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Jurisdiction, responsibility & private entities under international space law

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Abstract
The broad aim of this paper is to consider principles of international law such as territorial jurisdiction, responsibility and liability and analyse how, in a space law regime, these concepts will be applied given that presently, the rules governing the same are not coherent, efficient and advanced enough to keep up with the advances in technology. While international law, by itself, has very low levels of enforcement, that is doubly so in the case of international space law as the existing legal regime does not contemplate an effective debris mitigation system, an efficient dispute resolution mechanism and how private entities may be incentivised to participate and be appropriately regulated within the legal regime. In this paper, the author has attempted to lay down the issues related to jurisdiction and fault-based liability currently utilised for calculating damages, sketch out a proposed dispute resolution mechanism and consider the benefits of commercialising outer space, leading to more investment as well as looking at how these entities may be regulated in outer space.

Keywords: international arbitration, outer space, jurisdiction, responsibility, liability

1. Introduction

Prof. Bin Cheng, while discussing the international responsibility and liability of States in outer space, has considered how jurisdiction, specifically territorial jurisdiction is the primary criterion by which States judge whether or not there has been any damage or injury caused to them and the method by which they are owed reparations as under international law. This is due to the fact that under international law, so far as jurisaction is concerned, territorial jurisaction takes precedence over quasi-judicial and personal jurisaction. However, there is a possibility of confusion arising when this system is to be applied in the international space law regime. This is of particular importance as even though various Treaties and Conventions have attempted to streamline and unify the procedures and laws involved, they have failed to remain consistent. Despite the problems put forth, Prof. Bin Cheng remains adamant on the fact that *"the problem of jurisdiction is pivotal in determining the authorities of which State exercise control over, and which system of law is applicable to, a given space object, a question of special relevance in the case of manned space stations, whether in outer space or on any celestial body"* [1]. The reason for this is that unless States *"...exercise effective jurisdiction and control, or have made adequate and effective arrangements to see that such jurisdiction and control are exercised, over all the activities for which they may be held responsible and for any damage caused for which they may be held liable, they can easily incur such responsibility and liability without even realizing it simply through failure to ensure that such jurisdiction and control are exercised"* [2].

From the above, it is understood that jurisdiction over space objects and assignment of liability is limited to actions committed by State actors or governmental organisations supervised by States. This leads to an unfortunate exclusion of private entities who now have the financial and technological resources to fund a space exploration project, with help only being sought for with regards to launching facilities. Further since private activities are not regulated and the principles of international space law do not explicitly apply to them, it is possible that such non-regulation of activities may lead to excessive and commercial exploitation of resources found in outer space. While arguments have been put forth to suggest that commercialisation of outer space aids in investment and greater research and development, it may also be considered that increased exploitation of resources may lead to issues such as pollution, increased space debris and environmental concerns without having a proper legal regime in place.

In this paper, the author has attempted to consider how States, generally under international law and specifically under international space law, look at concepts such as jurisdiction, responsibility and liability, taking into account the various Treaties and Conventions that have developed over time. While there exists an excellent foundation of a legal regime for outer space, there are certain issues that were not considered, possibly due to the lack of technology and information access freely available at that point, such as the lack of an efficient dispute resolution mechanism where the author has proposed a workable solution that may be implemented if found suitable by States, solutions for the problem of space debris and how to incorporate the introduction of private entities in outer space since the Treaties do not contemplate a situation where non-State actors may be involved in causing injuries to other State or non-State actors. With rapid advancements being made by private actors in space exploration, it is but obvious that in 2020, serious changes are to be made with regards to the introduction of private entities as well as the growing commercialisation of outer space.

1. What does it mean for A State to Have Jurisdiction and Responsibility?

[1] Cheng B. Studies in International Space Law. 1997; 63.
[2] *Id*.

"*The Earth is the cradle of humanity, but mankind cannot stay in the cradle forever."*
-Konstantin Tsiolkovsky

The concept of State jurisdiction is thought of as the right of a State to regulate, through legislative or executive measures, the activities of its people, property or events on matters that are not completely domestic in nature [3]. This conception of jurisdiction includes within itself the principles of territoriality, sovereign equality, non-interference in the domestic affairs of States as well as responsibility and liability in case of a breach of international law. State jurisdiction may also be divided into two elements: the jurisdiction to prescribe or *jurisfaction*, and the jurisdiction to enforce or *jurisaction* [4]. This is of particular importance in the context of international space law as there is no concrete and reliable mechanism for the enforcement of responsibilities and liabilities in the present and the injured States will be reliant on *soft* international law for imposition of responsibilities and liabilities.

The law of jurisdiction has historically relied upon, to a large extent, on the principle of territoriality, to introduce permissions and prohibitions on a specified area [5]. This stress on territorial borders is considered to be a product of the Westphalian influence on international law, where a State that has explicitly delineated its territory has full sovereignty and control over the territory so delineated and no control over any other delineated territory. However, with the great strides being made in modern technology, the necessity for the territoriality principle to be considered as the primary criterion for jurisdiction seems to be dwindling, even though States are reluctant to acknowledge the same given that it is the most forthright method of establishing delimitations [6]. This principle, however, may not be easy to adapt to the current circumstances of the Covid-19 pandemic or even climate change that affects every State without exception.

"*It is pointed out that where States have already taken the lead to tackle global governance challenges via domestic regulatory measures, they may have an incentive to geographically extend their domestic regulation so as to level the international playing field. Such territorial extension deprives foreign competitors from the competitive edge they have vis-à-vis domestic businesses that results from lax foreign regulation*" [7].

The idea of a State having inherent responsibilities and obligations is not a new one, with history being littered with examples of the various actions and inactions of States in relation to their international law obligations. It is interesting to note that due to linguistic differences (primarily in non-English speaking countries), the terms "responsibility" and "liability" have been conflated with each other, making it difficult to distinguish between the two terms which has led to civil law nations to express liability in terms of a responsibility of the State, where the implication of responsibility is equated to reparations [8]. The term "international responsibility" as envisaged under the 2001 International Law Commission's Articles on Responsibility of States for Internationally Wrongful Acts ("ILC Articles") covers the legal relationship that arises between States when an "internationally wrong" act is committed by them [9]. This principle was affirmed by the Permanent Court of International Justice ("PCIJ") in the case of *Phosphates in Morocco*, the PCIJ affirmed that when a State committed an internationally wrongful act against another State, an immediate legal relationship in the form of international responsibility was established between the two States [10]. "Internationally wrong" acts are seen in the form of a direct violation of international law such as violation of another State's sovereignty and territory or in the form of a breach of treaty obligations. The responsibility of a State also extends to the private actions of its citizens if it is found that the violations exceed the standards set by international law [11]. However, the actions of a State are not considered to be in breach of international law if it is found that those actions were found to be in conformity with the right to self-defence under the UN Charter or if it was required by the peremptory norms of international law [12].

From the above, it is seen that the concepts of jurisdiction and responsibility are tied to the overarching concept of territoriality and nationality, thereby creating physical divides between States with respect to the reach of their regulation. Further, States also have the obligation to protect the human rights of its citizens (which is in exercise of its prescriptive jurisdiction) which is most commonly done through the application of criminal law (and to a lesser extent, civil law) which is used to punish and prohibit violations of human rights [13]. Further, the exercise of jurisdiction by States is also affected by the emergence of technologies that are able to effectively cut distances between parties across the world, which has taken on absolute importance in the present times, with a majority of businesses choosing to operate virtually [14].

Even though the exercise of jurisdiction and imposition of responsibility is primarily based on the principle of territoriality, the principle of nationality is also used to perpetuate the idea that the State is able to control the actions of its citizens beyond its physical boundaries [15]. "*The most straightforward aspect of nationality-based jurisdiction is the public international law rule that a state may exercise jurisdiction over the conduct of its nationals, regardless of their territorial location (referred to as the active personality doctrine). Such jurisdiction is typically exercised in the context of criminal law, where a state criminalises conduct by its nationals (who may be natural or legal persons) regardless of where their acts take place. The power to regulate nationals extra-territorially is, however, usually only exercised in the context of particularly serious crimes – suggesting a degree of*

[3] Csabafi I.A. The Concept of State Jurisdiction in International Space Law. 1971; 49.
[4] *Id*, at 50.
[5] Ryngaert C. Jurisdiction in International Law.2015; 4.
[6] *Id*, at 3.
[7] *Supra* Note 5, at 18.
[8] Sucharitkul S. State Responsibility and International Liability under International Law. Loyola of Los Angeles International & Comparative Law Journal. 1996; 18: 821- 839.
[9] International Law Commission. Commentaries to the draft articles on Responsibility of States for internationally wrongful acts. 2001; 63.
[10] *Phosphates in Morocco*, Preliminary Objections, 1938, P.C.I.J., Series A/B, No. 74, p. 10, at p. 28.
[11] Shaw M. Brittanica Encyclopedia. International Law. https://www.britannica.com/topic/international-law (last visited 12 August, 2020).
[12] *Id*.
[13] Mills A. The Oxford Handbook of Jurisdiction in International Law. Private Interests and Private Law Regulation in Public International Law Jurisdiction. 2018; 6.
[14] Mills A. Re-Thinking Jurisdiction in International Law. The British Yearbook of International Law. 2014.
[15] *Id*, at 12.

deference to the primacy of territorial jurisdiction" [16].

Once jurisdiction has been established and responsibility has been invoked, the obligation of the State that caused injuries to pay reparations begins. Articles 42 and 48 of the ILC Articles provide for the invocation of liability in three forms, i.e. individual obligations, multi-party obligations and integral obligations. Here, the Articles represent a shift from the previously held conception of violation of rights and breach of duty by a single State leading to damages being incurred and has transitioned into allowing the injured State to identify the wrong committed against it and invoke responsibility accordingly, which allows greater autonomy and understanding of multilateral relations between States in the diplomatic sphere [17].

It is seen that the concepts of jurisdiction, responsibility and liability (in the form of reparations) require adapting to current world events, thereby creating new meaning and precedents for its application, which may also be used in international space law as will be considered in the next chapter.

2. How Does the Application of State Jurisdiction and Responsibility Change in Outer Space?

As discussed previously, the common understanding of the concepts of jurisdiction and liabilities is slowly being adapted for use in scenarios where it is difficult for a single State to fully exercise its jurisdiction due to the very nature of the territory, the most common example of this being the regulation of the high seas which will be discussed below.

The high seas, by its very nature is impossible to be regulated by a single or even multiple States and hence, the principles of jurisdiction and territoriality have been changed to suit the same where the High Seas Convention has allowed for certain freedoms to be granted while regulating the high seas [18]. The point is illustrated very well by Brierly who said, "*So far as concerns jurisdiction, the freeing of the high seas from the exclusive sovereignty of individual states did not leave them subject to no jurisdiction. The right of jurisdiction, like the rights of navigation and exploitation, became vested in each and every state. It was not, however, a condominium with all the states exercising concurrent jurisdiction over all vessels and persons on the high seas; the jurisdiction of each state was limited to its own vessels and nationals"* [19]. There are certain other features (under various Convention) exclusive to the regulation of the high seas such as the contiguous zones which gives the coastal States limited jurisdiction under international law and sovereign rights being granted to the coastal State to explore and exploit the natural resources found on the continental shelf [20]. This can be used in an analogous manner in international space law, by allowing certain States the sovereign right to explore and exploit resources that have been acquired by them, thereby extending their jurisdiction for specific and pre-approved purposes.

It must be understood that under traditional international law, there are various methods of acquiring territory and declaring jurisdiction over it by a State which are occupation, annexation, sovereignty, accretion, cession and prescription. All of these methods have been outlawed by Article 2 of the Outer Space Treaty, 1967 [21]. Given that appropriation of outer space objects and celestial bodies has been made illegal, what then is the legal status of outer space and celestial bodies? "*Under international customary law, outer space is a res communis while celestial bodies are res nullius, i.e., capable of being under national sovereignty. Article II of the Space Treaty has abrogated the res nullius notion of international customary law. The concept of non-appropriation meant that "as among the contracting states, none will be entitled to exercise territorial jurisdiction, no matter on what basis, over any part of outer space or celestial bodies"*" [22].

With international space law gaining importance and various States attempting to further their space race agenda, the United Nations Committee on the Peaceful Uses of Outer Space ("COPUOS") was established in 1959 with the aim of governing exploration and use of outer space with the overarching benefit being provided to all of humanity as under the principles of non-appropriation and universality [23]. In 1967, the Principles Declaration (which was a Resolution introduced on the possible legal regime to be applied in outer space) was transformed into the Outer Space Treaty, with the Rescue Agreement, the Liability Convention, the Registration Convention and the Moon Treaty following in quick succession.

The Outer Space Treaty, 1967 is the most expansive treaty and is often considered the foundation of international space law, encompassing a number of principles which have been laid down in the form of Articles in the Treaty. Article I of the Treaty provides that all activities in outer space will be carried out for the "benefit of all mankind" and "in the interest of all countries" without any discrimination between States [24]. Since it is a common perception shared among States that outer space belongs to all of humanity and any advances made must be shared between States without any subterfuge, it is heartening to note the principle of universality being explicitly written into the Outer Space Treaty, especially since there are many advances being made by private entities who are not necessarily bound by these treaties to the same extent as States. As has been stated by Csabafi, *"…State jurisdiction may not be exercised in an abusive manner, which would lead to the creation of monopoly positions by certain States vis-a-vis the international community. This is without prejudice to the fact that States are their own masters also in this "province of mankind" and deal with each other as sovereign equals. Reference in Article I to the principle of sovereign equality and the framework of contemporary international law instantly sets the entire Treaty on the sobering basis of realism. It is this approach, rather than the lofty principles of the Preamble, that will shape State practice"* [25].

Article VII of the Outer Space Treaty gives us the principle of liability where States are internationally liable for damage caused to other States' property or persons

[16] *Id.*

[17] Crawford J.R. State Responsibility. Max Planck Encyclopedia of International Law. 2006; 6.

[18] *Supra* Note 3, at 61.

[19] Clapham A. Brierly's Law of Nations: An Introduction to the Role of International Law in International Relations. 2012; 306.

[20] Convention on the Conventional Shelf, Art. 2, 29 April 1958, 499 U.N.T.S 311.

[21] Ogunbanwo O. International Law and Outer Space Activities. 1975;77.

[22] *Supra* Note 21, at 78.

[23] von der Dunk & Tronchetti. Handbook of International Space Law. 2015; 39.

[24] *Supra* Note 3, at 116.

[25] *Id.*

(including space objects). How then is liability and fault to be ascribed to a single State? The Liability Convention is clear on this point: the State that is found to be liable for the damage caused will be required to pay reparations for the same in accordance with international law and will *status quo ante* restore the State [26]. This means that the concept of relative fault is not envisaged under the Liability Convention, 1972; hence, if it found at a later stage that the fault may be divided between States, the liability will not be reduced but merely the consequence of that liability may be considered diminished [27].

From the above, it can be seen that fault under the Liability Convention cannot be read in consonance with responsibility under Article VI of the Outer Space Treaty which provides that States are internationally responsible for national space activities and that the activities of non-governmental entities in outer space will require the authorisation and continuing supervision by the States [28]. Therefore, it can be understood to mean that while a State is responsible for "national activities in outer space" under the Outer Space Treaty, the same State will be held liable as it is the "launching State" of the space object that caused the damage. This is particularly interesting in the case of non-governmental space activities as this could lead to different States having to bear the burden as opposed to the States bearing responsibility for their national (government-approved) space activities [29].

It must be understood that international space responsibility arises in cases where activities are undertaken which are in violation of legal obligations under space law. It is primarily dependant on the commission of an internationally wrongful act (as explained previously in Chapter 1) with the damage incurred being an auxiliary criterion [30]. Further, national activities must be seen to include activities undertaken by its nationals as well as those activities that are undertaken within the territory of the State. Hence, responsibility can arise for the appropriate state to the extent that those activities fall under its jurisdiction, for which authorization and continuing supervision is provided for by Article VI of the Outer Space Treaty [31]. *"This definition of national activities of course implies that in respect of a specific activity there can be more than one appropriate state namely to the extent that jurisdictions overlap; this problem of concurrent jurisdiction however exists in general international law as well, and various methods and techniques exist there to solve it"* [32]. This naturally leads to the question of reparations that, as under international law once State responsibility has been invoked, can only be done *restitutio in integrum* where the right of reparations depends on the kind and extent of violations and injuries caused [33].

3. What Changes Can be introduced in International Space Law?

With tremendous advances being made in the field of space technology, it is but obvious that the legal regime governing the same must also advance with the changing times. Some of the main reasons as to why the legal regime for space law needs to be constantly updated are technological advances, increased capabilities of States to launch satellites and shuttles into orbit, increased capabilities of private entities to invest in research and infrastructure required for space travel (with space tourism being made popular due to certain entrepreneurs like Elon Musk and Richard Branson) and most importantly, issues that were not foreseen at the time of creating the various Treaties [34]. Another issue that is brought to the forefront is the lack of an effective dispute resolution system and enforcement mechanism, given that international space law operates in consonance with the principles of international law, thereby creating difficulty for States who are in dispute with each other.

One of the most important issues to be considered is the risk of collisions in outer space with space debris. Due to its high speed, it is difficult to keep a track on the various debris found, especially with increased capabilities for spaceflights and commercialisation of outer space [35]. Space debris is broadly known to contain fragments of exploded rocket stages and satellites as well as a variety of other objects such as trash bags, metal shards, by-products of intentional and unintentional space explosions, and clouds of gas molecules [36]. Given that there is no official definition of space debris, it becomes more difficult for the international community to ascertain and pin liability for space debris accidents on specific States [37]. The closest definition to space debris may be (if looked at carefully) found in the definition of "space objects" under the Liability Convention which is defined as follows: *"includes component parts of a space object as well as its launch vehicle and parts thereof"* [38]. The Science and Technology Sub-Committee of the COPUOS, taking note of the confusing definition of space objects as well as the lack of definition for space debris, drafted and subsequently adopted a set of high-level guidelines in 2007, which defined space debris as follows: "*All man-made objects including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional*" [39]. Even though this definition is not considered to be legally binding, the very fact of its existence is reflective of the shifting priorities and practices adopted by various States who all regard space debris as an important issue to be regulated. Article III of the Liability Convention states that,

[26] Von der Dunk F. Liability versus Responsibility in Space Law: Misconception or Misconstruction. Space, Cyber and Telecommunications Law Program Faculty Publications. 1991; 363- 371.
[27] *Id.*
[28] The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, Article 6, 27 January 1967, 610 U.N.T.S. 207.
[29] *Supra* Note 23, at 52.
[30] *Id.*
[31] *Supra* Note 26, at 367.
[32] *Supra* Note 31.
[33] *Id.*
[34] Avgerinopoulou and Stolis. Current Trends and Challenges in International Space Law. https://www.essc.esf.org/fileadmin/user_upload/essc/Article_Current_Trends_and_Challenges_in_Space_Law.pdf (last accessed on 16 August, 2020).
[35] Lampertius J.P. The Need for an Effective Liability Regime for Damage caused by Debris in Outer Space. Michigan Journal of International Law. 1992; 13(2): 447- 468.
[36] Schafer B.K. Solid, Hazardous, and Radioactive Wastes in Outer Space: Present Controls and Suggested Changes. California Western International Law Journal. 1989; 19:1- 23.
[37] Kerr S. Liability for space debris collisions and the Kessler Syndrome (part 1). https://thespacereview.com/article/3387/1 (last accessed on 16 August, 2020).
[38] Convention on International Liability for Damage Caused by Space Objects, Article 1(d), 1 September 1972, 961 U.N.T.S. 188.
[39] Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, as annexed to UN doc. A/62/20, Report of the COPUOS 1 (2007).

"*In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible* [40]. From the above, it is seen that the liability imposed under Article III is fault-based liability where if damage is caused by the space object of one State, that State is only liable to pay damages if it is established that the damage was caused due to the fault of that State. However, Article IV provides for two scenarios, the first being if two or more States cause injuries to a third-party State anywhere except the surface of the Earth (usually held to be at 100 km from the surface of the Earth), the States shall be jointly and severally liable (based on the fault imposed) to be responsible and pay reparations. The second scenario is when the damage is caused on the surface of the Earth or in the airspace, absolute liability is imposed on the States [41]. The author believes that the main reason for the imposition of different kinds of liability is to give precedence to the persons and property on Earth, thereby protecting the private interests of the citizens of the injured State. However, with the entry of many private players in the space race, it is unclear how long this differential liability regime can be kept alive, given that responsibility and jurisdiction under international law is usually State-based.

The prevailing situation in the outer space dispute resolution sector is lacking clarity owing to the fact that there is no hierarchical structure or single settlement method in place for the parties. In order to combat this, the author suggests that a specialised system is put in place which will help establish procedures should such a specialised space dispute arise. The lack of a sector- specific settlement mechanism [42] is the foremost reason to establish a working dispute resolution mechanism. Further, the lack of an established international tribunal capable of dealing with highly specialised issues also leads parties to look for alternate legal measures such as negotiation and mediation, even though the awards rendered are not final and binding [43].

The question of jurisdiction is also problematic owing to the fact that the issue of the increasing commercialisation of outer space activities must be considered; by virtue of the issue being an outer space matter, the traditional notions of jurisdiction and territoriality must be reconsidered. In the present day, due to increased globalisation and access to technology, it is highly likely that teams of different nationalities would have collaborated to create the specified equipment for outer space activities [44]. This collaboration of different States further adds to the confusion on which State has the right to claim damages.

Therefore, in such a case, assigning jurisdiction to a single State would be impossible. Further, the accessibility to that particular State by the rest of the parties could also be limited in terms of geographical access or financial resources. In the case of a private party, they may be barred from filing claims directly and may be forced to approach their domestic government for help [45].

Regarding the question of public and private interests, the domain of outer space activities is locked in a paradoxical situation: on the one hand, international space law is based on the principles of public international law. On the other hand, in today's highly commercialised world, it is important for the space industry and the lawmakers to consider the interests of private entities who may be willing to participate in outer space activities [46]. What must also be considered is the fact that the principles of international cooperation, non-interference, non-appropriation and freedom of exploration will have to be tested against the commercial principles and mindset present [47]. This is because of the fact that space law may be rendered obsolete and useless if factors such as the commercial interests of the parties involved are not taken into account [48].

The author proposes a dispute resolution mechanism taking into account the various difficulties that may arise by altering the screening process mechanism first put forth by Dr. Gerardine Goh [49]. Dr. Goh's screening process involves testing the dispute against various parameters in order to reach the most appropriate and efficient dispute resolution mechanism, given the substance and degree of dispute between the parties [50]. During the screening process, neutral experts sort the disputes based on the content as well as parties' submissions and reliefs claimed [51]. The urgency required for settlement will also be another factor being considered by the experts. It must be understood that the neutral experts are expected to follow independence and impartiality while sorting the disputes in order to ensure that the trust of the parties is not misplaced, which will also aid in establishing the permanent dispute settlement mechanism as a recognised and reliable system for outer space disputes [52].

The author proposes that modifying the screening process described above may lead to a more streamlined and efficient dispute resolution mechanism, which is as follows: once the screening process has been used to determine the degree of the dispute, the cases may be assigned to the specified dispute resolution methods of either negotiation or mediation. However, if there is a multi-tiered arbitration clause between the parties, then the screening process may be avoided and the procedure prescribed in the arbitration agreement may be followed, given importance to the principle of party autonomy.

In a case where a multi-tiered arbitration clause does not exist, the cases may be screened and if it is decided by the panel of experts that arbitration is the best method to be used in the specific case, then it will be required of various arbitral institutions such as the ICC, LCIA, etc. to keep a

[40] Convention on International Liability for Damage Caused by Space Objects, Article 3, 1 September 1972, 961 U.N.T.S. 188.
[41] *Supra* Note 37.
[42] Similar to that of the ICSID.
[43] Van Traa-Engelman H.L. Commercial Utilisation of Outer Space: Law and Practice. 1993; 17.
[44] Bostwick PD. Going Private with the Judicial System: Making Creative Use of ADR Procedures to Resolve Commercial Disputes. 1995; 33.
[45] Bockstiegel KH. Development of a System of Dispute Settlement Regarding Space Activities.1992.
[46] Havel B.F. "International Instruments in Air, Space and Telecommunications Law: The Need for A Mandatory Supranational Dispute Settlement Mechanism" in Arbitration in Air, Space and Telecommunications Law: Enforcing Regulatory Measures Permanent Court Of Arbitration. Peace Palace Papers. 2002; 11.
[47] *Id*, at 12.
[48] Jaenicke G. Settlement of Space Law Disputes. Proceedings of an International Colloquium. 1980; 130.
[49] Goh G. Dispute Settlement in International Space Law: A Multi-Door Courthouse for Outer Space (Studies in Space Law). 2007; 275.
[50] *Supra* Note 49, at 277.
[51] *Supra* Note 149, at 276.
[52] *Supra* Note 49, at 278.

Standing Committee of Arbitrators who will be appointed for the disputes. This proposed Standing Committee should be equally divided between legal experts and technical experts to ensure that the nuances of the dispute are not lost during the decision-making process.

4. Introduction of Private Players: How Does this Change the Outer Space?

The United Nations took a significant interest in outer space exploration and exploitation when several States sufficiently demonstrated their space capabilities. With increasing technology, there was a more welcoming attitude towards the commercialisation of outer space in order to gain greater returns on the investment by States. However, private entities have not been integrated into the existing space law regime, making it difficult for them to meaningfully contribute to the advances in technology [53].

It is seen that the definition of non-governmental space activities is not provided for in the Outer Space Treaty. This is because most, if not all space activities so far were carried out by the State or companies that had been set up by the State and were effectively acting in State interest [54]. With growing liberalisation and globalisation across the world, it has become more commonplace for private companies (which are not affiliated with the State in any manner) to take an active interest in outer space exploration. However, the degree to which privatisation has been allowed varies from State to State where the line between commercial interest and privatisation are blurred, often having an overlap in responsibilities [55].

If private entities are to be fully welcomed into the fold, the existing international law regime will have to be reconsidered. *"International law clearly requires international cooperation and consideration, especially with respect to undeveloped States. This suggests that an international commercial space enterprise may be better suited for space exploration and exploitation than a … other national commercial space enterprise. The only question is whether the international activity envisioned by space law is public (i.e., a consortium of different national governments) or private (i.e., a consortium of different national individuals) or both. Similarly, the Moon Treaty, where applicable, prohibits appropriation unless executed according to an international regime. The two treaties are policing not against appropriation per se, but against unilateral appropriation contrary to international interests"* [56]. From the above, it may be implied that private space enterprises may potentially be allowed to appropriate outer space and celestial bodies, given that even though the Outer Space Treaty prohibits non-appropriation, it only does so in the case of national actors and does not consider the scenario of private actors being able to appropriate them, which the author believes must be considered by the States and various international organisations in order to bring private entities under the international space law regime by including private space activities under the jurisdiction of the Treaties. This is of prime importance as private entities have proved that they have the technological capabilities to run a manned spaceflight safely [57] as well as transport several satellites and other essential supplies to the International Space Station.

There are several issues that arise when the question of private actors in outer space is considered- the most important of which is that of sovereignty and proprietary rights. Article II of the Outer Space Treaty states as follows: "*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"* [58]. However, a concrete definition has not been provided by Treaties or Conventions, leading to disputing contentions regarding the boundary between outer space and air space of the Earth, which was also considered in the 52nd session of the Legal Sub-Committee report, 2013 [59]. Still, when technologies such as remote sensing or satellite telecommunication (used for television broadcasting) are used, there is a high risk that these satellites may inadvertently pick up information from other States to which it does not belong and is not authorised to do. Hence, even the national security of a State may potentially be threatened [60]. For example, *"the private company Google Inc. has violated the norms for national security of India through Google Map on disclosing vital military installations, core of Apsara nuclear reactor, sensitive areas of the Hindon airbase, ammunition depots, markings of hangers meant for specific fighter jets, warships in naval dockyards and much more. The satellite imagery generally available on Google Earth or through any other remote sensing satellites can only give a viewer a vague idea of structures and objects. But Google shows specific sensitive (with respect to national security) areas of the Apsara reactor within the Bhabha Atomic Research Centre (BARC) and air force's base station at Hindon* [61]. *This problem of Google is not only in India but other countries have also faced this problem earlier but then again in different ways"* [62].

Further, the question of liability is also to be considered. Given that the existing Treaties only impose liabilities on States for nationally approved activities, under the current circumstances, it is impossible to hold a private entity liable in the event of any damage being caused in outer space to the space objects of another State. The author believes it important to keep in mind that private companies often take extensive help from the national agencies with regards to their launch activities (for example: even though SpaceX owns and operates its private shuttles, the launch activities for the shuttles are conducted in collaboration with NASA). However, if an accident occurs during or after the launch,

[53] Adhikari M., Legal Regulation of Private Actors in Outer Space. 2019; 37.
[54] *Id*, at 38.
[55] *Id.*
[56] Meyer Z. Private Commercialisation of Space in an International Regime: A Proposal for a Space District. Northwestern Journal of International Law and Business. 2010; 30: 241-261.
[57] Nadia Drake, *SpaceX launches new era of spaceflight with company's first crewed mission* https://www.nationalgeographic.com/science/2020/05/spacex-nasa-launch-human-astronauts-crew-dragon-international-space-station-demo-2/ (last accessed on 21 August, 2020).
[58] The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, Article 2, 27 January 1967, 610 U.N.T.S. 207.
[59] *Supra* Note 53, at 84.
[60] *Id*, at 85.
[61] Vijay, T., *Drawing the line on Google* https://www.thehindu.com/opinion/op-ed/drawing-the-line-on-google/article4693193.ece (last accessed on 21 August, 2020).
[62] Bostwick, H., *Google Street View Privacy Issue Raised Again*, https://www.legalzoom.com/articles/google-street-view-privacy-issues-raised-again (last accessed on 21 August, 2020).

the private company will not be held responsible but rather, it will be the launching State as under Article I of the Liability Convention. With these significant advances being made by private entities, it is only right that the existing Treaties and Conventions are amended to reflect the changing times and modern perspectives and technology available. It is also to be noted that keeping in mind the various advances made by private entities, the Indian government has announced the creation of a new organisation which will assess the needs of private actors including research institutions in India (even though at present, there are none) and explore methods to accommodate their demands by also factoring in the needs and demands of ISRO. This organisation is proposed to be called IN-SPACe (Indian National Space Promotion and Authorisation Centre) and is likely to be set up within the next six months and will provide all facilities to the private entities approved by IN-SPACe [63].

Furthermore, the lack of an adequate dispute resolution mechanism (which has already been discussed in the previous chapter) will be compounded as now, state versus private actor disputes will also have to be taken into consideration where there will be a multiplicity of national laws to be applied for all the States involved. It is also possible that disputes between private and private entities become prominent but given the nature of international space law, the author believes that the straightforward application of national laws cannot be the solution in this case as it would disregard all international law jurisprudence. Hence, there must be a separate dispute resolution system established, specifically for outer space disputes thereby effectively adjudicating upon all issues including jurisdiction, sovereignty, choice of laws and the like.

The argument that the introduction of private entities into outer space exploration incentivises capitalism and commercialisation of outer space [64] is one that is slowly gaining ground, since technological advances make it absurdly easy for those parties with enough capital to invest in the required research and development and ultimately send astronauts into space. In recent times, the concept of space tourism has also been gaining ground with tickets being sold at very high prices. However, we must not forget that outer space exploration holds within it the dreams of millions of people who hope to travel to the stars and thus, if more investment is brought in due to the commercialisation of outer space, it must be welcomed with appropriate legal regimes and procedures put in place to prevent abuse and misuse of outer space.

2. Conclusion

Broadly, this paper has attempted to address the issues found in the international space law regime by considering the principles of international law and how it is applied in the international space regime, with the principles of universality and non-appropriation given primary importance. This is particularly noteworthy due to the fact that this protects the outer space and celestial bodies from excessive and profit-motive related exploitation of the available resources. Given that the Treaties permit exploration, it is only fair that no one State is able to claim sovereignty over them and limit access to resources that may be used for technological advancements by States all over the world. The concepts of jurisdiction, responsibility and liability under international law have been considered extensively along with its applicability in international space law where the question of jurisdiction remains contentious.

The author has also considered the Liability Convention in detail and how responsibility and liability are to be imposed on States, given that responsibility is equated with fault under the Convention. Further, the Convention also does not consider situations where private entities are at fault as the provisions of the Convention only account for State activities and hold State actors liable for the injuries caused.

Finally, the author has considered the increased private player participation in outer space activities, specifically pointing out the recent successes achieved by SpaceX (which has not been emulated by any other private entities, even though it has been promised). However, increased investment and interest in commercialisation of outer space is important as it helps develop technology and other research with benefits seen in the future. Hence, due to the increased participation, there is an urgent need for the international community to amend the Treaties and Conventions governing international space law in order to accommodate the modern advances made such as including definition for "space objects" as well as better regulating the role of private entities in outer space.

[63] Amitabh Sinha, *IN-SPACe explained: what it means to the future of space exploration* https://indianexpress.com/article/explained/in-space-india-space-missions-private-participation-isro-6476532/ (last accessed on 22 August, 2020).

[64] Shammas, Holen, *One giant leap for capitalistkind: private enterprise in outer space*, https://doi.org/10.1057/s41599-019-0218-9 (last accessed on 22 August, 2020).

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