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- Part I -

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Abstract: *Beginning with 1966, under the aegis of the United Nations, five international treaties covering various aspects of states' activities in outer space came into existence, the most important being the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies or "the Outer Space Treaty" (OST). However, as technological development progressed and states incurred new vulnerabilities from their dependence on space-located assets, the danger of conflict in this new realm also increased, thus transforming outer space into an area of confrontation.*

Currently, there is no clarity as to the interpretation of international legal norms in the particular context of outer space warfare. The international legal community has promoted two initiatives, with the aim of drafting a manual on the applicability of international law in the context of space military operations. Both the Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS) and the Woomera Manual on the International Law of Military Space Operations attempt to draw from other relevant manuals, such as the San Remo Manual or the Tallinn Manual which contain soft law rules on armed conflicts at sea and, respectively, on cyberspace conflicts.¹

The purpose of the present paper is to analyse the five UN treaties pertaining to outer space and to clarify certain issues related to the legal regime of this environment, such as the definition of outer space, the

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¹ *"What is the MILAMOS Project", available at <<https://www.mcgill.ca/milamos/>>, last visited 10/09/2020 (hereinafter cited as: The MILAMOS Project); "Drafting the Woomera Manual", available at <<https://law.adelaide.edu.au/woomera/drafting-the-woomera-manual>>, last visited 10/09/2020 (hereinafter cited as: The Woomera Manual).*

demarcation of outer space from airspace and the legal status of the geostationary orbit.

Key-words: *Outer Space Treaty; geostationary orbit; delimitation; customary international law; res communis.*

1. Introduction

The Statute of the International Court of Justice (ICJ) contains, in Article 38(1), a list that commentators refer to as being the most authoritative statement of the sources of international law.¹ Consequently, according to the said article, the formally acknowledged sources of international law are treaties, custom, general principles of law, judicial decisions and the teachings of the most highly qualified publicists.

Space law is a newly developed branch of international law, the earliest attempts to formulate norms pertaining to this subject dating back to the end of the 1950s, when the UN General Assembly acknowledged the necessity of cooperation in space-related matters and of concluding international agreements.² To materialize these efforts, the General Assembly established an Ad Hoc Committee on the Peaceful Uses of Outer Space, tasked with the analysis of the technical, legal and other issues raised by the launch of the first satellite.³ The Committee (COPUOS) became permanent one year later, in 1959, and its works are the roots of the cluster of international agreements pertaining to outer space.⁴

The outer space legal framework comprises the five UN treaties dealing with general and particular issues triggered by the states' activities in this

¹ United Nations, Statute of the International Court of Justice, 18 April 1946, Art. 38(1); Malcolm N. Shaw, *International Law*, Cambridge University Press, Seventh Edition, 2014, p. 70; James Crawford, *Brownlie's Principles of Public International Law*, Oxford University Press, 8th Edition, 2012, p. 20; Cassandra Steer, "Sources and law-making processes relating to space activities", in Ram Jakhu, Paul S. Dempsey, *Routledge Handbook of Space Law*, Routledge, 2017, pp. 3-24, p. 5.

² United Nations General Assembly Resolution 1348 (XIII), 13 December 1958, A/RES/1348 (XIII); Isabella Henrietta Philepina Diederiks-Verschoor, Vladimir Kopal, *An Introduction to Space Law*, Kluwer Law International, 2008, p. 2; Peter Jankowitsch, "The background and history of space law", in Frans Von der Dunk, Fabio Tronchetti, *Handbook of Space Law*, Edward Elgar Publishing, 2015, pp. 1-28, p. 10.

³ Jankowitsch (2015), p. 10; Bin Cheng, *Studies in International Space Law*, Clarendon Press Oxford, 1997, p. 102; Diederiks-Verschoor and Kopal (2008), p. 3.

⁴ United Nations General Assembly Resolution 1472 (XIV), 12 December 1959, A/RES/1472 (XIV), Part A, Art. 1; Jankowitsch (2015), p. 12; Cheng (1997), p. 217.

new environment.¹ The present article will analyse each of these instruments in the following paragraphs. However, it will firstly attempt to clarify the issues related to the legal status of outer space, including the controversial aspect of delimiting outer space from air space.

2. The Legal Status of Outer Space

Discussing sovereignty in the merits of the *Palmas Arbitration*, Judge Max Huber underlined the tripartite classification of territory according to the degree of sovereignty a state might exercise over it and as recognized under international law.² Firstly, there is the national territory over which the state has full sovereignty and jurisdiction, including the territorial sea, soil, subsoil and the column of air above.³ The second category is *terra nullius*, which designates a territory open for acquisition, over which no state exercises sovereignty.⁴ *Res communis* or *res extra commercium* displays the same absence of sovereign control but, as opposed to the second category, states are not allowed to acquire it.⁵ The 1970 UN General Assembly Declaration on the Seabed and Ocean Floor introduced a new territorial regime, *the common heritage of mankind*, which was subsequently reiterated in the Moon Agreement and the Convention on the Law of the Sea.⁶

Territories designated as *res communis* or *common heritage of mankind* cannot be acquired by states. However, the former allows freedom of access,

¹ United Nations, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, United Nations General Assembly Resolution 2222(XXI), 1966; United Nations, Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, United Nations General Assembly Resolution 2345 (XXII), 1967; United Nations, Convention on International Liability for Damage Caused by Space Objects, United Nations General Assembly Resolution 2777 (XXVI), 1971; United Nations, Convention on Registration of Objects Launched into Outer Space, United Nations General Assembly Resolution 3235 (XXIX), 1974; United Nations, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, United Nations General Assembly Resolution 34/68, 1979.

² Permanent Court of Arbitration, *Island of Palmas Case (Netherlands, USA)*, 4 April 1928, Reports of International Arbitral Awards, Volume II, pp. 829 – 871, p. 838.

³ Cheng (1997), p. 386; Brownlie's Principles (2012), p. 447; Shaw (2014), p. 354.

⁴ Brownlie's Principles (2012), p. 251; Jan Klabbbers, *International Law*, Cambridge University Press, 2013, p. 77; Shaw (2014), p. 355.

⁵ Brownlie's Principles (2012), p. 252; Shaw (2014), p. 355.

⁶ United Nations General Assembly Resolution 2749 (XXV), "Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction", 17 December 1970, para. 1; The Moon Agreement, Art. XI (1); United Nations, Convention on the Law of the Sea, 10 December 1982, Arts. 136, 137.

exploitation and exploration, while the latter is regulated by a strict international management regime based on equity in terms of distribution of resources and benefits derived from its exploitation.¹ The OST explicitly prohibits the appropriation of outer space, the Moon and other celestial bodies, while mentioning that the exploration shall benefit all states, without discrimination as to the economic or scientific development.² At a first glance, the wording of Article I seems to suggest that outer space and its elements fall within the scope of the common heritage of mankind. However, this exploration “for the benefit and in the interests of all countries” is more likely to imply open access and dissemination of scientific information with the international community, as well as access to telecommunication or weather satellites. The OST does not provide for the obligation of establishing an international regime to manage resources on an equitable basis, unlike the Moon Agreement.³ Consequently, there appears to be a contradiction between the two instruments as to the legal status of outer space. To solve this impediment, recourse shall be made to the status of each of the two instruments and their acceptance by the international community. On the one hand, as will be demonstrated in the second part of the present article, the provisions of the OST, at least those deriving from the UN General Assembly Resolutions on outer space, have gained the status of customary international law.⁴ On the other hand, the Moon Agreement has been ratified by an exceptionally small number of states compared to the total membership of the UN.⁵ At best, its provisions are binding *inter partes*. Nevertheless, an international management regime for lunar and celestial bodies resources, as suggested by the phrase “*common heritage of mankind*” included in the Moon Agreement, established among 18 non-space faring states is highly unlikely to function. Recognition by a vast majority of the international community is inherent in the nature of the concept and is required for it to emanate rights and obligations.

In conclusion, the author of the present article considers that the outer space, the Moon and other celestial bodies shall be considered *res communis*, outside national appropriation but allowing freedom of exploration and exploitation. The first argument supporting this conclusion is the fact that

¹ Cheng (1997), p. 386; Shaw (2014), p. 385

² The Outer Space Treaty, Arts. I, II.

³ The Moon Agreement, Art. XI.

⁴ See pp. 11-13.

⁵ Only 18 states ratified the Moon Agreement. United Nations Office for Outer Space Affairs, “Status of International Agreements Relating to Activities in Outer Space as at January 2020”, available at <<https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/TreatiesStatus-2020E.pdf>>, last visited 10/09/2020.

the provisions of the OST are also applicable to the Moon and other celestial bodies and the treaty enjoys a wide acceptance by the international community, thus gaining the status of customary international law. Secondly, as previously mentioned, only a small number of states signed and ratified the Moon Agreement. Moreover, the treaty only qualifies the Moon and other celestial bodies as "*common heritage of mankind*", without providing additional details as to how this status will affect states's activities in this environment. In comparison, the other instrument creating a special regime for an area designated as "*common heritage of mankind*", the Convention on the Law of the Sea, has 168 states parties and establishes a detailed international management regime to regulate activities in the area.¹ This difference strenghtens the unsustainable nature of this status for the moon and other celestial bodies. Consequently, the void space, as well as the Moon and other celestial bodies, are *res communis* as within the scope of the OST.

2.1 Definition and Delimitation of Outer Space

Throughout the texts of the outer space-related agreements and even in the title of the most important treaty in this field, one can persistently encounter the term "outer space".² Despite its importance in establishing the jurisdictional scope of the outer space legal system, there is no agreed definition of what constitutes the "outer space" from a legal point of view.³ From a scientific perspective, there is a distinction between atmospheric and extra-atmospheric space based on the physical characteristics of each environment, but no legal instrument clearly stipulates a delimitation between air space and outer space, thus also defining the latter.⁴

From a legal perspective, the importance of the locational differentiation between air and space stems from the opposite regimes regulating each of them. States have sovereignty over the air space above them, which is considered an inalienable part of their territories.⁵ The OST and all other relevant agreements prescribe the freedom of exploration and use of outer

¹ The Convention on the Law of the Sea, Part XI;

² Vladen S. Vereshchetin, "Outer Space", in Max Planck Encyclopaedia of Public International Law, 2006, available at <<https://opil.ouplaw.com/view/10.1093/law:epil/9780199231690/law-9780199231690-e1202?prd=EPIL>>, last visited 10/09/2020.

³ Ibid.

⁴ Ibid.

⁵ United Nations, Convention on International Civil Aviation, Chicago, 7 December 1944, 15 UNTS 295, Art. 1; Vereshchetin (2006); Brownlie's Principles (2012), p. 204; Gennady Zhukov, Yuri Kolosov, *International Space Law*, Statut Publishing House, 2014, p. 141.

space and the prohibition of asserting sovereignty over any part of it, including the moon and other celestial bodies.¹ Consequently, the issue rests in how to reconcile two opposed legal regimes regulating two locations not clearly delimited from each other. So far, they have harmoniously co-existed side by side, without any serious conflicts arising from this ambiguity.² However, the evolution of technology might lead to the development of objects capable of conducting flights in both air and space, such as the Space Shuttle. Thus, distinguishing the jurisdictional scope of the two legal regimes based solely on the technical characteristics of a particular object will no longer suffice and additional difficulties will emerge.

Discussions concerning the delimitation of outer space from air space date back to the end of the 1950s, when the Ad Hoc Committee on the Peaceful Uses of Outer Space decided in its report that the issue does not call for prioritization.³ During the first ten years following the conclusion of the Outer Space Treaty, 27 proposals concerning the delimitation and definition of outer space have been lodged with the COPUOS Legal Sub-Committee.⁴ According to the views expressed by the UN member states over the 50 years since the birth of the outer space legal framework, two main approaches regarding the definition and delimitation of outer space can be inferred.

The *functionalist* approach argues that a strict geographical delimitation between air space and outer space is unnecessary and the jurisdictional scope of the outer space legal regime can be derived from the nature of the object and the purpose for which it is employed.⁵ Therefore, the activity in itself rather than its *locus* is determinant in asserting which legal regime is

¹ The Outer Space Treaty, Arts. I, II; The Moon Agreement, Art. 4; Zhukov and Kolosov (2014), p. 141.

² Vereshchetin (2006); Diederiks-Verschoor and Kopal (2008), p. 15; Zhukov and Kolosov (2014), p. 141

³ United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space, "Report", A/4141, 14 July 1959, p. 68; Cheng (1997), p. 426.

⁴ United Nations Committee on the Peaceful Uses of Outer Space, Legal Sub-Committee, Background Paper "The Question of the Definition and/or the Delimitation of Outer Space", A/AC.105/C.2/7, 7 May 1970, pp. 15-35; United Nations Committee on the Peaceful Uses of Outer Space, Legal Sub-Committee, Background Paper "The Question of the Definition and/or the Delimitation of Outer Space", Addendum, A/AC.105/C.2/7/Add.1, 21 January 1977, pp. 8 – 15; Diederiks-Verschoor and Kopal (2008), p. 17.

⁵ Cheng (1997), p. 445; Diederiks-Verschoor and Kopal (2008), p. 18; Franken Lyall, Paul B. Larsen, *Space Law. A Treatise*, Ashgate, 2009, p. 169; Zhukov and Kolosov (2014), p. 142.

applicable.¹ One of the consequences of this view is that an aborted space launch where the space object failed to reach orbit would fall under the ambit of space law.² The launch or re-entry of a space object through the air space of a third state could also raise issues as to the safety of air traffic.³ Under the functionalist approach, outer space law would regulate the object and its activity and air traffic control regulations would not be applicable.⁴

The *spatialist* approach favours the determination of a lower limit from which outer space would begin, thus delimitating it from air space.⁵ States have put forward proposals for a wide range of criteria that could provide a basis for the delimitation of outer space from air space. Firstly, there was the equation of the upper limit of air space with the concept of “atmosphere”, a proposal rejected on the ground that there is no clear demarcation line between the atmospheric and extra-atmospheric space.⁶ The same criticism was brought to Belgium’s suggestion of delimitation based on the division layers of the atmosphere.⁷ Other proposals took into account the maximum altitude an aircraft can reach, based on the definitions of “aircraft” included in the annexes of the Paris and Chicago Conventions, and the lowest perigee of an orbiting satellite.⁸ A similar approach based on the capabilities of flight instrumentalities proposes as boundary between air space and outer space the so-called Von Karman Line, situated at about 100 km above sea level.⁹ However, changes in atmospheric conditions, such as the density of the air, make the Von Karman Line unstable.¹⁰ This, coupled with technological developments allowing the stationing of satellites at lower altitudes might trigger uncertainty as to the exact boundary, thus reviving the issue. The most criticized criterion for establishing a boundary between

¹ Cheng (1997), p. 445.

² Lyall and Larsen (2009), p. 170.

³ Ibid., p. 171.

⁴ Ibid., p. 172.

⁵ Vereshchetin (2006); Diederiks-Verschoor and Kopal (2008) pp. 17-18; Lyall and Larsen (2009), p. 165; Zhukov and Kolosov (2014), p. 141;

⁶ Background Paper on the Definition and Delimitation of Outer Space – Addendum (1977), p. 16.

⁷ Ibid., p. 17.

⁸ Background Paper on the Definition and Delimitation of Outer Space (1970), p. 41; Background Paper on the Definition and Delimitation of Outer Space – Addendum (1977), p. 19.

⁹ Background Paper on the Definition and Delimitation of Outer Space (1970), p. 45; Background Paper on the Definition and Delimitation of Outer Space – Addendum (1977), p. 20.

¹⁰ Background Paper on the Definition and Delimitation of Outer Space (1970), p. 44; Lyall and Larsen (2009), p. 168.

air space and outer space is the one of “effective control”.¹ The proposal argued that the upper limit of air space and the lower limit of outer space should be the highest altitude at which a state can exercise effective control.² This clearly favoured the most developed states in terms of economy and technology, while breaching the principle of equality of states since some of them would enjoy sovereignty over a wider portion of air space than others.³

As Bin Cheng argues, public international law is mostly a spatialist regime, especially since sovereignty and jurisdiction are two of the most important elements in international relations.⁴ This feature helps to provide clarity as to the implementation of a certain regime and the solution for international disputes.⁵ For instance, the law of the sea regime clearly establishes the limits of the territorial waters, the exclusive economic zone, archipelagic baselines, and other geographical elements, demarcating them from the high seas, which enjoy a different legal status.⁶ Similarly, Article VI of the Antarctic Treaty provides for the locational scope of the treaty.⁷

An additional argument in favour of the demarcation of outer space from air space stems from the fact that, in certain instances, the mere nature of an activity might not suffice to determine its legality since this depends on the *locus*. An example of such an act is the monitoring of defence installations of a foreign state.⁸ If this act is conducted within the jurisdiction of the observed state, it can be deemed as illegal and the said state might take coercive action against the perpetrator.⁹ However, if the same act occurs in the high seas or in the airspace above high seas, it is permissible and the observed state has no right to interfere.¹⁰ This is the reason why, in 1960, the United States did not object to the USSR’s shooting down of a U-2 reconnaissance aircraft and the imprisonment of the pilot, while, two months later, protested to the downing of an RB-47, which flew over the high seas.¹¹

¹ Background Paper on the Definition and Delimitation of Outer Space (1970), p. 49; Background Paper on the Definition and Delimitation of Outer Space – Addendum (1977), p. 24.

² Ibid.

³ Ibid.

⁴ Cheng (1997), p. 441.

⁵ Ibid.

⁶ The Convention on the Law of the Sea, Arts. 3 – 16, 48, 57, 76, 86.

⁷ Conference on Antarctica, The Antarctic Treaty, Washington, D.C., 1 December 1959, Art. VI.

⁸ Cheng (1997), p. 445.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

It was the same action, but conducted in locations under different legal regimes.

Most nations, including those active in outer space, favour the functional approach or adopt a “wait and see” position, arguing that there is no urgent need for the delimitation of outer space from air space.¹ While the United States always refrained from circumscribing to one of the approaches, the Russian Federation (as successor of the USSR) oscillated from the Soviet Working Paper of 1979, which proposed a clear demarcation boundary at 100 – 110 kilometres above sea level, to a reluctance in supporting such a development since it might “complicate space activities currently being carried out”.² France explicitly favours a functional approach, while Germany and the United Kingdom adopted a position similar to that of the United States, according to their answers to the questions raised by the COPUPOS Legal Sub-Committee in relation to the definition and delimitation of outer space.³

As already discussed, the demarcation of outer space from air space bears a significant importance for the applicability of international law rules pertaining to the two different legal regimes, thus providing clarity and predictability. The present article proposes as solution the establishment of a boundary according to the lowest perigee a satellite can attain. Member states of the United Nations, such as Italy and Belgium, have already made proposals based on this criterion.⁴ According to Czech astronomer Lubos Perek, this criterion has the advantage of depending on the physical characteristics of the object and the environment in which it would be stationed.⁵ Building a satellite capable of attaining a perigee point lower than 90 km would entail excessive costs since it requires large quantities of heavy materials to obtain an “extreme mass-to-area ratio”.⁶ Moreover, there

¹ Vereshchetin (2006); Stephan Hobe, Kuan-Wei Chen, “Legal status of outer space and celestial bodies”, in Ram S. Jakhu, Paul Stephen Dempsey, *Routledge Handbook of Space Law*, Routledge, 2017, pp. 25 – 41, p. 28.

² United Nations Committee on the Peaceful Uses of Outer Space, “Questions on the definition and delimitation of outer space: replies from Member States”, Addendum, A/AC.105/889/Add.10, 21 February 2012, p. 5; Cheng (1997), p. 452

³ A/AC.105/889/Add.10, p. 3; United Nations Committee on the Peaceful Uses of Outer Space, “Questions on the definition and delimitation of outer space: replies from Member States”, A/AC.105/889/Add.8, 9 December 2010, p. 3; United Nations Committee on the Peaceful Uses of Outer Space, “Questions on the definition and delimitation of outer space: replies from Member States”, A/AC.105/889, Add.3, 2 February 2009, p. 2.

⁴ Background Paper on the Definition and Delimitation of Outer Space – Addendum (1977), p. 22.

⁵ Ibid.

⁶ Ibid.

would be no benefits from stationing a satellite at such a low altitude.¹ The lowest perigee registered by a satellite was 96 kilometres in 1974.² More recently, Japan's Aerospace Exploration Agency (JAXA) Tsubame satellite attained an orbital altitude of 167.4 kilometers in 2019 and maintained it for seven days, thus attaining the title of "the lowest altitude by an Earth observation satellite in orbit".³ According to the European Space Agency (ESA), commercial airplanes do not reach an altitude higher than 14 kilometres, thus far lower than the lowest perigee ever registered.⁴ In conclusion, according to the analysis conducted above, the line of demarcation between outer space and air space should be established at an altitude between 90 and 100 kilometres above sea level, subject to a potential revision if significant technological breakthroughs intervene. This lower limit of outer space is supported by scientific arguments, related to the technical characteristics of satellites and economic arguments, since a satellite capable of orbiting at a very low altitude would require costly materials. Moreover, several states in the COPUOS already suggested a similar limit, suggesting the possibility of reaching political consensus. The following part of the present paper will discuss the legal status of the geostationary orbit.

2.2 The Legal Status of the Geostationary Orbit

In 1976, eight equatorial states signed the so-called *Bogota Declaration*, claiming that they have sovereignty over the portions of the geostationary orbit above their territory.⁵ Colombia even included in its constitution that the relevant segment of the geostationary orbit is part of the country's territory.⁶ States argued that the declaration does not contradict the terms of

¹ Background Paper on the Definition and Delimitation of Outer Space – Addendum (1977), p. 22.

² Skynet – IIA, launched by the United Kingdom, no longer in orbit - Cheng (1997), p. 450.

³ Japan Aerospace Exploration Agency, "Super Low Altitude Test Satellite "TSUBAME" (SLATS), available at <<https://global.jaxa.jp/projects/sat/slats/>>, last visited 10/09/2020; "Japan's low altitude satellite Tsubame registered in Guinness World Records", 30 December 2019, available at <<https://www.japantimes.co.jp/news/2019/12/30/national/japan-low-altitude-satellite-tsubame/#.XtU7GTozaUk>>, last visited 10/09/2020.

⁴ European Space Agency, "Types of orbits", available at <https://www.esa.int/Enabling_Support/Space_Transportation/Types_of_orbits>, last visited 10/09/2020.

⁵ "Declaration of the First Meeting of Equatorial Countries", Bogota, 3 December 1976, Art. 1(3).

⁶ "Colombia's Constitution of 1991 with Amendments through 2015", available at <https://www.constituteproject.org/constitution/Colombia_2015.pdf?lang=en>, last visited

the Outer Space Treaty, to which five of the signatories are part of, since the agreement did not mention the geostationary orbit or explicitly define it as part of the outer space.¹ Consequently, the Bogota Declaration is an outcome of the lack of definition and delimitation of outer space.

The geostationary orbit is “a circular orbit above the equator at a height of approximately 36.000 kilometres (22.300 miles)” and it is mostly used for stationing telecommunication, meteorology and navigation satellites.² The geostationary orbit has been placed under the jurisdiction of the International Telecommunications Unit (ITU), an agency of the United Nations tasked with the allotment of radio spectrum and satellite orbits.³ The allocation of slots for the placement of satellites on the geostationary orbit must be made on an equitable and non-discriminatory basis, placing a particular consideration on the needs of developing states.⁴

Considering the similarities of the language used in Article 44 of the ITU Constitution with the one of the outer-space related treaties and the geographical position of the geostationary orbit, located far above the 100 kilometres limit established as viable in the previous sub-chapter, it can be strongly affirmed that the geostationary orbit is part of the outer space. As a result, it enjoys the same legal status of *res communis* and no state has the right to appropriate parts of it. This position coincides with the views recently expressed in the COPUOS Legal Sub-Committee, which argue that the geostationary orbit “should not be subject to national appropriation (...) and that its utilization should be governed by applicable international law and in accordance with the principle of non-appropriation of outer space”.⁵

10/09/2020, Art. 101; United Nations Committee on the Peaceful Uses of Outer Space, “National legislation and practice relating to the definition and delimitation of outer space”, Addendum, A/AC.105/865/Add.13, 6 March 2013, p. 2.

¹ Cheng (1997), p. 455; M. J. Peterson, *International Regimes for the Final Frontier*, State University of New York Press, 2005, p. 63; Zhukov and Kolosov (2014), p. 143.

² Ibid.

³ Plenipotentiary Conference of the International Telecommunications Union, “Instrument Amending the Constitution of the International Telecommunication Union”, Minneapolis, 1998;

UCS Satellite Database, updated 1 April 2020, available at <<https://www.ucsusa.org/resources/satellite-database>>, last visited 10/09/2020, Arts. 1, 12, 44; Peterson (2005), p. 63; Lyall and Larsen (2009), p. 234; About International Telecommunication Union (ITU), available at <<https://www.itu.int/en/about/Pages/default.aspx>>, last visited 10/09/2020.

⁴ Instrument Amending the ITU Constitution, Art. 44.

⁵ United Nations Committee on the Peaceful Uses of Outer Space, Legal Sub-Committee, “Draft Report – Matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and

3. The Five Outer Space-Related Treaties

3.1 The Outer Space Treaty

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies ("The Outer Space Treaty") was adopted in December 1966 and entered into force in October 1967.¹ It is considered the foundational basis of the entire corpus of outer space law, encompassing both general principles of international law and principles specifically applicable to outer space.² An important feature of the treaty is the fact that it transforms the provisions of the UN GA Resolutions 1721 and 1962, the first documents to prescribe the guidelines for states' activities in outer space, into binding legal obligations.³

Presently, 110 member states of the UN have ratified the OST and 23 member states have signed it.⁴ This widespread endorsement of the principles prescribed in the convention and their codification from non-binding Resolutions adopted unanimously prompted certain authors to argue that, at least, some of them gained the status of customary law and, therefore, are binding on all states regardless whether they are signatories or not.⁵ Before addressing the customary character of the principles contained in the OST, they need a brief assessment.

means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union", A/AC.105/C.2/L.309/Add.2, 5 April 2019, p. 3.

¹ The Outer Space Treaty; Lyall and Larsen (2009), p. 53; N. M. Matte, "Outer Space Treaty", in Rudolf Bernhardt (ed.), *Encyclopedia of Public International Law. Law of the Sea, Air and Space*, Elsevier Science Publishers, B.V., 1989, pp. 251 – 253, at p. 251.

² Frans Von der Dunk, "International space law", in Frans Von der Dunk, Fabio Tronchetti (ed.), *Handbook of Space Law*, Edward Elgar Publishing, 2015, pp. 29-126, p. 49; Lyall and Larsen (2009), p. 53; Cheng (1997), p. 156; Diederiks-Verschoor and Kopal (2008), p. 23.

³ United Nations General Assembly Resolution 1721 (XVI) "International co-operation in the peaceful uses of outer space", 20 December 1961, A/RES/1721 (XVI); United Nations General Assembly Resolution 1962 (XVIII) "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space", 13 December 1963, A/RES/1963 (XVIII); Matte (1989), p. 251; Lyall and Larsen (2009), p. 54.

⁴ Outer Space Treaties Status January 2020, p. 10.

⁵ Hobe and Chen (2017), p. 26; Lyall and Larsen (2009), p. 71; Antonio Cassese, *International Law*, Oxford University Press, 2001, p. 120.

a) Substantive Content

The first three articles of the OST encompass the fundamental norms, which regulate space activities. Article III bears a particular importance for the purpose of the present article since it recognizes the applicability of international law and the UN Charter to the activities of states in outer space.¹ Consequently, states must comply with the obligation to maintain international peace and security, states must respect the prohibition of the threat or use of force and states have the obligation to promote international cooperation and understanding, even when they act outside the boundaries of Earth.² Another fundamental norm enshrined in the OST is the equality of states regarding the exploration and use of outer space, including the moon and other celestial bodies.³ Article I of the OST prescribes that any endeavour “shall be carried out for the benefit and in the interests of all countries”, without discrimination as to their level of economic or scientific development.⁴ The wording of the Article suggests that this right is not limited to member states.⁵ The treaty extends and recognizes the right to benefit from, explore and use space to all states, irrespective of their status as parties to the convention, in a similar manner to the Convention on the Regulation of Aerial Navigation and the Convention on International Civil Aviation regarding the right of states over the airspace above their territory.⁶ Article II of the OST bars states from appropriating or claiming sovereignty over portions of outer space, the moon and other celestial bodies, either through occupation or through other means.⁷ This provision is key to the distinction between the airspace and outer space in terms of legal status, the former being under state sovereignty.⁸

The only provision focused on military activities in outer space is Article IV, which prescribes for a partial demilitarization of the extra-terrestrial space.⁹ It contains an absolute prohibition on placing nuclear weapons or other weapons of mass destruction in the orbit around the Earth, on the

¹ The Outer Space Treaty, Article III.

² United Nations, Charter of the United Nations, 1945, Article 2; The Outer Space Treaty, Article III.

³ The Outer Space treaty, Article I.

⁴ Ibid.

⁵ Ibid.

⁶ League of Nations, Convention on the Regulation of Aerial Navigation, Paris, 13 October 1919, 11 LNTS 173, Art. I; The Chicago Convention (1944), Art. I; Lyall and Larsen (2009), pp. 59-60.

⁷ The Outer Space Treaty, Art. II.

⁸ Diederiks-Verschoor and Kopal (2008), p. 26.

⁹ The Outer Space Treaty, Art. IV.

moon or other celestial bodies, or in the void space between them.¹ However, the demilitarization of outer space is only partial because, while the moon and other celestial bodies must remain weapon-free, there is no prohibition regarding the placement of military installations and non-nuclear weapons in the empty space between them.²

Article V of the OST defines the status of astronauts as “envoys of mankind” and imposes the obligation upon states parties to “render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas”.³ Moreover, states have the obligation to inform other states parties or the Secretary-General of the UN of any phenomenon manifesting in outer space that might pose a danger to the astronauts.⁴

Despite the evident “state-centricity” of space law, as developed through the OST, Article VI envisages the possibility of private actors to conduct activities in the extra-terrestrial space.⁵ Under Article VI of the OST, a state incurs international responsibility for any national activity conducted in outer space, regardless whether a governmental or non-governmental entity carries it out.⁶ Moreover, the state party has the obligation to authorize and continuously monitor the actions of non-governmental entities in outer space, including the moon and other celestial bodies.⁷ However, this international responsibility triggered under Article VI OST cannot be equated with state attribution under the Articles on Responsibility of States for Internationally Wrongful Acts. As the next chapter will argue, there is an important difference between attributing a wrongful conduct to a state and holding that state responsible under the OST for failure to take all necessary measures to ensure compliance with international law. This distinction is essential in the context of warfare, since attribution determines the legitimate target for an action in self-defence.

The treaty is silent as to the definition of “national activities”, thus creating uncertainty in terms of the instances when a state may be held responsible. It

¹ The Outer Space Treaty, Art. IV; Matte (1989), p. 252; Cheng (1997), p. 245.

² The Outer Space Treaty, Art. IV; Matte (1989), p. 252; Cheng (1997), p. 245; Diederiks-Verschoor and Kopal (2008), p. 27.

³ The Outer Space Treaty, Art. V (1).

⁴ The Outer Space Treaty, Art. V (3).

⁵ The Outer Space Treaty, Art. VI; Stephen Gorove, “Sources and Principles of Space Law”, in Nandasiri Jasentuliyana (ed.), *Space Law - Development and Scope*, Greenwood Publishing Group, 1992, pp. 45–58, at pp. 46–48; Lyall and Larsen (2009), pp. 65 – 68; Von der Dunk (2015), pp. 45 – 46.

⁶ The Outer Space Treaty, Art. VI.

⁷ Ibid.

is generally considered that three schools of thought emerged on this issue. The first one holds that any activity in outer space conducted by nationals of a state party falls under the definition of “national activities”.¹ The second school of thought argues that the state is responsible for any activity for which liability for damage is triggered under Article VII of the OST and when it holds the status of the state of registry of a satellite under Article VIII.² The third approach defines “national activities” as any activity over which a state has the right to exercise some form of jurisdiction.³ This last perspective is desirable since, according to Article VIII of the OST, the state of registry retains both jurisdiction and control over any object launched into space and the personnel on board.⁴

Article VII establishes the regime of liability for damage caused by space activities and follows the same broad lines as Article VI.⁵ The two articles constitute an innovation in international law since, traditionally and as mentioned above, states are responsible or liable only for acts directly or indirectly attributable to them.⁶

In regards to jurisdiction, the OST provides that a state retains it over launched objects carried on its registry and the personnel on-board while stationed in outer space or on a celestial body.⁷ Moreover, the objects’ presence in outer space or on a celestial body bears no consequence on the state’s ownership over them, thus making it impossible to become *res nullius*.⁸ The issue of registration was quite ambiguous at the moment the treaty was drafted since there was no obligation on the state parties to maintain such registries and no formal institution established for the purpose of keeping record of objects launched into space.⁹ Under the terms of UN General Assembly Resolution 1721, states were called upon to voluntarily

¹ Carl Q. Christol, *Space Law: Past, Present, and Future*, Kluwer Law International, 1991, p. 247; Armel Kerrest de Rozavel, “Remarks on the Responsibility and Liability”, in *Proceedings of the Fortieth Colloquium on the Law of Outer Space*, 1998, p. 139; Lyall and Larsen (2009), p. 66; Von der Dunk (2015), p. 53;

² Henri Abraham Wassenbergh, “Public Law Aspects of Private Space Activities and Space Transportation in the Future”, in *Proceedings of the Thirty-Eighth Colloquium on the Law of Outer Space*, 1996, p. 246; Von der Dunk (2015), p. 54

³ Cheng (1997), pp. 658; Zhukov and Kolosov (2014), pp. 66-67; Von der Dunk (2015), p. 54.

⁴ The Outer Space Treaty, Art. VIII.

⁵ The Outer Space Treaty, Art. VII.

⁶ Cheng (1997), pp. 238 – 239; Zhukov and Kolosov (2014), pp. 65 – 68; Lyall and Larsen (2009), p. 66.

⁷ The Outer Space Treaty, Art. VIII.

⁸ The Outer Space Treaty, Art. VIII; Lyall and Larsen (2009), p. 67

⁹ Cheng (1997), p. 655; Lyall and Larsen (2009), p. 67; Zhukov and Kolosov (2014), p. 82.

provide data to the UN Secretary General on any launch they plan to perform.¹ The adoption of the 1975 Convention on Registration of Objects Launched into Outer Space crystallized the practice of national and international registration into a binding obligation and formalized the registry held by the UN Secretary General.²

Articles IX to XII of the OST focus on international cooperation and actions that will foster good relations among states in the quest of pursuing the exploration of outer space.³ State parties are under the obligation to avoid actions that might lead to the harmful contamination of the moon and other celestial bodies or the Earth's environment.⁴ In case their activities might negatively interfere with the activity or experiment of another state, states must consult with them.⁵ The potentially affected state also has the right to request such a consultation.⁶ Additionally, the treaty imposes the obligation on state parties to allow other states "to observe the flight of space objects" launched by them and facilitate access to their "stations, installations, equipment and space vehicles on the moon and other celestial bodies", all on a non-discriminatory and reciprocity basis.⁷ Article XII, which prescribes the obligation to allow access to objects stationed in outer space, derives its content from Article VII of the Antarctic Treaty, a legal instrument that greatly influenced the outer space regime established through the UN GA Resolutions and, subsequently, the OST.⁸

This concludes the analysis pertaining to the substantive content of the OST, the main legal instrument regulating activities in outer space. The following part of the present article will argue the customary nature of the norms included in this treaty.

b) The Outer Space Treaty and Customary International Law

Scholars support the idea that, at least some of the provisions of the Outer Space Treaty gained the status of customary international law.⁹ The author

¹ UN GA Resolution 1721, Part B; Lyall and Larsen (2009), p. 67; Zhukov and Kolosov (2014), p. 84.

² The Registration Convention, Arts. II, III.

³ The Outer Space Treaty, Arts. IX – XII.

⁴ The Outer Space Treaty, Art. IX.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid., Arts. X, XII.

⁸ The Outer Space Treaty, Art. XII; The Antarctic Treaty, Art. VII; Cheng (1997), pp. 221, 249; Lyall and Larsen (2009), p. 69; Zhukov and Kolosov (2014), p. 23.

⁹ See supra.

of the present paper concurs with this position and the following paragraphs will prove that the principles enshrined in the treaty are part of the corpus of customary international law. As a result, all states must abide by them, regardless whether they are parties to the treaty.

Article 38(1) of the ICJ Statute defines custom as “evidence of general practice accepted as law”.¹ Consequently, two elements are involved in the creation of customary international law namely, an objective or material one constituted by the actual behaviour of states, and a subjective or psychological element represented by the belief that such behaviour is required by law (*opinio juris sive necessitatis*).² Evidence of state practice can be derived from administrative acts, decisions of courts, legislation, participation in treaty-making, diplomatic correspondence and statements of officials.³ Often, proof of *opinio juris* overlaps with that of state practice since passing a certain law, concluding a treaty or voting in a certain manner a UN GA resolution suggest a conviction that legal norms or principles require such an action.⁴

Considering that the creation of a customary rule is an abstract process, which poses difficulties in determining the substantive content based on evidence of state practice and *opinio juris*, the International Court of Justice (ICJ) dealt in its jurisprudence with a wide array of issues on this topic. On uniformity and consistency, the Court held in the *Anglo-Norwegian Fisheries Case* that a relatively uniform state practice is essential before a custom comes into existence.⁵ There is no need for the practice to be in “absolute rigorous conformity” with the presumed rule and any actions contrary to it should be regarded as breaches rather than proof of the emergence of a new rule.⁶ As the Court emphasized in the *North Sea Continental Shelf Cases*, the passage of only a short period of time since the rule came into existence does not constitute a bar to the emergence of customary law.⁷ Moreover, the Court clearly recognized the possibility that a treaty might constitute the basis of customary law rules, as long as the rule

¹ The ICJ Statute, Art. 38(1)(b).

² Brownlie’s Principles (2012), pp. 24-26; Klabbbers (2013), p. 26; Shaw (2014), p.53.

³ Brownlie’s Principles (2012), p. 24; Klabbbers (2013), p. 28; Shaw (2014), p. 58.

⁴ Ibid.

⁵ *Fisheries Case (United Kingdom v. Norway)*, Judgment of December 18th, 1951: ICJ Reports 1951, p. 116, p. 131.

⁶ *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America)*, Merits, Judgment, ICJ Reports 1986, p. 14, para. 186.

⁷ *North Sea Continental Shelf Cases (Federal Republic of Germany/Denmark; Federal Republic of Germany/Netherlands)*, Judgment, ICJ Reports 1969, p. 3, para. 74.

is “of a fundamentally norm-creating character”.¹ Paragraph 73 of the judgment bears a particular importance for the purpose of the present sub-chapter. In it, the Court held that a “widespread and representative participation in the convention might suffice of itself” to prove the emergence of customary international law, as long as the states whose interests are particularly affected by the rule become state parties.² In their dissenting opinions to the judgment, Judges Lachs and Sorenson concurred with the judgment of the Court and clearly emphasized that the dynamic and swift evolution of technology calls for a more rapid development of international law norms.³

The first argument supporting the customary nature of the OST stems from the fact that, out of 193 members of the United Nations, 110 states ratified the treaty and an additional 23 signed it.⁴ These figures show a widespread participation of states to the convention, including the space-faring nations having the financial and technological possibilities to conduct outer space activities.⁵ This is clearly in line with the decision of the ICJ in the *North Sea Continental Shelf Cases*.⁶ Even in the absence of this decision, the widespread participation would suffice to prove the existence of both state practice and *opinio juris* necessary for the emergence of customary international law.

The second argument substantiating the contention that the OST gained the status of customary international law rests in the fact that most of the provisions included in the treaty are based on the text of the UN General Assembly Resolution 1962 adopted unanimously by the member states of the UN.⁷ The operative part of the Resolution is almost identical to the provisions included in the treaty. It prescribes the equality of states in the

¹ Ibid. para. 71.

² Ibid, para. 73.

³ Dissenting Opinion of Judge Lachs, *North Sea Continental Shelf Cases (Federal Republic of Germany/Denmark; Federal Republic of Germany/Netherlands)*, ICJ Reports 1969, pp. 219 – 240, p. 230; Dissenting Opinion of Judge Soresen, *North Sea Continental Shelf Cases (Federal Republic of Germany/Denmark; Federal Republic of Germany/Netherlands)*, ICJ Reports 1969, pp. 242 – 258, p. 244.

⁴ UN GA Resolution 1962; Matte (1989), p. 251; Lyall and Larsen (2009), p. 54; “Status of the Charter of the United Nations and Statute of the International Court of Justice”, available at <https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=I-1&chapter=1&clang=_en>, last visited 10/09/2020.

⁵ Ibid. The United States of America, the United Kingdom of Great Britain and Northern Ireland, the Russian Federation, Japan, China, India, Canada, Germany, France, Luxembourg have all ratified the Outer Space Treaty.

⁶ *The North Sea Continental Shelf Cases (1969)*, para. 73.

⁷ UN GA Resolution 1962; Matte (1989), p. 251; Lyall and Larsen (2009), p. 54

exploration and exploitation of outer space, the prohibition on the national appropriation, the rule on international responsibility and the obligation to conduct outer space activities in accordance with international law, including the Charter of the UN.¹ The fact that there has been no formal objection towards the treaty further supports the customary nature of the OST.² With the exception of the signatories of the Bogota Declaration that claimed sovereignty over portions of the geostationary orbit, there is a generally uniform state practice, in compliance with the principles of the Outer Space Treaty.³ Consequently, the Bogota Declaration represents a violation of Article II of the OST, rather than proof of absence of its status as customary law.⁴ As upheld by the ICJ, any instances departing from the rule are breaches of it.⁵ In accordance with ICJ's decision in the *North Sea Continental Shelf Cases*, the fact that only five decades passed since the Outer Space Treaty entered into force bears no consequence to the crystallization of its principles into customary international law.⁶

In conclusion, space law principles such as non-appropriation, peaceful uses of outer space, the Moon and other celestial bodies, international cooperation in space-related matters and non-militarization have transformed from mere treaty obligations among state parties into customary rules binding upon all states in the international community.

3.2 The Rescue Agreement

The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space ("The Rescue Agreement") was adopted by the General Assembly in December 1967 and entered into force one year later.⁷ It builds on Articles V and VIII of the OST, which contain provisions regarding the status of astronauts and prescribe the conditions for the return of space objects.⁸

Article V of the OST confers upon astronauts the status of "envoys of mankind", thus indicating their entitlement to assistance in case of distress.⁹

¹ Ibid.

² Lyall and Larsen (2009), p. 78

³ Ibid.

⁴ The Outer Space Treaty, Art. II.

⁵ *The Nicaragua Case (1986)*, para. 186

⁶ *The North Sea Continental Shelf Cases (1969)*, para. 74.

⁷ The Rescue Agreement; Cheng (1997), p. 265; Lyall and Larsen (2009), p. 135; Von der Dunk (2015), p. 78.

⁸ Ibid.

⁹ The Outer Space Treaty, Art. V; Cheng (1997), p. 417; Von der Dunk (2015), pp. 79 – 80.

The Rescue Agreement extends the obligations of the Contracting Parties to render support to a spacecraft's personnel experiencing distress, such as an accident or an emergency landing.¹ It can be observed that the title and the Preamble of the agreement refers to "astronauts", whereas the operative part uses the word "personnel". While they used to be considered synonyms, this slight difference has more relevance in the context of evolving technologies, which will allow commercial space flights.² Consequently, this interpretation might extend the applicability of the agreement to cover situations of distress experienced by "space tourists" or other persons on board of a spacecraft falling outside the scope of the term "astronaut".

In accordance with Articles 2 and 3 of the Rescue Agreement, the degree of responsibility for giving assistance to space personnel in distress depends on whether their location is under the jurisdiction of the Contracting State.³ If the emergency or unintended landing took place in the territory of a state party to the convention, the state has the obligation to take all necessary measures to rescue the personnel and must promptly inform the launching authority and the UN Secretary General of the steps it takes.⁴ In cases of accident or unintended/emergency landing in the high seas or a territory outside the jurisdiction of a state, the Contracting Parties having the capabilities and the possibility to render assistance shall do so, if necessary.⁵ The Rescue Agreement makes mandatory the return to the launching state of any personnel of a spacecraft landed on the territory of another state party, in the high seas or "in any other place not under the jurisdiction of any State".⁶ Reading Articles 3 and 4 of the Rescue Agreement in conjunction with Article V of the OST, it can be concluded that state parties must also render assistance to the personnel of a distressed aircraft in outer space or on a celestial body and must return any such personnel to the launching authority.⁷

In regards to space objects and their component parts, the state parties to the convention incur similar responsibilities to those attached to the personnel

¹ The Rescue Agreement, Art. 1.

² Nandasiri Jasentuliyana, *International Space Law and the United Nations*, Brill Nijhoff, 1999, pp. 190–191; Manfred Lachs, *The Law of Outer Space: An Experience in Contemporary Law-Making – Reissued on the Occasion of the 50th Anniversary of the International Institute of Space Law*, Martinus Nijhoff Publishers, 2010, pp. 76–77, 83; Von der Dunk (2015), p. 80.

³ The Rescue Agreement, Arts. 2, 3.

⁴ Ibid., Art. 2.

⁵ Ibid, Art. 3.

⁶ The Rescue Agreement, Art. 4.

⁷ The Rescue Agreement, Arts. 3,4; The Outer Space Treaty, Art. V; Cheng (1997), p. 285; Lyall and Larsen (2009), pp. 139 – 140;

of an aircraft.¹ However, in this case, the obligation of taking steps for the recovery is triggered only as long as there is a request made from the launching state.² If a contracting party receives information that a space object or its components landed anywhere except on territory under the jurisdiction of a third state, it must immediately inform the launching state and the UN Secretary General.³ The same obligation applies to information about potentially hazardous objects, which the launching authority must remove immediately.⁴

Another important feature of the Rescue Agreement is the definition of “launching authority” included in Article 6.⁵ It is important to mention that it places states and international organizations on equal footing in terms of the rights and obligations stemming from the treaty.⁶ However, an international organization can be considered the “launching authority” as within the scope of the agreement only if it has declared its acceptance of the terms and if a majority of its states parties are also part of the Rescue Agreement and the OST.⁷

In the context of a potential outer space conflict, the status of the astronauts might differ according to their involvement in the hostilities. States parties to the Rescue Agreement will incur the same obligations of assistance in regards to astronauts conducting peaceful exploratory missions. However, the same rules will not be applicable to those directly involved in military operations during warfare, which will fall under the scope of international humanitarian law norms.

3.3 The Liability Convention

The third treaty, part of the *corpus juris spatialis*, is the 1972 Convention on International Liability for Damage Caused by Space Objects (“the Liability Convention”).⁸ The issue of liability for damage caused by objects launched into outer space was brought before the COPUOS Legal Sub-Committee by the United States in 1962, when the US representative produced a metal piece presumably originating from Sputnik IV, found on a street in

¹ The Rescue Agreement, Art. 5.

² Ibid.

³ Ibid., Art. 5(1).

⁴ Ibid., Art. 5(4).

⁵ Ibid., Art. 6.

⁶ Cheng (1997), p. 281; Von der Dunk (2015), p. 81.

⁷ Ibid.

⁸ The Liability Convention.

Manitowoc, Wisconsin.¹ Following proof that accidents in outer space might lead to harmful consequences on Earth's surface, the UN member states reached an agreement on an international convention that regulates liability for damage caused by outer space objects.² 98 states ratified the Convention, with an additional 18 signing it and four international organizations lodging declarations of acceptance of rights and obligations.³ It is the last outer space treaty to enjoy a relatively widespread acceptance.

Article I of the Liability Convention defines the terms relevant for the purpose of the treaty.⁴ Damage comprises both harm against individuals (loss of life, injury or other health impairment), as well as against property of states, natural or juridical persons, and of international organizations.⁵ The convention explicitly stipulates that "launching" covers attempted launching and "space object" covers its components, the launching vehicle and parts of it.⁶ Drawing from Article VII of the Outer Space Treaty, it establishes four categories of states that can simultaneously incur liability for damage caused by a space object.⁷ These are as follows:

- a) the state launching the object;
- b) the state procuring the launch of the object;
- c) the state from whose territory the object is launched;
- d) the state from whose facility the object is launched.⁸

Article XXII clarifies that any reference to "states" also includes intergovernmental organizations, as long as they have lodged a declaration of acceptance and the majority of the state parties to that organization have ratified the Liability Convention and the OST.⁹ This interpretation is not applicable to Articles XXIV to XXVII, which grant the right to initiate and take part in a review process of the Convention, to propose amendments and to withdraw.¹⁰

¹ Cheng (1997), p. 288

² Ibid.

³ Outer Space Treaties Status January 2020.

⁴ The Liability Convention, Art. I.

⁵ Ibid., Art. I(a).

⁶ Ibid., Art. I (b), (d).

⁷ Ibid., Art. I (c).

⁸ Ibid.

⁹ The Liability Convention, Art. XXII (1).

¹⁰ Ibid.

The Liability Convention draws two distinct liability regimes, depending on the location where the damage has occurred.¹ Damage caused on the surface of the Earth or to aircraft in flight triggers absolute liability for the launching state, while fault-based liability is attached to damage caused anywhere outside the terrestrial surface to a space object or to the property or personnel on board of it.² However, the last category fails to cover certain instances of damage such as that caused to an astronaut outside of his spacecraft while in outer space or on the surface of a celestial body or to a parachutist in airspace.³

According to the convention, joint liability is applicable in two instances. Firstly, in case a third state incurs damage from the collision of two space objects belonging to other states, the launching states are jointly and severally liable.⁴ The same differentiation between absolute and fault-based liability is provided for in this case.⁵ Compensation due to be paid to the third state is calculated according to the extent each launching state is at fault.⁶ The second instance of joint liability is represented by the damage caused by a space object jointly launched by two or more states.⁷ The article grants the state, which paid compensation for damage the right to a claim for indemnification from each participant to the joint launching.⁸ It was necessary to include this entitlement since the damaged state has the right to request compensation from “any or all of the launching States”.⁹ The Convention envisages the possibility of exoneration from absolute liability as long as the launching state proves that the damage occurred, wholly or partially, as a result of gross negligence or of an intentional act or omission of the claimant state.¹⁰ No exoneration is possible for damage caused by an act in breach of international law, particularly the UN Charter and the OST.¹¹

Another interesting feature of the Liability Convention is the significant relaxation of the rule on nationality of claims.¹² The categories entitled to

¹ Ibid., Arts. II, III.

² Ibid.

³ Cheng (1997), p. 323; Zhukov and Kolosov (2014), p. 96.

⁴ The Liability Convention, Art. IV (1).

⁵ Ibid., Art. IV 1(a), (b).

⁶ Ibid., Art. IV (2).

⁷ Ibid., Art. V (1).

⁸ Ibid., Art. V (2).

⁹ Ibid., Art. V(2).

¹⁰ The Liability Convention, Art. VI (1).

¹¹ Ibid., Art. VI (2).

¹² The Liability Convention, Art. VIII; Cheng (1997), p. 307; Lyall and Larsen (2009), p. 111; Von der Dunk (2015), pp. 90-91.

claim compensation for damage caused by a space object are the nationality state, the state on whose territory the damage occurred or the victims' state of permanent residence.¹ The Article seems to establish a hierarchy among these categories, which are mutually exclusive in regards to the claim for compensation. A claim made by the nationality state excludes the other two from the right to request compensation, whereas a claim presented by the territorial state entails that the state of permanent residence is barred from lodging one. However, this hierarchy is only apparent since states positioned lower in this hierarchy can present a claim before those higher in the hierarchy decided to do so.²

Victim states should first present a claim for compensation through diplomatic channels within one year from the date the incident has occurred or the state received information about it.³ If the diplomatic negotiations fail, the claimant state and the launching state shall establish a Claims Commission.⁴ Articles XV to XIX deal with procedural aspects concerning the activity of the Commission.⁵ If an international organization is liable for damage caused by a space object, the claim for compensation shall be firstly presented to the organization itself.⁶

Currently, there are more than 2000 operational satellites orbiting the Earth.⁷ Any attack of a state against the space assets of another state might cause damage to a third state. Components of a destroyed satellite might fall on the surface of the Earth and space debris is released following the use of an ASAT weapon. Moreover, a weaponized satellite might incidentally destroy a space asset of a third state located near the actual target. Therefore, the rules on liability are important to ensure that the third state will be adequately compensated for any damage incurred as a result of aggressive acts perpetrated between two or more states.

3.4 The Registration Convention

The fourth legal instrument comprised by the outer space treaties package is the Convention on Registration of Objects Launched into Outer Space ("the Registration Convention"), which entered into force in 1975.⁸ Its importance

¹ The Liability Convention, Art. VIII.

² Cheng (1997), p. 307.

³ The Liability Convention, Arts. IX, X.

⁴ Ibid., Art. XIV.

⁵ Ibid., Arts. XV – XIX.

⁶ Ibid., Art. XXII (3).

⁷ UCS Satellite Database as of 1 April 2020.

⁸ The Registration Convention.

stems from the fact that it clarifies and details the concept of registration introduced in the Outer Space Treaty.¹

The Convention creates two sets of obligations, namely the establishment of both a national register and an international one maintained by the UN Secretary General.² These registries provide the means to identify a space object for planning a launch and, most importantly, for establishing liability in case of a potential damage.³ Moreover, they provide the basis for jurisdiction over space objects and astronauts on board, as within the scope of Articles V and VIII of the Outer Space Treaty.⁴

According to Article II, the launching state has the obligation to register any space object sent into “earth orbit or beyond” in an appropriate register, on whose existence the UN Secretary General shall be informed.⁵ In case there are two or more launching states, they should jointly decide which one of them shall register the object.⁶ The state of registry enjoys a margin of appreciation in regards to the content of the registry and “the conditions under which it is maintained”.⁷ The Outer Space Treaty provides that the state of registry retains jurisdiction over the space object and the personnel on board.⁸ However, the Registration Convention acknowledges the possibility of additional agreements concluded among launching states in regards to jurisdiction and ownership.⁹

States have full and open access to the international registry held by the UN Secretary General.¹⁰ Article IV includes a non-exhaustive list of elements that the states of registry must communicate in relation to each space object they have registered.¹¹ These comprise:

- ”... (a) *Name of launching State or States;*
- (b) *An appropriate designator of the space object or its registration number;*

¹ Aldo Armando Cocca, ”Registration of Space Objects”, in Nandasiri Jasentuliyana, Roy S.K. Lee (eds.), *Manual on Space Law*, Vol. 1, Oceana Publications, 1979, pp. 173–193, p. 173; Christol (1991), p. 213; Von der Dunk (2015), p. 94.

² The Registration Convention, Arts. II, III.

³ Lyall and Larsen (2009), p. 86.

⁴ The Outer Space Treaty, Arts. V, VIII.

⁵ The Registration Convention., Art. II (1).

⁶ Ibid., Art. II (2).

⁷ Ibid., Art. II (3).

⁸ The Outer Space Treaty, Art. VIII.

⁹ The Registration Convention, Art. II (2).

¹⁰ The Registration Convention, Art. III.

¹¹ Ibid., Art. IV (1).

(c) *Date and territory or location of launch;*

(d) *Basic orbital parameters, including:*

(i) *Nodal period;*

(ii) *Inclination;*

(iii) *Apogee;*

(iv) *Perigee;*

(e) *General function of the space object.*"¹

The non-exhaustive nature of the list stems from the text of the second paragraph, which envisages the possibility that the state of registry may provide the UN Secretary General with additional information about the space object.² Moreover, notification should also be made about any space object which has left Earth orbit.³ One of the faults of the Convention is the fact that it does not impose a certain time limit for the provision of information by the state of registry. The expression "as soon as practicable" is vague and leaves room for different interpretations.⁴ This is all the more important since lack of sufficient information might lead to negative consequences and impunity in cases of damage provoked by a space object. The safety net provided for in Article VI does not completely solve the issue, the process of identifying a space object and its origin potentially being a lengthy one.⁵

The development of private enterprises in space corroborated with the fact that launching states have the right to jointly and freely decide the state of registry, brings the issue of the "flag of convenience" into the realm of outer space law. In a quest to avoid rigorous regulations, commercial enterprises might seek to register their space objects with states that do not have the necessary capabilities to exercise proper supervision and control.⁶ Consequently, a "genuine link" test should be established, similar to the one envisaged in the *Nottebohm Case*, Article 5 of the Convention on the High Seas and Article 91 of the Convention on the Law of the Sea.⁷ Moreover, in

¹ Ibid., Art. IV (1).

² Ibid., Art. IV (2).

³ Ibid., Art. IV (3).

⁴ Ibid., Art. IV (1).

⁵ Ibid., Art. VI.

⁶ Lyall and Larsen (2009), p. 94

⁷ *Nottebohm Case (Liechtenstein v. Guatemala)*, second phase, Judgment of April 6th, 1955, ICJ Reports 1955, p. 4, p. 23; United Nations, Convention on the High Seas, 29 April 1958, Art. 5; The Convention on the Law of the Sea, Art. 91.

its Separate Opinion to the *Barcelona Traction Case*, Judge Jessup clearly argued the possibility of extending the rule of "genuine link" to the relationship between a private company and the state of incorporation.¹ As a result, a potential review of the Registration Convention in accordance with Article X should have on the agenda the possibility to impose conditions in regards to the choice of the state of registry. This is particularly important in outer space warfare since the state of registry retains jurisdiction and control over the space assets and the personnel on board, even if a non-governmental entity actually launches the object.² A state having the technical capabilities of effectively supervising the conduct of the space assets under its registry would ensure compliance with international law, including the prohibition on the use of force enshrined in the Charter of the UN.³ On the contrary, a state merely used as "flag of convenience" for a satellite would be unable to prevent a non-state actor from perpetrating attacks against other states.

The final part of the present article will analyse the substantive content of the Moon Agreement, the last treaty in the series of five instruments regulating outer space and the least recognized by the international community.

3.5 The Moon Agreement

The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies ("the Moon Agreement") represents the final branch of the body of outer space law.⁴ Adopted in 1979 by the UN General Assembly, it entered into force only five years later, in 1984, when Austria ratified it.⁵ The Moon Agreement enjoys the lowest degree of ratifications among all outer space treaties, with only 18 states parties and 11 signatories, none of them being the major space-faring nations.⁶ Professor Bin Cheng considers that it is the poorest drafted instrument in the series of treaties originating from the COPUOS.⁷ However, its poor ratification degree might actually

¹ Separate Opinion of Judge Jessup, *Case Concerning the Barcelona Traction, Light and Power Company Limited (Belgium v. Spain)*, Preliminary Objections, Judgment, ICJ Reports 1964, p. 6, pp. 161 – 221, p. 188.

² The Outer Space Treaty, Art. VIII.

³ Charter of the UN, Art. 2(4).

⁴ The Moon Agreement.

⁵ "Agreement Governing the Activities of States on the Moon and Other Celestial Bodies", available at <<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html>>, last visited 10/09/2020.

⁶ Outer Space Treaties Status January 2020; Lyall and Larsen (2009), p. 178.

⁷ Cheng (1997), p. 357

stem from a controversial phrase of “*common heritage of mankind*” included in the treaty, rather than from the style and clarity of the text as a whole.¹

The treaty greatly extends its cosmographical scope in Article 1, providing that any reference to the “Moon” shall be understood as referring also to the orbits around and the trajectories to or around it.² Moreover, it explicitly mentions that any provision relating to the Moon is also applicable to the other celestial bodies, except extra-terrestrial material reaching Earth through natural means.³

The non-controversial part of the Moon Agreement essentially reiterates and details the principles enshrined in the Outer Space Treaty, the Liability Convention and the Rescue Agreement for the particular instance of the moon and other celestial bodies.⁴ Article 3(2) translates for the first time the prohibition on the threat or use of force enshrined in Article 2(4) of the UN Charter to the realm of outer space.⁵ Consequently, any threat or act of aggression originating from the moon or other celestial bodies against the Earth, the moon, spacecraft, personnel on board or man-made space objects is prohibited.⁶ However, due to the limited ratification of the agreement, the use of force regime in outer space remains regulated by customary international law and the UN Charter. Other principles covered by the Moon Agreement include freedom of exploration, international cooperation, non-appropriation, the obligation to render assistance to astronauts, rules pertaining to jurisdiction, responsibility and liability, open access to installations and stations.⁷

The controversy surrounding the Moon Agreement and, potentially, the reason why the space-faring nations did not ratify it is raised by Article 11, which declares that “the Moon and its natural resources are the common heritage of mankind”.⁸ As per Article 1, this extends also to the other celestial bodies.⁹ This represents the first instance when an international law

¹ The Moon Agreement, Art. 11(1).

² The Moon Agreement, Art. 1(2).

³ Ibid., Art. 1(1) and (3).

⁴ Cheng (1997), p. 374; Stephan Hobe, “The 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies”, in Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, K.U., *Cologne Commentary on Space Law*, Vol. II, 2013, pp. 325 – 426, p. 355; Von der Dunk (2015), p. 100.

⁵ The UN Charter, Art. 2(4); The Moon Agreement, Art. 3(2).

⁶ The Moon Agreement, Art. 3(2).

⁷ The Moon Agreement, Arts. 2, 6, 10, 12, 15.

⁸ The Moon Agreement, Art. 11(1).

⁹ See supra note 140.

instrument grants the status of “*common heritage of mankind*” to a part of the world, even before the Convention on the Law of the Sea did so for the deep ocean bed and subsoil.¹ The concept indicates that certain elements should be exploited under an international arrangement bringing benefits to all mankind, rather than unilaterally by states or commercial entities.² Paragraph 1 of Article 11, read in conjunction with paragraphs 5 and 7(d), suggest that any benefits derived from the exploitation of lunar resources or those found on other celestial bodies must be shared equitably among states parties according to an international regime established for the purposes of exploitation.³ The idea that space-faring nations might be under an international obligation to share proceeds resulted from the commercial exploitation of these extra-terrestrial resources or technologies used in this process with less developed nations which incurred no costs might have acted as a bar against a widespread ratification of the treaty.⁴

4. Conclusion

Since the launch of Sputnik 1 in 1957, states have constantly competed for outer space dominance. Initially, only two nations had the economic and technological capacity of conducting activities in the extra-terrestrial environment. Nowadays, nine countries have launching capacities and the private sector is strongly represented by companies such as SpaceX, Arianespace and Blue Origin. Despite significant efforts by the international community to preserve the outer space for purely peaceful purposes, recent trends show that the five outer space related treaties are far from preventing a military confrontation in this environment. Increased reliance on satellites for both civilian and military purposes created new vulnerabilities and threats for states. Space-faring nations are constantly developing new technologies to protect their space assets, technology that can be used both for defensive and offensive purposes, as demonstrated by ASAT tests conducted by China, Russia and the US. Moreover, the US established the Space Force, the only space-oriented military branch in the world, while a large number of other countries integrated a space component in their air force structure. Consequently, we are currently facing an ascending trend

¹ Cheng (1997), p. 357; Lyall and Larsen (2009), p. 194; Von der Dunk (2015), p. 101.

² Edwin Egede, *Common Heritage of Mankind*, Oxford Bibliographies, 2014; Hobe and Chen (2017), pp. 33-34.

³ The Moon Agreement, Art. 11 (1), (5), 7(d).

⁴ Lyall and Larsen (2009), p. 196; Fabio Tronchetti, *The exploitation of natural resources of the Moon and other celestial bodies: a proposal for a legal regime*, Vol. 4, Martinus Nijhoff Publishers, 2009, p. 50; Von der Dunk (2015), p. 101.

towards the weaponization of space and the possibility of an outer space conflict.

In this context, the international legal community acknowledged the need to assess the applicability of international law pertaining to armed conflict to a potential outer space war and, thus, the MILAMOS and the Woomera Manual projects debuted. The present article attempted to contribute to these efforts and analysed the rules regulating state behaviour in outer space, as well as certain issues arising from these norms. Determining the legal status of outer space and identifying the *lex specialis* applicable to this new environment are important first steps in the process of analysing the applicability of the *jus ad bellum* and *jus in bello* legal regimes in the context of outer space warfare.

As a result, the article addressed the issues of the legal status of outer space, as well as its definition and delimitation. It found that outer space, including the moon and other celestial bodies, are *res communis*, free from national appropriation, but allowing exploitation and exploration. The delimitation of outer space has long been a controversial issue and, so far, states did not reach consensus on this matter. However, based on a series of state proposals made before COPUOS, as well as scientific considerations as to the technical characteristics of a satellite, the present article concluded that the lower limit of outer space should be between 90 and 100 kilometres above sea level, this being the lowest perigee a satellite can attain. Consequently, the geostationary orbit is also part of the outer space treaty, despite the equatorial states' claim of sovereignty. The article also analysed the most relevant provisions of the outer space-related treaties and their significance in the context of an outer space conflict. It is important to mention that the paper demonstrated the customary nature of the provisions included in the Outer Space Treaty.

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