Journal of Autonomy and Security Studies
Vol. 10 Issue 1 (2026)
Research Note

Use of Armed Force in Outer Space: An Introduction

Dr. Katariina Simonen

Journal of Autonomy and Security Studies
10(1) 2026, 6–18
DOI: https://doi.org/10.61199/85bv-9w0s

Abstract

Space is increasingly a theater for States' and private companies' activities. Space as a normative environment faces multiple challenges. Some of these are innate to space law proper, such as the limited applicability of the Moon Agreement. Others emanate from the general erosion of international law and arms control, technological developments and innovation. The limits of accepted space behaviors need urgent clarification. Absence of clear rules is likely to contribute to further unilateralism, at the cost of existing multilateral rules like the UN Charter, and to increased risk of conflict. A clear normative environment in space provides an environment with predictability, clarity and risk-minimization for states and private actors alike. To achieve this, states and private actors may want to look for progressive soft law steps, starting by agreeing on gaps, on useful measures to promote, like the ENMOD Convention, and on priorities such as the clarification of the law of self-defense and its limits.

Keywords

Outer space, use of force, self-defense, international humanitarian law

About the author

Katariina Simonen is Adjunct Professor at the National Defense University (Finland) as well as Visiting Researcher at the Department of World Cultures, University of Helsinki. She is also Pugwash Council Member. Her research interests include law of armed conflict, arms control and legal history.

1. Introduction

A recent research webinar organized by Pugwash Conferences on Science and World Affairs and the Åland Islands Peace Institute discussed Outer Space Governance with a specific focus on weapons of mass destruction (WMD) and arms control in an era of eroding multilateralism.[1] The purpose of this research note is to provide some contextual concerns which contributed to the organization of the webinar in the first place.

The core concern is the erosion of rules on the use of armed force and its significance for outer space governance. The said rules regard the threshold for the use of force (*jus ad bellum*) and the conduct of actual hostilities (*jus in bello*). They provide also for the overall regulatory context for arms control and disarmament discourses taking place on supra-national and national levels.

Today's challenges to space governance are many, starting from the fact that key international agreements on space, such as the Outer Space Treaty[2] (hereafter OST) and the Moon Agreement[3], have limited applicability, either for their dominantly state-centric nature or their limited coverage by participants or by their contents. Recent years have seen the emergence of companies as space actors beside the classic ones, i.e. the US and Russia, and others (China, Europe, Japan, India *et cetera*), propagating easier and cheaper access to space, new satellite services in the communications and satellite sector or the exploitation of raw materials of other celestial bodies.[4] Moon Agreement has only 16 State Parties with none possessing significant space exploration capabilities. Rivaling soft-law arrangements are emerging, such as the Artemis Accords, raising concerns regarding the future of the Moon Agreement.[5]

Yet, international efforts at the United Nations (UN) level stall. The notion of the "Prevention of Arms Race in Outer Space" (PAROS) emerged already in 1978, and in 1982 PAROS was added as an item to the Conference on Disarmament's agenda. Since then, PAROS has been present on the agenda in multilateral discussions, becoming the umbrella term under which states discuss the maintenance and improvement of space security at

1 Webinar Report: Outer Space Governance. 2025. Sept. 1. https://pugwash.org/2025/09/01/webinar-report-outer-space-governance/.

2 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967), https://unoosa.org/oosa/en/spacelaw/treaties/introouterspacetreaty.html.

3 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1984), https://unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html.

4 Neuneck, Götz. 2022. "A New Arms Race in Space? Options for Arms Control in Outer Space." In *Security and Defence: Ethical and Legal Challenges in the Face of Current Conflicts,* edited by J. Cayón Peña. Springer Nature Swizerland AG, 23–36.

5 Artemis Accords are a non-UN but US-promoted soft law accord regarding the exploration of the Moon. Stefan-Wedenig, Michael & Nelson, Jack Wright. 2023. "The Moon Agreement: Hanging by a Thread?" *Institute of Air and Space Law (McGill),* January 6. https://www.mcgill.ca/iasl/article/moon-agreement-hanging-thread.

the United Nations (UN), so far with limited success.[6] At the core of PAROS is the desire to prevent arms racing, but states remain unable to agree on proper definitions for space arms or weapons, or even on the need for such definitions.[7] In an effort to define the terms more clearly, certain states, namely Russia and China, introduced to the Conference on Disarmament the draft treaty on the Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT) in 2008 and then again in 2014. Dual use capabilities have also prompted serious concerns and have led to attempts to regulate space behaviors, in addition to regulating specific capabilities (e.g. UNGA Res 75/36).

In addition to these open questions regarding space law proper, the general erosion of the rules on armed force and humanitarian law raises serious concerns as to the capability of such rules to provide guidance for states' space behaviors. This research note serves as an introduction to these open issues, hoping to pave way for further discussion on how to consolidate the normative environment.

2. Peaceful use, militarization and weaponization

The OST regulates in article IV.2 that "the moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes". When the OST was drafted, "peaceful purposes" could be seen as a reflection of the efforts of détente during the Cold War.[8] Also, the Antarctic Treaty (1959) served as a model in the process.[9] Antarctica was preserved as a demilitarized zone, meaning 'non-military'. As to the OST, the exact meaning of peaceful purposes has been amply debated, due to the fact that outer space has been militarized since the earliest communication satellites were launched.[10] Military uses of outer space have also been accelerated in terms of both participating countries and technologies used.[11] And what of the void of outer space, considering that Art. IV does not explicitly establish limitation of exclusive use for peaceful purposes therein? Ortega and Koller argue that this obligation can be inferred from the applicability

6 Pobjie, Erin & Azcárate Ortega, Almudena. 2024. "Space Security Legal Primer 1 – Outer Space & Use of Force." *UNIDIR*. https://doi.org/10.37559/WMD/24/Space/02.

7 *Ibid*. 12–13.

8 Kopal, Vladimir. 2008. "Treaty on Principles Governing the Activities of States in the Exploration and the Use of Outer Space, Including the Moon and Other Celestial Bodies*". United Nations Audiovisual Library.*

9 Von Bonsdorff, Sara. 2024. "From satellites to battlegrounds: Use of outer space for peaceful purposes, the use of force and the right of self-defence in the modern space landscape*".* Master's Thesis, Åbo Akademi University, https://urn.fi/URN:NBN:fi-fe2024053041811, 15.

10 *Ibid*.

11 Su, Jinyuan. 2010. "Use of Outer Space for Peaceful Purposes: Non-Militarization, Non-Aggression and Prevention of Weaponization." *Journal of Space Law* 36(1): 253–272, 257. https://ssrn.com/abstract=1662238.

of general international law to the space domain, established in Art. III of the OST.[12] The said article stipulates that "States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding".[13] The regulation in the Moon Agreement differs from the OST in that it includes explicit prohibitions regarding the use of force, threat of use of force, other hostile acts or threats of hostile acts on the Moon or using the Moon to commit any such act or threat of such acts in relation to the earth, the Moon, spacecraft, the personnel of spacecraft or man-made space objects (Art III.2).

At this point, it is useful to note that the prohibition of the use of force does not explicitly ban specific space capabilities or space behaviors. In fact, the weaponization of space is not strictly prohibited by the OST, whose Art. IV.1 decrees only on *limited demilitarization*, as follows: "States Parties…undertake not to place in orbit around the earth of any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner" and "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". A similar logic is found in Articles 3.3–4 of the Moon Agreement: "States Parties shall not place in orbit around or other trajectory to or around the moon objects carrying nuclear weapons or any other kinds of weapons of mass destruction or place or use such weapons on or in the moon" and "The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on the moon 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 and use of the moon shall also not be prohibited".

The Partial Test-Ban Treaty, in turn, bans nuclear weapon tests in the atmosphere, in outer space and under water.[14] Out of all these regulations, the most likely to affect potential means and methods of the use of force in outer space is the Convention on the prohibition of military or any other hostile use of environmental modification techniques (ENMOD)

12 Azcáte Ortega, Almudena & Lagos Koller, Hellmut. 2023. "The Open-Ended Working Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours: The Journey so Far, and the Road Ahead." *Air and Space Law* 48: 19–40, https://doi.org/10.54648/aila2023029.

13 Legal scholars have amply debated the applicability of international law to outer space. However, many leading authors point out that a proper reading and understanding of Art. III of the OST makes *lex specialis* applicable to outer space, meaning that international law that is applied on Earth also applies to outer space and obliges states to carry out their space activities in accordance with the UN Charter. Von Bonsdorff, footnote 9, 26 and references therein.

14 Treaty banning nuclear weapon tests in the atmosphere, in outer space and under water (1963), https://treaties.un.org/pages/showDetails.aspx?objid=08000002801313d9.

whose usability is growing in importance due to technological advancements.[15] The ENMOD was the first instrument that dealt with deliberate destruction of the environment during warfare, and it also applies in time of peace.[16] The ENMOD treaty's Art. I states that 'Each State party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party'. The treaty is of particular importance to the use of force in outer space in that environmental modification techniques are defined to include 'any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space' (Art. II).[17]

To sum up, space law creates a limited demilitarization of outer space, leaving open the limits to other weapons than weapons of mass destruction. An interpretation further corroborated by the fact that both the US and the former Soviet Union had sent military satellites into orbit before the OST was even negotiated.[18] In the absence of an explicit prohibition, states have developed numerous forms of counterspace capabilities, ranging from debris-creating kinetic capabilities to non-kinetic counterspace assets which can deny, disrupt, degrade, damage, destroy or otherwise harm a system through electronic or cyber means.[19] An essential issue, then, that requires resolution is the regulation of legality of certain space weaponry.[20] However, the multilateral space security debates have not been able to produce tangible outcomes over the years due to the international community's inability to agree on which issues to tackle as well as how to best address them.[21] Risk of uncontrolled weaponization, even if allegedly non-aggressive, can easily shift into aggressive. Such risks are further exacerbated by the great complexity of today's eroded

15 McGee, Jeffrey, Brent, Kerryn, McDonald, Jan and Heyward, Clare. 2021. "International Governance of Solar Radiation Management: Does the ENMOD Convention Deserve a Closer Look?" *Carbon & Climate Law Review* 14(4): 294–305. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3806914.

16 Freeland, Steven. 2004. "Human Rights, the Environment and Conflict: Addressing Crimes against the Environment." *Sur – international journal on human rights* 2(2):112–139, 122. https://sur.conectas.org/en/human-rights-environment-conflict/.

17 Maogoto, Jackson & Freeland, Steven. 2007. "The Final Frontier: The Laws of Armed Conflict and Space Warfare". *Connecticut Journal of International Law* 23:165–195, 175.

18 Rodman, Lindsay R. 2021. "Orbiting Legal Analysis: Armed Attacks in Space." *NATO Legal Gazette* 42: 68–85, 72.

19 Weeden, Brian & Samson, Victoria. 2024. "Global Counterspace Capabilities." *Secure World Foundation*. https://www.swfound.org/publications-and-reports/2024-global-counterspace-capabilities-report.

20 Maogoto, Jackson & Freeland, Steve. 2010. "Space Weaponization and the United Nations Charter Regime on Force: A Thick Legal Fog or a Receding Mist?" February 26. http://dx.doi.org/10.2139/ssrn.1559922.

21 West, Jessica & Azcárate Ortega, Almudena. 2022. "Space Dossier 7 – Norms for Outer Space: A Small Step or a Giant Leap for Policymaking?" *UNIDIR*. https://doi.org/10.37559/WMD/22/Space/01.

arms control landscape.[22] Sufficient here is to refer to the 2nd Trump administration's plan regarding the Golden Dome missile defense system, still in the conceptual phase, which, if completed, would lead to the introduction of hundreds if not thousands of space-based sensors and missile interceptors, thereby destabilizing the already precarious strategic stability and heightening the risk of space becoming a war zone.[23]

3. Prohibition of the use of force

A recent study by UNIDIR on outer Space & Use of Force examines thoroughly the question of use of force in outer space and the contents of prohibited use of force, detailing the contextual requirements and elements that make the act a 'use of force'.[24] A key norm in this context is the UN Charter's Article 2.4, according to which "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".[25]

Not surprisingly, there has always been disagreement as to what is prohibited under the treaty (Art. 2.4), custom or general principles. According to Franck, the prohibition of the use of force is a so-called "idiot rule": it seems to enjoy high determinacy, but despite its superficial clarity, its compliance pull is feeble, especially as comes to the interpretation of the expressions "threat or use of force", "international relations" and the conditions under which force may be used without violating the injunction of the Article 2.4.[26] In fact, apart from self-help for the defense of legal rights (see *Corfu Channe*l 1949[27]), every phrase is amenable to interpretation.[28]

These controversies have led many states to interpret their right to use force autonomously, especially when their physical security was concerned. Hence, states have made the application of the article conditional upon the effective functioning of collective security, or argued for independent right to use force in cases of humanitarian intervention, rescue of nationals aboard, pro-democratic intervention, armed reprisals against the unlawful

22 Rose, Frank. (2025). "The Future of Arms Control: Time for a New Strategic Framework." July 11. https://www.justsecurity.org/116786/the-future-of-arms-control-time-for-a-new-strategic-framework/.
23 Kimball, Daryl G. (2025). "Golden Dome: Doubling Down on a Strategic Blunder." *Arms Control Association* June. https://www.armscontrol.org/act/2025-06/focus/golden-dome-doubling-down-strategic-blunder.
24 Pobjie & Azcárate Ortega, footnote 6.
25 United Nations Charter, https://www.un.org/en/about-us/un-charter/full-text.
26 Franck, Th.M. 1990. *The Power of Legitimacy Among Nations.* Oxford University Press. 50–66, 72–77, 88–90.
27 Corfu Channel (United Kingdom of Great Britain and Northern Ireland v. Albania), ICJ Judgement 1949, https://www.icj-cij.org/case/1.
28 Higgins, Rosalyn. 2004. *Problems and Process. International Law and How We Use It.* Clarendon Press, 239–242.

small-scale use of force and the like.[29] In fact, the growing number of breaches of the prohibition, such as NATO intervention in Kosovo (1999), US intervention in Iraq (2003), Russian intervention in Ukraine (2022) and Israel's interventions in Iran (2025) and several interventions over the years in Lebanon, Syria and Yemen are a cause for pessimism. Typical for the later breaches is that the states in question have not sought to appeal to exceptions within the rule (Art. 2.4) to justify their use of force, thereby undermining the rule in question.[30]

Space is not an environment apart. When the normative guidance provided by the UN Charter Art. 2.4 is not only open to interpretation but also weakened, states are more likely to interpret it according to their own interests, thereby lowering the threshold for unilateral uses of force short of armed attack, such as self-help, armed reprisals and the like, constituting for instance "harmful interference" under Art. IX of the OST, "unlawful intervention" under customary international law or a prohibited "threat of force " under Art. 2.4.

4. Self-defense

Self-defense in international law refers to the inherent right of a state to use force in response to an armed attack. Self-defense is one of the exceptions to the prohibition against use of force under article 2.4 of the UN Charter. According to the UN Charter Art. 51 (first phrase), "Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security". Like Art. 2.4, the exact contents of Art. 51 are open to interpretation, and states have frequently justified unilateral uses of force by claiming self-defense. The Charter does not provide a definition of an armed attack. The implication is that even if a State uses force against another state's territorial integrity or independence, it does not necessarily in all cases constitute an armed attack, due to lack of force used.[31] The ICJ's judgment in *Nicaragua* provides for some guidance into the matter regarding the gravity, scale and effect for the use of force to be recognized as an armed attack.[32] In the *Oil Platforms* case the ICJ suggested that the cumulative nature of forcible actions could

29 Cassese, Antonio. 2001. *International Law.* Oxford University Press. 319–320.

30 The ICJ's approach in the Nicaragua case is that by appealing to exceptions within the rule, a state's justification implicitly reinforces the prohibition of the use of force in the first place. Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. the United States of America), ICJ Judgement 1986, https://www.icj-cij.org/case/70.

31 Von Bonsdorff, footnote 9, 55–58.

32 Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), ICJ Judgement 1986, https://www.icj-cij.org/case/70, para 191.

possibly turn them into an armed attack.[33] In addition, as an interpretative environment space poses further challenges, such as the extent of self-defense (space as *res communis*), limits of self-defense and problems relating to the dual use of satellites.[34] When exercising the right of self-defense, states would also have to respect the demilitarization limitations imposed under space law (OST Art. IV and the Moon Agreement Art. 3.3-4). States also must adhere to additional duties of established principles of international law when exercising their right of self-defense as stated in Art. III of the OST.

In space, states retain ownership, jurisdiction and control over their space objects, including their satellites.[35] Satellites can, however, be 'attacked' by using kinetic and non-kinetic means. Destroying a satellite with kinetic means involves directly colliding with the satellite or in any other way 'hitting' it and causing significant destructive damage to it via high-speed impact.[36] Due to their destructive nature, these weapons are usually called anti-satellite weapons (ASATs). Non-kinetic means are slightly the opposite of the former. The purpose of non-kinetic means of warfare against a satellite is to alter the function of the satellite, not causing any permanent damage to it, but in the worst case causing the loss of the total function of the satellite.[37] Kinetic ASATs include high-altitude nuclear explosion, kinetic energy ASATs, direct-energy ASATs, microsatellites and ballistic missiles, for example intercontinental ballistic missiles (ICBM). Non-kinetic ASATs, or non-kinetic means of attacking a satellite include cyber-attacks, interference or jamming.[38] The establishment of the threshold for the use of Art. 51 in self-defense is quite complicated in the latter case, as targeted satellites would not be physically destroyed (as would be the case with kinetic ASATs) but temporarily disabled. There have been cases of satellites being jammed, which have not resulted in any military responses based on self-defense. For instance, Russia has actively been jamming GPS signals in Ukraine as they attempt to advance. The debate of cyber activities violating the principle of non-use of force and/or constituting armed attack is on-going.[39]

33 Oil Platforms (Islamic Republic of Iran v. United States of America), ICJ Judgement 1996, https://www.icj-cij.org/case/90.

34 Unfortunately, the Registration Convention does not distinguish between military, dual-use and civilian satellites in the international register for space objects. Jakhu, Ram S., Jasani, Bhupendra, McDowell, Jonathan C. 2018. "Critical issues related to the registration of space objects and transparency of space activities." *Acta Astronautica* 143:406–420. https://doi.org/10.1016/j.actaastro.2017.11.042.

35 Coglianti-Bantz, Vincent P. 2010. "Disentangling the Genuine Link: Enquiries in Sea, Air and Space Law." *The Nordic Journal of International Law* 79(3):383–432.

36 Koplow, David A. 2009. "Asat-isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons." *Michigan Journal of International Law* 30(4):1187–1272, 1201.

37 Von Bonsdorff, footnote 9, 52–54.

38 *Ibid*.

39 See for instance Roscini, Marco. 2021. "Cyber Operations as a Use of Force'. In *Research Handbook on International Law,* edited by Nicholas Tsagourias and Russel Buchan. Edward Elgar, 233–254 and Schmitt, Michael N. 2011. "Cyber operations and the *Jus in Bello*: Key issues." *International Law Studies* 87:89–112, 96. Other principles of international law may also become implicated, such as the prohibitions of non-intervention and the inviolability of territorial sovereignty.

The threshold for self-defense becomes even more complicated with the deployment of weapons in space, advancement in technologies and innovation. Already in 1947, the advent of a new genre of weapons, atomic weapons, prompted the UN Atomic Energy Commission to note in its first report to the Security Council that "Interpreting its provisions [Article 51 of the Charter] with respect to atomic energy matters, it is clear that if atomic weapons were employed as part of an 'armed attack', the rights reserved by the nations to themselves under Article 51 would be applicable. It is equally clear that an 'armed attack' is now something entirely different from what it was prior to the development of atomic weapons. It would therefore seem to be both important and appropriate under present conditions that the treaty define 'armed attack' in a manner appropriate to atomic weapons and include in the definition not simply the actual dropping of an atomic bomb, but also certain steps in themselves preliminary to such action"[40].

The ensuing necessity for the flexibility in interpretation of Art. 51 opens up the argumentation to anticipatory or pre-emptive self-defense, departing from time-constraints imposed by Article 51 (ongoing or imminent armed attack). Counterspace technologies have already been developed faster than international space law, leaving states vulnerable for a surprise attack that would potentially harm a state's intelligence gathering, early warning systems and battlefield capabilities.[41] The right of true anticipatory self-defense has therefore arguably developed outside of article 51 in the light of new counterspace technologies and especially WMDs. Inevitably, first-strike capabilities have contributed to the necessity of the doctrine of 'anticipatory self-defense'".[42]

Pre-emptive self-defense, in turn, is not triggered by any event but comes from a general apprehension of being attacked ("the Bush doctrine of use of force against Iraq,[43] Russia's justifications for invading Ukraine"[44] or Israel's use of force against Iran[45]). The problem with pre-emptive self-defense is, according to Milanovic, that it is so boundless that it completely eviscerates the prohibition on the use of force – a state could act whenever it perceives an existential threat.[46] The doctrine is not endorsed by state practice.[47]

40 The 1st report of the Atomic Energy Commission to the Security Council (3 January 1947) UN Doc Nr AEC/18/Rev.1, for quote see UN Repertory of Practice, Article 51, vol. II (1945–54) chapter II.2 11–15.
41 Von Bonsdorff, footnote 9, 62.
42 Franck, Th.M. 2001. "When, If Ever, May States Deploy Military Force Without Prior Security Council Authorization?" *Washington University Journal of Law & Policy* 5:51–68, 57–58.
43 Milanovic, Marko. 2009. "The OLC Memoranda on Iraq: Revisiting the Case for War. *EJIL: Talk!* January 10. https://www.ejiltalk.org/the-olc-memoranda-on-iraq-revisiting-the-case-for-war/.
44 Milanovic, Marko. 2025. "Is Israel's Use of Force Against Iran Justified by Self-Defence?" *EJIL: Talk!* June 13. https://www.ejiltalk.org/is-israels-use-of-force-against-iran-justified-by-self-defence/.
45 *Ibid*.
46 *Ibid*.
47 Byers, Michael. 2002. "Terrorism, The Use of Force and International Law After 11 September." *International and Comparative Law Quarterly* 51(2):401–414. doi:10.1093/iclq/51.2.401.

5. International Humanitarian Law (IHL)

The starting point for discussing the application of IHL is that neither the OST nor the subsequent international space treaties negotiated under the auspices of the UN (Rescue Agreement 1968, Liability Convention 1974, Registration Convention 1979 and the Moon Agreement 1979) provide further clarification regarding the placement of other types of weapons (other than WMD) in space. Regardless, as discussed above, Art. III of the OST confirms the application of international law into the outer space environment. Also, the applicability of international law to the space environment is highlighted in Art. I of the OST which indicates that the use and exploration of outer space shall be carried out "in accordance with international law". Without going further into the problematics regulating space security (PAROS, PPWT) mentioned briefly in the introduction, from the point of view of IHL it is useful to note the potential dual-use of certain space objects, which have caused significant concern for the international community as well as the inclusion of behaviors (how capabilities are used) into discussions on how to reduce threats to space systems.[48]

The International Committee of the Red Cross (ICRC) has alerted the international community to this problematic of outer space uses of force, "making the potential consequences of attacks on space systems a matter of humanitarian concern".[49] The ICRC highlights the substantial human consequences of deploying weapons in outer space, especially those capable of interfering with, harming, destroying, or incapacitating civilian or dual-use space assets. Civilian infrastructure, essential for various sectors such as health care, transportation, communications, energy, and trade, is strongly dependent on space systems that often have both military and civilian purposes; global navigation satellite systems, such as GPS, are essential for air traffic control, maritime shipping, and accurate time synchronization of crucial civilian infrastructure; weather, communication, navigation, and Earth observation satellites are crucial in humanitarian efforts for tasks such as needs assessment, emergency assistance delivery, catastrophe risk reduction, and conflict prevention.[50] Moreover, causing physical harm or destruction to things in space could result in more space debris, which could endanger other space objects that are crucial for safety-critical civilian operations and essential services on Earth.

48 OEWG on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Threats to the Security of Space Activities and System, UNIDIR 23–27, U.N.Doc. A/AC.294/2022/WP.16 (12 Sep. 2022), https://documents.unoda.org/wp-content/uploads/2022/08/20220817_A_AC294_2022_WP16_E_UNIDIR.pdf.

49 International Review of the Red Cross, Position paper submitted by the International Committee of the Red Cross to the Secretary-General of the United Nations on the issues outlined in General Assembly Resolution 75/36 (2020), 102 (915), 1351–1356.

50 *Ibid*. and Von Bonsdorff, footnote 9, 66–67.

The 1977 Additional Protocol I to Geneva Conventions also prohibits the employment of means and methods of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment. The term 'damage to the natural environment' could encompass negative environmental changes and accordingly space debris could fall under that notion.[51] States must also consider the environment and debris while evaluating necessity and proportionality. In the late 1970s, a NATO scientist named Donald Kessler proposed the hypothesis that the probability of satellite collisions rises as the number of satellites launched into orbit increases. Each collision would have a significant influence on the orbital environment. According to UNIDIR, "States have become increasingly concerned about the danger presented by space debris, and the ever-increasing potential for collisions, particularly in highly populated orbits such as low Earth orbit".[52]

In addition to space-specific concerns, the general erosion of IHL is likely to have an effect on how states interpret IHL, also in outer space. The President of the ICRC draws attention to the great number of conflicts and the complete disregard for IHL, as follows:

"The scale of human suffering, in Gaza, Myanmar, Ukraine, Sudan, Afghanistan, Syria and dozens of other countries across the world must never be accepted as inevitable. These are not unfortunate side effects of war, but consequences of a profound failure to uphold international humanitarian law. They are the results of political failure. When wars are fought with the mentality of 'total victory' or 'because we can' a dangerous permissiveness takes root – one where the law is bent to justify killing rather than prevent it. The Geneva conventions were created specifically to prevent senseless suffering and death".[53]

Last, there is the challenge that private actors pose from the point of view of attribution of responsibility. Article VI of the OST expresses that any act carried out by a non-governmental entity in outer space is imputable to the state as if it were its own, making the state directly responsible for such acts.[54] There are two aspects that warrant a short comment. One is the issue of commercial satellites becoming legitimate targets when used for intelligence-gathering in attack planning and the second one concerns the question whether Article VI could implicate states in violations of *jus ad bellum* rules with respect to activities of non-governmental entities in outer space.

51 Von Bonsdorff, footnote 9, 69.

52 Open-ended working group on reducing space threats through norms, rules and principles of responsible behaviours, threats to the security of space activities and systems, UNODA (12 September 2022), A/AC.294/2022/WP.16 (12 Sep. 2022).

53 Speech given by Mirjana Spojaric, president of the International Committee of the Red Cross, on 18 August 2025 in Bangkok, Thailand and the 11th HRH Princess Maha Chakri Sirindhorn Lecture on International Humanitarian Law; https://www.icrc.org/en/statement/ihl-only-as-strong-as-leaders-will-uphold-it.

54 The OST's regulation is a unique development in public international law in that it differentiates itself from the regime of state responsibility applicable on Earth. The way many states implement their Art. VI responsibilities is through the enactment of national laws and regulations. Pobjie & Azcárate Ortega, footnote 6, 27.

Commercial satellites being used for intelligence-gathering is not a mere academic question as many nations, including the US, are using commercial satellite imagery in their defense enterprise.[55] According to Schmitt and Tinkler the US position in this regard is that the law of war treaties and the customary law of war are understood to regulate the conduct of hostilities, regardless of where they are conducted, which would include the conduct of hostilities in outer space.[56] They also point out that this is the ICRC's view as well, so that the law of armed conflict "applies to any military operations conducted as part of an armed conflict, including those occurring in outer space". [57] Hence, when commercial assets are used for military purposes, they become legitimate targets. Whether nations are likely to discriminate between military satellites and commercial satellites providing services to the government in the event of conflict is another open question.[58]

Another issue is the attributability of a commercial actor's acts to the state, making the latter party to the armed conflict. In Ukraine, due to Russian attacks on Ukrainian telecommunications infrastructure, Elon Musk offered Ukraine internet services through his constellation of 2,400 SpaceX Starlink satellites positioned in low Earth orbit and launched from the US. SpaceX made its highly effective services available first to the Ukrainian armed forces and emergency services, and then to the wider populace. Tara Brown discusses the Starlink case in detail, concluding, indeed, that the fact that the US bears international responsibility for the actions of commercial providers operating from within its jurisdiction under Article VI of the OST means that Musk's provision of Starlink services to Ukraine is attributable to the United States.[59] The subsequent question was, then, whether the traditional law of neutrality, under which the US assumes neutral obligation to abstain from providing material support to belligerent parties, was breached.

55 Dunlap, Charlie, J.D. (2021). "Are commercial satellites used for intelligence-gathering in attack planning targetable?" *Lawfire* 5 March. https://sites.duke.edu/lawfire/2021/03/05/are-commercial-satellites-used-for-intelligence-gathering-in-attack-planning-targetable/.

56 Schmitt, Michael and Tinkler, Kieran (2020). "War in Space: How International Humanitarian Law Might Apply. The Woomera Manual Project – Part 3." *Just Security* March 9. https://www.justsecurity.org/68906/war-in-space-how-international-humanitarian-law-might-apply/.

57 *Ibid*.

58 Colin Clark & Theresa Hitchens. 2019. "Commercial Satellites: Will They Be Military Targets?" *Breaking Defense* July 16. https://breakingdefense.com/2019/07/commercial-satellites-will-they-be-military-targets/.

59 Brown, Tara. 2022. "Ukraine Symposium – The Risk Of Commercial Actors In Outer Space Drawing States Into Armed Conflict." *Articles of War* Jul 8. https://lieber.westpoint.edu/commercial-actors-outer-space-armed-conflict/.

The response to this question warrants a complex review of concepts of traditional and qualified neutrality, exemptions thereto, as well as questions of co-belligerency.[60] According to Brown's analysis, the mere provision of enduring internet and communication services would not make the US a party, as facilitating the service does not demonstrate the intent to contribute to specific conduct of hostility operations.[61] The conclusion that follows is that the implication of states in an armed conflict would seem to depend on the degree of connection between the support and specific conduct of hostility operations and whether the actions of the commercial operator are under the "overall control" of the state.

6. Conclusions

As the above discussion shows, there are complex issues at play when deciphering the applicability of rules *jus ad bellum* and *jus in bello* in outer space. Even if space security debates at the UN level stall, there is no reason for states and private companies operating in space not to engage in clarifying the current interpretation of the rules governing the outer space environment. Soft law instruments are perfectly valid, and realistic, tools in such an enterprise. There is some urgency to such discussions too, concerning the breathtaking speed of counterspace capabilities, innovation and, at the same time, the erosion of arms control regulating the WMD. For instance, the development of first-strike capabilities has already obliged states to adopt an anticipatory stance instead of waiting for an armed attack prescribed by Art. 51 of the UN Charter. Technological advances may tip the balance in favor of pre-emptive action, so far not favored by states due to the high risks involved. It is for states and companies operating in space to assume a more proactive and innovative role in promoting space as a clear normative environment for the benefit of everyone.

60 For further reading, see for instance Nasu, Hitoshi. (2022). "Targeting A Satellite: Contrasting Considerations between the Jus ad Bellum and the Jus in Bello." *99 INT'L L. STUD.* 142:143–179; Schmitt, Michael N. 2022. "Providing Arms And Materiel To Ukraine: Neutrality, Co-Belligerency, And The Use Of Force." *Articles of War* Mar 7. https://lieber.westpoint.edu/ukraine-neutrality-co-belligerency-use-of-force/ and Gill, Terry D. 2022. "A Ukraine No-Fly Zone: Further Thoughts On Law And Policy." *Articles of War* Mar 23. https://lieber.westpoint.edu/a-ukraine-no-fly-zone-further-thoughts-on-law-and-policy/.

61 Brown, footnote 58.