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Dispute Resolution in the Commercial Space Age: Are All Space-Farers Adequately Catered For?

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In light of the marked increase in activity in the outer space sector, particularly by private players, this article examines whether the associated disputes arising in this sphere are adequately catered for; in the context of contractual commercial space disputes, State-to-State disputes, and the recourses available to private entities against States, under the current international dispute resolution framework.

1. Introduction

There is no doubt that commercial space activity already plays an integral part in our everyday lives. Space-derived technologies are constantly evolving, and benefit mankind on many levels. This has been made more apparent than ever in the wake of the COVID-19 pandemic. Over the past months, humankind across the globe has come to operate in a fully virtual world; this has been made possible by satellite technology, which has in turn enabled the provision of education, information, communication, healthcare, entertainment and, even, social interaction in a time of worldwide crisis.

In addition to satellite services (including those relating to telecommunications, Earth observation, navigation, security and defence), future extra-terrestrial initiatives may include the generation of solar power in outer space,¹ the mining of valuable resources including rare Earth minerals from asteroids,² and *in situ* resource utilisation (ISRU), by which space resources can be simultaneously harvested and processed in space into valuable reserves such as rocket fuel, with the potential to revolutionise future space missions.³ The establishment in low earth orbit of huge multi-satellite 'constellations' in the next decades will also radically

transform internet and broadband services, making them faster and broader-reaching than ever. Further, it seems space tourism is now only just over the horizon.

The seemingly infinite opportunities which exist in outer space have given birth to the *commercial space age*, which is only set to grow over the coming decades. Whereas extra-terrestrial realms were once restricted to State activity, given their inherent inaccessibility and the astronomic cost of any mission, private activity the sector has never been more prevalent than today. The reason behind this shift is likely threefold; (i) scientific advances, such as the ability to reuse rockets, have dramatically driven down the cost of space missions, (ii) evolving technologies have opened up possibilities which could never before have been contemplated and (iii) this combination has provided fertile ground for private investment, by 'space billionaires', such as Elon Musk, Jeff Bezos and Richard Branson, as well as venture capital and other funds, which have financed initiatives that national budgets have not been willing, or able, to stretch to.

Statistics now suggest that the global space industry could generate revenue in excess of US\$ 1 trillion by 2040.⁴ This represents an exponential growth in activity, even from today's progressed starting point. With the further increase in private sector initiatives in space over the coming decades, it is only inevitable that disputes arising from such endeavours will also grow in number. This begs the question as to whether these disputes are adequately catered for, in terms of the dispute resolution mechanisms available to space-faring operators.

1 A report commissioned by the UK's Department for Business, Energy & Industrial Strategy, and undertaken by Frazer-Nash Consultancy was published on 27 Sep. 2021 titled 'Space Based Solar Power: De-risking the pathway to Net Zero' supports a case for developing space-based solar power. See also P. Hollinger, 'Asimov's vision of space-based solar power is more than science fiction' (Financial Times, 25 Aug. 2021).

2 See B. Dorminey, 'Does Commercial Asteroid Mining Still Have A Future?' (Forbes, 31 Aug. 2021). See also the website of UK-based Asteroid Mining Corporation (<https://asteroidminingcorporation.co.uk>) as an example of current initiatives in this arena.

3 Further information on ISRU can be found on NASA's website: <https://www.nasa.gov/isru/overview>.

4 See 'Space, Investing in the Final Frontier', Morgan Stanley Research, 'Space, Investing in the Final Frontier', dated 24 July 2020 (<https://www.morganstanley.com/ideas/investing-in-space>).

2. Contractual commercial space disputes

A. The nature of contractual commercial space disputes

Although the subject matter may be novel, and perhaps more susceptible to gripping popular attention than other industries due to its common relatability, commercial space activity is very often similar, in many respects, to other business sectors, at least from a legal perspective. While initiatives in the outer space arena inherently relate to extra-terrestrial undertakings, almost all involve a strong terrestrial component, at the heart of which lies one, or more, contracts.

Contractual relationships encompass, for example, agreements for the manufacture, launch, lease, funding or insurance of space-craft, or components thereof. Such contracts will typically be governed by the law of a particular jurisdiction and will often set out the relevant dispute resolution mechanism to be pursued in the event of an alleged breach – be it the jurisdiction of a national court or, frequently in contracts formed in the context of the commercial space age, an arbitration clause. Standard boilerplate clauses will most likely mirror those used in any other commercial contracts. In sum, there is no particular reason to presume that a commercial contract relating to the outer space sector will be alien in character; aside from its subject matter, it will most likely echo familiar provisions of many other business contracts.

Arbitration naturally lends itself to the resolution of space-related disputes; many contracts pertaining to outer space activity are international, given the breadth of players involved in the sector, and contracting parties are likely, therefore, to favour a neutral tribunal, and seat of arbitration, over a particular domestic court. Moreover, commercial space contracts frequently involve industry-sensitive information, scientific know-how, and detailed technical data. The confidentiality which arbitration offers, as well as the opportunity to appoint arbitrators from within the industry, or with specific knowledge of outer space law, therefore matters. The exceptional speed at which the space industry moves also makes arbitration a natural fit, with the possibility of expedited proceedings and/or the appointment of an emergency arbitrator now a commonly available offering. It has been observed that the timely resolution of commercial space disputes is particularly significant:

This can be of great importance given that space activities often operate on precise and fixed schedules, especially as regards the time windows for landing, atmospheric re-entry, descent and landing, and orbit insertion. In these situations, only swiftly-obtained decisions are of any value.⁵

Above all, though, the ability to enforce awards on a global basis, under the New York Convention, appeals to the inherently fast-paced and international character of the space industry.

It is likely for these reasons that arbitration clauses are frequently included in commercial space contracts, between private business entities.⁶ SpaceX,⁷ Avanti,⁸ Boeing,⁹ Airbus¹⁰ and Arianespace,¹¹ for example, are among the many commercial companies operating in the sector which appear to routinely incorporate arbitration clause in their contracts.

B. Mechanisms for the resolution of commercial space disputes

Traditional arbitration institutions, such as the ICC, the majority of which have regularly updated their administrative rules in recent years to cater for highly complex, multi-party, multi-contract disputes as well as expedited proceedings and other such features, are well qualified to administer these kinds of contract-based commercial space-related disputes, whether they involve private parties only or include a State, or State entity, on one side.

Some institutions have even adopted space-specific dispute resolution tools. In 2011, for example, the Permanent Court of Arbitration adopted its *Optional Rules For Arbitration Of Disputes Relating To Outer Space Activities* ('Outer Space Rules'). These were based on the UNCITRAL Arbitration Rules 2010,

5 F. Pocar, 'An Introduction to the PCA's Optional Rules for Arbitration of Disputes Relating to Outer Space Activities' (2012) 38 *J Space L* 171, 178.

6 See statistics provided in Dadwal & Macdonald, p. 6, *supra* note 1.

7 'Avanti Wins Arbitration Award Against SpaceX' (Space News, 20 Apr. 2011).

8 *Id.*

9 C. Sanderson, 'Boeing faces claim over cancelled merger' (GAR, 28 Apr. 2020).

10 Following the acquisition of Arianespace by Airbus Safran Launchers in 2016, arbitration mechanisms in future deals with third parties will be used to maintain firewalls in compliance with anti-competitive restrictions – see: European Commission Press Release: Mergers: Commission approves acquisition of Arianespace by ASL, subject to conditions, 20 July 2016, https://ec.europa.eu/commission/presscorner/detail/en/IP_16_2591.

11 *Id.*

with several adaptations to take into account the specificities of outer space activity, such as access to specialised panels of arbitrators and experts, the possibility to appoint a five-member tribunal, and the right of the tribunal, once appointed, to request from the parties ‘a non-technical document summarizing and explaining the background to any scientific, technical or other specialized information which the arbitral tribunal considers to be necessary to understand fully the matters in dispute’.¹² More recently, in February 2021, Dubai established its *DIFC-based ‘Space Court’* as a further space-specific dispute resolution forum. No cases have yet been administered under either, though the PCA predicts, on the basis of the number of enquiries received relating to the incorporation of its *Outer Space Rules* within arbitration clauses in commercial space contracts, that it will only be a matter of time before claims are brought pursuant to this instrument.¹³

Space-related, contract-based, commercial disputes therefore appear to be well catered for; the menu of dispute resolution mechanisms available to commercial space faring operators currently appears to meet present demands. Commercial space disputes are, in fact, already prevalent. Satellite companies and telecommunications providers, for example, have appeared with increasing frequency as parties before arbitral institutions, such as the ICC and the LCIA, in recent years.¹⁴

Commercial space activity is still maturing, meaning that uncertainties and risks are still prevalent in many operations. While contracts make provision for these hazards, grounds for potential disputes still abound. Many launch agreements, for example, are conditioned upon a certain number of successful prior launches – if the launch failure rate is higher than that prescribed by the contract, satellite operators may be able to terminate their launch contracts without penalty.¹⁵ On the flip side, launch providers work to strict time slots – while an operator normally has some discretion in setting the exact launch window, if it is then missed for any reason (such as a delay in the manufacture of a payload) the financial consequences can be very

significant. These are but a couple of examples of the nature of commercial space-related disputes that have already arisen before arbitral tribunals in recent years.

With private investment in the commercial space industry rising at exponential rates, coupled with the continuous, fast paced, technological advances and innovations which are being made in the sector, an increase in disputes relating to commercial space activity is to be expected. It will therefore be important to ensure that the offering of suitable and sufficient dispute resolution mechanisms remains available to commercial space players to meet the ever-evolving needs of this industry sector as it expands.

3. Space-related State-to-State disputes

For many of the same beneficial reasons outlined above, arbitration clauses can also be found in the constitutional agreements of many of the principal intergovernmental bodies that operate in the sector, should disputes arise between member States out of or in connection with such instruments.

The *International Telecommunications Satellite Organisation Agreement* (‘ITSO Agreement’) for example, stipulates that ‘[a]ll legal disputes arising in connection with the rights and obligations under this Agreement’, both between contracting States, on the one hand, and between contracting States and the ITSO, on the other hand, are to be submitted to *ad hoc* arbitration.¹⁶ Annex A of the ITSO Agreement sets out the procedural rules which will govern such process. The convention which established the *European Telecommunications Satellite Organisation* (‘EUTELSAT’), both pre and post its amendment, also provides for mandatory arbitration to resolve disputes arising in connection with its interpretation and/or application.¹⁷ Again, the specific arbitral procedure prescribed is of an *ad hoc* nature and is set out in detail in the convention’s Annex B. The founding convention of the *European Organisation for the Exploitation of Meteorological Satellites* (‘EUMESAT’) similarly provides that disputes between its members must be arbitrated, though leaves the tribunal to ‘itself determine its seat and establish its own rules of procedure’ rather than setting out more detailed procedures in an annex.¹⁸

12 Outer Space Rules, Art. 27(4).

13 Comments made by E. Goriatcheva, Senior Legal Counsel, Permanent Court of Arbitration, in webinar ‘Towards Space Arbitration and Beyond’, hosted by The Space Court Foundation, 14 Apr. 2021.

14 V. Dadwal and M. Macdonald, ‘Arbitration of Space-Related Disputes: Case Trends and Analysis’, *71st International Astronautical Congress (IAC) – The Cyberspace Edition* (Eleven International Publishing, 2020).

15 This was the case in the dispute between Avanti and SpaceX, *supra* note 7.

16 ITSO Agreement, Art. XVI(a).

17 EUTELSAT Amended Convention, 28 Nov. 2002, Art. XV. The original Convention Establishing the European Telecommunications Satellite Organization (1 Sep. 1985) contained similar arbitration provisions at Art. XX.

18 Convention for the Establishment of a European Organisation for the Exploitation of Meteorological Satellites, as amended, 19 Nov. 2000, Art.15.

Several instruments provide for optional, rather than compulsory, arbitration. The *International Mobile Satellite Organisation* ('IMSO'), for its part, provides for optional arbitration (and again contains an annex delineating the arbitral procedure) should it be elected.¹⁹ Other inter-governmental organisations with access to optional arbitration under their founding instruments include the *European Space Agency* ('ESA')²⁰ and the *International Telecommunication Union* ('ITU'),²¹ though the ITU has, additionally, made available an 'Optional Protocol', whereby States may elect compulsory arbitration should they prefer.²² Incidentally, the ESA has also incorporated arbitration clauses into its model contracts with contractors.²³ Even the *International Space Station Intergovernmental Agreement*, signed on 29 January 1998 by the 15 governments involved in the Space Station project, includes an arbitration clause.

While it is unclear whether such *ad hoc* arbitration provisions have to date been triggered, their very existence demonstrates the widely-acknowledged suitability of arbitration to this field.

For the resolution of space-related State-to-State disputes arising outside of the parameters of these intergovernmental agreements, the International Court of Justice (ICJ) remains an available facility open to States should they elect, and consent, to its jurisdiction. As one author has commented, this would be a 'justified choice as several judges of the Court are well acquainted with space law'.²⁴ At the celebratory colloquium for the fiftieth anniversary of the ICJ, in a session presided over by Judge Vereshchetin on 'Equipping the Court to deal with developing areas of international law: Space Law',²⁵ a proposal was made to establish a standing chamber of the Court specifically to deal with space disputes, in a similar manner to that in which the Court had created a

Chamber for Environmental Matters in 1993.²⁶ While no such chamber was ever created, such a suggestion demonstrated that the ICJ is alive to the issue of the increasing potential for space disputes between States as extra-terrestrial activity increases. The PCA's Outer Space Rules, discussed above, are also at the disposal of States should they so require.

The other notable dispute resolution system available for space-related disputes between States is the Claims Commission process foreseen by the 1972 *Convention on International Liability for Damage Caused by Space Objects* ('Liability Convention'). When adopting the Liability Convention, the UN stated that its purpose was to embody 'the principles of a full measure of compensation to victims and effective procedures which would lead to prompt and equitable settlement of claims'.²⁷ In the Preamble of the Convention itself, it is again confirmed that its purpose is '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'.²⁸ Despite these noble goals, however, the practical utility of the Claims Commission foreseen by the Liability Convention, whose mandate is to 'decide the merits of the claim for compensation and determine the amount of compensation payable, if any',²⁹ is questionable and unlikely to stand up to the demands of the modern-day space age.

For a start, the scope of disputes which can be referred to the Claims Commission by States is limited to those arising out of or in connection with the Liability Convention itself – i.e. those which involve damage caused by space objects. It does not appear that the Claims Commission would have jurisdiction over other forms of dispute. Further, all claims must be brought within a one-year time limit from the date that the damage occurred (or the date upon which the knowledge of such damage could reasonably have become known).³⁰ Given the nature of space-related activity and the distances and technology involved, this may prove problematic. Moreover, while it is expressly confirmed that the exhaustion of local remedies is not a precondition to any claim, States must attempt to

19 IMSO Convention Amended as Adopted by the Twentieth Session of the IMSO Assembly Provisionally Applied from 6 Oct. 2008, Art. 17 and Annex.

20 Convention for the Establishment of a European Space Research Organisation, 30 Oct. 1980, Art. XVII.1.

21 Constitution of the International Telecommunications Union, as adopted at the ITU Plenipotentiary Conference in March 2015, Art. 56.2.

22 Optional Protocol on the Compulsory Settlement of Disputes Relating to the Constitution of the International Telecommunication Union, to the Convention of the International Telecommunication Union and to the Administrative Regulations, as adopted at the ITU Plenipotentiary Conference in March 2015. See also ITU Constitution, Art.56.3.

23 European Space Agency, General Clauses and Conditions for ESA Contracts (2019), online: Highlights of ESA Rules and Regulations, https://esamultimedia.esa.int/docs/LEXL/Contracts/ESA-REG-002_rev3_EN.pdf.

24 I.H.Ph. Diederiks-Verschoor, 'The Settlements of Disputes in Space: New Developments' (1998) 26 *J Space L* 41, p. 44.

25 *Id.* p. 43.

26 As per the website of the International Court of Justice (<https://www.icj-cij.org/en/chambers-and-committees>): 'In 1993 the Court created a Chamber for Environmental Matters, which was periodically reconstituted until 2006. However, in the Chamber's 13 years of existence no State ever requested that a case be dealt with by it. The Court consequently decided in 2006 not to hold elections for a Bench for the said Chamber.'

27 UN General Assembly Resolution no.2777 passed at the 1998th plenary meeting on 29 Nov. 1971.

28 Liability Convention, Preamble.

29 Liability Convention, Art. XVIII.

30 Liability Convention, Art. X.

achieve a resolution through diplomatic channels for no less than 12 months before a Claims Commission can be established.³¹ Again, this is lengthy, especially in an industry which moves so fast; it is double the length of the ‘cooling-off’ period found in most investment treaties. The most decisive blow to Claims Commission process, however, is the fact that, in any event, the decision of the appointed panel is not likely to be enforceable. Indeed, the Convention states, in relevant part:

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**.³²

To date, there do not appear to be any publicly available examples of State-to-State disputes that have been resolved, or even pursued, using any of the recourses identified above. Perhaps the most publicised State-to-State dispute in this field has been Canada’s claim against the Soviet Union arising out of the 1978 crash of the Soviet satellite, Cosmos 954, in Canadian territory, following its re-entry into Earth’s atmosphere.³³ Canada’s claim for damages was based primarily on the provisions of the Liability Convention but was ultimately settled in 1981 for a sum of 3 million Canadian dollars.³⁴

4. Disputes between private players and States

A. Investment treaty disputes

To the extent that private parties engage in commercial, contractual relationships with States, or State entities, as may be the case more frequently in the field of commercial space activity than in other fields of business given the intrinsic level of State involvement, the dispute resolution mechanisms in those contracts, as discussed above, should apply.

In addition to any contractual recourse that may be available to them, participants in the space industry are also finding, increasingly, that they are able to benefit from protections afforded by the global matrix of investment treaties in force. These include an investor’s right to direct recourse against a State, and access to binding arbitration, in the event that such State breaches the safeguards it has undertaken towards investors in an international investment treaty.

Investor state arbitration in the outer space sector is beginning to take off; at least six cases have been commenced to date under investment treaties, on grounds that space-related investments have been harmed by the host State in question, thereby violating certain treaty provisions.³⁵ In *CC/Devas vs India*,³⁶ for example, the claimant brought a claim under the Mauritius-India bilateral investment treaty, pursuant to the UNCITRAL Arbitration Rules, alleging that India had unlawfully expropriated its investment and breached its right to fair and equitable treatment (FET). The investment in question was an S-band frequency spectrum licence, which had been granted to the claimant by the host State for the provision of high-speed Internet services, before being revoked on grounds of national security. More recently, Eutelsat brought claims against Mexico under the Mexico-France bilateral investment treaty, in accordance with ICSID’s Additional Facility Rules.³⁷ Eutelsat’s claim concerned its investment in a Mexican satellite company, which operated three important telecoms satellites. It alleged, inter alia, that Mexico had breached its FET obligation under the treaty by obliging the claimant, through

31 Liability Convention, Arts. IX and XIV.

32 Liability Convention, Art. XIX (2) (emphasis added). This principle was recognised by the UN General Assembly Resolution no.2777, passed at the 1998th plenary meeting on 29 Nov. 1971, which noted that State Parties to the Liability Convention ‘may, on becoming a party to the Convention, declare that it will recognise as binding, in relation to any other State accepting the same obligation, the decision of the Claims Commission concerning any dispute which may become a party’ (emphasis added).

33 For a full account of this event and Canada’s resulting claim see A Cohen, ‘Cosmos 954 and the International Law of Satellite Accidents’, *Yale Journal of International Law*, Vol. 10:78, 1984.

34 ‘Settlement of Claim between Canada and the Union of Soviet Socialist Republics for Damage Caused by “Cosmos 954”’, released on 2 Apr. 1981.

35 See e.g. *Deutsche Telekom v. India* (PCA Case No 2014-10); *CC/Devas (Mauritius) Ltd, Devas Employees Mauritius Private Limited and Telcom Devas Mauritius Limited v. India* (PCA Case No 2013-09); *Eutelsat SA v. United Mexican States* (ICSID Case No ARB(AF)/17/2); see also statistics provided in Dadwal & Macdonald, supra note 1.

36 *CC/Devas (Mauritius) Ltd, Devas Employees Mauritius Private Limited and Telcom Devas Mauritius Limited v. India* (PCA Case No 2013-09).

37 *Eutelsat SA v. United Mexican States* (ICSID Case No ARB(AF)/17/2)

its investment, to reserve capacity on these satellites for government use (essentially, Eutelsat argued, amounting to a tax), and by requiring that Eutelsat reserve greater capacity than its competitors. An award was issued in Mexico's favour in September 2021.³⁸

Notwithstanding the current debate on investor-State dispute settlement (ISDS) mechanisms,³⁹ the offering of dispute resolution tools found in the majority of investment treaties (both bilateral and multilateral) is impressive, and the tribunals appointed under such instruments are extremely experienced and well versed in matters of international law. Most treaties offer a choice, at least, of ICSID or UNCITRAL arbitration proceedings, both of which have proved to be robust means to administer international disputes between States and private parties. There is no reason that these should not also serve the space faring community equally as well, in the resolution of space-related disputes, as they increase in number, in the future.

B. Other players vs State disputes arising under international law

As the commercial space age matures, space faring operators are likely, increasingly, to conduct activities falling outside the parameters of the legal frameworks established by commercial contracts and, even, international investment treaties. Absent these legal scaffolds, aspects of public international law will come to have a growing bearing on private entities operating in this field.

As with all areas of public international law, it is the international legal framework, which governs human activity in outer space, that provides the overarching legal apparatus pursuant to which governments (and their respective nationals) may execute their various space programs. Yet despite the recent revolution that has taken place in commercial space activity over the last decades, and which shows no sign of slowing down, international space law is noticeably in need of reform. Absent modernisation, this may become problematic if human activity in space continues to advance at its present pace.

The five UN treaties which underlie and form the basis of the international legal framework governing outer space (the 'Space Treaties') are comprised of: (i) 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* ('Outer Space Treaty' or 'OST'); (ii) the 1968 *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*; (iii) the 1972 *Liability Convention*, discussed above; (iv) the 1976 *Convention of Registration of Objects Launched Into Outer Space* ('Registration Convention'); and (v) the 1984 *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* ('Moon Agreement'). Of these, 'it is the Outer Space Treaty that remains, almost 50 years after its entry into force, the mothership of international space law';⁴⁰ the other four treaties serve to expand upon specific aspects of the OST, but it is the OST which, even today, truly underpins international space law as a whole.

The Space Treaties were adopted in an era far removed from that of the present commercial space age – in the 1960s, in the midst of the Cold War. When the OST was signed, the principal motivation of politicians was the avoidance of a third world war and, with the former Soviet Union in lead position in the ongoing 'space race',⁴¹ the preservation of outer space as the common heritage of mankind. While transformational technical, scientific and commercial advances in outer space have been achieved since, to the point where the present space scene would be unrecognisable to the politicians of the 1960s, the legal rulebook governing the field still reads the same, which does not bode well for commercial space activity.

One particular area in which international space law and current commercial space activity may collide relates to *the exploitation of resources* procured in outer space. The matter of ownership, and proprietary rights, over extra-terrestrial materials is one which will likely be the focus of increasing debate when industries such as space mining become commercially viable and ISRU becomes a common feature of standard space missions. The OST does not grant ownership rights over any land, resources or other materials derived from space. On the contrary, it expressly confirms that:

38 While the award itself has not yet been made public, there has been have been many press reports on the case. See e.g.: T. Fisher, 'Mexico Declares Win Against Satellite Operator' (GAR, 17 Sep. 2021); 'Eutelsat loses SATMEX case against Mexico' (Opportimes, 16 Sep. 2021); C. Forrester, 'Eutelsat loses \$120m dispute with Mexico' (Advanced Television, 20 Sept. 2021).

39 See e.g. R. Echandi, 'The Debate on Treaty-Based Investor-State Dispute Settlement: Empirical Evidence (1987-2017) and Policy Implications', *ICSID Review - Foreign Investment Law Journal*, Vol. 34, Issue 1, Winter 2019, pp. 32-61.

40 R. O'Grady, 'Star Wars: the Launch of Extranational Arbitration?', *Arbitration: The International Journal of Arbitration, Mediation and Dispute Management*, Vol. 82, Issue 4 (2016), p. 382.

41 The former Soviet Union won the race to put the first satellite into orbit, in Oct. 1957 (Sputnik 1), as well as the race to put the first man into space, in 1961 (Yuri Gagarin). It was not until 1969 that the US became the first nation to put a man on the Moon (Neil Armstrong).

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.**⁴²

There has been much debate over the interpretation of this provision between governments, academics and lawyers, including in relation to whether the prohibition against national appropriation applies, equally, to appropriation by private commercial entities. Whatever the correct reading of this text may be, the very fact that it has conjured so much argument serves to demonstrate that a large question mark exists, under international law, over the rights that private players may have to any resources that they manage to extract in space.

Another grey area is that of *liability*. It is unclear whether the articles on liability in the OST and the Liability Convention apply to private spacefaring entities or, equally, whether such private operators are themselves able to rely upon, and benefit from, such provisions. In any case, the rules on liability were created in an era when even State activity in outer space was in its infancy. When read in the context of the modern space age, it becomes quickly clear that they are severely limited, harbour significant gaps and omissions, and give rise to confusion by, for example, specifying concepts such as fault as a prerequisite to the establishment of liability, and any resulting compensation.⁴³

A final example of an area in which disputes may arise between private entities and States over the coming years, and which fall outside the scope of commercial contracts or terrestrial investment treaties, is that of the *outer space environment* and the problem of *space waste*. This is a topic which is not addressed by any of the Space Treaties and yet which has become an issue of concern as Earth's orbit becomes increasingly populated with satellites, spacecraft and vast amounts of debris from various historic missions. The pollution of the space environment not only poses a risk to the long-term sustainability of outer space, which is an issue, similar to climate change, that must be taken seriously at a global level, but it also impacts each new space endeavour conducted by private commercial enterprises – on the one hand, there is the matter of accountability, in that new missions should be regulated in a way that minimises further contamination of the space environment; on the other hand, future space missions by commercial actors will themselves be put

at ever increasing risk until the issue of space pollution is brought under control. Here again, therefore, the potential for disputes to arise between private operators and States is very real.

The UN appears to be fully aware of the lacunae highlighted above; the *Legal Subcommittee of its Committee On The Peaceful Uses Of Outer Space* ('COPUOS') meets annually to discuss these and other issues, and to moot potential solutions. However, a common global motivation to reach an international consensus on an updated legal regime for outer space does not yet exist. This is perhaps unsurprising, given the sheer number of member States required to reach unanimous accord and the colossal variety in their respective national space programs and stages of advancement in the sector. Unlike the field of climate change, for example, there is not yet any wide-felt, overriding urgency to motivate all States to come together to strive in earnest to find common agreement notwithstanding their different stages of development and diverging political views. Until there is, international space law may be unlikely to progress or evolve. Some States have responded to this legal stalemate by moving forward independently and unilaterally passing their own domestic laws with respect to certain issues, to 'clarify' the situation and to encourage those investing in the space sector. The United States, Luxemburg, and Japan, for example, have all passed national legislation granting ownership rights to their respective citizens with respect to natural resources procured in outer space.⁴⁴ This will not hasten a common, global, resolution to the need for reform. It may even risk geopolitical fragmentation in this arena and could lead to potential conflicts with the international legal order that does remain in existence.

Whatever the correct approach may be – and however different States chose to interpret the Space Treaties which bind them – it is clear, at least, that the ground for potential disputes is fertile. In this context, disputes may arise under international space law, between private space-faring entities and States, that are not caught by the terms of terrestrial investment treaties. For example, claims may arise under the Liability Convention which do not amount to an investment, as per the ICSID Convention, let alone one in the territory of another contracting State, as required by most investment treaties. In such cases, there is no automatic or default recourse pursuant to which such private entities can bring their claims against a State.

42 OST, Art. II (emphasis added).

43 Liability Convention, Arts. III and IV.

44 See US Commercial Space Launch Competitiveness Act 2015; Luxembourg's Exploration and Use of Space Resources Act 2017; Japan's Space Resources Mining Act, Jun. 2021.

The OST is silent when it comes to any kind of *dispute resolution facility* and, despite the Treaty's assurances to 'natural or juridical persons',⁴⁵ it provides no means to those persons to bring an action against a liable State. While there is undoubtedly a serious issue surrounding the lack of clear and comprehensive substantive rights for private actors in outer space, as set out above, even the few unambiguous rights which do exist cannot currently be enforced by private entities or nationals against States in the event that they are breached.

The present situation of private, space-faring entities with non-contractual disputes against States, or State entities, therefore mirrors the situation that existed in the early 1960s with respect to foreign investment disputes, at a time when the ICSID Convention had not yet been promulgated. At that time, foreign investors were wholly dependent on their own governments accepting to take on, and then expeditiously pursue, claims on their behalf against another State. The investor in question would have no control over the proceedings itself and would be wholly reliant upon the conduct of its own State. The ICSID Convention transformed this *status quo*, granting private investors a direct recourse against foreign States in the event that the rights pertaining to their investments were harmed under international law. With the acceleration of the commercial space industry and surge in extra-terrestrial activity by private entities and individuals, the time must have now come for a similar facility to be created with respect to outer space disputes between private entities and States which arise on international legal plane.

C. Bridging the gap: how to serve private space players going forward

The need for a tool to facilitate the resolution of outer space disputes between private entities, on the one hand, and States, on the other, was first seriously identified, and addressed, almost 25 years ago, by Professor Karl-Heinz Böckstiegel, when he led a task force to produce the *Final Draft of the Revised Convention on the Settlement of Disputes Related to Outer Space Activities*. This comprehensive instrument was adopted in 1998 by the International Law Association (ILA) at its 68th Conference in Tapei (Draft Convention).⁴⁶ It provides for three possible binding dispute resolution mechanisms; an International Tribunal for Space Law (the establishment of which is foreseen by the Draft Convention itself), the ICJ (to

the extent that the disputing parties are both States), or an arbitral tribunal (the appointment procedure for which is outlined in the Draft Convention).⁴⁷ Of these, arbitration will serve as the default provision should the disputing parties be unable to agree on the process to be followed.⁴⁸ The Draft Convention expressly authorises the court or tribunal, as applicable, to rule upon questions of interpretation arising out of international agreements, perhaps in recognition of the numerous complexities which characterise international space law.⁴⁹ There is also provision for scientific and technical experts to sit with the relevant court or tribunal.⁵⁰

No States, however, have ever proceeded to adopt the Draft Convention. It is possible that this has been due to its perceived drawbacks. The most notable downside to the Draft Convention, with regard to the arbitration option, is that no provision is made for a seat of arbitration. While this echoes of the ICSID system, the latter does provide for grounds upon which an award may be challenged, under Article 52 of the ICSID Convention, and sets out a process – the *ad hoc* committee procedure – by which such challenge may be pursued. By contrast, the Draft Convention not only fails to provide for a seat of arbitration (which would result in recourse to domestic courts in the event of a challenge) but also stops short of setting out any process akin to ICSID's *ad hoc* procedure. Instead, the Draft Convention simply provides that:

Any controversy which may arise between the parties to the dispute as regards the interpretation or implementation of the award may be submitted by either party for decision the arbitral tribunal which made the award.⁵¹

It goes on to provide that:

Any such controversy may be submitted to another court or tribunal under article 6 [i.e. the three possible dispute resolution procedures foreseen by the Draft Convention] **by agreement** of all parties to the dispute.⁵²

It therefore appears that the authority of the arbitral tribunal (which also has the power to determine its own jurisdiction) would be unfettered and without reproach, unless of course the disputing parties

45 OST, Art. VII.

46 The Report of the 68th Conference of the International Law Association (ILA) in Tapei can be purchased via the website of the ILA at <https://www.ila-hq.org/index.php/publications/order-reports>.

47 Draft Convention, Art. 6.1.

48 *Id.* Art. 6.4. If two parties have agreed to the same procedure, however, then any dispute may only be submitted to that procedure, unless the parties otherwise agree.

49 *Id.* Art. 7.2.

50 *Id.* Art. 8.

51 *Id.* Art. 35.1.

52 *Id.* Art. 35.2 (emphasis added).

miraculously agreed to the jurisdiction of an alternative panel to review any award. This is not likely to have appealed to States when considering whether to adopt the Draft Convention. However, it is also possible that the reason for the lack of take-up of the Draft Convention is simply because it was ahead of its time; while commercial space activity has been ongoing for decades, it is arguably only in very recent years that it has really boomed.

In 2016, almost 20 years later after the Draft Convention was proposed, the present author called for the establishment of an instrument of this nature, proposing an *International Convention on the Settlement of Outer Space Disputes* ('ICSOD Convention').⁵³ Such a convention could be adapted not only to the modern space age but could also take into account the latest procedural developments in arbitration including, for example, in recognition of the need to weigh confidentiality with transparency and making provision for such a balance. To date, however, no suitable instrument has been successfully created or adopted by the international legal community. Some maintain that it is too soon for such an initiative, arguing that the kind of space activity that will give rise to private vs State disputes under public international law is still too far in the future to merit serious consideration of such a dispute resolution framework at this point in time. Three points are worth making in this respect.

First, the commercial space age is developing at such a dazzling pace that this opportunity to act, and to put mechanisms in place so that they are available when truly needed, is likely to be available only for a short while, and the window is closing quickly. *Second*, the successful creation of an international convention will take time. Again, as a consequence of fast developing space technologies, that temporal resource is not in abundance. *Third*, to again draw a comparison with the establishment of the ICSID Convention, that instrument, which is now fundamental to international foreign investment, was created pre-emptively. At the time of its adoption, there were only about 70 bilateral investment treaties in force, all providing for the settlement of disputes through State-to-State arbitration. As ICSID's 'principal architect',⁵⁴ Mr Aron Broches, General Counsel of the World Bank, later stated, the idea for what ultimately became the ICSID Convention was simply 'in the air' at the time of its creation.⁵⁵ In 1960, a few years before the adoption

of the ICSID Convention, a report of the UN Secretary General recognised that, while a broad investment convention may be difficult to achieve, one which focused purely on an investment dispute resolution framework could provide an alternative, 'at least as an intermediary solution'.⁵⁶ The report even suggested that the jurisprudence of investment tribunals constituted under such dispute resolution treaty may ultimately 'create the "code" of substantive standards of treatment hoped for from an investment convention'.⁵⁷

The same reasoning can be applied, by analogy, to the rationale for the creation of an ICSOD Convention, or similar. While the views of developed, and less-developed, spacefaring nations may now be too divided to conclude a global update to the Space Treaties any time soon, including in relation to the substantive rights of those operating in outer space, it may still be possible to at least agree upon the formation of a dispute resolution framework. This may be done more easily if it were adopted by an organisation with less polarised membership than the UN, such as the World Bank or the World Trade Organisation. Again, the analogy with ICSID – itself an innovation of the World Bank, possibly for the same reasons – is pertinent. Were such a facility to be established, it could then be linked with, and incorporated within, the new wave of bilateral agreements currently being concluded between spacefaring nations, such as those agreed in the context of NASA's Artemis Program.⁵⁸ This is exactly what happened in the context of ICSID; once the facilities of the Centre were available, including the provision of model clauses for incorporation of bilateral investment treaties from 1969, they were then adopted by and included within the thousands of bilateral investment treaties which were subsequently concluded around the globe.

The time is therefore ripe to create and establish a new, international dispute resolution framework for the settlement of outer space disputes, which provides private commercial entities with direct recourse against States and State entities. At least if the international legal regime remains confused on a substantive level, there will then be a common and neutral forum, with clear rules, procedures, and an administrative body to oversee proceedings, before which debates on these matters can run their course and, ultimately, achieve binding results. The decisions and awards rendered as a product of such process may in turn themselves come to guide the evolution of international space law.

53 See R. O'Grady, *supra* note 10.

54 C.H. Schreuer, *The ICSID Convention: A Commentary* at 2 (Cambridge University Press, 2d ed., 2009).

55 A.R. Parra, 'Establishing ICSID: an idea that was 'in the air'' (Oxford University Press Blog, 8 Sep. 2015).

56 *Id.*

57 *Id.*

58 See <https://www.nasa.gov/specials/artemis/>.

5. Conclusion

The benefits that can be drawn from space-derived technologies are set to continue to grow over the coming decades as the commercial space age continues to soar. The constant speed at which new scientific advances are being made is impressive and hugely encouraging. If the proliferation in commercial space activity leads to an associated rise in space-related disputes, which is to be expected, it seems that, for the most part, disputing parties already have adequate options available to them through which such legal battles may be administered. Of these, arbitration features heavily, which is reflective of its suitability to the specific characteristics of the modern space age.

The one notable omission arises at the public international law level, both in terms of substantive as well as procedural rights. While the substantive international legal regime governing private and commercial activity in outer space is in clear need of reform, such a process will take time, no matter how necessary it may be, given the difficulty of finding unanimous agreement between nations with differing political agendas and motivations. In the meantime, the establishment of an international system for the resolution of disputes in this arena, and the global uptake of such system by States, should be achievable. While it may not provide private space-farers with any guarantee as to their substantive rights at the international level, it would at least ensure that, in the event of a dispute arising in this context, they would have a direct recourse against potentially liable States. By signing up to such a convention and incorporating it into future bilateral and multilateral space treaties, member States would, for their part, ensure greater protections for their own space-faring nationals as well as further the advancement of their own domestic and international space programs.

If one looks back at the staggering achievements that have been made in outer space over the last 50 years, it is mind-blowing to even ponder upon what mankind might accomplish in the next half a century. Much of this future progress will inevitably be made by the private sector, which has already come to play an essential role in harnessing the possibilities and benefits offered by outer space. While it is impossible to foresee each and every exciting breakthrough that lies ahead, one thing is clear. As the commercial space industry escalates, the number of disputes arising from it will inevitably also grow. The role of the arbitration community in this evolution will therefore be central.