Teka Komisji Prawniczej PAN Oddział w Lublinie, vol. XVI, 2023, no. 2, pp. 309-327
https://doi.org/10.32084/tkp.5621

LEGAL FOUNDATIONS OF SPACE SECURITY*

Dr. habil. Małgorzata Polkowska

War Studies University, Poland
e-mail: m.polkowska@akademia.mil.pl; https://orcid.org/0000-0002-6633-2222

Dr. habil. Marzena Toumi

War Studies University, Poland
e-mail: m.toumi@akademia.mil.pl; https://orcid.org/0000-0003-3838-1315

Abstract. The advancement of space technology in recent times and the diplomatic efforts by the countries involved in space exploration indicate that conflicts in space are still possible. It is important to note that conflicts on Earth can have adverse effects in space, thereby jeopardizing security for all countries. Securing safe and sustainable access to space and preventing space hazards are crucial components of space security and safety. Maintaining the principle of peaceful use of space has become increasingly challenging today. Hence, greater attention is being devoted to the issue of space security and the corresponding international regulations. This article presents some global-level programs and initiatives, such as disarmament programs, PAROS and UN Long Term Sustainability.

Keywords: space security; space law; space debris; UN Long Term Sustainability; PAROS

INTRODUCTION

Space security and safety mean a secure, safe and sustainable access to Space and mitigation of Space hazards. This definition covers also aspects of security and safety of man-made equipment sent into Space as well as ground stations. Space infrastructure can be described as a network of Space and ground systems connected by means of communication channels and enabling access to Space. Security and safety of Space infrastructure involve numerous challenges, such as: unintended hazards (Space debris, geomagnetic and solar storms and other accidental interferences), intended hazards (anti-satellite weapons – ASAT, malicious interferences and cyber-attacks) and increasing problems with Earth orbit congestion

* This publication is financed under the project implemented in the Research Grant Programme of the Ministry of National Defense Republic of Poland.

ISSN 1899-7694
e-ISSN 2719-7379

and growing quantities of Space debris coming from equipment launched into Space. The definition of space security guiding this report reflects the intent of the 1967 Outer Space Treaty that outer space should remain accessible for all to use for peaceful purposes now and in the future. The key consideration in this approach to space security is not the interests of particular national or commercial entities, but the security and sustainability of outer space as an environment that can be used safely and responsibly by all. This definition encompasses the sustainability of the unique outer-space environment, the physical and operational integrity of humanmade objects in space and their ground stations, as well as security on Earth from threats and natural hazards originating in space. Outer space is a global commons that is central to military, environmental, socioeconomic, and human security on Earth, as well as science, exploration, and discovery. The ability to access and use outer space is critical to the well-being of all nations and people. Resources in outer space support applications from global communications to financial operations, farming to weather forecasting, and environmental monitoring to navigation, surveillance, and treaty monitoring. It is imperative that all humankind can access and enjoy its many benefits today, and that this use is sustainable in the future. But maintaining the safety, security, and sustainability of outer space is challenging.

The outer space environment is fragile and threatened by the accumulation of debris that results from all human activities, but which is exacerbated by accidental collisions and the intentional destruction of objects in orbit. Even the smallest pieces of debris can be harmful to satellites operating in space. At this moment, we don't have sufficiently precise information on what exactly is in outer space, where it is, and how it is moving through orbit to ensure that the objects and people that we send there remain safe.

This environment is also a scarce natural resource with limited abilities to support human activity, including available orbital positions, and radiofrequency spectrum to communicate data back to Earth. It is a harsh environment where safe operations are threatened by natural occurrences such as space weather. And this environment is increasingly congested. The access and use of outer space is growing rapidly. These new activities are expanding the number of global stakeholders who have an interest in maintaining the security of outer space and contributing to global well-being. Renewed interest in space exploration – particularly of the Moon – is inspiring a new generation of exploration and science, and possibly the discovery of new resources. But this activity, if not well governed, also adds pressure to equitable access to and sustainability of this environment.

As on Earth, activities in outer space are subject to cooperation, competition, and conflict. Sometimes these dynamics advance access to space through technological transfers and capacity building, and the agreement

of new governance rules, such as the recent guidelines on the long-term sustainability of outer space. Sometimes, competition encourages wider access to space by spurring innovation in launch technology and new satellite services. But, sometimes, it hinders the ability to enhance security by, for example, encouraging competition and secrecy linked to orbital data. And, increasingly, competition – particularly military competition – risks escalating into conflict.

The prospect of conflict in space is accelerating as more states come to rely on space assets to support a broad array of military purposes, such as precise positioning, navigation, and timing; surveillance, reconnaissance, and intelligence gathering; strategic and tactical communications; and missile early warning and tracking. In this context, some states now consider outer space to be a domain of warfare. No hostile anti-satellite attacks have been carried out against an adversary; however, development and demonstration of capabilities to interfere with or physically damage space systems are accelerating. Governance is not keeping up. While there is widespread international recognition that the existing regulatory framework is insufficient to meet current and future challenges facing the outer space domain, the development of an overarching normative regime has been slow. While some progress has been made related to sustainability and safety, it remains insufficient. Questions related to national security uses of space and the dynamics of conflict and arms control remain unresolved.

1. DEFINITION OF SPACE SECURITY

Space security entails the possibility to access and use space for all nations. Although traditionally it has been associated with military engagement, over the past years it has been enriched with safety aspects. The space race between the United States and the former Soviet Union in the 1960s triggered the first concerns regarding space security. The attempt to end an arms race in space was effected with the conclusion of the United Nations (UN) Outer Space Treaty in 1967 (United Nations 1967).[1] The treaty sought to define boundaries for the security of outer space by establishing the principle of peaceful purposes in accordance with the UN Charter and by prohibiting the militarization and weaponization of space. The ratification of the Outer Space Treaty was a remarkable endeavor of resolving the space race tension, ensuring stability, and promoting international cooperation. Thus, space security – although not explicitly defined – was

[1] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html [accessed: 22.02.2021].

the result of the stabilizing effect of a treaty-based mechanism, and vice versa space security meant that activities in outer space ensure stability and peaceful uses of outer space.

In this context, the interrelatedness between space security and stability was reinforced by the explicit distinction between civil and military uses of outer space. Five decades later, the scope of space security has changed. In the chapter "Defining Space Security," of the previous edition of this Handbook, "space security includes now aside the military dimension, also, economic, societal and environmental dimensions." These elements are indispensable to space security, in view of the ongoing transformation of the space sector that moves away from the traditional confines of space activities. The so-called New Space encapsulates major changes taking place at unprecedented rate. These are related to the growing participation of private actors, the rising number of spacefaring nations, and the emergence of the civil-military paradigm. This means that the dividing line between civilian and military uses of outer space has yet become artificial leading to uncertainty regarding governance of dual-use or hybrid areas.

The terms "safety," "security," and "defense" are intertwined and used interchangeably with no clear separation between areas of action. In many languages there is no clear distinction between the words safety and security. The cultural aspects of safety, security, and defense vary from country to country and from region to region. What is more, the understanding of space security has been redefined considering the new often blurred borders between safety – a clearly civilian area – and defense – a clearly military one. Security lies in between and for some countries/regions is closer to safety while for others closer to defense. This debate extends to governance questions as to who has legitimacy to act in space security and for what type of actions. Also, what would the role of the civil and defense actors respectively be and in which area. Accordingly, the various and divergent concepts, approaches, and definitions across the chapters of this Handbook are representative of an evolving space security landscape.

The absence of an internationally agreed definition – combined with the systemic nature of the space sector with multiple strategic objectives – presents challenges when endeavoring to build cooperative approaches among diverse organizational actors. As such, this requires the development of a mechanism that fosters new forms of cooperation among states in the advent of the new space era. Therefore, stability remains of strategic importance to the space sector, as it influences the effectiveness of states to manage the growing challenges and ultimately ensure space security.

There is no commonly agreed definition and uniform understanding of space security. Be that as it may, there are myriad definitions adopting either a "soft" or "hard" approach. Often, the concept of "security" is used

instead of the term "safety" or the term "defense," or instead of both. This creates ambiguity concerning the content of space security and the set of underlying shared values and principles. As a result, the lack of clear boundaries between these concepts poses a major definitional challenge for space security. In attempt to address this definitional challenge, this section will first take a closer look into the security concept under international relations/law perspective and, then, it will examine the evolution of the security concept in the outer space context.

The definition of space security is as elusive as the definition of security itself. Similarly, to the ambiguity of the security concept within the frame of international relations, there is no universally agreed definition on space security. As such space security is a multifaceted term that many have attempted to define yet no consensus has been reached. The evolution of the security concept over time combined with the evolution of outer space activities poses unique challenges to the understanding and definition of space security. What is more, a significant challenge remains the dual-use nature of space technology and applications.

The military perspective of space security, closer to the "defense" side, has to a large extent derived from the global agenda on international peace and security. The launch of Sputnik-1 in the 1960s, followed by the first manned spaceflights in the 1970s, marked a technological race between the former Soviet Union and the United States. This created the fear of an arms race in space and profoundly influenced the definition of space security.

Use of Outer Space, including the Moon and other Celestial Bodies, with the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) being the most important UN body engaging in the development of international space law [Antoni 2020]. Space safety includes the protection of human life, the safeguard of critical and/or high-value space systems and infrastructures, as well as the protection of Earth, orbital, and planetary environments. Space safety is necessary for the sustainable development of space activities. Space safety actually covers many diverse areas that are discussed in this chapter. Space safety can be defined as freedom from or mitigation of human or natural harmful conditions. These conditions can cause death, injury, illness, damage to or loss of systems, facilities, equipment or property, or damage to the environment. The term "safety" refers to threats that are non-voluntary in nature (design errors, malfunctions, human errors, natural hazards, etc.), while "security" refers to threats which are voluntary (i.e., of aggressive nature such as use of anti-satellite weapons).

Peter Martinez write the terms space security and space sustainability are sometimes used interchangeably to encompass a set of largely overlapping concerns as seen from two somewhat different perspectives. Underlying

both of these perspectives is the acknowledgment that space systems underpin the modern information society and now form part of the critical infrastructure of most nations, whether they are spacefaring or not, and that this infrastructure is exposed to a series of risks of natural and anthropogenic origin. Regardless of the perspective from which one sees the problem, the point is that coordinated global action will be required to address these concerns. Acknowledging and addressing these different perspectives is one of the challenges that will be faced by multilateral initiatives to promote either space security or space sustainability.

Space security is a term that is used among space actors to refer to preserving order, predictability, and safety in space and avoiding courses of action that would ultimately undermine mission assurance, operational safety, and freedom of action in outer space. Another key dimension of this dialogue is the notion that, because of growing reliance on space systems in every facet of modern life, security on Earth (regardless of how one defines it) is increasingly underpinned by security in outer space. Hence one of the key aims of the space security dialogue is to ensure freedom from threats (either ground-based or space-based) to the effective access to and utilization of outer space. For some actors this is closely coupled to concerns about the potential weaponization of outer space, although it is difficult to progress beyond a general acknowledgment of the potential problem to practical measures to avoid it, because of disagreements around the definition of what constitutes a space weapon.

An important point to note is that the space security discourse has, up until recently, been dictated by the national interests and concerns of the major space powers, who are the ones who most heavily invested in space-based infrastructure to support their national security. For some sitting on the sidelines of the debate, space security has sometimes been perceived to be predominantly the preoccupation of the advanced space actors and thus far-removed from the day-to-day concerns of the non-space nations. Others, particularly those from emerging or aspiring space nations, have seen the promotion of multilateral space security discussions as an attempt by the leading space actors to advance and preserve their national space interests and advantages by raising entry barriers to aspiring newcomers on the pretext that the space environment is already "saturated" with actors. Neither of these perceptions has helped to build multilateral consensus on normative rules of behavior for all space actors. However, there are promising signs of middle space powers beginning to play a more active role in promoting multilateral space security dialogues in the future and hence helping to bridge the gap between these different perceptions of space security.

Space Sustainability – the word sustainability is derived from the Latin verb sustinere (tenere, "to hold"; sus, "up") and is usually used in the context of being able to maintain an activity at a certain rate or level. Since the 1980s the concept of sustainability has been applied to human habitation and utilization of planet Earth and its resources. This has given rise to the widely used term sustainable development. This term was coined in the book Our Common Future, which contains the report published by the Brundtland Commission in 1987 (UNGA 1987). The definition for sustainable development given in that book is worth quoting here: development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Notice the emphasis on "needs" in this definition. The Brundtland Commission's report placed emphasis in particular on meeting the essential needs of the world's poor, rather than satisfying the nonessential desires of the well-to-do. The connection of sustainability with outer space arises from the perspective that space systems are now major global utilities that meet various societal needs. When seen in this light, space sustainability is understood to be about using outer space in such a way that all humanity will be able to continue to use it in the future for peaceful purposes and for societal benefit. The sustainability concern here is driven by the realization that the Earth's orbital environment and the electromagnetic spectrum are limited natural resources. This realization leads naturally to a concern for how to ensure that the benefits of space activities will continue to be accessible to future generations and to all nations and raises issues about the equitable and responsible access to and use of space resources. In other words, from this perspective, space sustainability is seen in the context of wider sustainability discussions and is perceived to be the concern of all beneficiaries of space activities. It is thus an intrinsically multilateral issue. This is a significantly and fundamentally different point of departure for addressing a very similar set of issues driving the space security discourse [Martinez 2020].

Space security is safe and sustainable access to space and the reduction of threats from there. This definition also includes security aspects of manmade devices sent into space and ground stations. Space infrastructure can be described as a network of space and ground systems connected by communication channels that allow access to space. There are many challenges associated with the security of space infrastructure, such as unintentional threats (space debris and accidental disruptions), intentional threats (anti-satellite weapons-ASAT, malicious disruptions and cyber-attacks) threats related to space weather (geomagnetic storms, solar storms, etc.) and the growing problem of space debris from devices launched into Space.

Because space is so important to many countries, their leaders are creating policies and strategies for its safety and security. The first task is to secure the significant investments made by public and private entities. The state must protect the economy and society from the dangers of their significant dependence on space infrastructure. Security also plays an increasingly important role in commercial space markets. The 21st century for the process of space development has brought many significant achievements. New technologies have been developed, the commercialization of the space industry has taken place, the number of countries actively working in space has increased, space resource utilization projects have emerged, etc. However, the continuous process of commercialization of Space requires adapting existing legislation to current needs and challenges. In addition, economic challenges and those related to security, have increased conflicts between democratic states and autocratic states. As early as the 1960s, space was at risk of becoming a new arena for military competition. If space was not weaponized, it was nevertheless constantly used: space devices became very important for military communications, navigation, nuclear early warning and other functions [Silverstein, Porras, and Borrie 2020, 1-25]. Today, space has become more accessible and much more valuable to the most powerful countries than before. A wide range of space technologies are now essential to today's global economy and society. Meanwhile, information is proliferating about states that can disrupt or destroy space-based systems and devices. While few states have successfully demonstrated ground-launched anti-satellite (ASAT) weapons capabilities, others have the means to disrupt or destroy space assets using cyber and electronic techniques. This has caused concern in the international community.

2. DISARMAMENT PROGRAMS

Among those working to prevent an arms race is the Geneva Conference on Disarmament, which in 1979 was given a mandate to negotiate arms control and disarmament agreements.[2] The Conference on Disarmament soon changed its name to the "Diplomatic Conference" (CD). Each year, three separate sessions of the Diplomatic Conference are held in Geneva with the participation of representatives of 65 states. Each year, or more often if necessary, the conference reports to the UN General Assembly. The CD may adopt its own agenda, taking into account the recommendations submitted to it by the UN General Assembly and the proposals made by its members.[3] The CD is an important mechanism in the field

[2] See https://www.unog.ch/CD [accessed: 22.06.2020].

[3] UNGA Res S-10/2 UN Doc A/RES/S-10/2.

of disarmament to help the UN fulfill its role as an organizer on this issue [Froehlich and Seffinga 2020, 24]. The CD's terms of reference cover virtually all multilateral arms control and disarmament issues. Currently, the CD focuses its attention primarily on the issues of: stopping the nuclear arms race, preventing nuclear war and preventing an arms race in space.

The organization's mandate to deal with disarmament issues in outer space was confirmed by the UN General Assembly in Resolution 36/97-C.[4] Moreover, in Resolution 36/99, the General Assembly asked the CD to consider the possibility of a treaty banning the stationing of weapons of any kind in space.[5] In fact, however, the powers of the Diplomatic Conference clash to some extent with the statute of the UN COPUOS (UN Committee on the Peaceful Uses of Outer Space), which was established by the General Assembly in 1959 to manage the exploration and use of outer space for the benefit of all mankind, for peace, security and development. The Committee was tasked with reviewing international cooperation in the peaceful uses of outer space, examining space-related activities that could be undertaken by the United Nations, supporting space exploration programs and providing opinions on legal issues arising from space exploration. The committee was instrumental in the creation of the five treaties and five principles on space.[6]

Due to rapid advances in space technology, the space agenda is constantly changing. As such, the Committee provides a unique platform at the global level to monitor and discuss these developments. The Committee has two subsidiary bodies: the Scientific and Technical Subcommittee and the Legal Subcommittee, both established in 1961. The Committee reports to the General Assembly's Fourth Committee, which adopts a resolution annually on international cooperation in the peaceful uses of outer space.[7] A cursory glance indicates that UN COPUOS focuses exclusively on the peaceful uses of space and the legal problems associated with space exploration. However, the use of space for military purposes has been and continues to be an important part of space activities, as stated in the 1967 Outer Space Treaty (Articles III and IV). The following CD sessions, among others, deliberated on this topic.[8] However, some countries considered the 1967 OST treaty

[4] UNGA Res 36/97-C Doc A/RES/36/97-C.

[5] UNGA Res 36/99 Doc A/RES/36/99.

[6] See https://www.unoosa.org/oosa/en/ourwork/copuos/index.html [accessed: 22.06.2020].

[7] See https://www.unoosa.org/oosa/oosadoc/data/resolutions/1959/general_assembly_14th_session/res_1472_xiv.html [accessed: 22.06.2020].

[8] Europe, Space and Defense, From "Space for Defence" to "Defence of Space", file:///C:/Users/ASzWoj25/Downloads/ESPI%20Public%20Report%2072%20%20Europe%20Space%20and%20Defence%20-%20Full%20Report.pdf [accessed: 22.06.2020]

inadequate because it failed to prevent the development and deployment of weapons in space.

3. PAROS PROGRAM

In this situation, discussions on new ways to prevent an arms race in outer space intensified at the UN; as a result, work on the PAROS (Prevention of an Arms Race in Outer Space) program began in 1978. In 1981, the first two draft General Assembly resolutions on PAROS appeared. Western countries spoke only in favor of banning ASAT systems. The USSR and its allies, proposed issuing a ban on stationing weapons of any kind in space. The two camps could not come to an agreement. The end of the Cold War and the collapse of the Soviet Union in the early 1990s changed the political landscape. Discussions at Diplomatic Conference (CD) sessions became more substantive and involved diplomats from many countries. Against this backdrop, China and the Russian Federation submitted a joint working paper outlining the elements of a future international legal instrument on preventing the deployment of weapons in space. Subsequently, the two delegations submitted compilations of other countries' comments and suggestions on their original proposal as diplomatic conference documents, and prepared further working papers on specific aspects of their treaty proposal.

In February 2008. China and the Russian Federation submitted the final draft of the Treaty on the Prevention of the Placement of Weapons in Outer Space (PPWT) to the CD. This draft consisted of 14 articles, which obligated states not to "place in orbit around the Earth any objects carrying any kind of weapons" or "resort to the threat or use of force against space objects." In particular, the draft PPWT defined terms such as "space," "weapons" and "use of force," which had not previously been introduced in discussions related to the PAROS program. Based on its missile defense program and the technical advantages of its space weapons, the United States has consistently refused to negotiate PAROS in the CD. In this situation, China and the Russian Federation introduced a new text in 2014 that sought to allay these concerns. To this day, however, the United States and other Western countries continue to oppose the draft MSP, considering the amendments made to PAROS insufficient. In 2014. The European Union proposed an alternative, submitting a draft voluntary international code of conduct for space activities, but this initiative too eventually collapsed [Harrison 2020, 13]. It appears that the PAROS treaty would complement and reaffirm the importance of the 1967 Outer Space Treaty, which aims to preserve outer space for peaceful purposes by prohibiting the deployment and use of space weapons. The treaty would prevent any state from gaining military superiority in space. The discussion of PAROS has actually not completely

stopped; one of the research platforms dealing with this project is the United Nations Institute for Disarmament Research – UNIDIR.[9]

The current situation has changed significantly and is in many ways more complex. The use of space no longer reflects the dynamics of bipolar competition. The number of countries, as well as commercial entities launching and operating space objects, and the number of satellites in orbit have increased significantly. New threats have emerged, such as hacking and cyber-attacks, electronic jamming of space facilities and unauthorized maneuvers near satellites – all of which can lead to the outbreak of armed conflicts. Protecting space infrastructure is a concern for those countries that depend on space systems for strategic military functions, such as communications, navigation, control of certain precision weapons on Earth and anti-missile systems [Silverstein, Porras, and Borrie 2020, 26-35]. In general, arms races are the product of competitive pressures that motivate or otherwise induce states to improve the quality of their armed forces or to expand them.

Back in the "Cold War" period, scholars proposed normative ways of defining arms race behavior, including indicators that take into account the impact of "bureaucratic political games" and other intra-state interactions. Other definitions have addressed the causal aspects of arms races, pointing to "conflicting goals or mutual concerns" between "two states or coalitions of states." These definitions capture important aspects of the dynamics of arms races, but were developed at the height of the Cold War and focus on rivalry factors that may only partially motivate states to compete today, if at all. They also often attempt to capture the multifaceted technical and political problems of contemporary interstate competition in space. It is difficult to draw meaningful conclusions from this framework when trying to determine whether there is an arms race in space. In the current geopolitical environment, it seems unlikely that the international community will reach consensus on negotiating legally binding measures on PAROS. One challenge is that the PAROS debate covers an increasingly diverse range of technologies and activities. A second challenge is that diverse inter-state rivalries complicate attempts to formulate universal or general agreements that encourage states to refrain from arms races in space. Third, because many space-related technologies serve both civilian and military purposes, states are reluctant to agree to restrictions or limitations that may stifle innovation in the emerging commercial or military space sectors. A fourth challenge for the countries involved in the PAROS discussion is to clearly define the success and end goals of such an agreement.

PAROS emerged out of concern about the potential effects of an unfettered arms race in space, and four decades later, the language used in the PAROS

[9] See https://www.unidir.org/ [accessed: 22.06.2020].

debates remains largely the same. The latest version of the General Assembly's annual resolution on PAROS lists its main goals as preventing serious threats to international peace and security and ensuring the continued use of outer space in accordance with international law and space treaties. The language gives policymakers the necessary latitude to shape PAROS measures or agreements, but gives no guidance on how to overcome the associated political obstacles. It seems that a concise and concrete codification of PAROS goals could help advance the discussion. Countries could agree that the short-term goal of PAROS activities is to ensure the safe and responsible use of space by countries. This includes access to space and its use for economic, civil and military purposes. This approach could help focus PAROS discussions on those technologies or activities that make the greatest contribution to stabilizing order in space. On this basis, states could jointly identify the most destabilizing aspects of military competition in space and analyze how these specific threats could be mitigated, including how competing states could be encouraged to cooperate in such efforts.

Most states would prefer to prevent the placement of weapons in space and establish clear rules on what military activities are allowed. However, a solution that achieves both of these goals is unlikely. Moreover, it is unclear whether imposing restrictions on military competition in space is an acceptable solution for large states with significant space capabilities. In 2020, UNIDIR experts began work on a report on the future approach to PAROS. The first, dubbed the "three vectors," refers to three directions of attacks: space-to-space; earth-to-space; and space-to-earth. The first of these, space-to-space attacks, involves co-orbital vehicles and other types of technology that can threaten vulnerable satellites in orbit. This includes the use of such vehicles to destroy a satellite, eavesdrop on or interfere with telecommunications signals, or control the physical properties of space objects.

The second vector, ground-to-space, includes kinetic, destructive weapons such as re-aligned missile interceptors, as well as jamming capabilities. The last category, space-to-earth, includes technologies that are probably still far from economic or operational feasibility. These three vectors have the advantage of dividing technologies into three distinct categories that could essentially be addressed independently. Homing missiles and electronic interference on the ground are two elements of the earth-space vector. In particular, disruption of communications between satellites and other nodes in space systems is becoming more common. To date, states and commercial entities appear to have tolerated jamming activities, or at least the victims have not resorted to overt military or legal responses. However, if jamming interferes with some strategically important space systems, such as missile launch detection and early warning systems, it could raise fears of an imminent attack and trigger a more aggressive response from

the targeted party. Countries could negotiate protected bands by designating certain parts of the radio spectrum as being off limits to jamming and interference. The space vector is particularly difficult to resolve through international negotiations, primarily because these systems remain unproven to date. The usual example cited is the U.S. space-based missile interceptors, designed to combat surface-launched missiles.

One recent proposal promotes the principles of non-interference, derived from the START treaty. Such an arrangement could be extended to all satellites considered critical to strategic systems, such as command and control or guidance systems. This approach is not perfect. Countries may be reluctant to determine which of their satellites are strategic. Or conversely, they may want to designate all of their satellites as critical to strategic systems. In the meantime, the idea of adopting rules or formal agreements to protect certain important satellites could alleviate the ambiguity surrounding the deployment of capabilities (capabilities) in space. UNIDIR's second approach is to divide the topic into two types of threats: to and from space objects. Technologies such as co-orbital vehicles and direct-attraction rockets pose a threat to space systems because they destroy or otherwise disrupt the functions of space facilities. Unfortunately, threats to and from space systems are strongly linked in the perceptions of some policymakers. States may be particularly reluctant to formally limit or abolish terrestrial ASATs (which pose a threat to space) without simultaneously banning the deployment of space-based weapons on the ground Eliminating a viable capability to counter threats from space would artificially increase the value of space-based systems, without consequently reducing the effectiveness of the threats these systems pose.

As past discussions at forums such as the CD conference have shown, some countries still do not accept the PAROS project. However, some experts argue that a willingness to discuss missile interceptors in the context of PAROS is essential in light of current realities. Among other benefits, such a discussion could help build trust between states, which could benefit their subsequent willingness to engage in strategic arms control issues. A third approach considers the impact of space countermeasure capabilities more broadly, including in terms of economic and other civilian space impacts that states may wish to avoid. This type of technology is mostly "non-destructive" and has limited impact on the continued availability and utility of orbits around the Earth (large-scale jamming can still be destabilizing). Countries could apply this approach to PAROS by focusing on destructive technologies that could threaten more objects in space, especially those that raise the prospect of "shared tragedies" (the production of persistent space debris). At present, the utility of destructive ASATs is questionable

in a military sense, since combatants would likely have to destroy many satellites over a short period of time to mount an effective attack with ASAT weapons.

It is clear that the development of space technology and military space units is part of a broader strategic competition taking place on Earth. States are investing in quantitative and qualitative improvements in military functions, and space is an additional area in which some are seeking to gain or maintain an advantage over their rivals or future competitors. Competing states are more openly seeking ways to exploit or neutralize this advantage [Silverstein, Porras, and Borrie 2020, 30].

4. PASSING A NEW CODE OF CONDUCT IN SPACE

Due to the lack of success of new international law projects, soft law codes began to be developed; initially, they did not find recognition. Meanwhile, the UN Committee on the Peaceful Uses of Outer Space – UN COPUOS launched its own initiative to create a "soft law."[10] In June 2016. The Committee agreed on the first set of guidelines for the long-term sustainability of space activities (A/71/20, Annex). In 2018, agreement was reached on a preamble and nine additional guidelines (A/AC.105/1167, Annex III and A/73/20). Although the working group could not agree on its final report for quite a long time, on June 21, 2019, the 62nd session of UN COPUOS adopted a preamble and 21 guidelines for "long-term sustainability of space activities" (LTS). These documents contain programs on the policy and regulatory framework for space activities. This is the result of more than eight years of work by a working group established by UN COPUOS and supported by the United Nations Office for Outer Space Affairs (UNOOSA). The subject of their work was issues of sustainable use of space. The committee urged countries and international organizations to take appropriate action to implement the guidelines adopted on June 21. At that session, UN COPUOS decided to establish, for the next five years, a new working group to continue work on "long-term sustainability of space activities." The Committee decided that at the fifty-seventh session of the Scientific and Technical Subcommittee in 2020, the working group would agree on its own terms of reference, working methods and special work plan toward: a) to identify and analyze new challenges and consider possible new recommendations for the "long-term sustainability of space activities;" b) exchange experiences, practices and lessons learned from the voluntary implementation of the adopted guidelines at the national level;

[10] UNCOPUOS – The Committee on the Peaceful Uses of Outer Space, http://www.unoosa.org/oosa/en/ourwork/copuos/index.html [accessed: 21.01.2023].

c) awareness-raising and capacity-building, particularly among developing countries and countries intending to launch space activities.

The 21 guidelines represent the first concrete achievement of the Committee for the Peaceful Uses of Space since 2007. Over the past 10 years, it has succeeded in persuading most member states not only to reach an agreement, but also to continue further discussion regarding the implementation of the guidelines into member states' national legal systems. The enactment of the guidelines, or "soft" law, represents a major success for the international community. The main goal of the guidelines is to help states and international organizations, in their efforts to reduce the risks of conducting activities in space, so that current benefits can be maintained and future ones can be exploited. The guidelines promote international cooperation in the peaceful use and exploration of space.

Peter Martinez, chairman of the Working Group on the Long-Term Sustainability of Space Activities, which completed its term last year, presented, among other things, "This is a historic moment for the Committee. It represents an important step forward in ensuring the long-term sustainability of space activities so that present and future generations from all countries can continue to benefit from the peaceful exploration and use of space." André Rypl, chairman of the Committee's 62nd session, commented: "We started this session by talking about how we at UN COPUOS are making the impossible possible. We just did it. The guidelines for the long-term sustainability of space activities and, more importantly, the decision to continue and develop the concept of sustainable development in space, are probably the most important achievement of UN COPUOS in a decade." Simonetta Di Pippo, director of UNOOSA, stated, among other things: "The office looks forward to continuing its efforts to support countries in building capacity in space science, technology, law and policy. Ensuring the long-term sustainability of space activities is a key part of this work."[11]

The main purpose of the guidelines is to help states and international intergovernmental organizations, to reduce the risks associated with conducting space activities, so as to maintain current benefits and realize future opportunities. In this regard, the implementation of the guidelines for the long-term sustainability of space activities should promote international cooperation in the peaceful use and exploration of space.[12] Long-term sustainability of space activities is defined as the ability to maintain the conduct of space activities indefinitely into the future in a manner that achieves the goals of equitable access to the benefits of space exploration and use for peaceful purposes to meet the needs of present generations while

[11] UNIS/OS/518; 22nd of June 2019.

[12] A/AC.105/L.318/Add.4, 19th June 2019; V.19-04973.

preserving the space environment for future generations. This is in line with the objectives of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty). States understand that maintaining the exploration and use of space for peaceful purposes is an objective to be pursued in the interest of all mankind.

The goal of ensuring and enhancing the long-term sustainability of space activities, as understood internationally and defined in the guidelines, involves the need to set the overall context and conditions for continuous improvement in the way states and international intergovernmental organizations, in developing, planning and implementing their space activities, continue to engage in the use of space for peaceful purposes to ensure the preservation of the space environment for present and future generations.

The guidelines are based on the premise that space exploration and use should be conducted in a manner that ensures the long-term sustainability of space activities. They are therefore intended to support states in engaging in activities to preserve the space environment for the exploration and use of space for peaceful purposes by all states and international intergovernmental organizations. The guidelines also promote international cooperation and understanding to counter natural and man-made threats that could jeopardize the space activities of states and international intergovernmental organizations and the long-term sustainability of space activities.

The guidelines support the development of national and international security practices and frameworks for conducting space activities and for states and international intergovernmental organizations in developing their space capabilities through joint efforts, where appropriate, in ways that minimize or, where possible, avoid causing damage to the space environment and the security of space operations. The document addresses political, regulatory, operational, security, scientific, technical, international cooperation and capacity-building aspects of space activities. It is based on the knowledge as well as the experience of some countries, international intergovernmental organizations and relevant national and international non-governmental entities. As such, the guidelines are relevant to both governmental and non-governmental entities. They also apply to all space activities, both planned and ongoing, and to all phases of space missions, including launch, operation and disposal of end-of-life waste.

The guidelines are based on the premise that the interests and activities of states and international intergovernmental organizations in space, which have or may have an impact on national defense or security, should be consistent with the preservation of space for peaceful exploration and use

and the preservation of its status in accordance with the Outer Space Treaty and relevant principles and norms of international law. The guidelines take into account the relevant recommendations of the report of the Group of Government Experts on Transparency and Confidence-Building Measures in Space Activities (A/68/189).

Existing United Nations space treaties and principles provide the basic legal framework for the guidelines. They are voluntary and not legally binding under international law, but any action taken to implement them should be consistent with existing principles and norms of international law. Nothing in the guidelines should constitute a revision, qualification or reinterpretation of these principles and norms. Nothing in the guidelines should be interpreted as creating any new legal obligation for states. Any international treaties referred to in the guidelines apply only to states that are parties to those treaties.

States and international intergovernmental organizations should voluntarily take measures, through their own national or other applicable mechanisms, to ensure that the guidelines are implemented to the fullest extent possible and in practice, in accordance with their respective needs, conditions and capacities, and with their existing obligations. States and international intergovernmental organizations are encouraged to administer existing and, if necessary, establish new procedures to meet the requirements of the guidelines. In implementing these guidelines, states should be guided by the principle of cooperation and mutual assistance and conduct all their space activities with due regard for the respective interests of all other states. States and relevant international intergovernmental organizations that can support developing countries in developing their national capabilities to implement these guidelines are encouraged.

The competent body of the United Nations is the Committee on the Peaceful Uses of Airspace, which is the main forum for further institutionalized dialogue on issues related to the implementation and review of the guidelines. States and international intergovernmental organizations are encouraged to share their practices and experiences in the Committee on the implementation of these guidelines. States and international intergovernmental organizations should also work within the Committee and the Office of Foreign Affairs of the United Nations Secretariat, as appropriate; to address issues that have arisen in connection with the implementation of the Guidelines.

The guidelines reflect a common understanding of existing and possible challenges to the long-term sustainability of space activities, the nature of those challenges, and measures that could prevent or reduce their harmful effects, based on current knowledge and established practices. States and international intergovernmental organizations are encouraged

to promote or conduct research on topics related to these guidelines and their implementation.

CONCLUSION

At present, it makes no sense to talk about an arms race in space isolated from the strategic development of the superpowers. Progress on PAROS is likely to remain limited again until there is a shift in the strategic relationship between major competitors such as China, the Russian Federation and the United States. All three countries are developing technologies that will have an increasing impact on both the space sphere and international stability on Earth. Currently, the relationship is strained, and strategic arms control is still non-existent. The United States has indicated that it wants China to participate in negotiations on various strategic systems in the context of New START, the last remaining nuclear arms control agreement between the United States and the Russian Federation. This desire is not currently reciprocated by China. Nevertheless, there may be new opportunities for PAROS progress in the broader arms control efforts between the three countries.

Many space systems are linked to strategic nuclear missions and could be included in arms control agreements that address broader strategic systems. If such agreements were concluded, China, the Russian Federation and the United States would have an incentive to promote broader international efforts to control space. PAROS-related approaches could be negotiated in multilateral or ad hoc forums if traditional forums such as CDs remain ineffective.

Perspectives on PAROS suggest specific confidence-building and transparency measures that could be valuable, both bilaterally and multilaterally. The three-vector approach discussed in the UNIDIR report shows that greater transparency and unified rules of engagement could significantly reduce ambiguity for operations near or directed at strategically sensitive satellites. Distinguishing between destructive and non-destructive weapons could be a way to find an area of common interest for all, including the superpowers, which could lead to non-testing or nonproliferation agreements for certain weapons. While neither of these approaches addresses concerns about the arms race in space, they could at least serve to refresh the discussion of PAROS and offer new ways out of the current stalled debates.

In conclusion, it should be said that the development of space technology in recent times and the diplomatic action conducted by the countries involved in the process of exploiting space indicate that conflicts in space are still possible. Conflicts on Earth may have their effects in space, with

devastating consequences for security in Space and all states on Earth. Today, more and more countries are either using or planning to use space for military purposes. In addition, more and more civilian satellites are being used for military purposes. There is also a process of transition from militarization to weaponization of Space. Maintaining the principle of peaceful use of Space is increasingly difficult. Hence, more and more attention is being paid to the issue of space security and international regulations related to it – space security, such as disarmament programs or UN Long Term Sustainability.

REFERENCES

Antoni, Ntorina. 2020. "Definition and Status of Space Security." In *Handbook of Space Security*, edited by Kai-Uwe Schrogl, 10-31, 2nd edition. Switzerland: Springer.

Froehlich, Annette, and Vincent Seffinga (eds.). 2020. *The United Nations and Space Security. Conflicting mandates between UN COPUOS and the CD*. Springer.

Harrison, George. 2020. "International Perspectives on Space Weapon. CSIS report." https://www.csis.org/analysis/international-perspectives-space-weapons [accessed: 23.02.2022].

Martinez, Peter. 2020. "Space Sustainability." In *Handbook of Space Security*, edited by Kai-Uwe Schrogl, 320-21, 2nd edition. Switzerland: Springer.

Silverstein, Benjamin, Daniel Porras, and John Borrie. 2020. "Alternative Approaches and Indicators for the Prevention of an Arms Race in Outer Space." UNIDIR report, 1-35, https://unidir.org/sites/default/files/202005/Space%20Dossier%205%20%20Final%5B3%5D.pdf [accessed: 23.04.2022].