

Article

Militarization of Outer Space: Challenges to Global Peace and International Law

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Abstract: Militarization of outer space is one of the most complex challenges to global peace, harmony, and security in the 21st century. Initially, recognized as a subject area of scientific exploration and constructive engagement, outer space has progressively become a critical zone for defense competition among major powers. The arrangement of multi-domain satellites, development of anti-satellite weapons (ASAT) and creation of autonomous defense structure by powerful nations like USA, China, Russia and India. These countries have shifted from the peaceful uses to framework conceived in 1967 Outer Space Treaty. This evolving militarization intimidates to rebuild space into a war zone and risk of conflict beyond boundaries. The existing international skeleton secured by the Outer Space Treaty, like the Convention on Registration of Objects Launched into Outer Space 3235(XXIX), was created in a time when space capabilities were limited. These treaties restrain the installation of weapon of mass destruction in orbit but are still silent on the usage of cyber-based weapons in space. This vagueness created an inadequacy that states can justify their military activities as a self-defense or technological advancement. To safeguard outer space as a global collective good, there is an urgent need for recommencing diplomatic engagement, stronger transparency measures and development of a comprehensive international legal authority addressing both military and non-military threats. Preserving space as a peaceful and collective land is crucial for global security as well as collective survival of humankind.

Keywords: militarization; outer space treaty; global security; space laws

1. Introduction

Outer space has been viewed as a quiet frontier, but with the advent of satellites, it becoming important in contemporary warfare. Space assets provide military the intelligence information, communication, navigation, and missile warning. The 1967 Outer Space Treaty (OST) ascertains that space is to be used for peaceful purposes and nuclear weapons and other weapons of mass destructions (WMDs) should not be kept in orbit. The ambiguous term of the OST, the peaceful purposes of clause, has been used to legitimize the conventional uses of military, and compliance with it is purely voluntary. In the meantime, increased participation by the private sector (e.g. SpaceX mega constellations) is becoming more complex, as both civilian and military applications of space become confused. This study explores the arm race in outer space, historical background, legal initiative, and recommendations.

The Cold War made space a military sphere. The space-based reconnaissance and the introduction of Sputnik in 1957 triggered the development of the ICBMs and space-based sensors between the US and USSR. The two superpowers also engaged in ballistic defense missiles, e.g., the US “Star Wars” (SDI) program that was unveiled in 1983. These endeavors put in place that space and space launch vehicles formed part of strategic deterrence. With the end of the Cold War, space militarization accelerated due to technology.¹ In 1990s and 2000s, large resolution space-satellites, GPS controlled bombs and missile warning constellations became the norm and space entered the inclusive force planning. China, India and Russia have recently demonstrated anti-satellite capabilities. China destroyed its own satellite in 2007, followed by India in 2019 and Russia in 2019. All these direct-ascent tests pose a risk to space debris, and it’s possible to start treating space as a potentially military pressure point.

2. Legal Framework of Outer Space

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¹ <https://press.un.org/en/2024/ga12597.doc.htm>

The Outer Space Treaty is the foundation of Space Law. It proclaims that space study must be a benefit of all nations, outlaws claim of national sovereignty (Article II) and bans nuclear or WMD deployment in space, on the Moon, or on other heavenly bodies. Article IV talks about banning of nuclear weapons and other weapons that can create mass destruction in the orbit or on Celestial bodies and can only be used for peaceful purposes. However, countries can send their military personnel for scientific research.² Articles VI-VII hold states responsible for what their government, or the individuals themselves, do in space. The OST, however prohibits only space WMD. The treaty lacks an enforcement mechanism, and breaches are not subject to any inbuilt sanctions, which implies that adhering to them is voluntary. Big powers claim that defensive or dual-use operations (e.g. missile-warning satellites) are in themselves peaceful, and therefore avoid the spirit of OST.

There are four other UN space treaties. The Rescue Agreement (1968)³ and The Liability Convention (1972) which place obligations and responsibilities on astronauts and liability to space objects. The Registration Convention (1976) obliges states to register objects that they launch. The Moon Agreement of 1979⁴ was based on the OST, which declares moon and its resources as the common heritage of mankind. Although OST Articles VI-VII make a state that launches satellites internationally liable to damage, they do not express any words on the prohibition or prevention of militarization.⁵ Overall, the current legal framework, written in 1960s and 1970s, was not based on the 21st century space environment. It has loopholes and archaic provisions that make space susceptible to militarization. With changes in technology, new rules or treaties are essential to revise or add new restrictions as part of the OST that are no longer relevant.

3. Technological and Strategic Drivers

With the advancements in miniaturization, propulsion, and communication, satellites are everywhere and cheap. Space has become a vital resource in the world for command, navigation, reconnaissance, and tracking of missiles by the militaries.⁶ Rapid technological development and operational experience are the major factors of change, and the threat by China and Russia, is driving the development of new space capabilities. Both China and Russia especially have military space capabilities (e.g. early-warning satellites or space-based missile defense) to counter the conventional edge of the US. The United States has in turn increased its space warfighting doctrines in response, e.g., the US Space Force, doctrines of space superiority and new missions (such as space-based missile intercepting systems). The proliferation of new capabilities, including anti-satellite weapons (kinetic kill vehicles, co-orbital killers or co-orbital killer satellites and counterspace systems (cyber, jamming, lasers) is accelerating the phenomena (Zhou 2023). Commercial considerations such as satellite internet constellations and multinational space infrastructure are both strategically important and the cost of putting payloads (not to mention military ones) into orbit is reduced by the presence of commercial launch companies.

The Space Force is the branch of US military created in 2019 to specialize in space. The presidential directive (SPD-4) indicated that, although possible enemies of the US were developing their own space capabilities and actively planning to deny the U.S. the use of space. The order mandated the establishment of a separate service to make sure of unhindered access and the freedom to operate within, out, and to the space domain. The forces of Space Force will defend against satellites, take control of space, and establish new missions (e.g. space-based missile interception). This space warfare institutionalization intends to make orbit a warfighting area⁷.

According to council on foreign relations (CFR), the ascent anti-satellite (ASAT) launched by China left hundreds of pieces of hazardous debris in space and put the Chinese space program on the path of increasing strength. The 2007 ASAT is a historic occurrence, as China declared that it was not going to carry out any further such tests the very next day. The debris field poses a danger to all the space users and highlighted the existential dangers in space. China has since gone on to acquire additional counterspace weapons, including ground-based lasers and a direct-ascent interceptor which was tested in 2013 (Hussain 2024).

Recently, Russia created the Nodal ground-launched ASAT missile (it has been tested as recently as 2021) and runs the co-orbital satellites, which can approach spacecraft of other countries. U.S. warned Russia for working on ASAT weapons that might carry nuclear weapons. Dozens of satellites can be disabled if case such a system is deployed. Though not armed with nuclear weapons, the behavior of Russia is indicative of a larger pattern. It has often disrupted GPS signals, attempted to blind satellites with lasers, and deployed several military satellites in communications and radar. Russia considers space resources as strategic objects and is ready to invest in the capabilities of space control. Kremlin avoids the American military hegemony in space. Combined with the recent satellite actions by Russia along with the alleged ASAT programs, Russia is proving how space competition among the great powers is gaining momentum (Swope and Makena 2024).

4. Diplomatic Processes and Proposals

States have experimented with multiple ways to check space arms racing. The important process is the current PAROS (Prevention of an Arms Race in Outer Space) which takes place in the UN. ⁸A nonbinding resolution on PAROS is adopted annually by the First Committee of the UN General Assembly since 1981, and only US and voted against it. These resolutions reiterate the objectives of the Outer Space Treaty but recognize that the contemporary outer space legal framework fails to do so as it does not ensure the avoidance of an arms race in outer space. PAROS addresses all states (and space powers) to avoid engaging in activities

² <https://www.unoosa.org/pdf/publications/STSPACE11E.pdf>

³ https://www.unoosa.org/oosa/oosadoc/data/resolutions/1967/general_assembly_22nd_session/res_2345_xxii.html

⁴ <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html>

⁵ Ibid,2

⁶ <https://lieber.westpoint.edu/russias-nuclear-anti-satellite-weapon-international-law/>

⁷ https://www.mofa.go.jp/press/release/pressite_000001_00771.html

⁸ <https://www.nti.org/education-center/treaties-and-regimes/proposed-prevention-arms-race-space-paros-treaty/>

that are against PAROS and promote negotiations of a legally binding treaty (through the Conference on Disarmament) to prohibit space weapons.

In 2008, Russia and China were the first to initiate a joint proposal of a Treaty on the Prevention of the Placement of Weapons in Outer Space (PPWT). The draft (revised in 2014) suggested to prohibit the weapons in orbit and any force against space objects. The PPWT does not specify the definition of weapons or use of force, and does not include non-kinetic tools (e.g. cyber or electronic attacks). As a result, the PPWT has not achieved any gains in the CD, where the U.S and allies have voted against it.

During the early 2010s, the European Union funded an outer space activities political binding instrument of norms called the International Code of Conduct (ICoC). This voluntary code-of-conduct was negotiated between 2008 and 2015 as a means of enhancing transparency and confidence-building. In 2014, the EU announced the ICoC negotiations were not successful following years of revisions. Subsequently, suggestions have been made of revised voluntary rules or confidence-building measures (TCBMs) on space (such as a 2019 UN resolution drafted by Russia and China on space TCBMs passed by consensus). However, none of these non-binding initiatives are substantially enforced. There have been some normative pronouncements generated by the existing multilateral diplomacy, yet no new space-based arms control regime has been reached.⁹

5. Global Peace and Arms Control Regimes

Militarization of space is a threat to international peace in various aspects. Space was traditionally viewed as the domain of sanctuary, and weapons tests have proved it wrong. Any fight in the orbit might have direct effects on the earth. ASAT tests do produce debris that may hit and destroy any satellite randomly. The risks of such debris are long-term and a massive satellite crash would leave an entire swarm of debris, which would make earth orbit unusable in the years after the incident, disabling GPS, communications and reconnaissance satellites around the world.

Offensive space operations may trigger open confrontation. Civilian life can be brought to knees by interference with the space-based infrastructure as navigation, banking, air traffic control, and power grids all rely on satellites.

Militarization is also a threat to existing arms control structures. If Russia uses a nuclear-equipped ASAT, trust will be undermined between Russia and the United States. In fact, the militarization of space would undermine even non-space treaties (Britt 2024). The same mistrust that paralyzes space negotiations can easily be transferred to the nuclear and missile weapons negotiations. Finally, the space violence threat is putting the entire basis of the 1967 OST in question. The increasing militarization of space started to invalidate the original spirit of the treaty almost 60 years later. Outer space would be a catalyst for a high-stakes arm race and even armed conflict that would extend off-planet, putting a strain on peace and the rule of law on Earth.

6. Legal and Ethical Dilemmas

Emerging technologies are posing legal and moral challenges that have never been raised before. If a satellite is attacked or destroyed, will this use of force fall under the Charter of the UN? Is an attack on the military satellite of an adversary a legitimate self-defense action of a state? Current international law (Charter of UN, *jus ad bellum*) can be applied to space, yet a lot remains unclear. States need to be cautious about their right of self-defense in space, as with current laws on the subject, such a right can have a significant restriction on its exercise. Jamming or cyber-attacks on satellites are less kinetic, but could still cripple intelligence gathering of a nation, without it being destroyed physically, which begs the new question of what constitutes aggression.

Space is viewed as global commons and as custodianship of the entire humanity. The introduction of weapons into orbit will impose non-unilateral risks, the debris and electronic interference will damage non-military parties, both with and without military space programs. This brings up the issue of injustice and shared responsibility. Should one power experiment with an ASAT and threaten the satellites of other countries? According to one authority, further militarization of space poses a danger to the infrastructure that supports the daily lives of ordinary people, and suggests an ethical need to restrain aggression. The private actors in space make things even more difficult. What are the laws of retaliation or liability in case a commercial satellite is attacked? Currently space treaties are signed only by states and therefore non-state actors are not subject to formal arms control yet enjoy the same safety standards and frequently contribute to them.

Researchers propose new standards, such as banning the attack on civilian satellites, but these are legal challenges. Unchecked space warfare would run counter to fundamental values, even without the new treaty. In the absence of more precise regulations or a generally accepted set of norms, though, every force will still push the boundaries of what is permissible in space, increasing the possibility of unintended escalation or tragedy (Eastwood 2017).

7. Role of UN

The United Nations has been a major multilateral platform that deals with space security. United Nations Office of Disarmament Affairs (UNODA) and the First Committee (Disarmament) are spearhead the above listed PAROS discussions. The UN Committee on the Peaceful Uses of Outer Space (COPUOS) is concerned with civil and scientific collaboration (including space debris guidelines). Similarly, the 1979 advisory opinion of the ICJ regarding the Moon on the obligations of the international law has an element of moral obligation.

Some 150 NGOs in the world, most prominently the Global Network Against Weapons and Nuclear Power in Space, have been campaigning against the militarization of space through advocacy networks. Think tanks and other academic organizations also do so. For example, the Secure World Foundation, collaborates with governments, industry and NGOs to act on ideas of international cooperation towards the goal of secure, sustainable, and peaceful use of outer space. It also releases reports based on facts (e.g. the Space Security Index). Similarly, Project Ploughshares (Space Security Index), the Stimson Center, and researchers at

⁹ Ibid,2

universities present policy choices.¹⁰ Even the space sector, in such bodies as the Space Safety Coalition or the industry-sponsored Inter-Agency Debris Coordination Committee, has a role in establishing nonbinding safety norms (with dual-use advantages to the militaries). The civil society and the UN system complement each other. States use the work of NGOs and societal pressure to keep up with the information, and the UN provides such issues with an official voice. A lot relies on voluntary adherence. Therefore, UN institutions and civil societies need to ensure space security remains a global agenda and formulate workable solutions.

8. Recommendations

The big powers should compromise on new norms, including a possible international protocol that nuclear-filled satellites maybe prohibited, or creating a codification that the civilian satellites should remain untargeted. It's imperative to focus on narrower, more practical bans on debris-destroying kinetic ASATs and come up with trust because of trust-building behaviors. Simultaneously, a more detailed treaty must be prefigured to build up the legal regime, beginning with the most devastating types of actions (nuclear explosions, blast ASATs). It is proposed to rewrite a new code of conduct (or the reinstatement of the ICoC). Arms control in space could be linked to weapons discussions or even Nuclear non-proliferation treaty (NPT) discussions on No First Placement of weapons in space. Numerous nations and new space actors (commercial and emerging space nations) require training and the voice in the establishment of the rules. Engaging industry in setting of norms and making sure that guidelines extend to the privately-owned satellites (such as through licensing terms limiting military applications) can be beneficial. The recent Summit of the Future and its Pact of the Future of the UN directly requested member states to make progress to end arms race in all its forms. States can finance collaborative research in space traffic management, distribute space debris mitigation technology and facilitate space-security discourse of civil society.¹¹ US and its allies should, strengthen the authority of the OST by giving it tangible treaties or norms. The international community can only steer space out of arms race destabilizing process by both employing technical precautions (debris regulations, resilient satellite design) and diplomatic pledges (arms-control that is legally binding).

9. Conclusions

Historically, space was considered a cooperative space, a non-violent frontier, which was guaranteed by the 1967 Treaty. However, in the past few decades, the vision has been bent under the pressure of hi-tech weaponry and great-power politics. Satellites have become the target and strategic assets of major states. The space law established so far prohibits WMDs but has no ability to restrict these new capabilities. This is creating a legal vacuum, as countries are using the loopholes in the OST, and a crisis on earth will be transferred to orbit. Unless there is a swift response, the blistering use of counter-space weapons would contribute to an arms race or even a space war, with repercussions worldwide. Effective space arms control can only be achieved when states embrace a culture of cooperative security with the assistance of revised law as well as moral restraint. The peaceful use of space demands the renewal of diplomacy and civil society pressure, so that new space uses are not harmful to the countries.

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¹⁰ <https://www.ohchr.org/en/civic-space/role-united-nations-protecting-and-promoting-civic-space>

¹¹ https://www.eeas.europa.eu/delegations/un-new-york/eu-statement-%E2%80%93-un-general-assembly-4th-committee-peaceful-uses-outer-space-1_en