AN EXAMINATION OF SPACE REGIMES ON THE ARBTRATION OF FUTURE SPACE RELATED DISPUTES

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Abstract

Attendant in the use of space resources are disputes which may arise due to situations seen (debris fall out to foreign territory, satellites collision etc) and unforeseen (privatisation, commercialisation, space travel etc). Soon private individuals would be able to jet to outer space for tourist purpose and just like we have airports, space transport operations will take the lime light. Inherent in this future projection of space utility is the high possibilities of disputes or issues that man has not comprehended, at least, for now. Outer space regimes adopts arbitration as one of the various means of space dispute resolution and this has been applied in series of space disputes such as the COSMOS 954 between Canada and Soviet Union, Cosmos 2251 between Russia and US, Eutelsat S.A. v. United Mexican States, etc. International arbitration is the most fancied means of resolving commercial disputes. Hence, its favour for space disputes. The question is, do the major international space treaties foresee the emerging and future developments as regards the use of space as to accommodate disputes that may arise from them to be arbitrable? The intention of this paper is to put its pro-active mind and fast forward same into the projected future space disputes, analyse same and discuss whether such disputes are projected as subject of arbitration in the provisions of space treaties. A qualitative legal research methodology is adopted; and at the end of the paper, appropriate recommendations shall be made based on the findings.

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1.0 Introduction

Outer space, as a final frontier, is one of the internationally most sought after harbour of goodies. The environment which is described to be rare resources as well as capable of being utilised for technologies for the purposes of telecommunication, weather forecasting, air navigation, agriculture, military reconnaissance etc.[1] The quest to dominate this environment necessitated putting in place five major Space Treaties by the International community. 1957 marked the beginning of space activities by man, the launching[2] by the USSR served as a wake-up call for the United States of America because it, within three months,[3] also launched its first unmanned satellite named *Explorer-1*. In the first few years of space exploration, a country's leadership in science and technology, engineering, and National defense was a measure of its success in space activities.[4] Though "Explorer 1" was smaller than "Sputnik", it had more sophisticated instruments on board and discovered a pair of radiation belt[5] which enveloped the Earth.[6]

A sort of technological-rivalry evolved between the Soviet Union and United States as the two Nations began competing in space programs development. The first space flight carrying human being made its way to space when a Soviet cosmonaut[7] orbited Earth in the spaceship "Vostok 1"[8] after many scientific observations and research had been carried out on various materials such as plants and animals. A month after another Soviet Union Satellite, named Sputnik 2, carried a dog named Laika was launched into space. The survival of Laika proved that humans could survive the

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[2] "To place, or attempt to place, a launch vehicle and its payload, if any, in a suborbital trajectory, in Earth orbit in outer space, or otherwise in outer space." National Aeronautics and Space Act, 51 U.S.(5)(2010)."The term launching includes attempted launching" Article 1(b) Liability Convention, 1972

[3] January 1958.

[4] Oberg James, *"Space Exploration"* (World Book Online Reference Center, 2004) <http:www.worldbookonline.com. /web/Article? 1d=ar 522550>&<http://www.mathsquad.com >accessed 28 July 2022.

[5] Later named Van Allen Belts

[6] This launch further informed a series of scientific missions to other celestial bodies such as the Moon in the later 1950s and early 1960s. See Oberg J, *"Space Exploration"*

[7] Yuri .A. G

[8] On April 12, 1961

environment of Outer Space. The year 1971 also experienced the first launch of a space station.[9]

Well, space activities has gone past US and Russia now as there is influx of participation of other countries like China, Japan, South Africa, Ghana, United Kingdom, Nigeria etc, inter-governmental organizations, private entities and agencies such as NASA[10] and ROSCOMOS[11] especially in the areas of satellite launch. Outer space is free for exploitation. States are even encouraged to explore and exploit the resources of outer space as all areas of outer space is free[12] to access without any hindrance as long as the readiness is available interms of finance and technology. As expected, issues or disputes will arise in the course of the use of the environment reserved as heritage of mankind. Issues/disputes involving breach of space related contracts, satellite collision due to malfunction and overcrowding of the finite resources, debris fallout to territory not of the launching state, detection of fragment of space object in a foreign territory are quite common narratives in space exploration.

2.0: Examples of space related disputes so far

Dispute is an inevitable phenomenon in human existence. The uniqueness of the environment of outer space has not spared those who engage in its activities from disputes. Disputes identifiable with space activities ranges from satellite collision or accident, space debris fallout and space contract.

Satellite collision occurs where two satellites collide in orbit irrespective of their functionality. A defunct satellite can collide with a satellite that is still functioning just like two or more functioning satellite can collide. In-orbit-collision can loosely be extended to collisions of objects including fragments and component part. As stated earlier, actors in space activities are mostly states which indicates that state A's satellite may collide with state B's satellite which may destroy state B's satellite completely or disrupt its functionality. Often time, fragments from such collision may collide with a private entity's satellite. This usually leads to claims for damages as a result of the destruction of satellite by the collision. The proliferation of satellite launch has increased the possibility of satellite collision on regular basis. Since the inception of satellite launch in 1957 in

[9] "Salyut 1"

[10] United State of America' space Agency<http//:www.nasa.gov/about/index.html> accessed 31 March 2022

[11] Russia's space Agency<http//:www.russianspaceweb.com> accessed 31 March 2022

[12] Art. 1 Outer Space Treaty 1967

orbit, the number of active satellite orbiting the earth is over 4,852 of January 1,2022.[13]

The first of such collision occurred in 2009 where Russian satellite Cosmos collided with U.S Iridium.[14] Russian's Cosmos 2251 was a derelict Satellite to which it claimed that, in the exercise of its freedom to explore Outer Space, it is not under any international obligation to remove same and was quick to point out the fact that the US Iridium could have maneuvered to avoid the collision, this, the US also replied and claimed not to be obligated to maneuver either, even if it foresaw the collision.[15] In 1978, the then Soviet Union's nuclear-powered ocean surveillance Satellite, COSMOS 954 crashed and caused debris to scatter over regions of Northern Canada.[16]The most recent of such collision is that of Russian satellite, object 48078 and China satellite, Yunhai 1-02[17]

The case of Cosmos 945 is very relevant here. Cosmos 954 is a Soviet nuclear power Satellite launched in on the 18th September 1977. This Satellite showed signs of abnormal behavior and on the 23rd January 1978 at about 6:53 Eastern Standard Time, before the startled eyes of a few Northwest Territory residents, it re-entered the earth atmosphere to the north of the Queen Charlotte Islands and disintegrated. This caused radioactive debris to scatter over portions of Canadian territory, particularly along a strip of land starting near Great Slave Lake and continuing north eastward toward Baker Lake. One of the reasons averred by Canada in their claims is that the presence of Radioactive contamination caused by Cosmos 954 amounted to devaluation of the Canadian Territory and that such presence has also caused anxiety to its people and the governments of its nation, hence, the Canadian population are subjected to

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[13] Erick Murgueno Salas, *'Number of satellites in orbit – major countries* 2022' (Statista, 27 July 2022) <www.statista.com/statistics/264472/number-by-operating-country> accessed 30 June 2022.

[14]Asher Isbrucker, 'Kessler *Syndrome: What Happens When Satellites Collide'* (Asher Isbrucker, 2 November 2018) <asherkaye.medium.com/Kessler-syndrom-what-happens-when-satellites-collide-1b571ca3c47e> 30 June 2022.

[15] Michael Listener, *'Iridium 33 and Cosmos 2251 Three Years Later: Where Are We Now?* (The Space Review, 13 February 2012) http://thespacereview.com/article/2023/1> accessed 30 June 2022.

[16] "Settlement of Claim between Canada and the Union of Soviet Socialist Republics for Damage Caused by Cosmos 954" (Released on April 2, 1981) <http://www.jaxa.jp/library/space_law/chapter_3/3-2-2-1_e.html> accessed 19 July 2022. Bryan Schwartz & Mark L.Berlin, 'After The Fall: Analysis of Canadian Legal Claims for Damage Caused by Cosmos 954 (1982) 27 McGill Law Journal 678- 680

[17] Mike Wall, '*Space Collision: Chinese satellite got whacked by hunk of Russian rocket in March'* (Space News, 17 August 2021) <http://www.space.com/space-junk-collision-chinese-satellite-yunhai-1-02> accessed 30 June 2022.

mental stress and anxiety generated by fear of the debris and this is a cause of injury to them.[18]

Another aspect of dispute that may occur in relation to space are the of contracts, this time, not the regular multilateral or treaty contract. Cases that fall under this area are usually between private companies and sovereign states, international intergovernmental organisation or another private company, where if the problem is on defective product,[19] claimant are often required "to adduce evidence of a casual link between the defective product and the damage caused by it; and for the manufacturer to prove amongst others, that he did not put the product into circulation, that the product was not defective when he put into circulation, that the defect is due to compliance of the product with mandatory regulations issued by the public authorities, that the state of scientific and technical knowledge at the time when he put the product into circulation was not such as to enable the existence of the defect to be discovered."[20] As observed in *Appalachian Insurance Co V. McDonnell Douglas Corporation,*[21] on the 3rd February 1984, the Wester VI Satellite was released from the cargo bay of the space shuttle and when it was at a safe distance from the shuttle its solid rocket motor was fired. The motor ceased to burn properly, causing the Wester VI to stay in low orbit and making its intended communication operations impossible. Sometime after this incident, the owners of the Palapa B-2 satellite (whose satellite was also manufactured by the defendant) decided that the malfunctioning of Wester VI was only due to an accidental, one-off failure of the carbon exit cone, and they proceeded to launch their satellite. The result was that Palapa B-2 could not achieve its targeted objective either. Both owners were insured and their insurers had to more than $150 million as both satellites were considered total loss. Following these events, three American insurers and

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[18] *"Settlement of Claim between Canada and the Union of Soviet Socialist Republics for Damage Caused by "Cosmos 954""* (Released on April 2, 1981) <http://www.jaxa.jp/library/space_law/chapter_3/3-2-2-1_e.html> accessed 20 July 2022. Bryan Schwartz & Mark L.Berlin, *'After The Fall: Analysis of Canadian Legal Claims for Damage Caused by Cosmos 954* (1982) 27 McGill Law Journal 678- 680

[19] See the case of *AT & T V. Martin Marietta* in 1995 over the loss of telecommunication Satellite where the risk allocation had shifted from the buyer to the manufacturer. The case was eventually of settled out of court. See Bostwik, *'AT & T V. Martin Marietta: Further Reallocation of the Risk of Loss in Commercial Space Agreement'* (1995) 23 Journal of Space Law 177

[20] As required by many countries in Europe including Romania, Belgium, Germany, Denmark, Lithuania, Latvia, Spain, France, Estonia). See also the "EEC Directive 85/374/EEC of July 1985" on Liability for defective product (as amended). Source <http://eur-lex.europa.eu/search.html?type=advanced&qid=> accessed 20 July 2022

[21] (1989) 214 Cal.App.3d 2 [No. D009875. Court of Appeal of California, Fourth Appellate District, Division One. August 29, 1989

three of the insurers on the Palapa B-2 policy filed subrogation actions against McDonnell Douglas and the subcontractors Thiokol and Hitco to recover the money they had been required to pay to the owners. The Claimants (Insurers) contended *inter alia* that McDonnell Douglass, its sub-contractor Thiokol and Thiokol's subcontractor Hitco had been negligent in designing, manufacturing and testing each of the two exit cones in question, and that they had been negligent in deciding on safer material for the exit cones. They also contended that McDonnell had been negligent by failing to warn the owners of Palapa of the risk of loss, following the Wester misadventure. All these claims were based on the contract concluded with McDonnell Douglas.

In *Hughes Galaxy Inc v. US Government*[22] the contract entered with the US Government containing obligations to launch their satellite was nullified as a result of the Challenger disaster in 1986, causing the Companies to suffer damage due to delay and additional expense incurred in procuring the launch of their satellite by Arianespace. Hughes Galaxy is the owner and operator of a large fleet of communication satellites and provides communication services to domestic and international customers. On 5 December 1985 the US Government represented by NASA entered into a launch service agreement with Hughes Galaxy whereby the Government agreed to launch 10 Galaxy communications satellites over a period of 8 years. The contract required the Government to use its best efforts to provide "the launching on shared shuttle flights of 10 space craft." On 28 January 1986, the Shuttle Challenger exploded within minutes of the launch. NASA advised Hughes Galaxy at that time that it would attempt to reschedule the Galaxy Satellite programme in a manner consistent with the contract. But on 25 September 1986, a White House memorandum was sent to the administrator of NASA to the effect that NASA was no longer to provide launch services for commercial and foreign payloads, except for payloads that were 'shuttle unique', and payloads that had national or foreign policy implications.[23]

In October 1986 NASA issued a new shuttle manifest for launches throughout 1994 that excluded all 10 of Hughes Galaxy satellites. Hughes Galaxy had meanwhile arranged for a backup contract with Arianespace in April 1986, a contract which caused Hughes Galaxy enormous expenses. On 11 December 1990 the Company started a court case

[22]*Hughes Galaxy Inc v. US Government* (2001) F.3d 271, 1060, 1070; U.S Court of Appeal for the Federal Circuit.

[23]A similar situation could be found in the case of *American Satellite Co. V. US Government (1993)* F.2d 998, 950

claiming that NASA had failed to launch the satellites, that it had breached the obligation under the contract.

3.0: Emerging trends in outer space and dispute that may ensue

Launching in outer space has gone farther than the regular the earth obser vation satellite, communication satellite, navigation, weather forecasting e tc. Now there are satellites that can refuel and service other satellites in o uter space, attempt is been made to mine asteroid for rich mineral resourc es as well as the ability to extract fuel needed to power the satellite from l unar and asteroid. The space as the final frontier has experienced unimagi nable exploitation from space tourism *(world's first space hotel, Voyager Station, is scheduled to open in 2027*[24]*)* to civilian space travel.[25]

According to Micheal,[26] longer term application of space resources includ e new earth orbital operations architectures, construction of solar power s atellite or lunar satellite that beams energy unto the earth, low-valued maj or constituent of asteroid (water and metals) for use in space, high-valued major constituent of asteroid (egPt, Pd, Ir) for use on earth, 3He from the Moon for fusion energy and wide range of materials for space industrialis ation (product manufactured in space for use on earth).[27] Therefore, the fu ture of space travel is imminent and beneficial to attract commercialisatio n whereby states, NGOs, corporations and individuals are interested in.[28]

With the presence of rare natural resources, free access to all areas of space, prospect of commercial space travel and availability of hotel in outer space, there is bound for the world to experience disputes not yet envisaged by human mind to ensue. This dispute may be similar to that

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[24]Eric Baldwin, 'World's first hotel scheduled to open in 2027'(Archdaily, 15 March 2021))<https://www.archdaily.com/958528/worlds-first-space-hotel-to-open-in-2027> accessed 16 August 2022; CNN Atlanta, US 5 March 2021 <https://edition.cnn.com/travel/article/voyager-station.scn/index.html> accessed 19 July 2022

[25]Denis Chow, 'First All-Civilian Crew launches on mission to international space station' (nbc NEWS, April 8, 2022) http://www.google.com/amp/s/www.nbcnews.com/news/amp/rcna23391> accessed 19 July 2022

[26]Micheal Duke, *'Space Resources'*<http://www.sciencedirect.com/science/article/abs> accessed 19 July 2022

[27]Ibid

[28]Private Companies now provide services to facilitate Space travel. This can be seen in Ventures like Virgin Galactic which had its first flight with tourist on board in 2008. Simon Hattenstone, Joy Ride, The Guardian weekend, 11 November 2006 at 20

experienced with air travel interms of accident, missing persons, missing or non-delivery of cargo, security, flights delay or cancellation, breach of contracts etc

As it is, because commercialisation of space were not realized at the point of entering into the major space treaties hence, difficulties may arise as to the lack of legal solution to disputes identified in this paper. As it is the focus of this paper, did the international community foresee the economic and commercial realisation of the use of outer space and thus provided arbitration as a mechanism to settle disputes that may arise?

4.0: Arbitration of space disputes

The general principle of international commercial law gave parties contractual freedom to insert certain clauses in their agreement in order to manage and control their affairs which will enable the parties to settle disputes amicably.[29] One of such clauses is arbitration, which requires parties to conform to specific conditions in line with standard international arbitration law. These conditions constitute arbitration agreement such as freedom of parties to submit self to the jurisdiction of arbitrators and voluntary willingness to be bound by the decision/award thereon. Parties must also determine applicable law either national or international law, appointment and numbers of arbitrators as well as experts of arbitrators so chosen. Parties must consider language of arbitration, subject matter, venue, cost and time limit to complete arbitration process.[30]

However, the contests whether space related disputes are arbitrable or not are complex in nature. It has been raised that outer space disputes can't be subject of arbitration, while space activities are governed by public law and are considered being too cumbersome for arbitrators to deal with because of its complexity.[31]Even though the scope of non arbitrability of some space dispute due to public policy doctrine has been limited to the minimal level.[32]Public policy principles asserts that certain awards reached by arbitration panel often contravene public policy and cannot be enforced

[29]Masoudreza Ranjbar, and Mehdi Dehshiri, *'General and Specific Conditions of Arbitration Agreement'* 2017, Journal of Politics and Law; Vol. 10, No. 5; p. 4 available at <www.doi.org/10.5539/jpl.v10n5p95> accessed 20th July, 2022

[30] Ibid

[31]Beata Kozubovska, "*Trends in Arbitrability*" Spring 2014, IALS Student Law Review | Volume 1, Issue 2, p 20

[32] L A Mistelis and S L Brekoulakis, "*Arbitrability: International & Comparative Perspectives*" 2009, Kluwer Law International, , p 22. The limits imposed by Article 2(3) and Article 5(2)(a) of the New York Convention.

against sovereign dignity[33] thereby making certain space matters not subject to arbitration.[34] This was among the point raised in the case of Alexander v. Gardner-Denver Company[35] where in the U.S. Supreme court observed that arbitration process lacks fact-finding compare to judicial fact-finding. The record of the arbitration proceedings is usually not complete; absence of particular rules of evidence, lack of cross-examination, and testimony on oath, are often limited or unavailable.[36]

Another aspect of space disputes to consider is parties involved in space exploration whether state actors or non-state actors; and their respective economic state policy as well as the applicable national law or international law in order to settle disputes before an arbitrator. It has been argued that the decision of an arbitrator in space related disputes will likely favour industrialized states at the detriment of under developed states or non-state actors.[37]

It is therefore pertinent to consider whether the provisions of outer space treaties are in tandem with the conditions precedent by the international arbitration law as earlier mentioned. Thus, as at 1984, five major United Nations (UN) treaties[38] on outer space were in operation to address issues such as the non-appropriation of outer space by any one country, arms control, the freedom of exploration, liability for damage caused by space objects, and the safety and rescue of spacecraft and astronauts. None of these major space law treaties provide modality for binding and enforceable dispute resolution mechanism. For instance, the Convention on Liability for Damages Caused by Space Objects[39] provides certain conditions/steps that space disputants must exploit as dispute settlement

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[33] Gary B Born, "*International Commercial Arbitration*" (Kluwer International, 5 January 2016) <www.uniform-arbitrability-ruleneeded-at-an-international-level/ > accessed 2 August 2022

[34]Redfern, A., & Hunter, M. *"Law and Practice of International Commercial Arbitration*" (London, Sweet & Maxwell Limited, 2005) p. 215

[35] *Alexander v. Gardner-Denver Company* (1974) US 415, 60

[36] Ibid

[37] Henry R. Hertzfeld and Timothy G. Nelson, *"Binding Arbitration as an Effective Means of Dispute Settlement for Accidents in Outer Space"* 2013, Proceedings of the International Institute of Space Law Space Policy Institute, The George Washington University, Washington, D.C., USA, www.wipo.int/export/sites/www/freepublications/en/arbitration/919/wipo_pub_919.pdf accessed 30 July, 2022

[38] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1967, Convention on International Liability for Damage Caused by Space Objects 1972

[39]*Convention on International Liability for Damage Caused by Space Objects* 1972

mechanism.[40] This mechanism comprises of diplomatic and arbitration stage.

At the diplomatic stage, the claimant state may present a claim for compensation against the launching state of the object that caused damage through diplomatic channels within one year of the date on which the damage occurred.[41] If the Claimant State does not have diplomatic relations with the launching state, the injured state can request another state to commence the diplomatic stage or may request it to the Secretary General of the United Nations. The parties need not to exhaust any internal or national remedies, which it procedure is differs from traditional international law once same is not anonymous. Parties are also allowed to select arbitrators of their respective choice who are often selected for their expertise and can operate on a confidential basis. The compensation to damages caused shall be determined in accordance with the doctrine of international law, justice and equity. The disputants must however resolve their grievances within one year of the presentation of the claim[42]; otherwise the dispute will be move to arbitration stage before a claim commission established for that purpose.[43]

This can be initiated by either party made up of one member chosen by each disputant state to the dispute and a chairman appointed jointly by them.[44] If the parties failed to reach agreement on the appointment of the chairman, either party may request the Secretary General of the United Nations to do so.[45] The commission shall determine its own rules, procedure, venue and all others incidental matters for administrative convenience. The Claims Commission/arbitrators shall determine the legality or otherwise of the claims for compensation and consequently decides the amount of compensation payable to the injured party. The final decision of the arbitrators is however not mandatory as pointed out earlier as same operate only a recommendation unless the parties agree for it to be mandatory.[46]

The liability convention despite its usefulness in some outer space dispute related matter such as Settlement of Claim between Canada and the Union

[40] Art. IX to XX of Liability Convention
[41] Art. X of Liability Convention
[42] Art. 14 of Liability Convention
[43] Art. 4, the obligation to establish the Claims Commission is not a must. It is activated only when one of the parties request same.
[44] Art. 15 of Liability Convention
[45] This was done through the office of the United Nations Secretary General in the case of New Zealand's claims against France arising from the deliberate sinking in 1985.
[46] Art. 19 of Liability Convention

of Soviet Socialist Republics for Damage Caused by Cosmos 954[47]It has attracted a lot of condemnation for several reasons. The convention can only be used if the two disputant States have ratified it. The convention failed to specify applicable laws as claim commission can decides it rule and regulation on their own. The convention can only be used if the parties are state actors without considering commercialization or exploitation of space by private or non-governmental actors.[48] The time of a settlement of dispute can in certain instance be very long depending on the circumstance of each case.[49] The final decision of the claim commission is not compulsory and not enforceable against a default party.[50]

There are other international treaties providing arbitration clauses as an option for outer space dispute resolutions mechanism such as the U.N. Convention on the Law of the Seas,[51] the ITU Convention,[52] the World Trade Organization Convention,[53] the European Space Agency Convention,[54] among others, all have provisions for binding arbitration to be used to settle space related disputes.

In an attempt to fill the lacuna created by the Liability Convention, the new optional rules of arbitration of disputes relating to outer space activities were adopted in December 6, 2011.[55] The optional rules gave disputants'

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[47] Wherein the Soviet Union agreed to pay a compensation in the amount of 3 million Canadian dollars "in full and final settlement of all matters connected with the disintegration of the Soviet satellite Cosmos 954. Bryan S & Mark L.B, 'After The Fall: Analysis of Canadian Legal Claims for Damage Caused by Cosmos 954 (1982) 27 McGill Law Journal 678- 680

[48]Viikari, Lotta. '*Towards More Effective Settlement of Disputes in the Space Sector*' 2011, Lap Land Law Review. n. 1, p. 226.

[49] Camilo G G, *The Optional Rules of Arbitration of Disputes Relating to Outer Space Activities of the Permanent Court of Arbitration, A Real Option for the Solution of Conflicts in Space Matter?* September, 2012 https://www.researchgate.net/publication/316461354

[50] Von der Dunk F, *'Settlement mechanisms Space for Dispute - Dispute Resolution Mechanisms for space*? A few legal considerations' (2001). Space and Telecommunications Law Program Faculty Publications. Paper 38. <http :// digitalcommons.unl.edu/space law/38, p. 450

[51] United Nations Convention on the Law of the Sea, opened for signature Dec. 10, 1982.

[52]Article 56(1) of ITU Constitution and ITU Convention.

[53]Article 21 (3) (c) of Final Act Establishing the World Trade Organization, Understanding on Rules and Procedures Governing the Settlement of Disputes, 15 April, 1994.

[54] Article XVII of Convention for the Establishment of the European Space Agency, Paris, France 1975.

[55] Permanent Court of Arbitration, Optional Rules for Arbitration of Disputes Relating to Outer Space Activities, introduction (Dec. 6, 2011), available at <www.pca-cpa.org/showfile> accessed 15 July, 2022

power to modify the rules to suit their purpose.[56] The parties can appoint arbitrators of their choice; decide venue to be used[57] and the agreed language[58] accordingly. The arbitration panel can determine its own procedures provided that the parties are treated with equality and party should be given reasonable time/facilities of presenting their claims.[59] State parties and private actors are entitled to use the optional rules. The arbitration tribunal entertain contractual and non-contractual disputes between two or more States-parties to a multilateral agreement relating to the use of outer space.

Subject to the provisions of international trade practice, the parties can determine the applicable law to be use. If the parties fail to agree, the arbitration panel will choose whether to apply national or international law.[60] The decision shall be made in writing; final and binding on the parties which must be complied with without delay.[61] It is therefore apposite to say that despite the critics of the antagonist on the use of arbitration to settle space related disputes based on the concept of public policy, international arbitration is being used by both state and non-state actors in the resolution of space-related disputes[62] using the provision of liability convention and optional rules simultaneously depend on the circumstance of each case.

5.0 Challenges and prospects

5.1 Challenges

The use of arbitration to settle disputes emanating from transactions relating to the outer space is however not without challenges. One of the challenges in the use of arbitration to settle space disputes is the fact that there is greater freedom and lack of regulation in space.[63] This is a challenge because in recent years, space has witnessed an increasing diversification, commercialization and democratization with space actors

[56] Art. 1 Optional rules
[57] Art. 18 Optional rules
[58] Art. 19 Optional rules
[59] Art. 17 Optional rules
[60] Art. 35 Optional rules
[61] Art. 34 Optional rules
[62] Viva Dadwal & Madeleine Macdonald, *'Arbitration of Space-Related Disputes: Case Trends and Analysi*'s 71st International Astronautical Congress (IAC) the Cyberspace Edition, 12-14 October 2020 where the authors analyzed 38 out of the total number of space related disputes referred to arbitrators, 32 were commercial disputes, and 6 were investor-state disputes related cases.
[63] Eytan Tepper, Ms Viva Dadwal and Ras S Jakhu; Mc Gill University, Institute of Air & Space Law (IASL) Research Project on Space Related Disputes. <mcgill.ca/iasl/spacedisputes>Accessed 10 July, 2022

increasingly attempting to open up new fields such as space tourism and mining, as well as for enhanced military uses.[64] About ten years ago, the Permanent Court of Arbitration (PCA) published its Optional Rules for Arbitration of Disputes Relating to Outer Space Activities[65]. These Rules are based on the 2010 United Nations Commission on International Trade Law Arbitration Rules (UNCITRAL Rules), which are procedural rules that parties use in international arbitration. The Rules provide for a voluntary and binding dispute resolution process accessible to all space actors. Unfortunately, the CPA Outer Space Rules have not made much impact in the Space Industry.[66] Also there has been no consolidated catalogs for publicly reported space related disputes that have been resolved through international arbitration.[67]

Another challenge is the obsolete nature of the international framework governing liability in outer space. For instance, the outer space treaty and convention signed in 1967 and 1972 respectively were drafted at a different stage in space exploration.[68] Much like the onset of the digital age, the space industry is said to be developing at a faster pace than the supporting legal framework and while it may be agreed that one way to address the problem is to create a new treaty , this faces the obvious difficulties of international cooperation and the reluctance of States to enter into new binding obligations.[69]

Apart from its obsolete nature, the international legal regime governing liability for incidents in outer space is directed at States, with no specific regulation on the rights and obligations of private enterprises. This vacuum

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[64] Laura Yvonne Zielinski, *'Space Arbitration: Could Investor-State Dispute Settlement Help Mitigate the Creation of Space Debris?* EJIL: Talk Blog of the European Journal of International Law, March 19, 2021. https://www.ejiltalk.org/space-arbitration-could-investor-state-dispute-settlement-help-mitigate-the-creation-of-space-debris. Accessed 17 June 2022

[65] http://arbitrationblog.kluwerarbitration.com/20212/02/16/ the-10-year-anniversary-of-the-pca-outer-space-rules-a-failed-mission-or-the-next-generation? Accessed 15 July 2022

[66] Charles B Rosenberg and VivasvatDadwal, *'The 10 Year Anniversary of the PCA Outer Space Rules; A Failed Mission or the Next Generation*. http://arbitration.kluwerarbitration.com/ 2021/02/16. Accessed 15 July 2022

[67] Viva Dadwal and Madeleine Macdonalds: Arbitration of Space Related Disputes, Trends and Analysis, McGill University, 71st International Astronautical Congress. Docx.https://www.mcgill.ca/iasl/files/iasl/arbitration_of_space_disputes.pdf Accessed 12 July 2022

[68] JanFrohloff'Arbitration in Space Disputes, Abbitration international, Volume 35, Issue 3, September 2019 pages309-329; https://doi.org/10.1093/ arbint/aiz015.Published 29 October 2019. Accessed 18 July 2022.

[69] Laura Yvonne Zielinski, Opsit.

makes it difficult for States to coordinate and maintain minimum standards across national licensing regimes, particularly now that governments race to attract space industry investments.[70] Having looked at the challenges the question one may like to ask is, is there any future for arbitration of space related disputes?

5.2 Prospects

Despite the above mentioned challenge there is however prospects for arbitration of disputes in outer space. First of all, wherever we find people or humans, there will always be the need to settle disputes among them, and whenever there are disputes there will be different means devised to settle them. Given that arbitration provides a confidential forum in which decision makers with relevant expertise can be appointed, as well as the fact that many of these outer space contracts provide for disputes to be resolved by international arbitration, there are indications that arbitration will play a key role in space-related dispute resolution in the nearest future.

First, space-related disputes are likely to increase significantly simply by virtue of more contracts being entered into as the global space economy grows, and as new space-related industries appear. An accelerated growth of the space sector is therefore expected to give rise to space disputes, thereby paving way for arbitration as one of the means of resolving future space related disputes.[71]

Second, space is increasingly commercialized with private and commercial interests driving many of the developments at a pace not previously seen.[72] Creating novel risks in an already crowded orbital space, anticipated to lead to numerous disputes which are likely to find their way to arbitration.[73]

Third, a number of arbitration institutes are considering the need to develop specific rules to cater for the anticipated increase in space-related disputes, similar to the Permanent Court of Arbitration's Rules for Arbitration of Disputes Relating to Outer Space Activities (which

[70] International Arbitration Review , 2022, The Role of Arbitration in Space Related Disputes

[71] EytanTepper et al ibid

[72] For example Space X owns one third of all active satellites currently in orbit around earth. International Arbitration Review, 2022.

[73] International Arbitration Review 2022; Managing Risks and Resolving Disputes in Challenging Times. allenovery.com . Accessed 19 July 2022

celebrated their ten-year anniversary in 2021).[74] Plans among these institutions to attract space disputes will no doubt be accelerated by the United Arab Emirates' (UAE) creation of a dedicated 'Space Court.'[75] Increase in investment in the space industry, together with the development of new regulatory regimes will likely lead to further investment - arbitration disputes, related to space activities.[76]

Jeff Bezos, founder and Chief Executive Officer of Amazon anticipates, 'millions of people living and working in space'' in the coming decades. He is so confident of this outcome that he is investing more than $1 billion per year into his space transportation firm, Blue Origin.[77] 2021 was a record breaking year in space industry because it witnessed the most active satellite in orbit,[78] ; the most successful orbit missions[79]; the most space tourist flights[80]; the most people in weightless space at the same time[81]; the most Space X rocket launches[82]; and the launch of the world's most powerful space telescope.[83] There were 7,389 individual satellites –active and inactive in space at the end of April 2021, which is an increase of 27.97% when compared to 2020. In 2021, it was reported that Mexico prevailed on its investment- treaty dispute with Futelsat arising out of a dispute over capacity requirements imposed on satellite companies.[84] In December 2021, the United Nations General Assembly First Committee created a working Group to develop norms, rules and principles of responsible behavior in space, with a view to the negotiation of legally binding instruments, and arbitration being likely to be one of the key options that are being considered.[85]

6.0 Conclusion and recommendation

Having established that outer space is free for exploitation, and that space related disputes are likely to increase as a result of the likely or projected increase in commercial activities in space in the nearest future. Also as

[74] Ibid
[75] Which was announced in February 2021
[76] International Arbitration Review, 2022 opcit
[77] Joe Landon,Etienne Schneider https://www.weforum.org/agenda/2017/ii/industries-will-make-money-in-space/. Accessed 20 July 2022
[78] Over four-thousand (4000)
[79] One hundred and thirty four (134)
[80] Six (6)
[81] Nineteen (19)
[82] Thirty one (31)
[83] James Webb Space Telescope
[84] Ibid
[85] Recent Developments and Emerging Trends in International Arbitration Law and Policy

new space related industries appear, many of their contracts will likely provide for disputes to be settled through international arbitration. While the 1967 outer space treaty and the 1972 liability convention permit the states to file claims against each other for damages incurred either by themselves or their nationals, it is obvious that these treaty and convention signed over five decades ago are obsolete as they do not conform to present day space exploration reality. A review is therefore necessary to accommodate current outer space commercial activities or realities.

In 2011, the Permanent Court of Arbitration presented its Optional Rules for Arbitration of Disputes Relating to Outer Space Activities that are based on the tested UNCITRAL Rules. While there has been a call for an International Centre for the Settlement of Outer State Disputes, others have analysed the possibility of solving space disputes within the existing framework of Investor-state-arbitration and concluded this to be a viable option – a conclusion that seems to have been confirmed by the three Investor-State-Dispute-Settlement (ISDS) cases that have arisen so far in the space sector.[86]

Arbitration is suitable for all categories of disputes due to its flexibility process offered in a wide majority of disputes across global world. Record shows that there are more than 2,000 bilateral and multilateral international investment treaties in operation with arbitration clauses, which most states have undertaken to arbitrate a vast range of disputes therein.[87] Using arbitration to resolve highly complex and technically specialized issues in outer space activities is realistic with the variety of options currently open to states and non-state private actors to resolve their disputes is a good indicator for future occurrences.

There is need for the creation of a new Space Law Court or Tribunal for space activities which has witnessed an increasing diversification, commercialization and democratization with space actors increasingly efforts to open up new fields such as space tourism and mining, space transport operations, as well as for enhanced military usespresently and in the foreseeable future. States should create enabled, hospitable and safe environment for voluntary and binding arbitration that will accommodate

[86] Devas v India, PCA Case No. 2013-09, Deutsche Telecom v India, PCA Case No. 2014-10 and Eutelsat v Mexico, ICSID Case No. ARB(AF)/17/2

[87] Michael Ostrove, Ben Sanderson & Andrea LapunzinaVeronelli, *"Developments in African Arbitration"* 2018 (The Middle Eastern and African Arbitration Review) www.globalarbitrationreview.com/benchmarking/themiddle-eastern-and-african-arbitration-review-2018/1169293/ developments-in-african-arbitration> accessed 19 July, 2022

contractual, accidents and incident disputes for all space users' without discrimination of any kind.

There are loop holes in the current treaties on outer space which require amendment to address issues such as time limit for arbitration, place of arbitration that will not favour one party at the expense of the other, the cost of arbitration and enforcement mechanism in order to cater for future occurrence disputes. Since there is no substantial connection between arbitrability and public policy thus, non-arbitrability should be applied narrowly and states should not abuse the use of escape clauses.[88] Finally, the most industrialised current users of space facilities should cease from causing deliberate hardship to the passive future users since outer space is a common heritage of mankind.

[88] AkinwumiOgunranti, '*Separating the Wheat from the Chaff: Delimiting Public Policy Influence on the Arbitrability of Disputes in Africa*' 2019, Afe Babalola University Journal. Of Sust. Dev. Law & policy VOL. 10: 1: p. 109