BINDING ARBITRATION OF DISPUTES ARISING FROM SPACE ACCIDENTS

Uzay Kazalarından Doğan Uyuşmazlıkların Zorunlu Tahkim Yoluyla Çözülmesi

İnan ULUÇ*

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ABSTRACT

The desire to discover space's unique environment, mine its resources, and changes in national regulations in favor of private enterprises have brought about significant technological advancement. This technological advancement has concomitantly helped humanity to exponentially increase its presence and activities in space. Alas, the law as to outer space has failed to precede this progress. The existing space legal regime is centered around States' dominance in space and comprised of mechanisms purposed to resolve disputes between two or more States. Hence, it is bereft of effective procedures for the resolution of disputes among private actors, international organizations, and other non-governmental bodies with satellites and spacecrafts in outer space. In this respect, whilst outer space emerges as a new habitat where state and non-state actors are compelled to co-exist, how humanity will address unavoidable, extraterrestrial disputes between these actors becomes a pressing concern. Notably, the non-appropriable nature of space, the cornucopia of actors operating in it, and the abstruse nature of space-related disputes demand a resolution mechanism that may be readily adjusted to protect the interests of public or private enterprises. In light of this, this article assesses the viability of arbitration as an effective means of dispute settlement for accidents that occur in outer space. More specifically, this article analyzes the current international regulations as to outer space, the dispute resolution mechanisms enshrined in them, and how arbitration may play a key role in the effective and efficacious resolution of disputes in space accident cases.

Key Words: The Outer Space Treaty, the Liability Convention, Dispute Resolution Mechanisms, Arbitration.

There is no requirement of Ethics Committee Approval for this study.

* Assist. Prof. Dr., Ankara Sosyal Bilimler Üniversitesi Hukuk Fakültesi, Medenî Usûl, İcra ve İflâs Hukuku Anabilim Dalı, e-mail: inan.uluc@asbu.edu.tr, ORCID ID 0000-0001-6261-3142

ÖZET

Uzayın sıra dışı yapısını keşfetme ve minerallerinden faydalanma isteği, özel sektör lehine yapılan ulusal düzenlemeler ve teşvikler sonrası önemli teknolojik atılımlar elde edilmiştir. Bu atılımlar sayesinde insanoğlu uzaydaki varlığını ve etkinliğini de önemli ölçüde arttırmıştır. Ne yazık ki, uzay hukuku bu gelişmelerin gerisinde kalmıştır. Mevcut uluslararası düzenlemeler ve bu düzenlemelerin benimsediği uyuşmazlık çözüm metotları devlet merkezli bir anlayışla kaleme alınmış, uzayda faaliyet gösteren özel hukuk kişileri ve onların menfaatleri dikkate alınmamıştır. Bu durum özel sektörün uzaydaki varlığını önemli ölçüde arttırmasıyla birlikte daha da önem arz eden bir hale gelmiş, mağdurunun ve/veya failinin özel hukuk tüzel kişisi olduğu uzay kazalarının hangi uyuşmazlık çözüm metodu ile daha etkili ve etkin bir şekilde çözüme kavuşturulabileceği tartışılmaya başlanmıştır. Bu metodun tespitinde uzayın devletlerin egemenliğine tabi olmayan yapısı, uzayda faaliyet gösteren aktörlerin çeşitliliği ve uzay kazalarından doğacak uyuşmazlıkların karmaşık yapısı dikkate alınmalı, esnek ve somut olayın özelliklerine ve tarafların tercihlerine göre düzenlenebilecek ve uzayda faaliyet gösteren gerek kamu gerekse özel hukuk tüzel kişilerinin menfaatlerini koruyabilecek bir uyuşmazlık çözüm sistemi tercih edilmelidir. Bu bağlamda işbu makalede uzaya ilişkin uluslararası düzenlemeler, bu düzenlemelerce benimsenmiş uyuşmazlık çözüm metotları, bu metotların noksanlıkları incelenmiş olup, tahkimin neden bu metotların yerine tercih edilmesi gerektiği ve uzay kazalarından doğan uyuşmazlıkların etkili ve etkin çözümünde oynayabileceği rol analiz edilmiştir.

Anahtar Sözcükler: Uzay Anlaşması, Sorumluluk Sözleşmesi, Uyuşmazlık Çözüm Mekanizmaları, Tahkim.

INTRODUCTION

Space constitutes physically and legally a unique environment for humanity. It is still difficult and financially burdensome to get to, not survivable for humankind without special paraphernalia, and even perilous for satellites and robots to operate in. Yet, these drawbacks have not dispirited humanity from endeavoring to escape gravity and venture beyond the perceived limits of Earth. With the defiance of gravity and risks have come the invention of tools and technologies both transforming our world and helping to realize sustainable development goals.[1]

While this defiance was spearheaded by the United States and the former Soviet Union in the early years of space exploration,[2] there are currently

[1] Does Earth's Future Depend on Space? <https://www.morganstanley.com/ideas/space-earth-sustainability> accessed 4 August 2022 ("While increased space exploration could certainly present new sustainability issues – space debris and the potential impact of increased launches on the atmosphere among them – there are many potential benefits emerging from the space theme such: •Food security; •Greenhouse-gas monitoring; •Utilities; Access to Renewable Energy; •Supply- Demand Optimization; •Internet Access for Billions of People;•Tertiary Benefits.").

[2] George Khoukaz, 'ADR That is Out of This World: A Regime for the Resolution of Outer-

more than 30 countries with significant space industries and new States yet to come.[3] Further, with States' policies to foster a private aerospace sector,[4] there is an ever-increasing number of privately-funded outer space endeavors.[5] Currently, it is believed that there are globally more than 10,000 space-focused companies, 55.82% of which are from the United States.[6]

Further, pursuant to the reports published by prominent financial institutions, the global space economy's value reached US$424 billion in 2020, having

Space Disputes' (2018) 2018(1) Journal of Dispute Resolution 265, 265-266.

3 One of these new States implementing a national space program is Türkiye. Under the leadership of the Turkish Space Agency, Türkiye aims to enhance its indigenous technological capabilities and increase its existence and operations in outer space. For further information, *see* <https://tua.gov.tr/en/national-space-program> accessed 5 August 2022.

4 For example, the Commercial Space Launch Act 51 U.S.C. § 50901(a)(7) (1984) ("[T]he United States should encourage private sector launches, reentries, and associate services and, only to extent necessary, regulate those launches, reentries, and services to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States."). *See also* Carson W. Bennett, 'Houston, We Have an Arbitration: International Arbitration's Role in Resolving Commercial Aerospace Disputes' (2019) 19(1) Pepperdine Dispute Resolution Law Journal 61, 64 ("President George W. Bush signed Executive Order 13326 that created the Commission on Implementation of United States Space Exploration Policy (Commission). The Commission's final report recommended that 'NASA's role must be limited to only those areas where there is irrefutable demonstration that only government can perform the proposed activity' and that 'the preferred choice for operational activities must be competitively awarded contracts with private [companies].'").

5 Bennett (n 4) 63 ("Space, once the exclusive domain of national space programs, is now becoming a crowded marketplace with ambitious businessmen seeking to change the world (and turn a profit) [...]. Today, a new group of 'Space Barons' featuring Elon Musk, Jeff Bezos, and Sir Richard Branson, have started a new space race and raised the stakes. The initial vision of the [Google Lunar] XPrize was commercial space travel, but these young companies – Space Exploration Technologies (SpaceX), Blue Origin, Virgin Atlantic, Virgin Orbit, and Vulcan Aerospace (now Stratolaunch) – have started exploring new ways to launch commercial satellites, send supplies (and crew members) to the International Space Station, and are even attempting to colonize Mars."); Svetla Ben-Itzhak, 'Companies are commercializing outer space. Do government programs still matter?' *The Washington Post* (Washington, 11 January 2022)<https://www.washingtonpost.com/politics/2022/01/11/companies-are-commercializing-outer-space-do- government- programs-still-matter/> accessed 4 August 2022 ("2021 was a big year for private companies and space travel, and 2022 will probably be just as busy. Last year, three companies – SpaceX, Blue Origin and Virgin Galactic – achieved key feats in space travel previously reserved for countries. They transported astronauts to the International Space Station, flew space enthusiasts into space, delivered cargo to low Earth orbit and developed reusable booster rockets.").

6 John Koetsier, 'Space Inc: 10,000 Companies, $4T Value…And 52% American' *Forbes* (22 May 2021) <https://www.forbes.com/sites/johnkoetsier/2021/05/22/space-inc-10000-companies-4t-value--and-52- american/?sh=1f90d38e55> accessed 4 August 2022.

expanded 70% since 2010.[7] Also, it is projected that the space industry could generate US$ 1 trillion or more in annual revenue by 2040.[8]

Alas, the considerable strides that have been made in outer space have not been witnessed in the legal sphere. Though private enterprises from varying nations pierced States' dominance in outer space and emerged as co-players/ partners, the existing international treaties as to space realm and activities have stagnated since Cold War. They have maintained their focus on preserving peaceful relations between spacefaring nations, namely the United States and the Soviet Union, and have failed to espouse revisions corresponding to the shifting dynamics of space exploration and the developing diversity among both actors operating in space and interests in space assets.[9]

To date, this stagnation has not become the center of attention mainly because there have been no significant international disputes arising out of outer space accidents that have inflicted severe economic damage on States or private actors. Yet, along with both the increasing number of satellites and spacecrafts launched into space[10] and space debris originating from purposeful

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7 Michael Sheetz, 'The space industry is on its way to reach $1 trillion in revenue by 2040, Citi says' *CNBC* (21 May 2022)<https://www.cnbc.com/2022/05/21/space-industry-is-on-its-way-to-1-trillion-in-revenue-by-2040- citi.html#:~:text=America%20and%20others.,The%20global%20space%20economy's%20value%20reached%20%24424%20billion%20in%202020,satellite%20sector%2C%E2%80%9D%20Citi%20said> accessed 4 August 2022.

8 Ibid.

9 Henry R. Hertzfeld and Timothy G. Nelson, 'Binding Arbitration as an Effective Means of Dispute Settlement for Accidents in Outer Space' (2013) 2013 Proc. Int'l Inst. Space L. 129, 130 ("The set of international space treaties were negotiated and ratified during the early period of human space activity in the 1960s and early 1970s and reflect the drafters' focus on government rather than commercial uses of space."); Jack Busby, 'Dispute resolution in a vacuum? Arbitration's role in resolving space disputes' (*Allen&Overy*) <https://www.allenovery.com/en-gb/global/news-and-insights/international- arbitration-review/dispute-resolution-in-a-vacuum-arbitrations-role-in-resolving-space-disputes> accessed 4 August 2022 ("Much like the onset of the digital age, the space industry is developing at a faster pace than the supporting legal framework. The international legal regime governing liability for incidents in outer space is directed at States and is out-of-date, with no specific regulation on the rights and obligations of private enterprises.").

10 Busby (n 9) ("2021 was a record-breaking year in the space industry. It witnessed the most active satellites in orbit (over 4,000); the most successful orbital missions (134); the most space tourist flights (6); the most people in weightless space at the same time (19); the most SpaceX rocket launches (31); and the launch of the world's most powerful space telescope (James Webb Space Telescope). There were 7,389 individual satellites – active and inactive – in Space at the end of April 2021, which is an increase of 27.97% compared to 2020.").

acts[11] or collisions,[12] the potential for space accidents grows yearly. This potential inevitably prompts a question as to the existence and adequacy of dispute resolution mechanisms embraced by the international space treaties governing liability for outer space accidents. Indeed, as will be discussed in further detail below, only one of the five major international treaties makes any mention of a dispute resolution mechanism, which can only be initiated by state parties, and, even then, the outcome of the mentioned mechanism is non-binding.

In the face of this legal black hole, this article explores the role that may be played by arbitration and discusses whether arbitration may constitute a venue where both commercial and government interests in space are catered to. Specifically, Part I analyzes the major treaties governing the space realm and activities. Part II examines the tools at States' disposal to resolve space accidents. Finally, Part III addresses the current stance of arbitration in the present matrix of outer space dispute resolution mechanisms and looks at how arbitration may fill the very black legal hole in the system.

I. CURRENT STATE OF SPACE LAW

To better understand the reasons why arbitration may play an essential role in the resolution of space disputes, it is of importance to analyze the current space legal regime, which is comprised of the five United Nations (the "U.N.") treaties, the U.N. resolutions, the documents issued by the Committee on the

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11 For example, in November 2021, Russia conducted a strike against a Soviet-era satellite in space. According to the data shared by the U.S. State Department spokesman, the anti-satellite test generated more than 1,500 pieces of trackable debris and hundreds of thousands of pieces of smaller orbital debris that threaten the interests of all nations. For further information, *see* Paul Sonne, Missy Ryan and Christian Davenport, 'In first, Russian test strikes satellite using Earth- based missile' *The Washington Post* (16 November 2021) <https://www.washingtonpost.com/national-security/russia- satellie-weapon/2021/11/15/0695621c-4648-11ec-973c-be864f938c72_story.html > accessed 4 August 2022.

12 Space Debris and Human Spacecraft <https://www.nasa.gov/mission_pages/station/news/orbital_debris.html> accessed 4 August 2022 (On Feb. 10, 2009, a defunct Russian spacecraft collided with and destroyed a functioning U.S. Iridium commercial spacecraft. The collision added more than 2,300 pieces of large, trackable debris and many smaller debris to the inventory of space junk."); United Nations General Assembly: Committee on the Peaceful Uses of Outer Space: Note verbal dated 3 December 2021 from the Permanent Mission of China to the United Nations (Vienna) addressed to the Secretary General <https://www.unoosa.org/res/oosadoc/data/documents/2021/aac_105/aac_1051262_0_html/AAC105_1262E.pdf> accessed 4 August 2022 ("Starlink satellites launched by Space Exploration Technologies Corporation (Space X) of the United States of America have had two close encounters with the China Space Station. For safety reasons, the China Space Station implemented preventive collision avoidance control on 1 July and 21 October 2021, respectively.").

Peaceful Uses of Outer Space (the "COPUOS"), bilateral and multilateral agreements, and national space regulations.[13]

The treaties that amount to the legal foundation of all space activities are as follows:

- The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (the Outer Space Treaty);
- The 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the Rescue Agreement);
- The 1972 Convention on International Liability for Damage Caused by Space Objects (the Liability Convention);
- The 1976 Convention of Registration of Objects Launched into Outer Space (the Registration Convention); and
- The 1984 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the Moon Agreement)

Of these five treaties, the Outer Space Treaty and the Liability Convention remain to be the motherships of international space law. Thus, these two treaties will be the center of our analysis under this title.

A. The Outer Space Treaty[14]

Negotiated and drafted during the heightened political tensions of the Cold War, the Outer Space Treaty is mainly the materialization of efforts by the United States and the former Soviet Union to establish ground rules and minimum standards with the aspiration of de-escalating the potential confrontation.

The Outer Space Treaty was largely based on the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space[15] and was opened for signature in 1967. Notably, despite being an echo of the Cold War era and the geopolitical interests of the two superpowers,

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13 National space legislations and bilateral and multilateral agreements lie outside of the scope of this article. Thus, the United Nations' treaties constitute the subject matter of the analysis conducted under this title. However, more information as to national space legislations and bilateral and multilateral agreements may be found at the Office for Outer Space Affairs' website; https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw.html.

14 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies ('Outer Space Treaty') (1967) <https://www.unoosa.org/pdf/gares/ARES_21_2222E.pdf>.

15 U.N. G.A. Res. 1962 (XVIII), the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space <https://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/legal-principles.html>.

since it entered into force,[16] the Outer Space Treaty has been ratified by over 100 countries and is referred to as the constitution of international space law.[17]

With the emphasis it places upon free and equal access to and use of outer space,[18] international cooperation,[19] and purposing to benefit all humanity,[20] the Outer Space Treaty is believed to conserve space as an international domain and evade 'land grab' and colonialism.[21]

From a pertinent legal perspective, the Outer Space Treaty both establishes international responsibility for signatory States and addresses their liability in case of harm inflicted upon another contracting state or upon its natural or juridical persons, by an object which they launched or procured the launching of into outer space. More specifically, Article VI places international responsibility upon signatory States for their national activities in outer space, including the Moon and other celestial bodies, whether such activities are conducted by public or private entities.[22] Apropos of liability, according to

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16 Khoukaz (n 2) 272; Status of International Agreements relating to activities in outer space as at 1 January 2022 (A/AC.105/C.2/2022/CRP.10) <https://www.unoosa.org/res/oosadoc/data/documents/2022/aac_105c_22022crp/aac_105c_22022crp_10_0_html/AAC105_C2_2022_CRP10E.pdf>.

17 Stefan Pislevik, 'Law Without Gravity: Arbitrating Space Disputes at the Permanent Court of Arbitration and the Relevance of Adverse Inferences' (2019) 43(2) Journal of Space Law 280, 284; Khoukaz (n 2) 272.

18 The Outer Space Treaty (n 14) Article I ("(1) The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind; (2) Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies."). Additionally, by providing that outer space is not subject to national appropriation through claim of sovereignty, the Outer Space Treaty further emphasizes the importance it attaches to every nation's equal and free access to and use of outer space. Article II of the Treaty States that "[o]uter space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."

19 ibid Article I ("(3) There shall be freedom of scientific investigation in outer space, including the Moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation."). In addition to Article I, Articles IX, X, XI, and XII also aim to elevate international co-operation among States signatory to the Treaty.

20 Preamble of the Outer Space Treaty ("*Believing* that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development.").

21 Matthew J.P. Horton, 'Consolidating Space: A Proposal to Establish a Central Forum for the Settlement of Space-Related Disputes' (2020) 22(3) Vanderbilt Journal of Entertainment & Technology Law 627, 634.

22 The Outer Space Treaty (n 14) Article VI ("State Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and

Article VII, a signatory state will be held liable for damages caused by a space object that the state has either launched or assisted in its launching.[23]

The Outer Space Treaty still maintains its status as the cornerstone in the regulation of activities in space. However, changing dynamics of the space race and the emergence of new issues that were not foreseen then pose a great test for the Treaty in terms of adequacy and enforcement issues.

First, despite being the most comprehensive treaty regulating space activities, the Outer Space Treaty does not reflect the current commercialization of outer space by private companies. While the Treaty does not prohibit the activities of private enterprises in space, it places its primary focus on States. This failure inevitably deprives the Treaty of the competence to cater to the interests of private entities with assets in space. Second, this state-oriented perspective concomitantly limits the dispute settlement procedures to primarily diplomatic negotiations (direct diplomacy), which may resolve state-to-state disputes, but may easily become futile for disputes involving or between private entities.

Undoubtedly, these primary shortcomings, which cast doubt upon the Treaty's adequacy today, may be correlated with the period in which it was created. As stated before, this Treaty was negotiated and drafted under rather extraordinary circumstances of the Cold War with a noble objective to de-escalate military confrontation and prevent the armament of outer space. Thus, the priority of the drafters was understandably not to herald and regulate a new space era. The end of the Cold War, however, marked the beginning of the new space era, which is increasingly commercialized by private enterprises[24] and militarized by States.[25] In this respect, while the Outer Space Treaty thankfully lays the groundwork for tackling the militarization of space by States, its

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

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

24 Trevor Kehrer, 'Closing the Liability Loophole: The Liability Convention and the Future of Conflict in Space' (2019) 20(1) Chicago Journal of International Law 178, 189-190.

25 ibid 190-191.

failure to regulate the rights, obligations, and dispute settlement of private enterprises creates a substantial lacuna and inhibits its functionality. As will be discussed in further detail below, the Outer Space Treaty falls short from a legal standpoint when it comes to facilitating the economic exploitation of outer space.[26]

B. The Liability Convention

The Outer Space Treaty established the foundation for a system of international liability for damages caused by objects in outer space, but did not set forth rules regarding the liability regime and its operation. This task was instead assigned to the Liability Convention. The Liability Convention essentially expounds upon Article VII of the Outer Space Treaty and "elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of [the] Convention of a full and equitable measure of compensation to victims of such damage."[27]

The liability addressed by the Convention is that of "launching States"[28] towards foreign States and their nationals. Notably, a launching State shall not bear international liability if the damage is inflicted upon the launching State's own nationals or foreign nationals who participate in the operation of the space object in question.[29] The damage that will result in the launching State's liability is defined as "loss of life, personal injury or other impairment of health; or loss of or damage to property of States or persons, natural or juridical, or property of international intergovernmental organizations."[30]

As to the extent of a launching State's liability, the Convention embraces different standards premised on the location where the damage occurred. Article II implements a strict liability standard for any damage that is caused

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26 Rachel O'Grady, 'Star Wars: The Launch of Extranational Arbitration?' (2016) 82(4) CIArb Arbitration Journal 3.

27 Convention on International Liability for Damage Caused by Space Objects ('Liability Convention') (1972), Preamble <https://www.unoosa.org/pdf/gares/ARES_26_2777E.pdf>.

28 ibid Article I ("For the purposes of this Convention: (c) The term 'launching State' means: (i) A State which launches or procures the launching of a space object; (ii) A State from whose territory or facility a space object is launched.").

29 ibid Article VII ("The provisions of this Convention shall not apply to damage caused by a space object of a launching State to: (a) Nationals of that launching State; (b) Foreign nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its decent, or during such time as they are in the immediate vicinity of a planned launching or recovery area as the result of an invitation by that launching State.").

30 ibid Article I.

"on the surface of the Earth or to aircraft in flight."[31] Article III, on the other hand, espouses a negligence standard according to which a launching state shall be liable if the damage is caused "in outer space" due to the launching State's fault or the fault of persons for whom it is responsible.[32]

Besides establishing the liability and compensation regime, the Liability Convention also accords a means by which disputes arising out of space accidents may be settled. Following the occurrence of an actionable harm, a claim by a damaged state should be presented to a launching State through diplomatic channels[33] within one year following the date of the occurrence of the damage or the identification of the launching State which is liable.[34] Diplomatic negotiations are expected to take place thereafter. Should the negotiations come to no fruition, the parties concerned establish a claims commission,[35] which shall be composed of three members: one appointed by each party (or collection of parties) and one chosen jointly.[36] If one State fails to appoint its member within 2 months, the other State may request the Secretary-General of the United Nations to constitute a single-member claims commission.[37] After its constitution, the commission issues its decision within one year, which shall be final and binding if the parties have so agreed.[38]

As seen, the Liability Convention purposes to both orderly settle disputes among States and equitably redress damages inflicted by space objects.[39] It is, however, believed that neither of these purposes is fully actualized. The reasons why the Convention fails to actualize the former purpose will be discussed under the title concentrating on the current means to resolve space accident cases. Thus, the following paragraphs will delve into the problems inhibiting the Liability Convention's ability to actualize the latter purpose.

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31 ibid Article II ("A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight."). Here, it should be noted that Article VI of the Convention furnishes exoneration from strict liability imposed under Article II. According to Article VI, "exoneration from absolute liability shall be granted to the extent that a launching State establishes that the damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State or of natural or juridical persons it represents."

32 ibid Article III ("In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.").

33 ibid Article IX.

34 ibid Article X.

35 ibid Article XIV.

36 ibid Article XV.

37 ibid Article XVI.

38 ibid Article XIX.

39 Kehrer (n 24) 181.

The first problem is the Convention's lack of standard whereby 'fault' may be judged. As touched upon before, Article III embraces a fault-based liability regime for the damages that occurred in outer space. Thus, for compensation to be owing to a victim state injured by a space object in outer space, the elements of causation, damage, and more notably, proof of fault must be satisfied.[40] Alas, the Convention does not define fault or, at least, establish a standard of care according to which a launching State's conduct(s), which resulted in harm, may be judged. It is possible to resort to the general principles of law to interpret fault under the Liability Convention. Yet, whether this is the suitable interpretation of fault for the purposes of the Convention is to remain unclear. Considering that the exploration and exploitation of outer space will continue, a clear and consistent legal regime must be developed. With the development of proper interpretation of Article III, the Liability Convention may operate as intended and may serve its purpose of providing an effective liability and compensation regime.[41]

The second problem with the Convention's liability regime is rooted within the strict liability standard implemented under Article II. Article II attributes strict liability to a launching State for damage caused by its space object on the surface of Earth or to aircraft in flight. With this wording, Article II deviates from analogous international law's liability standard, which recognizes 'control' as the essential element of responsibility[42] and links a State's liability to the mere ownership or assistance in launching the space object.[43]

It is unknown whether this deviation from the control-based liability standard was intentional. It is, however, believed that the drafters' failure to envisage probable changes in the character and volume of human spatial activities contributed to the departure. Today, the bar to access to space has

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40 Joel A. Dennerley, 'State Liability for Space Object Collisions: The Proper Interpretation of 'Fault' for the Purposes of International Space Law' (2018) 29(1) The European Journal of International Law 281, 282.

41 For an in-depth analysis of the lack of fault's definition under the Liability Convention, *see* ibid.

42 Kehrer (n 24) 181 ("The customary law of war at sea provides that whichever state takes control of a ship via capture also assumes ownership and responsibility for it. Moreover, under the U.N. Convention on the Law of the Sea, individuals who seize ships for private ends are pirates subject to any penalties an apprehending state sees fit, and their stolen ships are understood to be pirate ships while under pirate control…Thus, the customary law of the sea comprehends that responsibility for harm flows not from ownership, but from effective control.").

43 ibid 203 ("[U]nder the Liability Convention, the legal liability does not flow from agency or control, but instead from ownership."). Also, *see* the commentary to Article 1 of the "Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, with Commentaries" <https://legal.un.org/ilc/texts/instruments/english/commentaries/9_7_2001.pdf>.

been lowered and commercialization of space is nigh-universal. In the face of these facts, such a farcical launch-oriented liability standard not only curtails the Liability Convention's ability to reach its professed objectives[44] but also places an undue burden on launching States and disincentivizes international cooperation.[45] Moreover, this standard lacks the capacity to handle giant leaps taken in technological capabilities and the threats radiating from these capabilities, such as cyberwarfare.[46] Understandably, the Convention's drafters would not have been expected to have forecasted this kind of science-fictional threat in the 1960s,[47] especially considering the fact that their motivation was to promote peaceful and cooperative uses of outer space.[48]

Yet, today, cyberwarfare in space is present. For example, there is a real possibility that the control of a satellite launched by Country A may be gained by a malevolent private or state actor with the purpose of inflicting harm upon Country B on Earth.[49] Under the extant liability regime established by Article II of the Convention, as a launching state, Country A will probably be held strictly liable for the damage suffered by Country B on Earth even if it had no hand in bringing the harm about.

This scenario may seem unrealistic. Yet, it gracefully depicts the perceived loophole in Article II's launch-based liability standard[50] and the probable

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44 The Liability Convention (n 27), Preamble ("Recognizing the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage.").

45 Kehrer (n 24) 195 ("Such absurd ownership-based punishment makes little sense if the Liability Convention's purpose is to create 'effective international rules and procedures concerning liability' that strengthen 'international cooperation.' Presently, it would be unreasonable for launching States…to cooperate and pay restitution without some sort of security for when they are not at fault. Because of this, the result of the [liability] regime may well be more international tension and armed conflict instead of dispute resolution.").

46 ibid 184 ("Cyberwarfare is a broad term that refers generally to operations with the goal of hostile exploitation of networked infrastructure within or belonging to a state.").

47 The Liability Convention was drafted and negotiated by the Legal subcommittee from 1963 to 1972. The agreement was reached by the General Assembly in 1971 and the Convention entered into force in September 1972.

48 The Liability Convention (n 27) ("The General Assembly, reaffirming the importance of international co-operation in the field of the exploration and peaceful uses of outer space, including the Moon and other celestial bodies, and of promoting the law in this new field of human endeavor.").

49 Kehrer (n 24) 184-185; ibid 191-192 ("It is now possible for purely commercial satellites to be turned into weapons or be used in support of an armed attack on Earth – even if that was not part of their original design – by a sophisticated actor or state. The rapid commercialization of space also means that there are now several more tools for bad actors to take advantage of.").

50 For more information as to this loophole, *see* ibid.

unfair attribution of liability that may be caused by this very standard due to its blindness to possible intervening acts of third parties. Further, Article VI of the Liability Convention rubs salt in the wound by conditioning exoneration from strict liability upon gross negligence or omission on the part of a claimant state or of natural or juridical persons it represents.[51] Thankfully, however, the Convention vests a claims commission with authority "to decide the merits of the claim for compensation and determine the amount of compensation payable, if any."[52] Via this authority, the claims commission may adjudicate a launching State's arguments as to possible intervening third party acts and, if finds them credible, may absolve the launching State from liability for harm to the claimant State.

II. CURRENT MEANS TO RESOLVE DISPUTES ARISING FROM SPACE ACCIDENTS

To date, there has been no significant international dispute arising from space accidents to warrant a review of the dispute resolution instruments available in the space legal regime's repertoire. Yet, with a notable increase in human activity in space, the prospect of such accidents grows exponentially. With this prospect in mind, of critical importance for space law is to precede the occurrence of accidents and to offer mechanisms for the orderly settlement of disputes. In this respect, this chapter analyzes the current dispute resolution mechanisms and discusses their adequacy.

A. Litigation

The first mechanism that may be utilized to have damages redressed is litigation. Domestic courts may assert jurisdiction over an array of claims on the basis of territoriality (territory-based jurisdiction) and nationality (nationality-based jurisdiction). Territory is deemed to be the exclusive basis for jurisdiction. According to the general understanding of international law, "each nation-state, being a sovereign entity under international law, has exclusive jurisdiction within its territorial boundaries over all persons, whether nationals or foreigners, and all things, whether tangible or intangible."[53] In addition to the territory-based jurisdiction, international law also recognizes the nationality-based jurisdiction whereby domestic courts may assert jurisdiction over issues, regardless of territorial location.[54]

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51 The Liability Convention (n 27) Article VI.

52 ibid Article XVIII.

53 Horton (n 21) 641.

54 *See* generally Alex Mills, 'Rethinking Jurisdiction in International Law' (2014) 84(1) British Yearbook of International Law 187. *See also* Horton (n 21) 641 ("In addition to this broad territorial principle of jurisdiction, international law recognizes a series of principles

Through either of these jurisdictions, domestic courts may exercise their judicial powers over disputes arising from space accidents. As a result, a plaintiff may file a lawsuit in its domestic courts, as well as the domestic courts of the defendant inflicted the harm. The most notable advantage of litigation is that it grants space companies a direct access to dispute resolution without requiring a State to espouse their claim. Alas, this advantage is not enough to compensate for the caveats affiliated with litigation.

First, it is an exigent probability that a domestic court trying the case may be biased against either the plaintiff or the defendant, depending on in whose state the lawsuit is filed. Second, domestic judges' likely lack of familiarity with the space law regime and industry may inhibit them from grasping the details of the case and may cause significant delays or adversely impact the fair resolution of the disputes. Other obstacles that may complicate the resolution of space accident cases via litigation involve determining the applicable law, the procedure for collection of evidence, the standard of proof, and the level of confidentiality.

Of greater concern, however, is the prospect that a private party may not be even able to litigate its dispute at all.[55] In cases where a private party brings the legal action against a state party, the state may have recourse to the doctrine of sovereign immunity, which shield it from being brought into a lawsuit in a foreign court without consent.[56]

Finally, presuming a private actor manages to overcome all these limitations of litigation and acquires a resolution to its dispute, there is still one colossal problem standing before the plaintiff company: enforcement of the judgment on a foreign plaintiff. According to international custom, there are four fundamental criteria to which the recognition and enforcement of a foreign judgment is subject: (1) the judgment must be rendered by a competent court; (2) the foreign court proceedings led to the judgment must be in conformity with the principles of due process; (3) there must be no fraud vitiating the

that expand the jurisdiction of domestic courts, including (1) the nationality principle of jurisdiction over a nation's citizens located outside national territory; (2) the passive personality principle of jurisdiction over disputes with a citizen victim.").

55 Horton (n 21) 642.

56 Report on Sovereign Immunity: Past, Present, and Future: Session 9 of the Congressional Study Group (11 May 2022) < https://www.brookings.edu/research/sovereign-immunity-past-present-and-future/> ("Rooted in customary international law, sovereign immunity generally protects states and their officials from a range of legal proceedings in other foreign states' domestic courts. These immunities were initially quite broad but, over the course of the twentieth century, many states (including the United States) began to adopt a 'restrictive theory' that treated foreign states and their agencies and instrumentalities the same as private actors for commercial activities while retaining sovereign immunity for states' sovereign and public activities."); Horton (n 21) 642

judgment; (4) the judgment must not contravene the public policy of the enforcing state.[57]

Fortunately, there are global attempts to overcome the complications inherent in international litigation, enhance access to justice, and facilitate international trade and investment by heartening the mutual recognition of judgments across national borders.[58] In this regard, the most noteworthy step was taken in Hague with the "Convention of 2 July 2019 on the Recognition and Enforcement of Foreign Judgments in Civil or Commercial Matters" (the "Hague Judgments Convention").[59] As of 23 June 2022, by adopting JURI Committee Report A9-0177/2022,[60] the European Parliament consented to the accession of the European Union (the "EU") to the Hague Judgments Convention and, as of 12 July 2022, the Council of the EU adopted a decision completing the EU's accession to the Convention.[61] Further, on 15 July 2022, the President of Ukraine signed the law on ratifying the Hague Judgments Convention. With the EU's accession and Ukraine's ratification, the Hague Judgments Convention clears an important hurdle standing before its entry into force, which, by Article 28, is conditioned upon the ratification, accession, acceptance of two States.[62] Current developments satisfy the preceding condition stipulated by Article 28 and pave the way for the Convention's entry

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57 ibid 643. These criteria that will become applicable while deciding the enforcement and recognition of a foreign judgment may vary from one country to another. *See* 28 U.S.C. § 2467(d)(1)(A) - (E) for the United States; Article 54 of the Code of Private International Law and Procedure for the Republic of Türkiye.

58 The United States Becomes the Sixth Signatory to the 2019 Hague Judgments Convention on the Recognition and Enforcement of Foreign Judgments (18 March 2022) <https://www.gibsondunn.com/the-united-states-becomes-the-sixth- signatory-to-the-2019-hague-judgments-convention-on-the-recognition-and-enforcement-of-foreign-judgments/> accessed 4 August 2022.

59 Convention of 2 July 2019 on the Recognition and Enforcement of Foreign Judgments in Civil or Commercial Matters <https://www.hcch.net/en/instruments/conventions/full-text/?cid=137> accessed 4 August 4, 2022.

60 European Parliament Legislative Resolution of 23 June 2022 on the Draft Council Decision Concerning the Accession of the European Union to the Convention on the Recognition and Enforcement of Foreign Judgments in Civil or Commercial Matters (13494/2021–C9-0465/2021–2021/0208(NLE)) <https://www.europarl.europa.eu/doceo/document/TA-9-2022-0261_EN.pdf> accessed 4 August 2022.

61 Convention on the recognition of judgments: Council adopts decision on EU accession (12 July 2022) <https://www.consilium.europa.eu/en/press/press-releases/2022/07/12/convention-on-the-recognition-of-judgements- council-adopts-decision-on-eu-accession/>.

62 With respect to the entry into force, Article 28 of the Hague Judgments Convention stipulates that it shall enter into force 12 months after the ratification, acceptance, approval or accession of two States.

into force. The Hague Judgments Convention will become enforceable for the EU and Ukraine on 1 September 2023.[63] Yet, so far, there is no data available to analyze the Hague Judgments Convention's performance in facilitating recognition and enforcement of foreign judgments across the globe.

However, even if the Hague Judgments Convention acquires worldwide recognition and enforcement, it is sincerely doubted that it will morph litigation into a viable dispute resolution mechanism for spacefaring companies unless the above-mentioned obstacles concerning private litigation are overcome.

At the end, there is an array of inherent problems inhibiting litigation from catering to the interests of private enterprises and accordingly rendering it unappealing within the context of space accident cases. In this respect, the methods embodied in the Liability Convention may be turned to as feasible alternatives to litigation, but alas, as delineated below, they fall short of accomplishing this undertaking.

B. Direct Diplomacy and Claims Commission

As delineated before, the Liability Convention not only establishes the liability regime upon the groundwork laid by the Outer Space Treaty but also blueprints a two-tier process for the resolution of disputes resulted from space accidents.

The first tier of the process is diplomatic negotiations.[64] For the commencement of the negotiations, Article X of the Convention requires a claim for damage compensation to be presented to the relevant launching State within one year following the date of the damage's occurrence or the identification of the launching State.[65] In history, diplomatic negotiations were actually resorted to for the amicable resolution of Canada's damage claims arising from the crash of Cosmos 954.

When a Soviet spy satellite, Cosmos 954, depressurized and deorbited to Earth, it crashed in uninhabited Canadian territory. Since the satellite was powered by a nuclear reactor, the collection and disposal of debris necessitated the utmost care and urgency.[66] Nigh a year after the accident, Canada presented a claim for damages premised upon the Liability Convention and general

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63 European Commission, the European Union joins the Hague Judgments Convention, *Daily News* (29/08/2022) <https://ec.europa.eu/commission/presscorner/detail/en/mex_22_5224>.

64 The Liability Convention (n 27) Article IX.

65 ibid Article X.

66 Alexander P. Reinert, 'Updating the Liability Regime in Outer Space: Why Spacefaring Companies Should Be Internationally Liable For Their Space Objects' (2020) 62(1) William&Mary Law Review 325, 337.

principles of international law[67] and initiated diplomatic negotiations with the Soviet Union.[68] While the Soviet Union initially argued that "Canada had taken excessive measures to restore the environment"[69] and refused to pay C$6.94 million,[70] diplomatic negotiations came to fruition and the Soviet Union accepted to pay C$3 million to settle the claim.[71] The Cosmos 954 accident remains to be the only invocation of the Liability Convention to date[72] and has set a precedent of utilizing diplomacy for inter-state disputes arising from space accidents. Notably, however, the success of the diplomacy in this case might not have necessarily flown from the sweeping terms of the Liability Convention, but perhaps from Canada's cognizance of the frailty of its claim for property damage under the Convention.

The Canadian claim described damage to property as "the deposit of hazardous radioactive debris from the satellite throughout a large area of Canadian territory, and the presence of that debris in the environment rendering part of Canada's territory unfit for use."[73] It is not, however, certain that damage as contemplated under the Liability Convention[74] occurred, given that the satellite landed in an uninhabited territory.[75] While the crash indisputably altered the conditions of the land and rendered it unsafe, the *actual* damage remained unmeasurable.[76] The unclarity as to the actual damage inevitably cast doubt upon Canada's access to the eventual restitution under the Liability

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67 Settlement of Claim Between Canada and the Union of Soviet Socialist Republics for Damage Caused by "Cosmos 954" (Released on April 2, 1981), Statement of Claim by Canada, paras. 17 < https://www.jaxa.jp/library/space_law/chapter_3/3-2-2-1_e.html>.

68 ibid paras. 14-23

69 Reinert (n 66) 337.

70 ibid.

71 Settlement of Claim Between Canada and the Union of Soviet Socialist Republics for Damage Caused by "Cosmos 954" (n 67) Articles I & II of the Protocol.

72 Reinert (n 66) 337.

73 Settlement of Claim Between Canada and the Union of Soviet Socialist Republics for Damage Caused by "Cosmos 954" (n 67), Statement of Claim, para. 15.

74 The Liability Convention (n 27) Article I ("For the purposes of this Convention: (a) The term 'damage' means loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations.").

75 Joseph A. Burke, 'Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident' (1984) 8(2) Fordham International Law Journal 255, 276; Kehrer (n 24) 185-186 ("[R]adioactive debris from the Soviet Cosmos 954 satellite landed in uninhabited Canadian land and Canada's claim was the cost of cleanup rather than property damage, so it was not clear that the terms of the Liability Convention controlled.").

76 ibid 276-277.

Convention.[77] This lack of legal coverage experienced by Canada,[78] indeed, raises the question of whether diplomatic negotiations may be relied upon as an efficient and efficacious dispute settlement mechanism unless a disputant State has a reason to compromise.

Maybe, this very same question had sprung to the minds of the Liability Convention's drafters, given the fact that there is a second tier of dispute resolution process instituted, should the diplomatic negotiations fail. Articles XIV through XX of the Convention regulate the constitution of a claims commission and the adjudication of claims by this commission. After the parties have unsuccessfully negotiated for one-year through diplomatic conduits,[79] Article XIV calls for the establishment of a commission consisting of three members.[80] It is the duty of this commission to "decide the merits of the claim for compensation and determine the amount of compensation payable, if any."[81]

Rightfully, even without the launching State's consent and participation, Article XVI (1) of the Convention allows the establishment of a one-member claims commission and the adjudication of the claimant State's claim for damages.[82] Unfortunately, however, Article XIX (2) of the same Convention States that the award of the claims commission is *not* binding unless the disputant States agree for it to be binding.[83] If they do not agree, then the commission's award is merely "recommendatory."[84]

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77 ibid 277 ("Unless there was damage within the article I meaning of the word, article XII was powerless to supply the compensation Canada sought in its claim despite its reference to international law and the principles of justice and equity. If the property damage issue had come before a Claims Commission pursuant to articles XIV through XX of the Liability Convention, it is conceivable that Canada could have been denied recovery on this basis.").

78 ibid 275 ("Canada's use of a secondary claim based on general principles of international law is illustrative of the problems a state faces in attempting to frame a claim for damages under the Liability Convention.").

79 The Liability Convention (n 27) Article XIV ("If no settlement of a claim is arrived at through diplomatic negotiations as provided for in article IX, within one year from the date on which the claimant State notifies the launching State that it has submitted the documentation of its claim, the parties concerned shall establish a Claims Commission at the request of either party.").

80 For the details regarding the composition of a claims commission, please *see* ibid Articles XV & XVI.

81 ibid Article XVIII.

82 ibid Article XVI (1) ("If one of the parties does not make its appointment within the stipulated period, the Chairman shall, at the request of the other party, constitute a single-member Claims Commission.").

83 ibid Article XIX (2) ("The decision of the Commission shall be final and binding if the parties have so agreed; otherwise, the Commission shall render a final and recommendatory award, which the parties shall consider in good faith.").

84 ibid Article XIX (2).

Consequently, good faith cooperation and collaboration of the launching State become the sine qua non of the commission's proper adjudication and the enforcement of the final award. This inevitably accords the launching state an opportunity to avert liability and renders both the claims commission process and the Liability Convention toothless. At the end of the day, an award without enforcement does not go beyond being a piece of paper.

In addition to the potential advisory status of an award, the claims commission also suffers from a jurisdictional bar against natural or juridical persons. While harms suffered by these persons are considered to be damage within the context of the Liability Convention, they are not afforded direct recourse to the claims commission. Thus, the mechanism that may be utilized to resolve a space accident case involving a private party depends on who the other party is.

If the "defendant" is a state party, the private owner cannot resort to the claims commission directly but may enlist the help of its State to make a claim on its behalf. Upon the espousal of the claim, the respective State may invoke Article IX for diplomatic negotiations and, should the negotiations fail, Article XIV for the constitution of the claims commission.[85] In the opposite scenario (state *v*. private party), the definition of a "launching State" given under Article I of the Convention becomes determinative because the liability scheme is predicated upon launching State status. In this respect, even if the space object that inflicted harm is owned by a private party, the State, whose territory was used to launch the private party's space object, is considered to be the launching State under Article I and may be held liable for the damages. As a result, it becomes possible for the claimant State to evoke Articles IX and XIV for diplomatic negotiations and the claims commission process respectively, rather than filing a lawsuit in a national court. Finally, if both disputants are private parties, the claimant private party may enlist the support of its state to make a claim on its behalf. And, if the state espouses the claim, it may raise the claim against the respondent private party's state based on the launching State status as explained in the second scenario above. If this espousal does not take place, the dispute may be referred to litigation in either the claimant's or the respondent's national court. Regardless of the venue, however, litigation is accompanied by legal complications, such as competent court, applicable law, evidence collection, and judgment enforcement. Thus, to bypass these complications, private parties may opt into arbitration via a submission agreement.[86]

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85 Hertzfeld and Nelson (n 9) 133 ("Alternatively, the private owner might seek to sue the foreign government for damages in a national court (either its home court or that of the foreign government) – assuming it can overcome any objections to sovereign immunity.").

86 Submission agreements are agreements to arbitrate made after the dispute has arisen.

Irrespective of the scenario, due to the state-centric, impractical dispute resolution regime of the Liability Convention and its ineffective award enforcement proceedings, many spacefaring private actors are incentivized to find ways to estop the Convention from being invoked if their space objects were to damage an international party or to be damaged by an international party. Indeed, many companies aim to resolve disputes arising from space accidents extra-judicially.[87] Companies implement "cross-waivers of liability"[88] via which "each party agrees bear its own risk."[89] As a result, if something goes awry, the parties adjudicate the dispute as a matter of contract law in municipal court, rather than effectuating the terms of the Liability Convention.[90]

These legal moves made by spacefaring companies illustrate that the Liability Convention is woefully underdeveloped and fails to cater to the interests of private actors. If private enterprises are to be encouraged to spearhead the advancement of space technologies and exploration of space in the years to come, it is of importance that the Liability Convention is amended to provide private companies with effective dispute resolution and award enforcement mechanisms. Otherwise, the Liability Convention fails to serve its purpose of establishing effective procedure for settling international disputes and becomes obsolete.

C. International Court of Justice

Another forum for the resolution of space accident cases is the International Court of Justice (the "ICJ"). Founded by the Charter of the United Nations in 1945, the ICJ is considered to be a reflection of global commitment to the pacific settlement of international disputes. In this regard, Article 33 of the United Nations Charter lists the pacific methods for the settlement of disputes.[91]

As an international court operating under the aegis of international law,[92] the

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87 Dan St. John, 'The Trouble with Westphalia in Space: The State-Centric Liability Regime' (2012) 40(4) Denver Journal of International Law & Policy 686, 712.

88 *See* 14 CFR Chapter V – National Aeronautics and Space Administration, Part 1266 <https://www.govinfo.gov/content/pkg/CFR-2021-title14-vol5/pdf/CFR-2021-title14-vol5-sec1266-102.pdf>.

89 John (n 87) 712.

90 Reinert (n 66) 345.

91 United Nations Charter (1945), Article 33(1) <https://www.un.org/en/about-us/un-charter/chapter-6> ("The parties to any dispute, the continuance of which is likely to endanger the maintenance of international peace and security, shall, first of all, seek a solution by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice.").

92 Statute of the International Court of Justice, Article 38(1) <https://www.icj-cij.org/en/statute> ("The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply: a. international conventions, whether general or

ICJ may be perceived to be an ideal forum for international disputes pertaining to space. This perception is furthered by some other key factors, such as the neutral and impartial third-party nature of judges, the ICJ's experience in enforcing international treaties and tackling interstate conflicts, and the final and binding nature of judgments furnished by the Court.

When compared with domestic litigation and the Liability Convention's claims commission process, these features are much appreciated. Unfortunately, however, they are not enough to render the ICJ "the venue" for the settlement of disputes arising from space accidents.

The foremost inadequacy limiting the ICJ's role in dispute settlement is its restrictive jurisdiction. Pursuant to Article 34 of the Statute of the ICJ, "only States may be parties in cases before the Court."[93] As a result, spacefaring companies have no standing to bring a legal action before the ICJ unless their claims are espoused by their respective States. Moreover, even in a scenario where a State espouses its company's claim for damages resulted from a space incident, jurisdictional issues remain to exist. According to Article 36(1) of the Statute of ICJ, "[t]he jurisdiction of the Court comprises all cases which the parties refer to it." In other words, notwithstanding its prominence, the ICJ is principally not granted a general and unrestricted competence in dispute settlement under its Statute. It primarily derives its jurisdiction from the consent of the disputant States.[94] This inevitably inhibits the ICJ's ability to address space accident disputes. Further, the Court lacks recognition among major spacefaring nations when it comes to its competence and this lack of recognition also obstructs the Court's emergence as an ideal venue for the resolution of space accident cases.

In sum, the ICJ appears to embody some most-needed elements integral to resolution of disputes arising from space accidents.[95] Yet, it may not become instrumental in the orderly settlement of such disputes unless the States parties to the ICJ Statute is divested of their discretion to deny the Court jurisdiction and private companies are endowed with a direct recourse to the Court.

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particular, establishing rules expressly recognized by the contesting States; b. international custom, as evidence of a general practice accepted as law; c. the general principles of law recognized by civilized nations; d. subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.").

93 ibid Article 34.

94 *See generally* Hanqin Xue (ed), Jurisdiction of the International Court of Justice (Brill 2017).

95 *See generally* George Paul Sloup, 'Peaceful Resolution of Outer Space Conflicts through the International Court of Justice: The Line of Least Resistance' (1971) 20(3) DePaul Law Review 618; Horton (n 21) 645-646.

D. The Permanent Court of Arbitration

Established in 1899, the Permanent Court of Arbitration (the "PCA") is an intergovernmental body dedicated to provide dispute resolution services to international community. Traditionally, the PCA administered arbitrations between States. In 1934, however, subsequent to the PCA Administrative Council's approval of a request for the administration of an arbitration among the Radio Corporation of America and the Republic of China,[96] the precedent has been set for the PCA's involvement in disputes among private parties and States, including today's investor-state arbitrations. The number of investor-state arbitrations currently being administered by the PCA unmistakably exhibit that this expansion of the Court's role is appreciated in the arbitral arena. Indeed, according to the PCA's website, the Court "is currently acting as registry in 4 interstate proceedings, 105 investor-state arbitrations and 65 cases under contracts or other agreements involving a state or other public entity."[97]

In 2011, the PCA made another elevating move through the adoption of the "Optional Rules for Arbitration of Disputes Relating to Outer Space Activities" (the "Optional Rules") and extended the Court's reach to aerospace disputes. Notably, these rules, which were modelled after the 2010 UNCITRAL Arbitration Rules, are tailored to the particular needs of the space industry. Indeed, the introduction to the Optional Rules provides that the Rules reflect "the particular characteristics of disputes having an outer space component"[98] and "the public international law element that pertains to disputes that may involve States and the use of outer space, and international practice appropriate to such disputes."[99]

Unlike the United Nations' aforementioned treaties, the Optional Rules actually reflect the exponentially changed dynamics of spatial activities. Among these reflections is the recognition of the commercialization of space by private enterprises.[100] The Rules afford not only States but also private enterprises access to binding arbitration process, subject to the consent of all involved

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96 For the details and award of the case between the Radio Corporation of America and the National Government of the Republic of China, *see* Radio Corporation of America *v*. the National Government of the Republic of China, PCA Case No. 1934-01, Award of the Tribunal (13 April 1935) <https://pca-cpa.org/en/cases/16/>.

97 For more information about the PCA's caseload, *see* <https://pca-cpa.org/cases/>.

98 Optional Rules for Arbitration of Disputes Relating to Outer Space Activities ('Optional Rules') (2011) <https://docs.pca- cpa.org/2016/01/Permanent-Court-of-Arbitration-Optional-Rules-for-Arbitration-of-Disputes- Relating-to-Outer-Space- Activities.pdf>.

99 ibid.

100 ibid 4 ("[Optional] Rules…reflect the particular characteristics of disputes having an outer space component involving the use of outer space by States, international organizations and private entities.").

parties.[101] Further, with the foresight concerning possible difficulties private companies may face vis-à-vis state parties, Article 1(2) of the Optional Rules bars States from resorting to sovereign immunity. Specifically, Article 1(2) states that "[a]greement by a party to arbitration under these Rules constitutes a waiver of any right of immunity from jurisdiction, in respect of the dispute in question, to which such party might otherwise be entitled." For the award enforcement stage, however, under Article 1(2), a waiver of immunity must be explicitly expressed.

Other notable aspects of the Optional Rules account for the highly complex nature of space disputes: specialized panel of arbitrators,[102] specialized panel of scientific experts,[103] non-technical documents,[104] and confidentiality.[105]

With these principal traits, the Optional Rules is considered to be the much-longed filling to the void in the existing space law regime. Alas, there is virtually no demand for the Rules. There are currently no publicly reported arbitration cases where the Optional Rules have been implemented.[106] The lack of cognizance may be "a" reason behind this almost non-implementation, if not "the" reason. Undoubtedly, the PCA is a prominent institution that enjoys the confidence of States and international organizations. It may, however, not have the same level of prominence and/or confidence among private entities. At least an informal survey conducted with space industry respondents indicates inadequate awareness of the PCA and its work. According to the survey, while respondents desired technical expertise in the field, the PCA expert panels and arbitrators were not referred to by any of the respondents.[107] This may connote insufficient awareness of the PCA's work among practitioners or insufficient acceptance of the procedure or arbitrator and expert panels formed by the PCA.[108]

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101 ibid Article 1(1) ("Where parties have agreed that disputes between them in respect of a defined legal relationship, whether contractual or not, shall be referred to arbitration under the Permanent Court of Arbitration Optional Rules for Arbitration of Disputes Relating to Outer Space Activities, then such disputes shall be settled in accordance with these Rules subject to modification as the parties may agree.").

102 ibid Article 10(4).

103 ibid Article 29(1) & (7).

104 ibid Article 27(4).

105 ibid Article 17(6).

106 Charles B. Rosenberg and Vivasvat Dadwal, 'The 10 Year Anniversary of the PCA Outer Space Rules: A Failed Mission or The Next Generation?' (*Kluwer Arbitration Blog*, 16 February 2021) <http://arbitrationblog.kluwerarbitration.com/2021/02/16/the-10-year-anniversary-of-the-pca-outer-space-rules-a- failed- mission-or-the-next-generation/> accessed 4 August 2022.

107 Viva Dadwal and Eytan Tepper, 'Arbitration in Space-related Disputes: A Survey of Industry Practices and Future Needs' <https://www.mcgill.ca/iasl/files/iasl/iac-19e723x50661_dispute_settlement_in_space_law.pdf> accessed 4 August 2022.

108 ibid 9.

With the increasing size of the space industry and actors there will be a concomitant increase in types of space-related disputes. As portrayed before, mechanisms incorporated into the U.N. treaties do not hold any future promise as to the orderly settlement of such disputes. On the other hand, as discussed in further detail below, arbitration emerges as a viable option in settling a perceivably growing space-related disputes. In this respect, while there is a need for refinement, the Optional Rules essentially embody the features valued by spacefaring actors, such as party autonomy, confidentiality, technical expertise, timeliness, award enforceability[109] and accordingly have a potential to facilitate the utilization of arbitration in the resolution of space-related disputes.

III. BINDING ARBITRATION FOR THE RESOLUTION OF SPACE ACCIDENT CASES

The first recorded collision between two satellites in outer space took place on February 10, 2009, when an American commercial satellite collided with a decommissioned military satellite of Russia.[110] The collision caused the destruction of satellites and created at least two thousand pieces of large space debris.[111] More recently, in September 2019, a satellite from SpaceX's Starlink constellation was on a collision course with a wind monitoring satellite of the European Space Agency (the "ESA").[112] As the odds of collision neared 1 in 1,000 – "ten times higher than the threshold that requires a collision avoidance maneuver"[113] – the ESA unilaterally altered its satellite's orbit to evade the collision.[114] In the last major instance, in December 2021, according to the reports, Chinese space station Tianhe was nearly struck by Starlink satellites of SpaceX in two different occasions, both of which were evaded after the Chinese Space Station's implementation of preventive collision avoidance control.[115]

Collectively, these incidents show the risk of accident inherent in space activities. Certainly, this risk will grow exponentially in the coming years as

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109 ibid 5.

110 Reinert (n 66) 338.

111 ibid.

112 Jonathan O'Callaghan, 'SpaceX Declined To Move A Starlink Satellite At Risk Of Collision With A European Satellite' *Forbes* (2 September 2019) <https://www.forbes.com/sites/jonathanocallaghan/2019/09/02/spacex-refused-to-move-a- starlink-satellite-at-risk-of-collision-with-a-european-satellite/?sh=7f38a75b1f62> accessed 4 August 2022.

113 ibid.

114 Reinert (n 66) 338.

115 'China says SpaceX satellites nearly collided with its three-member crew space station' (*PBS*, 29 December 2021) <https://www.pbs.org/newshour/world/china-says-spacex-satellites-nearly-collided-with-its-three-member-crew-space- station> accessed 5 August 2022.

a result of the increase in the number of objects launched into outer space and cascading debris.[116] In this respect, of important is to recognize that disputes arising from space accidents will be intricate and high-value. Further, the resolution of these disputes will demand confidentiality, technical expertise, and timeliness. Yet, as analyzed under Chapter-II, the current means of dispute resolution available to space actors are not capable of addressing this kind of disputes, nor can they meet these demands. They are far from accommodating the interests and appeasing the concerns of private ventures as they are notably state-centric.

More specifically, there is currently no established framework for the resolution of disputes arising from space accidents involving a private enterprise. The dispute settlement mechanism that may be initiated by or against the enterprise is primarily incumbent upon who the other party is. If the defendant party is a State, the private claimant may either enlist the support of its state or file a lawsuit in its or defendant State's national courts. In the opposite scenario where a private enterprise is a defendant, the claimant State may resort to either litigation against the enterprise or the diplomatic negotiations and the claims commission process against the private actor's State, if it is the launching State, under the Liability Convention. Finally, so far as a purely private dispute is concerned, the current U.N. treaties fall short in according private actors a direct and effective dispute settlement instrument. Further, as again delineated under the prior chapter, regardless of the scenario in play, current dispute settlement mechanisms are not binding and prove inadequate in terms of impartiality and neutrality, access to necessary expertise and confidentiality, and lastly, enforcement.

These inadequacies have inevitably created a lacuna in the space legal regime's dispute resolution front. Fortunately, with the rapid growth of the space industry and global space economy have come with many renewed efforts to establish effective and binding dispute settlement methods to fill this lacuna.[117]

The leading contender in such efforts is international arbitration. This method of dispute resolution is frequently utilized for the resolution of disputes among parties that are located in different jurisdictions or disputes involving

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116 Mike Wall, 'Space collision: Chinese satellite got whacked by hunk of Russian rocket in March' (*Space.com*, 17 August 2021) <https://www.space.com/space-junk-collision-chinese-satellite-yunhai-1-02> accessed 5 August 2022.

117 Hertzfeld and Nelson (n 9) 133 ("It has long been recognized that accidents will occur in outer space and that the provisions included in the space treaties do not provide for effective enforcement or resolution of many potential types of disputes that are likely to occur. Beginning in the late-1970s, there were a series of proposals for new dispute resolution mechanisms to be incorporated into the space legal regime.").

a cross-border element.[118] Arbitration is premised upon the consent of parties and is governed by the principles of confidentiality and party autonomy. Arbitral procedures provide a better setting,[119] as parties may dispense with the redundant formalities and procedures that are inherent in other forms of dispute resolution mechanisms and fashion procedures tailored to their particular needs and disputes.[120] As a rule, the decisions of arbitrators are final and binding. There are no or very limited grounds whereby arbitrators' awards may be appealed to the domestic courts.[121] Also, the grounds via which arbitral awards' validity or enforcement and recognition may be challenged are equally restricted.[122]

In fact, with the help of these virtues, international arbitration has already made its way into space law. It has been utilized by state and non-state actors for the resolution of disputes arising from commercial contracts. For example, "the European Space Agency (ESA) has long used arbitration as its preferred method of dispute resolution in its model contracts with contractors."[123] Also, arbitration clauses have been incorporated into collaboration and project-based agreements, such as the "2010 Cooperation Agreement Between the Government of Canada and the European Space Agency."[124]

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118 Viva Dadwal and Madeleine Macdonald, 'Arbitration of Space-Related Disputes: Case Trends and Analysis' <https://www.mcgill.ca/iasl/files/iasl/arbitration_of_space-related_disputes.pdf> accessed 4 August 2022.

119 Hertzfeld and Nelson (n 9) 136; ibid 137 ("Although arbitration is often a private process, there may be instances where
some third-party transparency is appropriate (e.g., in cases involving environmental damage that affects third parties). The experience of investor-state arbitration under the ICSID Convention and UNCITRAL Rules (including UNCITRAL cases administered by the [Permanent Court of Arbitration]) shows that it is possible to incorporate procedures for third parties or *amici* to participate in the arbitral process.").

120 Inan Uluc and Kristi R. Sutton, Esq., 'Without Silence, There is No Golden Rule; Without Dissent, There is No Progress' (2018) 20 Oregon Review of International Law 219, 220. More specifically, the principle of party autonomy affirms the parties' freedom to select the arbitral seat, number of arbitrators, language of arbitral proceedings, substantive and procedural laws applicable to the proceedings, and waiver of means of recourse against the final award.

121 Julian D.M. Lew, Loukas A. Mistelis and Stefan Michael Kröll, *Comparative International Commercial Arbitration* (Kluwer Law International 2003) 7.

122 ibid.

123 Dadwal and Macdonald (n 118) 2.

124 For other cooperation and project-based contracts involving an arbitral clause, *see* ibid ("1969 United States-Italy Memoranda of Understanding between the Università degli Studi di Roma (Aerospace Research Centre) and the National Aeronautics and Space Administration (NASA) for Launching Satellites from the San Marco Range; and the 1972 France-Federal Republic of Germany Agreement for the Construction, Launch and Utilization of an Experimental Telecommunications Satellite.").

Likewise, arbitration has been embraced by the constitutional treaties of the intergovernmental bodies, which regulate various outer space activities.[125] For example, the "International Telecommunications Satellite Organization's Agreement" (the "ITSO Agreement") stipulates that all disputes arising from the Agreement, either among its 149 member or among those States and the ITSO, shall be submitted to arbitration.[126] The "Convention of the European Telecommunications Satellite Organization" (the "EUTELSAT Convention") also mandates that disputes arising between parties or between EUTELSAT and a party or parties in connection with the interpretation or application of the Convention must be resolved via arbitration, should the negotiations result in failure.[127]

This prevalence of arbitration vis-à-vis other dispute resolution methods connotes the trust placed upon arbitration by institutions regulating outer space activities and actors operating in outer space. Yet, considering the fact that arbitration's competence is not yet tested within the ambit of space accident cases, it is not known whether this trust will follow arbitration to the realm of accident cases. Further, due to this lack of testing, it is still questionable whether arbitration is "the" panacea to the absence of an effective and efficient dispute resolution mechanism for space accident cases. It is, however, believed to be "a" panacea, if not "the" panacea, that is equipped well to tackle space accident cases and cater to the interests of both private and state actors operating in space.

First, unlike the diplomatic negotiations and claims commission process, arbitration is available to all spacefaring private and state actors. Through the

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125 O'Grady (n 26) 4.

126 International Telecommunication Satellite Organization Agreement ('ITSO Agreement') (1973), Article XVI https://itso.int/wp-content/uploads/2018/01/ITSO-Agreement-Booklet-new-version-FINAL-EnFrEs.pdf ("(a) All legal disputes arising in connection with the right and obligations under this Agreement between Parties with respect to each other, or between ITSO and one or more Parties, if not otherwise settled within a reasonable time, shall be submitted to arbitration in accordance with the provisions of Annex A to this Agreement.").

127 European Telecommunications Satellite Organization Amended Convention ('EUTELSAT Convention') (2002), Article XV < https://www.eutelsatigo.int/wp-content/uploads/2022/07/E-Amended-Convention-281102.pdf>
("(a) All disputes arising between Parties or between EUTELSAT and a Party or Parties in connection with the interpretation or application of the Convention shall be submitted to arbitration in accordance with Annex B to the Convention, if not otherwise settled within one year of the time a party to the dispute has notified the other party of its intention to settle such a dispute amicably."). Similar provisions may be found in the constitutional documents of the European Organization for the Exploitation of Meteorological Satellites (EUMESAT), the International Mobile Satellite Organization (IMSO), the European Space Agency (ESA), and the International Telecommunications Union (ITU).

party autonomy vested within the parties, each party may not only appoint its own arbitrator based on the sought technical or industry experience but also tailor the procedures in accord with their needs and preferences. Also, as mentioned before, the arbitral procedure is governed by the principle of confidentiality whereby parties can avoid the disclosure of highly sensitive intellectual property associated with high-technology spacecraft or of national security matters. Finally, unlike other means of dispute resolution analyzed before, international arbitration comes with a legal framework whereby the majority of nations have agreed to enforce the decisions of arbitral tribunals.[128]

On the other hand, there are some drawbacks that may render arbitration an unviable option for space accident cases. Under the cloak of the confidentiality principle, States and private enterprises may attempt to evade submitting classified, proprietary information, even with the appropriate safeguards. In this kind of scenario, while an arbitral tribunal does not have the same coercive powers with a domestic court to enforce compliance with the document production requests, it has a quasi-coercive power to draw an adverse inference from the act of non-compliance and may infer the withheld document to be adverse to the non-compliant party's interest.[129] The other drawback emanates from the lack of rules and institutional framework that may be utilized to avert parties' guerilla tactics[130] hindering efficient and expeditious conduct of the arbitration. Notably, the rules of major arbitral institutions impose a duty upon parties to act, at all times, "in good faith for the fair, efficient and expeditious conduct of the arbitration, including the arbitral tribunal's discharge of its

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128 Hertzfeld and Nelson (n 9) 137 ("Under [the 1958 New York Convention on Recognition and Enforcement of Foreign Arbitral Awards], which currently has 149 parties, the courts of each contracting state are required to recognize and enforce arbitral awards rendered in other contracting States, subject to certain relatively narrow criteria for denying enforcement (e.g., that the award violates of important norms of international public policy). The New York Convention, as well as a number of other regional treaties such as the 1975 Panama Convention on International Commercial Arbitration, thus provides a mechanism for the worldwide enforcement of awards arising out of international commerce."). For further information as to why arbitration is well-suited to resolve space-related disputes, *see* Susan Cone Kilgore, 'Arbitration Rules for Disputes Arising From Space Activity' (2018) Federal Lawyer 58, 60-61; Khoukaz (n 2) 276-277.

129 For further information, *see* Pislevik (n 17).

130 Oliver Browne and Robert Price, 'A collision of two heads' (2018) <https://www.lw.com/admin/upload/SiteAttachments/CLJ82%20p18-21%20Browne.pdf> accessed 5 August 2022 ("Guerilla tactics in arbitration take many forms, including: • attempts to bribe tribunals, intimidation of parties, witnesses and counsel, and forging of documents; and • inappropriate and unethical conduct including failing to produce documents in accordance with a tribunal's orders, introducing evidence for the first time at a hearing, excessive document requests, late filing of submissions, and failure to pay deposits/advances on costs.").

general duty."[131] Despite this duty, some parties may continue gamesmanship and engage in improper tactics obstructing the conduct of the arbitration. Of notable in this context is that the authority of arbitral tribunals to levy sanctions on actors acting in bad faith has usually been circumscribed by the terms of the arbitration agreement or remains unaddressed by arbitral institutions. Thus, while there are some tools available to arbitral tribunals to deter parties from dilatory tactics,[132] tribunals' reluctance to employ these tools[133] and the existing legal gap continue to increase parties' temptations to misbehave and casts doubt upon arbitration's adequacy as a venue for disputes arising from space accidents.

The most important drawback of arbitration, however, originates from the lack of an international legal framework that obliges parties to resolve their dispute via arbitration. In the commercial realm, parties primarily agree on employing arbitration as a dispute resolution mechanism during the negotiations of the main contract. In other words, parties undertake a contractual duty to submit their dispute to arbitration before any dispute arises. In the realm of space accidents, due to the inability to foresee these accidents and their victims, it is almost impossible for spacefaring States or private actors to enter into an arbitration agreement until after the accident occurred. Upon the occurrence of the accident, parties may opt into a submission agreement and submit themselves to arbitration, but the finalization of this agreement is highly incumbent upon good faith of the party at fault. If this party acts with recalcitrance, the dispute cannot be resolved via arbitration and the claimant has to have recourse to other dispute resolution methods and tackle inherent difficulties of these methods that are analyzed under Chapter-II.

With the aforementioned characteristics arbitration offers a great potential to remedy the inadequacy suffered by the space legal regime in terms of dispute resolution. Yet, for this potential to be tapped, of significant is to reconcile

131 Article 14.2 of the Arbitration Rules of the London Court of International Arbitration. *See also* Article 22(1) of the 2021 Arbitration Rules of the International Chamber of Commerce ("The arbitral tribunal and the parties shall make every effort to conduct the arbitration in an expeditious and cost-effective manner, having regard to the complexity and value of the dispute.").

132 For more information, *see* Browne and Price (n 130).

133 ibid ("[R]espondents to the 2015 International Arbitration Survey conducted by the Queen Mary University of London lamented the 'lack of effective sanctions during the arbitral process.' The Queen Mary survey found that this was the second worst feature of arbitration (46% of respondents), behind the linked problems of excessive costs (68% of respondents). Users of arbitration expect tribunals to deal with [guerilla tactics]. Some respondents to the Queen Mary survey suggested that tribunals are reluctant effectively to use their powers for fear that their awards will be challenged. But users highlight an important point: tribunals should be more mindful of the rights of parties suffering the consequences of guerilla tactics than the potential for guerillas to challenge the award.").

the last drawback mentioned above and find a method mandating spacefaring actors, whether state or private, to resolve their disputes via arbitration.

One method to actualize this mandate is the amendment of the Liability Convention. The Convention's amendment process is governed by Article XXV.[134] According to the article, any State Party to the Convention may initiate the amendment process via proposing amendments. With extensive negotiations and political will, the Liability Convention may be effectively amended to address the modern realities of outer space. The proposed amendments comprise rendering arbitration binding, abolishing the jurisdictional bar refraining private enterprises from initiating the claims commission process, and making the outcome of the claims commission process binding. While these amendments, along with others,[135] are poised to accomplish all the objectives professed in the annex of the Convention, the task of amending an international legal instrument is an arduous and time-consuming one to undertake. Further, an attempt to amend one article may catalyze attempts to amend other articles and accordingly may jeopardize coherence and foreseeability that currently exists in the space liability regime.[136]

The second method propounded to morph arbitration into the overarching dispute resolution mechanism utilizes national licenses[137] issued by States. Article VI of the Outer Space Treaty requires States to ensure that outer space activities, whether conducted by governmental agencies or by non-governmental entities, are in conformity with the provisions set forth in the Treaty.[138] According to the same article, so far as the spatial activities of non-

134 The Liability Convention (n 27) Article XXV ("Any State Party to this Convention may propose amendments to this Convention. Amendments shall enter into force for each State Party to the Convention accepting the amendments upon their acceptance by a majority of the States Parties to the Convention and thereafter for each remaining State Party to the Convention on the date of acceptance by it.").

135 For other amendment proposals to reform the Liability Convention, *see* Kehrer (n 24); Sam Logterman, 'Astronomical Arbitration: Why Amending the Liability Convention is the Best Step Forward for Interstellar Adjudication' (2020) 30(1) Minnesota Journal of Int'l Law 183.

136 In the same vein, *see* Logterman (n 135) 199 ("[B]roaching the issue of amending the Liability Convention could prompt other States to bring up their own issues with the Liability Convention or other United Nations treaties dealing with space.").

137 Names, types, and scopes of licenses may vary from one State to another in accord with the respective State's space capabilities. For the implementation of this method, however, licenses authorizing the launch and/or operation of a spacecraft are considered to be essential.

138 The Outer Space Treaty (n 14) Article VI ("States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.").

governmental entities are concerned, the conformity with the treaty will be ensured via authorization and continuing supervision by the appropriate state party to the Treaty.[139] Thus, spacefaring States have instituted licensing and regulatory regimes to authorize and oversee the private actors' spatial activities and ensure that they adhere to the provisions of the Outer Space Treaty and other pertinent treaties.[140]

In light of this, the advocates of the second method propose to utilize these national licensing regimes and make the issuance of a launching and/or operator license conditional upon the private party (licensee)'s consent to arbitration given in advance of space accidents.[141] Indisputably, via this method, arbitration becomes a mandatory dispute settlement mechanism for the claims between private parties. Yet, while the balance in exploration and use of outer space has indisputably shifted towards private enterprises, States and state entities are still key players in outer space endeavors and possess assets in space. Thus, space accidents may – and will – arise between a private entity and a State or state entity. In such a scenario, arbitration becomes operative if the State party accepts the standing offer to arbitrate made by the private party through the launching and/or operator license. In sum, the implementation of this method requires the revision of States' domestic regulations. Yet, more importantly, the utilization of it is highly contingent upon States' receptiveness to accepting the standing offer of a private party by initiating arbitration or to opting into the arbitration initiated by a private party. In this regard, the approach of top spacefaring nations, such as the United States and China, is believed to be determinative of whether this method may actually acquire universal implementation.

The penultimate method is a centralized, convention-based arbitration of space-specific disputes. While this method is primarily elevated for the resolution disputes arising from space contracts, it will here be analyzed in the context of disputes emanating from space accidents.

More specifically, this approach ventures the idea of establishing an institution analogous to the International Centre for Settlement of Investment

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139 ibid ("The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.").

140 Reinert (n 66) 343.

141 Hertzfeld and Nelson (n 9) 137-138 ("[A] network for arbitration of collision cases could be developed through an agreed system of national laws or regulations, making it a standard condition of any launch license that the launching party agree in advance to: (1) accept international arbitration of any collision claims involving any private or public actor which is also engaged in space-faring activity; and (2) publishes its consent to arbitration so as to notify potential claimants of the availability of arbitration.").

Disputes ("ICSID") and arbitrating space-related disputes via this institution.[142] Promoters of this method call for the development of an International Convention on the Settlement of Outer Space Disputes (the "ICSOD Convention") and for the foundation of International Centre for the Settlement of Outer Space Disputes (the "ICSOD") "before which private companies and individuals could bring claims directly against States, who have unlawfully interfered with their outer space activities."[143]

The institution of such a centre would centralize the resolution of space-related cases and would "prevent the fragmentation of space law by providing a single and unique forum […] thereby avoiding the unsystematic application of international and domestic law."[144] On the other hand, this proposal is erected upon the investor-state arbitration model and overlooks the fact that disputes may occur solely between private actors.[145] Besides, within the specific context of space accident cases, given that these accidents may happen between parties who have not submitted to the ICSOD's jurisdiction via a bilateral or multilateral agreement, unless the ratification of the ICSOD Convention constitutes a standing consent given by a state to arbitration on an ad hoc basis, the ICSOD approach may not succeed to render arbitration "the" venue for the resolution of disputes arising from space accidents. Finally, even in a scenario where these flaws are addressed, materializing the ICSOD proposal is a colossal task requiring a grave amount of time, collaborative effort, and expertise.[146]

Today, as a result of the exponential increase in outer space activities, there is more attentiveness to the need for an effective dispute resolution mechanism in the space law regime. Arbitration, in this regard, is viewed to be a viable option to meet this need. Thus, as analyzed above, different methods have been set forth to promote arbitration and mandate space industry adherence to the resolution of space accident cases through arbitration. In this respect, it is believed that the PCA and its Optional Rules merit a renewed attention. The Optional Rules are tailored to reflect the particular characteristics of space

142 O'Grady (n 26) 8-9.

143 ibid 8.

144 ibid 9.

145 Bennett (n 4) 13 ("The ICSOD proposal continues the presumption that space arbitration is primarily an investor-state model. While States remain an essential consideration for any space-related arbitral solution, a space-specific dispute resolution forum should not overlook the growing number of private actors and the expected commercial disputes between aerospace investors themselves.").

146 O'Grady (n 26) 9 ("The drafting of such an ICSOD Convention will clearly require an astronomic amount of time and effort from anyone bold enough to embrace the challenge, not least with respect to difficulty of defining the extent of its extraterritorial scope. However, the magnitude of such a feat does not render it any less necessary.").

disputes and cater to the interests of both public and private actors operating in outer space. While these rules are not perfect, they constitute a significant progress in the space legal regime with the provisions addressing the need for specialized panel of arbitrators and scientific experts, setting forth standards as to handling confidential information and award enforcement. Further, using the PCA to resolve space accident cases may facilitate the actualization of the objectives of the Outer Space Treaty[147] and may render States more receptive to submitting themselves to binding arbitration. In addition, it may become possible to insulate the resolution process from political pressure, to create binding awards complemented by an enforcement mechanism, and to develop a body of precedent.

Vis-à-vis the suggestion of adopting a centralized approach to space accident cases, some scholars may assert that there is no practicality of such approach given that the demand is unknown.[148] Yet, the increase in human's spatial activities and cascading space debris will indisputably come with a concomitant increase in the prospects of space accidents. Resultantly, it is the ideal time for the space legal regime to prepare for a centralized approach embracing the PCA and its administration of arbitration.

CONCLUSION

The current space legal regime was developed in an era defined by the Cold War. As a result, the main objectives of the regime were the aversion of the armament of space, the promotion of the peaceful use and exploration of space, and the amicable resolution of disputes among States. Where this state-centric approach played an essential role in the actualization of these critical objectives during the Cold War, it has become increasingly antediluvial and inoperative in the 21st century's modern space industry, which has borne witness to a shift in the dynamics of spatial activities. The industry's control that once belonged to States has been assumed by spacefaring private enterprises.

Alas, despite this shift in the dynamics, the space legal regime has remained stagnant. Neither the Outer Space Treaty nor the Liability Convention has been amended or updated to correspond to the new dynamics. This loss of touch of the legal regime rises more concern given the fact that the currently available dispute resolution mechanisms under this regime are ineffective for resolving disputes involving a private enterprise. Remedying this legal black

147 The Outer Space Treaty (n 14) Annex.

148 Hertzfeld and Nelson (n 9) 141 ("Unlike other sectors of the economy, there have been so few litigated incidents within space law (except for breach of contract) to warrant any special court or tribunal to be devoted solely to those cases. It would be impractical today to form a standing court or tribunal composed of full-time judges to handle such disputes when the demand is unknown and in the indefinite future.").

hole is of consequence as the risk of space accident grows exponentially due to increasing commercialization of spatial activities and rapid congestion of outer space with new space objects and cascading debris. To decrease this risk of space accidents, governments of major space nations strive both to establish minimum standards applicable to space activities[149] and to manage existing space debris and minimize the creation of new ones.[150] These governmental actions, however, do not meet the urgent need for a dispute resolution mechanism that caters to the interests of both public and private space actors and provides foreseeability via final and binding decisions.

In this respect, due to reasons delineated before, arbitration is deemed to be a very viable and workable mechanism to address this need. The implementation of arbitration may help to resolve space accident cases in an effective, efficacious, and amicable manner and, in the long run, may "contribute to [a] broad[er] international co-operation in the scientific as well as the legal aspects of the exploration and use of outer space."[151] The utilization of the PCA and its Optional Rules, in this regard, emerges as a preferable method to succeed this implementation, rather than forming a new institution or substantially amending prominent international law instruments.

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149 The most prominent example of these endeavors to establish the minimum standards via which the civil exploration and use of outer space may be enhanced is the Artemis Accords. As of August 2022, more than a dozen countries have signed the Artemis Accords. Some of the principles incorporated into the Accords are as follows: the peaceful use of outer space, transparency, registration of space objects, release of scientific data, interoperability of systems, emergency assistance, and orbital debris and spacecraft disposal. For further information as to the Artemis Accords, *see* the Artemis Accords <https://www.nasa.gov/specials/artemis-accords/index.html> accessed 5 August 2022.

150 ibid; Ramin Skibba, 'The US Space Force Wants to Clean Up Junk in Orbit' *Wired* (17 November 2021) < https://www.wired.com/story/the-us-space-force-wants-to-clean-up-junk-in-orbit/> accessed 5 August 2022; 'Remove Debris: Testing technology to clear out space junk' *AIRBUS* <https://www.airbus.com/en/products-services/space/in-space-infrastructure/removedebris> accessed 5 August 2022.

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