ADDRESSING THE LEGAL AND SECURITY IMPLICATIONS OF OUTER SPACE CONFLICTS ON INTERNATIONAL COOPERATION AND COLLECTIVE SECURITY*

Abstract

It has been decades ago since the adoption of various space treaties and resolutions that regulate man's activities in outer space, yet the international legal regime governing these activities for peaceful use of outer space has remained largely un-amended. The new space era however, has experienced dramatic changes in the manners outer space is explored and used. The privatization and commercialization of space, proliferation of State and private space actors and prolonged presence of man in space were not in the purview when the current space regimes were adopted. Changes in the nature and scope of space actors and the spectre of space turning out a hippodrome for conflicts raise serious concern for the future of space activities and humanity, which the present space legal regime can no longer address. This work examines the issue of outer space conflicts and finds that outmoded, ineffective space governance regime is the bane. The work argues that issues concerning outer space security are important, not solely for the sake of the space but have far-reaching implications for global terrestrial security, as mankind increasingly rely on space for survival. Man's growing dependence on space assets for social, economic and scientific benefits makes the space indispensable today, heightening States and other space-faring bodies' desperation for dominance in outer space. As States intensify their space politics, space security is threatened the more, with attendant implications on international cooperation and collective security. Against this backdrop, this paper recommends the adoption of an effective and robust international space governance system that would adequately regulate State behaviours and address the intricacies of space affairs in the present space era, through a coordinated universal cooperation in form of international and interdisciplinary dialogues involving various space experts and actors.

Keywords: Outer Space, Space Environment, Space Conflicts, Space Governance, International Cooperation

1. Introduction

Although, the world may be unaware, the fact is that lives, interactions and movements on earth presently are highly dependent upon and controlled by outer space assets. For instance, satellite technologies have become an inextricable part of man's life on earth, especially in terms of weather forecasting, disaster management and control, GPS[1] for navigation, traffic regulation, civil aviation, precision timing for financial transactions, as well as remote sensing for geographical or topographical mapping.[2] The international community has growing interest in the importance of outer space in commercial, military, scientific and political arenas. The high dependence of the global community on outer space indicates a growing vulnerability of mankind, particularly regarding conflict and security situations in space. Today, outer space plays a critical role in States' intelligence, disaster response, surveillance and reconnaissance, troop movement tracking both on land, at sea, and in the air. The space is equally important for tracking of refugee movement, identification of evidence of war crimes, genocide or other mass human right violation, drone operations, GPS-guided weapons, as well as cyber-warfare.[3] The 21st century naval, air and army units of various States are depending heavily on multiple forms of space technology, making the outer space a hippodrome of conflict. Pursuant to the relevant provisions of the Outer Space Treaty of 1967,[4] outer space is reserved to be used only for peaceful purposes.[5] The requirement of this article is meant to act as a restraint on the approach and behavior of spacefaring nations, all of which held the view that continued access to and use of outer space demand that States should refrain from threats or activities that might jeopardize the peaceful cooperation in space environment. In the recent times however, the provisions of the present outer space legal regime can no longer hold sway, due to a discernible shift in States' behaviours towards a more

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[1]Global Positioning System. This is utility owned by the United States which provides the users with the positioning, navigation and timing (PNT) services.

[2]C Steer, 'Why Outer Space Matters for National and International Security', (2020) *Center for Ethics and the Rule of law, University of Pennsylvania, 2*

[3] C Steer, 'Global Commons, Cosmic Commons: Implications of Military and Security Uses of Outer Space', (2017) *Georgetown Journal of International affairs*, 9-16.

[4]This is a treaty that forms the basis of international space governance, formally referred to as the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other celestial Bodies'. The Teaty was opened for signature in 27 January 1967, and entered into force on 10 October 1967.

[5]Outer Space Treaty of 1967, Art. IV.

offensive approach to defense in outer space. The limitations of the current outer space regime, is such that it cannot exercise or exert full control over the actions of individual States and commercial entities in space. The situation has been exacerbated by the multiplication of public and private space actors, the possibilities of prolonged outer space exploration and development, coupled with the lack of transparency regarding the actual capabilities and intentions of major space players, all of which have made the outer space conflict-prone. All these go with direct chilling effect on international cooperation and security.

In the light of the above, it is arguable that outer space is fast becoming the next frontier for human conflict. The major and most powerful nations on Earth today[6], are deeply involved and investing in a new kind of space race to gain and maintain supremacy in the space domain. These and other spacefaring nations already have plans on how to colonize the Mars, developing a variety of space-based weapon systems and spacecraft with capacities to maneuver in zero gravity[7]. The combination of these can be used to control space and the future of humankind. Regrettably, the existing international legal instruments lack sufficient legally binding language to address these space-based technologies and other emerging factors that threaten the peaceful use and development of the outer space.

2. The Outer Space

Outer space depicts the large expanse that exists beyond earth and between celestial bodies. In other words, it is described as the relatively empty regions of the universe outside the atmospheres of the earth and celestial bodies where other planets and stars situate. Outer space simply means the region beyond earth's atmosphere and especially beyond the solar system. Contrary to the popular view, outer space is not completely empty, not a perfect vacuum but, a hard vacuum containing a low density of particles, predominantly a plasma of hydrogen and helium, electromagnetic radiation, magnetic fields, neutrinos, dust, as well as cosmic rays. Outer space has no definite boundary from which altitude it begins above the earth's surface because the density of the atmosphere simply decreases gradually as the altitude increases. However, the Kármán line[8], is conventionally applied as the starting point of outer space in space treaties and for aerospace records keeping.

When discussion on outer space comes up, the question of ownership does not immediately spring to mind. However, as human race continues to advance in space exploration, and with commercial space enterprises becoming feasible due to advances in technology, questions relating to power politics and their interaction with space exploration have become of utmost importance. Ordinarily, when *Neil Armstrong* mounted a US flag on the Moon in 1969, the gesture may have signified territorial ownership, but was rather symbolic, owing to relevant provisions of the 1967 Outer Space Treaty. The treaty declares outer space a global common and precludes any form of appropriation or claims of national sovereignty over any portion of outer space including the Moon and other Celestial Bodies, but permits free exploration and use of outer space by all States without discrimination of any kind.[9]

3. Unique Characteristics of Outer Space Environment

The peculiarities of outer space domain require greater degree of space literacy, awareness and attention on the part of stakeholders, policymakers and space experts in addressing the factors that threaten space security in the new space age. This is particularly so, as our civil, political and military society continues to rely heavily on outer space assets for survival and recognition. Therefore, to guarantee both national and international security and continual cooperation in the new space era, it is a requirement that decision makers, relevant authorities as well as space actors become more familiar with the use of space and the unique characteristics and challenges of space domain in terms of governance. These unique characteristics include the congestion, contestation and competitiveness of outer space[10].

The Congestion of Space

The drastic change in the number, nature and scope of space actors has expectedly resulted in space congestion. For decades now, the number of spacefaring nations has continued to increase with many States

[6]More specifically, the Russian Federation, People's Republic of China, and United States

[7]J E Duke, 'Conflict and Controversy in the Space Domain: Legalities, Lethalities, Celestial Security', (2020) *Wild Blue Yonder Online Journal*

[8]An altitude of 100 km (62 mi) above sea level.

[9]Outer Space Treaty, Arts. I & II

[10]Outer Space Increasingly 'Congested, Contested and Competitive', First Committee Told, as Speakers Urge Legally Binding Document to Prevent Its Militarization', Meetings Coverage and Press Releases available at: http://www.un.org/press/en/2013/gadis3487.doc.htm. Last accessed in August 3, 2021.

possessing the capacity to launch satellites to the orbit, from their own territory. Consequently, a number of satellites are launched each year. Study has revealed that, approximately 2,000 operational satellites are in orbit currently belonging to, and manned by different States as well as commercial entities.[11] The increase in the number of satellites in the space has resulted in space congestion,[12] which invariably complicates space traffic management. This is so because, although, space is large, the near-Earth environment where satellites can operate optimally in the orbital paths is grossly limited. Objects launched into the space must be registered in the national registry and with the UN Office of Outer Space Affairs under the auspices of the 1974 Registration Convention[13]. In like manner, the International Telecommunications Union (ITU) is saddled with the responsibility to determine and allot slots and frequency bands upon which satellites can send their signals to the earth in accordance with their purpose[14].

In addition to the growing number of satellites in space, space debris constitutes another serious form of space congestion presently. Orbital space debris result from a number of activities in outer space, ranging from older satellites that have outlived their life span but are still in orbit, to the enormous amount of orbital space debris resulting from routine space activity conducted by State and non-state actors since the commencement of space age. The testing or use of kinetic anti-satellite (ASAT) weapons that physically collide with satellites at high speed also results in space debris[15]. The use of ASAT by super powers especially during wartimes when military satellites play more active roles in force enhancement mission is of great concern to the safety and stability of outer space environment. Both the United States and the former Soviet Union had developed and tested ASAT weapons during the 1970s and 1980s[16] and lately China in 2007 and India. The particular concern and worry over space debris is due to the fact that objects in space travel at such incredible high velocity and capable of causing huge damage to satellites and even affect their operational ability[17]. Space debris can also cause damage to space infrastructure such as the International Space Station which may put human life at serious risk[18]. The ugly implication of the continuous increase in the amount of space debris in orbit is that the traditional lines of transit to and from the space environment will eventually become impassable.

Management of space traffic is particularly difficult today, due to lack of international legal regime governing the 'rules of the road' or providing guidance on how 'to counteract the physical forces dictating the motion of the inanimate objects in space'.[19] There are no legal clarity regarding the movements of objects in space environment, how to avoid them or what actually constitutes avoidance in the context of earth orbit.

The Contestation of Space

The outer space since the early space age had been and remains a contested domain with space powers[20] contesting each other's capabilities in the space environment. In fact, the space is the newest domain where powerful nations showcase their technological, political and now military prowess. However, in the early stage of spacefaring, the two major space powers realized in time, that the effect of the nuclear and electro-magnetic pulses test in space were rather unbearable and impossible to contain or control in space as a result of the unique characteristics of the space environment. The super nations realized also that they were bringing their own satellites under serious threats[21]. This situation enabled and precipitated the negotiation and adoption of the Outer Space Treaty of 1967[22] between the two superpowers during the Cold War. The

[11]C Steer, (n 2) 5.

[12]It must be noted that numerous obsolete satellites still in orbit creating space debris and the enormous orbital space debris from the after-effects of routine space activity conducted by States and non-State actors since the beginning of the space age also contribute to congestion in space.

[13]Convention on the Registration of Objects Launched into Outer Space, (GA Resolution 3235 (XXIX)) adopted by the UNGA in 1974.

[14]See *Art. 45* of the Constitution of the International Telecommunications Union

[15]C Steer, (n11) 9

[16]D Stephens & C Steer, Conflicts in Space: International Humanitarian Law and its Application to Space Warfare, (2015) *Annals of Air and Space Law*, 2.

[17]A Rathi, Photos: This is the damage that tiny space debris traveling at incredible speeds can do, QUARTZ, https://qz.com/773511/photos-this-is-the-damage-that-tiny-space-debris-traveling-at-incredible-speeds-can-do

[18]J Foust, 'ISS leak highlights concerns about orbital debris and station operations, SPACENEWS.COM' (2018), https://spacenews.com/iss-leak-highlights-concerns-about-orbital-debris-and-station-operations

[19]C Steer, (n 11) 7.

[20]The United States and Soviet Union

[21]C Steer, (n15) 10.

[22]Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (OST)

Outer Space Treaty formed the general principle and constitutional document regulating space activities. The Treaty was actually responding to the contesting nature of outer space environment, when through its relevant articles guarantees freedom of access to and use of space for all. It further establishes non-appropriation principle whereby outer space, including the Moon and Other Celestial Bodies, cannot be a subject of claim or appropriation by means of use or occupation, or any other means whatsoever, by any nation[23]. The provisions and principles contained in the Outer Space Treaty, had served as means of restraints to State behavior in space. The concern today however, is that, although still relevant, the Treaty cannot any longer, prevent States from contesting each other's capabilities in the space environment. This is particularly so, given the degree to which contemporary militaries depend on space systems for their routine operations both in peacetime and during conflict.

The contested nature of outer space cannot be adequately regulated by the present Outer Space Treaty due to some drastic changes in space actors and operations. Also, paying particular attention to the relevant provisions of the OST suggests that it lacks some authority, clarity or details to fully regulate and control States and other space actors' interest and behavour in space. For instance, *Article IV* of the Treaty provides to the effect that "the Moon and Other Celestial Bodies, shall be used...*exclusively* for peaceful purposes". It prohibits the placement of nuclear weapons or other weapons of mass destruction in orbit around the Earth and the establishment of military bases on the Moon or any other celestial body. A close look at the provision reveals that it is not as far-reaching or effective as it appears to be. The article for instance, does not reserve the use of space itself exclusively for peaceful purposes, which results in loophole already squaring up in the new space age. The preamble of the Treaty only states that 'space' shall be used for 'peaceful purposes' but did not go further on the question of 'exclusivity'. This situation has left a vacuum needed to be filled for effective governance of outer space. The preamble of the OST does mention that "space" shall be used for "peaceful purposes" but does not reiterate the all-important adjective "exclusively."[24] This situation is made more critical with the understanding that preambles of treaties are not in themselves binding. They do, however, provide context for interpreting the clauses of a treaty. Moreover, the general position on the meaning of 'peaceful purposes' is that it only seeks to prohibit aggressive purposes and does not necessarily prohibit other military purposes such as intelligence or defense against an act of aggression[25].

Enabled by advancement and sophistication in new technology, the entire humanity is presently in the age of cross-domain warfare with the ability of States to target or compromise their adversary's systems. Such possibility comes also with the fears and tensions among space nations that adversaries may reciprocate any negative gestures by the opponent. This reality has therefore led to some dramatic changes in nations' domestic space policies and strategies leading to the development of counter-space technologies and other ways in which to target or interfere with each other's space-based assets[26]. In addition to the scientific and technology value of outer space, the new knowledge regarding the economic potential in the space mining industry had increased the contested nature of space environment, regarding commercial rights in space zone.

Competition in Space

The national interests to access space resources are not only a matter of economic and technological drive as noted above, but have indeed induced competition among the key nation States and commercial entities. With the speed of advancement in technology, expectation is high that space mining will soon become fruition. These advances in technology have a positive upward spiral in terms of what is becoming feasible in space exploration and use[27]. The increase in the number of both States and private space actors, prolonged presence of man in space and the capabilities of these space actors to explore the space in unprecedented manners have made space domain highly competitive. On equal note, the increase in the number of commercial entities and companies[28] entering space market with offers of services especially to governments, has added to the competitive nature of space. These competitions bring along with it, a range of complex issues with respect to international law and national security.

The above unique characteristics of the space environment- congestion, contestation, and competition, account for the growing attention towards issues of national and international security in space domain.

[23]*Op Cit*, Arts. I & II

[24]C Steer, (n21) 11.

[25]S Hobbe, and N Hedman, 'Preamble' Cologne Commentary on Space Law, (2009) *Outer Space Treaty 22*

[26]B Weedon & V Samson, (eds) 'Global Counterspace Capabilities: An Open Source Assessment' (2019*) Secure World Foundation*. Available at: https://swfound.org/counterspace/

[27]C Steer, (n21) 14

[28]SpaceX, Blue Origin, Virgin Galactic are examples of such companies.

Understanding the rising tensions in the contemporary space age requires urgent attention and review of the existing international legal framework for adequate outer space governance and security.

4. Uses of Outer Space

Pursuant to the provisions of the 1967 Outer Space Treaty, outer space is reserved for peaceful purposes only in line with the spirit and intendment of *Article 2(4)* of the United Nations Charter[29] which also applies to outer space along the exceptions set out in the UN Charter and general international law. *Article IV* of the 1967 Treaty provides *inter alia* that,

> …The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.

The Committee on the Peaceful Uses of Outer Space (COPUOS) was established by the United Nations General Assembly in 1959 based on the concept that outer space should be reserved for peaceful purposes only. The Committee was to regulate the exploration and use of space for the benefit of all humanity. The overall intention is to achieve global peace, security and development. The Committee was saddled with the responsibility of reviewing international cooperation regarding peaceful uses of outer space, studying activities in relation to space affairs that could be undertaken by the United Nations, encouraging space research programmes, and studying legal problems which may arise from the exploration and use of outer space. The Committee orchestrated the creation of the five treaties and five principles governing the use of outer space. The issues of international cooperation and security in space exploration for sustained global developments goals form part of the Committee's major debate every year. However, due to rapid advances in space technology, space actors and agenda keep on evolving, constituting a challenge to the idea of peaceful uses of outer space. In the face of this however, the Committee can still provide a unique platform at the global level to monitoring, discussing and creating a regime that would facilitate and enhance international cooperation in the peaceful uses of outer space.

5. Understanding the Term "Peaceful Purposes" in the Use of Outer Space

The exact meaning, dimension and application of the concept of the 'use of outer space for peaceful purposes' have never been certain. The uncertainty surrounding the idea is more complicated today owing to the dramatic rise in space activities, the multiplication and diversification of the use of space applications and data in the modern space era. The situation is fast exposing outer space environment to serious security threats due to the fact that the idea of "peaceful purpose" constitutes the core element of outer space treaties and the general international legal regime on space. The term is utilized in different perspectives without precise and authoritative definition of its content. The discrepancies in the approaches and common understanding of the concept 'peaceful purpose' has a lot to do with its evolving nature and more especially the lack of legal perspective on the term[30]. Although the preamble to the Outer Space Treaty provides that the exploration and use of outer space should be for peaceful purposes, it failed to offer any definition of the term 'peaceful purpose'. The preamble also, did not set out any legally binding obligations, because in principle, preambles have a non-binding nature, serving merely as an interpretative guidance.[31] The only provision in the Outer Space Treaty addressing directly the concept of "peaceful purposes" in a legally binding manner is *Article IV* as indicated earlier, with paragraph 1 unambiguously imposing a ban on stationing weapons of mass destruction in outer space. Still the article does not shed sufficient light on the meaning of the term. Also, the general international law provides no express definition whatsoever, of the term "peaceful purposes" regardless of the fact that the maintenance of international peace and security forms one of the core objectives of public international law under the auspices of the UN Charter.[32] This

[29]The Charter provides under paragraph IV of Article 2 that 'All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations'

[30]M Smuclerova, 'Use of Outer Space for Peaceful Purposes' (2019) online publication available at: https://doi.org/10.1093/acrefore/9780190647926.013.38. Last accessed on September 9, 2021.

[31]*Ibid*

[32]Article, particularly paragraph 4 provides to the effect that 'All Member States to refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistence with the Purpose of the United Nations'

requirement applies *erga omnes* [33] even as the Charter rules are binding on UN Member States in all their activities whether on the Earth or in outer space.[34] In practice however, there has been at least two divergent views of the concept of 'use of outer space for peaceful purpose'. While some understand the term to mean 'non-military' other group holds the view interpreting the term as 'non-aggressive'.[35] It seems however, that whichever meaning one chooses to ascribe to the term, in reality, both approaches would arrive at the same core objective, which is 'prohibition of aggressive use of outer space, in accordance with existing international legal regime.[36]

6. The Evolving Realities in Space Domain and their Implications on Outer Space Security

With the continued drastic changes in space operations in the 21st Century, 'it would seem hypocritical to argue or pretend that outer space is immune to any uses for military purposes'.[37] In line with these development and realities, it has been argued that,

> Outer space is increasingly now being used as part of active engagement in the conduct of armed conflict. … information gathered from outer space through …the use of remote satellite technology and communications satellites (are) used to plan military engagement on earth… also space assets are now used to direct military activity and represent an integral part of the military hardware of the major powers. It is now within the realms of reality that outer space may itself become an emerging theatre of warfare.[38]

Sequel to the launch of the first artificial satellite (Sputnik), in 1957, the United Nations General Assembly wittingly adopted several resolutions, maintaining that 'the sending of objects through outer space shall be exclusively for peaceful and scientific purposes';[39] appealing also that outer space should be used for peaceful purposes only. The core purpose of these steps was to avoid the extension of national rivalries into the space environment. In practice however, the motive and incentive of space powers to building space programmes had been primarily military[40] and it is an open secret today that space has been utilized for military activities, especially with the advance in technology, increase and proliferation of space actors in the recent times. The non-appropriation principle of outer space and other celestial bodies was put in place to enhance and strengthen cooperation in the common use and benefit of outer space assets. However, with the recent drastic changes in space affairs, this principle has come under serious threat due to change in States and other space actors' attitude with the knowledge of the industrial and economic potential in space resources.

Probably, to acquire ownership and use of these potentially rich portions of space, some companies have started lobbying for national legislation to allay the fear arising from legal uncertainty surrounding outer space investments due to the Outer Space Treaty prohibitions. Sequel to this, the United States Congress in 2015, adopted the Commercial Space Launch Competitiveness Act. The crux of this Act is to grant any U.S. citizen including U.S. registered companies, the right to 'possess, own, transport, use, and sell 'any' asteroid resource or space resource obtained in accordance with applicable law'.[41] The Act also offers protection to the landing rights of any U.S. citizen who first lands on an asteroid[42]. It is very clear that these steps contravene the provision of Outer Space Treaty on non-appropriation, freedom of use principles, and many international lawyers have seen them as fundamental breach of the Outer Space Treaty[43]. In a similar but even more drastic way, Luxembourg came up with the Space Resources Act in 2017, offering similar legal

[33]This is a Latin word, meaning 'towards all'. It means obligations in international law, of which all States have legal interest in their fulfillment as their subject matter is of importance to the entire international community.
[34]M Smuclerova, (n30)
[35]S. Freeland, 'Peaceful purposes? Governing the military uses of outer space, (2016) *European Journal of Law Reform,* 18, 35–51; J. Su, '2010Use of outer space for peaceful purposes: Non-militarization, non-aggression and prevention of weaponization' (2010) *Journal of Space Law, 36,* 253–272.
[36] M Smuclerova, (n34)
[37]*Ibid.*
[38]S. Freeland, (n35) 37
[39]UN Doc. UN GA Res. 1148 (XII), November 14, 1957, para. 1(f)
[40]B. Cheng, 'Properly speaking, only celestial bodies have been reserved for use exclusively for peaceful (non-military) purposes, but not outer void space' In M. N. Schmitt (Ed.), *International Law across the Spectrum of Conflict: Essays in Honour of Professor L.C. Green on the Occasion of his Eightieth Birthday* (pp. 81–117). Newport, RI: Naval War College.
[41]51 US Code Section 51303
[42]C Steer, (n27) 12
[43]J. Rostoff, 'Asteroids for Sale: Private Property Rights in Outer Space, and the Space Act of 2015, (2016) *51 New Eng. L. Rev. 373*

protection to any corporation with a registered office in Luxembourg, thereby encouraging a kind of 'forum shopping'. As there are clamours already for legal regime to support and protect new space industries, the steps taken by the United States and Luxembourg only portend danger to space environment by complicating the legal contest with attendant space insecurity.

Notably, the race to access outer space assets is not only commercially driven but a kind of competition between nation States. In January 2019 for instance, China became the first State to successfully land a rover on the dark side of the moon[44], while the Japanese Space Agency (JAXA) successfully landed a probe on an asteroid twice in the same year to collect and analyze subsurface materials[45]. Afterward, a spacecraft built by Israeli company *SpaceIL* crashed upon reaching the moon. The incident can be a disappointing one to the concerned company and to Israel as a nation, notwithstanding that, reaching the moon was an achievement of its own. However, the Israeli Space Agency was collaborating with *SpaceeIL* and providing technical support to ensure successful landing in Moon[46]. The world today depends largely on space assets for success, survival and recognition. This inevitably leads to increase in human activities in space. The drastic increase in space activities and exploration by public and private actors are ostensibly undertaken in the name of scientific exploration. Historically however, there are high risks of conflict each time competition for resources and technological advancement occurs in the manner it is currently happening in space environment. The extension of human activity into space has inevitably resulted in the increase and prolonged human presence in space. Sequel to this, more and new sectors of commercial and international competition are emerging in the zone, heightening security risk in space domain. There is therefore, urgent need for international legal and policy agenda to regulate the behavior of both State and private space actors. This would be achievable only through coordinated universal cooperation in form of international and interdisciplinary dialogues with relevant input from various space actors and experts from relevant fields.

7. Creating an International Legal Regime for Outer Space Security in 21st Century

It is a trite knowledge from the present realities in outer space that the establishment of outer space legal regime to regulate space affairs is now apt. Without such regulatory and binding international policies on outer space environment, it will soon degenerate into a hippodrome for conflicts with chilling terrestrial security implications. However, efforts to modernize the international legal frameworks in a manner to adequately control conduct of States and private actors in space has always faced daunting challenges. This is partly, due to 'the lack of political will surrounding the negotiation of new treaties or other binding norms since the end of the Cold War'.[47] The existing international space regime has been ineffective in advancing international space law for some two major known reasons. Firstly, because it is susceptible to consensus decision making, meaning that States can block any advances especially for political reasons. Secondly, such ineffectiveness can as well be attributed to the paradigm shift from geopolitical conditions just in favor of a single nation, the United States, since after the Cold War. The problem with this shift is that any effort or move by the international community towards stricter treaties or sterner rules on behavior in outer space is unlikely to succeed unless it enjoys the support of the United States. These and other myriad of factors have consistently stymied every international effort to create legal and political environment with respect to responsible behavior in outer space[48].

However, because today, the whole world increasingly relies on space assets for survival resulting invariably in the rise of military tensions in space, the international community must quickly determine the kind of leadership it wishes to demonstrate by setting up a clear legal regime for proper regulation of outer space affairs. The world community must endeavor to put into effect, the UN General Assembly Resolution on the Prevention of an Arms Race in Outer Space (PAROS) [49] and the call to develop 'Transparency and

[44]M. Rivers, H. Regan & S. Jiang, 'China Moon Mission: Chang'e-4 Probe Touches Down on Far Side, State Media Announce -CNN (2019), https://www.cnn.com/2019/01/02/health/china-lunar-rover-far-moon-landing intl/index.html. Accessed on 28 Sept. 2021.

[45]C Steer, (n42) 13

[46]M. Wall, 'Israel's Beresheet Spacecraft Crashes Into Moon During Landing Attempt', (2019) *SPACE.COM* https://www.space.com/israeli-beresheet-moon-landing-attempt-fails.html. Accessed on 29 Sept 2021.

[47]C Steer, (n45) 20.

[48]*Ibid*, 20.

[49]CD Documents related to Prevention of an Arms Race in Outer Space, UNITED NATIONS OFFICE AT GENEVA https://www.unog.ch/80256EE600585943/(httpPages)/D4C4FE00A7302FB2C12575E4002DED85?OpenDocument. Last accessed on 30 September, 2021.

Confidence Building Measures' (TCBMs) by the UN Group of Government Experts[50]. Development and adoption of a 'Treaty on the Prevention of the Placement of Weapons in Outer Space' as proposed by Russia and China[51] would be germane in the efforts to attain a secure and peaceful outer space domain. This however, has been hampered by the requirement of consensus voting and resistance by some powerful nations particularly the United States.[52] Also, the treaty met some stiff objection because, in the view of many, the term 'weapon' is imprecise and incapable of clear-cut definition in relation to space, and that it is virtually impossible to categorize a particular technology as being deployed for benign or threatening purposes[53].

It seems that, till date, establishment of a legal regime to adequately control behavior in outer space is still proving elusive and unrealistic. This is due to the high level of uncertainty in relation to the intention or purpose for which objects are launched into space. Even with a high level of international compliance with the Registration Convention, to monitor and verify what individual States launched, whether they align with what is being registered is still a grueling task. An example is the case of North Korea which successfully launched objects into space, developing a conventional weapons capability, in the guise of embarking on a peaceful space programme.[54] Since, North Korea duly registered those launches with the United Nations Office of Outer Space Affairs (UNOOSA), attempt by South Korea to have the activities of North Korea checked for allegedly developing missile technology in breach of the moratoriums against it did not garner support. The position of UNOOSA was that it had no way to verify the operations of North Korea and no powers either, to intervene. The danger the unfolding arms race in outer space holds for space and world security calls for urgent action by the international community, may be, under the leadership of the United Nations, to quickly and unequivocally determine effective legal and political measures for the prevention of an arms race and other intricacies in outer space. New negotiation should commence to establish a kind of *International Code of Conduct* as working document setting out what should constitute responsible behavior and the limits of unacceptable behavior in space. It is hoped that every State, including space powers such as the United States,[55] would learn to balance the desire for technological advances in space with the need for restraint, to prevent any escalation of conflicts and facilitate effective outer space governance in the 21st century.

8. Conclusion and Recommendations

The space environment is undergoing tempestuous period due to the abrupt growth and diversification occasioning drastic changes in its exploration and use. The number of State and commercial actors in space has continued to grow in the past decades as a result of increasing awareness of its multifaceted potential. The multiplication of space actors, prolonged presence of man in space, rise in competing space policies by various States, among other factors have created the fear and concern for the inevitability of a space-based conflict with chilling consequences on terrestrial life. Outer space environment is faced with huge threat due to conflicting, competing and divergent space programmes by various spacefaring States. This calls to mind, the urgent need for an effective international rule of law for the regulation of State and private conduct in space. The strategic importance and potential, as well as peculiar physical conditions of outer space environment require the standard legal regime to be particularly adapted for space activities. It therefore, behooves the international community to urgently consider whether, and the best way to adopt international space regime that can play a role in conflict prevention in space. Space legal order is utterly in the hands of States and the emerging challenges in space, and the threats space insecurity holds for man's corporate

[50]Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, U.N. GAOR, 68th Sess. U.N. Doc A/68/189 (July 29, 2013), http://www.un.org/ga/search/view_doc.asp?symbol=A/68/189. Accessed on 30 September, 2021.

[51]People's Republic of China Ministry of Foreign Affairs, 'Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (Draft' (2014), https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/jks_665232/kjfywj_665252/t1165762.shtml Accessed on 30 September, 2021.

[52]C Steer, (n48) 21.

[53]*Ibid*

[54]M. Hanham & S. Ji, 'Advances in North Korea's Missile Program and What Comes Next', (2017), *Arms Control Association* https://www.armscontrol.org/act/2017-08/features/advances-north-korea-missile-program-what-comes-next. Accessed on 5th October, 2021; C. Sang-Hun, 'North Korea Tests Five Missiles', (2015) *The New York Times*, https://www.nytimes.com/2015/02/09/world/asia/north-korea-launches-5-short-range-missiles.html. Accessed on 5th October, 2021.

[55]The U. S. in particular has been fingered as being constantly unwilling to assent to any treaty that might limit its technological advances and behavior in space. See [55]C Steer, (n52) 22.

existence on earth should inspire a route to an effective international legal regime to adequately regulate the present and future exploration and use of outer space.

Prevention of conflicts and insecurity in outer space requires consensus and concerted input by all States. No single or group of States can unilaterally alter the existing international space regime to arrest the present situation in space. Addressing the security situation in space requires a great array of measures, including legal, political and military. There is already, the prohibition of the use of force as contained in *Article 2 (4)* of the UN Charter. This is applicable to outer space along with the exceptions contained in the UN Charter and general international law. This paper strongly recommends the creation and adoption by the international community, of effective legal and political measures in form of binding and/or non-binding rules that will prescribe the code of conduct in space. Such measures will help in prevention of escalation of adverse competition to full-blown armed conflict in space. This can only be possible through coordinated efforts of all States, and space actors including independent experts in legal and space field. Measure must be taken also in national level, especially by spacefaring States to update their national legislation and policies in line with the prevailing circumstances in space with the aim of ensuring peaceful exploration and use of space. Space actors should voluntarily share information about space activities to improve safety of operations, follow measures of caution, promote and facilitate international cooperation, in the exploration and use of outer space, in line with the Guidelines on the Long-Term Sustainability of Outer Space Activities recently adopted by the Committee on Peaceful Uses of Outer Space. This work contemplates a legal regime for outer space that would adequately provide clarity on the applicable rules in relation to military activities in space, particularly on the use of force and the law of armed conflict. Such regime would prove effective in controlling the behaviours of various space actors and ultimately reduce the risk of space-based conflict occasioned by lack of transparency in space affairs. Achieving this requires the political will and collaboration of the international community of State because, only one State or a group of nations would not possess requisite legitimacy to unilaterally alter the fundamental international norms of maintenance of international peace and security.