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Office for Outer Space Affairs

Preventing the Escalation of an Arms Race in Outer Space

President Chair: Mathilde Billiet

Deputy Chair: Debora Lazarev

Introduction

Preventing the escalation of an arms race in outer space is a current affair and essential for strengthening international peace and security. Space is progressively becoming more obstructive and competitive posing substantial challenges and threats to security and stability over the last years. The pursuit of security and strategic interests by an increasing number of states in outer space, coupled with advancements in technology, has heightened concerns about the potential eruption of hostilities and the destabilisation of global security.

Key Terms

Arms Race: The competition for superiority of military capabilities between states or entities, potentially leading to heightened tensions and conflict.

Outer Space: The physical region beyond Earth's atmosphere, including celestial bodies, stars, and satellites.


Space Security: The protection of assets, activities, and interests in outer space from threats such as militarization, weaponization, debris, and interference.

Multilateralism: Diplomatic relations involving multiple states working together through international organisations, agreements, and treaties to address common challenges and promote cooperation.

Arms Control: Agreements, or regulations designed to limit the development, or proliferation of weapons, including those intended for use in outer space.

Confidence-Building Measures (CBMs): Actions, agreements, or protocols aimed at reducing tensions, building trust, and enhancing communication between parties to prevent misunderstandings or miscalculations.

Weapons of Mass Destruction: Highly destructive weapons capable of causing widespread devastation and significant harm to human life and the environment, including nuclear, chemical, and biological weapons.



Outer Space Treaty: The foundational international agreement (1967) governing activities in outer space, including provisions related to preventing the placement of weapons of mass destruction (WMDs) in orbit and the peaceful use of outer space.

Space Debris: Non-functional, man-made objects in orbit around Earth, posing risks to operational satellites and spacecraft.


Non-Proliferation: Efforts to prevent the spread of WMD including potentially space-based weapons.

General Overview

United Nations efforts to maintain outer space for peaceful purposes began in 1957, a few months prior to the first artificial satellite launch. From this moment on, it has been on the United Nations agenda to prevent any aggression in outer space. Multilateral agreements and treaties serve as a foundation in preventing the escalation of an arms race in outer space. In the 1950s and 1960s proposals for prohibiting outer space for military purposes were considered, nevertheless the first law implemented was the Outer Space Treaty in 1967.¹ The treaty's key aims are to prohibit the placement of weapons of mass destruction (WMD), including nuclear weapons, in Earth's orbit or on celestial bodies. It refrains countries from establishing military bases, conducting weapon tests, or military training on celestial bodies. Furthermore, it reiterates universal access to space, open to all states for scientific exploration and rejecting any claims of ownership over space or celestial bodies. Lastly, the treaty states that actors engaging in space exploration bear responsibility for any damages they cause. The Outer Space Treaty therefore is the foundation of space exploration.

The worldwide rising dependence on space-based technology, systems, and information necessitates cooperative measures to counter risks to the security and sustainability of space operations. Transparency and Confidence-Building Measures (TCBMs) can be introduced to prevent the escalation of an arms race in outer space. These are mechanisms aimed at increasing transparency, trust, and predictability among space-faring states. These measures include the exchange of information on space activities, notifications of space launches and manoeuvres, and voluntary guidelines for

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responsible behaviour in space. Today, there are more than 1,000 operational satellites in orbit around the Earth. More than 60 states, government consortiums and other entities own or operate those space assets and more and more states are becoming space-faring nations and/or increasing their space-based capabilities and resources. In the context of international peace and security, there is growing concern that threats to vital space capabilities may increase during the next decade as a result of both natural and man-made hazards and the possible development of disruptive and destructive counter space capabilities.

Arms control initiatives specific to outer space seek to limit the development, deployment, or testing of space weapons. Proposals for space arms control measures include bans on certain types of space weapons, limitations on the testing of anti-satellite (ASAT) weapons, and the establishment of verification mechanisms to monitor compliance with agreements. This is necessary as nations such as China, Russia, and the United States have conducted tests involving anti-satellite weapons, prompting concerns regarding the possibility of conflict occurring in outer space. Raising even more concern, the United States and Russian Federation have developed specialised space defence to protect their space-based assets against potential threats. These units have the responsibility of overseeing and safeguarding satellites and other assets located in space, protecting them against potential attacks. Consequently, there is an increasing acknowledgment of the necessity for international collaboration in tackling challenges related to preventing the escalation of an arms race in outer space.

Major Parties/Countries Involved

United States: The United States has been a leading player in outer space exploration, technology development, and military activities. With a budget almost double that of the next highest agency, the National Aeronautics and Space Administration (NASA) of the United States stands out as the most advantageous and dynamic space agency globally.

Russian Federation: The Russian Federation has a long history of space exploration and significant military space capabilities. Starting with the first launch of a space mission ever and first to send a human to space, executed by USSR's space organisation SSSR. Their successor ROSCOSMOS was established in 1992. ROSCOSMOS is a major partner



in the International Space Station, though it has announced plans to leave the ISS program and establish its own space station and lunar base in the coming decade.

People's Republic of China: As a rising space power, China has made significant advancements in its space program, including the development of anti-satellite capabilities. China was the third nation to launch a human into orbit in 2003, marking the start of their involvement in outer space. The People's Liberation Army is viewed as a significant driver for the Chinese space program, which aims to achieve goals such as lunar exploration and the construction of a space station.

India: With its ambitious space program, India has demonstrated significant space capabilities and technological advancements. It is increasingly becoming a relevant player in discussions about space security and arms control. India's space ambitions are driven by a combination of scientific exploration, technological advancement, and strategic objectives. With programs like the Indian Space Research Organisation (ISRO), India aims to expand its presence in space through a variety of missions, including satellite launches for communication, Earth observation, and navigation. Additionally, India's space endeavours align with its broader goals of international cooperation, economic development, and harnessing space technology for societal benefits.

Japan: Japan has a well-established space program and is an important contributor to space exploration and technology development. It plays a role in discussions concerning space security, particularly in the Asia-Pacific region. Its national aerospace research and development activities are controlled by the Japan Aerospace Exploration Agency (JAXA), which was formed in 2003. Japan launched its first satellite, Osumi, into space in February 1970, becoming the fourth country to possess indigenous satellite launch capability. It currently operates a fleet of meteorological, communication, astronomical, and earth observation satellites.

France: As a major space-faring nation with advanced space capabilities, France contributes significantly to discussions on space security and arms control, both independently and as part of the EU.

European Space Agency: Headquartered in Paris, the European Space Agency (ESA) comprises 22 member states alongside several associate members and cooperative partners, forming an international alliance dedicated to space exploration and research. Its main goals are Science and Exploration (unlocking the secrets of the universe), Space

Safety (protecting life and infrastructure on Earth and in space), Applications (practical ways to use space to benefit mankind), and Enabling & Support (making space accessible and developing future technologies).

Timeline of Key Events

1957: The first artificial satellite "Sputnik-1" is launched into Earth orbit by SSSR, the national space programme of the USSR, signalling a new era.

1958: First resolution on outer space adopted in the First General Assembly. This identified the common interest of humankind in outer space and reflected on how outer space can help benefit Earth.

1959: Permanent Committee on the Peaceful Uses of Outer Space established

1961: First manned spaceflight. Soviet cosmonaut Yuri Gagarin orbits the Earth in "Vostok 1" becoming the world's first space explorer.

1962: Cuban Missile Crisis, heightened tensions during the Cuban Missile Crisis underscore the potential for conflict in the Cold War era, including in space.


1963: First Legal Principles governing Outer Space adopted by the General Assembly. Laying the foundations of an entirely new body of law - space law - , the General Assembly adopts resolution 1962 (XVIII) entitled "Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space".

1967: The United Nations adopts the Outer Space Treaty, prohibiting the placement of weapons of mass destruction in outer space and establishing principles for peaceful cooperation.

1968: First United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE).

1969: First humans land on the Moon, Neil Armstrong & Edwin Aldrin "Apollo 11"

1983: Strategic Defense Initiative (SDI) announced by U.S. President Ronald Reagan, SDI proposed a space-based missile defence system. It sparked concerns about the weaponization of space and contributed to tensions between the U.S. and the Soviet Union.



2007: China conducts an anti-satellite test (ASAT), targeting a defunct Chinese weather satellite. The test generates debris in orbit, heightening concerns about space debris and the security implications of anti-satellite capabilities.

2008: The United States releases a new National Space Policy emphasising the preservation of space access for peaceful purposes, cooperation with international partners, and the prevention of conflict in space.

2019: Space Policy Directive-4 issued by the Trump administration, SPD-4 directs the establishment of the United States Space Force as a new branch of the U.S. military, highlighting the growing emphasis on space security.

2021: The UN General Assembly adopts resolutions reaffirming the importance of preventing an arms race in outer space and promoting transparency and confidence-building measures among space-faring nations.

2023: Space Security Conference, key space-faring nations convene for a high-level conference to discuss space security challenges and explore opportunities for collaboration on arms control measures and space governance.


UN Involvement & Relevant Resolutions

UNOOSA was founded in 1958 as a division of the UN Secretariat with the goals of advancing global collaboration in the peaceful uses of space and easing member state-to-state information and expertise sharing.

Resolution 1721 (XVI) (1961) of the General Assembly: This resolution created the Committee on the Peaceful Uses of Outer Space (COPUOS) as an official UN entity. COPUOS functions as the principal platform for global collaboration in space-related endeavours, overseen by UNOOSA.

Resolution 2222 (XXI) (1966) of the General Assembly: This resolution advocated for the creation of legal guidelines guiding states' actions in space and reiterated the significance of international collaboration in the peaceful exploration and use of space.

Resolution 3234 (XXIX) (1974) of the General Assembly established the Declaration of the Principles Governing the Use of Nuclear Power Sources in Outer Space. This resolution lays out guidelines for the use of nuclear power sources in space missions with the goal of protecting the environment and ensuring the safety of space activities.



Resolution 42/93 (1987) of the General Assembly: This resolution urged for the prevention of a weapons race in space and restated the fundamentals of the Outer Space Treaty. In order to advance peace and security in space, it underlined the significance of international collaboration and measures aimed at fostering confidence.

Resolution 51/122 of the General Assembly of 1996: By releasing data on space objects and their launches, this resolution intends to promote transparency and confidence-building among member states. It also established the UN Register of Objects Launched into Outer Space.

Resolution 72/89 of the General Assembly (2017): This resolution called for intensified efforts to promote the peaceful uses of space, notably through capacity-building initiatives for developing nations, and emphasised the significance of international cooperation in space operations for the benefit of all humanity.

Possible Solutions:

One possible solution to address the issue of preventing an arms race in outer space could be to strengthen international treaties. Advocating for the reinforcement and expansion of existing treaties such as the Outer Space Treaty of 1967 to include provisions specifically addressing the prevention of an arms race in outer space, could profoundly decrease the threat in outer space. This could involve negotiating additional protocols or amendments to strengthen the prohibition of the placement of weapons in space. To facilitate this, relevant UN and NGO organisations could be called upon to address emerging international tensions impartially, acting as neutral mediators and advocating for global security interests.

Secondly, states involved in outer space affairs could be encouraged to promote transparency. To enhance transparency regarding their space activities could have a significant impact on the threat of an arms race in outer space. Transparency measures would include the sharing of information, warnings of launches and manoeuvres, and participation in confidence-building measures. This can help reduce suspicions and misunderstandings that may contribute to the escalation of an arms race.


Propose the development of mechanisms for monitoring and verifying compliance with international agreements related to outer space, including the use of satellite surveillance and on-site inspections. Verification measures can help build trust among states and provide assurances of compliance with disarmament obligations.

Encourage collaboration and partnerships among space-faring nations, space agencies, and the private sector to pursue peaceful and cooperative space exploration endeavours. Joint missions and projects can foster trust and cooperation while advancing scientific knowledge and technological innovation.

Call for regular diplomatic dialogues and multilateral forums dedicated to discussing space security issues, including the prevention of an arms race in outer space. These dialogues can facilitate the exchange of views, identification of common interests, and exploration of cooperative measures to address shared challenges.

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