United Nations Office for Outer Space Affairs

Advanced Committee

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Topic 1: Regulating the Militarization of Outer Space

Introduction

As outer space becomes increasingly accessible, the risk of its militarization is growing. Countries including the US, Russia, and China are developing advanced space technologies, including Satellites capable of conducting surveillance, whilst disabling other satellites, or even deploying weapons such as Anti-Satellite (ASAT) technology. ASAT technologies are designed to destroy or limit the functionality of satellites for military purposes such as blocking the control centres and communication of an adversary's military. Although there are many previous treaties such as the Outer Space Treaty of 1967, many are outdated and are not prioritized. As well, countries are not willing to improve transparency in space activities, sparking fear in the future of space militarization, or a leak in information.

History

The journey to space militarization began during the Cold War, when the Soviet Union successfully launched Sputnik I, the world's first satellite, in 1957. This success instilled feared in the US as it progressed the Soviet Union to its goal of creating nuclear armed satellites capable of circling the Earth. Two years later, the US launched the first ASAT weapon, the Bold Orion. The Soviet Union then made its own ASAT program, developing weapons throughout the 1960s and 1970s. Since then, the US, Russia, and other nations have been competing to achieve the strongest space military in the world. In 1967, UNOOSA created the Outer Space Treaty. This agreement provides a basic overview of international space law to slow down the development of space weapons. Although, this treaty has been overlooked as it lacks clear detail, nations have found loopholes to these laws for the benefit of their country. Moreover, UNOOSA also created a Liability Convention on international liability for any damage caused by a country's space objects. In 1985, the United States the ASM-145, a hit-to-kill weapon. Instead of using explosives, this weapon used the energy generated by the collision the weapon and the intended satellite. About 30 years later, China and India joined the race when China launched the KE-SAT and when India launched Mission Shakti. Currently, countries have been focusing on the development of non-kinetic space weapons, weapons with an extreme amount of radiation that could damage other space objects without direct contact, causing disrupt among nations. These type of weapons makes it less obvious for enemies to expect an attack.

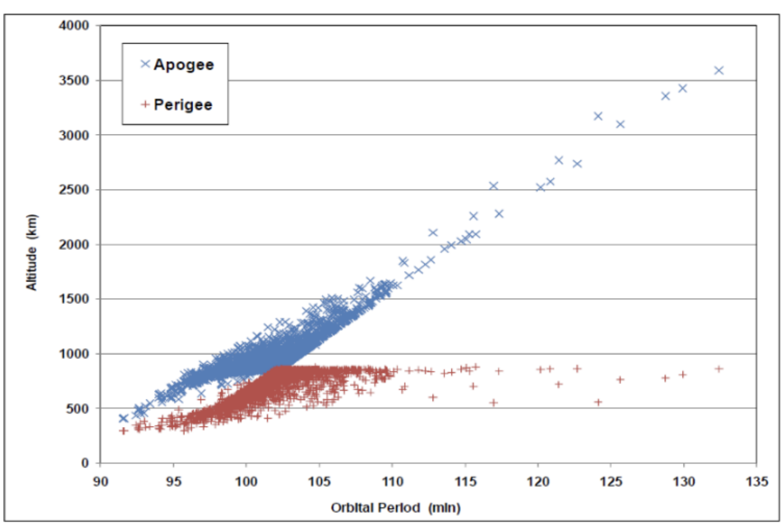
Current Situation

The United Nations has recognized how the intensity of the space race has grown in the last five years and is concerned about the possible chaos that could occur in space sooner than expected. Negotiations to conclude an international, legal treaty to prevent the progression of the race in space are a priority. Additionally, efforts to encourage international transparency on space activities are being made. Few nations consider outer space as a 'war-fighting domain' according to the representative of China. However, commercial space companies are exploring the space weapon industry under the guise of civilian applications.

Case Study: 2007 Chinese ASAT Test

On January 11, 2007, China launched a ballistic missile from the Xichang Space Launch Center carrying a Kinetic Kill Vehicle (KKV). The KKV struck and destroyed the non-operational Chinese weather satellite Fengyun-1C (FY-1C) at an altitude of 863 km. This event was a direct ascent anti-satellite (ASAT) attack, in which the KKV does not enter orbit but follows a ballistic trajectory through space. The impact generated over 3,000 pieces of space debris—the largest tracked debris cloud in history—much of which will remain in Low Earth Orbit (LEO) for decades, increasing the risk of collisions with other space objects.

The KKV collided with the FY-1C at a velocity of over 32400 kilometers per hour, destroying the satellite without any explosives on board the KKV. Solid objects usually act like liquids in hypervelocity impacts such as this test. Hence, the debris from both objects continued to move in the same direction and velocity as before. Minutes after the collision, a debris cloud spread around the satellite's former orbit. Ten days after the collision, the debris was dispersed around the entire orbit, creating a ring of debris around Earth. Three years following the test, the debris had started to cover much of the Low Earth Orbit (LEO). As of 2010, the US military's Space Surveillance network (SSN) found about 3037 pieces of debris from the test, with 97% of which remaining in the same orbit. Currently, scientists expect there to be 32000 smaller, untracked pieces from the collision. This is the largest debris cloud created by a single event in orbit.



Distribution of the FY-1C debris as of 1 Sept 2010 [6]

According to Celestrack, on January 22, 2007, there were 2864 functioning or non-functioning satellites in Earth's orbit. Of these, 1899 are affected by the debris from the Chinese test, which is 2/3 of the payloads in Earth's orbit. Later that year, a detailed study of the FY-1C predicted that about 6% of the debris will have entered the Earth's atmosphere and 79% will remain in orbit.

Questions to Consider

1. How should the international community define "militarization" and "peaceful uses" of outer space in the context of modern technology and geopolitical realities?
2. How can space treaties b to leave clearer boundaries on space militarization?
3. How can international law and norms address dual-use technologies that serve both civilian and military purposes?
4. With many global conflicts on Earth, how can the international community prevent the escalation of terrestrial conflicts into space-based confrontations?
5. What measures might reduce tensions and mistrust regarding confidential military activities in space?

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Topic 2: Establishing International Guidelines for Mining and Resource Extraction in Outer Space

Introduction

Natural resources on Earth are depleting and cannot sustain the current human lifestyle for exceptionally long. So, a few nations have turned to resources in space. Exploiting resources from the Moon and other celestial bodies has become more feasible, nations have been exploring what materials space could provide humans with. For example, countries and private companies are exploring asteroid mining and lunar resource extraction for rare minerals, metals, and water. However, there has been a growing concern about the lack of sustainability and monopolization within the industry. Many fear that the resources in space could deplete like how resources on Earth are if nations continue to treat space as an unlimited resource.

History

The first proposal of space mining was in the 19^{th} century by Russian scientist, Konstantin Tsiolkovsky. Although, the idea was not considered by the space community until late 1900s. Throughout six Apollo missions that occurred between 1969 and 1972, the National Aeronautics and Space Administration (NASA) obtained about 2200 samples of rock, sand, and dust from the moon. Throughout the 1970s, the NASA conducted several studies regarding the feasibility of space resource exploitation while the Soviet Union brought back 300g of moon samples through one of the first successful unmanned missions. The main purpose of this was to find resources that could possibly act as a fuel source for spacecrafts, allowing astronauts to refuel or even repair their spacecraft in space. The Moon Treaty of 1979 established by UNOOSA declared that resources of the Moon and other celestial bodies are the collective heritage of humankind. It also emphasizes the need for an international administration responsible for governing the number of resources exploited by nations. In 1997, the first commercial company focused on developing asteroid mining technology, Planetary Resources, was founded. Following the Apollo 17 mission in 1972, human interest grew towards asteroid mining. The Japan Aerospace Exploration Agency (JAXA) landed the Hayabusa craft in 2005 on Itokawa, a near-Earth asteroid.

Current Situation

Only a few countries including the United States, Luxembourg, Japan, and the United Arab Emirates have enacted national legislation recognizing the rights of their citizens and private companies to own extracted resources from celestial bodies. Other nations do not have the funding needed to explore the resources of space. At the same time, rapid technological advancements in robotics in these few countries makes space resource extraction more feasible, creating a higher risk of overexploitation from not only governmental organizations, but privately owned companies. The A/RES/73/91 UN General Assembly Resolution urges for international cooperation to find solutions to encourage space exploration while maintaining long-term sustainability. However, many countries are ignoring the need to maintain sustainability because there are too focused with the potential of technological advancements in space.

Case Study: The Rise and Fall of Planetary Resources

Planetary Resources Inc. was founded in 2009 (originally known as Arkyd Astronautics). Their goal was to develop the most advanced asteroid mining technologies that could bring space resources back to Earth without any astronauts in space. Their visions for space exploration persuaded many high-profile investors to invest millions of dollars into the program. The early years of Planetary Resources were marked by bold technological initiatives and significant media attention. Between 2015 and 2016, the company achieved several milestones, successfully launching two test satellites: Arkyd-3R and Arkyd-6. However, beneath the surface of these achievements, Planetary Resources was grappling with mounting challenges. The technical hurdles proved more formidable than anticipated. Miniaturizing mining technology for space operations presented unexpected complications, and the costs of development continued to escalate.

By 2016, a market downturn made it increasingly difficult to secure additional funding, forcing the company to fire many of its employees. To generate guaranteed revenue, Planetary Resources pivoted away from its original asteroid mining focus to concentrate on Earth observation technology. This shift signaled a retreat from the company's founding vision.

This example proves the lack of funding space exploration has in one of the leading countries of the industry. Startups in other countries are not even able to receive the initial investments needed to start their companies. This gap can create a monopoly in an industry that may be the only way to get natural resources in the long run.

Questions to Consider

1. How can nations be allowed to explore space resources while obliging to the 20230 Agenda for Sustainable Development?
2. What mechanisms for benefit-sharing would ensure that developing countries and future generations benefit from space resource utilization?

3. How can conflicts over competing claims to these limited resources be prevented or resolved?
4. How can transparency in space mining operations ensure a sustainable future in space?
5. How should countries prevent irreversible damage to the Moon and other celestial objects when space mining?

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