



Open-ended working group on reducing space threats through norms, rules and principles of responsible behaviours

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Reducing space threats through norms, rules and principles of responsible behaviours**Taking stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space**

Existing Legal and Regulatory Frameworks concerning threats arising from State behaviours with respect to outer space

Submitted by the United Nations Institute for Disarmament Research (UNIDIR)*

I. Introduction

1. The Open-Ended Working Group (OEWG) established under United Nations General Assembly resolution 76/231 on “Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviour” is mandated to, *inter alia*, “take stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space.”¹ In support of the work of the OEWG, this background paper aims to provide an overview of existing international legal and other normative measures of relevance to space security.

II. Existing outer space law

A. Treaties

2. There are five international treaties relating to outer space matters, as well as several principles and resolutions adopted by the United Nations General Assembly.² The most relevant to space security is the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial

* This document is submitted late due to circumstances beyond the submitter's control.

¹ General Assembly Resolution 76/231, 76th Sess. (24 December 2021) [hereinafter “Res. 76/231”], available online at <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F76%2F231&Language=E&DeviceType=Desktop>

² A compendium of all of these treaties, as well as principles and resolutions adopted by the United Nations General Assembly can be found online <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html>



Bodies (OST), which has 111 State parties and has been signed by an additional 23 States.³ While the OST does not focus primarily on space security, it nevertheless establishes a series of principles that constitute the basis for space law. It is therefore significant for the OEWG given its stated purpose to “take stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space.”⁴

3. As expressed in its preamble, under the OST, outer space shall be used for “peaceful purposes.”⁵ Furthermore, the articles of the OST include the following provisions:

Article I	Article I states that “the exploration and use of outer space, [...] shall be carried out for the benefit and in the interests of all countries, [...] and shall be the province of all [hu]mankind.” ⁶ The exploration and use of space and their benefits are to be enjoyed by all States, irrespective of whether they are spacefaring or not.
Article II	Article II prohibits the national appropriation of outer space, including celestial bodies.
Article III	Article III stipulates that States Parties to the Treaty “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.” From a space security perspective, this article is particularly relevant since it makes the prohibition of the use of force or threat of use of force enshrined in article 2(4) of the United Nations Charter, as well as other obligations under international law that directly relate to security matters, applicable in space.
Article IV	Under Article IV States Parties “undertake not to place in orbit around the Earth 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”. ⁷ The article also forbids “the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies”. The OST does not provide further clarification regarding the placement of other types of weapons in space. ⁸ Nor does it explicitly prohibit the launching of weapons from Earth to target an asset in outer space or the use of outer space for certain hostile purposes directed at targets on Earth.
Article VI	Article VI compels States to “bear international responsibility for national activities in outer space,” whether they are carried out by governmental

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 27 January 1967, 18 UST 2410; 610 UNTS 205; 6 ILM 386 [hereinafter “Outer Space Treaty” or “OST”]. The status of the treaty, as well as other international agreements relating to activities in outer space compiled is available online at <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html>

⁴ See Res. 76/231, *op. cit. supra* note 1.

⁵ See preamble and arts. IV and IX OST, and art. 3 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies. The preambles of the Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space, the Convention on International Liability for Damage Caused by Space Objects and the Convention on Registration of Objects Launched into Outer Space also highlight this core principle. It should be noted that while the preamble is not binding to signatories, it informs the object and purpose of the treaty, which can aid in interpreting a treaty’s substantive legal obligations. See Vienna Convention on the Law of Treaties art. 31.2, May 23, 1969, 1155 U.N.T.S. 331.

⁶ See art. I OST.

⁷ See art. IV OST.

⁸ Dale Stephens & Cassandra Steer, Conflicts in Space: International Humanitarian Law and Its Application to Space Warfare, 40 *Annals Air & Space L.* 71, 74 (2015).

agencies or non-governmental entities. Furthermore, States are responsible for ensuring that the activities of their nationals “are carried out in conformity with the provisions” of the OST.⁹ Furthermore, “The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.”¹⁰

- Article VII Article VII states that “Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty.” There is a key difference between Article VI (international responsibility) and Article VII (international liability). Under Article VI, a State assumes responsibility for its actions, as well as the actions of private citizens under its jurisdiction. Under Article VI, a State has two responsibilities: first to ensure that the national activities, including those of non-governmental entities “are carried out in conformity” with the provisions of the OST; and second, to authorize and continually supervise the activities of non-governmental entities. Article VII on the other hand imposes a financial obligation to compensate another State for damages caused by its space objects. The 1972 Convention on International Liability for Damage Caused by Space Objects¹¹ expands on this duty.
- Article VIII Article VIII establishes that a “State Party [...] on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.” This article introduces the concept of “State of registry” (which is further developed by the Registration Convention¹²). This concept is different from the launching State defined by Article VII. A launching State may often be the State of registry,¹³ but this is not always so. In instances where several nations qualify as launching States, they shall be jointly and severally liable for any damage caused,¹⁴ but only one of them shall bear the title of State of registry and the responsibilities derived thereof. In those cases, the launching States shall jointly determine which one of them shall be the State of registry.¹⁵
- Article IX Article IX establishes States’ obligation to conduct their space operations with “due regard to the corresponding interests of all other States Parties.”¹⁶ This due regard obligation is an explicit limitation on the freedom to use and explore outer space guaranteed by Article I of the OST. The concept of “due regard” is not defined in the OST. However, under other sources of international law (see below) “due regard” means that States are bound to refrain from any acts that might adversely affect the

⁹ See art. VI. OST.

¹⁰ See art. VI OST.

¹¹ Convention on International Liability for Damage Caused by Space Objects (1972), 961 U.N.T.S. 187, 24 U.S.T. 2389 [hereinafter “Liability Convention”].

¹² Convention on Registration of Objects Launched into Outer Space (1975), 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter “Registration Convention”].

¹³ If there is only one launching State, it shall also be the State of registration as per art. II.1 of the Registration Convention

¹⁴ See art. V Liability Convention.

¹⁵ See art. II.2 Registration Convention.

¹⁶ See art. IX. OST.

use of outer space by other stakeholders in space prior to and while conducting space activities.¹⁷

Related to the concept of “due regard” is the duty of States to undertake international consultations before proceeding with any activity that might cause harmful interference with activities of other State parties. Other States may also request consultations if they have reason “to believe that an activity or experiment planned by another State Party in outer space, [...], would cause potentially harmful interference with activities in the peaceful exploration and use of outer space” either prior to or during the performance of the space activity.

Under Article IX, States are also obligated to avoid the harmful contamination of space as well as “adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter.”

Article X Article X seeks to “promote international cooperation in the exploration and use of space” by encouraging States to “consider on a basis of equality any requests by other States Parties to the Treaty to be afforded an opportunity to observe the flight of space objects launched by those States.”

Article XI Article XI also seeks to promote international cooperation. Under this article States “agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities.”

4. When the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)¹⁸ adopted the OST, it recognized that further instruments would be required to expand upon specific OST principles.¹⁹ Subsequently, the following agreements were agreed: the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (Rescue Agreement);²⁰ the 1972 Convention on International Liability for Damage Caused by Space Objects (Liability Convention);²¹ the 1976 Convention on Registration of Objects Launched into Outer Space (Registration Convention);²² and the 1984 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement).²³

5. Out of all of these, only the Moon Agreement directly addresses the issue of space security. Expanding on Article IV of the OST, Article 3.2 of the Moon Agreement prohibits any “threat or use of force or any other hostile act or threat of hostile act on the Moon” as well as using “the Moon in order to commit any such act or to engage in any such threat in relation to the Earth, the Moon, spacecraft, the personnel of spacecraft or manmade

¹⁷ James D. Rendleman & Sarah M. Mountin, *Evolving Spacecraft Operator Duty of Care*, in *Space Safety is No Accident. The 7th IAASS Conference 394* (Tommaso Sgobba & Isabelle Rongier eds., 2015). See also 3 Myron H. Nordquist & Shabtai Rosenne, *United Nations Convention on the Law of the Sea, 1982: A Commentary* 86 (1985).

¹⁸ It should be noted that COPUOS is tasked with reviewing international cooperation in relation to the peaceful uses of outer space, hence why the five space treaties created under its auspices focus on this aspect of the use of space, as opposed to space security and the possibility of conflict in outer space. For more information on COPUOS see <https://www.unoosa.org/oosa/en/ourwork/copuos/index.html>

¹⁹ ALBERT K. LAI, *THE COLD WAR, THE SPACE RACE, AND LAW OF OUTER SPACE: SPACE FOR PEACE* (Routledge eds., 2021).

²⁰ *Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space* (1968), 672 *United Nations Treaty Series Online (UNTS)*. 119; 19 *U.S.T.* 7570.

²¹ See *Liability Convention*, *op. cit. supra* note 11.

²² See *Registration Convention*, *op. cit. supra* note 12.

²³ *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* (1979), 1636 *U.N.T.S.* 3, 18 *I.L.M.* 1434.

space objects.” Article 3.3 of the Moon Agreement also expands on the OST’s Article IV prohibition, by forbidding the placement “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 [the placement] or use such weapons on or in the Moon.” It should be noted that, per Article 1.1 of the Moon Agreement, the reference to the Moon also includes other celestial bodies.²⁴

6. The Liability Convention, while not prohibiting the use of any technologies in space, establishes that a State can be liable for launching an object that causes damage to another State’s assets (whether on Earth or in space).²⁵ The concept of space object includes “component parts of a space object as well as its launch vehicle and parts thereof”.²⁶

B. Principles and resolutions adopted by the General Assembly

7. In addition to international treaties, the United Nations General Assembly has adopted five declarations and legal principles.²⁷ Particularly relevant here are the Guidelines for the Long-term Sustainability of Outer Space Activities,²⁸ and the Space Debris Mitigation Guidelines,²⁹ as they address matters directly related to Article IX of the OST and the obligations of due regard for the interests of others in the use and exploration of outer space.

8. The aforementioned treaties and principles do not focus on space security matters. To fill this gap, during the Tenth Special Session of the General Assembly devoted to disarmament (SSOD) in 1978, States concluded that:

[I]n order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (the Outer Space Treaty).³⁰

9. This marks the formal initiation of work around the concept of the Prevention of an Arms Race in Outer Space (PAROS). The General Assembly adopted the first two resolutions related to PAROS in 1981.³¹ These resolutions reflect differing approaches to addressing space security issues. General Assembly Resolution 36/97 C on the *Prevention of an arms race in outer space*, requested the Committee on Disarmament to “consider the question of negotiating effective and verifiable agreements aimed at preventing an arms race in outer space” as well as “the question of negotiating an effective and verifiable agreement

²⁴ Fabio Tronchetti, *Legal aspects of the military uses of outer space*, in HANDBOOK OF SPACE LAW (Frans G. von der Dunk & Fabio Tronchetti eds. 2015).

²⁵ The liability can be absolute (for any harm caused on Earth or to aircraft by its space object), or fault-based (if the space object were to cause harm elsewhere than on the surface of the Earth to other space objects or to persons or property on board). See art. II and art. III Liability Convention.

²⁶ See art. I(d) Liability Convention.

²⁷ Examples of principles and guidelines that have stemmed from General Assembly discussions: Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space; Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting; Principles Relating to Remote Sensing of the Earth from Outer Space; Principles Relevant to the Use of Nuclear Power Sources in Outer Space; Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.

²⁸ Guidelines for the Long-term Sustainability of Outer Space Activities, available online at https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf

²⁹ Space Debris Mitigation Guidelines, available online at https://www.unoosa.org/pdf/publications/st_space_49E.pdf

³⁰ General Assembly Resolution S-10/2, 10th Special Session of the United Nations General Assembly on Disarmament: Final Document, para. 80, United Nations document A/RES/S-10/2, para. 80 (Feb. 5 1980), available online at <https://undocs.org/pdf?symbol=en/A/res/S-10/2>.

³¹ Benjamin Silverstein, Daniel Porras, John Borrie, Space Dossier 5 - Alternative Approaches and Indicators for the Prevention of an Arms Race in Outer Space, UNIDIR 9 (2020).

to prohibit anti-satellite systems.”³² General Assembly Resolution 36/99, on the *Conclusion of a treaty on the prohibition of the stationing of weapons of any kind in outer space* (9 December 1981), pushed for the conclusion of “an appropriate international treaty, to prevent the spread of the arms race to outer space” and required the Committee on Disarmament to “embark on negotiations with a view to achieving agreement on the text of such a treaty”.³³

10. States have since pursued two Group of Governmental Experts (GGE) processes aimed at advancing both legal and non-legal approaches to PAROS. In 2013, a GGE on transparency and confidence-building measures adopted a consensus report recommending a series of voluntary measures, such as the sharing of information and notification of certain space activities, to reduce military tension in space and increase transparency.³⁴ Following informal discussions on the practical implementation of these Transparency and Confidence-Building Measures (TCBMs) in 2017, the United Nations Disarmament Commission (UNDC) adopted the topic of TCBMs on its agenda for the 2018-2020 cycle.³⁵ However, the United Nations Disarmament Commission (UNDC) was unable to convene from 2019 through 2021 as a result of the Covid-19 pandemic.

11. Another GGE was convened in 2018 and 2019 to “consider and make recommendations on substantial elements of an international legally binding instrument on the prevention of an arms race in outer space.” The group was unable to reach consensus on a substantive final report.³⁶ Nevertheless, the work carried out by the group highlighted points of convergence in several areas. A report annexed to the GGE report written by the Chair in his own capacity states:

Experts generally affirmed or recognized the relevance to the prevention of an arms race in outer space of the principles codified in that Treaty, including:

- The applicability of the Charter of the United Nations in outer space;
- Freedom of access to outer space without discrimination and on the basis of equality;
- The non-placement of nuclear weapons or other weapons of mass destruction in outer space;
- The use of the moon and other celestial bodies exclusively for peaceful purposes;
- State responsibility for the activities of their nationals in outer space;
- The liability of launching States for damage;

³² General Assembly Resolution 36/97 C, 36th Session, on the Prevention of an arms race in outer space (9 December 1981), available online at <https://undocs.org/en/A/RES/36/97>. This resolution was sponsored by Australia, Barbados, Belgium, Canada, Denmark, France, Germany (Federal Republic of), Greece, Italy, Japan, Netherlands, New Zealand, Niger, Norway, Spain, United Kingdom, and Uruguay.

³³ General Assembly Resolution. 36/99, 36th Session, on the Conclusion of a treaty on the prohibition of the stationing of weapons of any kind in outer space (9 December 1981), available online at <https://digitallibrary.un.org/record/27062?ln=en>. This resolution was sponsored by Angola, Bulgaria, Byelorussian SSR, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Lao People’s Democratic Republic, Mongolia, Poland, Ukrainian SSR, USSR, and Viet Nam.

³⁴ Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, General Assembly Official Records (GAOR), 68th Session United Nations document A/68/189* (29 July 2013), available online at https://www.unoosa.org/oosa/oosadoc/data/documents/2013/a/a68189_0.html.

³⁵ 2018 United Nations Disarmament Commission Working Group II, Secretariat non-paper (2018) available online at <https://www.un.org/disarmament/wp-content/uploads/2018/03/WG2-secretariat-non-paper-outer-space-TCBMs-FINAL.pdf>

³⁶ General Assembly Resolution 72/250, 72nd Session, on Further practical measures for the prevention of an arms race in outer space (24 December 2017), available online at <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F72%2F250&Language=E&DeviceType=Desktop>

- The requirement to give due regard to the interests of others in the use and exploration of outer space;
- The duty to consult before proceeding with any activity that could cause potentially harmful interference with the outer space activities of others.³⁷

12. There is a long history of discussion around issues relating to PAROS at the United Nations General Assembly's First Committee. In 2021 the First Committee passed five draft resolutions on this topic. They were all adopted by the General Assembly: "Prevention of an arms race in outer space,"³⁸ "No first placement of weapons in outer space,"³⁹ "Further practical measures for the prevention of an arms race in outer space,"⁴⁰ "Transparency and confidence-building measures in outer space activities,"⁴¹ and "Reducing space threats through norms, rules and principles of responsible behaviours."⁴²

C. Other international instruments affecting the outer space domain

13. In addition to the above, States have concluded international agreements (legally binding and non-binding, as well as multilateral and bilateral), of relevance to outer space security, sometimes outside the framework of the United Nations. In some cases, these agreements explicitly regulate activities in outer space, even when the agreements themselves may not concern solely the space domain. The following table provides an overview of such agreements.

Multilateral agreements

1963 Limited Nuclear Test Ban Treaty	104 Signatory States 125 States Parties	The 1963 Limited Nuclear Test Ban Treaty (LTBT) ⁴³ prohibited the testing of nuclear weapons "in the atmosphere; beyond its limits, including outer space; or under water, including territorial waters or high seas." ⁴⁴ The OST complements this agreement, which prohibits their placement in orbit, installation on celestial bodies, and stationing in space, but not their detonation.
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³⁷ See Annex II of the Report of the Group of Governmental Experts on further practical measures for the prevention of an arms race in outer space, General Assembly Official Records (GAOR), 74th Session United Nations document A/74/77 (9 April 2013), available online at <https://undocs.org/pdf?symbol=en/A/74/77>

³⁸ General Assembly Resolution 76/22, 76th Session, on Prevention of an Arms Race in Outer Space, (6 December 2021), available online at <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F76%2F22&Language=E&DeviceType=Desktop>.

³⁹ General Assembly Resolution 76/23, 76th Session, on No First Placement of Weapons in Outer Space, (6 December 2021), available online at <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F76%2F23&Language=E&DeviceType=Desktop>.

⁴⁰ General Assembly Resolution 76/230, 76th Session, on Further Practical Measures for the Prevention of an Arms Race in Outer Space, (24 December 2021), available online at <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F76%2F230&Language=E&DeviceType=Desktop>.

⁴¹ General Assembly Resolution 76/55, 76th Session, on Transparency and Confidence-building Measures in Outer Space Activities, (6 December 2021), available online at <https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F76%2F55&Language=E&DeviceType=Desktop>.

⁴² General Assembly Resolution 76/231, op. cit. supra note 1.

⁴³ Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, 5 August 1963, 14 UST 1313, 480 UNTS 6964.

⁴⁴ See art. I.1(a) LTBT.

Multilateral agreements

2021 Treaty on the Prohibition of Nuclear Weapons (TPNW)	86 Signatory States 59 States Parties	On 22 January 2021, the Treaty on the Prohibition of Nuclear Weapons (TPNW) ⁴⁵ entered into force. Article 1 stipulates that States shall under no circumstance “[d]evelop, test, produce, manufacture, otherwise acquire, possess or stockpile nuclear weapons or other nuclear explosive devices,” as well as “[u]se or threaten to use” them. States who are party to the TPNW are also prohibited from encouraging others who are not to engage in any activity prohibited to a State Party under the treaty. This prohibition of encouragement provides an additional layer that limits the use of nuclear weapons in space.
1978 Convention on The Prohibition of Military or Any Hostile Use of Environmental Modification Techniques (ENMOD)	48 Signatory States 78 States Parties:	The Convention on The Prohibition of Military or Any Hostile Use of Environmental Modification Techniques (ENMOD) ⁴⁶ prohibits State parties 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.” ⁴⁷ This prohibition extends to outer space. ⁴⁸

⁴⁵ Treaty on the Prohibition of Nuclear Weapons, 7 July 2017, 729 UNTS 161 (entered into force 20 January 2021). As of 22 January 2021, the TPNW has 52 Member States and has been signed by an additional 36 States, and among them are none of the States that have nuclear weapons inventories. Treaty status available online at

https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtmsg_no=XXVI-9&chapter=26

⁴⁶ Convention On The Prohibition Of Military Or Any Hostile Use Of Environmental Modification Techniques, 18 May 1977, 31 UST 333, 1108 UNTS. 151.

⁴⁷ See art. I Environmental Modification Convention (ENMOD).

⁴⁸ See art II Environmental Modification Convention (ENMOD).

Multilateral agreements

Missile Technology Control Regime (MTCR)	35 member countries ⁴⁹	The Missile Technology Control Regime (MTCR) is a set of international guidelines that seeks to control the exports of missile and rocket technology. It is a non-binding, informal political understanding among participating States that aims to limit the proliferation of such technology by controlling exports of goods and technologies that could contribute to delivery systems (other than crewed aircraft) for Weapon of mass destruction (WMDs). The MTCR technical annex on technology that should be controlled includes space launch technology. ⁵⁰
Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies	42 member States	The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (Wassenaar Arrangement) is a multilateral arrangement on export controls for conventional weapons and sensitive dual-use goods and technologies. ⁵¹ It serves as a non-binding framework through which the 42 member States agree on which items should be controlled. The arrangement calls on States to disclose information regarding their export activities related to weapons and items appearing on the arrangement's two control lists —the List of Dual-Use Goods and Technologies and the Munitions List. ⁵² Space technology is included in the agreed upon control list, with an emphasis on launch vehicles, which can be repurposed as intercontinental ballistic missiles (ICBMs). ⁵³

⁴⁹ Frequently Asked Questions (FAQs), MISSILE TECH. CONTROL REGIME, <https://mtr.info/frequently-asked-questions-faqs/> (last visited Oct. 16, 2021).

⁵⁰ MTCR, Software and Technology Annex, available online at https://mtr.info/wordpress/wp-content/uploads/2017/10/MTCR-TEM-Technical_Annex_2017-10-19.pdf

⁵¹ *What is the Wassenaar Arrangement?*, WASSENAAR ARRANGEMENT SECRETARIAT, <https://www.wassenaar.org/the-wassenaar-arrangement/> (last visited Oct. 16, 2021).

⁵² Daryl Kimball, *The Wassenaar Arrangement at a Glance*, ARMS CONTROL ASS'N (December 2017), <https://www.armscontrol.org/factsheets/wassenaar>.

⁵³ Wassenaar Arrangement Secretariat, List of Dual-Use Goods and Technologies and Munitions List at 9.A.10 (Dec. 2020), <https://www.wassenaar.org/app/uploads/2019/consolidated/WA-DOC-18-PUB-001-Public-Docs-Vol-II-2018-List-of-DU-Goods-and-Technologies-and-Munitions-List-Dec-18.pdf>; P.J. Blount, *Space Security Law*, in OXFORD RESEARCH ENCYCLOPEDIA OF PLANETARY SCIENCES (Oxford Univ. Press, 2018).

Multilateral agreements

The Hague Code of Conduct against Ballistic Missile Proliferation (HCoC)	143 Signatories	The Hague Code of Conduct against Ballistic Missile Proliferation (HCoC) is a non-legally binding set of guidelines that regulates the area of ballistic missiles capable of carrying WMDs. ⁵⁴ With regards to space technology, the HCoC seeks to prevent the use of space launch vehicle (SLV) programmes to conceal the acquisition of ballistic missiles (BM) capable of delivering WMDs. ⁵⁵ In order to achieve this objective, the HCoC encourages Member States to sign and ratify existing space treaties, in particular, the OST, the Liability Convention and the Registration Convention. ⁵⁶ It also urges States to “curb and prevent the proliferation,” ⁵⁷ as well as to “exercise maximum possible restraint in the development, testing and deployment” ⁵⁸ of BMs. The code further establishes a set of transparency and confidence-building mechanisms that would allow States to exchange information on BM and SLV programmes, as well as the number of annual launches of such systems. It additionally proposes the exchange of pre-launch notifications which “should include such information as the generic class of the Ballistic Missile or Space Launch Vehicle, the planned launch notification window, the launch area and the planned direction.” ⁵⁹
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Bilateral agreements

2011 New START Treaty	United States and the Russian Federation	The New START Treaty ⁶⁰ between the United States and the Russian Federation entered into force on 5 February 2011 with a view to establishing limits on intercontinental-range nuclear weapons. In February 2021 both
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⁵⁴ The Hague Code of Conduct against Ballistic Missile Proliferation (HCoC), Description of the HCoC, available online at <https://www.hcoc.at>

⁵⁵ See art. 2.g HCoC.

⁵⁶ *Ibid.* art. 3.a.

⁵⁷ *Ibid.* art. 3.b.

⁵⁸ *Ibid.* art. 3.c.

⁵⁹ *Ibid.* art. 4.

⁶⁰ Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, 5 February 2011, Treaty Doc. 111-5, 111th Congress, 2d Session.

Multilateral agreements

parties agreed to extend the treaty until 4 February 2026. This limits the location of non-deployed launchers for mobile ICBMs as well as non-deployed mobile ICBMs at certain facilities among which are space launch facilities. Moreover, New START prohibits interference with the “National Technical Means” (NTM), of which reconnaissance satellites are an important component.⁶¹

III. General international law

A. Why it applies

14. Article I of the OST states that the use and exploration of outer space shall be carried out “in accordance with international law.” Furthermore, Article III of the OST also establishes 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 view of this, it could be useful to consider other bodies of law when taking “stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space.”

B. Environmental law

15. As an increasing number of space actors carry out activities and place objects in the space domain, there is greater risk of harmful contamination, as well as harmful interference with the activities of others. Article IX of the OST establishes the duty of due regard, as well as provisions on the prohibition of harmful interference and harmful contamination. This is further supported by wider international environmental law.

16. For example, the 1972 Stockholm Declaration,⁶² agreed during the United Nations Conference on the Human Environment, highlights the importance of protecting the environment. Under principle 21 of the Declaration, States have “the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.” The Stockholm Declaration is not legally binding. However, States have used this language on numerous

⁶¹ See art. IV New START.

⁶² Declaration of the United Nations Conference on the Human Environment, United Nations document A/CONF.48/14/Rev.1 (June 1972), available online at <https://digitallibrary.un.org/record/523249?ln=es>

occasions since then,⁶³ suggesting the concept may have become customary international law and could apply to outer space.⁶⁴

C. Laws on the use of force, international security and International Humanitarian Law (IHL)

17. The rules and regulations relating to the use of force and international security could also be of value when assessing threats emerging from space activities.

18. Article 2(4) of the United Nations Charter⁶⁵ establishes a general prohibition on the use of force. Under this article all States shall refrain 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.” Particular attention should be paid to the reference to the “Purposes of the United Nations,” as it makes article 2(4) a catch-all provision that constitutes a comprehensive ban against all uses or threats of force.⁶⁶

19. The object and purpose of the United Nations can be found in the preamble of the Charter, which indicates it seeks “to prevent future generations from the scourge of war.” This purpose is further specified in Article 1 of the Charter. In particular, Article 1(1) affirms that its aim is:

To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace.

20. Furthermore, Article 2(4) should be interpreted broadly: a use of force does not have to be explicitly directed against another State in order to be considered a violation of this United Nations Charter precept. As the ICJ has indicated, assisting others “in the form

⁶³ See for example Rio Declaration on Environment and Development, 13 June 1992, 31 I.L.M. 874. See Principle 2: “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.” See also World Charter for Nature, GA Res. 37/7, art. 21(d), United Nations document A/RES/37/7 (28 October 1982), available online at <https://digitallibrary.un.org/record/39295>

⁶⁴ Steven A. Mirmina, *The Ballistic Missile Defense System and Its Effects on the Outer Space Environment*, 31 J. Space L. 287, 305 (2005); Francis Lyall & Paul B. Larsen, *Space Law: A Treatise* 272 (2d ed. 2018). Furthermore, the International Court of Justice (ICJ) has further confirmed this obligation in the Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons, the ICJ stated that “[t]he existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.” Notably, a year later, the ICJ repeated that conclusion in the Case Concerning the Gabcikovo-Nagymaros Project (Hungary vs. Slovakia). See *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, ICJ GL No 95, [1996] ICJ Rep 226, ICGJ 205 (ICJ 1996), 8 July 1996, United Nations; International Court of Justice, available online at <https://www.icj-cij.org/files/case-related/95/095-19960708-ADV-01-00-EN.pdf>. See also *Gabcikovo-Nagymaros Project, Hungary v Slovakia*, Judgment, Merits, ICJ GL No 92, [1997] ICJ Rep 7, [1997] ICJ Rep 88, (1998) 37 ILM 162, ICGJ 66 (ICJ 1997), 25 September 1997, International Court of Justice, available online at <https://www.icj-cij.org/files/case-related/92/092-19970925-JUD-01-00-EN.pdf>

⁶⁵ Charter of the United Nations and Statute of the International Court of Justice, 26 June, 1945, 59 Stat. 1031; T.S. No. 993; 3 Bevans 1153 [hereinafter “UN Charter”].

⁶⁶ Tom Ruys, *The Meaning of Force and the Boundaries of the Jus ad Bellum: Are Minimal Uses of Force Excluded from UN Charter Article 2(4)?*, 108 Am. J. Int’l L. 159, 163-164 (2014).

of the provision of weapons or logistical or other support [...] may be regarded as a threat or use of force.”⁶⁷

21. The only exception to this prohibition is expressed in Article 51 of the United Nations Charter, which allows States to exercise “the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations.” Even then, this right is limited, as it is only “until the Security Council has taken measures necessary to maintain international peace and security.” Furthermore, when exercising their right to self-defence, States must meet the demands of immediacy and imminence, necessity, and proportionality.⁶⁸

- Immediacy demands that an act of self-defence occurs within reasonable proximity of a hostile act by an adversary.⁶⁹ Alternatively, if an attack is imminent, a State has the right to take anticipatory or pre-emptive action in order to defend itself.⁷⁰
- Necessity establishes that the use of force should always be a last resort.
- Proportionality requires that the amount of force used in self-defence must be of the same magnitude as the threat to which it responds.⁷¹

22. Should existing tensions in the space domain ever grow to become an armed conflict -irrespective of whether the use of force that triggered the armed conflict is lawful under the United Nations Charter⁷²- international humanitarian law (IHL) could apply to space. Of particular significance are the following principles:

- Distinction. Under this principle, parties to an armed conflict are obligated to distinguish at all times between civilians and civilian objects on the one hand and combatants and military objectives on the other and direct their attacks only against the latter.⁷³ This is particularly challenging considering the proliferation of dual-use objects in space, that is, those that are or can be used for both military and civilian purposes.⁷⁴
- Proportionality establishes a prohibition against launching an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated. The

⁶⁷ Military and Paramilitary Activities in and Against Nicaragua, Nicaragua v United States, Merits, Judgment, (1986) ICJ Rep 14, ICGJ 112 (ICJ 1986), 27 June 1986, United Nations; International Court of Justice: “But the Court does not believe that the concept of “armed attack” includes (...) assistance to rebels in the form of the provision of weapons or logistical or other support. Such assistance may be regarded as a threat or use of force.” Available online at <https://www.icj-cij.org/files/case-related/70/070-19860627-JUD-01-00-EN.pdf>

⁶⁸ Yoram Dinstein, War, Aggression and Self-Defence 276 (6th ed., 2017).

⁶⁹ Geoffrey S. Corn, Victor Hansen, Richard Jackson, Christopher Jenks, Eric Talbot Jensen, James A. Schoettler, The Law of Armed Conflict. An Operational Approach, 22 (2nd ed., 2019).

⁷⁰ Geoffrey S. Corn, Jimmy Gurulé, Eric Jensen, Peter Margulies, Aspen Treatise for National Security Law: Principles and Policy 105 (2nd ed. 2019).

⁷¹ This definition corresponds to jus ad bellum proportionality, or strict proportionality, and is different from jus in bello proportionality, under which there is a prohibition on only those attacks that cause incidental loss of civilian life that is excessive in relation to the concrete and direct military advantage anticipated. In bello proportionality will be discussed below.

⁷² Int’l Comm. Red Cross, The Potential Human Cost of the Use of Weapons in Outer Space and the Protection Afforded by International Humanitarian Law. Position paper submitted by the International Committee of the Red Cross (ICRC) to the Secretary-General of the United Nations on the issues outlined in General Assembly Resolution 75/36 (8 April 2021) [hereinafter “ICRC, Res. 75/36 Position Paper”], available online at <https://front.un-arm.org/wp-content/uploads/2021/04/icrc-position-paper-ung-on-resolution-A-75-36-final-eng.pdf>

⁷³ This basic rule is codified in art. 48 AP I, and it applies to all parties to a conflict, whether or not they have signed the Additional Protocol, due to its status as a customary rule. See Int’l Comm. Red Cross, Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949 598 (1987).

⁷⁴ ICRC, Res. 75/36 Position Paper, op. cit. supra note 72.

proportionality analysis requires an evaluation of the reasonably foreseeable reverberating effects that the attack can have.⁷⁵

- Military Necessity establishes that a military force is allowed to exercise only those operations that are not otherwise prohibited by international law and are indispensable in securing the prompt submission of the enemy.
- Precautions. When conducting military operations, care must be taken to spare the civilian population and civilian objects, and to take all feasible precautions in the choice of means and methods of warfare, with a view to avoiding, and in any event to minimizing, incidental civilian casualties and damage to civilian objects.⁷⁶

D. Air Law, Law of the Sea and the Antarctic Treaty

23. The law applicable to air space and the law of the sea can serve as useful guidance for outer space. In fact, these domains are often compared to outer space, and their respective legal regimes have served to inform the interpretation of outer space law.

24. As was highlighted above, there are certain concepts that the existing outer space treaties do not define. “Due regard,” is one such example. The concept of “due regard” first appeared in the 1944 Chicago Convention,⁷⁷ and later in the United Nations Convention on the Law of the Sea (UNCLOS),⁷⁸ which mentions this concept in several instances.⁷⁹ The arbitral Tribunal constituted under UNCLOS Annex VII provides examples of how this term could be interpreted.⁸⁰ Experiences with the ICJ can also provide insight into how the principle of due regard signified a shift from a system of uncorroborated freedoms to a more deeply normative structure of rights and correlative duties, including duties to the international community.⁸¹

25. The legal regimes applicable to the high seas, the deep seabed, and Antarctica are often compared to outer space. For example, the laws of the sea could also provide insights into the “use of signals, the maintenance of communications, and the prevention of collisions.”⁸² In addition, these agreements can help understand issues of sovereignty. Like

⁷⁵ Int’l Comm. Red Cross, Humanitarian Consequences and Constraints Under International Humanitarian Law (IHL) related to the Potential Use of Weapons in Outer Space, Working paper submitted to the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space (March 2019), available online at <https://undocs.org/GE-PAROS/2019/WP.1>.

⁷⁶ Ibid. See also art. 57(2)(ii) AP I.

⁷⁷ See art. 3(d) Convention on International Civil Aviation, 7 Dec. 1944, 61 Stat. 1180, 15 U.N.T.S. 295 [hereinafter “Chicago Convention”].

⁷⁸ United Nations Convention on the Law of the Sea, 10 December 1982, 1833 U.N.T.S. 3, 397; 21 I.L.M. 1261. [hereinafter “UNCLOS”]

⁷⁹ See for example art. 87.2 UNCLOS: “These freedoms shall be exercised by all States with due regard for the interests of other States in their exercise of the freedom of the high seas, and also with due regard for the rights under this Convention with respect to activities in the Area.” See also art 194 UNCLOS: “States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention.”

⁸⁰ For example, in its Award on the Merits in the Chagos Marine Protected Area Arbitration (Mauritius v United Kingdom) the Tribunal stated that “the ordinary meaning of “due regard” calls for the United Kingdom to have such regard for the rights of Mauritius as is called for by the circumstances and by the nature of those rights.”. See Chagos Marine Protected Area Arbitration, Mauritius v United Kingdom, Final Award ¶519, ICGJ 486 (PCA 2015), 18 March 2015, Permanent Court of Arbitration, available online at <https://www.pcacases.com/pcadocs/MU-UK%2020150318%20Award.pdf>

⁸¹ Fisheries Jurisdiction, United Kingdom v Iceland, Merits, Judgment, ICJ Rep 3, ICGJ 142 (ICJ 1974), 25 July 1974, United Nations; International Court of Justice, available online at <https://www.icj-cij.org/files/case-related/55/055-19740725-JUD-01-00-EN.pdf>

⁸² See art. 94 UNCLOS.

outer space, these are domains where States⁸³ may not exercise sovereign rights and no State may claim sovereignty over an area that would preclude another entity from entering or using outer space or the celestial bodies.

26. However, even though States may not claim sovereignty over outer space or celestial bodies, States do hold jurisdiction and control over their own space objects,⁸⁴ and this jurisdiction and control must be respected by other actors in space.

E. Other international legal frameworks

27. Other legal frameworks might also provide insights into how to conduct activities in outer space. For example, both the 1972 Biological Weapons Convention (BWC)⁸⁵ and the 1993 Chemical Weapons Convention (CWC),⁸⁶ recognize the dual-purpose nature of biology and chemistry respectively and have accordingly developed intent-based definitions for the prohibitions of these weapons.⁸⁷ Such intent-based approaches to defining weapons are imperfect, but nonetheless useful in generating common understanding and building trust.⁸⁸

28. Notably, both the above agreements, along with the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)⁸⁹ obligate States Parties to promote international cooperation for peaceful purposes in their respective areas.⁹⁰

IV. Conclusion

29. Outer space is already regulated to some extent by a rich body of laws, rules, guidelines and principles. The Outer Space Treaty establishes the foundation upon which the subsequent space-specific laws and regulations were built. Even the regulations that are not space-specific, such as those that mention space but do not solely focus on it, as well as general international law more broadly, have to be interpreted through the lens of the principles laid out by the OST when applied to the outer space domain.

30. As highlighted in this background paper, current space-specific law does not focus primarily on space security matters. Thus, in order to be able to take stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space” other bodies of international law can serve as an informative guide to establish norms, rules and principles of responsible behaviours in outer space.

⁸³ Under the Antarctic Treaty previous sovereign claims to the territory on the basis of various legal grounds are understood to exist, and the acceptance of the text of the treaty by contracting parties does not signify a renunciation of these claims. See art. IV of the Antarctic Treaty, 1 Dec. 1959, 12 UST 794; 402 UNTS 71; 19 ILM 860 (1980)

⁸⁴ See art. VIII OST.

⁸⁵ Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, 10 Apr., 1974, 1015 UNTS 163; 11 ILM 309 (1972) [hereinafter “BWC”]

⁸⁶ Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, 13 Jan., 1993, 1974 UNTS 45; 32 ILM 800 (1993) [hereinafter “CWC”].

⁸⁷ See art. II of the CWC and art. I of the BWC.

⁸⁸ Audrey M. Schaffer, *The Role of Space Norms in Protection and Defense*, 87 *Joint Force Q.* 88, (2017).

⁸⁹ Treaty on the Non-proliferation of Nuclear Weapons, 1 Jul., 1968, 729 UNTS 161; 7 ILM 8809 (1968); 21 UST 483 [hereinafter “NPT”].

⁹⁰ See art. IV NPT.