Space (in Greek) (Ant. N. Sakkoulas, 1996), p. 266

[89] Bin Cheng, Studies in International Space Law, Oxford University Press Inc., New York, 2004, p.485.

identification of the operators and their respective States for the purposes of grounding responsibility.[90]

A feature unique to the law of the sea concerns the existence of a *"genuine link"* between ships and states, in order for registration to be performed and nationality to be granted.[91] According to ITLOS, the *"genuine link"* concept aims at securing a "*more effective implementation of the duties of the flag State"*[92] in the sense that the latter shall remain under the obligation to exercise effective jurisdiction.[93] Absent an internationally accepted definition of what the *"genuine link"* principle should consist of, it has been suggested that a minimum national element is required, since a state can only effectively exercise control and jurisdiction over its ships, where there is in fact a relationship between the two other than that based on mere registration.[94] Despite the fact that states are entitled to determine when there is such a genuine link through their national legislation, it is internationally accepted that such link exists when the private entity under its jurisdiction has ownership of the vessel.

Similarly, it shall be underlined that as a matter of administrative practice in Belgium, the notification form for the purposes of both authorization and registration of space objects requires the identification of its owner.[95] This can be seen as an affirmation that Belgian licensing authorities do require a legal connection with the object proven by ownership.

Although such a requirement is not directly provided under the Chicago Convention 1944,[96] the purpose of an aircraft registration is identical to that articulated in maritime law, meaning the assurance of its conformity with the international and national provisions on air safety and navigation. State practice indicates that the *"genuine link"* principle shall also be satisfied in aircraft registration, as in most cases aircrafts are registered in the national state of their owner. Said principle operates to eliminate the use of flags of convenience.[97] The

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[90] *Preamble* of the REG: States shall bear international responsibility for their national activities in Outer Space and refers to the State on whose registry an object launched into Outer Space is carried; UNOOSA official website https://www.unoosa.org/oosa/en/aboutus/roles-responsibilities.html (accessed: 25.09.2021).

[91] Article 91(1) of the Law of the Sea Convention, entitled *"Nationality of Ship"*, indicates: *"Ships have the nationality of the State whose flag they are entitled to fly. There must exist a genuine link between the State and the ship.*"

[92] The M/V 'Saiga' (No. 2), St Vincent and the Grenadines v. Guinea, 1 July 1999, ITLOS, Reports 1999, p. 42, para. 83; Serdy A., Public International Law Aspects of Shipping Regulation in: Yvonne Baatz (Ed.), Maritime Law, third edition, Informa Law, New York, 2014, pp. 303-338, p. 318.

[93] The contents of effective jurisdiction specified in Article 94 include not only maintaining a register of ships and assuming jurisdiction on each ship flying its flag, its master, officers and crew concerning administrative, technical and social matters, but also taking measures to ensure safety at sea with regard to the construction and seaworthiness of ships, the manning of ships, labor conditions, training of crews and the maintenance of communications.

[94] Report of the ILC covering the work of its Seventh Session, Yearbook of the ILC, 1955-II, p. 22, UN Doc. A/2934.

[95] Mayence J. F., The relevance of the Concept of Ownership in Space Activities and their Regulation in: Ownership of Satellites, Hofmann M., Loukakis A. (eds. 2017), 4th Luxembourg Workshop on Space and Satellite Communication Law, Volume IX, Nomos Verlagsgesellschaft and Hart Publishing, Germany, p. 62-63.

[96] Chicago Convention on International Civil Aviation (adopted on 7th December 1944, entered into force on 4th April 1947), Ninth Edition 2006, ICAO Doc. 7300/9 [Hereinafter, CC].

[97] A "flag of convenience" is defined as *"the flag of any country allowing the registration of foreign-owned and foreign-controlled vessels under conditions which, for whatever the reasons, are convenient and opportune for*

development of said phenomenon and the subsequent discrepancy between registration and effective jurisdiction in space would compromise the expediency of States to maintain safety standards and would possibly induce a proliferation of space debris, and a threat to the safety of space activities.[98]

Although this does not pose a real threat to the space sector for the moment, the increasing commercialization of space activities in the context of a competitive space economy may result in an attempt to reduce costs by escaping legal requirements as to supervision and liability.[99] For example, operators may choose to relocate their seat to a State that does not have a comprehensive legal framework in place in order to avoid complex regulatory requirements and/or other tax-related obstacles. Admittedly, the present regulatory regime could possibly lead to the registration of space objects in countries less space-competent than others, thus creating flags of convenience.[100] This could easily happen mainly because the space treaties do not require that the State of Registry be the one which can showcase a real capacity to ensure that the operation of a satellite is in conformity with the international rules.

This is why the State responsible for the authorization and supervision of the space activity, which exercises its jurisdiction effectively and can ensure conformity with international obligations should be the ones that shall register the object. Indicatively, this concept has been embodied in the national legislation of the UK, which requires the existence of effective control over the space object in order to consider itself to be a procuring State and be able to register it. Specifically, if a UK national which has obtained a license does not have the effective control of the object due to the fact that it has transferred its operation to a foreign company, the UK seizes to regard itself a procuring State because it does not have a genuine link with the object anymore and as a result, cannot serve as its State of Registry either.[101]

*D. Proposals; recalibrating the registration regime*

Towards establishing a more uniform approach to transfers of ownership and operation to non-launching States, a possible first step could be the adoption of a resolution by consensus within COPUOS, urging the UNSG to accept changes of the State of Registry, so that the acquiring, non-launching State be able to perform registration.[102] This way, the State of the private party acquiring the rights over the satellite would be able to legally perform the functions of the State of Registry and assert jurisdiction based on actual control. However, it is indeed acknowledged by the author that reaching consensus is a time-consuming and quite

*the persons who are registering the vessels."* Boczek B. A., Flags of Convenience, An International Legal Study, Harvard University Press, Cambridge, Massachusetts, 1962, p. 8.

[98] Taghdir A., Flags of Convenience and the Commercial SpaceFlight Industry: The Inadequacy of Current International Law to Address the Opportune Registration of Space Vehicles in Flag States, 19 B.U. J. Sci. & Tech. L. (2013) pp.405-431, p. 420.

[99] Hermida J., Transfer of Satellites in Orbit: an International Law approach, 46 Proc. on L. Outer Space (2003) p. 191.

[100] Lyall F., Larsen P. B., Space Law: A Treatise, 2nd ed., Routledge, New York, USA 2018, p. 98.

[101] Aoki S., Nationality for Spacecraft? Revisited: Nationality to Be Found, 44 J. Space L. 373-404 (2020), p. 397.

[102] Kerrest A., Legal Aspects of Transfer of Ownership and Transfer of Activities, 55 Proc. Int'l Inst. Space L. 794 (2012), pp. 799-800.

uncertain process at this point. Besides, as a matter of fact, the UNSG has already accepted registration by non-launching States, as was the case with Sweden and Sirius-1. Although this might seem to be a *contra legem* solution at first glance, at least with respect to the provisions of the REG, it could be seen as an acceptable means for restoring the injustices that the current system creates. Besides, deploying an evolutionary interpretation of the term "launching State" could correct the inconsistencies and allow acquiring States to lawfully register the transferred satellites, accommodating commercial realities.

*a. Evolutionary interpretation of the term "launching State"*

In this context, many scholars propose the re-interpretation of the term *"launching State"*,[103] so as to allow the acquiring State to register the transferred object and also become directly liable under LIAB. According to Articles 31 and 32 VCLT,[104] "*a treaty shall be interpreted in the light of its object and purpose*",[105] and in such a manner so as to assure the *effet utile* of a provision.[106] Besides, as the I.C.J. stipulated in several occasions,[107] the meaning of a treaty's terms must be seen in the light of present-day conditions[108] and within the legal framework prevailing at the time of the interpretation.[109]

The ordinary meaning of the *"launching State"* is originally founded in four criteria. While three of these criteria are straightforward and closely connected with the launch activities, the fourth criterion, referring to the *"state procuring the launch"*, is more complex and open to interpretation. Absent an official definition, there is a common consensus that procurement entails an active involvement, in the sense of initiating, authorizing and financially contributing to the launch, as well as obtaining benefit from the launch,[110] and by extension, from the operation of the satellite. What is more, when the Space Treaties were drafted, only a limited number of space faring nations could have been involved (practically or financially) in the launch of a space object, for reasons of policy, security and prestige. The purpose of the space treaties through the inclusion of this fourth criterion was to assign the

[103] Chatzipanagiotis M., Registration of Space Objects and Transfer of Ownership in Orbit, 56 German J. Air and Space L. (2007), pp. 229-238, p. 235.
[104] Vienna Convention on the Law of Treaties, entered into force Jan. 27, 1980, 1155 U.N.T.S. 331 [hereinafter VCLT].
[105] Territorial Dispute (Libyan Arab Jamahiriya v. Chad) (Judgment) 1994 I.C.J. 21 (Feb. 3); M. E. Villiger, Commentary on the 1969 Vienna Convention on the Law of Treaties, Martinus Nijhoff, Leiden & Boston, 2009, p. 427.
[106] Question of the Delimitation of the Continental Shelf between Nicaragua and Colombia beyond 200 nautical miles from the Nicaragua Coast (Nicaragua v. Colombia) (Judgment) 2016 I.C.J 119 (March 17).
[107] Dispute regarding navigational and related rights (Costa Rica v. Nicaragua) (Judgment) 2009 I.C.J 242 (July 13), Aegean Sea Continental Shelf Case (Greece v. Turkey) (Judgment) 1976 I.C.J. 32 (Sept. 11), Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay) (Judgment) 2010 I.C.J 83 (Apr. 20), Case Concerning the Gabcikovo-Nagymaros Project.
[108] Loizidou v. Turkey (Preliminary Objections) 15318/89 [1995] ECHR 10 (23 March 1995), para 71.
[109] Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) (Advisory) 1971 I.C.J. 31 (June 21).
[110] Boeckstiegel K. H., The Terms "Appropriate State" and "Launching State" in the Space Treaties - Indicators of State Responsibility and Liability for State and Private Space Activities, 34 Proc. on L. Outer Space (1991) p. 13; Schmidt-Tedd B., Gerhard M., How to Adapt the Present Regime for Registration of Space Objects to New Developments in Space Applications, 48 Proc. on L. Outer Space 353 (2005) p. 359.

particular space activity to the appropriate State, as defined in Article VI OST, thus establishing a connection between on the one hand responsibility/liability, jurisdiction and control and ownership on the other.

It derives that, the state which has the strongest connection with the operation of the space object, even if that connection is established after the object has been launched, should also be included in the concept of the *"procuring State",* mainly because after the transfer of the object, the rights and obligations associated with its operation are also transferred to that State. Given the purpose of the Space Treaties, and according to a teleological interpretation thereof, the status of the launching State should not only be acquired at the moment of the launch, but may also be acquired later by the State that authorized and supervised its activity. Thus, the acquiring State would become a launching State, according to the REG and the LIAB. This would re-install the link between ownership and factual control with the legal obligations that arise under the applicable framework. Ex post involvement of a non-launching State to the operation of a space object is no more a novelty. International law needs a concrete method of attribution of rights when an already launched space object becomes subject of a cross-border transaction involving nationals of different States. Legal certainty implies that registration should be as accurate as possible. Therefore, *de lege ferenda*, the new State should be entitled to register the object as soon as the shift of control takes place.[111]

*b. Inter-state agreements on jurisdiction and control*

In any case, under Article II(2) REG, as already explained, certain jurisdictional rights may be transferred to states other than the State of Registry by means of special agreements. In this respect, States B and C, in our scenario, would have to conclude an agreement as the original launching States so as to allow the stipulation of jurisdictional rights to State E. Said agreement would be permitted both under customary and conventional international law;[112] As a principle and in accordance with Article 29 VCLT, international agreements only have an *inter partes* effect. Nevertheless, Article 34 VCLT provides that rights and responsibilities may be created for third parties as well, provided they so consent. Thus, State E in our example would have to enter into an agreement with both States B and C so as to officially acquire jurisdiction, without having to register the object. This solution seems unsatisfactory as it creates complex legal scenarios and perplexes the relations between the parties concerned. Despite the above, it is a legal tool that is used in practice quite often; tripartite agreements (i.e. between a launching state, the State of Registry and the transferee State) usually require the two latter states to hold the launching State harmless of any potential liability claims and to indemnify it in case it is called to pay damages. The latter on its part declares that it cedes its jurisdiction and acknowledges that legal control is transferred to the third State of the operator

[111] Dimopoulou A. Is the Launching State the Only "Appropriate State" to Register a Space Object? Change of Registry in Case of Change of Ownership in George D. Kyriakopoulos, Maria Manoli (eds.), The Space Treaties at Crossroads: Considerations de Lege Ferenda, Springer 2019, p. 106.
[112] Free Zones Case (France v. Switzerland) (Judgement), 1932, P.C.I.J. para. 97.

/ owner,[113] following the transfer of technical capabilities. This has been the case for example with regard to ESA's practice with the Artemis satellite.[114]

Adding to that, there are many scholars who support that the above-mentioned agreements can only be concluded between launching States. In order to resolve the practical implications of said assertion, amendments similar to Article 83*bis* CC could be adopted to facilitate the conclusion of agreements on the transfer of jurisdictional rights over space objects. Specifically, the concept of *"transfer of control"* is well known to the aviation industry, whereby aircrafts are leased or operated under charter or similar arrangements by airlines, whose principal place of business is in a state other than the State of Registry.[115] In such cases, it is recognized that the latter may be unable to fulfill its responsibilities, such as ensuring compliance with the rules of the air as per Article 12 CC. To resolve this issue and ensure aviation safety, Article 83*bis* CC was adopted in order to encourage the State of the Operator to enter into bilateral agreements with the State of Registry so that the latter may be relieved of its responsibilities with respect to the functions and duties transferred.[116] The aim is to ensure that the state which is in a better position to control the aircraft will bear the corresponding duties.[117] The view has been expressed that it is lawful to transfer registration to a non-launching State as soon as all launching States agree to such transfer.[118] However, let it also be underlined that it might be the case that the States involved do not wish to alter the legal status of the object, for example in case the technical control by a foreign operator is agreed to be transferred for a short period only.[119]

### 5. The perpetual liability of the launching State

According to Articles VII OST and the LIAB states are internationally liable for damages caused by their space objects, as long as they qualify as launching States. The existing legal framework imposes a strong connection between the duty to compensate for damages and the launching phase, as the concept of the "*launching State*" is solely determined at the time of

[113] Thomas I., M., Transfer of satellites in orbit: the ESA experience in: Ownership of Satellites, Hofmann M., Loukakis A. (eds. 2017), 4th Luxembourg Workshop on Space and Satellite Communication Law, Volume IX, Nomos Verlagsgesellschaft and Hart Publishing, Germany (2017), p. 101.

[114] Upon its end of mission, it was decided to prolong its lifetime and to be transferred to a private entity to continue providing services. ESA organized an open Invitation to Tender and Artemis was transferred to Avanti, incorporated under the laws of England. A resolution by the Council was adopted to pass the ownership and all MS of ESA agreed to dispose of it. The Res addressed also the liability issues given that ESA remained a launching State and the UK was acknowledged to bear international responsibility.

[115] In air law, aircrafts acquire the nationality of the state in which they are registered under Article 17 CC.

[116] Abeyratne R., Convention on International Civil Aviation A Commentary, Springer, New York, Dordrecht, London, 2014, pp. 272-273. In any case, under Article 18 CC, registration of an aircraft can also be changed to another State.

[117] Coglianti-Bantz V. P., Disentangling the genuine link: Enquiries in sea, air and space law, 79 Nordic J. Int'l L. 3 (2010) pp. 383-432, p. 422.

[118] Horl K. U., Hermida J., Change of Ownership, Change of Registry? Which Objects To Register, What Data To Be Furnished, When, and Until When?, in: Lyall F. & Larsen P.B. (eds.), Space Law (2007) pp. 266-67.

[119] Chatzipanagiotis M., Using Space Objects in Orbit as Transaction Objects: Issues of Liability and Registration *de lege lata* and *de lege ferenda* in: Kyriakopoulos G., Manoli M. (eds.), The Space Treaties at Crossroads: Considerations de Lege Ferenda, Springer (2019) p. 92.

the launch.[120] However, the perpetuity of state liability places significant limitations to the future of spatial transactions, as it induces inefficient and unjust results. To note that the increase in sales and leases due to the adoption of the Space Assets Protocol, as stated, will create more situations in which the launching state loses control over the space object (or loses control, by way of loss of jurisdiction, over the entity that controls the space object), thus making more distinct the disconnection between, *inter alia*, the existing liability regime and the realities and needs of the commercial space industry.[121]

### *A. Liability established through Responsibility*

In the context of a transfer of ownership/operation in-orbit, the initial launching States would remain perpetually liable for damages caused by a space object, pursuant to Articles II and III LIAB, irrespective of the fact that they may not have the capacity and the means to control its operation and properly exercise jurisdiction over it.[122] On the contrary, the acquiring state, having *de facto* control over the satellite, would not be considered liable under these provisions, merely due to its lack of involvement in the satellite's launch and delivery into orbit, at least under the provisions of the Space Treaties.

In the aforesaid example of the in-orbit transfer of ownership of the four INTELSAT satellites, although the Netherlands accepted responsibility and jurisdiction over the satellite, only the initial launching States continued to bear international liability under the Space Treaties. This constitutes a logical anomaly. In any event, the Netherlands may be considered liable pursuant to the general principles of public international law. Customary international law on State responsibility,[123] as reflected to a large extent in the ARSIWA, is directly applicable in space law as per Article III OST. Particularly, Articles 1, 2 and 12 ARSIWA provide that internationally wrongful acts of a State which constitute violations of international obligations and are attributable to it, entail the international responsibility of said State.[124] As aforementioned, Article VI OST prescribes that States Parties shall bear international responsibility for *"national activities"*, hence space-faring states become directly responsible in case one of their nationals violates their international obligations. In addition, Article 31 ARSIWA obliges the responsible State to compensate for injuries caused by its wrongful act,[125] irrespective of fault. Article VI OST does not provide for damage reparation. Therefore, this aspect is covered by the relevant customary norms enshrined in the ARSIWA. It becomes clear

[120] Armel Kerrest, National Space Legislation - Crafting Legal Engines for the Growth of Space Activities, 53 Proc. on L. Outer Space, 551- (2010) p. 556.
[121] Sundahl M. J., The Cape Town Convention and the Law of Outer Space: Five Scenarios, 3 Cape Town Convention J. 109 (2014), p. 114.
[122] *Supra note* 104, p. 230.
[123] Noble Ventures, Inc. case (U.S. v. Romania), ICSID Case No. ARB/01/11, 69 (2005).
[124] United States Diplomatic and Consular Staff in Tehran (Judgment) 1980 I.C.J. 29 (May 24); Phosphates in Morocco (Italy v. France) (Judgment) 1938, P.C.I.J. 28 (ser. A/B), No. 74 (Jun. 14); Case Concerning the Gabčikovo-Nagymaros Project (Hungary v. Slovakia) (Judgment) 1997 I.C.J. 38 (Sep. 25); Dickson Car Wheel Company (U.S.A. v. United Mexican States), 1931, IV R.I.A.A. 678.
[125] Chorzów Factory (Germany v. Poland) (Merits) 1928 P.C.I.J. 21 (ser. A), No. 9 (Sep. 13).

that these provisions establish liability through responsibility.[126] Thus, in the aforesaid example, the Netherlands would bear liability pursuant to the ARSIWA, provided that the necessary preconditions were fulfilled.

### *B. The deconstruction of the axiom "once a launching state, always liable"*

The idea that *"once a launching State, always a launching State"* can once again be explained if we have a look at the circumstances prevailing at the time the Space Treaties were drafted; the states involved in space activities would usually own the launch facilities, launch vehicles, spacecrafts and payloads and would have the exclusive capacity to control their operation. Since the purpose of the LIAB was to establish a victim-oriented system, considering the ultra-hazardous nature of Outer Space,[127] it was logical to expect those states to remain liable throughout the satellite's lifetime. At the time, the States having procured the launching of a space object would normally continue being in control of its operation afterwards. Therefore, in case the said object would later cause damage, it would make sense to require the state responsible for its operation to pay compensation. However, as demonstrated above, in the present commercial reality the state responsible for the authorization and supervision of the satellite's operation can very well change, following a transfer of ownership in-orbit or leasing and use of a satellite by another entity. In that case, since the State of the transferor does not possess the legal and technical means to practically surveil the location and parameters of the object's operation and would normally not have the information needed even when there is a risk of collision or reentry, holding it still responsible and liable for potential damages caused by that same object would neither be rational nor fair.

### *C. Reinstalling the link between responsibility and liability*

In order to overcome said limitations, it has been suggested that the life of a satellite shall be divided into two distinct phases; launch and operation.[128] The current regime of absolute liability serves the launch phase sufficiently, as all launching States are liable for potential damage due to their involvement in the launch. However, during the operation and disposal phase, the liable state should be equated to the state having the operational control of the satellite, so as to re-install the link of the duty to compensate for damages to the actor actually causing that damage (due to intentional or reckless conduct).[129]

However, it shall be noted that underpinning the State that has actual control over a satellite is not an easy task. The operation of a space object is a complex undertaking that may sometimes involve multiple institutions. An analogy could be drawn between a satellite and an

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[126] Boyle A. E., *State Responsibility and International Liability for Injurious Consequences of Acts not Prohibited by International Law: A Necessary Distinction?*, 39 INT. COMP. L. QUARTERLY 9 (1990).
[127] Smith L. J., Kerrest A., Preamble in: Hobe S., Schmidt-Tedd B., Schrogl K. U. (Eds.), Cologne Commentary on Space Law, Volume II, Carl Haymanns Verlag, Cologne, 2013, p. 100.
[128] Lee R. J., Effects of Satellite Ownership Transfers on the Liability of the Launching States, 43 Proc. on L. Outer Space 148 (2000) p. 153. The author actually suggests the division into three phases including end-of-mission and return of the object concerned.
[129] Supra note 82, pp. 350, 352, 356.

autonomous car operated by distance in order to understand the complexity of the subsystems involved in their operation.[130] Imagine for example that the driver steers the car remotely after receiving relevant information from the onboard computers and its surveillance systems through a radio telecommunications link (telemetry). The car may also have a special payload e.g. firefighting equipment operated by another entity via a separate communication system. Coordination between the different persons operating the subsystem relevant to the motion of the car and the special equipment would be required to fulfil a common mission. Likewise, satellite communications systems may be operated and controlled by different entities. Which one should be considered to be in actual control of the object remains a difficult question. Besides, with the advent of new technologies, satellite ownership has become very fragmented, as legal interests and rights may be separated with respect to the different satellite subsystems. For example, transponders may be leased, assigned, sold to another entity while the operational component of a satellite may belong to another entity. In that scenario, which player should be considered as the one being in actual control so that the different treaty obligations could be associated with it? National space laws could serve to clarify such issues by including a definition of the term "actual control". Luxembourg's recently adopted national law on space activities[131] defines it in Article 4 as "*the authority exercised over the activation of the means of control or telecommand and, where appropriate, the associated monitoring devices, required for the execution of the launch, flight operation or guidance activities of one or more space objects."*

Besides, Article III LIAB establishes liability based on fault for damages caused in orbit. In this context, it would be impossible to prove fault on behalf of a launching State having transferred control over its space object. In spite of the fact that the liability system aims at securing the rights of potential victims by ensuring that they would receive proper compensation for the damages suffered, by failing to designate the State of the new owner as a liable state, it ultimately leaves potential victims completely unprotected. The aforesaid proposal of reinstalling the link between responsibility and liability could only be accomplished by means of an amendment, which however is not feasible due to the demonstrated reluctance of States to do so.[132] At any rate, it is noteworthy that under the general rules of state responsibility the responsible state would be required to pay for the damages caused by its failure to ensure compliance with international space law.

In order to facilitate the applicability of the LIAB without requiring a reconstruction of the whole system, the re-interpretation of the term *"launching state",* as analysed above, could serve perfectly so as to correct the unjust results that the current system creates.

### *D. Bilateral agreements between the transferor and the transferee state*

[130] Kaiser M. M., The Geostationary Ring: Practice and Law, Nijhoff/ Brill, Leiden (2020).
[131] Loi du 15 décembre 2020 portant sur les activités spatiales. English version here https://space-agency.public.lu/en/agency/legal-framework/Lawspaceactivities.html
[132] Gerhard M., Transfer of Operation and Control with Respect to Space Objects - Problems of Responsibility and Liability of States, German J. Air and Space L. (2002) p. 571; Kerrest A., Remarks on the Notion of Launching State, 42 Proc. on L. Outer Space 308 (1999) p. 309.

In practice, states enter into bilateral agreements as a form of guarantee to the transferor State in order to address the issue of perpetual liability and to avoid paying compensation for a damage they did not cause. Accordingly, the transferee State undertakes the obligation to compensate the victim, or alternatively to indemnify the transferor State in case of claims raised against it. Although this might indeed be a solution, it induces a very complicated system that hampers commercial activities and leads to a fragmentation of space law.

In order to conclude said agreements, states by means of enacting national legislation, often require the involvement of the transferee's national licensing authority, so as to guarantee that the original liable state will be exempted from its obligation to pay compensation for damages. This possibility has been recognized in point 8 of Resolution 68/74[133] and is provided for example under the national laws of the UK, the USA and Australia.[134] Moreover, Luxembourg's law states in Article 12 that any transfer of space activities that have been authorized or of real or personal rights, including guarantee rights, involving the transfer of actual control over the object shall only be effective following an authorization by the competent Minister. There is an additional requirement in case of cross-border transactions, whereby the Minister shall refuse to authorize the transfer in the absence of a special agreement with the State of which the transferee operator is a national or which has international liability for the space activities thereof and which guarantees the Luxembourg State against any recourse brought against it on account of its international liability, under the current regime and its qualification as a launching, State or for compensation paid for losses or damages. Furthermore, it is also common to include a relevant clause in the initial license, whereby the private entity will be required *a priori* to ensure that the transferee's state will enter into bilateral negotiations with the transferor state and accept to indemnify the latter in case of damage being caused by the transferred object. Provided that the state of the transferee has enacted a comprehensive national legislation, requiring the obtainment of private insurance by the operator, this agreement shall not constitute an additional burden for that state.[135]

On the one hand, this way the purpose of the LIAB is not altered and the victim is even better protected, as the number of the liable states is increased by one.[136] The original launching State continues to be liable, but it can have recourse to the transferee State in case the victim turns against the first one.[137] However, in practice entering into bilateral agreements is time

[133]Recommendations on national legislation relevant to the peaceful exploration and use of Outer Space, A/RES/68/74, 68th sess: 2013-2014.

[134] Section 6 of the UK Outer Space Act. Section 7 of the US Commercial Space Launch Act. Sections 22, 31, 38 of the Australian Space Activities Bill and Sections 2.08, 3.05, 3.06 and 4.05 of the Australian Space Activities Regulations.

[135]M. Chatzipanagiotis, Registration of Space Objects and Transfer of Ownership in Orbit, 56 German J. Air and Space L. )2007( ,pp .229-238 ,p .234.

[136] A. Kerrest, Legal Aspects of Transfer of Ownership and Transfer of Activities, 55 Proc. Int'l Inst. Space L. 794 (2012), p. 800.

[137] According to Article V LIAB, the launching states may include agreements regarding the apportioning among themselves of the financial obligation in respect of which they are jointly and severally liable. Such agreements shall be without prejudice to the right of a State sustaining damage to seek the entire compensation due from any or all of the launching states.

consuming and directly affects the transaction in question. Moreover, it does not have the opposability against any third State which may have suffered damage, since every agreement is binding only upon the parties to it pursuant to Article 26 VCLT. Besides, although the transferee state took the final burden of liability, the transferor -and original launching- State is the one which shall compensate the victims in the first place.[138] Moreover, such agreements usually remain confidential and cannot be assessed *a priori*.[139] Plus, it becomes more complex for private operators to negotiate such perplex agreements or know the respective national laws of each state, sometimes even leading to increased costs.

## 6. Additional licenses and authorization requirements

As a final note, except for the above authorizations that may be required for the transfer of rights for reasons of limiting a launching state's liability and ensuring that jurisdiction may be legitimately exercised by the State of the satellite's owner, other licenses and administrative approvals may be required prior to the execution of a transfer agreement.

### *A. Export controls regulations for dual-use items*

At this point it would be also useful to note that, in practice, the exercise of satellite ownership rights is often limited by export controls based on national security considerations.[140] The right to use at will and transfer the object in question, inherent in private ownership, may be restricted as a result of the applicability of national and international regulations[141] aiming at export limitations of military or "dual use" strategic goods and related technologies, including space technology.[142] For example, according to US national export control regulations,[143] transferring by a natural or legal person established in the US of registration, control or ownership of a spacecraft subject to the Export Administration Regulations (EAR)[144] to a person in or a national of any other country, is subject to authorization. To note that the present study does not intend to provide a comprehensive overview of the export control rules that exist at a regional and international level, but merely highlights the potential hurdles that private operators wishing to acquire a new satellite are

[138] Watanabe A., The Possible Liability of the State Which Does Not Fall within the Concept of the Launching State, 59 Proc. Int'l Inst. Space L. 141 (2016), p. 143.
[139] Dunk F., Transfer of Ownership in Orbit: From Fiction to Problem, in: M. Hofmann, A. Loukakis (Eds.), Ownership of Satellites: 4th Luxembourg Workshop on Space and Satellite Communication Law, Nomos Verlagsgesellschaft and Hart Publishing, Germany (2017) pp. 29–43, p. 37.
[140] To note that such security considerations also constitute lawful exceptions that allow limitation of trade under Article XXI of the WTO General Agreement on Tariffs and Trade (GATT).
[141] See also the Wassenaar Agreement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies which aims to promote "greater responsibility" among its 41 participating States in exports of weapons and dual-use goods and to prevent "destabilizing accumulations."
[142] Mineiro M., Space Technology Export Controls and International Cooperation in Outer Space, Springer Science & Business Media (2011)
[143] 15 CFR § 734.13.
[144] The US EAR, 15 CFR Parts 730-774, which implements the Export Administration Act ("EAA"), 50 USCA app. § 2401, et. seq., process controls items and technologies considered to be "dual use", meaning applicable to commercial or military use. These items are detailed under the Commerce Control List. The vast majority of commercial spacecraft and components fall under the scope of the EAR and are thus subject to restrictions.

likely to face. This is due to the fact that satellites qualify as dual use items always subject to some restrictions when it comes to their cross-border movement.

At a regional level, EU Regulation (EU) 2021/821 on export controls also includes satellites in the list of dual use items which shall be subject to authorization before transferred to a third state outside the EU. Although it could be arguably claimed that in case of in-orbit transfers, there is basically no act of exportation in the sense of Article 2(a) of the said Regulation,[145] as the goods are not physically transferred outside the customs union territory, it should be accepted that the relevant rules are applicable by analogy. In fact, commodities, equipment, associated rights and technical operational capabilities are handed over to an entity outside the Customs Union. Besides, under item 9A004 of the Regulation's list, terrestrial equipment specially designed for "spacecraft",[146] including telemetry and telecommand equipment are also considered as dual-use items subject to restrictions and authorization.

*B. Rights to use radio frequencies and associated orbital slots*

In-orbit sales and acquisition of rights to use satellites after they have been launched and put into operation under the filing of another administration have also been accepted as a modern practice by the ITU. Specifically, it was recognized by WRC-12,[147] which observed that "*an administration can bring into use, or continue the use of, frequency assignments for one of its satellite networks by using a space station which is under the responsibility of another administration, provided that this latter administration or intergovernmental organization, after having been informed, does not object, within 90 days from the day of receipt of the information, to the use of this space station for such purposes.*"

It follows from the above that there is no transfer of filling under the ITU regime. On the contrary, the responsible administration to make sure that the radio station onboard a satellite complies with the ITU RR[148] and does not cause harmful interference remains the initial one that concluded the assignment of radiofrequency rights and registered the satellite network. The ITU does not delve into the matter, as commercial aspects of the use of the radiofrequency spectrum are not covered by its terms of reference. [149]

[145] According to Article 2(a) an export means a procedure within the meaning of Article 269 of the Union Customs Code; the latter provides that "Union goods to be taken out of the customs territory of the Union shall be placed under the export procedure."
[146] Regulation (EU) 2021/821 of the European Parliament and of the Council of 20 May 2021 setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items (OJ L 206, 11.6.2021, pp. 1–461).
[147] Document CMR12/554 No. 3.12, Minutes of the 13th Plenary of the WRC-12.
[148] Administration means any governmental department or service responsible for discharging the obligations undertaken in the Constitution and the Convention of the ITU and in the Administrative Regulations (No. 1.2, Section I, Article I, Radio Regulations of the ITU).
[149] No. 4.7.1 & 4.7.2, Report by the RR Board to WRC-15 on Res 80 (Rev.WRC-07).

On several occasions, intergovernmental satellite telecommunication organizations (e.g. Intersputnik)[150] have requested the ITU Bureau to make a change in their notifying administration.[151] In order to clarify the conditions under which the Bureau can effect such a change and update its various databases, the Board has concluded that there must be a written notification by the legal representative of the IGO in question which shall include evidence of agreement from the newly named administration to undertake this role. A similar approach and solution could be followed in cases where satellites are sold while in orbit to another country or to its nationals. In such a scenario, it should be possible for the new administration under whose jurisdiction the acquiring operator is based to become the notifying responsible administration.

As already explained, for the conclusion of such complex business transactions, highly sophisticated contracts are being drafted whereby the parties involved clarify their rights and obligations. Notably, in the case of ESA's transfer of the Artemis satellite, it was accepted by all national administrations of ESA Member States that the French authority which had been administering the frequencies on behalf and in the name of ESA for the operation of Artemis,[152] would transfer as well the said rights and obligations to the country of the new owner. Following such change, notification was made to the ITU, respectively. The selling state in order to authorize such a practice will most probably require that the new owner respects the requirements as established under the filing and that its respective administration has a proper supervision mechanism in place as is the case with other international law obligations, as explained in the above analysis.

## 7. Conclusion

It is obvious that the existing legal regime concerning registration and liability suffers from serious inconsistencies. The practice of transferring ownership and the subsequent shift of control -especially to non-launching States- reveals legal *lacunae* and raises questions on the competency of the existing national and international legal frameworks to regulate this complex commercial reality. In this context, it is more critical than ever to reconsider the registration and liability regimes, so as to facilitate commercial developments. In any case, finding a pragmatic solution, while considering both the interests of potential victims and the needs of the private space industry, is imperative.

[150] Intersputnik grants to outside partners the right to operate a satellite and earth stations using its own radio-frequency spectrum, while itself remaining fully responsible for their operation in compliance with the ITU RR; Morozova, E. Legal Regulation of the Commercial Use of the Radio-Frequency Spectrum, 58 Proc. Int'l Inst. Space L. (2015).

[151] See the ITU Circular Letter CCRR/42 issued on 4 April 2011 on rules concerning the treatment of change of notifying administration which acts as the notifying administration of a satellite network on behalf of a group of named administrations.

[152] ESA is not a Member of the ITU. On the other hand, ESA has ratified the REG and the LIAB by means of a Declaration of Acceptance of the Astronauts Agreement, the Liability Convention and the Registration Convention (adopted by the ESA Council on 12 December 1978, deposited on 2 January 1979).

As deduced from the previous analysis, registration shall function mainly as proof of attribution to a particular state of the rights and duties with regards to a space object. The ownership test and the criterion of *"actual control"* could instead enable a more effective application of the registration system and serve as a more solid foundation for responsibility and liability to arise. The author supports the idea that there is no need for fundamental changes, but rather for a more unified approach on the matter, as in the absence of a comprehensive international legal framework, private operators are inevitably exposed to different regimes and requirements. At any rate, it has become clear that individual rights over space objects are not complete without associated authorizations, licenses and other regulatory requirements. In this context, their transfer to third parties is often subject to conditions and they are not reassigned automatically following usual private law mechanisms.

## Chapter B: Dispute settlement with regard to international transactions involving artificial satellites

Chapter B of this study will discuss the available mechanisms under the current international legal framework for resolving legal disputes, arising from commercial spatial transactions, ranging from contractual disputes to investment disputes, and disputes over harmful frequency interference.[153] In view of the New Space era and the proliferation of the actors involved in space activities, the possibility of disputes increases on an unprecedented scale[154] and the available law mechanisms for resolving them are becoming less effective in light of the complex commercial reality.[155] Space-related disputes also include matters concerning the application and interpretation of the space law treaties and the ITU RR.

After referring to the general public international law mechanisms, which are only available to State actors, the author shall discuss in more detail the procedure of international arbitration which seems to be the most suitable mechanism for the resolution of modern space-related disagreements. In the past, satellite disputes that gave rise to international arbitrations have for example arisen out of delivery of defective satellites already in orbit, the lease of satellite capacity, the right to orbital positions and frequency bands, export control and the cancellation of space contracts.[156] International arbitration offers the necessary tools as long as there is enough expertise that would take into consideration the needs and interests of the industry players involved. As a final note, the role of the ITU and the potential for creating a

[153] Harmful interference is described in the ITU RR (RR1.166 to RR1.169) as any interference that may endanger the functioning of a radio navigation service or of other safety services or *seriously degrade, obstruct, or repeatedly interrupt a radiocommunication service* operating in accordance with the RR.

[154] Boeckstiegel K. H., Settlement of Disputes Regarding Space Activities, 21 J. Space L. 1, p. 8. The author expresses the opinion that dispute settlement plays a greater role for private enterprises than for state institutions, because the former do not have available diplomatic and political means and rely much more on calculating the exposure to costs and risk on the fulfillment of contractual obligations. Thus, offering comprehensive mechanisms to secure their rights will result in increased activity and allow the sector to expand.

[155] Williams M., Dispute resolution regarding space activities in: F. Dunk, F. Tronchetti (Eds.), Handbook of Space Law, Edward Elgar Publishing, Cheltenham, UK, Northampton, MA, USA, 2015, p. 995.

[156] Frohloff J., Arbitration in Space Disputes, Oxford University Press, 35 Arbitration International 3, 2019, pp. 309–329.

specialized tribunal competent to adjudicate certain disputes relating to radio frequency assignments will be discussed.

### 1. Definition of the term *"disputes relating to space activities"*

Before proceeding with the main analysis, the meaning of the term "dispute" should be explained. In short, its constituent element is the existence of conflicting claims or rights between two or more subjects, or as defined by the PCIJ "a dispute is a disagreement on a point of law or fact, a conflict of legal views or of interests".[157] Moreover, a dispute may be characterized as "relating to space", not only when it derives from an event actually occurring in space (i.e satellite collisions), but also when it is generally linked to a space business.[158] Thus, any dispute arising either from contractual agreements concerning the acquisition of rights over satellites or from the application and interpretation of international and national space legislation shall be included under the umbrella term "space-related disputes" and shall fall under the subject of this chapter.

### 2. Dispute resolution mechanisms under the UN Space Treaties

It is true that the drafters of the international space law treaties had not foreseen the rapid technological progress in its proper dimensions and their original intention was to set general principles for the peaceful exploration and use of Outer Space. The majority of the delegations to the UN COPUOS were reluctant to accept uncertain, comprehensive obligations and failed to adopt effective dispute settlement mechanisms, covering space activities. On the contrary, the *modus operandi* of international space law could be far better characterized as conflict avoidance, based on the widely accepted principles of international cooperation and mutual understanding. In that exact context, Article IX of the OST and Article 15 of the MOON provide for prior consultations, in order to avoid future harmful interference with activities of other States, instead of referring to methods of settlement.

The existing legal framework which regulates space activities is characterized by the lack of a compulsory mechanism available to all actors involved and the few available procedures are limited *ratione personae* and *ratione materiae,* rendering them rather inadequate to meet the challenges of the contemporary spatial transactions, as discussed above. The only document that lays down a detailed procedure to be followed upon the occurrence of disputes arising in relation to the application of its provisions, is the LIAB. Specifically, the detailed dispute resolution framework applies to disputes regarding compensation for damages caused by a space object in orbit, on the surface of the Earth or to an aircraft in flight.

Accordingly, only disputes that meet the definition of damage, under Article I(a) of the same Convention, can be brought before it. Article IX contains a system to settle claims

[157] Mavrommatis Palestine Concessions (1924) PCIJ Ser. A, No. 2, 11.
[158] Brisibe T., Settlement of disputes and resolution of conflicts in: Jakhu R. S., Dempsey P.S. (eds.) Routledge Handbook of Space Law, Routledge, New York (2017) p. 90.

"through diplomatic channels", without requiring the prior exhaustion of any local remedies. If no settlement of a claim can be reached through diplomatic negotiations within one year from the date on which the claimant State notifies the launching State that it has submitted the documentation of its claim, procedures will continue via the establishment of a Claims Commission under Article XIV. The latter, composed of three members as per Article XV, shall determine the merits of the dispute and determine the amount of the compensation payable. According to the second paragraph of Article XIX, the decision of the Commission shall be final and binding if the parties have so agreed; otherwise, the Commission functions as little more than a conciliation body and renders a final and recommendatory award, which the parties shall consider in good faith.

Therefore, the efficacy of the procedure under the Claims Commission is dependent upon the parties' will to accept the binding force of the award. In practice, the dispute settlement system under the Claims Commission provided for in the LIAB has never been used.[159] Two major disadvantages of the procedure are that applicants are required to prove the fault of the defendant, as well as that private entities do not have direct standing to present their claims for compensation of damage. In that case, their national State can act on their behalf.[160] Another shortcoming concerns the non-compulsory nature of the dispute settlement mechanism it establishes. As it requires the exhaustion of direct negotiations and the agreement of the parties to render its award binding, its effectiveness seems to be rather circumscribed. Furthermore, the limited material and personal scope minimise the efficiency of the mechanism, since it only concerns claims for compensation for damage caused by space objects, leaving claims which emerge in relation to other activities outside its scope. Consequently, in case a private party acquires rights over a satellite which is later on damaged in orbit by another space object, it shall request compensation through its State. Of course, it is also possible that it sues directly the operator of the object causing the damage in national courts.

### 3. Dispute resolution under General international law

In the absence of any other specific provisions, Article III of the OST makes it clear that general international law, including the UN Charter, is applicable to space activities as well. Accordingly, under Article 3 para 2 of the Charter, States are obliged to "resolve their disputes by peaceful means in such a manner that international peace, security and justice are not endangered" and to refrain from the use of armed force. A number of multilateral

[159] The only incident concerning damages caused by space objects is the Iridium 33 / Cosmos 2251 satellite collision which resulted in environmental damages after the satellite crashed in Canada's territory. However, the two States resolved their dispute amicably outside the context of the REG.

[160] Several States tend to interpret the text very strictly, thus recognizing only the owner of the satellite as the eligible person to request compensation through its national State, while excluding potential operators or providers of satellite-based services. This is mainly based on the idea that damage only covers the good as such and not other intangible commercial rights stemming from a contract.

instruments reiterate that obligation.[161] Such means would traditionally be divided into two major groups: diplomatic and arbitral/judicial means. Article 33 of the Charter refers to a number of traditional mechanisms such as negotiation, inquiry, mediation, conciliation, arbitration, and judicial settlement, which may sufficiently cover any inter-State dispute.[162] However, some of them are unsuitable to manage commercial contract disputes that involve private parties.

In general, states seem to be more amenable to non-legal means and -as practice indicates- they often resort to mediation, conciliation or other non-binding procedures in cases where diplomatic attempts have already failed. This obvious reluctance to have recourse to any binding third party dispute settlement mechanism proves that the current legal system is inadequate at providing suitable solutions to today's legal, space-related conflicts, in the light of the absence of compulsory procedures. To justify this statement, reference should be made to some of the aforementioned procedures and to their peculiarities. At any rate though, States are not obliged to resolve their differences at all. All the methods available to settle disputes are operative only upon the consent of the particular states.[163]

### *A. Negotiations*

Negotiation is evidently the principal and preferred method of settling international disputes, mostly because it favours compromise and it may be used by private parties also. It is very common that negotiation is included in many contracts and international agreements as a means of settlement, or as a preliminary to other methods.[164] Moreover, in some cases, negotiations have even been obliged by judicial decision.[165] Despite their importance for the maintenance of good relations, it is not a compulsory procedure and it does not lead to binding solutions.

Except for diplomatic methods, the "list" of Article 33 of the UN Charter includes the possibility to resolve an international dispute by adjudication, as mentioned above. States can have recourse to the ICJ or initiate arbitral proceedings, while it is also possible that instruments of commercial cooperation between private parties, nationals of different states, foresee judicial settlement by submission under a national jurisdiction.

### *B. Judicial proceedings*

Space activities managed by States and government agencies in their sovereign capacity as *acta jure imperii* are subject to international law. As such, any dispute arising from sovereign

[161] Hague Convention for the Pacific Settlement of International Disputes of 1899, entered into force5 Sept. 1900, 1AJIL 103)1907( and Hague Conventions for the Pacific Settlement of International Disputes of 1907, entered into force26 Jan. 1910, 2 AJIL Supp. 43 (1908).
[162] Article 33, Charter of the United Nations, *entered into force* 24 Oct. 1945, 1 UNTS XVI, United Nations.
[163] Shaw M. N., International Law, 9th ed., Cambridge University Press (2017), p. 1970.
[164] Goh M., Dispute Settlement in International Space law: A multi-door Courthouse for Outer Space, Martinus Nijhoff, (2007), p. 92.
[165] Fisheries Jurisdiction (U.K. v. Ice.), 1974 I.C.J. 3 & the North Sea Continental Shelf (1969) ICJ Rep. 3, 48.

acts that constitute a breach of international law, fall under the jurisdiction of the ICJ. Moreover, since in international space law, States are also directly responsible for the activities of their nationals, any breach of an international obligation by a private entity or natural person under their jurisdiction shall be attributed to the State under Article VI OST. Concerning the jurisdiction of the ICJ, according to Article 36(2) of its Statute, the Court can consider any legal dispute referred to it on the interpretation of treaties and any question of international law. Therefore, the Court enjoys the authority and jurisdiction to hear space law disputes as well, provided that the parties concerned have accepted its compulsory jurisdiction. A total of 72 states have deposited their declarations of acceptance and none of them includes a *ratione materiae* reservation.[166] The problem again lies on Article 34 of the Statute, which states that "only States may be parties in cases before the Court".

On the contrary, in cases of international disputes arising from contractual agreements between private entities, the disputing parties can sue either before their own courts or before a court of the country of the opposing party,[167] where rules of private international law apply and there may be legal issues of *jus standi* or/and enforcement.[168] States enjoy immunity from the jurisdiction of domestic courts. Therefore, when it comes to breaches of contracts between public and private actors, only arbitral proceedings can be commenced - especially in cases where the acquisition of rights over satellites can be considered as falling under the definition of investment as per any applicable BITs.

### *C. Arbitration*

Arbitration is a legal technique for the resolution of disputes outside the courts, wherein the disputing parties refer it to one or more persons and agree to abide by their decision. Contracting Parties can ensure that any future dispute relating to commercial space activities will be submitted to a panel of arbitrators of their choice.[169] Arbitration can be provided *ad hoc* or by a relevant institution.[170] Nowadays, international commercial arbitration is the most preferable process of resolving transnational business disputes between either governmental or private parties, especially in the satellite industry,[171] guaranteeing confidentiality and meeting perfectly the objectives of space businesses with regards to costs and scheduling. What is more,

[166] Georgilas S., Judicial Settlement of Space-Related Disputes: Sovereignty's Final Fetters in: Kyriakopoulos G., Manoli M. (eds.), The Space Treaties at Crossroads: Considerations de Lege Ferenda, Springer (2019) p. 133.
[167] Note, however, that recourse to domestic courts is likely to face obstacles such as language barriers, bias, arguments over the competent court and the applicable law, and the absence of industry knowledge of the decision-makers.
[168] Notably, the adoption and entry into force of the Hague Convention on the Recognition and Enforcement of Foreign Judgments in Civil and Commercial Matters, can facilitate such issues.
[169] Supra note 25, p. 116.
[170] e.g. the International Chamber of Commerce in Paris (ICC), the London Court of International Arbitration (LCIA), or Stockholm Chamber of Commerce Arbitration Institute (SCC), which have their own procedural rules and exercise judicial supervision of the arbitration proceedings.
[171] Dadwal V., Mcdonald M., Arbitration of Space-Related Disputes: Case Trends and Analysis, 63 Proc. Int'l Inst. Space L. (2020).

arbitral awards are in principle final and enforceable in all 146 signatory states of the New York Convention.[172]

Arbitration is also envisaged in many international trade law conventions. For example, the WTO dispute resolution system combines an arbitral with a supranational appellate process as described in the Dispute Settlement Understanding (DSU). At this point, it could be argued that disputes stemming from trade practices involving satellites may fall within that system.[173] Within the WTO framework falls also the purchase of satellite equipment under the Government Procurement Agreement (GPA);[174] The only relevant case so far has been a dispute between the EU and Japan because of the procurement of a purchase of a multi-functional satellite, which was however concluded amicably in the end. It has to be seen though that the WTO structure is less suitable for the needs of individual operators and companies, as they lack standing.[175] Other international organizations such as ESA[176] and (former) intergovernmental satellite operators[177] regularly provide for specific arbitral procedures between them and their Member States.[178] Moreover, in commercial practice, arbitration clauses seem to be routinely included into space contracts by SpaceX, Boeing, Airbus and Arianespace.[179]

A new development in the field of arbitration is the adoption of a new set of optional rules by the Permanent Court of Arbitration (PCA) and a model treaty, previously adopted by the ILA,[180] which sets forth both binding and non-binding settlement procedures. These rules are designed to meet the specific legal and economic characteristics of the space sector and they provide for scientific and technical expertise in support of the arbitral proceedings.[181]

To be more specific, the main focus of the Draft Convention was to establish a compulsory dispute resolution system underpinned by a free choice of means covering all

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[172] Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York, 1958) (the "New York Convention"), *entered into force* 7 June 1959, 330 UNTS 3.
[173] Malanczuk P., From Negotiations to Dispute Settlement: the role of the WTO in relation to satellite communications in: Hoffmann M. (ed.), 2nd Luxembourg Workshop on Space and Satellite Communication Law, Volume II, Nomos Publications and Hart Publishing (2015), p. 71-92.
[174] The GPA provides two independent mechanisms for settling procurement-related disputes: “domestic review mechanisms” at the national level; and the WTO dispute settlement mechanism. More info available here https://www.wto.org/english/tratop_e/gproc_e/disput_e.htm
[175] Hofmann M., Space Activities in the Jurisprudence of International Dispute Settlement Institutions, 57 Proc. Int'l Inst. Space L. (2014), p. 745.
[176] ESA Regulations: General Clauses and Conditions for Contracts, ESA/REG/002, revised on 5 July 2019.
[177] such as Intelsat, Inmarsat, Eutelsat for disputes concerning their activities and legal rights following therefrom.
[178] Lyall F., Larsen P. B., Space Law: A Treatise, 2nd ed., Routledge, New York, USA 2018, p. 212.
[179] Grady R., Dispute Resolution in the Commercial Space Age: Are All Space-Farers Adequately Catered For?, ICC Dispute Resolution Bulletin, Issue 3, 2021, p. 55, citing Avanti Wins Arbitration Award Against SpaceX, SpaceNews, 20 April 2011; Sanderson C., Boeing faces claim over cancelled merger, Global Arbitration Review, 28 April 2020; European Commission Press Release: Mergers: Commission approves acquisition of Arianespace by ASL, subject to conditions, 20 July 2016.
[180] Final Draft of the Revised Convention on the Settlement of Disputes related to Space Activities, ILA, Report of the 68th Conference, Taipei, Taiwan, Republic of China, (1998). [the Draft Convention]
[181] Tronchetti F., The PCA Rules for dispute settlement in Outer Space: A significant step forward, 29 Space Policy 3 (2013), pp. 181-189.

activities in Outer Space and activities with effects in Outer Space. However, once again private entities are excluded from its scope of application and they can only rely on it inasmuch as their national State that has authorised their activity is a contracting party. Any party to the dispute can initiate the binding procedure upon failure to reach a settlement at the non-binding stage, which may include any peaceful means of dispute resolution. As regards the binding procedure, three alternatives are provided, namely (a) the International Tribunal for Space Law, if and when such a tribunal has been established; (b) recourse to the ICJ; or (c) to an arbitral tribunal, constituted in accordance with the provisions of the Convention.[182] To date though, the Draft Convention has not been signed or ratified by any State.

Moreover, the PCA Optional Rules for Arbitration of Disputes Relating to Outer Space Activities constitutes an attempt to fill the gap of the Space Treaties with regard to dispute settlement and respond to the contemporary particularities of space activities, namely the need to include all parties conducting business in the space sector. The PCA Rules are based on the UNCITRAL Arbitration Rules[183] and provide for a flexible procedure. They present certain significant elements which render them an appropriate instrument for the resolution of space related disputes. Firstly, their scope of application is extremely broad, encompassing all commercial space activities[184] and all actors involved including private parties and secondly, the arbitral award issued has a final and binding character.

### 4. Dispute Settlement procedures under the ITU regime

As previously noted, in order for a satellite to function and perform its services the use of radio frequencies and associated orbital slots is essential. The said natural resources are allocated by the ITU only to States and then States assign frequencies to private operators.[185] As radio signals recognize no borders, disputes may arise from harmful radio interference, which can result in significant financial damages to other satellite operators.[186]

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[182] Viikari, L., International Law Association´s Draft Convention on the Settlement of Disputes related to Space Activities, Arbitration.ru Magazine (March-April 2021) pp. 14-17.

[183] UNCITRAL Rules on Transparency in Treaty-based Investor-State Arbitration.

[184] Many of these activities involve contracts between various actors often based in different jurisdictions. The subject matter of these contracts is often highly technical and any satellite agreement can be subject to specific insurance requirements, heightened confidentiality and often export controls as a result of the dual-use nature of satellite technology. Read further Zielinski L. Y., The Rise of Satellite Arbitrations, The Guide to Telecoms Arbitrations, Global Arbitration Review (2022), pp. 98-111.

[185] The licenses granting radio spectrum rights are individual administrative acts and public administrative rules apply in this regard. Disputes may thus also arise in case there is a revocation of a license to use radio spectrum whereby administrative law procedures may be initiated in the courts of the State concerned.

[186] e.g. The dispute that arose in 2012 between Eutelsat S.A. and SES S.A. related to the non-compliance with a coordination agreement which resulted in radio interference and was resolved through international arbitration administered by the Court of Arbitration of the ICC. It is not public whether the coordination agreement contained an arbitration clause or whether the parties agreed to refer their dispute to arbitration after the event. Either way, this arbitration serves as an example that future disputes arising out of coordination agreements are likely to end up before arbitral tribunals, too. See Karadelis K., Eutelsat Settles ICC Satellite Dispute, Global Arbitration Review, 30 January 2014. SES & Eutelsat settle their dispute and conclude a series of agreements concerning the 28.5 Degrees East Orbital Position.

When such a case occurs, the parties can bring it to the attention of the ITU. As a general note, ITU procedures place particular emphasis on *negotiations, diplomatic channels and coordination*[187] in case of a dispute arising regarding its scope of application.[188] Specifically, apart from any arrangements under bilateral or multilateral agreements, Member States may have recourse to arbitration under article 56 of the ITU Constitution (233–5) and article 41 of the Convention (507–18), or they may apply the procedures under the Optional Protocol on the Compulsory Settlement of Disputes in case they are parties thereto. It is noted that the said Protocol has never been used up until today. It derives from the above that no binding dispute resolution mechanism is provided under the ITU framework either.

In practice, however, and despite the fact that emphasis is given on cooperation and prevention, the scarcity of the radio frequency spectrum and the ever-growing demand for access to such spectrum and the subsequent increase of commercial uses of satellite orbits,[189] have resulted in disputes related to the frequency assignments, coordination, notification and recording of satellite networks, and other relevant issues.[190] Parties to such disputes may be either administrations or satellite operators. To note that the adjudication of the said disputes falls to some extent under the jurisdiction of the RR Board,[191] which addresses matters referred by the Bureau when they cannot be resolved by applying the RR. The Board is a collegiate body, which currently consists of twelve skilled experts from various countries thoroughly qualified in the field of radiocommunication and possessing practical experience in the assignment and utilization of frequencies. Nevertheless, the Board only treats disputes administratively in the absence of the parties concerned making the whole process non-adversary.

Moreover, decisions can be revised by subsequent WRC, which may put a case in limbo for a few years and in any case, its decisions are merely recommendatory and do not bind the parties concerned. To note that the Board does not consider any recovery claims in case economic loss has been caused due to harmful interference and failure of operators to observe the applicable RR and the technical requirements agreed in the context of coordination agreements. Its powers are limited by its inability to review the confidential provisions of applicable agreements, its inability to award damages and, among other drawbacks such as the length and the public nature of its proceedings, the non-binding nature of its decisions. As a

[187] The results of the coordination procedure are reflected in coordination agreements, which generally contain mutually acceptable technical parameters for the operation of certain frequencies.

[188] General Regulations, 28 UST 2495 at 2589, TIAS No. 8572 October 25, 1973, Those rules were founded on its 1989 Constitution; International Telecommunications Union, Final Acts of the Plenipotentiary Conference, Nice 1989, Nice, 30 June 1989.

[189] Muelhaupt T. J., Sorge M. E., Morin J., Wilson R. S., Space Traffic Management in the New Space Era, The Journal of Space Safety Engineering 6 (2019), p. 83.

[190] See for example the "Devas Cases" concerning a contract with Antrix Corporation Limited for the lease of a segment in the S-band spectrum and the award for compensation granted by the adjudicating tribunal.

[191] The Board generally approves Rules of Procedure used by the Bureau in applying the RR provisions and registering frequency assignments made by Member States, interprets the ITU's rules and resolutions, and provides advice to Radiocommunication Conferences and Radiocommunication Assemblies, thus participating in drafting new ITU resolutions, which in certain cases help resolve the disputes in question. Also, following an investigation the Board can formulate recommendations helping in the resolution of interference.

consequence, to recover damages caused by the breach of an agreement, parties need to resort to alternative dispute settlement mechanisms.[192]

Breaches of the provisions of the ITU RR or their undue observance, including undue fulfillment of the recommendations of the Board or late response to messages from the Bureau, impede efficient use of the radio frequency spectrum. All the above-mentioned defects of settlement by the RR Board can be avoided if disputes are adjudicated by other jurisdictional bodies. However, none of the existing bodies is specialized enough. Therefore, the establishment of a specialized tribunal under the ITU with sufficient authority based on the principles of justice to adjudicate disputes[193] related to the radio frequency spectrum would help improve the efficiency of the use of such resources, assure equal protection of the interests of all states and become an extra guarantee that international treaties in the field of space activity are observed. Besides, also in the past, new international courts and tribunals have been established in response to the existence of an international legal crisis.[194] Alternatively, the ITU could make sure that arbitral agreements are entered into to refer the disputes in question to arbitration.[195]

Despite the above, it shall be remembered that each state is sovereign[196] and the ultimate sanction should the applicable technical regulations are not respected is the Laws of Physics. If activities authorized by one state cause harmful interference to the activities of another, the former itself will suffer reciprocal harmful interference from the activities of the other. This is exactly why Member States and private operators eventually respect the applicable procedures and regulations and the ITU framework enjoys general success.

### 5. Investor State dispute settlement procedures

As stated from the very beginning of this study, artificial satellites are expensive assets and their manufacturing, launching and operation require significant economic resources. The companies involved in the satellite industry have a strong incentive to make sure their satellite projects benefit from international investment protection. It could arguably be accepted that, due to the very high financial costs related to the above, the corresponding risk of satellite projects and the high economic and reputational contribution to the host state of the satellite, such projects fall under the definition of "investment" under the majority of the existing

[192] However, note that coordination agreements are commonly drafted by technical experts and therefore rarely contain arbitration clauses. See Morozova E., Vasyanin Y., Disputes in Satellite Communications: Settlement Mechanisms Available for Breach of Coordination Agreements, 62 Proc. Int'l Inst. Space L. p. 3.

[193] Veshchunov V., Morozova E., Establishment of a specialized tribunal under the International Telecommunication Union to adjudicate disputes as a means to improve the efficiency of the management of the radio frequency spectrum, 56 Proc. on L. Outer Space, p.1-3.

[194] Katzenstein S., In the Shadow of Crisis: The Creation of International Courts in the Twentieth Century, 55 Harvard Int. L. J. 1 (2014) pp. 151, 153.

[195] Goh M., Dispute Settlement in International Space Law, a Multi-Door Courthouse for Outer Space (2007), p. 49.

[196] Member States retain their sovereign right to regulate their telecommunications within their territory and freely decide whether they will follow the international standards and procedures or not.

bilateral treaties and Article 25 of the Convention of the International Centre for Settlement of Investment Disputes (ICSID).[197]

Generally, it is common in international investment agreements to define the notion of "investment" as any kind of asset that is directly or indirectly controlled by investors of the home state.[198] Indicatively, under Article 1(6) of the Energy Charter Treaty (ECT), the term investment includes tangible and intangible, movable and immovable property and any property rights such as leases, mortgages, liens and pledges. Similarly, the Czech Republic – Greece BIT defines investments as any kind of asset and in particular it includes movable property and any other property rights. Although, there are investment agreements that take a narrower approach,[199] it could very well be argued that contractual agreements concerning the acquisition of property rights over satellites would normally fit under the said definitions and qualify as investments.

Although ICSID tribunals have been hesitant to recognize contracts related to trade in goods as investment, non- ICSID tribunals have been more inclined to do so. In the NAFTA context, for instance, tribunals have shown some readiness to accept the interrelation between trade and investment.[200]Although there is currently no clear answer to the question whether purely commercial transactions shall amount to investments worthy of protection,[201] a number of arbitral tribunals have held that contractual rights may indeed amount to investments under certain circumstances.[202] Whether ownership or control of an asset meets the threshold of an investment treaty is a cardinal issue in almost every case brought by an aggrieved investor against a host state.

It follows that, as long as purchases of satellites are accepted to be 'made in the territory of the host State' as routinely required under bilateral investment treaties, satellite-related investments could be protected by international investment protection. ISDS tribunals are likely to have jurisdiction over most disputes arising out of such operations. To have

[197] Hobe S., Popova R., et al., The Protection of Satellite Telecommunications Activities Under Bilateral Investment Treaties, 19 J. World Investment & Trade, (2018), pp. 1024–1058.
[198] Dolzer R., Stevens M., Bilateral Investment Treaties, Kluwer Law International, The Hague (1995), pp. 26–27;. Salacuse J. W., The Law of Investment Treaties, 3rd ed., Oxford International Law Library, Oxford (2015), p. 176 and, more generally, at pp. 174– 96.
[199] e.g. The US Model BIT has traditionally provided for a narrower definition with more recent versions expressly stipulating that 'investment' is 'every asset that an investor owns or controls, directly or indirectly, that has the characteristics of an investment, including such characteristics as the commitment of capital or other resources, the expectation of gain or profit, or the assumption of risk'.
[200] Yannaca-Small K., Katsikis D., The Meaning of 'Investment' in Investment Treaty Arbitration in Arbitration under International Investment Agreements: A Guide to Key Issues (2nd ed), Oxford University Press (2018), p. 273
[201] Article 8.1 of the Comprehensive Economic and Trade Agreement (CETA) between Canada and the European Union and its Member States excludes claims to money that arise solely from commercial contracts for the sale of goods.
[202] e.g. Inmaris Perestroika Sailing Maritime Services GmbH and Others v. Ukraine, ICSID Case No. ARB/08/ 8 Decision on Jurisdiction (Mar. 8, 2010); Bayindir Insaat Turizm Ticaret Ve Sanayi A.S. v. Pakistan, ICSID Case No. ARB/ 03/ 29 Decision on Jurisdiction (Nov. 14, 2005); Eureko B.V. v. Republic of Poland, Ad Hoc Partial Award (Aug. 19, 2005); Impregilo S.p.A. v. Pakistan, ICSID Case No. ARB/ 03/ 3 Decision on Jurisdiction (Apr. 22, 2005).

jurisdiction, there must be both a covered investment under the applicable treaty and a foreign investor that has invested in the territory of the host State.[203]

Interestingly, in past investor–state proceedings involving satellites, no jurisdictional objections over the territorial requirement seem to have been raised, as the link between the host state and the investment had been clearly established through the usage rights of the respective host states over the frequency spectrum and orbital positions at issue. On the merits, past investment treaty cases have dealt with alleged conventional treaty breaches related to expropriation and the violation of the fair and equitable treatment standard. In practice, the cases Devas v. India and Deutsche Telekom v. India[204] arose out of India's revocation of leased S-band frequency spectrum,[205]and Eutelsat v. Mexico related to a provision contained in the concession contracts for the use of Mexican geostationary orbital positions allowing for the free reservation of satellite capacity for the Mexican government.[206]

## 6. Conclusion

It has been made clear that the general mechanisms under the ITU and the framework created by the Space Treaties, focuses on the prevention of disputes rather than providing settlement tools. Also in commercial practice, until recently, the presence of only a few large market participants that were mainly collaborating with each other, allowed them to focus on dispute avoidance and other mechanisms such as cross-waivers etc.[207] instead of resorting to binding dispute resolution procedures. However, as more players are entering into the market, it becomes clear that a more concrete framework is required for the resolution of space-related disputes. As a conclusion, with regard to international commercial transactions involving satellites, it could be argued that it is international arbitration that can best guarantee the rights and protect the interests of all actors involved,[208] while also being able to cater to the international and confidential nature of the satellite industry. It is therefore unsurprising that

[203] Zielinski L. Y., Space Arbitration: Could Investor-State Dispute Settlement Mitigate the Creation of Space Debris?, EJIL:Talk!, 19 March 2021

[204] Devas v. India, PCA Case No. 2013-09 arbitral proceedings initiated by Devas arguing that India had proceeded to an unlawful expropriation of investment. The tribunal awarded compensation limited to 40% of the value of the investment as it was considered an expropriation for the protection of essential security interests by India (reservation of part of the S-band spectrum allocated for military purposes). Also, Deutsche Telekom v. India, PCA Case No. 2014-10; proceedings initiated for violations of the FET standard of the applicable Germany - India BIT.

[205] Antrix Corporation Ltd owned by India entered into a commercial contract for the lease of a segment in the S-band spectrum (2.5 – 2.69 GHz) for Devas to offer multimedia and broadcasting services through a system of satellite communications. Antrix obtained the necessary governmental approval to provide services, but the contract was later annulled for security considerations by the Indian Cabinet Committee on Security.

[206] Eutelsat v. Mexico, ICSID Case No. ARB(AF)/17/2). Eutelsat claimed violation of FET under the Mexico-France BIT for having been required to provide a larger amount of capacity. The award was issued in favor of Mexico.

[207] Viikari L., Towards More Effective Dispute Settlement of Disputes in the Space Sector, in Dispute Resolution in the Space Sector: Present Status and Future Prospects, Rovaniemi: Lapland University Press, p. 233; Mourre A., Arbitration in Space Contracts, Arbitration International, 21 Oxford University Press 1 (2005) p. 43; Dunk F., Space Law and the Resolution of Disputes on Space Activities, Global Arbitration Review, Arbitration.ru, March-April 2021, No. 2(26) p. 1.

[208] Henderson S., Space Courts: Do we need a new dispute settlement body? 62 Proc. Int'l Inst. Space L. (2019).

many satellite disputes – both contractual and investment in nature – have already been resolved through arbitration. However, the creation of an international specialized adjudicating body, whose procedures would be open also to private entities, and which would issue binding decisions, while being able to understand the highly technical nature of the space activities, is viewed as the best solution. In this respect, it is noteworthy that in 2021, the Dubai International Financial Centre (DIFC) Courts and the Dubai Future Foundation (DFF) launched a new global initiative, called the Courts of Space,[209] with the objective of building a new judicial support network to serve the stringent commercial demands of the space industry and settle commercial disputes relevant to space endeavours.[210]

[209] Dubai International Financial Centre (DIFC), Courts of Space launches into orbit in support of global space economy.
[210] Dubai Creates 'Space Court' for Out-of-This-World Disputes, Courthouse News Service, 29 October 2022.

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