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SPACE SECURITY AND COLLECTIVE SECURITY: BASIC CONCEPTUAL RELATIONS

INTRODUCTION

The United Nations Security Council has recently failed to adopt its first resolutions directly concerning space security. The first draft resolution, prompted by troubling information, authored by two and co-sponsored by a large number of states, sought to reaffirm the long-standing obligation not to place nuclear weapons or any other kind of weapons of mass destruction in outer space.¹ In the course of the debate, two permanent members proposed an amendment to expand the scope of the text by calling for urgent measures to prevent the placement of any weapons in outer space and by urging the early elaboration of legally binding multilateral agreements to that effect.² The amendment, which would have extended far beyond the existing obligations of states, was turned down. The original draft resolution ultimately failed due to a negative vote cast by a permanent member,³ which later submitted its own draft resolution incorporating elements of the previously turned down amendment.⁴ This draft resolution was co-sponsored by a handful of states and suffered a similar fate, having failed

¹ Japan and United States of America et al.: Draft Resolution, 24 April 2024, UN Doc. S/2024/302.

² China and Russian Federation: Amendment to the Draft Resolution Contained in Document S/2024/302, 24 April 2024, UN Doc. S/2024/323.

³ United Nations Security Council, Provisional Verbatim Record, 24 April 2024, UN Doc. S/PV.9616, 5.

⁴ Belarus, China, Democratic People's Republic of Korea, Nicaragua, Russian Federation and Syrian Arab Republic: Draft Resolution, 20 May 2024, UN Doc. S/2024/383.

to obtain the required number of affirmative votes.⁵ The General Assembly held a debate on the exercise of the right to veto, as explicitly required by an earlier resolution.⁶ For a while, it appeared that the debate had concluded the sharp diplomatic exchange in the two principal organs, but the following year brought another round of lawfare over matters of space security.⁷ The General Assembly's First Committee held a side event hosted by the permanent member, which resorted to its veto power in the previous year, and two additional members that focused on the challenges and threats posed by low orbit satellite internet systems for international peace and security.⁸ The side event was followed shortly by an Arria-formula meeting of members of the Security Council. This informal discussion, convened by the same permanent member, also focused on the risks and challenges posed by the uncontrolled use of low Earth orbit satellites and resulted in a heated debate, along geopolitical fault lines, over the safety and security implications of large satellite constellations.⁹

The failure to adopt any of the draft resolutions and the tone of the subsequent debates came as no surprise in the prevailing geopolitical environment, but even these heavily and rightly criticised developments have positive aspects. The course of events clearly indicates the inextricable link between space security and collective security. It highlights the importance and untapped potential of the system of collective security at a time when outer space is becoming increasingly congested, contested and competitive.

⁵ United Nations Security Council, Provisional Verbatim Record, 20 May 2024, UN Doc. S/PV.9630, 4.

⁶ United Nations General Assembly, Verbatim Record, 6 May 2024, UN Doc. A/78/PV.78 and UN Doc. A/78/PV.79. See also the Standing Mandate for a General Assembly Debate When a Veto is Cast in the Security Council, G.A. Res. 76/262, 76 UN GAOR, Supp. No. 49 A/76/49 (Vol. III), 72.

⁷ AZCÁRATE ORTEGA – SAMSON 2023: 40; PEKKANEN–BLOUNT 2024.

⁸ United Nations General Assembly First Committee Side Event: Low Orbit Satellite Internet Systems in the Context of International Peace and Security: Challenges and Threats, 13 October 2025.

⁹ Permanent Mission of the Russian Federation to the United Nations: Risks and Challenges Emanating from the Uncontrolled Use of Low Earth Orbit Satellites, Concept Note, UN Security Council Arria-formula Meeting, 29 December 2025.

However, space security and collective security have developed distinct vocabularies. For that reason, the present study focuses on space security and collective security at a conceptual level. In order to promote a better understanding of that relationship, the analysis seeks to define and delineate the rather vague basic concepts of space security,¹⁰ in order to enable their positioning within the older and long-established conceptual framework of collective security. The concepts of space security and collective security that will be analysed include 'space weapon', 'counterspace capability', 'irresponsible behaviour' and 'space threat', as well as 'use of force', 'threat of force', 'threat to the peace', 'breach of the peace', 'act of aggression' and 'armed attack', respectively. The analysis primarily employs a linguistic, logical and functional approach, supplemented, as appropriate, by other techniques. The conclusions are expected to facilitate a more nuanced comprehension of the concepts concerned, thereby contributing to the ongoing scholarly dialogue on matters of space security.

SPACE SECURITY

The term 'space weapon' has long been used in professional and colloquial parlance. It probably ranks among the oldest of concepts of space security under deliberation, but agreement on a legally binding or generally accepted definition has not been achieved. Nevertheless, decades of international concern and scholarly attention have crystallised several core elements and facilitated the development of a taxonomy of space weapons. The United Nations General Assembly and the Conference on Disarmament, the single multilateral disarmament negotiating forum of the international community,¹¹ have had numerous opportunities to engage themselves with the concept when discussing the prevention of an arms race in outer space, or proposed amendments to the prevailing military provisions of space law, or proposed international treaties on the prohibition of the

¹⁰ AZCÁRATE ORTEGA 2026: 400–401, 413.

¹¹ Final Document of the Tenth Special Session of the General Assembly, G.A. Res. S-10/2, S-10 UN GAOR, Supp. No. 4 (A/S-10/4), 13.

stationing of weapons in outer space and/or the threat or use of force against space objects. Despite the absence of definitions in the more elaborate documents, including the draft additional protocol submitted by Italy in 1979¹² or the draft treaties submitted by the Soviet Union in 1981 and 1983,¹³ several early proposals presented coherent descriptions of the concept.¹⁴ These texts attest to a shared understanding that space weapons are devices, instruments or installations capable of destroying, damaging, disturbing the normal functioning or changing the flight trajectory of their targets. Further characteristics of space weapons appearing in these early texts include their offensive or defensive purposes, the possible locations of their deployment or targets, their operational components or encompassing systems, their underlying scientific principles, or their existing or prospective status. The actual details were obviously determined by the political and military objectives and considerations of submitting states. Expert proposals presented in the same period contain similar elements.¹⁵

The transition to a multipolar world order, the rapid pace of technological development and the emerging new space race provided new impetus to the old discourse on space weapons after the turn of the millennium. The Russian Federation continued the efforts to pursue the adoption of a legally

¹² Additional Protocol to the 1967 “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies” with a view to Preventing an Arms Race in Outer Space, 26 March 1979, Doc. CD/9.

¹³ Draft Treaty on the Prohibition of the Stationing of Weapons of Any Kind in Outer Space, Letter dated 10 August 1981 from the Minister for Foreign Affairs of the Union of Soviet Socialist Republics addressed to the Secretary-General, UN Doc. A/36/192, Annex; Treaty on the Prohibition of the Use of Force in Outer Space and from Space against the Earth, Letter dated 19 August 1983 from the First Vice-Chairman of the Council of Ministers of the Union of Soviet Socialist Republics, Minister for Foreign Affairs of the USSR, to the Secretary-General, UN Doc. A/38/194, Annex.

¹⁴ Draft Definition of Space Strike Weapons, 22 July 1986, Doc. CD/OS/WP.13/Rev.1; Compilation of Definitions of Space Weapons, 21 July 1986 and 29 July 1986, Doc. CD/OS/WP.14/Rev.1 and Add.1. See also WOLTER 2006: 29–30.

¹⁵ Union of Concerned Scientists et al.: A Treaty Limiting Anti-Satellite Weapons, May 1983, in GARWIN–PIKE 1984: 105; FISCHER, Horst et al.: Proposed Draft Treaty on the Limitation of the Military Use of Outer Space, July 1984, in SCHEFFRAN 2021: 170–174.

binding instrument, an objective that received increasing support from the People's Republic of China. Position and working papers submitted by the latter emphasised the importance of clear definitions, and formulated the following tentative descriptions:

Weapons are devices or facilities that strike, destroy or disrupt the normal functions of a target directly by various destructive ways. Weapon systems are the collective of weapons and their indispensably linked parts that jointly accomplish battle missions. Components of weapon systems are subsystems that [are] directly and indispensably involved in accomplishing battle missions.¹⁶

The following year, the two space powers tabled, with the support of a small group of like-minded countries, a working paper on possible elements of a future international treaty. The unofficial annex to that document reiterated the importance of definitions and proposed that any description of relevant weapons should focus on them being components of a system, their intended effects, and how they achieve those effects.¹⁷

These concerted efforts resulted, a few years later, in the Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects, commonly known as the Draft PPWT. The People's Republic of China and the Russian Federation submitted the original version of the proposed instrument to the Conference on Disarmament in 2008. This version expressly defined 'weapons in outer space' as "any device placed in outer space, based on any physical principle, specially produced or converted to eliminate, damage or disrupt normal function of objects in outer space, on the Earth or in its air, as well as to

¹⁶ Possible Elements of the Future International Legal Instrument on the Prevention of the Weaponization of Outer Space, 7 June 2001, Doc. CD/1645, IV. (Insert added).

¹⁷ Possible Elements for a Future International Legal Agreement on the Prevention of the Deployment of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects, 23 June 2002, Doc. CD/1679, Unofficial Annex: Compilation of Comments and Suggestions to the CD Working Paper CD/1679, 31 July 2003, II.2. See also LEWIS 2007: 171–192.

eliminate population, components of biosphere critical to human existence or inflict damage to them”.¹⁸ The ‘placement’ of weapons in outer space was intended to cover devices completing at least one orbit around our planet, devices following a section of an orbit before leaving that orbit, and devices permanently stationed somewhere in outer space.¹⁹ The document raised concerns and prompted criticism; therefore, an updated version was submitted in 2014. The definition was retained with some modifications. The updated version defines ‘weapon in outer space’ as “any outer space object or component thereof which has been produced or converted to destroy, damage or disrupt the normal functioning of objects in outer space, on the Earth’s surface or in its atmosphere, or to eliminate human beings or components of the biosphere which are important to human existence, or to inflict damage on them by using any principles of physics”.²⁰ The meaning of placement in outer space is identical to the original version, although the formulation of the third scenario has been refined as permanently located “in outer space or on any celestial bodies other than the Earth”.²¹

¹⁸ Draft Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects, Letter dated 12 February 2008 from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament addressed to the Secretary-General of the Conference, Doc. CD/1839, Article I (c).

¹⁹ Draft Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects, Letter dated 12 February 2008 from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament addressed to the Secretary-General of the Conference, Doc. CD/1839, Article I (d).

²⁰ Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects, Letter dated 10 June 2014 from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament addressed to the Acting Secretary-General of the Conference, Doc. CD/1985, Article I (b).

²¹ Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects, Letter dated 10 June 2014 from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament addressed to the Acting Secretary-General of the Conference, Doc. CD/1985, Article I (c).

Both definitions cover any weapon located in outer space, including the Moon and other celestial bodies, weaponised dual-use or dual-purpose assets, as well as fractional orbital bombardment systems. Direct-ascent anti-satellite missiles, on the other hand, are not covered despite the grave threat they pose.²² The conspicuous exclusion of such missiles is criticised as a major and dangerous shortcoming.²³ The European Union's Draft Codes of Conduct for Outer Space Activities, published in 2008 and 2014, do not contain a definition of space weapon either.²⁴

The absence of consensus on a definition does not preclude the taxonomy of space weapons, whether past or present, planned or built, experimental or operational, deployed or decommissioned, or tested or used. Space weapons can be deployed on land, at sea, in the air or in outer space. The possible locations of their targets are essentially identical. Targets can be located on land, at sea, in the air or in outer space.²⁵ The location of deployment and the location of the target collectively determine the potential directions of their application: Earth to outer space, outer space to Earth, and outer space to outer space. It should be noted that any weapon deployed on the planet that only traverses outer space on the way to its designated target located elsewhere on the planet is not regarded as a space weapon. Hence, ballistic missiles or hypersonic glide vehicles are not space weapons. Similarly to other weapons, space weapons can be divided into two main categories, weapons of mass destruction and conventional weapons. Weapons of mass destruction include nuclear weapons, biological weapons, chemical weapons and radiological weapons. The present catalogue is not exhaustive, technological development may extend its scope in the future. Conventional weapons can be further divided into kinetic and non-kinetic weapons; the

²² Destructive Direct-ascent Anti-satellite Missile Testing, G.A. Res. 77/41, 77 UN GAOR Supp. No. 49 A/77/49 (Vol. I), 225.

²³ BARTÓKI-GÖNCZY 2026: 367.

²⁴ Draft Code of Conduct for Outer Space Activities, 8–9 December 2008, Council Conclusions and Draft Code of Conduct for Outer Space Activities, 17 December 2008, 17175/08, Annex II; Draft International Code of Conduct for Outer Space Activities, 31 March 2014.

²⁵ United Nations Institute for Disarmament Research 1987: 17.

latter subcategory includes directed energy weapons, devices of electronic warfare and devices of cyber operations. Finally, in terms of effects, space weapons can have permanent or temporary, or hard-kill and soft-kill effects. The development, testing, production, manufacturing, acquisition, possession, retention, stockpiling, transfer of, or transfer control over such weapons, or the reception of transfer of, or control over such weapons, may or may not be lawful, depending on the international obligations assumed by the state concerned. The same holds for providing assistance, encouragement or inducement to anyone, or to seeking or receiving assistance from anyone to engage in any of these activities. States are expected to assess whether the employment of a new space weapon would be prohibited under the law of armed conflict.²⁶ The taxonomy of space weapons, along with selected examples of actual or conceived weapons, is displayed in Table 1.

The terminological complexity is exacerbated by the frequently used, but more recent term, ‘counterspace capability’. This expression also lacks a legally binding or generally accepted definition. The relevant literature describes counterspace capabilities in a variety of ways. For example, ‘counterspace’ or ‘space control’ is defined as capabilities or techniques used to gain space superiority, which is the capability of an actor to use outer space for its own purposes and to deny that to its adversary for a limited time and location.²⁷ The same concept is also defined as capacities, techniques or assets deliberately used to deceive, disrupt, deny, degrade or destroy space objects or space systems of an adversary.²⁸ Space systems comprise the space segment, the ground segment, the user segment and the data links: uplink, crosslink and downlink. A distinction is made between offensive and defensive, destructive and non-destructive, and reversible and non-reversible capabilities. Possible subcategories of such capabilities include kinetic, non-kinetic, direct-ascent, co-orbital, electronic warfare, directed energy and cyber capabilities.²⁹ For these reasons, the conceptual relationship of ‘space weapon’ and ‘counterspace capability’ is hard to establish. Depending

²⁶ DINSTEIN-DAHL 2020: 6–7.

²⁷ SAMSON-WEEDEN 2024: xxxvii.

²⁸ AZCÁRATE ORTEGA – SAMSON 2023: 28.

²⁹ SAMSON-WEEDEN 2024: xxxviii; AZCÁRATE ORTEGA – SAMSON 2023: 28–30.

on the user and context, the terms may or may not seem interchangeable.³⁰ Nevertheless, the natural meanings of the components of these two adjectival structures may facilitate a degree of conceptual clarity. The meaning of ‘counterspace’ appears to be narrower than that of ‘space’. If the prefix is not superfluous in ‘counterspace’, its meaning cannot be equated with ‘space’ and must be more limited. The meaning of ‘capability’, on the other hand, appears to be much broader than that of ‘weapon’. In fact, space weapons are the primary, but not exclusive, means by which a state or non-state entity may acquire counterspace capabilities. Therefore, the terms concerned are in a complex relationship and should not be regarded as being synonymous or being in a part–whole relationship.

However, the mere possession of counterspace capabilities is not necessarily unlawful or a serious problem. It is the combination of capabilities and behaviours of a state or a non-state entity that may pose a threat to space security. This realisation has prompted a recent shift of focus from capabilities to behaviours. Focusing on behaviours does not entail the disregard of capabilities, but has, among others, the benefit of being able to address the challenge posed by dual-use and dual-purpose assets.³¹ This holistic approach is based on a landmark UN General Assembly resolution,³² and characterises the activities of the Open-ended Working Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours.³³ Even though the working group was unable to adopt a final report, the process has turned the attention towards the concept of ‘irresponsible behaviour’. These efforts have produced a range of documents, including the UN Secretary-General’s report on reducing space threats, the Open-ended Working Group’s unadopted draft reports, and the Chairperson’s summary, which outline what contributing states

³⁰ AZCÁRATE ORTEGA 2026: 397.

³¹ AZCÁRATE ORTEGA – ERICKSON 2024: 16.

³² Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, G.A. Res. 75/36, 75 UN GAOR, Supp. No. 49 A/75/49 (Vol. I), 238.

³³ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, G.A. Res. 76/231, 76 UN GAOR, Supp. No. 49 A/76/49 (Vol. I), 299.

consider to be possibly irresponsible behaviours in outer space.³⁴ For example, behaviours related to space debris include anti-satellite weapon tests or simulations, the damaging or destruction of satellites, and threats of damaging or destruction of satellites.³⁵ Behaviours related to weapons include the development of counterspace capabilities, the placement of weapons in outer space, and the destructive use of space objects.³⁶ Behaviours related to interference include interference with normal operations, interference with military space systems, interference with command and control, disruption or impairment of space services, disruption of situational awareness systems, jamming, spoofing or cyber operations, and the use of laser dazzling or chemical sprays.³⁷ Behaviours relating to other space operations include intentional collisions of space objects, the hindering of orbital movement, the failure to perform avoidance manoeuvres, irregular movements in geostationary orbit, uncoordinated activities, tests or exercises, the uncoordinated release of objects, and the failure to deorbit satellites.³⁸ Behaviours relating to information include the failure to provide information on satellites or extraordinary activities, the failure to declare service or mission purposes, the lack of transparency on ambiguous behaviours, the sharing of misleading information, and the reporting of unprovable hostile

³⁴ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77; Draft Report of the Open-ended Working Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, 18 August 2023 and 31 August 2023, UN Doc. A/AC.294/2023/CRP.1 and UN Doc. A/AC.294/2023/CRP.1/Rev.1; Chairperson's Summary, Open-ended Working Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, 1 September 2023, UN Doc. A/AC.294/2023/WP.22.

³⁵ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (a).

³⁶ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (b).

³⁷ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (c).

³⁸ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (d).

acts.³⁹ Behaviours relating to rendezvous and proximity operations include a lack of transparency or prior communication, and a lack of consent or cooperation.⁴⁰ Miscellaneous other behaviours include the unnecessary overpopulation of orbits or frequency bands, the underestimation of the impact of new programmes, the delegation of control to non-certified or unqualified parties, the improper operation or placement of unpermitted technology, the use of low-cost or low-resilience components, the use of insufficiently cyberresilient ground segments or data links, and the use of nuclear power sources contrary to relevant guidelines and principles.⁴¹ These actions, activities or omissions may or may not be lawful, but could be regarded as equally irresponsible from the perspective of space security.

‘Space threats’ also emerge from the intersection of capabilities and certain behaviours. The concept of space threat is relatively old, but it also lacks a legally binding or generally accepted definition. The difficulties in defining the concept are primarily related to the inescapable subjectivity of threat perception and the dual-use or dual-purpose nature of most space objects. There are fundamental differences in how stakeholders perceive, assess and react to threats. This absence of a shared understanding is evident even among allied or like-minded countries. Furthermore, space threats should not be treated in isolation. Since the space domain cannot and should not be separated from the land, maritime, air and cyber domains, the identification and assessment of these threats require a holistic approach and a comprehensive analysis.⁴² Nevertheless, policy documents and the relevant literature facilitate the clarification of basic characteristics of space threats.

³⁹ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (e).

⁴⁰ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (f).

⁴¹ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 19 (g).

⁴² COTICCHIA 2024: 107–108.

Space threats are intentional conducts or deliberately created situations that target a space system or any of its components.⁴³ It should be recalled that space systems should be broadly understood to include the space segment, the ground segment, the user segment and the data links. The potential directions of these threats are as follows: Earth to outer space, outer space to Earth, outer space to outer space, and Earth through outer space to Earth. This last direction, as mentioned, is mostly excluded from the concept of a space weapon, but it should, by all means, be taken into consideration in the context of space threats. The conducts and situations that constitute space threats are inherently hostile, may vary in terms of gravity or intensity, and may utilise a range of low-end non-kinetic or high-end kinetic counterspace capabilities. However, they do not necessarily involve actual recourse to space weapons. These hostile conducts or situations are intended, as appropriate, to eavesdrop on, inspect, intercept, manipulate, deceive, disrupt, deny, degrade or destroy a space system or any of its components.⁴⁴ Their effects can be reversible or irreversible, temporary or permanent. Even though space threats are inherently hostile, the relevant conducts or situations may or may not be lawful. The European Union has grasped the essence of space threats with commendable brevity and clarity, stating that “space threats are intentionally hostile activities through counterspace capabilities”,⁴⁵ and its institutions are actively studying the possible scenarios and implications of the future development of space security.⁴⁶

⁴³ AZCÁRATE ORTEGA – SAMSON 2023: 41.

⁴⁴ NATO’s Overarching Space Policy, 27 June 2019, 2–4.

⁴⁵ European Union Space Strategy for Security and Defence, Joint Communication to the European Parliament and the Council, 10 March 2023, JOIN(2023) 9 final, 1.2.

⁴⁶ PATAKI 2025: 12–23.

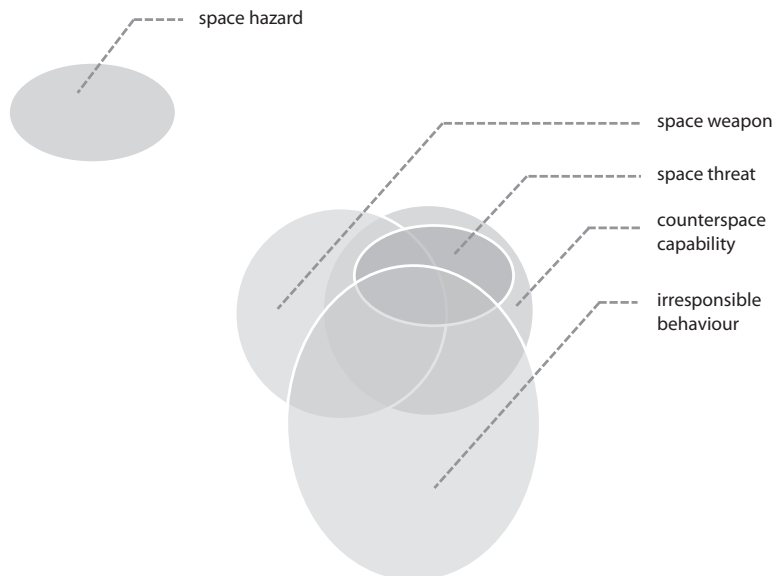


Figure 1. *Tentative relationship of concepts of space security*

Source: Compiled by the author.

Space threats should not be confused with ‘hazards’.⁴⁷ The distinction is far from being straightforward, as the latter concept also has numerous scopes and meanings that change with the context. In general, hazards are sources of harm originating from natural, human-induced or socio-natural factors. These processes, phenomena or activities can be single, sequential or combined, and have the potential to cause, among others, loss of life, personal injury, health impairment or property damage.⁴⁸ The likelihood of a hazard causing harm, and the severity of that harm, are described by the concept of risk. Unlike the previously discussed concepts, hazards

⁴⁷ Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours, Report of the Secretary-General, 13 July 2021, UN Doc. A/76/77, para. 9.

⁴⁸ Report of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction, 1 December 2016, UN Doc. A/71/644, 18–19.

belong to the realm of space safety as opposed to space security.⁴⁹ In this context, the relevant hazards are mostly environmental or technological, and include solar storms, geomagnetic storms, cosmic radiation, technical incidents, various accidents, and micrometeorite or space debris impacts. While they have the potential to disrupt, damage, disable or destroy a space system or any of its components, for the sake of conceptual clarity, they should not be classified as space threats.

The four concepts appear to have distinct areas of focus: ‘space weapon’ focuses on means and use, ‘counterspace capability’ focuses on ability and impact, ‘irresponsible behaviour’ focuses on conduct and standards, and ‘space threat’ focuses on perception and strategic considerations. Their tentative relationship is displayed in Figure 1.

The concept of space weapon has one overlap with the concept of counterspace capability, one overlap with the concept of irresponsible behaviour, one triple overlap with the concepts of counterspace capability and irresponsible behaviour, one triple overlap with the concepts of counterspace capability and space threat, and one quadruple overlap with the concepts of counterspace capability, irresponsible behaviour and space threat. The concept of counterspace capability has one overlap with the concept of space weapon, one overlap with the concept of irresponsible behaviour, one overlap with the concept of space threat, one triple overlap with the concepts of space weapon and irresponsible behaviour, one triple overlap with the concepts of space weapon and space threat, and one quadruple overlap with the concepts of space weapon, irresponsible behaviour and space threat. The concept of irresponsible behaviour has one overlap with the concept of space weapon, one overlap with the concept of counterspace capability, one triple overlap with the concepts of space weapon and counterspace capability, one triple overlap with the concepts of counterspace capability and space threat, and one quadruple overlap with the concepts of space weapon, counterspace capability and space threat. Finally, the concept of space threat forms a subset of the concept of counterspace capability. As such, it has one overlap with the concept of counterspace capability, one triple

⁴⁹ AZCÁRATE ORTEGA – SAMSON 2023: 39.

overlap with the concepts of space weapons and counterspace capability, one triple overlap with the concepts of counterspace capability and irresponsible behaviour, and one quadruple overlap with the concepts of space weapons, counterspace capability and irresponsible behaviour. The concepts of space weapon, counterspace capability and irresponsible behaviour also have non-overlapping cores, respectively. Examples are provided in Table 2. These examples reveal a correlation that the more overlaps exist between the concepts, the more severe the relevant conducts or situations become.

Table 2. *Examples of relevant conducts or situations*

Concepts of space security		
Overlap	Relationship	Examples
None	Space weapon	Development of space weapons Possession of space weapons
	Counterspace capability	Red teaming cybersecurity exercises Possession of rendezvous and proximity operation satellites
	Irresponsible behaviour	Irregular movements in geostationary orbit Reporting of unprovable hostile acts in orbit
	Space weapon + counterspace capability	Possession of anti-satellite weapons Possession of electronic warfare or cyber operation capabilities
Double	Space weapon + irresponsible behaviour	Uncoordinated release of objects from satellites Placement of orbital bombardment systems in outer space
	Counterspace capability + irresponsible behaviour	Unintentional disruption of satellite telecommunications Unintentional disruption of space situational awareness services
	Counterspace capability + space threat*	Placement of inspection satellites in close orbit Placement of rendezvous and proximity operation satellites in close orbit
	Space weapon + counterspace capability + irresponsible behaviour	Destructive test of direct-ascent anti-satellite missiles Nuclear weapon test explosions on other celestial bodies
Triple	Space weapon + counterspace capability + space threat	Deployment of direct-ascent anti-satellite missiles Placement of co-orbital killer satellites among space debris
	Counterspace capability + irresponsible behaviour + space threat	Intentional hindering of space objects in orbit Uncoordinated rendezvous and proximity operations
Quadruple	Space weapon + counterspace capability + irresponsible behaviour + space threat	Hostile and destructive use of space weapons against space systems Deliberate generation of space debris as methods or means of warfare

Note: *Space threats presuppose a certain level of threat perception.

Source: Compiled by the author.

COLLECTIVE SECURITY

The majority of basic concepts of collective security are contained in Chapters I and VII of the UN Charter, entitled “Purposes and Principles” and “Action with Respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression”, respectively. The obvious point of departure is the prohibition of the threat or use of force, a fundamental principle and peremptory norm of international law.⁵⁰ The Charter does not define the ‘use of force’ or ‘threat of force’, or any of their components, but the interpretation of related provisions, the practice of states and the relevant literature provide a solid basis for the clarification of its meaning. This meaning is centred and contingent on the meaning of ‘force’, which, in this context, is to be interpreted as armed or military force, even when the noun is not accompanied by a restrictive adjective.⁵¹ The use of force, therefore, refers to the physical application of armed or military force, regardless of the type of weapon used. Indeed, the use of force may also involve dual-use or dual-purpose means. However, the concept applies only to military actions by a state against another state; it does not cover civil wars, insurgencies, or other intra-state violence.⁵² These military actions may take place anywhere and in any operational domain, including cyberspace and outer space. It should be pointed out that the use of force is a comprehensive and objective concept. The use of force encompasses the categories of war and hostile measures short of war, as well as acts of aggression and armed attack. The determination of its existence is a matter of fact; the subjective reasons, motivations or considerations of states are irrelevant. Unlike the ‘use of force’, the ‘threat of force’ does not involve the physical application of armed or military force. Threats of force are explicit or implicit messages or promises from one state to another, which raise the credible prospect of the actual use of force should a demand not be complied with. These messages or promises may be delivered in writing or verbally, directly or indirectly, through a single act or a series of acts. However, the possession

⁵⁰ UN Charter, Article 2 (4).

⁵¹ RANDELZHOFFER–DÖRR 2012: 208; DÖRR 2019: [11].

⁵² RANDELZHOFFER–DÖRR 2012: 213–214; DÖRR 2019: [21].

of various weapons or weapon systems, *per se*, does not amount to a threat of force.⁵³ Examples include ultimatums, shows of force, military build-ups and general mobilisations. The threat or use of force is unlawful, except in the exercise of the right to individual or collective self-defence, or upon a prior and express authorisation by the Security Council under Chapter VII of the UN Charter.⁵⁴ These observations, like international law itself, also apply to the domain of outer space.⁵⁵

The UN Charter does not define any of the three concepts in the title of Chapter VII either. Instead, the Security Council is granted the power to determine whether a specific conduct or event constitutes a 'threat to the peace', a 'breach of the peace' or an 'act of aggression'.⁵⁶ This determination is based on an exceptionally broad discretion,⁵⁷ and forms an indispensable precondition for the taking of measures available under the chapter concerned.⁵⁸ From among the three concepts, 'threat to the peace' is undoubtedly the broadest. It can be applied to conducts or events between states, within states or not involving states, provided they pose a generic or specific threat to international peace and security. The threat does not necessarily involve recourse to weapons; a threat to peace is not synonymous with a threat of force.⁵⁹ Unsurprisingly, the Security Council favours this rather flexible and readily expandable category. It has already classified international and non-international armed conflicts, gross, systematic and widespread violations of international human rights and humanitarian law, massive flows of refugees towards and across international frontiers, all forms and manifestations of terrorism, the proliferation of weapons of mass destruction and their means of delivery, the illicit trafficking of drugs, small arms and light weapons and transnational organised crime, maritime

⁵³ KLECZKOWSKA 2023: 15–26; RANDELZHOFFER–DÖRR 2012: 217–218; WOOD 2013: [6]–[11].

⁵⁴ UN Charter, Articles 42, 51. See also DINSTEIN 2017: 195–378.

⁵⁵ BEARD–STEPHENS 2024: 201–238.

⁵⁶ UN Charter, Article 39.

⁵⁷ KRISCH 2012a: 1275–1276; CONFORTI 2005: 171–172.

⁵⁸ KELSEN 1951: 725; KRISCH 2012a: 1294–1295.

⁵⁹ UN Charter, Article 2 (4). See also KELSEN 1951: 727–728.

piracy and armed robbery, and the outbreak of epidemics and pandemics as threats to the peace.⁶⁰ More recently, the malicious use of information and communications technology has also been considered an evolving threat and a threat multiplier.⁶¹

‘Breach of peace’ is narrower than ‘threat to the peace’. Breaches of the peace mostly occur in cases of armed conflicts between states, armed conflicts between states and *de facto* regimes not recognised as states, and in cases of unlawful military occupation. In such cases, peace is not merely threatened, but manifestly violated.⁶² Since the Security Council is granted an exceptionally broad discretion in the interpretation of the concept, the potential scope of breaches of the peace appears to be broader than that of the use of force.⁶³ The principal organ has seldom used this category and has instead relied on the concept of threat to the peace. Determinations of the existence of ‘acts of aggression’ are even more sporadic. The concept of aggression is probably the oldest of the three concepts under deliberation and started to gain ground in international law in the first half of the previous century.⁶⁴ The UN Charter also contains the concept of aggression, alongside threat to the peace and breach of the peace, but leaves it undefined. However, a General Assembly resolution, adopted in 1974, provides a general definition and a non-exhaustive catalogue of relevant conducts.⁶⁵ It should be noted that the resolution is not legally binding and does not in any way affect the functions and powers of the Security Council. Nevertheless, it could be reasonably argued that the contents of the resolution reflect the common opinion of the international community. It contains the following definition:

⁶⁰ Repertoire of the Practice of the Security Council (<https://main.un.org/securitycouncil/en/content/repertoire/structure>).

⁶¹ Final Report of the Open-ended Working Group on Security of and in the Use of Information and Communications Technologies 2021–2025, 24 July 2025, UN Doc. A/80/257, paras. 22–25.

⁶² KELSEN 1951: 727; KRISCH 2012a: 1293.

⁶³ Cf. KAJTÁR 2015: 81.

⁶⁴ BROWNIE 1963: 351–360.

⁶⁵ Definition of Aggression, G.A. Res. 3314, 29 UN GAOR Supp. No. 31 A/9631 (Vol. I), 142.

Aggression is the use of armed force by a State against the sovereignty, territorial integrity or political independence of another State, or in any other manner inconsistent with the Charter of the United Nations [...]. The first use of armed force by a State in contravention of the Charter shall constitute *prima facie* evidence of an act of aggression [...].⁶⁶

The resolution submits that the following conducts may constitute acts of aggression, regardless of a declaration of war: the invasion or attack on the territory of another state by the armed forces of another state, any military occupation resulting from such an invasion or attack, or the annexation by the use of force of the territory of another state or any part thereof; the bombardment or the use of any weapon against the territory of another state; the blockade of ports or coasts of another state; any attack against the land, sea or air forces, or marine and air fleets of another state; the use of armed forces in the territory of another state in contravention of the conditions laid down in the agreement with the receiving state, or their extended presence in that territory after the termination of the agreement; the placement of a state's territory at the disposal of another state enabling the latter to perpetrate an act of aggression against a third state; the sending of armed bands, groups, irregulars or mercenaries by or on behalf of a state to carry out acts of armed force against another state the gravity of which amounts to the conducts listed above, or a state's substantial involvement therein.⁶⁷ The last conduct is often labelled 'indirect aggression', as opposed to the direct forms of aggression. The resolution also makes it clear that acts of aggression are, *per definitionem*, unlawful, and entail the international responsibility of the perpetrating state.⁶⁸ The planning, preparation, initiation or execution of acts of aggression by persons effectively exercising control over or directing the political or military actions of a state also entail individual criminal

⁶⁶ Definition of Aggression, Articles 1–2.

⁶⁷ Definition of Aggression, Articles 3–4.

⁶⁸ Definition of Aggression, Article 5 (2).

responsibility.⁶⁹ The examples above reveal that acts of aggression and breaches of the peace are in a part–whole relationship.⁷⁰

Since the Security Council is a political organ, the determination of the existence of a threat to the peace, a breach of the peace or an act of aggression is primarily a political and factual decision, not a legal one. The determination is based on the impact of a conduct or an event on international peace and security rather than on the lawfulness or unlawfulness thereof. Hence, the Security Council may take action even against lawful conducts or events, if it considers them impermissible from the perspective of international peace and security. For example, it may characterise such conducts or events as threats to the peace, and take appropriate measures to suppress them.⁷¹ Having determined that there exists a threat to the peace, a breach of the peace or an act of aggression, the Security Council has a range of options: it can make recommendations, adopt provisional measures, or take enforcement measures not involving or involving the use of armed force.⁷² The organ decides, at its discretion, which tools to use from its inventory and what form they should take. It also decides the sequence and duration in which the various tools should be used. The Security Council's practice reveals a tendency towards proportionality and gradualism, but this pragmatic approach may be set aside if the circumstances so require. The Security Council is not bound to apply the means at its disposal sequentially. These powers can also be exercised in the domain of outer space.⁷³

The UN Charter does not define 'armed attack' either; it only reveals that the victim of such an attack is a state.⁷⁴ However, the relevant theory and practice make it clear that an armed attack, as the 'overture' of a situation of

⁶⁹ Rome Statute of the International Criminal Court, Rome, 17 July 1998, 2187 UNTS 3, as amended by Resolution RC/Res. 6, Article 8bis (1).

⁷⁰ KELSEN 1951: 727.

⁷¹ HIGGINS 1963: 174, 226; KELSEN 1951: 728–730; KRISCH 2012b: 1245.

⁷² UN Charter, Articles 39–42.

⁷³ BEARD–STEPHENS 2024: 263–272.

⁷⁴ UN Charter, Article 51. The International Law Commission holds that an international organisation may also become a victim of an armed attack. Draft Articles on the Responsibility of International Organizations, Article 21, in Yearbook of the International Law Commission, 2011. Vol. II. Part Two, UN Doc. A/CN.4/SER.A/2011/Add.1 (Part 2), 40.

self-defence, possesses a quantitative and a qualitative element. The former characterises the gravity and intensity of the attack; the latter characterises the perpetrator of the attack.⁷⁵ Being a subset of the concept of aggression, an armed attack can be described as the gravest and most intensive manifestation of the use of force.⁷⁶ For the same reason, it is always unlawful. The nature of the weapons used in an armed attack is not relevant; it may be carried out even with dual-use or dual-purpose means.⁷⁷ The attack may take place in any of the operational domains, including cyberspace and outer space,⁷⁸ and may be constituted either by a grave and intensive singular act or by a series of attacks of lesser gravity, known as an ‘accumulation of events’.⁷⁹ Isolated events of minor gravity are not considered to be armed attacks, even if they claim human lives.⁸⁰ The traditional understanding of the concept holds that only conducts attributable to states can constitute armed attacks.⁸¹ Similarly to acts of aggression, an armed attack can be carried out either directly or indirectly. In the latter case, the attack is carried out by a person or a group of persons whose conduct is attributable to a state.⁸² However, in the recent decades there have been debates over whether conducts of

⁷⁵ Sulyok 2024: 395–397.

⁷⁶ Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), Judgment of 27 June 1986, ICJ Reports 1986, 101.

⁷⁷ Marxsen 2025: [21].

⁷⁸ Beard–Stephens 2024: 250–262; Schmitt 2017: 339, 341–343; Jakhu–Free-land 2022: 22.

⁷⁹ Oil Platforms (Islamic Republic of Iran v. United States of America), Judgment of 6 November 2003, ICJ Reports 2003, 190–192; Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v. Uganda), Judgment of 19 December 2005, ICJ Reports 2005, 219, 223.

⁸⁰ Eritrea–Ethiopia Claims Commission, Partial Award: Jus Ad Bellum–Ethiopia’s Claims 1–8, Decision of 19 December 2005, RIAA Vol. XXVI, 465.

⁸¹ Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion of 9 July 2004, ICJ Reports 2004, 194.

⁸² Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), Judgment of 27 June 1986, ICJ Reports 1986, 64–65; Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro), Judgment of 26 February 2007, ICJ Reports 2007, 208–210.

non-state actors that are not attributable to any state can constitute armed attacks. Equally debated is the so-called ‘unwilling or unable’ doctrine, which holds that self-defence is permissible against non-state actors carrying out attacks from the territory of another state, provided that state is unable or unwilling to put an end to these attacks.⁸³ The relationship of these terms is displayed in Figure 2. Theory and practice have clarified their meaning to an extent that the explanation of the conceptual relationship is a relatively straightforward task.

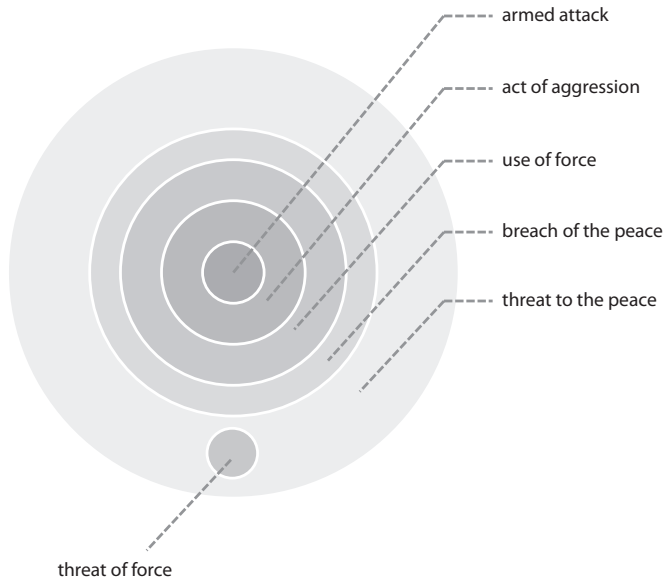


Figure 2. *Relationship of concepts of collective security*

Source: Compiled by the author.

⁸³ Letter dated 23 September 2014 from the Permanent Representative of the United States of America to the United Nations addressed to the Secretary-General, UN Doc. S/2014/695.

The relationship of these concepts can be illustrated by concentric circles, with the concept of armed attack forming the innermost circle and the concept of threat to the peace forming the outermost circle. The concepts are arranged in the following order from outside to inside: threat to the peace, breach of the peace, use of force, act of aggression and armed attack. This sequence represents not only a whole–part relationship between the concepts, but also an order of increasing severity of related conducts and situations. However, it should be pointed out that the concept of threat of force occupies a somewhat peculiar position in the depiction of conceptual relationship, and can arguably be described as a subset of threats to the peace. With the exception of threats to the peace, which may or may not be lawful, all other concepts describe concepts or situations that are by default unlawful.

CONCLUSIONS

The present study has focused on space security and collective security at a conceptual level in order to define and delineate the basic concepts of space security and to enable the positioning of these concepts within the conceptual framework of collective security. The concepts of space security and collective security analysed include ‘space weapon’, ‘counterspace capability’, ‘irresponsible behaviour’ and ‘space threat’, as well as ‘use of force’, ‘threat of force’, ‘threat to the peace’, ‘breach of the peace’, ‘act of aggression’ and ‘armed attack’, respectively. The analysis intended to promote a better understanding of these concepts and their relationships, and to contribute to the ongoing scholarly dialogue on matters of space security. It should be emphasised that the conclusions reached as a result of the analysis are inevitably tentative, owing to the fact that none of the concepts has a universally accepted or a legally binding definition.

The analysis revealed a correlation between the concepts of space security, indicating that the more overlaps exist between these concepts, the more severe the relevant conducts or situations become. However, the level of severity does not coincide with the lawfulness or unlawfulness of these

conducts or situations. The legal assessment of conducts or situations described by the concepts of space security has to be performed against the backdrop of the prevailing rules and principles of international law, particularly of the prohibition of the threat or use of force, guided by the fundamental principle that international law also applies to outer space. This is where the concepts of collective security come into play. Their meaning and conceptual relationship are incomparably easier to understand than those of the concepts of space security, even when the exceptionally broad discretion of the UN Security Council in their interpretation and application is factored in. Therefore, these concepts serve as a reasonably reliable compass for the legal assessment of relevant conducts or situations, with the notable exception of conducts or situations that constitute threats to the peace, which may or may not be lawful under international law.

Having established the relationship between the basic concepts of space security and collective security, it would seem logical to conclude by superimposing the former on the latter. While certain general observations could probably be formulated, they would be exceedingly abstract. Hence, a more practical approach would be to assess the conducts or situations of concern to space security on a case-by-case basis, taking into account the circumstances of each case. Indeed, such an objective assessment should be provided by the scholarly community whenever possible. Experience gained from specific cases would facilitate the identification of general perceptions, patterns or tendencies, thereby informing the behaviour of states and other stakeholders in the critical field of space security.

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