SPACE: THE FINAL (ARBITRATION) FRONTIER?

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'The Earth is the cradle of humanity, but mankind cannot stay in the cradle forever'.
Konstantin Tsiolkovsky (1911)

1. INTRODUCTION: THE RISE OF SPACE ACTIVITY

Since Yuri Gagarin first broke through the earth's atmosphere in the Vostok 1 spacecraft in 1961, the possibility of space travel has filled the global human imagination with endless possibilities. Over the following decades, further space exploration, the advent of satellites, telecommunications, and more recently the internet, cemented a new era in human civilization and our interdependence on the harmonious use of outer space for *'the province of all mankind'*.[2]

While space exploration was exclusively the domain of States and inter-governmental space agencies for much of the past 60 years, the increasing commercialization of outer space has given room for private actors to also enter the industry. Over the last twenty years, companies such as Blue Origin (Jeff Bezos), Virgin Galactic (Richard Branson), and SpaceX (Elon Musk) have all emerged, aiming to make space tourism a reality and push space travel to new horizons. And with the industry predicted to be worth more than 1 trillion USD by 2030,[3] it is inevitable that more State and private actors would be looking to enter this and other space-related fields.

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2 Outer Space Treaty, infra note 5, art I.

3 Subramaniam Iswaran, Minister of Singapore, Speech at the Global Space and Technology Convention (Feb. 15, 2023).

However, given the increasing competition in space, few sophisticated legal frameworks have been developed that could help address the inevitable disputes that would arise from such a coveted and lucrative sector. This is especially important given the increasing complexity and multi-party, multi-jurisdictional nature of space-related disputes that will arise as more private and State actors look to enter the market. As it stands, the current dispute resolution mechanism provided by international treaties envisions predominantly State actors and focus on inter-governmental diplomacy. But as more commercial actors and States which are not parties to those international treaties engage in space activities, they will likely require more binding and enforceable forms of dispute resolution.

2. THE INTERNATIONAL LEGAL FRAMEWORK FOR SPACE ACTIVITY

2.1. FOUNDATIONAL TREATIES AND OTHER INTERNATIONAL AGREEMENTS

Beginning in 1967, the United Nations ('U.N.') has adopted five treaties that regulate space activities. These treaties were developed during the space race between the United States and the Soviet Union and can be seen as a major accomplishment for promoting international law in space activities. Critically, four of the five treaties were both signed and ratified by the United States and the Soviet Union, with the Moon Treaty being the only exception. However, none of the treaties provide a dispute resolution mechanism, except for the *Space Liability Convention*.

a) The main constitutional legal framework governing the exploration and use of space is the *Outer Space Treaty*.[4] Adopted in 1967, the Outer Space Treaty is author to the famous line that the exploration of outer space 'shall be carried out for the benefit and in the interests of all countries' and 'shall be the province of all mankind'.[5]

b) Building atop the foundation laid by the Outer Space Treaty, the *Rescue Agreement*[6] was agreed in 1968 to ensure the safe and timely return of astronauts in distress.

4 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 610 U.N.T.S. 8843 (hereinafter *'Outer Space Treaty'*).

5 *Id.* at art I.

6 Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space, Apr. 22-Nov. 29, 1968, 672 U.N.T.S. 9574 (hereinafter 'Rescue Agreement').

c) Four years later (in 1972), the *Space Liability Convention*[7] developed the principles for addressing liability previously created in the *Outer Space Treaty* and the *Rescue Agreement*. This is the only space-related treaty that contemplates a mechanism for dispute resolution. Claims must be brought by a State against another State(s), and they can do so on behalf of its natural or juridical persons. However, it does not allow nationals of a State to be remedied for damage caused by that State.[8] The States must attempt to resolve through diplomatic negotiations first.[9] If diplomatic negotiations fail, then the disputing States should establish a Claims Commission that will decide the merits of the claim and whose decision shall be final and binding 'if the parties have so agreed'.[10]

d) The *Registration Convention*[11] was established in 1976 and aims to enhance transparency and accountability for space activities. The Convention requires States to furnish the United Nations Office for Outer Space Affairs ('UNOOSA') with details about the orbit of each space object, such as the name of the launching State, the object's registration number, date and territory of launch, its orbital parameters, and its general function.[12]

e) The *Moon Treaty*,[13] created in 1984, is the last of the five U.N. treaties on space law. The Treaty aims to develop principles first enshrined in the *Outer Space Treaty* that regulate the military use and natural exploitation of the Moon and other celestial bodies. Only 18 States have ratified the treaty, with a further 11 signatories. More telling, the treaty has not been ratified by any major spacefaring nation and many States have objected to the treaty based on its regulation of States' claims on mining rights.

7 Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 961 U.N.T.S. 13810 (hereinafter 'Space Liability Convention').

8 See *id.* at art. VI.

9 *Id.* at art. VIII.

10 *Id.* at art. XIV, XVIII, XIX.

11 Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 1023 U.N.T.S. 15020 (entered into force Sept. 15, 1976) (hereinafter 'Registration Convention').

12 *Id.* at arts. II, IV.

13 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 1363 U.N.T.S. 23002 (hereinafter 'Moon Treaty').

In addition to the international treaties that have been negotiated at the United Nations, the States participating in the International Space Station (Canada, Europe, Japan, the Russian Federation, and the United States) entered into the 1998 International Space Station ('ISS') Agreement concerning cooperation on the ISS.

Additionally, the U.N. General Assembly has issued several resolutions concerning the use and exploration of space.

3. AREAS OF SPACE-RELATED DISPUTES

The diversity of space-related disputes may be nearly infinite but given existing disputes in this sector and the publicized ambitions of States and companies, I would like to focus on five areas that are likely to yield numerous space-related disputes in the not so far, far away future.

3.1. SATELLITES

To this day, most space-related disputes have taken place within the telecommunications industry —in particular, relating to satellite operations. Two of the most notable space-related disputes in the last decade arise from breaches of contract and claims of expropriation for satellite rights.

In the dispute of *Devas v. Antrix*,[14] a digital multimedia company filed suit against Antrix, the commercial branch of the Indian International Space Research Organization, following the annulment of a contract that granted Devas satellite rights in India. Devas, a Mauritian-incorporated company with Mauritian-German ownership interests, claimed that such annulment amounted to expropriation of the claimant's investments. Under the agreement, Antrix would build, launch and operate two satellites and then lease part of the electromagnetic spectrum to Devas, which would then offer broadband wireless access and audio-video services throughout India. However, following media criticism about the agreement, India reversed course and annulled the contract, citing national needs, societal needs, and the country's strategic requirement. India's annulment of the contract has led to several parallel lawsuits brought against Antrix and India:

14 See Devas Multimedia Priv. Ltd. v. Antrix Corp. Ltd., ICC Case No. 18051/CYK (July 1, 2011).

a) In 2015, an International Chamber of Commerce ('ICC') tribunal found that Antrix had wrongfully repudiated the agreement and awarded Devas 562 million USD in damages.[15] By the time a judgment enforcing the award was entered in late 2020, the award had swelled to 1.3 billion USD.

b) In a Bilateral Investment Treaty ('BIT') arbitration against India brought by three Mauritian shareholders of Devas,[16] the Permanent Court of Arbitration ('PCA') tribunal found that that India had expropriated Devas' investment *'insofar as* [its] *decision to annul the Devas agreement was in part motivated by considerations other than the protection of* [India's] *essential security interest'*.[17] The tribunal awarded 111.3 million USD in damages to claimants.[18]

c) Deutsche Telekom ('DT'), who owned 19.62 % of Devas' shares, filed another claim against India under the Germany-India BIT.[19] Among India's defenses, it argued that DT was not a direct investor, and the Germany-India BIT did not cover indirect investors. Nonetheless, the PCA tribunal found no requirement of direct ownership in the definition of *'investment'* in the BIT and dismissed the related defense, as well as India's national security defense, noting that there was no indication that India's Cabinet Committee on Security allocated that spectrum to the military or otherwise earmarked it for security interests.[20]

Despite victories in the ICC and PCA, enforcement efforts have proved challenging. In 2022, the Delhi High Court set aside the ICC's award after finding that the company's incorporation and negotiation of the contract that led to the award were putatively tainted by fraud and that upholding the award would be contrary to public policy.[21] India petitioned to reverse the

15 Devas Multimedia Priv. Ltd. v. Antrix Corp. Ltd., ICC Case No. 18051/CYK, Final Award, § 401 (Sept. 14, 2015).

16 CC/Devas (Mauritius) Ltd. v. India, PCA Case Repository Case No. 2013-09 (Sept. 30, 2013).

17 CC/Devas (Mauritius) Ltd. v. India, PCA Case Repository Case No. 2013-09, Award of Jurisdiction and Merits, § 501(d) (July 25, 2016).

18 CC/Devas (Mauritius) Ltd. v. India, PCA Case Repository Case No. 2013-09, Award on Quantum, § 663(c) (October 13, 2020).

19 Deutsche Telekom v. India, PCA Case Repository Case No. 2014-10 (Sept. 2, 2017).

20 Deutsche Telekom v. India, PCA Case Repository Case No. 2014-10, Interim Award, §§ 153, 154, 273, 285 (May 27, 2020).

21 Antrix Corp. Ltd. v. Devas Multimedia Priv. Ltd., The National Company Law Tribunal, Bengaluru Bench, C.P No. 06/BB/2021 (Jan. 19, 2021).

ICC and PCA's decisions in national courts where enforcement proceedings were taking place on the back of this decision, arguing that the Delhi Supreme Court had conclusively established India's claims that the contract arose from corruption and fraud. Courts outside of India have uniformly rejected India's allegations.[22]

In *Eutelsat v. Mexico*,[23] a similar dispute arose after satellite company Eutelsat brought claims against Mexico under the France-Mexico BIT, which related to the obligation Mexico had imposed on Eutelsat's Mexican subsidiary, SatMex, to reserve portions of its satellite spectrum for guard bands and for Government use. Eutelsat argued that the Government's spectrum allocation obligations discriminated against its investment as compared to competitors.[24] The International Centre for Settlement of Investment Disputes ('ICSID') Tribunal disagreed, finding no evidence of discrimination from Mexico and ultimately finding Eutelsat's claims unfounded.[25]

3.2. SPACE COLLISIONS

Another key area of space-related arbitration that will likely emerge will arise from, perhaps ironically, the lack of space. Along with the rise in space activities has been the rise and congestion in the number of objects orbiting the earth. In 1970, 130 objects were launched into the earth's atmosphere; in 2021, that number has increased almost fourteen times with 1807 objects having been launched that year alone, 75 % of which are in earth orbits under 2,000 km.[26] Such a number will only continue to multiply as more national and private entities enter the field. This trend vastly increases the risk of a collision between space objects and raises important questions about liability for space collisions.

22 See*, e.g.*, Deutsche Telekom AG v. India, Berlin Court of Appeal, Judgment 12 Sch 7/21 (Jan. 27, 2023), <https://files.ibr.cloud/public/2023-02-230127_Kammergericht%20Berlin_Beglaubigte%20Abschrift%20Beschluss%20vom26.01.2023_12%20Sch%207_21.PDF?VersionID=0f2iNCLqMsmamUFrjvPQFBWpVDcySFlr> (in German); Jack Ballantyne, German Court Permits Enforcement Against India, GAR (Feb. 8, 2023), <https://globalarbitrationreview.com/article/german-court-permits-enforcement-against-india>; India v. Deutsche Telekom AG, Swiss Federal Tribunal, Judgment 4A_184/2022 (Mar. 8, 2023); Republic of India v. Deutsche Telekom AG, Court of Appeal of the Republic of Singapore, Judgment [2-23] SGCA(I) 10 (Dec. 15, 2023).

23 Eutelsat S.A. v. United Mexican States, ICSID Case No. ARB(AF)/17/2.

24 Eutelsat S.A. v. United Mexican States, ICSID Case No. ARB(AF)/17/2, Excerpts of the Award, § 435 (Sept. 15, 2021) (in Spanish).

25 *Id.* at §§ 436, 493.

26 Outer Space White Paper, ILA Paris (2023), p. 32.

A few cases have tested the existing mechanism dealing with space disputes. The first (and only) claim by one sovereign State against another on account of damage caused by a falling space object was the crash of Cosmos 954. This was a reconnaissance satellite launched by the Soviet Union that malfunctioned when it re-entered the earth's atmosphere in 1978 and scattered radioactive debris over Canadian territory.[27] After an extensive multi-year clean-up operation, the government of Canada made a formal legal claim to the Soviet Union, asking for 6 million CAD.[28] After a year of negotiations, Canada and the Soviet United reached a 3 million CAD settlement.[29]

While the Cosmos 954 case was settled diplomatically based on the guidelines of the *Outer Space Treaty* and the dispute resolution mechanism provided in the *Space Liability Convention*,[30] it presents a relatively straight forward incident where liability and harm are easily identified between two State parties. However, when the disputes involve private actors or more than two parties, simple diplomatic mechanisms would not be sufficient to answer some of the more complex questions. For example, how is liability determined for space accidents? How does a State or private actor seek compensation when the space debris belongs to a satellite powered by SpaceX or Blue Origin? Is there any recourse for natural or juridical persons who are harmed by State debris belonging to their own State? Such questions can become more complicated if a claim against a State or a State-owned entity gives rise to questions of sovereign immunity or judicial bias.

3.3. SPACE MINING

The issue of space mining has long been a contentious international topic, as demonstrated by the lack of signatories to the *Moon Agreement*, including by any space-faring nation.[31] The potential of extracting rare materials from celestial bodies such as the Moon will inevitably be enticing enough to attract investors in what could be an incredibly lucrative industry.

This prospect has been amplified by the controversial *Artemis Accords*, which was signed in 2020 by 20 States (including most space-faring nations) and provides

27 Settlement of Claim between Canada and the Union of Soviet Socialist Republics for Damage Caused by 'Cosmos 954', art 2 (Apr. 2, 1981).

28 *Id*., Statement of the Claim, at § 24.

29 *Id.* at arts. I-III.

30 See *supra*, Part 2.1.

31 See *supra*, Part 2.1.

that *'the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty'*.[32] Following this, NASA announced its intention to start mining the Moon in conjunction with private enterprises. Similarly, China and India each have well established lunar programmes that could enter the space mining field, and Elon Musk's SpaceX has been working alongside NASA to prospect for minerals on asteroids.

A handful of nations have also created legislation that provides private property rights over space resources to incentivize commercial space mining. Such nations include the United States,[33] Luxembourg,[34] the United Arab Emirates,[35] and Japan.[36] As no international consensus has been raised on the issue, these national laws and the *Artemis Accords* remain a noteworthy signal of intent for many States to facilitate space mining in the next couple of decades.

Since space mining would likely be a very competitive activity that may see national and private interests conflict, it would be important to establish a legal framework to govern disputes related to such activity. The first set of disputes would likely arise from the determination of whether space mining, as intended to be pursued, is even allowed under the current state of international space treaties. Specifically, whether the extraction of space resources constitutes 'national appropriation' under the *Outer Space Treaty*, whether those materials have to be used for *'the benefit and interest of all countries'*[37] as opposed to private commercial interests, and whether third party States may be entitled to the riches gained from the extraction of celestial resources.

The second set of disputes would be more practical. For example, a contractual dispute between the contractor in charge of a lunar project and the subcontractor responsible for the drilling in connection with delays to the project

32 The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes, Sec. 10 § 2 (hereinafter 'the Artemis Accords').

33 Commercial Space Launch Competitiveness Act of 2015, Pub. L. No. 114-90 (Nov. 25, 2015); Exec. Order No. 13914, 85 C.F.R. 20381 (Apr. 6, 2020).

34 Law on the Exploration and Use of Space Resources (July 20, 2017), <https://space-agency.public.lu/en/agency/legal-framework/law_space_resources_english_translation.html>.

35 United Arab Emirates, Federal Law No. 12 of 2019 on the Regulation of the Space Sector, <https://u.ae/en/about-the-uae/science-and-technology/key-sectors-in-science-and-technology/space-science-and-technology/space-regulation#:~:text=The%20UAE%20Space%20Law,-The%20Space%20sector&text=12%20of%202019%20on%20the,in%20the%20space%20sector%20activities>.

36 Japan's Act on the Promotion of Business Activities for the Exploration and Development of Space Resources, Act No. 83 (Dec. 23, 2021).

37 Outer Space Treaty, *supra* note 5, art. 1; see also Artemis Accords, *supra* note 47, at Sec. 10 § 1.

for encountering a much more solid surface than anticipated. It could also be tort-related, for example the damage caused to a nearby lunar base owned by a third-party in connection with the landing of a space-shuttle. The sky (or better said, the space) is the limit with the types of disputes and their examples.

3.4. SPACE TOURISM

The successful launch of Gagarin's first manned space flight in 1961 marked endless possibilities about the prospects of human travel in space. However, other than for a handful of billionaires and their associates, space tourism has remained a near-distant dream for the masses. That is, until recently. The rapid development of space technology has allowed companies to develop plans for reusable launch vehicles that would significantly reduce the costs of launching a rocket into space and make space tourism more accessible.[38]

Space tourism also lacks an adequate international legal framework. As mentioned above, the international treaties enacted in the late twentieth century focus on regulating the activities of States, and do not contemplate the expansion of commercial tourist activity in space, such as those envisioned by companies like Virgin Galactic, Blue Origin, and SpaceX.

Scholars have proposed various regulations that would govern space tourism. Some have proposed that commercial space tourism companies self-regulate via their own rules.[39] Others have expressed scepticism that self-regulation would provide adequate protections for passengers and the environment.[40] Parallels can be drawn to the aviation industry, where the International Civil Aviation Organization ('ICAO') has set uniform international procedures and standards for aviation safety which have successfully been adopted by numerous national aviation agencies. In 2021, the International Association for the Advancement of Space Safety ('IAASS') proposed supplementing the *Outer Space Treaty* to add safety and environmental protections.[41]

38 Z. YUN, 'A Legal Regime for Space Tourism: Creating Legal Certainty in Outer Space', J. Air L. & Comm., (Volume 74, Issue 4) pp. 960-61 (2009).

39 See Katrin Nyman-Metcalf, 'National and International Regulatory Aspects of Commercial Space Activities: Self-Regulation as the Way Forward', in Commercial Uses of Space and Space Tourism 266, 278 (Jan Woulters et al. eds., 2017).

40 See M. McCue, 'A Regulatory Scheme for the Dawn of Space Tourism', Van. J. Trans. L. ((2022), Volume 55, Issue 4) p. 1104.

41 *Id.* at 1105; see Int'l Space Safety Found. 4 (Dec. 2021), <https://iaass.space-safety.orglwp-content/uploads/sites/24/2021/12/Making-Space-Safe-and-Sustainable-A4-v1-3.pdf> [<https://perma.cc/R4AMLQWY>]

The dawn of space tourism would likely bring with it novel questions relating to protections for space tourists and regulations for commercial space flight operators. Parties in the space tourism sector very well may regulate their relationships contractually (such as with air travel), meaning space tourism may give rise to various contractual disputes between space tourists and operators, insurers, spaceflight training providers, etc.

Further, many envision that the development of a space tourism market would have serious adverse environmental consequences and may be the subject of future international agreements to address the environmental effect of commercial space travel.[42] These would therefore provide another dimension to the legal rights and responsibilities involved within space tourism.

3.5. INSURANCE OF SPACE-RELATED INVESTMENTS

A defining feature of space activity is the level of risk involved. The scientific process for space travel is highly complex with little room for error, and the human and financial consequences of a failed launch or a space collision could be astronomical.

As State and private actors continue to engage in space endeavours, insurance companies, cognizant of these risks, may seek to seize a notable market gap and provide coverage for space-related activities. Such a prospect is already becoming reality. For example, in 2022, insurance company Mitsui Sumitomo Insurance agreed to provide the world's first Lunar Insurance policy by covering risks associated with Japanese-led ispace Mission 1.[43]

The adoption of insurance policies for space-related investments will likely, in turn, give rise to uncharted coverage provisions and novel disputes. For example, policies may distinguish between newer satellites and those that are nearing the end-of-lifetime phase, at which point they are typically moved away from common operational orbits.[44] Similarly, insurance providers may opt to limit coverage for instances where a party's neglect or recklessness is at fault for a failed

42 See McCue, *supra* note 55, at 1106, 1111-12.

43 *iSpace Signs Commercial Lunar Insurance Agreement with Mitsui Sumitomo Insurance*, SPACEWATCH (Nov. 18, 2022), <https://spacewatch.global/2022/11/ispace-signs-commercial-lunar-insurance-agreement-with-mitsui-sumitomo-insurance/?no_cache=1669023589>.

44 See Katie Mak, *Space Arbitration: Protecting Space Investments*, SPACE ARB., <https://space-arbitration.com/space-arbitration-protecting-space-investments/> (last visited Dec. 12, 2023).

rocket launch or a space collision. This will no doubt bring disputes of hefty amounts to deal with.

4. SPACE ARBITRATION

4.1. ARBITRAL INSTITUTIONS

The space treaties listed in Part 2.1 supra, most of which were developed at a time when only two nations (and no private actors) were realistically capable of developing major space programs, only focus on State-State relationships, and only one, the *Space Liability Convention,* has a dispute resolution mechanism.[45]

One would expect that arbitral institutions could be the natural fora for disputes between private actors and treaty disputes. Many of these institutions already have well-tested mechanisms for parties and tribunals to address the highly technical and jurisdictionally ambiguous nature of space-related disputes. Moreover, arbitral institutions have the administrative capacities necessary to host large-scale disputes involving multiple State and private actors, and worth hundreds of millions of dollars.

Nonetheless, as of 2023, only the PCA has developed specialized arbitration guidelines for space-related disputes. These guidelines, known as the Outer Space Rules,[46] were published in 2011 and are based on the 2010 United Nations Commission on International Trade Law ('UNCITRAL') Arbitration Rules[47] but tailored to reflect 'the particular characteristics of disputes having an outer space component'.[48] Unlike the mechanism provided by the *Space Liability Convention*, the PCA's Outer Space Rules are *'available to States, international organizations, and private parties'*.[49] Among its distinguishing features, the PCA's Outer Space Rules provides for:

45 Space Liability Convention, *supra* note 11, at art. VII.

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

47 UNCITRAL Arbitration Rules (2010), United Nations Commission on International Trade Law ('UNCITRAL').

48 See Outer Space Rules, *supra* note 62, at 4.

49 *Id.*

a) The waiver of any right to immunity from jurisdiction,[50] which is important owing to the frequency of government actors and agencies in space-related activity.

b) A specialized panel of arbitrators and scientific experts that may be appointed, which the parties may ask the Secretary General to provide.[51]

a) The right for parties to apply to treat information as confidential, which the tribunal will decide based on whether *'the absence of special measures of protection in the proceedings would be likely to cause serious harm'* and for which it can appoint a confidentiality advisor as an expert to assist with the determination without disclosing the information to the opposing party or to the tribunal.[52]

It is perhaps surprising then that, over a decade later, there are no publicly reported arbitrations using the PCA's Outer Space Rules. Although the PCA has administered space-related disputes in the case of *CC/Devas (Mauritius) Ltd. v. India* and *Deutsche Telekom AG v. India*,[53] these have been conducted under the 2021 UNCITRAL Arbitration Rules.

Seeing the lacunae in space-related private dispute resolution mechanisms, the Dubai International Finance Center ('DIFC') announced its Court in Space as part of its Courts of the Future initiative, which will be established with the aim of resolving commercial disputes in outer space and to encourage businesses to select the DIFC Courts to resolve space-related disputes. Although the Dubai Government abolished the DIFC Arbitration Institute and transferred assets and operations to the Dubai International Arbitration Centre in 2021,[54] this decree does not affect the Court in Space initiative and the DIFC remains a valid choice of arbitration seat for potential space-related disputes in the future.

As both States and private companies compete for space, international disputes in commercial, investor-State, and State-State contexts are sure to increase in frequency.

50 *Id*, at 5.

51 *Id.* at 9, 17.

52 *Id.* at 12.

53 See *supra*, Part 3.1.

54 Dubai International Arbitration Centre, Decree No. 34 of 2021 (Sept. 30, 2021).

4.2. COMMERCIAL ARBITRATION

As discussed above, new developments in space technology, the emergence of new private actors, and the lucrative prospects that could arise from activities such as space tourism and space mining mean that commercial activity —and therefore commercial disputes— are highly likely to increase.

The scale and scientific complexity of the space industry is also likely to require the cooperation of multiple different private companies, which has historically been the domain of government agencies. For example, it is conceivable to see a chain of trans-national private companies involved in the technological and scientific development of rocket parts and mining equipment, the manufacturing of rocket components and construction of launch sites, and the operation of ground signal and in-space coordination to guide rockets safely. On the commercial side, these private companies could be responsible for securing licensing agreements, coordinating spaceflight training, and selling rights or claiming royalties from materials extracted from space mining. At each step of the chain, these private actors will need to execute contracts with sub-contractors or with government licensing agencies that would provide provisions for dispute resolution.

Companies must also be prepared to anticipate liability disputes arising from space collisions, damage to property, or interference with rights to airspace or mining. It is also conceivable to see other cases like the dispute between Eutelsat and Mexico or the cases of Devas/DT versus Antrix/India arising from companies competing over the use of satellite rights. Companies operating in space will not only need to insure themselves against the worst but should be ready to anticipate costly and high-profile disputes.

Commercial arbitration is well suited for such matters. Arbitration has already adapted to complex commercial issues concerning highly technical subject matter. For example, arbitration is often the preferred mechanism to resolve aviation disputes. Numerous arbitral institutions have been established in recent years, such as the American Arbitration Association International Centre for Dispute Resolution ('AAA-ICDR') Aerospace, Aviation, and National Security Panel, the Shanghai International Aviation Court of Arbitration, and the Hague Court of Arbitration for Aviation, equipped with the ability to address aviation-specific arbitration disputes.

Anticipating the nature of space-related disputes, the PCA rules have provisions that ensure parties have access to a specialized panel of arbitrators and scientific experts.[55] Going forward, arbitral institutions may adopt similar rules that would give parties confidence in the ability of the institutions and the tribunals to grapple with these space-related disputes. Better still, institutions may establish branches that are specialized in resolving commercial disputes for space-related activity.

4.3. INVESTOR-STATE ARBITRATION

The entrance of private actors also opens the possibility to a second type of disputes: those between investors and States. Apart from the already-existing foreign investment protections, States may adopt regulations or even enter into space-specific investment treaties designed to attract investors and make it easier (and more profitable) for companies to set up space projects within their borders and contribute to their economies.

Within this context, investor-State disputes may arise over the allocation of licenses for satellite space (as in the case of *Eutelsat v. Mexico*)[56], annulment of government contracts (as in the case of *Devos v. Antrix*[57]), or other expropriation of investments, for example from space-mining or space-tourism.

In the context of investor-State arbitrations for space activity, an immediate question that will need to be addressed is that of jurisdiction. Most BITs grant the arbitral tribunal jurisdiction to address disputes relating to an investment made *in the territory* of a host State.[58] The territoriality requirement may be obvious when it comes to the design and manufacturing of component space parts or activity within launch sites, but it starts to become significantly more ambiguous when it concerns satellites and spacecrafts hundreds of thousands of kilometres above a nation's borders.

55 See Outer Space Rules, *supra*, note 62, at 9, 17.

56 See *supra*, Part 3.1.

57 See *supra*, Part 3.1.

58 See, *e.g.*, ICSID Convention, Regulations and Rules, Report of the Executive Directors on the Convention on the Settlement of Investment Disputes Between States and Nationals of Other States, ICSID/15, Sec. III § 12 (Apr. 2006) (stating that the 'primary purpose' of the ICSID Convention is to 'stimulate a larger flow of private international investment into' the territory of the host State); Argentina-United States of America BIT (1991) (defining 'investment' as 'every kind of investment *in the territory of* one Party owned or controlled directly or indirectly by nationals or companies of the other Party') (emphasis added).

Interestingly, several arbitration tribunals have already addressed similar matters of jurisdiction when it comes to territoriality outside a State's borders. In *Ambiente Ufficio S.p.A. v. Argentine Republic*,[59] the tribunal assumed jurisdiction asserted by several Italian investors concerning investments involving the issuance of Argentine government bonds. Although Argentina argued that these investments were issued outside of Argentine territory and registered in the accounts of banks located outside of Argentina, the tribunal determined the situs of the investment based on 'which State benefits from this investment',[60] and concluded that since the funds were destined to contribute to only Argentina's economic development, *'it is hard to imagine the investment's situs to be elsewhere than in Argentina'*.[61] Similarly, in *SGS v. Philippines*,[62] the Philippines ended a contract with Swiss company SGS for the performance of customs clearance and control processes for the Philippines. The Philippines similarly challenged the jurisdiction of the tribunal by arguing that there was no investment in its territory since the main obligation revolved around pre-shipment inspections made outside the Philippines.[63] The tribunal disagreed, concluding that SGS's activities constituted an investment in the territory of the Philippines, and gave special weight to the scale and duration of SGS's activity and the significance of the activities of the Manila Liaison Office.[64]

When dealing with space-related investments, arbitral tribunals may similarly find the territoriality requirements satisfied by analyzing whether the host State's economy was intended to benefit from the investment or whether there were significant coordination activities between the investor and the host State.

4.4. STATE-STATE ARBITRATION

The nature of space activity has historically required the collaboration of many States. A notable example is the ISS. As space activities become more complex and costly, and as more nations develop space-related capabilities, more international partnerships may emerge to take advantage of the special talents, technol-

59 Ambiente Ufficio S.P.A. v. Argentine Republic, ICSID Case No. ARB/08/9, Decision on Jurisdiction and Admissibility (Feb. 8, 2013).

60 *Id.* at § 499.

61 *Id.* at § 508.

62 SGS Société Générale de Surveillance S.A. v. Republic of the Philippines, ICSID Case No. ARB/02/6, Decision of the Tribunal on Objections to Jurisdiction (Jan. 29, 2004).

63 *Id.* at § 57.

64 *Id.* at §§ 111-112.

ogies and resources of each nation. All of this will increase the opportunity for State-State disputes.

Another important consideration comes from the States signatories to the U.N. treaties governing space. States operating in space are bound by these obligations. Examples of State-State disputes might arise where: one State interferes with another State's right to explore space or where they make a territorial claim over celestial bodies such as the moon;[65] multiple States collaborate in space mining projects and disagree on the ownership of extracted resources; signatories to the *Outer Space Treaty* and *Moon Agreement* challenge the use of space mining by other parties as a form of 'national appropriation or claim of sovereignty' prohibited by the treaties;[66] States establish national scientific bases that are challenged as quasi-military in nature;[67] or States refuse to 'take all possible steps' to rescue and assist personnel of a spacecraft that land in their territory.[68] State-State disputes may also arise out of accidents or collisions.[69]

So far, State obligations under these treaties have not yet been openly challenged, one reason is because such treaties, except for the *Space Liability Convention*, contain no dispute resolution mechanisms. Another reason is because we are still very early in the space exploration process. However, as the prospects for space activity increase, it is likely that they may become a basis for legal challenge. Arbitration would arguably be a suitable forum to host such disputes, provided the parties agree to use that platform to resolve their dispute.

65 See Outer Space Treaty, *supra* note 5, at art. I ('Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States').

66 See *id.* at art. II ('Outer 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'); Moon Treaty, *supra* note 17, at art. 11.3 ('Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non- governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof').

67 See Outer Space Treaty, *supra* note 5, at art. IV ('The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies shall be forbidden').

68 Rescue Agreement, *supra* note 8, at art. 2 ('If, owing to accident, distress, emergency or unintended landing, the personnel of a spacecraft land in territory under the jurisdiction of a Contracting Party, it shall immediately take all possible steps to rescue them and render them all necessary assistance').

69 See *supra*, Part 3.2.

5. ARBITRATION AS THE PREFERABLE DISPUTE RESOLUTION MECHANISM FOR SPACE-RELATED DISPUTES

In each of these potential scenarios (commercial, investor-State, State-State), arbitration offers unique features that would make it an ideal and well-suited forum to resolve space-related disputes. These features would make international arbitration preferable to domestic courts, and a viable forum when diplomatic solutions are not available:

a) *Party autonomy*. International arbitration is a creature of consent built atop the foundation of party autonomy. For space disputes, arbitration would allow a forum where parties can agree on the seat and rules of arbitration to ensure an efficient and impartial process. Procedures outside of domestic courts would also likely assure the parties that the outcome will be fair and neutral.

b) *Specialized arbitrators*. Space disputes involve not only highly technical and scientific matters but may also relate to specific areas of national law, treaty interpretation, or customary international law. International arbitration is a well-tested forum for these more specialized forms of space-related disputes. For example, the PCA rules provide that parties may appoint or nominate an arbitrator to the tribunal to ensure that the tribunal has sufficient technical expertise to adequately resolve the dispute.[70]

c) *Procedural flexibility*. International arbitration has the flexibility to address disputes between States and private entities, as well as purely commercial disputes. For example, numerous arbitral institutions provide for the ability to expedite cases, provide interim measures, and call on emergency arbitrators to provide temporary orders. Given its procedural flexibility, arbitration would be well suited for space-related disputes.

d) *Confidentiality*. Space-related disputes may also relate to issues of national security or patented technology that parties would want to avoid being made public. The confidentiality of arbitration and its ability to tailor confidentiality procedures would be attractive to parties with disputes that are highly sensitive in nature. For example, the PCA Outer Space Rules allows for the tribunal to appoint a confidentiality expert to assist with certain confidentiality determinations without disclosing the information to the opposing party or the tribunal.[71]

70 See Outer Space Rules, *supra*, note 62, at 9, 17.

71 See *id.* at 12.

e) *Enforceability.* For space claims that may be worth hundreds of millions—if not billions—of dollars, parties would want to ensure that they can enforce an award in their favour. As arbitration awards are definitive, final, and enforceable in the almost 170 countries that are signatories to the New York Convention, parties can have some degree of certainty that they can enforce decisions rendered by arbitral tribunals in the respective national courts. That being said, enforceability will inevitably prove an issue where States stubbornly try to frustrate enforcement attempts or if States manipulate decisions in their own judicial systems that undermine the findings of the tribunal. The challenges that Devas and Deutsche Telekom continue to face in enforcing their arbitral awards are a clear example of the challenges that can arise with enforceability.

f) *Accessibility.* Arbitration may also be a good platform for disputes arising from space activities that would not otherwise be covered by the international space treaties or domestic remedies. For example, under the *Space Liability Convention*, claims of liability do not offer private individuals or entities the ability to claim compensation for liability from their own State. In the absence of judicial mechanisms within such States, or where parties fear that national judicial or administrative systems block their avenues to fair compensation, arbitration would be an attractive option for private individuals to make claims for compensation against their own State. Assuming the States agree beforehand to arbitrate such type of claims.

6. CONCLUSION

There is no doubt that there is a need for an appropriate dispute resolution mechanism for disputes relating to the continuously increasing space activity. And while arbitration (in all its forms) would certainly offer the best conditions to resolve the disputes relating to this rapidly changing and highly technical and diverse area, the capacity of arbitral institutions to host space-specific disputes are still at their early stages. Nevertheless, international arbitration benefits from its distinctive capacity to adapt to the needs of the parties in a highly sensitive and technical subject area. Thus, the future of space arbitration is undeniably promising, both regarding its institutional developments, as well as its capacity to address the inevitable challenges of this field in expansion. So, while space may not be arbitration's final frontier, it is without doubt its next one.