

Reconsidering Rules of Engagement in Outer Space

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1. Introduction

The new wave of commercial space activities has given States and the private sector unique opportunities and challenges to achieve historical heights. While these stakeholders move forward into new frontiers, the global community watches with hopes for a better future. These hopes are based on two commonly known principles. The first is that outer space is to be used for peaceful purposes. The second is a more general principle that expects space activities to consider the benefits of human development. As members of the global community, space lawyers must take the initiative to engage uncertainty and inspire others. Along with other stakeholders, these lawyers are capable of becoming collaborators and architects of a better future. To achieve this goal, they must become agents of change to shape the global culture. It is up to them to aid in enabling a positive evolution, one that although fast-coming, it will help nations grow. All stakeholders must challenge their own realities and accept that change is an ally. While the development of technology creates change, it is the collaboration of humanity in outer space that promises to redefine how to face new initiatives.

At the outset, it is non-controversial to assert that peaceful uses and the benefits to humanity are harmonious with military and commercial activities in outer space. There is an increasing need to consider the extraction of resources from non-terrestrial objects potentially needed to satisfy energy requirements of our growing population. While the improvement and development of technologies for the benefit of humanity is a powerful motivator, the reality is that the required resources for such endeavors signal additional considerations. A long-term development of humanity will require that it returns to space and ventures to other worlds. This journey of exploration will offer many treasures. In the other hand, the future will be

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motivated by the law governing space activities, and the relationship between space law and military activities.

When considering the legal and relevant landscape—as Wilfred Jenks observed—the rapid evolution of technology encourages the urgent examination of challenges to be confronted by those seeking to set rules for know-how -related activities.¹ Jenks would further observe that attempts to consider potential developments in the field of electronics were undertaken too late by international law experts.² Jenks would probably agree that it is also uncontroversial to note that humanity has entered a new age of exploration. Visions of voyages by Vasco da Gama, Ferdinand Magellan, and Christopher Columbus with his 17-ship fleet echoed into a future of space fleets moving into the unknown distances of far-off galaxies. Even more so, it is a vision of future space weapons programs and exotic technologies that may dramatically change the landscape of international space law. At the center of this future exploration is the utilization of space objects for telecommunications and remote sensing. This is the other part of the story. While looking at the stars with the help of our space objects is reason for awe and celebration, and while we enjoy the rapid communication that satellites offer, the perception surely changes once those same space objects are turned around to threaten the surface of our planet. This is the reality that we now must recognize. Weapons in outer space represent activities that have evolved dramatically to include a wide range of methods. Our present reality takes us to the inescapable realization that the use of outer space should respond to a minimum public order.

2. Non-Terrestrial International Law

It is no secret that nations have unique reasons for the regulations of their own space activities.³ Yet, these unique reasons are subject to state responsibility.⁴ How then to gage this responsibility in outer space? The answer has already been delineated for us. The preamble of the General Assembly Resolution on the *Question of the Peaceful Use of Outer Space* highlighted the importance of promoting “the fullest exploration and exploitation of outer space for the benefit of mankind.”⁵ This is a good point of departure. A minimum public order in outer space represents a framework

1 C. Wilfred Jenks, “International Law and Activities in Space” (1956) 5:1 *The International and Comparative Law Quarterly* 99 at 101.

2 *Ibid.*

3 Ronald L. Spencer, Jr., “International Space Law: A Basis for National Regulation” in Ram S. Jakhu, ed., *National Regulation of Space Activities* (New York: Springer, 2010) at 1.

4 *Ibid.*

5 *Question of the Peaceful Use of Outer Space*, GA Res 1348(XIII), UNGAOR, 13th Sess, UN Doc A/RES/13/1348(XIII) (1958).

of inquiry for assessment, planning, and resolution. The inquiry begins by assessing the problem at hand: what is the non-terrestrial international law applicable to space weapons programs? Myres McDougal, in providing a public order template, would surely caution against putting emphasis on misconceptions that would take the discussion into a negative outcome.⁶ McDougal would be concerned with misconceptions that assume a lack of existent legal guideposts to resolve the applicable law for the utilization of weapons in outer space.⁷ McDougal explained it by stating that space lawyers would “do a great disservice to what we have already achieved... [if they would] grievously undercut an existing consensus among states about a great many problems, and by their overemphasis on explicit agreement and underemphasis upon custom in the creation of international law, may make more difficult the taking of appropriate measures to achieve a still greater consensus.”⁸ Any utilization of weapons in outer space responds to the overall flow of the activities of States, especially those activities that shape international custom.⁹ True, we have the advantages of treaty law in space law. Article 38 of the ICJ statute includes the authoritative sources of binding principles realized in treaties, customary law, and general principles of law.¹⁰ The United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) left for us five outer space treaties, which continue to provide the basis of international space law: the Outer Space Treaty;¹¹ the Rescue Agreement;¹² the 1972 Liability Convention;¹³ the 1975 Registration Convention;¹⁴ and the Moon Agreement.¹⁵ These are considered in

6 Myres S. McDougal, “Emerging Customary Law of Space” (1963-1964) 58 Nw. U. L. Rev. 618 at 619.

7 *Ibid.*

8 *Ibid.*

9 *Ibid.*

10 See, Ram S Jakhu & Steven Freeland, “The Sources of International Space Law” (2013) 56 Proceedings of the Intl Institute of Space L 461.

11 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, January 1967, 18 UST 2410, 610 UNTS 205, 6 ILM 386 at Article 1 (entered into force October 1967) [Outer Space Treaty].

12 *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, (22 April 1968) 672 UNTS 119, 19. U.S.T. 7570, TIAS 6599 (entered into force on 3 December 1968) [Rescue Agreement].

13 *Convention on International Liability for Damage Caused by Space Objects* (29 March 1972) 961 UNTS 187, 24 U.S.T 2389, TIAS 7762 (entered into force on 1 September 1972) [Liability Convention].

14 *Convention on Registration of Objects Launched into Outer Space* (14 January 1975) 14:1 Intl Leg Materials 43 (entered into force on 15 September 1976) [Registration Convention].

15 *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* (18 December 1979) 18:6 Intl Leg Materials 1434 (entered into force on 11 July 1984) [The Moon Agreement].

conjunction with the Charter of the United Nations;¹⁶ the Constitution and Convention of the International Telecommunication Union;¹⁷ the 2012 ITU Radio Regulations; and, the Partial Test Ban Treaty (PTBT) of 1963.¹⁸ Unfortunately, there are recent activities are not necessarily delineated by the guidance of these treaties or subsequent noted principles. Technology now allows satellites to provide aid in forest monitoring via imagery datasets to support, for example, international policy agreements, such as “those associated with emissions of CO₂ into the atmosphere from deforestation and other types of land-use change.”¹⁹ From soil studies, to mapping, to surveillance, searching for habitats, and weather conditions, there have been many applications attributable to satellites.²⁰ These certainly contrast with anti-satellite weapons.

At center stage, we encounter many benefits that serve as a reminder that outer space activities involve gathering data from outer space, for example, by an electromagnetic retrieval process that recognizes objects on the surface of our planet.²¹ We also have present challenges to public order that remind of the days of the German V2 rockets traveling at the edge of the atmosphere during World War II, and the potential military uses of present—and future—outer space objects.²² Space objects offer military capabilities that support warfare activities on the surface of the Earth.²³ Weapons utilized in outer space must follow the principles enumerated in the space treaties, although it could be argued that military activities are influenced in various degrees by foreseeability and applicability. For example, the expansion of human conflicts into outer space will need to be tempered with mitigating activities associated with the dangers of anti-satellite weapons, and in one weapon in particular: cyberspace. Cyber threats and attacks are launched with high sophistication causing great damage. Another way to ponder about

16 United Nations, *Charter of the United Nations*, 24 October 1945, 1 UNTS XVI.

17 The Constitution and Convention of the International Telecommunication Union ATS (1994) 28, BTS 24 (1996).

18 *Treaty banning nuclear weapon tests in the atmosphere, in outer space and under water* (1963) U.S. TIAS 5433; 14 UST 1313, 1316-1319; 480 UNTS 43-99 (1963).

19 Scott Goetz & Ralph Dubayah, “Advances in remote sensing technology and implications for measuring and monitoring forest carbon stocks and change” (2011) 2:3 Carbon Management at 231.

20 GISGeography, *100 Earth Shattering Remote Sensing Applications & Uses*, online: <<http://gisgeography.com/100-earth-remote-sensing-applications-uses/>>.

21 Hamilton Desaussure, “Remote Sensing Satellite Regulation by National and International Law” (1989) 15 Rutgers Computer & Tech. L.J. at 351.

22 Regina Hagen and Jürgen Scheffran, “International Space Law and Space Security: Expectations and Criteria for a Sustainable and Peaceful Use of Outer Space” in *Current Problems and Perspectives for Future Regulation* (Marietta Benkö and Kai-Uwe Schrogl, eds, Eleven International Publishing, AJ Utrecht, the Netherlands, 2005) at 273.

23 *Ibid.*

these uses is to note these treaties as a further extension into the foreseeable realm of cyberspace operations applicable to outer space activities. None of the space treaties offer jurisprudential guidance for the challenges associated with needed rules of engagement that involve cyberspace.

Our concern is one that encompasses a range of actives related with military activities linked to private actors, States, and warfare in space; these being the actors and the arena of their interactions.²⁴ This is, of course, at the heart of future rules of engagement. There is a lack of international treaty norms applicable to the management of the Internet.²⁵ Bourely observed appropriately, that from the very beginning, space activities have been developed within the realm of States, “be it either on an exclusive level as is the case in some countries, or on a partial level as is the case in other countries.”²⁶ The conflicting claims that exist will continue to threaten the peaceful utilization of outer space because the actions of stakeholders are moving into a *legal lacunae* within the present legal system, ill-suited to analyze the past trends in decision, which are to be understood “in light of their conditioning factors.”²⁷

Any projection of future trends is also problematic. The newness of space activities involving cyberspace reminds of the words of Michael Bourely, when he noted that States’ intervention in space activities was “expressly foreseen by articles VI, VII and VIII of the 1967 Outer Space Treaty to which, it shall be recalled, nearly all the states of the world—including all the space powers—are parties.”²⁸ Bourely underscored the States’ “international, political and legal responsibilities for all national space activities —whether they are carried out by private or public organisms,” including authorization and supervision under their jurisdiction.²⁹

3. Space Weapons Programs

News about antisatellite weapons managed by various nations and the establishment of the US Space Force fuel the imagination of tension in outer space. To survive into the future, humanity will need to endeavor to apply—in good faith—the knowledge acquired for the utilization of new technologies in outer space. Looking back at the guiding light of space law,

24 See for example, Siegfried Wiessner, “The New Haven School of Jurisprudence: A Universal Toolkit for Understanding and Shaping the Law” (2010) 81:1 Asia Pac L Rev 45 at 49.

25 Lennard G. Kruger, “Internet Domain Names: Background and Policy Issues”, *Congressional Research Service* (28 August 2009) at 1.

26 Michael Bourely, “The Institutional Framework of Space Activities in Outer Space” (1998) 26:1 *Journal of Space Law* 1.

27 Wiessner, *supra* note 24 at 49.

28 Bourely, *supra* note 26 at 2.

29 *Ibid.*

as Manfred Lachs observed, the principles enshrined in some General Assembly Resolutions provide additional and tangible guidance.³⁰ For these reasons, the rapid expansion of space activities relating to cyberspace will necessitate a process for the creation of rules or *opinion juris*. While scholars note how international customary law requires the accepted legal obligation of States, this acceptance may not be inevitably absolute, especially when custom develops quickly in activities relating to technology.³¹ The United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space, in particular, the Legal Committee observed that it would be impossible to identify and define all juridical problems that would arise in the exploration of outer space.³² The committee did not leave legal scholars without guidance, as it noted that the provisions of the United Nations Charter and the Statute of the International Court of Justice would be, in the interest of cooperation, instruments not limited in their operation to the confines of the Earth.³³ This is the essence of Article III of the Outer Space Treaty.

The list of anti-satellite weapons accessible in the outer space arena illustrates potential threats. The development of any space weapons programs must place peaceful purposes as the main goal. This principle emphasizes the subsequent 1996 *Declaration on International Cooperation in the Exploration and Use of Outer Space*.³⁴ The Declaration anticipated new technological developments along with the emergence of new space-faring States.³⁵ Indeed, paragraph 1 stated in relevant part that “International cooperation in the exploration and use of outer space for peaceful purposes... shall be conducted... for the benefit and in the interest of all States...”³⁶

30 Manfred Lachs, *The Law of Outer Space: An Experience in Contemporary Law-Making* (Martinus Nijhoff Publishers 1972, 2010) at 6.

31 See, Tullio Treves, “Customary International Law” in *Max Planck Institute for Comparative Public Law and International Law* (Heidelberg and Oxford University Press, November 2006) at paragraph 1. See also, John Tasioulas, “Customary International Law and the Quest for Global Justice” in *The Nature of Customary Law: Legal, Historical and Philosophical Perspectives* 314, 325 (Amanda Perreau-Saussine and James Bernard Murphy, eds. 2007). See also, Treves, *Customary International Law*, *supra* note 72 at 24, 91. See also, Brian D. Lepard, *Customary International Law: A New Theory with Practical Applications* (2010) at 142- 143.

32 See, Ad Hoc Committee on the Peaceful Uses of Outer Space, Report of the Legal Committee, A/AC.98/2 at Paragraph A.1.

33 *Ibid* at paragraph A.1.(1).

34 *Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries*, GA Res 1962, UNGAOR, 51th Sess, UN Doc A/RES/51/122 (13 December 1996).

35 *Ibid*.

36 *Ibid* at paragraph 1.

The basic criterion by which stakeholders must be guided is the recognition that for a profitable and secure management of space exploration, there needs to be a definition for outer space cyber activities. The beginning of a resolution may be found in new rules of engagement applicable to cyber operations in outer space. An overriding preference must certainly include rules made for the protection of the peaceful enjoyment of outer space—activities that are now in danger of suffering the effects of cyberattacks. Based on the fundamental principles enshrined in the Outer Space Treaty, including the subsequent space treaties, which emerged to expand space law, and in the absence of an express and clear statement of international law, Article III of the Outer Space Treaty suggests the inclusion of military activities. There is no basis to conclude that States may ignore their duties arising from military activities conducted in such a manner properly regarded as essential outer space activities. Thus, the deduction is more relevant when addressing the more exotic weapon known as *cyberspace*.

4. Two Rules of Engagement for Cyber Operations

Cyberspace is now a vehicle of military operations within a borderless arena overwhelmed by covert cyber-weapons that now threaten outer space exploration. We must assume that given the need to achieve dominance or self-defense in outer space, new rules of engagement are needed to address the interference with satellite systems, including questions of how the military space capability in existence now support traditional war-making in outer space.³⁷ Manuals intended to clarify the applicability of international law to particular scenarios have not addressed cyberspace as an all-encompassing weapon in outer space. The primary concern here is acknowledging the challenges associated with the applicability of space law to cyberspace due to attribution or lack thereof; or, to simply resort to fit space law principles to more complex cyber law challenges. Likewise, lack of attribution of a cyberattack may affect the status of a State. In the other hand, rule 38 of the San Remo Manual on International Law Applicable to Armed Conflicts at Sea, would be illustrative here for cyber. It states in relevant part that in “any armed conflict the right of the parties to the conflict to choose methods or means of warfare is not unlimited.”³⁸ Liability, thus, is not necessarily the best measure. The second consideration is how to discourage and minimize the problems associated with attribution. Without this consideration, the

37 Laura Grego, “Technologies and Behaviors of Concern: What Threatens Long-Term Space Security and How Can These Threats be Monitored?” in UN Institute for Disarmament Research, *Building the Architecture for Sustainable Space Security: Conference Report 30-31 March 2006* (UN Publications, Geneva, 2006) at 68.

38 Louise Doswald-Beck, *San Remo Manual on International Law Applicable to Armed Conflicts at Sea* (Cambridge: UK, Cambridge University Press, 1995) at 15.

Liability Convention would be applied to situations not foreseen by its drafters. As noted before, this is the essence of Article III of the Outer Space Treaty. The best defence—at the moment—against attribution questions is mitigation. There is a need to minimize the consequences of a cyberattack.³⁹ All stakeholders, thus, must share in the situational awareness to achieve a meaningful cybersecurity policy.⁴⁰ The following suggested rule illustrate and expand this concept:

4.1 **Rule: Cyber Operations in Space**

A State not involved in a conflict that engages in cyber operations directed to disable or destroy space objects that belong to another State is in violation of Article III of the OST, if it knowingly allows its territory to be used for acts contrary to the rights of the other State.

5. Conclusion

The purpose, then, of these proposed rules of engagement is to address the present cyber-threat that now lies in wait in outer space. It is to be noted the ability of humanity to expand and develop in space, while taking in consideration that “the sciences and technologies capable of being used to consummate [humanity’s] wildest dreams of peaceful and opulent felicity” are threatened by the preparation of instruments of mutual annihilation.⁴¹ In the end—the success of outer space exploration depends in the appreciation of the endeavours at hand and the smallness of humanity against the background of the universe. As humanity moves into outer space, it must appreciate a future where space lawyers anticipate life, or to be prepared for—as Jenks explained— “circumstances in which the possibility of developing the law on sound principles depends primarily on an initiative being taken in the matter before *de facto* situations have crystallized too far.”⁴² The initiative to be taken now is that of innovative mitigating rules that place responsibility and liability on the appropriate State.

39 Jassim Happa and Graham Fairclough, A Model to Facilitate Discussions About Cyber Attacks, in Mariarosaria Taddeo & Ludovica Glorioso, eds, *Ethics and Policies for Cyber Operations* (Oxford, UK: Springer 2017) at 180-81.

40 *Ibid.*

41 Myres S. McDougal & Harold D. Lasswell, “Jurisprudence in Policy-Oriented Perspective” (1967) 19:3 U Fla L Rev 486 at 490.

42 Jenks, *supra* note 2 at 101.