IMPLEMENTATION OF NATO'S SPACE POLICY – FUNDAMENTAL LEGAL ISSUES

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Abstract: *NATO is looking at how to implement, in practice, its December 2019 declaration of space as an operational domain. As part of this effort, Allies will be reflecting on various policy and legal issues, including the applicability of the Washington Treaty's Article 5 and questions surrounding the attribution of hostile acts in space. The unique characteristics of outer space present potential challenges for the application of some of NATO's traditional principles. Questions remain outstanding on how collective self-defence might be invoked in the event of a hostile space activity that impacts one or more Allies. In addition, difficulties attributing hostile space acts, similar to those that exist in the cyber domain, present real challenges for a strong, coordinated Alliance response according to existed international law.*

Keywords: *NATO, article 5, outer space, use of force, armed attack, self-defence, cyberspace*

INTRODUCTION

The militarization of space has in the last few years become one of the most substiantal question concerning activites of states in space. In line with that, NATO has taken a renewed interest in space.[1] Following that, in June 2019 NATO Overarching Space Policy was adopted by NATO defence ministers. The main reason for NATO's "renewed interest in space" is the threat that adversaries can use space capabilities to track NATO and Allies forces. Various types of malicious activity, such as jamming of GPS signal, or non-kinetic or high-end kinetic capabilities can produce irreversible signals. Therefore, space assets are at risk. Furthemore, these capabilities can be developed by state actors, which can develop for instance counter-space and anti-satellite systems. However, we should not neglect the possibility of malicious terrorist activity, mainly due to the reason that terrorists operate in the cyber domain.

These security issues were furthermore specified in the Political–Military Advice on the further implementation of NATO's Overarching Space Policy. According to parag. 28 of the Political-Military Advice, *"secure access to space services is essential for the conduct of the Alliance operations."* Therefore, an Ally may request consultation on any threat, or attack, or malicious activity against its space systems. This represents a shift not just towards security in outer space in general, but also towards more closer cooperation between NATO member states with regard to the security of their space systems.

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[1] SARI, A. NATO In Outer Space: A Domain Too Far? In: *Lieber Institute West Point* [online]. 17. 3. 2023 [2020-10-01]. Available at: <https://lieber.westpoint.edu/nato-outer-space/>.

Following that, on Wednesday, November 20, 2019 NATO foreign ministers have for the first time formally declared space an operational domain. From now on, "outer space" has the same status as air, land, sea and cyberspace.[2] This declaration also represents that space is increasingly important to the Alliance and Allies security.[3] This can be understood in such a way that NATO, as an international govermental organization, depends in an important way on space systems. This includes, for instance, risks and threats in space, but also satellite communications, which are essential for providing security, specially during the current Russian aggression in Ukraine. As a result, specific concepts concerning security-related issues are required. These would have to take into consideration issues connected to space control, counterspace capabilities and use of force in space, namely within crisis situations, where immediate action is required. In addition, space should also feature more consistently in NATO's exercises, including a possible loss of access to space services, which can be crucial for Alliance security. Besides that, other aspects have to be taken into consideration. Namely, declaring space an operational domain should include a roadmap and provide political and military advice on the NATO Military Authorities Initial Implementation Plan. Following that, the implementation of space as an operational domain should address that there are many challenges for NATO to conduct operations from the baseline.

Furthermore, declaring space as an operational domain confirms that Allies retain jurisdictional control over their objects in space, as well as sovereignity over space capabilities.

Last but not least, from a military and operational point of view, the most important change resulting from the declaration of space as an operational domain is that NATO will extend the joint planning and execution functions to the space domain. As a result, this will enable the coordination of space activities across the space domain. Subsequently, and in line with that, NATO should consider establishing formal agreements between Allies and NATO on improving mechanism for the exchange of space data.[4] During our research, we asked the ChatGPT artificial intelligence system whether it is possible to apply the North Atlantic Treaty in outer space with the following conclusion:[5] *"While the North Atlantic Treaty does not currently apply directly to outer space, NATO's evolving stance on space as an operational domain suggests the potential for future policy shifts. However, any formal application of the treaty in space would likely require legal adjustments and agreements among NATO members, as well as consideration of international space law."* Our main goal is to confirm or refute this conclusion with the following analysis.

[2] At the Leaders' Meeting in London, December 2019, NATO Leaders stated in their declaration: *"We have declared space an operational domain for NATO, recognising its importance in keeping us safe and tackling security challenges, while upholding international law."* NATO's approach to space. North Atlantic Treaty Organisation. In: *NATO* [online]. 16. 3. 2023 [2020-10-23]. Available at: <https://www.nato.int/cps/en/natohq/topics_175419.htm>.

[3] Supra nt. 1.

[4] NEWMAN, C. J., ZELLNER, M. G. 'Heavens Open' – The Need for Increased Data from Space and Creating a Duty to Share that Data. *NATO Legal Gazette*. 2021, No. 42, p. 205.

[5] ChatGPT 3.0, "Is it possible to apply the North Atlantic Treaty in Outer Space?" 17. 3. 2023.

I. LEGAL IMPLICATIONS

This political declaration has, besides the above-mentioned political aspects, legal implications. Although space assets and services have been essential to military and security-related operations for a long, they have remained only as supportive of conflicts fought on Earth.[6]

I.1 Use of force and collective self-defence

However, by declaring outer space as an operational domain, legal questions concerning "pivotal" Article 5 of the North Atlantic Treaty (hereinafter also as "NAT") on collective self-defence of individual member States emerge. The right to use force in collective self-defence that is reflected in Article 51 of the UN Charter derives from customary international law. This right applies as equally in outer space as it does on Earth due to the lex specialis of space law.[7] It is likely that the inherent customary international legal right to collective self-defence as reflected in Article 51 of the UN Charter would provide a legal means to for NATO Allies to lawfully use force even if such recourse in the context of Article 5 of the Washington Treaty were unavailable.[8] This is important because Article 51 does not contain the same territorial restrictions as Article 5. In theory, then, recourse to collective self-defence as recognized in Article 51 might arise even where the initiation, the target[9] and the effects of an attack all take place entirely in outer space. Hypothetically, one might imagine an anti-satellite weapon housed on a space asset that is used to destroy another satellite. Better suited to our analysis is another scenario, one less difficult to imagine, that of a ground-based armed attack on an Ally's space system, such as via anti-satellite weapon. Subject to 1) qualification of the attack as an 'armed attack' (see below); 2) successful attribution to the perpetrator (see below); and 3) a demonstration that the satellite in question 'belonged' to the State invoking self-defence, a persuasive argument could be made that such an attack would trigger a right to use force in collective self-defence under the UN Charter. While it has not yet been tested in court, a potentially tricky legal issue in the outer space domain would involve the interpretation of the formulation in Article 51 of "against a member". In other words, in a domain where many State space assets are commercially owned, how do you establish linkages sufficient that an attack against a space

[6] According to Larry Greenemeier's article, the 1991 Gulf War was the first "Space war". GREENEMEIER, L. GPS and the World's First Space War. In: *SciAm* [online]. 25. 3. 2023 [2016-02-08]. Available at: <https://www.scientificamerican.com/article/gps-and-the-world-s-first-space-war/>.

[7] *Lex specialis* is a doctrine which states that if two laws govern the same factual situation, a law governing a specific subject matter (*lex specialis*) will take precedence over a law governing only general international law. However, there is no contradiction between space law treaties and the UN Charter regarding the use of force and armed attacks. In addition, it is worth noting that UN Charter Article 103 provides specifically that where there is a conflict between Charter obligations and obligations under other international agreements, UN Charter obligations prevail.

[8] The other conditions of UN Charter Article 51 would, however, also need to be met. These include that the state victim of an armed attack would need to notify the UN Security Council, and that the self-defence measures cease once the Security Council had "taken the measures necessary to maintain international peace and security". Importantly, the attack would also need to constitute an 'armed attack'.

[9] PRATZNER, P. R. The Current Targeting Process. In: Paul A. L. Ducheine – Michael N. Schmitt – Frans P.B. Osinga (eds.). *Targeting: The Challenges of Modern Warfare*. The Hague: T.M.C. Asser Press, 2016, p. 79.

asset is considered an attack against the Member State itself? This assessment will be primarily fact-based. For instance, establishing a connection should consider the ownership and registration of the space asset. However, given that ownership is often completely unlinked from its registration location,[10] the assessment should also take into account the purpose of the asset and by whom it is operated. All in all, the more evident it is that the space asset Fis operated and owned entirely by a commercial entity (irrespective of where they were registered), the more challenging it will be for a State to lawfully use force in self-defence of that asset. This is a highly evolving area, however, and in this author's view, for example, it is possible for a State to make a convincing case of lawful use of force in self-defence of an armed attack on a commercially-owned (a priori for multi-purpose) satellite which clearly has a significant state or military impact. All of this raises interesting implications for the international registration regime and current commercial realities in the satellite sector, which might be usefully unpacked in another context.

I.1.1 Application of the Article 5 of NAT

So, the most substiantal question concerning the Article 5 of the NAT, also called as *"mutual assistance clause"*, is whether the Article 5 may apply in outer space.[11] As a consequence, would that mean that if an armed attack against one or more of the parties in Europe or North America occurs in outer space, could "joint military actions" in outer space be legitimized?[12] In order to answer this question, one must elaborate on what international law says.

Unfortunately, there is no "special" body of law answering specific questions related to military operations in or from outer space. The reason is that two distinct bodies of law are relevant in this context, namely "space law", regulating activities of states in space, and the law on the use of force, also called as *"ius ad bellum"*, which has its legal basis in the U.N. Charter.

The main principles and rules regulating outer space stem from the Outer Space Treaty,[13] and three further treaties[14] elaborate specific aspects of that Treaty. These core treaties provide the main rules regulating outer space. The most fundamental principle based on these core treaties is the principle of *non-appropriation* in outer space, also called as the *Grundnorm* of International Space law.[15]

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[10] Under the Convention on Registration of Objects Launched into Outer Space, Article II, registration of a space object is done by the launching state, many of which offer commercial launching services for other states and/or commercial entities.

[11] Supra nt. 1.

[12] VON DER DUNK, F. G. Armed Conflicts in Outer Space: Which Law Applies? *International Law Studies*. 2021, Vol. 97, pp. 188–189.

[13] The Outer Space Treaty, officially titled as *"Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies"*, entered into force in October 1967. The Outer Space Treaty provides the basic framework on international space law. In: *United Nations Office for Outer Space Affairs* [online]. 17. 4. 2023 [2024-10-06]. Available at: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>

[14] These are the 1968 Rescue Agreement *(Agreement on the Rescue of Astronauts and the Return of Objects Launched in Outer Space)*, the 1972 Liability Convention *(Convention on International Liability for Damage Caused by Space Objects)* and the 1975 Registration Convention *(Convention on Registration of Objects Launched into Outer Space)*. VON DER DUNK, F. G. supra nt. 12, p. 194.

I.1.2 Territorial application

According to this principle, outer space is an area where territorial sovereignity or other form of national appropriation is prohibited.[16] This fact has several legal implications. Based on that, there is a clear prohibition on establishing military bases and undertaking military activities on the Moon and other celestial bodies, including stationing or orbiting weapons of mass desctruction in outer space.[17] Therefore, even though *ius in bello* has put limitations on the use of the territory of a neutral state by the belligerent parties, outer space cannot be regarded as a territory of State.[18] Therefore, it cannot also be regarded as a territory of a neutral state.

Besides, these questions are also relevant for the questions concerning especially the Articles 5 and 6 of the NAT. According to Article 6, *"for the purpose of Article 5, an armed attack on one or more of the Parties is deemed to include an armed attack:*

- *on the territory of any of the Parties in Europe or North America, on the Algerian Departments of France, on the territory of Turkey or on the Islands under the jurisdiction of any of the Parties in the North Atlantic area north of the Tropic of Cancer;*
- *on the forces, vessels, or aircraft of any of the Parties, when in or over these territories or any other area in Europe in which occupation forces of any of the Parties were stationed on the date when the Treaty entered into force or the Mediterranean Sea or the North Atlantic area north of the Tropic of Cancer."*

The first subparagraph of Article 6 concerns questions related to attacks on allied territory. With regard to the armed attacks on allied territory, space and celestial bodies are not capable to fall under the term "allied territory" due to above mentioned principle of *non-appropriation*, according to which outer space is not capable of "national appropriation". In addition to that, they cannot qualify as "islands" within the meaning of the law of the sea.[19] This does not, however, exclude the possibility that attacks *from space* into the territory of NATO member countries fall under the scope of the Article 5 of the NAT. The Article 6 "excludes" only armed attacks launched against objects or assets of Allies in space, including anti-satellite attacks. Article 6 of the NAT therefore seems to put geographical restrictions on the possibility that an armed attack on Ally's object in space could constitute an armed attack for the purpose of the Article 5 of the NAT. From this point of view, recourse to Article 5 remains limited. Furthermore, a possible extension of the scope of Article 6 also seems inappropriate.

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[15] According to Zachos A. Paliouras, the non-appropriation principle, promulgated in the Outer Space Treaty, has *"manifestly and explicitly eliminated the acquisition of sovereignity in outer space"*. PALIOURAS, Z. A. The Non-Appropriation Principle: The Grundnorm of International Space Law. *Leiden Journal of International Law*. 2014, Vol. 27, No. 1, p. 42. In: *Cambridge University Press* [online]. [2023-03-19]. Available at: <https://www.cambridge.org/core/journals/leiden-journal-of-international-law/article/abs/nonappropriation-principle-the-grundnorm-of-international-space-law/8AD09DA3D3B31AA7E9D87C8829C96464>.

[16] VON DER DUNK, F. G. supra nt 12.

[17] Ibid., supra nt. 12. p. 200.

[18] Ibid, supra nt. 12, p. 213.

[19] According to Article 121 of the United Nations Convention on the Law of the Sea, *"an island is a naturally formed area of land, surrounded by water, which is above water at high tide."* United Nations Convention on the Law of the Sea. Part VII. Regime of Islands. *Article 121. Regime of Islands*. 18. In: *un.org* [online]. [2024-10-06]. Available at: <https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf>.

Besides that, however, a more detailed analysis has to be taken. This relates to the second sub-paragraph of Article 6, which deals with attacks against *"forces, vessels, or aircraft of any of the Parties"*, when they are *in* or *over* the territories of the Allies. So, the question is, whether space objects fall within the second limb of Article 6 of the NAT, namely if they can be qualified as *„forces, vessels, or aircrafts of any of the Parties"*?

With regard to "vessels", "vessels" are incorporated in the definition of a "ship" within the International Convention for the Prevention of Pollution from Ships. In Article 2, paragraph 4 "ship" means a *"a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms."*[20] It follows that space objects, including "space vehicles" are from this definition excluded.[21] This is even in case that some space objects or spacecrafts in the end land on water.[22]

The next term to analyze is "aircraft", which is defined in Annex 7 of the Chicago Convention on International Civil Aviation as *"any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface."* However, from the Background paper prepared by the Secretariat *"The Question of the Definition and/or the Delimitation of Outer Space"* follows that vehicles above the Earth's atmosphere cannot longer be regarded as aircrafts.[23]

The last term concerns "forces". In this context the NATO Status of Forces Agreement (SOFA),[24] Article 1, I. a. is of special relevance, because it provides a definition of a "force".[25] Therefore, any land, naval or air forces that are going to be engaged in some form of specific space operations fall within the definition of the force for the purpose of Article 6 of the NAT.[26] Another question to ask would be if under the term "forces" other than land, naval, or air forces would fall. Should they also include space forces, such as the U.S. Space Force (USSF), which is the newest branch of the Armed Forces of the United States?[27] Even if we would assume that these specific space forces would be

[20] International Convention for the Prevention of Pollution from Ships. 1973. United Nations Treaty Series. In: *treaties.un.org* [online]. 18. 2. 2024 [2024-10-06]. Available at: <https://treaties.un.org/doc/Publication/UNTS/Volume%201340/volume-1340-A-22484-English.pdf>.

[21] SARI, A. supra nt. 2,. According to Frans G. von der Dunk, the drafters of the Outer Space Treaty made a conscious decision not to use the word "nationality" for properly registered space objects. This fact supposes that the status of space object is not entirely similar to that of a ship or an aircraft. VON DER DUNK, F. G. supra nt. 12, p. 197.

[22] Supra nt. 1.

[23] This is especially stressed in the part III., C. Demarcation based on the maximum altitude of aircraft flight (theory of navigable air space). United Nations General Assembly. In: *United Nations General Assembly* [online]. 21. 1. 1977 [2024-10-06]. Available at: <https://www.unoosa.org/pdf/limited/c2/AC105_C2_L007Add01E.pdf>.

[24] COOPER, C. G. From preparing for war to protecting the peace – legal hurdles for effectively dealing with hybrid threats in NATO. *The Military Law and the Law of War Review*. 2021, Vol. 59, No. 2, p. 159.

[25] According to Article I., 1.In this Agreement the expression a. *"force" means the personnel belonging to the land, sea or air armed services of one Contracting Party when in the territory of another Contracting Party in the North Atlantic Treaty area in connexion with their official duties, units or formations shall not be regarded as constituting or included in a "force" for the purpose of the present Agreement.* Agreement between the Parties to the North Atlantic Treaty regarding the Status of their Forces. 19. Jun. 1951. North Atlantic Treaty Organisation. In: *NATO* [online]. 19. 1. 1951 [2024-10-06]. Available at: <https://www.nato.int/cps/en/natohq/official_texts_17265.htm?>.

[26] Supra nt. 1.

[27] United States Space Force. About the Space Force. In: *United States Space Force* [online]. [2024-10-06]. Available at: <https://www.spaceforce.mil/About-Us/About-Space-Force/>.

covered under the term "force", Article 5 could be engaged when the attacks against these forces and their assets would have to be located over any of the territories defined in Article 6. However, as was mentioned above, Article 6 puts geographical limitations on the scope under which Article 5 can be invoked. Article 6 seems to be, from this point of view, not applicable. Consequently, one should ask what does this mean for NATO? Are there steps that Allies could take in order to change this assessment? Could some form of internal or public declaratory statement, even if done by all NATO member states, be sufficient to clarify the interpretation of the existing provisions, in accordance with the law of treaties?

I.1.3 Partial conclusion

This option could be, in accordance with the provisions of the Vienna Convention on the Law of Treaties, definitely taken into account. The Allies could make a formal declaration that they are ready to counter armed attacks on allied space objects. This would subsequently mean, that they could counter these attacks as part of NATO's collective self-defence. This would be no exceptional and extraordinary case, because much in the same way it was done in relation to cyber attacks.[28] Besides that, such an interpretative decla-

[28] This was made clear for instance in article by NATO Secretary General Jens Stoltenberg, published in Prospect's new cyber resilience supplement, according to which *"For NATO, a serious cyberattack could trigger Article 5 of our founding treaty. This is our collective defence commitment where an attack against one ally is trated as an attack against all"* In: *NATO* [online]. [2024-10-06]. Available at: <www.nato.int/cps/en/natohq/news_168435.htm?selectedLocale=en.>.
Furthermore, according to Rule 13 – Self-Defence Against Armed Attack: *"A State that is the target of a cyber operation that rises to the level of an armed attack may exercise its inherent right of self- defence. Whether a cyber operation constitutes an armed attack depends on its scale and effects."* SCHMITT, M. N. *Talinn Manual on the International Law Applicable to Cyber warfare.* Prepared by the International Group of Experts at the Invitation of the NATO Cooperative Cyber Defence Centre of Excellence. Cambridge: Cambridge University Press, 2013, p. 54. In: *Peace Palace Library* [online]. [2024-10-06]. Available at: <https://www.peacepalacelibrary.nl/ebooks/files/356296245.pdf>.
According to Treaty Handbook, *"a state may make a declaration about its understanding of a matter contained in the interpretation of a particular provision in a treaty. Interpretive declarations of this kind, unlike reservations, do not purport to exclude or modify the legal effects of a treaty. The purpose of an interpretative declaration is to clarify the meaning of certain provisions or of the entire treaty."* Treaty Handbook. Prepared by the Treaty Section of Office of Legal Affairs. United Nations. 2006. p. 16. In: *Treaty Section of the Office of Legal Affairs* [online]. [2024-10-06]. Available at: <https://www.cbd.int/abs/doc/treatyhandbook_en.pdf>.
Following a statement by the French Representative, the Council notes that insofar as the former Algerian Departments of France are concerned, the relevant clauses of the North Atlantic Treaty became inapplicable as of 3 July 1962. 16. Jan 1963. North Atlantic Treaty Organization. In: *NATO* [online]. [2024-10-06]. Available at: <https://www.nato.int/cps/en/natohq/news_26599.htm?selectedLocale=en>. *attack against all."* STOLTENBERG, J. NATO will defend itself. The alliance will guard its cyber domain – and invoke collective defence if required. Prospect. Cyber Resilience. October 2019. Check also the statement by the NATO Secretary-General: *"A serious cyberattack could trigger Article 5, where an attack against one ally is treated as an attack against all."* In: *NATO* [online]. [2024-10-06]. Available at: <https://www.nato.int/cps/en/natohq/news_168435.htm?selectedLocale=en.>. Furthermore, according to Rule 13 – Self-Defence Against Armed Attack: *"A State that is the target of a cyber operation that rises to the level of an armed attack may exercise its inherent right of self- defence. Whether a cyber operation constitutes an armed attack depends on its scale and effects."* SCHMITT, M. N. *Talinn Manual on the International Law Applicable to Cyber warfare.* Prepared by the International Group of Experts at the Invitation of the NATO Cooperative Cyber Defence Centre of Excellence. Cambridge: Cambridge University Press, 2013, p. 54. In: *Peace Palace Library* [online]. [2024-10-06]. Available at:<https://www.peacepalacelibrary.nl/ebooks/files/356296245.pdf>.

ration[29] was issued, when due to Algeria's independence in 1962 the clauses of the North Atlantic Treaty concerning the Algerian Departments of France had become inapplicable.[30] Issuing an interpretative declaration by Allies could therefore clarify the exact meaning of Articles 5 and 6 of the NAT with regard to threats or use of force in outer space.

I.2 Armed attack

However, apart from the above mentioned, another possibility has to be taken into consideration, namely if an attack on Ally's space object could at least constitute an armed attack for the purposes of Article 5 and 6 NAT by virtue of having effects of sufficient scale on the territory of an Ally? In order to assert a State's inherent legal right to use force in self-defence, (irrespective of whether it is asserted in the context of Article 5) the attack must constitute an 'armed attack'.[31] Not every act of violence will constitute an armed attack. It is clear that before an 'armed attack' can be identified as such, there needs to have occurred a 'use of force'.[32] A 'use of force' in a conventional setting is typically determined by the intent and capabilities of its author. The second constitutive element of an 'armed attack' is the *'animus aggressionis*'. This element does not refer to any particular motives, but presupposes that territorial incursions have been carried out with a general 'hostile intent', and/or that armed force has deliberately been used to cause loss of life or property destruction.[33] However, this is not easily transposed to a space (and cyber) context, where the consequences of an action are often unpredictable. This is where the method developed in the Tallinn Manual on the International Law Applicable to Cyber Warfare (further as *"Tallinn Manual"*)[34] for assessing uses of force during cyber warfare becomes useful as well in a space context. This approach assesses a potential 'use of force' using a 'scale and effects' analysis of the action. While somewhat controversial, the current state of international law is that the effects of a space action are more important than intent, so as not to

[29] According to Treaty Handbook, *"a state may make a declaration about its understanding of a matter contained in the interpretation of a particular provision in a treaty. Interpretive declarations of this kind, unlike reservations, do not purport to exclude or modify the legal effects of a treaty. The purpose of an interpretative declaration is to clarify the meaning of certain provisions or of the entire treaty."* Treaty Handbook. Prepared by the Treaty Section of Office of Legal Affairs. United Nations. 2006. p. 16. In: *Treaty Section of the Office of Legal Affairs* [online]. [2024-10-06]. Available at: <https://www.cbd.int/abs/doc/treatyhandbook_en.pdf>.

[30] Following a statement by the French Representative, the Council notes that insofar as the former Algerian Departments of France are concerned, the relevant clauses of the North Atlantic Treaty became inapplicable as of 3 July 1962. 16. Jan 1963. North Atlantic Treaty Organization. In: *NATO* [online]. 16. 1. 1963 [2024-10-06]. Available at: <https://www.nato.int/cps/en/natohq/news_26599.htm?selectedLocale=en>.

[31] For the purposes of this analysis, we have not deemed it necessary to delve into the distinction between 'actual' and 'imminent' armed attack, and the self-defence options that flow from these.

[32] Distinguishing between the two also determines which response options are available to you in your self-defence. For instance, if it is determined that an actor has used force in a manner that is incompatible with the UN Charter (prohibited use of force), you can legally use countermeasures in response. If, however, you can demonstrate neither, your recourse is limited to retorsion and/or diplomatic outreach.

[33] RUYS, Tom. *"Armed attack" and Article 51 of the UN Charte:customary law and practice*. Cambridge: Cambridge University Press, 2010, p. 177.

[34] The Tallinn Manual is a renowned study on how international law applies to cyber warfare and provides useful criteria in applying it to 'grey zone' domains. It considers a cyber-operation to rise to the level of a use of force when its scale and effects are comparable to non-cyber operations rising to the level of a use of force. The phrase 'scale and effects' is from the ICJ's Nicaragua case. See also Oil Platforms Case (ICJ) for more on this 'gravity threshold'.

let actors (whether hostile or not) off the hook for unintended, yet serious, consequences of their space actions. For instance, actions taken against space systems can not only affect the space system itself, but impact critical services provided by the system, which could have serious effects in space and on Earth. All of these should be considered in the assessment of whether or not a 'use of force' has occurred, and whether or not it rises to the threshold of an 'armed attack', such that Article 5 and/or Article 51 can be triggered. An armed attack can be a single significant use of force, lasting only a limited time. There is also emerging recognition that a series of actions that individually are not sufficiently severe to amount to an armed attack, could cumulatively cross that threshold, if conducted by the same author and sufficiently connected geographically and temporally. Guidance as to what constitutes an armed attack can be found in the court rulings of the International Court of Justice (ICJ).[35] In Nicaragua, the ICJ held that only "the most grave forms of the use of force" constitute an armed attack.[36] Thus, although an armed attack presumes the use of force, not all prohibited uses of force in the sense of Art. 2 (4) UNC constitute armed attacks.[37] The ICJ found that only uses of force of a significant scale and effect constitute an armed attack.[38] Assessing whether the scale and effects of an attack on a space asset or service are grave enough to consider it an armed attack is a consideration taken in the framework of international law. This consideration is not left to the discretion of the State victim of such an attack on space assets/services, but needs to be comprehensibly reported to the international community, i.e. the UN Security Council, according to Art. 51 UNC. Given the insidious nature of many space-based hostile interferences, and their increase in frequency, this is an area of jurisprudence we should expect to grow substantially in the coming years. This assumption follows the logic which is applied in connection with the cyber domain. In the cyber domain a way forward has been proposed by *Tallinn Manual* experts that might prove useful in an outer space context. It is premised on the assumption that the law seeks to avoid particular deleterious consequences or achieve positive ones. It is argued therefore that there is a right of States to use force against an armed attack when they face consequences severe enough to merit displacing the prohibition on the use of force. By this reasoning, an armed attack against a space system can be interpreted to include any acts that result in consequences equivalent to those caused by kinetic actions originally envisioned in the term 'armed attack'.[39] Those consequences would likely include any action that causes death or injury (including illness and severe

[35] Military and Paramilitary and Paramilitary Activities in and against Nicaragua (Nicaragua v USA) [Nicaragua], ICJ Reports (1986) 14; Iranian Oil Platforms (Iran v USA), ICJ Reports (2003) 161; Armed Activities on the Territory of the Congo (DRC v Uganda), ICJ Reports (2005) 201.

[36] Nicaragua, supra, at para. 191.

[37] Some States argue that every use of force amounts to an armed attack, only the response differs to meet the requirement of necessity and proportionality, see US DoD Manual, para. 16.3.3.1.

[38] Nicaragua, supra, at para 195; effects relates to consequences while scale takes into account magnitude and intensity of the attack. Hence, space activities with reversible, short-term effects not leading to any damage or injury but only inconveniences or irritations do not constitute an armed attack. Space activities that consequentially cause death or injury to persons, or significant damage to, or even the destruction of, objects of another State, for example, the destruction of a military satellite of another State with an ASAT weapon, could constitute an armed attack.

[39] SCHMITT, M. N. 'Attack' as a Term of Art in International Law: The Cyber Operations Context' (Presentation delivered at the 4th International Conference on Cyber Conflict, Tallinn, 2012).

suffering) to individuals or damage or destruction of objects. For example, where the disruption or disabling of multiple global navigation satellites, affecting navigation services for aircraft or ships, could put lives and property at risk, it would likely amount to an 'armed attack'. For the moment, the creation of debris[40] does not appear to constitute, on its own, a sufficient 'kinetic' consequence to qualify a satellite's destruction (whether owned by the perpetrator or not) as an 'armed attack', but this is a quickly evolving area of the law. In particular, it could change as debris mitigation efforts take shape in a UN context.[41] Although the UN Guidelines on Space Debris Mitigation are non-binding, they are increasingly being incorporated into State practice, not only from a regulatory perspective in relation to licensing domestic space systems, but also in the operating procedures of militaries.[42] These Guidelines are not only non-legally binding but also not related to use of force. According to paragraph 72 of the Wales Summit Declaration, *"cyber attacks can reach a threshold that threatens national and Euro-Atlantic prosperity, security and stability."* Wales Summit Declaration therefore confirms that certain attacks, in this case cyber attacks, are able to have effects of sufficient scale on the territory of an Ally. The same logic could be applied with regard to attacks on space objects, which would end up by having effects on Earth.

I.2.1 Attribution

As a last point, questions concerning attribution of an attack to the State emerge. Attribution can be for the purpose of these issues divided into three spheres. Attribution is the action of regarding something as being caused by a person or thing. Three categories of attribution have been elaborated in doctrine: (a) technical attribution; (b) political attribution and (c) legal attribution. Although this is not a legal categorization, it is helpful to understand the different objectives of attribution, and in turn pinpoint where specific problems might arise, including for NATO, in an outer space context.

(a) Technical attribution: This refers to a factual and technical investigation into the possible perpetrators of a hostile space activity and the degree of certainty with which their identity can be established. In short, it means identifying the wrongdoer. In cyber and outer space domains, this can be especially challenging given how easily nefarious actors can disguise their actions. Confirming that a governmental entity originated a hybrid operation is complicated enough even when launched from governmental infrastructure, in particular given that such infrastructure may be highly susceptible to exploitation by Non-state actors (hereinafter also as "NSA"), including through cyber means. In addition, groups or individuals may intentionally 'spoof', that is to say try to create the impression that a particular State was behind the operation. Whether or not the results of the investigation into attribution are made public has no bearing on technical attribution. At its simplest, without tech-

[40] NATO SPACE HANDBOOK: Introduction to Space Support in NATO Operations. NATO Strategic Commands. Space Working Group, November 2021, p. 20.

[41] BOOTHBY, W. H. *Conflict Law: The Influence of New Weapons Technology, Human Rights and Emerging Actors.* The Hague: T.M.C. ASSER PRESS, 2014, p. 187.

[42] The UN Space Debris Mitigation Guidelines are a set of high-level principles accepted in June 2007 by The Committee on the Peaceful Uses of Outer Space (COPUOS) and endorsed by the United Nations in January 2008.

nical attribution, responses are hindered. For instance, if you do not know who the wrongdoer is, you cannot even take the first step of diplomatic engagement, much less other acts of retorsion.[43]

(b) Political attribution: Essentially, this is ascribing responsibility for an act. It is a policy consideration whereby the decision is made to attribute (publicly or discretely; collectively or individually) a specific hostile space activity to an actor (State or NSA) without necessarily attaching legal consequences to the State. This is the type of attribution that can serve an important deterrence function. The willingness to publicly 'name and shame' a hostile space actor can be a powerful political tool.

(c) Legal attribution: Legal attribution is a decision whereby the victim State attributes an act or an omission to a specific actor with the aim of holding them legally responsible for the violation of a legal obligation. For instance, countermeasures are only available when the precipitating breach is attributable to a State pursuant to the law of State responsibility.[44] There is no fixed standard at international law concerning the burden of proof that a State must meet for legal attribution. The law does not demand guaranteed certainty, but a 'sufficient degree' of certainty is required.[45] What counts as a sufficient degree of certainty is a purely legal question based on information gathered as part of the technical attribution. There is also no legal obligation requiring a State to publicly disclose the underlying information on which its decision to attribute hostile activity is based.[46] A key source of law in the area of attribution are The International Law Commission Draft Articles on Responsibility of States for Internationally Wrongful Acts (hereinafter also as „Draft Articles"). They require a State to bear responsibility at international law for its internationally wrongful acts,[47] and also for the acts of individuals or groups acting under its instruction, direction or control.[48] Legal attribution is an individual State responsibility, and as such, there is no 'collective' legal attribution, as there can be for political attribution (see (b) above). Similarly, while a wrongful political misattribution does not violate international law, acting on mistaken legal attribution (i.e. taking countermeasures) can in some circumstances. Given the attribution challenges that arise in hybrid contexts, as mentioned above, *Tallinn Manual* experts concluded that

[43] Retorsion is conventionally understood as meaning an unfriendly, albeit lawful, response to another State's action. Examples include economic sanctions and declaring foreign diplomats as persona non grata.

[44] Draft Articles. Countermeasures are conventionally understood as meaning an act (action or omission) that would normally be unlawful but for the fact that they are taken in response to another State's unlawful conduct. To note that there is also no 'in-kind' requirement for countermeasures; for instance, a space-based response could be used to address an unlawful cyber operation.

[45] This take on 'certainty' is not universal. It stems from an approach suggested by Judge Higgins in the ICJ's Oil Platforms case, albeit on an unrelated set of facts.

[46] To note that this view is not unanimous. However, it is the view of NATO Allies and is a principle listed in the Tallinn Manual 2.0. Of course, should an international tribunal ever be called upon to consider the issue, the production of such evidence may be required.

[47] Draft Articles, Articles 1-3.

[48] Draft Articles, Article 8. This is often referred to as 'effective control'. The precise parameters for this kind of attribution are vague, though some are outlined in the ICJ's Nicaragua case. For instance, offering financial assistance to the activities of an NSA conducting a hostile space-based activity would likely be insufficient to result in attribution, pursuant to Nicaragua.

"[t]he mere fact that a cyber-operation has been launched or otherwise originates from governmental cyber infrastructure is not sufficient evidence for attributing the operation to that State[,] [it] is an indication that the State in question is associated with the operation".[49] It is reasonable to expect that similar legal conclusions would be reached in the space domain.

I.2.2 Partial conclusion

Concerning the mentioned above, the main question is if the victim state can attribute an act to originator of this attack. Concerning this question, *Tallinn Manual* can be helpful again. According to the Rule 7. – *Cyber Operations Launched from Governmental Cyber Infrastructure, "the mere fact that a cyber operation has been launched or otherwise originates from governmental cyber infrastructure is not sufficient evidence for attributing the operation to that State but it is an indication that the State in question is associated with the operation."* This rule, however, denotes only the fact that in the case of cyber operation, mounted from the governmental infrastructure, the State was involved. However, as point 3. of Rule 7. further precises: *"In and of itself, the Rule does not serve as a legal basis for taking any action against the State involved or otherwise holding it responsible for the acts in question."*[50] From this point of view, the *Tallinn Manual* therefore proves that when an operation has been launched or originates from governmental infrastructure, it is not sufficient evidence for attributing the operation to the State.[51] The same conclusions could be drawn with regard to attribution of States to an unlawful attacks against NATO Member States in outer space. This is especially due to situations, when for instance government infrastucture has come under control of NSA, who would launch an armed attack from outer space against the territory of a NATO Member State. Would here the criterion of *effective control*, as aticulated in the Nicaragua Judgment, apply? These questions concerning attribution are not easy to answer, but there seems to be a legal tool, which could make it easier to detemine attribution of states with regard to objects in outer space. This legal tool for determining attribution concerns the requirement of States to register space objects they launched. This is especially articulated in Article VIII. of the Outer Space Treaty and Registration Convention. Registration allows easier identification of objects in outer space and can be helpful in determining responsibility for compliance with international space law and also in determining liability for damage caused by space objects.[52] Furthermore, according to Article VIII. *"A State Party to the Treaty on whose registry an object launched into outer space is carried shal retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body."* Following that, State Pary to the Treaty should retain jurisdiction and control over an object launched into outer space. Here, however, for the purpose of the current issue concerning the applicability of Articles 5 and 6 of the NAT, would be welcomed, if also the test of effective control would be considered. It would make easier the determination of responsibility and liability

[49] Supra, nt. 39.
[50] SCHMITT, M. N. *Talinn Manual on the International Law Applicable to Cyber Warfare.* supra nt. 28.
[51] VALUCH, J., BEDNÁR, D. *Armed Conflicts and Cyber Threats as Challenges for International Law in the 21st Century.* Bratislava: Wolters Kluwer SR, 2022, p. 175.
[52] VON DER DUNK, supra nt. 12.

of States in cases, which could not clearly be assessed at the first hand. Some space law experts hold the view that Article VI of the Outer Space Treaty contains *lex specialis* for legal attribution in the outer space context also regarding internationally wrongful acts for its States Parties. Article VI specifies that *"States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities"*. Article VI does not make a noticeable difference for the attribution of acts or omissions of State entities, but it would lower the threshold for the attribution of space activities of non-state actors significantly.[53] This view, however, raises a couple of questions especially regarding the definition of "national activities" and is not undisputed. It could be argued that reading Article VI as a whole and in the context of the Outer Space Treaty, Article VI is not aimed at regulating the responsibility for internationally wrongful acts and hence cannot constitute lex specialis vis-à-vis customary international law dealing with attribution as enshrined in the Draft Articles. A plain reading of Article VI in the context of the treaty itself leads to the conclusion that Article VI rather regulates a States obligation to authorise and supervise its national activities in outer space to assure that national activities are carried out in conformity with the Outer Space Treaty, hence regulating space activities appropriately. Therefore, a State will be responsible for failing to take the appropriate measures to control space activities under Article VI rather than for an internationally wrongful act in outer space carried out under its jurisdiction if taken all appropriate measures to supervise space activities. Whether the wrongful act itself is attributed to that State will be decided based on customary international law as stipulated above. It could furthermore be argued that international responsibility is the consequence of attribution, i.e. only if the space activity is attributable to a State in accordance with Articles 4-9 of Draft Articles a State is responsible for such activities according to Article VI of Outer Space Treaty.

CONCLUSION

Rapid development of space technologies preceded the adoption of the North Atlantic Treaty by more than eight years. The drafters of the North Atlantic Treaty definitely did not envisage its application to outer space.[54] However, this does not mean that the NAT cannot or will not be applicable to legal questions surrounding situations in outer space. This relates especially to armed attacks, which are in some way connected to outer space. The unique characteristics of outer space present potential challenges for the application of some of NATO's traditional principles. Questions remain outstanding on how collective self-defence might be invoked in the event of a hostile space activity that impacts one or

[53] This view will also lead to unforeseen and likely unintended consequences. E.g if a NSA in State A would carry out an armed attack on a space asset of State B from a platform in State C, the application of Aricle VI of Outer Space Treaty in this context would mean that the armed attack would be attributed to State A and State C, giving State B the right to self-defence against State A and C, even if State A and State C have taken all appropriate measures to supervise space activities on the territory and by their nationals and did not have any control over the NSA.

[54] Supra nt. 1.

more Allies. In addition, difficulties attributing hostile space acts, similar to those that exist in the cyber domain, present real challenges for a strong, coordinated Alliance response. Evaluating whether or not an 'armed attack' has occurred (for the purpose of permitting the use of force in self-defence) is very complex in a space setting. There are several additional considerations that merit mention prior to conclusion. First, the right of self-defence cannot be exercised by an NSA, since only States can avail themselves to the sovereign prerogative of national self-defence.[55] The assessment of an action against a space system must consequently consider whether the space system belongs to a State, is commercially owned and integral to a State's functioning or if it is simply a private company's system used for commercial purposes. Secondly, there is general acceptance that the meaning of 'armed attack' for the purposes of self-defence applies not only to an ongoing armed attack, but also to an 'imminent' armed attack. The concept of imminence is particularly important in space, where waiting to be struck first is perilous in terms of long-term consequences for States and for the space environment.[56] Thirdly, while the creation of debris may not qualify as the sole factor for determining whether or not an armed attack has occurred, it should be considered in assessing appropriate response options.[57] For instance, tribunals may frown upon a use of force taken in lawful self-defence that creates undue debris, particularly where other response options are feasible. Finally, it is important to note that not all States agree on the threshold for an armed attack. It is worth keeping this in mind, as it is these types of differences in legal interpretation might create delays for a coordinated Alliance self-defence in response to a hostile space act.

There is no doubt, that armed attacks emanating from outer space are covered by Article 5 of the NAT. These cases cover especially situations, when adversaries use space assets to carry out armed attacks on the territories of Allies. On the other hand, cases involving armed attacks on space objects, for instance on satellites in outer space, do not fall within the scope of Article 5 of the NAT. This is especially due to the reason that space assets are not located on the territories of the Allies. The only possibly, when under current wording the NAT, an armed attack on allied space objects would engage Article 5 is if the object falls under the definition of "force". The threshold for an 'armed attack' is also not defined among NATO Allies, which could cause challenges in reaching consensus in the exercise of collective self-defence. Furthermore, the attack would have to take place over the territories, as they are defined in Article 6 of the NAT. As was mentioned above, the Article 6 puts geographical limitations on its scope. However, there is still possibility to recourse to Article 51 of the UN Charter. This could eventually be possible, mainly because this famous article deals with situations involving "armed attacks", but does not put territorial restrictions on the exercise of collective self-defence. Article 51 of the UN Charter could therefore be invoked, if Article 5 of the North Atlantic Treaty would be inavailable. Besides and in connection with that, we have to ask if each State acting in collective self-

[55] A State may engage in self-defence against another State when a State directs an NSA or where an NSA that is an 'organized armed group' commits an armed attack against a State. See also the Draft Articles.

[56] For the purposes of this analysis, we have not delved into the criteria applicable to an imminence assessment for self-defence under international law.

[57] In all cases, the international law regime requires that measures taken in self-defence be necessary and proportionate – see ICJ's Nicaragua Case.

defence should make its own assessment of the armed attack to the responsible actor. Concerning this question, the rules on collective self-defence have to be shortly analyzed. Under the UN Charter, which is also reflecting customary international law, the right to collective self-defence authorizes a State or multiple States to come to the assistance of another State it it becomes victim of an armed conflict. However, the necessary condition for another State to come to the assistance in collective self-defence is that it must receive a request for such assitance from the victim State. The requirement that there is an imminent or an ongoing armed conflict must be fulfilled. Therefore, for a State to engage in collective self-defence of another State solely on the basis of its own assessment of the situation is not permissible. Precisely, there is no such rule in customary international law.[58] Besides that, this was also reflected in the *Nicaragua* case, where the Court ruled that a State may not exercise the right of collective self-defence merely *"on the basis of its own assessment of the situation."*[59] It would seem, then, that the Court and state practice both indicate that action in self-defence must be taken as a 'last resort' for it to be necessary.[60] However, Allies should dedicate their time to questions concerning scale and effects when assessing armed conflicts in outer space. Besides that, there is a need for a further discussion on legal questions concerning standards for attribution of a conduct of State in outer space.

To conclude, there is also a possibility to formally modify the North Atlantic Treaty, especially Article 5 and 6, in order to be able to respond to situations including armed attacks in space. However, this would also mean a significant expansion of NATO's collective defence responsibilities. Furthermore, we can state that the answer of the OpenAI ChatGPT to the posed research question is very close to the conclusion reached by our analysis.

[58] SCHMITT, M. N. *Talinn Manual on the International Law Applicable to Cyber Warfare.*
[59] DINSTEIN, Y. *War, Aggression and Self-Defence. Fifth Edition.* Cambridge: Cambridge University Press, 2012, p. 294. also ICJ's Nicaragua Case.
[60] GREEN, J. N. *The International Court of Justice and Self-Defence in International Law.* Portland: Hart Publishing, 2009, p. 80.