

Advancing Norms for Outer Space Security

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Dr Natália Archinard¹ holds the space portfolio at the Federal Department of Foreign Affairs of Switzerland. She has been leading the Swiss delegation to the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) since 2007 and served as the Chair of COPUOS Scientific and Technical Subcommittee for the period 2020-2021. She represented the Swiss government in different multilateral processes, including the development of the Guidelines on the Long-term Sustainability of Outer Space Activities within COPUOS (2011-2018), the draft International Code of Conduct proposed by the European Union (2012-2015) and the United Nations Open-Ended Working-Group on reducing space threats through responsible behaviours (2022-2023). Ms Archinard is also member of the Swiss delegations to the European Space Agency (ESA) and the United Nations General Assembly (1st and 4th Committees). At national level, she is involved in revising the Swiss space policy and in drafting the national legislation for space activities. She obtained her MSc in Mathematics from the University of Geneva and her PhD from the Swiss Federal Institute of Technology (ETH) Zurich in 2000.

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Introduction

In the last decade the outer space sector has undergone a revolution. The number of space objects and missions has increased like never before,² with many new public and private actors and renewed ambitions in space exploration. Commercial actors are playing a more prominent role alongside governments. The so-called “New Space” industrial dynamic is largely supporting these developments by offering cheaper and faster production in numerous space-related areas, as well as new kinds of products and services. The value of the global outer space economy is estimated to have reached US\$547 billion in 2022 and could grow to US\$1 trillion by 2030.³

From the origins of the exploration of outer space, this domain has been a strategic site where states could develop and demonstrate their technological capacities. Space-based technologies and satellite applications are currently providing essential information, services and tools in many areas of socioeconomic development, including in support of the implementation of the UN Sustainable Development Goals. The collaboration between the public and private sectors in outer space is becoming ever more varied and entangled, leading to the establishment of strong ties and common interests. Military space-related capabilities may be used to impede the development of foreign commercial outer space systems⁴ and vice versa, while private actors may be directly involved in the development of military space capabilities or provide services to support them.⁵ Furthermore, pressure on the outer space environment, which is used both for military and civilian purposes, results in sustainability and safety considerations becoming intertwined with security concerns.

Outer space activities are thus particularly sensitive to geopolitical tensions between countries, which have reached new highs since the start of the Russian Federation’s invasion of Ukraine in February 2022. Given the intrinsic competition between space actors and the risk of confrontation in outer space, it has become clear that new norms are required to keep misunderstandings and misperceptions at as low a level as possible and to ensure that outer space remains a stable and secure environment where activities can be conducted safely in the long term.

² The number of catalogued objects in orbit has more than doubled since 2011. See, for instance, European Space Agency, *ESA’s Annual Space Environment Report*, June 2023, para. 2.1, pp.18-19.

³ <https://www.mckinsey.com/featured-insights/sustainable-inclusive-growth/chart-of-the-day/a-giant-leap-for-the-space-industry>.

⁴ For instance, ASAT tests may be deliberately conducted in specific orbital areas so as to impede the development of foreign commercial satellite constellations.

⁵ For instance, in the areas of space situational awareness or space domain surveillance.

Security challenges

The development of counterspace capabilities leads to mistrust.

Outer space is a site of strategic importance because states have increasingly used space technologies to support their military capabilities.⁶ During the Cold War, states were already developing counterspace capabilities, including direct ascent anti-satellite weapons (ASATs). With the return to ASAT testing at the beginning of this century, the occurrence of several long-lasting debris-creating events,⁷ and the development and use of further disruptive capabilities such as jamming, spoofing, hacking and laser blinding, the perception of threat has increased for many states. Some indicators suggest that intensifying competition in counterspace capabilities is creating an arms race dynamic in outer space.⁸ These developments have led NATO and several countries to declare outer space as a war-fighting domain and to streamline military space capacities into newly created “space forces”. While some states communicate openly on such developments, others do not. This overall situation generates a climate of mistrust which has an impact on the global governance of outer space activities.

Space security challenges generate safety and sustainability challenges, and vice versa.

The testing and development of capacities such as ASATs and co-orbital weapons able to disable the command and control systems of satellites may create concerns in terms of the long-term sustainability of outer space activities. Indeed, space debris created by ASAT weapons generates risks to satellites in orbit in the same way that non-controlled space objects may do. Equally, space technologies developed for peaceful purposes may raise security concerns if they are misused. For instance, active debris removal and on-orbit servicing aim at supporting a more sustainable orbital environment by removing space debris and extending the life of satellites, but these technologies could potentially be misused to approach, observe, seize or take control of foreign satellites.

⁶ Sometimes with benefits for civil society, e.g. the US GPS system was developed for military purposes and became famous for its civilian applications supported by a large commercial market.

⁷ Secure World Foundation, *Global Counterspace Capabilities: An Open Source Assessment*, Appendix I, pp.205-210, https://swfound.org/media/207567/swf_global_counterspace_capabilities_2023_v2.pdf.

⁸ B. Silverstein et al., *Alternative Approaches and Indicators for the Prevention of an Arms Race in Outer Space*, UNIDIR, 2020, p.1, <https://unidir.org/publication/alternative-approaches-and-indicators-prevention-arms-race-outer-space>.

The global governance framework for space activities is split among different United Nations forums.

The United Nations (UN) Committee on the Peaceful Uses of Outer Space (COPUOS) is the only UN forum with a permanent mandate from the UN General Assembly (UNGA) dealing exclusively with space.⁹ While space security is not part of its mandate, COPUOS has been dealing with the long-term sustainability of outer space activities and the safety of space operations for at least 15 years. Space-security-related topics are addressed by established disarmament bodies¹⁰ or in temporary UNGA subsidiary bodies under multi-year work plans.¹¹ Additionally, the Geneva-based International Telecommunication Union also plays a significant role in the global governance system for outer space activities in more specific areas such as spectrum management and frequency allocation.

Given the interconnection of security challenges with sustainability and safety challenges, determining where to address a specific type of challenge or activity may not always be straightforward. States have different views and often disagree on mandate-related or procedural matters. Hence, the fragmented structure of the global governance framework for space activities creates a challenge to the development of new international norms, guidelines and standards related to space security, safety and sustainability.

States have fundamentally different priorities and approaches to global space governance.

Priorities for how to address space security are not aligned and sometimes appear to be incompatible. Russia and China have focused on a legally binding instrument aimed at preventing the placement of weapons in outer space. The first draft treaty they presented to the Conference on Disarmament was updated in 2014,¹² but continued to be deemed by the United States and other Western countries as an insufficient basis for an effective, comprehensive and verifiable legally binding instrument. As a reply to a call by UNGA for further transparency and confidence-building measures¹³, the European Union (EU) proposed a draft International Code of Conduct for Outer Space Activities¹⁴. After bilateral

⁹ UNGA, Resolution [1472\(XIV\)](#), 1959, para. 1.

¹⁰ Such as the UNGA First Committee, the Conference on Disarmament, and the UN Disarmament Commission.

¹¹ Such as Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space (2012-2015), [A/RES/65/68](#), 2010; Group of Governmental Experts on the Prevention of an Arms Race in Outer Space (2018-2019), [A/RES/72/250](#), 2017; Open-Ended Working-Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours (2022-2023), [A/RES/76/231](#), 2021; Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space (2023-2024), [A/RES/77/250](#), 2022.

¹² Draft Treaty on the Prevention of the Placement of Weapons in Outer Space submitted by Russia and China: [first draft](#), CD/1839 (2008); [second draft](#), CD/1985 (2014).

¹³ [A/RES/61/75](#) and [A/RES/62/43](#)

¹⁴ After consulting informally on first drafts in 2008 and 2009, the EU led international consultations in 2012-2015. Draft version, 2014: https://www.eeas.europa.eu/sites/default/files/space_code_conduct_draft_vers_31-march-2014_en.pdf.

consultations, the draft was presented in Vienna to all UN-Member States on the eve of a COPUOS session in 2012. This proposed non-legally binding draft instrument was centered around preventing the creation of space debris. It was supported by the United States, but criticised by Russia, China and other countries. The reasons for such criticism included that the process was held outside of the UN. Opponents also deemed the draft instrument to create mistrust by foreseeing exceptions based on the inherent right of individual and collective self-defence.¹⁵ More recently, the United Kingdom proposed a new approach aimed at developing non-legally binding norms of responsible behaviours in outer space, an initiative that led to the establishment of an UNGA Open-Ended Working Group (OEWG) for the period 2022-2023.¹⁶

Common challenges to military and civilian uses of outer space require coordinated solutions.

Military and civilian outer space objects are circulating in the same orbital regions, and there are no separate dedicated areas. As seen above, space technologies are often of a dual nature, and military space activities can be intertwined with civilian ones. Therefore, actions aimed at disrupting or denying military uses of outer space may also affect civilian uses. To address common challenges, solutions will need to be developed in a coordinated manner. However, this is made difficult by the current structure of the global governance framework for outer space activities (cf. paragraph 2.3). This is particularly critical for the international coordination of space traffic supported by enhanced space situational awareness capacities, because disconnected and non-interoperable systems may lead to incoherent and inefficient space traffic management at the global level.

¹⁵ According to Article 51 of the UN Charter.

¹⁶ OEWG, [A/RES/76/231](#), 2021.

Policy implications

In order to prevent misunderstandings and misperceptions with regard outer-space-related activities and their potential consequences for the security and peaceful uses of outer space, the establishment of common norms, rules and principles seems to be a necessary step towards preventing an armed conflict in outer space. Such norms, rules and principles should have global reach and be fully implemented by all space actors in order to produce the required effect. In the current geopolitical context it is unlikely that new norms could be of legally binding nature. Nevertheless, the common ground that they would establish could pave the way to future legally binding agreements and would nonetheless in themselves contribute to more security and stability in outer space.

Since outer space security is closely linked to the safety and sustainability of space activities, coherence between the instruments developed in the different multilateral forums is required. The work of these forums should be complementary and address the whole array of challenges to space security, safety and sustainability, because they interlink.

International coordination is needed in many areas, and is partly taking place already, in order to establish communication channels, harmonise practice and establish compatible standards. One particular area where international coordination will need to be institutionalised at the global level is the area of space traffic management and coordination. In this area, objectivity and trustworthiness are key, and verifiability by independent sources will make a significant difference. This is especially applicable to observing, modelling and forecasting activities in relation to space situational awareness and space surveillance and tracking.

Furthermore, close consultation with commercial and other non-governmental actors in rule setting and policy determination processes seems to be a prerequisite of successful governance, given the increased role of the private sector in various types of outer space activities, including in close collaboration with governments and the military. Since sustainability and safety measures are usually not mandatory, as security-related ones will probably be, creating incentives for private (and other) actors to apply existing and possible new norms will become a key aspect of ensuring stability in outer space and the sustainability of outer space activities.

Policy recommendations

Make effective use of existing avenues of work.

In the last 20 years only one outer space security-related process has led to substantial consensual conclusions.¹⁷ Other processes may not have achieved consensual outcomes,¹⁸ but they nonetheless provided platforms for UN member states to hold in-depth exchanges. The recent OEWG in particular allowed to clarify views on important aspects of outer space security¹⁹ but further work will be needed to develop and agree on specific norms, rules and principles of responsible behaviour in outer space. This OEWG process should thus be continued with a renewed and more specific mandate because the behavioural approach it promotes is complementary to the approach aiming at preventing an arms race or the placement of weapons in outer space. Coherence and complementarity between the different processes should be sought in order to ensure the efficiency of work and the effectiveness of the results.

In his 2021 report entitled *Our Common Agenda*, the UN Secretary-General identified several challenges related to the peaceful, secure, and sustainable uses of outer space and suggested immediate actions in the areas of space traffic coordination and preventing the weaponisation of outer space.²⁰ In particular, it proposed the holding of a multi-stakeholder dialogue during the Summit of the Future to be held in September 2024. To support preparations for the dialogue, the Secretary-General issued a policy brief in May 2023 for the consideration of UN member states,²¹ which could use this process to raise political awareness about space security and sustainability in an overarching way and at a high political level. Existing UN forums, in particular UNGA and COPUOS, should be involved in the preparation of the Summit's conclusions on this topic.

Based on the recommendation of the Group of Governmental Experts on Transparency and Confidence-Building Measures,²² joint meetings of the First and Fourth Committees were organised in 2015, 2017, 2019 and 2022 to address possible challenges to outer space security and sustainability. Such joint meetings should be continued, because they offer unique settings where

¹⁷ Group of Governmental Experts on Transparency and Confidence-building in Outer Space Activities, Note by the Secretary-General, [A/68/189](#), 2013.

¹⁸ For example, the EU-led consultations on a proposed International Code of Conduct on Outer Space Activities (2012-2015), the Group of Governmental Experts on Preventing an Arms Race in Outer Space (2018-2019) and the Open-Ended Working Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviour in Outer Space (2022-2023).

¹⁹ For example, how international law applies to outer space activities and which kind of actions are considered as threats.

²⁰ *Our Common Agenda: Report of the Secretary-General*, 2021, paras. 90-91, pp.61-62.

²¹ *Our Common Agenda, Policy Brief 7: For All Humanity – the Future of Outer Space Governance*, May 2023.

²² [A/68/189](#), 2013, para. 72.

cross-cutting issues can be discussed in an overarching way. In order to be more effective, they could adopt joint conclusions on the challenges ahead and suggest possible ways forward that could then be taken up in permanent forums.

Build on previous results.

In 2018 the UN Disarmament Commission (UNDC) started reviewing the recommendations set out in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures with a view to promoting their practical implementation. A consensual report that included recommendations was adopted in April 2023.²³ Building on this example, UN member states could decide to reconsider past agreed work with a view to reaffirming common basics and bringing them a step further to fruition. Examples could include developing the space-related elements of the Hague Code of Conduct against Ballistic Missile Proliferation²⁴ and the non-contested elements of the draft International Code of Conduct proposed by the EU. Working on the basis of a common understanding of the past may provide a solid starting point.

Involve non-governmental actors.

Given the load of experience gathered by private operators, it would be advisable for governments to involve them closer in their work in multilateral forums. While the participation of non-profit non-governmental actors is usually foreseen already, the involvement of commercial actors often remains a sensitive question at the multilateral level. However, multilateral exchanges could only be enriched by the experience of the private sector. For instance, specific recommendations or guidelines used by the private sector could be presented directly to multilateral forums with a view to informing intergovernmental deliberations. In its report to the Secretary-General, the High-Level Advisory Board on the Future of Multilateralism suggested that COPUOS should include the expertise of a broader range of operational stakeholders and could possibly hold so-called “Arria meetings” for this purpose.²⁵

²³ [Recommendations to promote the practical implementation of transparency and confidence-building measures in outer space activities with the goal of preventing an arms race in outer space, in accordance with the recommendations set out in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities](#), as adopted by UNDC Working Group II, 2023.

²⁴ [The Hague Code of Conduct against Ballistic Missile Proliferation](#), 2003.

²⁵ High-Level Advisory Board on Effective Multilateralism, *A Breakthrough for People and Planet: Report of the High-Level Advisory Board for Effective Multilateralism*, 2023, p.21.

Find common denominators while preserving national interests.

While acknowledging the different priorities and approaches to space security, states may wish to focus on finding common ground, as small as it may be at this time, and try to build on it step by step. This “low-hanging fruit” approach may eventually lead to better results than trying to achieve too big a step at once. The role of the so-called “space middle powers”²⁶ in this endeavour should be encouraged, because they have a direct interest in ensuring that larger space actors do not massively degrade the outer space environment or put at risk the future of space activities. Usually, these countries are already active in space diplomacy and enjoy convening power. Ultimately, all parties should have an interest in preserving the conditions for the long-term safe and sustainable use of outer space at not too high a cost. Creating incentives for all actors to act responsibly and sustainably will be key in this respect.

Ensure effective coordination among the relevant UN forums.

In order to ensure the coherent and overarching treatment of governance challenges related to outer space activities, coordination mechanisms should be established between existing UN forums dealing with the governance of space activities (see paragraph 2.3). Such mechanisms could include establishing communication channels between these forums, for instance through regular briefings by their respective chairs or through written communications. The joint meetings of the First and Fourth Committees of the General Assembly (see paragraphs 4.1 and 4.1.3) could also be used to agree on recommendations in this respect. The UN Office for Disarmament Affairs and Office for Outer Space Affairs could further increase their collaboration to better support this coordination effort.²⁷

²⁶ D. Golston with B. Baseley-Walker, *The Realities of Middle Power Space Reliance*, UNIDIR, 2015.

²⁷ Inspired by the recommendation of the Group of Governmental Experts (see note 16), A/68/189, 2013, para. 66.

Conclusion

Given the dependence of modern societies on space technologies and their potential for sustainable development, most nations have a stake in preserving peace and security in outer space. The vulnerability of space systems make them attractive targets in situations of armed conflict, especially because they may be critical to the military capabilities of an adversary. However, if outer space were to become the theatre of an armed conflict, it is most likely that every nation on Earth would be adversely affected. Everyone would lose, including the belligerent parties. Hence, states involved in multilateral diplomacy should find ways to agree on new norms and rules for a stable and secure outer space environment that allows for its safe and sustainable exploration and use in the long term by all countries. In this endeavour the role of civil society will be crucial in reminding governments that the exploration and use of outer space is – and should remain – the province of all humankind, as implied by Article I of the UN Outer Space Treaty of 1967.

People make peace and security possible

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