UNOOSA

Secretary Generals: Joanna Nikolova & Diane Zhang

Chairs: Rishika Bansal & Aliyah Chutkan

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Welcome Letter

Dear Delegates,

Welcome to the 15th annual MIT Model United Nations Conference and to the Office for Outer Space Affairs Committee! We're excited about the topics for this year and are truly looking forward to being your chairs.

I'm Rishika, a Freshman studying Computer Science and Political Science here at MIT. Although I've never chaired before, I was involved with both MUN and Speech and Debate (Extemporaneous Speaking) in high school, with a focus on international current events. I'm so excited to work with you all later this year!

I'm Aliyah, a Freshman majoring in Physics with a concentration in Women and Gender Studies. This is my third time chairing a committee, although my first at MIT. I've been involved in Model UN since seventh grade, and have always found it not only an amazing way to learn more about the world around me and the global challenges our generation faces, but also a way to form connections with people from all over the world.

The two topics for this weekend are the implications of the militarization of space and the potential dangers of a space arms race, and the implications of potential lunar and asteroid resource extraction and mining. With a resurgence of interest in space exploration over the last five years, both topics have become increasingly important to consider. We hope you'll use this weekend not only to learn more about these topics, but also to collaborate in creating lasting solutions. You should submit your position papers five days prior to the beginning of the conference to the chairs at the following email: **unoosa-mitmunc-2023@mit.edu**.

Sincerely,

Rishika Bansal and Aliyah Chutkan

Topic 1: The implications of the militarization of space and potential dangers of a space arms race

OVERVIEW AND BACKGROUND INFORMATION

Space exploration has been closely tied to military power since it began in the 1950s. Indeed, it was the fear that the Soviet Union, or USSR, could use satellites to attack or gain information on the United States, as well as the belief that the United States and the USSR's success in space exploration reflected their technological and military capabilities, that started the Space Race[1].

While the dissolution of the USSR in 1991 marked the end of the Space Race, interest in the potential military advantages and threats in regards to space exploration only increased globally. Numerous countries currently operate military satellites, and countries including India, China, and the United States have anti-satellite weaponry, or ASATs[2], with China marking its entrance into space exploration with the successful testing of a kinetic energy ASAT[3].

While these ASATs provide a level of conflict deterrent due to the fact that using them could potentially blind a country's military, especially considering the increasing reliance on satellites for military intelligence, they also create a unique risk due to the nature of military conflict in space. It is significantly easier to attack a space system than it is to defend it, resulting in space conflict being offense-dominant. As a result, satellites going dark due to technological

[1] https://millercenter.org/the-presidency/educational-resources/space-race

[2] https://www.spf.org/iina/en/articles/nagashima_02.html

[3] https://hir.harvard.edu/anti-satellite-weapons-and-the-emerging-space-arms-race/

issues or interference due to debris could be falsely attributed to an ASAT attack, resulting in military action against other nations.

This use of anti-satellite weaponry reflects the growing sentiment that space will become a major battlefield in any future conflicts. The development of technologies including ballistic missile defense systems, hypersonic gliding vehicles, and Proliferated Low Earth Orbital constellations all reflect an increase in interest towards offensive and defensive space-oriented technologies. The issue with this, though, is that once one country gains superiority in space-oriented technology, another country then refocuses their attention on this technology, creating an unending cycle that results in the increase in the militarization of space.

Military operations in space are also inextricably linked to resource and land acquisition. Space represents a new frontier which, if one nation dominates it, would give them a technological and resource advantage over other nations. It is for this very reason that China, one of the top three players in space militarization, along with Russia and the United States, has compared the moon and Mars to contested islands in the South China Sea, which China has often attempted to claim through force[4].

As space weaponry is developed, the effects of testing such weaponry must also be considered. Currently, space weaponry is mostly made up of missiles, including ASATs. To test such weaponry, defunct satellites are destroyed. Russia and China in particular have been engaging in a large amount of missile tests in recent years. However, these tests create a large amount of space debris, which serve as risks towards other satellites and space stations.

[4]https://www.cnbc.com/2022/11/28/china-poses-increasing-threat-in-military-space-race-top-us-general-says.html

The United Nations Office for Outer Space Affairs, or UNOOSA, has long stood against the militarization of space, and has warned against any potential space arms race. The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967 served to prohibit the use of nuclear weapons or other weapons of mass destruction in space, as well as to outline procedure to ensure that space exploration would for the benefit of all nations, including that celestial bodies would not be subject to national appropriation or claims of sovereignty[5]. The United Nations has since adopted numerous resolutions aimed at reducing space threats, establishing rules and norms for responsible behavior, establishing confidence-building measures, and creating a level of transparency when it comes to nations' actions in space. However, with the development of new technologies and heightening tensions between the United States, Russia, and China, all of whom are attempting to become the dominant power in space, past actions are no longer sufficient in ensuring that the new space arms race does not result in global repercussions.

KEY TERMS/FIGURES

The Outer Space Treaty: Also known as The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, this treaty prohibited nuclear weapons or other weapons of mass destruction from being placed into orbit or placed on celestial bodies, but failed to prohibit other types of weaponry[6].

[5] https://www.un.org/disarmament/topics/outerspace/
[6] https://ndupress.ndu.edu/Media/News/Article/577537/defining-and-regulating-the-weaponization-of-space/

Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT): Jointly submitted in February 2008 by Russia and China, this proposal attempted to define and prohibit the proliferation of weapons in space. In this proposal, weapons in space were defined as "any device placed in outer space, based on any physical principle, which has been specially produced or converted to destroy, damage or disrupt the normal functioning of objects in outer space, on the Earth or in the Earth's atmosphere, or to eliminate a population or components of the biosphere which are important to human existence or inflict damage on them."

The Prevention of an Arms Race in Outer Space (PAROS): A UN resolution attempting to ban the weaponization of space. Each time it has been reintroduced, the United States has either abstained or voted against it.

Kinetic ASAT: Anti-satellite weaponry that must physically strike an object in order to destroy it, including ballistic missiles and drones. Any space asset could be classified a kinetic ASAT if it is used to destroy a satellite[7].

Non-kinetic ASAT: Nonphysical means to disable or destroy a space object, including cyberattacks and frequency jamming.

QUESTIONS TO CONSIDER

1. How does the development of new technologies change past resolutions?

[7] https://www.tribuneindia.com/news/archive/nation/what-is-asat-749403

2. What actions can be taken to ensure that technological malfunctions are not mistakenly attributed to an attack?
3. How does the development of new technologies contribute to the cycle of increasing militarization, and what steps can be taken to prevent this cycle from continuing?
4. What space capabilities does your country have, and how are they connected to your country's military?
5. How does the militarization of space influence further space exploration? And how does further space exploration affect militarization?

RECOMMENDED READINGS

1. Past UNOOSA Resolutions
    - Looking at past resolutions not only ensures that you are informed on what the United Nations has already done, but also allows you to examine what resolutions are potentially outdated, and where changes could be made, which is especially important considering how much space technology has developed over the past several decades.
2. World Space Agencies
    - A way to see what your country's current space capabilities are.

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Topic 2: **The implications of potential lunar and asteroid resource extraction and mining**

OVERVIEW AND BACKGROUND INFORMATION

Lunar and asteroid resource extraction is a relatively new possibility, with no country currently having widespread operations (although samples from space have been extracted). Space mining provides a large economic incentive: mining only the ten most cost-effective asteroids would produce $1.5 trillion US dollars worth of minerals and other resources. Just one asteroid, 16 Psyche, contains $700 quintillion US dollars worth of gold[8]. Some of the most valuable resources that could be mined include water and rare earth metals, most of which are used in technology manufacturing and serve as a gateway material for the world's transition from fossil fuels to battery-based energy storage[9].

The first attempt at enabling asteroid mining came from private corporations in 2012, Planetary Resources and Deep Space Industries, who both created satellites to identify suitable asteroids[10]. Since then, the United States' National Aeronautics and Space Administration (NASA) has embarked on the OSIRIS-REx mission to collect a substantial study sample from the asteroid Bennu, one of the closest to Earth[11]. In recent years, Japan's and China's space agencies have collected samples from the asteroid Ryugu and the moon, respectively[12]. The primary purpose of these projects, however, is planetary defense and research, rather than commercial resource extraction.

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[8] https://hir.harvard.edu/economics-of-the-stars/
[9] https://www.milkenreview.org/articles/mining-in-space-is-coming
[10] https://hir.harvard.edu/economics-of-the-stars/
[11] https://www.nasa.gov/feature/goddard/2022/1st-nasa-asteroid-sample-return-mission-on-track-for-fall-23-delivery
[12] https://www.milkenreview.org/articles/mining-in-space-is-coming

Currently, one of the largest challenges to asteroid mining is the exorbitant cost involved with manufacturing rockets and mining technology, and then sending them to space. Therefore, lunar resource extraction has been of particular interest due to the moon's close proximity to earth[13]. In order for space mining to become both feasible and commonplace, states must invest in building technology (such as reusable rocket parts) to lower cost and energy requirements. Luxembourg, which has the largest per capita expenditure on space exploration, is currently investing in space start-ups and focusing on educating a new generation of space entrepreneurs in order to do this.

Another concern for space mining is how it will affect the global supply of natural resources, and consequently the economies that depend on selling them. Global raw markets currently make up $660 billion US dollars, a large portion of which comes from developing countries[14]. Given the immense quantity of valuable natural resources available on asteroids, having these raw materials flood the market would almost immediately devalue them and severely damage the developing economies that depend upon those commodities. For example, Zimbabwe would be significantly affected by extraterrestrial platinum mining, since minerals account for 60% of exports in the country[15]. If a private corporation from the United States or Luxembourg suddenly controlled the largest source of platinum, Zimbabwe would need to find another export. Developing countries, especially, do not have the resources to establish public space programs or fund private ones, putting them at a considerable disadvantage when it comes to extraterrestrial mining. Steps must be taken to ensure resource extraction in space does not further damage already struggling economies.

[13] https://www.jpl.nasa.gov/infographics/the-lunar-gold-rush-how-moon-mining-could-work
[14] https://hir.harvard.edu/economics-of-the-stars/
[15] https://trade.ec.europa.eu/doclib/docs/2021/june/tradoc_159611.pdf

Despite the economic concerns, extraterrestrial resource extraction will have an undoubtedly positive environmental impact. By mining natural resources from space, states can avoid harmful projects on earth that release carbon into the atmosphere and leak toxic chemicals into the atmosphere and waterways.

Moreover, it is important to consider state ownership of extraterrestrial resources. Although no country can currently claim ownership of any celestial body (or its resources)[16], some argue that private corporations face no such barriers. Yet, according to UNOOSA's *Outer Space Treaty*, states are responsible for the actions taken by their private corporations in space[17]. As private companies join governments in space exploration, and oftentimes lead new efforts, so-called ownership of extraterrestrial resources has begun to come into question. The United States, United Arab Emirates, and Luxembourg have all rushed to codify space-resource laws in order to establish the legality of space mining on a national level[18]. A continued lack of international regulation will give countries with the resources to pursue advanced space programs an unfettered advantage in extraterrestrial resource extraction, and unhindered access to the consequent economic benefit.

KEY TERMS/FIGURES

European Space Agency (ESA): An intergovernmental organization made up of 22 member states that focuses on unifying European space policy and pooling resources in order to

[16] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html
[17] https://www.brookings.edu/blog/order-from-chaos/2020/12/14/what-you-may-have-missed-in-the-new-national-space-policy/
[18] https://www.bloomberg.com/news/articles/2021-12-15/space-mining-has-arrived-and-its-biggest-booster-is-luxembourg?leadSource=uverify%20wall

undertake larger missions. The ESA often cooperates with other state space programs from Africa and the Americas.

The Outer Space Treaty: Also known as the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, the Outer Space Treaty establishes that no country may claim ownership of any celestial body and that states are responsible for the activities of both governmental and non-governmental actors.

Committee on the Peaceful Uses of Outer Space: UNOOSA committee, consisting of 100 member states, that governs the exploration and use of space. The committee is responsible for the creation of the five space treaties and five principles of outer space that UNOOSA has released.

Rare Earth Metals (REM): Minerals such as lanthanum, terbium, and europium, most of which are crucial in technology manufacturing. Currently, China accounts for 63% of rare earth mining[19]. Extraterrestrial resource extraction would likely yield high volumes of rare earth metals.

[19] https://www.politico.com/news/magazine/2022/12/14/rare-earth-mines-00071102#:~:text=As%20of%20today%2C%20China%20accounts,firearms%2C%20radars%20and%20stealth%20aircraft.

Moon Agreement: Also known as the *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, this treaty establishes that lunar resources are common resources (belong to all of humankind) and that an international committee should be set up before the exploitation of these resources begins[20].

QUESTIONS TO CONSIDER

1. How will you use the organization and power of UNOOSA (and other international bodies) in order to arbitrate extraterrestrial resource extraction?
2. How can an UNOOSA resolution ensure the equitable distribution of wealth from lunar and asteroid mining among developed and developing countries?
3. What role will private corporations in your country play in extraterrestrial resource extraction?
4. How can states, especially those without adequate resources to pursue space exploration on their own, collaborate to fund projects?
5. How does the development of new technologies affect old resolutions?

RECOMMENDED READINGS

1. Wilson Center Overview of Space Laws
2. UNOOSA's Outer Space Treaty
3. UNOOSA's "Benefits Declaration"

[20] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html

4. Past UNOOSA Resolutions – note that these are different than the treaties and principles
5. World Space Agencies – for information on your country's space program
6. World Factbook – for information on your country's economic dependencies

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