United Nations Office for Outer Space Affairs (UNOOSA)

Intermediate Committee

Chair: Benjamin Kim

Co-Chair: Joshan Chopra

Topic 1: Space Militarization

Introduction

Space militarization has been a pressing concern for UNOOSA for many decades. Satellites, a product of the Cold War, are being used for reconnaissance and communications in military operations. In response, many nations have developed anti-satellite weapons (ASAT) in fear of the dangers that could come with space militarization. Recently, rapidly progressing space technology and decreasing costs of sending satellites into orbit has given many individuals, nations, and private corporations a fascination with exploring the last frontier, with the number of orbital launches doubling in the last decade. Space is increasingly viewed as a military domain with many opportunities to enhance a country's military capabilities and safety, and many nations have begun to devise programs that would directly threaten global cooperation in outer space. Advances in ASAT technology is an increasing concern, as the testing of such systems threatens the sovereignty of other nations and produces space debris, which can harm other human-made objects in orbit. This problem threatens to grow to uncontrollable proportions, and the resulting levels of fear and hate could possibly cripple entire nations. To ensure that everyone

can live long and prosper, delegates must devise a strategy to safeguard the final frontier from conflict.

Definitions/Acronyms

ASAT: Anti-satellite weapon, designed to incapacitate or destroy satellites for strategic or tactical purposes

FOBS: Fractional orbital bombardment systems, meant to launch into orbit to travel around the world, then re-enter Earth's atmosphere to perform a missile strike

ICBM: Intercontinental ballistic missile, usually armed with nuclear technology

Space militarization: The placement and development of weaponry and military technology in outer space

Sputnik 1: The first artificial satellite, launched by the Soviet Union in 1957

U.S.: United States of America

U.S.S.R.: Soviet Union

History: Space Military Technology

The Cold War sent the United States and the Soviet Union into a frenzied space race, pouring massive amounts of money into deploying satellites. The Soviet Union's Sputnik 1 led

the way for human-made satellites in 1957, and both countries were regularly deploying satellites by the 1960s, recognizing their value in spying on the other. As a result, both countries also developed increasingly advanced ASATs and space weaponry as satellite technology progressed, ranging from kamikaze satellites to ballistic missiles.

In the US, the Nike-Zeus programme involved firing nuclear missiles at ICBMs, exploding them over the North Pole, and Project Defender planned to destroy Soviet ICBMs as they launched with satellite weapon systems orbiting over Russia. The US went so far as to develop Project A119, which planned to detonate an atomic bomb on the Moon in a display of American superiority, as well as to develop a military base on the Moon. The Strategic Defense Initiative, proposed by President Ronald Reagan, involved a space-based defense against nuclear missiles. Although all of these plans were never realized due to insufficient technology and low feasibility, the US has relied on space technology for communications, intelligence, navigation, and missile warnings during times of conflict, so satellites are largely regarded as crucial providers of tactical information.

In the USSR, important military technological developments were also taking place. The R-36ORB Fractional Orbital Bombardment System (FOBS) was an ICBM meant to go into a low Earth orbit when launched, travelling over the South Pole to strike North America from the opposite direction that they were expecting. It was never realized due to the SALT II treaty. The Polyus spacecraft was an orbital weapons platform meant to destroy satellites from President

Reagan's proposed Strategic Defense Initiative, but it failed to reach orbit and burned up in the atmosphere over the South Pacific Ocean.

Important High-Altitude Tests

Operation Hardtack 1 (1958) was an American project that, among other explosions, involved three high-altitude nuclear tests: YUCCA, ORANGE, and TEAK, with YUCCA being the first nuclear test being carried by balloon.

Starfish Prime (1962) was an American nuclear test at an altitude of 400 km over Johnston Atoll in the North Pacific Ocean. It is the highest nuclear test ever demonstrated, and it is the largest nuclear test conducted in outer space. The resulting electromagnetic pulse effect was felt 1400 km away in Hawaii.

Nuclear Test 184 (1962) was a Soviet nuclear bomb detonated at an altitude of 290 km which damaged a 1000 km long line in Kazakhstan. The line in Kazakhstan was specifically designed to be protected from such damage.

China conducted an anti-satellite destruction test using ASAT weapons in January 2007, which renewed people's view of space as a domain for warfare after the Cold War. The country was widely criticized for the test, as it created a large amount of space debris.

Russia launched a weapons test against a defunct military satellite in November 2021, sending more than 1,500 trackable pieces of debris throughout space.

Costs of Space Militarization

A space arms race would threaten to destroy a significant amount of space infrastructure, especially satellites. Such satellites hold up the global economy, allow instantaneous global communication, help people navigate, coordinate military responses, monitor weather, provide national security information, and connect banks. Modern life is built around such satellites, and the destruction of them would be devastating. Nuclear testing is a significant threat, as resulting space debris can hit and damage such satellites, as well as orbiting space stations. Orbital debris has the potential to stay in space for long periods of time, posing future risks to any new satellites that are planned for launch in addition to current ones.

Treaties and Past Actions

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967): Also known as the “Outer Space Treaty”, it prohibits the placement of nuclear weapons or any other kinds of weapons of mass destruction in outer space or on celestial bodies.

SALT II treaty (1979): Prohibits the deployment of FOBS systems.

Resolution 75/36 (December 2020): Passed by the UNGA, it called on countries to submit reports on what they saw as the most pressing threats to space security and recommend the next steps forward.

The Conference on Disarmament in Geneva: held by the United Nations Office for Disarmament Affairs (UNODA) in September 2021, it talked about space militarization but experienced heavy disagreement over what the real threat to space is.

Open Ended-Working Group on Space Threats: Voted into existence by the UN First Committee in October 2021, it is open to all countries and has met in 2022 and 2023 with the goal of developing concrete proposals for addressing space threats.

Current Situation

Although the space race ended with the fragmentation of the Soviet Union at the end of the Cold War, countries such as China, Japan, and India have begun to build their own space programmes, and Russia has developed the Russian Space Forces as an independent section of the Russian military.

Japan has been developing ballistic missile defense systems since 2003. China established the Strategic Support Force in 2015, which deals with, among other things, matters of

space. The US issued its first National Space Strategy in 2018, which recognized that its adversaries had turned space into a warfighting domain. India conducted an anti-satellite weapons test in March 2019. Iran launched its first military satellite into space in April 2019. France established its Space Command in September 2019. The US labelled China and Russia as its biggest operational threats in outer space in June 2020.

Some believe that the only way to respond to the militarization of space is through increasing one's own space dominance in an effort of deterrence. With decreasing costs, improving technology, and increasing interest and involvement in space militarization, future conflict seems to be on the horizon.

Driving Questions

1. To what extent should the testing of space weapons (including ASAT testing) be allowed/banned? Are the impacts of space debris generated from testing more impactful on some countries than others?
2. Should the United Nations limit the amount of space weapons that each country has in their inventory? Would the United Nations be able to enforce such a limit? Should space weapons be allowed at all?

3. How much power should the United Nations have in regulating individual countries' actions and plans in space? Does the United Nations have a right to interfere with government agendas outside of the territory of any member countries?

Bibliography

ACMUN COMMITTEES. (n.d.). Appleby College. https://www.appleby.on.ca/ACMUN-committees

Bhatt, I. (2020, May 6). *Militarizing the final frontier: arms control in space*. Harvard International Review. https://hir.harvard.edu/militarizing-the-final-frontier-nor/

Davies, J. (2021, January 6). *The Militarisation and Weaponisation of Space - Human Security Centre*. Human Security Centre. http://www.hscentre.org/latest-articles/the-militarisation-and-weaponisation-of-space/

Outer Space – UNODA. (n.d.). https://disarmament.unoda.org/topics/outerspace/

The militarization of space. (2021). *House of Commons Library*. https://researchbriefings.files.parliament.uk/documents/CBP-9261/CBP-9261.pdf

The Militarization of Space and its Transformation into a Warfighting Domain | List of Articles | International Information Network Analysis | SPF. (n.d.). International Information Network Analysis | SPF. https://www.spf.org/iina/en/articles/nagashima_02.html

Weeden, B., & Samson, V. (2022, February 28). *It's time for a global ban on destructive antisatellite testing*. Scientific American. https://www.scientificamerican.com/article/its-time-for-a-global-ban-on-destructive-antisatellite-testing/

Wikipedia contributors. (2023a, October 24). *Project A119*. Wikipedia. https://en.wikipedia.org/wiki/Project_A119

Wikipedia contributors. (2023b, December 9). *Conference for the Reduction and Limitation of Armaments*. Wikipedia. https://en.wikipedia.org/wiki/Conference_for_the_Reduction_and_Limitation_of_Armaments

Wikipedia contributors. (2024, January 13). *Militarisation of space*. Wikipedia. https://en.wikipedia.org/wiki/Militarisation_of_space

Topic 2: Resource Rights in Space

Introduction

Along with space exploration comes space exploitation. Vast amounts of natural resources are waiting in space, and many individuals, companies, and nations see those resources as opportunities for wealth. With resources on Earth quickly diminishing, many have turned their eyes to the skies with a hint of greed in their eye. Extracting resources from space, while it can come with physical difficulties, is mostly hindered by legal and ethical difficulties. The Outer Space Treaty of 1967, which declares outer space to be separate from national appropriation, does not address extraction rights. This legal ambiguity has led to differing laws and interpretations from various nations. Environmentalists worry about space junk and greenhouse gas emissions, yet many people hunger for the minerals, gases, and potential water that could be used to provide raw materials, energy, and sustenance for human life. A universe full of resources could prove to be beneficial to resource-hungry humans overconsuming earthly reserves, but there is a potential for the same overconsumption to take over human reaches of the solar system. In addition, space mining can require extremely high financial costs to start, which could result in richer countries being the only benefactors if it is not regulated. Delegates must come to an international consensus on the morality and legality of space mining in order to balance resource exploitation.

Definitions/Acronyms

NASA: The National Aeronautics and Space Administration

Space resource: Any material that can be gained from an area outside of Earth's atmosphere that could be used to gain a profit

History

The US House of Representatives passed the US Commercial Space Launch Competitiveness Act in 2015, which says that US companies have a right to engage in the exploration and extraction of space resources. The legislation's definition of "space resources" was broad enough to include the moon, whose surface likely contains great amounts of worth in natural resources. Companies such as Moon Express and Shackleton Energy Resources believe that billions of tons of water lie at the poles of the moon in ice form, and NASA announced the discovery of water on the sunlit surface of the moon in 2020. Asteroid mining also holds a great deal of value. According to Asterank, which measures the potential value of over 6,000 asteroids that NASA currently tracks, even mining just the ten most cost-efficient asteroids, measured by proximity and value of resources, would produce a profit of around $1.5 trillion USD (around $2 trillion CAD at the time of writing).

Article II of the Outer Space Treaty of 1967 suggests that commercial space companies don't own the rights to any resources that they find in space, since it says that no celestial body

should be subject to “national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”. The US’s SPACE Act cleverly avoids this by removing all claims of sovereignty from the country of the United States and instead allowing private companies to assert similar claims, which the Outer Space Treaty does not cover. Article I of the Outer Space Treaty develops further diversity in the interpretations of this international law, as it states that space, including the moon and other celestial bodies, should be free for all to explore in accordance with international law.

Some have related space exploitation to fishing in international waters and believe that the rights of fishing ships should also apply to rocket ships. Fishing ships are often owned by companies and fly the flags of the country whose laws they have to follow. They have a right to peacefully fish in international waters that they don’t own and get to keep the fish that they catch. When applied to space exploitation, the same economic principles would give privately owned spaceships from any nation the freedom to mine throughout space and keep the resources that they acquire.

Environmental Impacts

Some argue that space is a better place to mine than Earth, as celestial bodies do not harbour complex ecosystems that can be disrupted through mining, so miners do not have to worry about direct habitat destruction. In addition, there is no atmosphere on asteroids or the

moon, so air and water pollution would not be as much of a concern as it is on Earth. Some claim that the greenhouse gases emitted by rocket launches and operations would even be less than the greenhouse gases produced by terrestrial mining. Currently, mining contributes four to seven percent of annual greenhouse gas emissions, and the negation of such emissions would be extremely beneficial to the fight against climate change.

Space mining, however, will likely create large amounts of space debris around mining sites, adding to the growing problem of space junk. This space debris can damage satellites that are crucial for modern life on Earth, as well as spacecraft for future mining operations. It is also largely unregulated, unlike terrestrial mining, and so the only limitation to private companies' space exploitation is a physical one. In addition, an increase in space mining will increase the number of rocket launches, which could potentially negate the decrease in carbon emissions from a lack of terrestrial mining. Whether or not the effects on the celestial bodies being mined should be considered is still a subject of debate.

Potential Mining Resources and Areas

There is an abundance of resources in space, which serve a diverse range of purposes. The isotope helium-3 can be used as fuel for nuclear fusion reactors. It is combined with a substance called deuterium during nuclear fusion to produce energy without any harmful waste being created. The natural abundance of the isotope on Earth, however, is very limited, resulting

in high costs for helium-3. It is abundant on the moon and is often cited as a reason to return to the moon. Little research has been conducted on mining the substance.

Platinum group metals can also be found in space. They are often used in vehicle exhaust catalysts, as well as anticancer drugs, industry machinery, dentistry, and electronics. Platinum is twenty-seven times more abundant in meteorites than it is on earth, and in meteorites, it is estimated that platinum is found in 1000 parts per billion.

Other precious and rare Earth metals lie in outer space, including erbium, neodymium, yttrium, silicon, iron, nickel, cobalt, carbon, zinc, gold, and silver. Scientists have also found an abundancy of water in space.

Current Situation

In 2019, China and Russia both launched uncrewed lunar missions, seeing them as a step towards future crewed missions. In 2021, the two countries announced plans to establish a permanently inhabited base on the moon called the International Lunar Research Station (ILRS), focusing on utilising in-situ resources and extracting minerals and water among other goals. This is similar to NASA's Artemis program, announced in 2020, which also plans to build a lunar base. Despite common aims, the ILRS and Artemis missions have a heavy lack of communication, and peaceful cohabitation of the moon is not guaranteed.

Whether or not to allow ownership and sovereignty are also topics of hot debate. In addition, according to John Locke's theory of property, ownership ensures that one can enjoy the benefits of one's efforts without having to worry about them being appropriated by another. In the case of the space exploitation race, an asteroid that one company has bored into could be taken over by another company, taking advantage of the already exposed resources. The first company would not be able to take the second to court, as it would have had no ownership over the mining site. If companies are constantly worried about mining sites being taken over by competitors, there will be less incentive for them to put long-term effort into space mining, thus likely reducing productivity. Ownership, however, can also generate negative consequences. Giving a company the sole right to mine on certain celestial bodies takes away that company's urgency to mine quickly, as no competitors will try to take over the mining site, thus decreasing production. In addition, giving companies or nations ownership will exacerbate inequality on Earth, as those with massive wealth and advanced economies will have more opportunities to claim ownership of space resources and locations. The act of space mining alone takes millions of dollars to perform, and allowing ownership would increase the cost further.

Driving Questions

1. Should UNOOSA allow the extraction of resources from space? If so, should space mining be an area explored by federal governments or privately owned companies? If not, how will the world regulate it?

2. Should sovereignty and ownership over certain areas of outer space or celestial bodies be allowed regarding the extraction of resources? Should private companies be included in the Outer Space Treaty's ban on sovereignty? Should a new version of the Outer Space Treaty be produced to better reflect current issues?
3. Do the benefits of space mining outweigh the deficits that come with it? Is space mining environmentally friendly or harmful? Can the exploitation of space occur without causing territory disputes?

Bibliography

A Human-Rights based approach to space resource governance. (n.d.). NASA/ADS. https://ui.adsabs.harvard.edu/abs/2022cosp. . .44.3192L

ACMUN COMMITTEES. (n.d.). Appleby College. https://www.appleby.on.ca/ACMUN-committees

AZoCleantech. (2023, September 6). *Is sustainable space mining possible?* https://www.azocleantech.com/article.aspx?ArticleID=1720

Basulto, D. (2021, December 5). How property rights in outer space may lead to a scramble to exploit the moon's resources. *Washington Post*. https://www.washingtonpost.com/news/innovations/wp/2015/11/18/how-property-rights-in-outer-space-may-lead-to-a-scramble-to-exploit-the-moons-resources/

Canada, N. R. (2023, March 24). *Platinum facts*. https://natural-resources.canada.ca/our-natural-resources/minerals-mining/minerals-metals-facts/platinum-facts/20520

De Zwart, M., Henderson, S., & Neumann, M. (2023). Space resource activities and the evolution of international space law. *Acta Astronautica*, *211*, 155–162. https://doi.org/10.1016/j.actaastro.2023.06.009

Environmental Impacts of Space Mining vs Terrestrial Mining. (2023, October 26). New Space Economy. https://newspaceeconomy.ca/2023/10/26/environmental-impacts-of-space-mining-vs-terrestrial-mining/

Feasibility of lunar Helium-3 mining. (2014). NASA/ADS. https://ui.adsabs.harvard.edu/abs/2014cosp. . .40E1515K/abstract

Gasparini, A., & Wasser, M. (n.d.). *Water & Ices - NASA Science*. https://science.nasa.gov/moon/moon-water-and-ices/

Masson-Zwaan, T., & Richards, B. (2023, January 23). *OP-ED | International Perspectives on Space Resource Rights*. SpaceNews. https://spacenews.com/op-ed-international-perspectives-on-space-resource-rights/

Munro, D. (2022, May 25). *Who owns outer space, and everything in it?* Centre for International Governance Innovation. https://www.cigionline.org/articles/who-owns-outer-space-and-everything-in-it/

Resources in space. (2024, September 1). Space Resources - Luxembourg Space Agency. https://space-agency.public.lu/en/space-resources/ressources-in-space.html

The Natural Sapphire Company. (n.d.). *PGMs and PGMs in space | Education*. Education. https://www.thenaturalsapphirecompany.com/education/additional-precious-metals-information/pgms-pgms-space/

Yarlagadda, S. (2022, April 8). *Economics of the Stars: The future of asteroid mining and the global economy*. Harvard International Review. https://hir.harvard.edu/economics-of-the-stars/


ACMUN XIX
Appleby College Model United Nations Conference 2024
ACMUN XIX