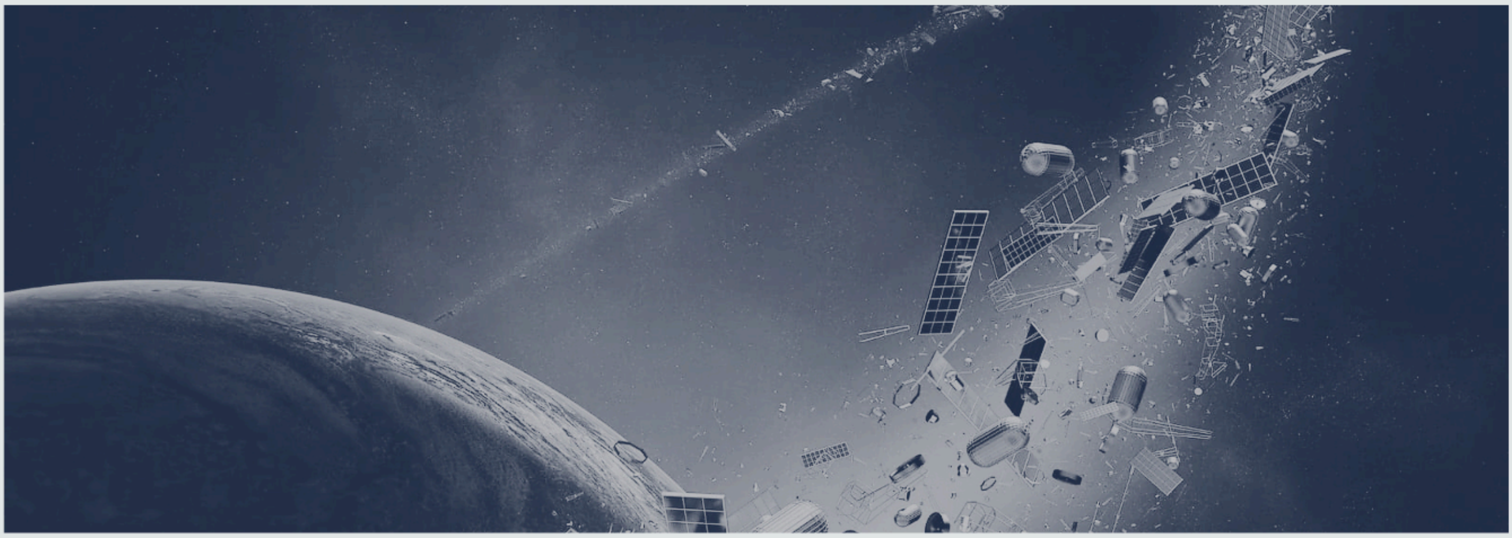
SHISHUKUNJ MUN
INDORE
2026

Agenda - Establishing International Frameworks for Space Traffic Management and Utilization

UNOOSA



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LETTER FROM THE EXECUTIVE BOARD

Dear Delegates,

We are thrilled to welcome you all to the 11th iteration of Shishukunj Model United Nations. We are just as excited as all of you for this year's conference and look forward to having spirited discussions on the agenda - 'Establishing International Frameworks for Space Traffic Management and Utilization.'

In this committee, you will satisfy or ignite the curious space enthusiast in you and learn how, in the present era, certain countries and companies have come to dominate space with their programs. As you go deeper, you'll see how each satellite out there is standing on its toes to survive, along with a *few* pieces of debris. As delegates of the United Nations Office for Outer Space Affairs, you will get an insight into the world of outer space and some of the pressing issues in the management of space traffic. With this agenda, you will debate these issues first-hand and collaborate in order to come up with workable and creative solutions for the same.

We have created this study guide to help you have a better understanding of the agenda and it should be used only as a reference while conducting research. We encourage and expect original work and creativity from our delegates and would like to emphasize that we value quality rather than quantity when it comes to thinking of original solutions. You must also note that **any form** or amount of **plagiarism** and **AI-generated** content in your speeches will **NOT** be tolerated; be prepared to face severe consequences in case you fail to take this warning seriously.

This is a complex and evolving field of international policy and requires a thorough understanding, but don't let that intimidate you; every great solution starts with a curious question! We're absolutely looking forward to seeing you all in the shoes of policymakers, keeping your country's interests forward and negotiating away every piece of debris that comes your way!

Best Wishes and Regards,
Shakambhari Karnik- Chairperson
Kabir Khan- Vice Chairperson
Deetya Shah- Rapporteur

KEYWORDS

1. **Orbits:** Orbits are the paths followed by objects as they move around a celestial body due to gravity.

2. **Space Debris** (which is also called **Space Junk)**: It is made up of man-made objects that are just floating around in space. These objects are not useful anymore

3. **Space Traffic Management:** rules and regulations to make sure everything runs safely in space without any threats, from Space Debris or other space objects

4. **Satellite**: It is an object that goes around a celestial body. This body can be natural or artificial. For example the moon is a satellite that revolves around the Earth

5. **A mega-constellation:** It is a large network of satellites that humans control in low Earth orbit.

6. **Mitigation**: reducing the effects of a problem or stopping it from getting worse

7. **Congestion**: when a large number of objects are crammed in a space and it gets hard for them to move smoothly.

8. **Low Earth Orbit** or **LEO:** is an area of space that's close to the Earth's surface. Many satellites are present in Low Earth Orbit as it is easy to get to and close to the Earth.

9. **Geostationary Orbit** or **GEO,** is where satellites can stay in a fixed place above the equator. This is useful for satellites that need to provide services to a particular area of the Earth. For example some satellites in this orbit help us with television and radio broadcasts.

10. **Orbital Slot**: it is a specific area in any orbit, from where satellites can provide services like telecommunications, weather monitoring and broadcasting. These Orbital Slots are important because they help satellites work properly and provide the services they are supposed to.

11. **Defunct satellite**: It is a type of space debris. A satellite that does not work anymore and cannot communicate with the Earth is called a defunct satellite in simple language.

12. **Private Space Companies**, also called **Private Actors:** These are non-governmental actors that work in the space domain or carry out space-related programs.

13. **Equitable Access:** (here) means that each country has opportunities to use space.

14. **Inter-Agency Space Debris Coordination Committee** or **IADC**: a platform that brings together the world's leading space organizations, including NASA, ISRO, ESA and the Chinese Space Agency.

15. **Cosmic**: it refers to things that are associated with space or the universe.

16. **Space sustainability**: it is about carrying out space activities in a way that satisfies our present needs without compromising on future space exploration.

17. **The Space Surveillance Network** or **SSN**: The Space Surveillance Network keeps track of all the things in space. It is a global tracking system which tracks all man made objects in space and keeps a record of their actions.

INTRODUCTION TO THE COMMITTEE

'UNOOSA' which stands for United Nations Office for Outer Space Affairs, is the branch or office of the United Nations that is responsible for working with the international community in matters related to the peaceful and sustainable exploration and use of outer space. It helps guide all space activities and plays a primary role in implementing all the existing space-related laws. This specific division of the UN started out as a small expert unit in 1958, exactly one year after the launch of 'Sputnik 1'(the world's first artificial satellite) by the Soviet Union. This unit was later upgraded as a formal division in 1968, after considering the growing satellite activity and innovations in space technology, and officially named as 'UNOOSA', in 1992. It also serves as the secretariat[1] for the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS), and the two bodies work together to create and carry out space policies.

When it comes to UNOOSA's current involvement in the real world;

- It keeps track of all the objects launched in space through the UN Register of Objects Launched into Outer Space.
- It actively prepares reports and studies in various sectors of space science.
- UNOOSA conducts workshops and various programmes to integrate space-tech capabilities in developing nations, allowing them to freely access space.

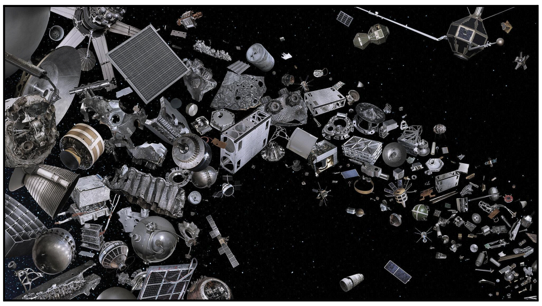
Note to delegates: Now that you have a basic idea of UNOOSA's mandate or functions, here are 2 questions you can ask yourselves based on the committee background and your portfolio, to give a kick start to your research:

- Does your country or company have objects in the UN register of objects in outer space?
- Does your country need help from UNOOSA's space tech workshops?

[1] A secretariat is like a permanent team of experts who coordinate and help in actually implementing the laws created by the member nations, which in this case are members of the UNCOPUOS.

INTRODUCTION TO THE AGENDA

The agenda- ‘Establishing International Frameworks for Space Traffic Management and Utilization’ mainly focuses on the creation of stricter and more standardized measures for managing the safe movement of objects in orbit and for better and more equitable utilization of space resources.



What is Space Traffic Management and Why is it Necessary?

Outer Space is vast beyond imagination, but since the last few decades, various countries have developed advanced space programs that go beyond curiosity or exploration and also hold immense commercial importance. The space that we talk about here is not some distant galaxy or black hole, but some major orbits where most of the mega-constellations and satellites operate. Two of the most significant and crowded ones are, namely, **the Low Earth Orbit,** also known as LEO, which is about 200 to 2000 km above Earth’s surface; this is where the International Space Station is situated and **the Geostationary Orbit** (GEO), which is around 36,000 km above Earth’s equator[2]. Satellites here are used for weather forecasting, telecommunications, etc. With the rapidly developing space programs worldwide and the orbital slots being finite, the number of satellites in space is increasing disproportionately, with no proper system to manage their movement. The co-existing space junk or space debris travelling at very high speeds and the many satellites sharing the same orbital space bring the risk of catastrophic collisions of satellites. And with this being the current situation, we need the management of space traffic now more than ever. **Space Traffic Management (STM)** is a set of technical regulations and systems designed to manage the safe and sustainable movement of space objects in and out of orbits. The concept of STM was formally introduced in 2001 by the International Academy of Astronautics[3] and has been developing ever since. Despite the developments and increasing awareness, there are critical enforcement gaps in STM and the system needs to be broadened. The system of tracking objects in space, which is a part of Space Situational Awareness (SSA) and the management of space debris are two ideas that lie at the heart of space traffic management and will be covered in detail in later sections of this guide.

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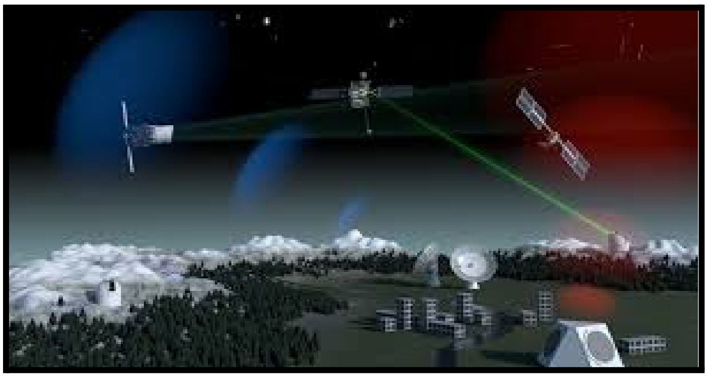
[2] https://anywaves.com/resources/blog/leo-meo-geo-satellites-definition-difference/
[3] https://iaaspace.org/wp-content/uploads/iaa/Communication/stm-mou.pdf

Space Tracking:



Space traffic management sets the traffic rules for outer space, including all the kinds of movements of space objects in orbit, while space tracking is a system of radars that makes these rules work by properly tracking the activity of each and every object in space. Without a clear system showing where cosmic objects are moving, it is impossible to avoid crashes in orbits. Space tracking uses a network of giant ground radars and telescopes, as well as certain satellites to find every single human-made object orbiting the Earth. The most powerful tracking system in the world is the Space Surveillance Network (SSN), but it is fully controlled by the United States military. A few other countries, like Russia and China operate their own independent space-tracking systems, which means a very small group of powerful nations decides who gets to see what is happening in orbit.

Because these tracking networks belong to militaries, countries keep their best tracking data and spy satellite paths top secret. They often refuse to share this raw data with the rest of the world because they worry it will hurt their national security leaving the international community without a clear picture of space traffic.

This system creates a great danger for developing nations because these countries do not have their own radar networks or space telescopes. This leaves them completely blind in orbit, so they have to rely on voluntary warnings from foreign militaries to protect their own satellite from colliding with trash or other spacecraft.

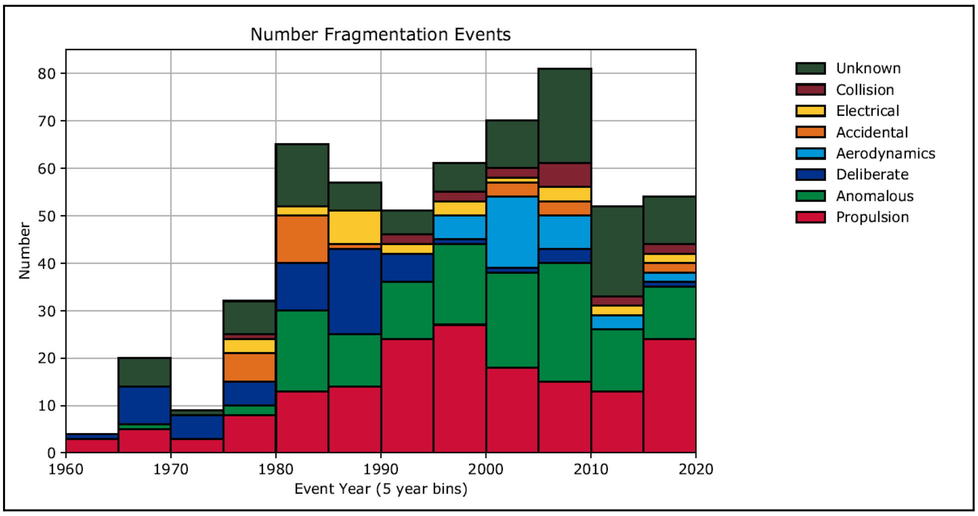
SPACE DEBRIS MANAGEMENT

What is Space Debris?

Space debris, also called 'space junk,' is composed of objects that float around trapped in orbits, including broken fragments of rockets or satellites after collisions, dead satellites from past space explorations, and flecks of paint. These objects coexist with the active satellites in orbit.

Why do we need to manage it?

These debris pieces travel at a **speed** of about 18,000 to 28,000 km/h in space orbits and are **estimated** to be about 130 million pieces, **weighing** roughly 13,000 tons![4] Their mass, number and area are expected to increase over time, only adding to the growing risk of their collision with satellites; and in general, 'fragmentation events' which are moments where debris is created due to accidental collisions, explosions, or detachment of objects due to the harsh space conditions. For each fragmentation event, a dangerous amount of debris can be added to space.



(The image below signifies the increase in debris-creating events according to a study by the European Space Agency (ESA)).[5]

4 https://www.polytechnique-insights.com/en/columns/space/the-proliferation-of-space-debris-in-the-earths-orbit/

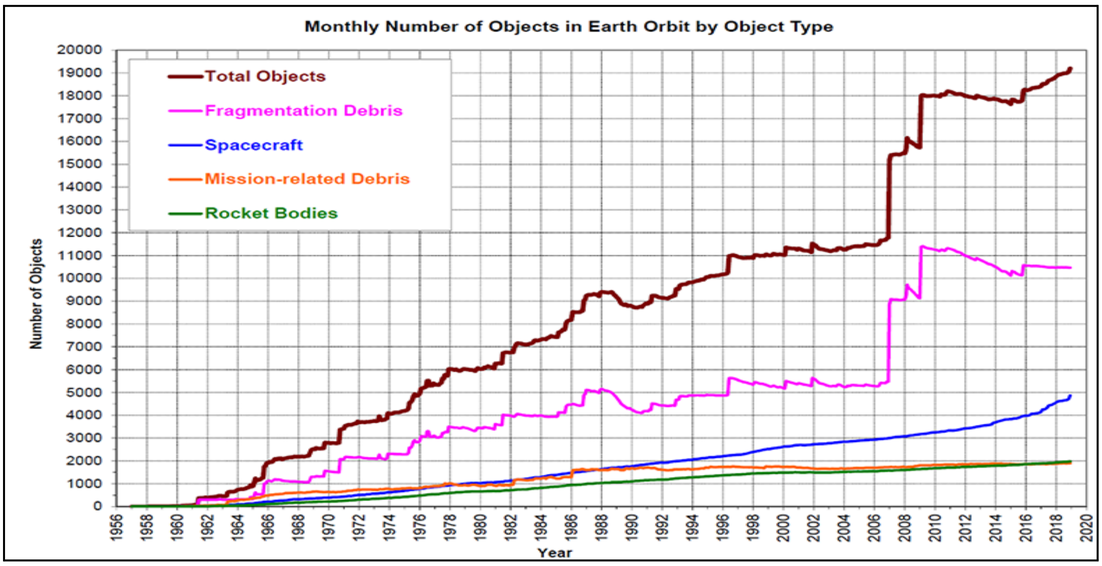
5 https://www.esa.int/Space_Safety/Space_Debris/The_current_state_of_space_debris

Congestion and Collision Risk:

That much debris travelling at such high speeds is creating congestion, where two satellites or debris pieces have come dangerously close and even collided at various instances.

- **Protecting satellites**- Many of these satellites at risk of collision are vital to the smooth functioning of human life and economy since they carry the GPS, weather forecasting and internet connectivity.
- **Preventing the 'Kessler Effect'**: This is a theoretical scenario (though not very far from turning into a reality) put forward by NASA scientist Donald J. Kessler, which talks about a time when space debris increases so much that when debris collides with a satellite and creates fragments, those fragments in turn collide with other satellites, creating a never-ending chain reaction that could make entire orbits permanently unusable.

Mitigation:



This image shows the monthly number of objects in Earth's orbit, 1956-2020[6].

Debris mitigation or preventing the creation of further debris is a step essential to the management of space debris. This process may involve creating satellites that can withstand the effect of small debris coming at them and passivating a satellite by removing stored energy sources such as residual fuel and battery charge after its mission ends in order to prevent accidental explosions.

Some of the existing guidelines include:

[6] https://ntrs.nasa.gov/api/citations/20200000826/downloads/JSC_60954_TN77636-2.xlsx.pdf?utm_

1) **The IADC (Inter-Agency Space Debris Coordination Committee) guidelines** introduced the primary deorbiting time of 25 years after the end of the mission. This basically means that a dead satellite must return to Earth's atmosphere and burn up (When a spacecraft re-enters Earth's atmosphere, it faces intense friction, gets heated up, breaks apart and vaporizes) within 25 years. Though in today's time, a dead uncontrollable satellite floating in space for 25 years is also a huge collision risk and this is why many space agencies and experts suggest the timeline be shortened to 5 years.
2) **The UN COPUOS (The UN Committee on the Peaceful Uses of Outer Space) Long Term Sustainability Guidelines**: These guidelines emphasize minimizing the risk of fragmentation by designing appropriate spacecraft and avoiding the release of any object that could become debris during the normal operations of spacecraft.

Though efforts towards debris mitigation have been observed, there is still a long way to go, especially with such guidelines being voluntary.

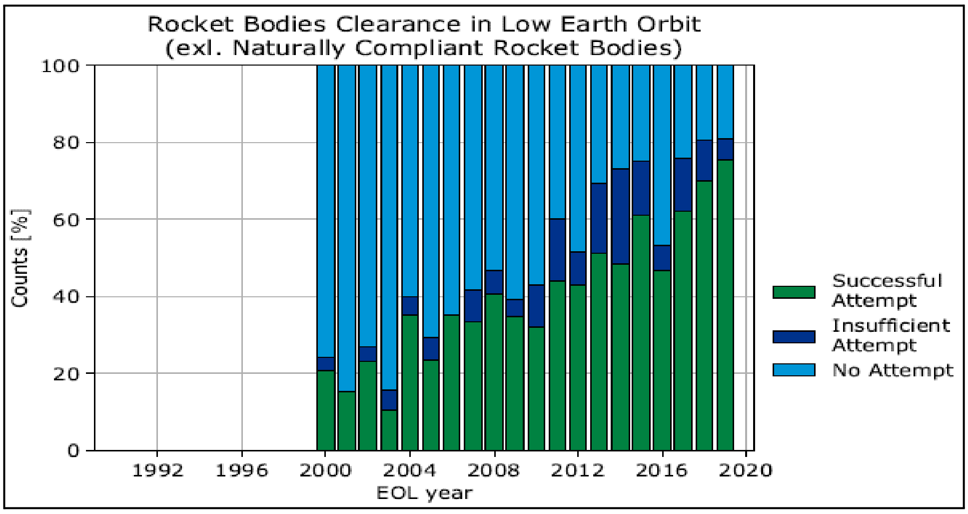
Removal of Space Debris:

Even if we succeed in preventing the creation of further debris, we would still have over 27,000 tracked pieces of debris to deal with. This is why actively removing space debris is also crucial to debris management. The primary process used in the removal of debris is known as Active Debris Removal (ADR). In this process, a chaser spacecraft[7] performs a rendezvous (when a chaser spacecraft adjusts its speed and path until it is flying alongside its target object) with a piece of space junk, grabs it and removes it from orbit.

- Other capture methods: Various new technologies of ADR have been developed, such as the release of large nets to entangle multiple debris pieces at once, the use of robotic arms to capture debris, firing a harpoon[8] to penetrate the shell of the debris, etc.
- Some initiatives towards active debris removal include: European Space Agency's Clear Space-1 Mission[9] aimed at removing a dysfunctional rocket adapter left behind by ESA's own mission in 2013 and the 'Zero Debris approach'[10].
- The Sovereignty problem with ADR: This method involves physically capturing another country's space object, which makes some countries skeptical about the tool involved in doing so, because how does one prove it's not a military spy satellite?

So, despite growing awareness and some successful efforts towards compliance with debris management guidelines, the progress remains much slower than the pace of congestion in the Low Earth Orbit. There remains the need for addressing such issues and looking into why many countries and companies fail to participate in these initiatives and what mechanisms will make compliance universal.

[7] A special highly maneuverable spacecraft designed to hunt down/capture objects in space.
[8] A long, sharp weapon attached to a rope.
[9] https://www.esa.int/Space_Safety/ClearSpace-1
[10] https://www.esa.int/Space_Safety/Clean_Space/ESA_s_Zero_Debris_approach



This image shows the percentage of rockets that were successfully cleared from the Low Earth Orbit from 1992 to 2020[11]

[11] https://www.esa.int/Space_Safety/Space_Debris/The_current_state_of_space_debris

EQUITABLE ACCESS AND UTILIZATION

Equitable Access and Its Challenges:

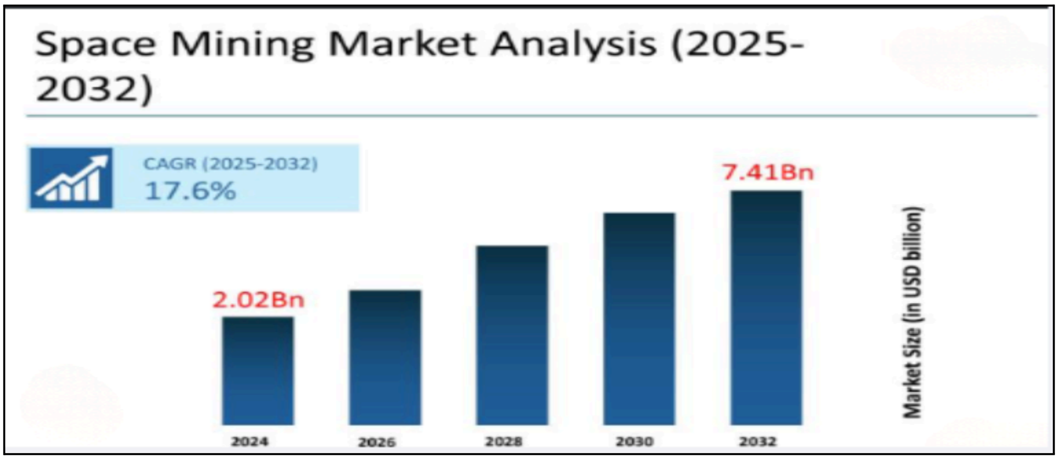
The old promise of 'fair access,' that space is for everyone and should benefit all countries, is breaking down because rich countries and giant private companies are grabbing the best parts of space. Long ago, international treaties declared that space exploration must benefit every single nation on Earth, regardless of how much money or scientific power they have. In fact, under the current rules, satellite parking spots and radio channels are allocated on a very strict first-come, first-served basis, allowing wealthy tech companies to dominate the prime locations before poorer nations can afford to build their own satellites. This setting is very unfair and creates a major problem, especially for developing countries. These countries suffer from severe natural disasters because they cannot afford the space tech required for weather prediction purposes. They are forced to buy this important life-saving data from private companies and developed countries at unreasonable costs, thus limiting their growth.

Orbital Slots:

An orbital slot is a specific location in space where a satellite can stay fixed and perform its task. Space is enormous, but not all of it is useful or suitable for satellites. The most valuable orbits (such as the geostationary orbit or GEO) are very much in demand and increasingly congested. The GEO is a thin ring, some 36 000 km above the Earth's equator. Satellites based here orbit at the same rate as the rotation of Earth, so they stay over the same part of the planet's surface, providing continuous coverage 24/7. This makes GEO essential for various purposes like weather tracking, TV broadcasts, etc.

However, GEO is just a thin line encircling the planet, which means there are only a limited number of safe, interference-free slots available. If satellites are parked very close, their radio signals may interfere with each other, so there is a possibility of data leakage or they can also collide, creating dangerous space debris and a huge impact, which is a threat to other satellites as well. These slots are allocated by the International Telecommunication Union to different countries. But instead of equally distributing them to all the nations, the ITU runs on a first come first serve policy. This system lets wealthier countries and large corporations claim the best positions and retain them indefinitely. When a satellite reaches the end of its operational life, a replacement is launched to replace its spot.

Resource Extraction and Ownership:



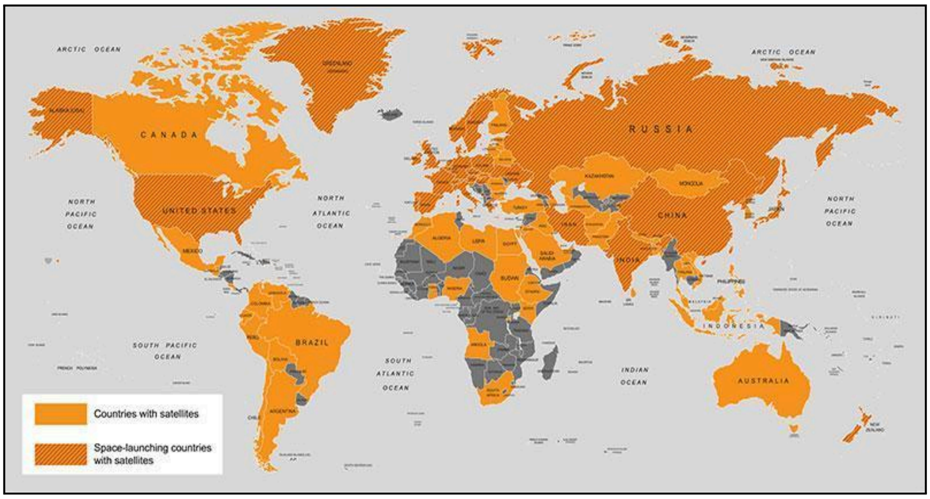
This graph shows that the space mining market is expected to nearly triple in size, from \$2.02 billion in 2024 to \$7.41 billion in 2032, at a rapid annual growth rate of 17.6%.[12]

The next big fight is over who owns valuable resources on other celestial bodies, such as the south pole of the Moon, which has helium-3 gas and sheets of water ice tucked away in deep, dark craters. This water ice is very valuable because it can be refined into rocket fuel and breathable oxygen. Whoever controls these deposits will control the essential refueling stations of future deep space travel.

These are materials of strategic importance but there are no international laws to decide who gets to own them at the moment. The 1967 Outer Space Treaty declares space to be the province of all mankind and forbids any nation from claiming sovereignty over the Moon or asteroids, but it has a critical regulatory loophole. It prevents governments from claiming territory but doesn't stop private companies or billionaires from mining these resources and selling them for profit. To make things more complicated, wealthy countries are creating new frameworks, like the US-led Artemis Accords, which introduce the concept of safety zones around operational sites, a provision that some states argue could create de facto control over strategic resources. How can we claim space belongs to all of humanity when individual countries and companies are already writing the rules of their own?

Access for Developing Nations:

[12] https://www.openpr.com/news/1133073/space-mining-market-size-analysis-forecasts-to-2025.html



The image shows the number of satellite-owning countries as of 2020.[13]

Developing nations currently face severe problems in entering space because of the loopholes in the existing rules. Now, with limited financial resources, these nations often cannot afford to build and launch satellites or rockets right away, and then they have to wait. By the time they are financially and technologically ready to establish their own space programs, they discover that the prime orbital slots that were most suitable for them now are already taken by the wealthier nations. Because they do not own satellites to track environmental changes or natural emergencies, they are forced to spend their limited budgets to buy important weather maps, critical climate data, and important information that is space-related from foreign entities at very high prices, creating a hindrance in the growth of developing nations.

Recently, this congestion issue has become a part of Low Earth Orbit (LEO) too. In low Earth orbit, SpaceX and some other private companies are launching thousands of satellites to give global internet coverage. As more objects crowd these orbits, two major challenges arise for developing nations:

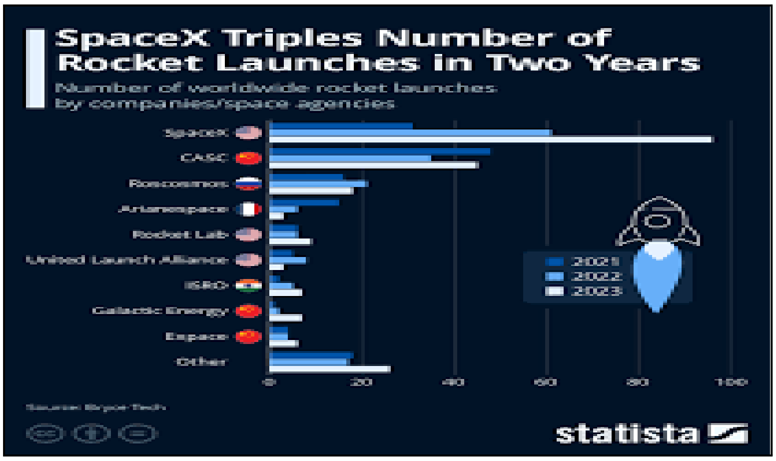
- **High risk of collision**: which basically means it drastically raises the risk of space collision, which can shatter into dangerous high-speed junk and make future rocket launches incredibly risky for new nations.
- **Frequency blockades**: That is, when these giant commercial fleets hog almost all the available radio frequencies. When a smaller country, financially managing to launch a single satellite to keep an eye on its own local farms or coastlines, struggles to find a clear, open radio channel just to send or transmit data.

[13] https://www.ucs.org/resources/satellite-database

RISE OF PRIVATE ACTORS

Who they are and why they matter:

Until not long ago, only governments were engaged in space. The United States and the



Soviet Union successfully launched rockets into space, built satellites and sent astronauts into space.

Private actors are non-governmental organisations and companies that are involved in space activities. Companies such as SpaceX, Blue Origin, OneWeb and Digantara fall into this classification. In the last few decades, private companies have played a major role in space advancement.

These companies develop satellites, provide internet services, collect data from space and develop emerging technologies. In fact, many of the satellites that orbit the Earth today are actually owned and operated by private companies, not governments. And with thousands of private satellites now orbiting, private companies have also begun to offer a hand with the Space Situational Awareness Program (SSA). That means tracking satellites and space debris, monitoring things in orbit, and warning others of possible collisions.

As space becomes more crowded each year, the role of private actors becomes more important. Nowadays, there are thousands of satellites orbiting around the Earth and many more will be launched. Not only because countries send them but also because of these private companies, sending satellites to space for their own needs and services.

The bigger problem is that these private companies have decided how the space is going to work and now all the countries have to also follow these rules. These companies can make the space more or less useful for us, and because of these changes private companies tell us how space is to be used.

Given the growing impact and behavior of private actors in space, it is important that they act in a moral way and meet the current international requirements. They offer many benefits but also new challenges that require specific rules and mutual support between governments and companies.

The Legal Gap:

What is a legal gap?

When new technology or new situations are not covered by existing law, there is a legal gap. The main international space laws were written 50 years ago, when only a few governments had space programs. The lawmakers who wrote these laws could not have foreseen a future with thousands of private satellites and large corporations operating in space. The conclusion is that today's space activities are well ahead of the laws that are supposed to regulate them. This gap between modern space activities and old space laws is called the legal gap.

Why Does the Legal Gap Exist?

The legal gap is there because space is not what it was. When the present laws were put into effect:

- There were very few countries active in space.
- There were almost no private space companies.
- The total number of satellites in orbit was extremely small.
- Space traffic was not a challenge.

And today:

- Space is becoming increasingly congested. Hundreds of firms are in it.
- Thousands of satellites orbit the Earth.
- Space is getting more packed.
- Every year, collisions are more likely.
- The laws have not changed enough to produce these recent developments

Why is the Legal Gap Important?

The legal gap is critical because space is growing more and more crowded every year. Without straightforward regulations, companies and countries can establish different safety standards. This may give rise to misunderstandings, accidents and conflicts. "On Earth we have roads, but there's no international system of traffic in space. There is no single global authority that orders every satellite and every move in orbit. The more satellites are launched, the more important it is that there are clear and common rules.

Problems Created by the Legal Gap:

No clear rules exist for space safety. Many rules that are supposed to control space safety are optional. This means that communities can decide to follow them or not.

There is no one accountable for what private companies do, if they harm another satellite or cause space debris. People are not really sure what happens when a private satellite causes harm or falls into another object so we need to think about the satellite and who is responsible for it.

ANALYSIS OF EXISTING SYSTEMS AND FRAMEWORKS

The need for revisiting some of the existing frameworks exists because they were created for a space that no longer exists! These treaties are outdated, have major gaps, and fail to address a lot of pressing issues that we face in space today. For example:

The Outer Space Treaty:

The Outer Space Treaty, formally 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,* is the first formal treaty created to regulate outer space and is often referred to as the 'constitution of outer space.'

- It came into force in October 1967
- 115 countries are a full part of the treaty, along with 23 signatories which are yet to ratify[14]
- It is considered the fundamental structure for international space law and has put forward several key principles, including the use of the moon and other celestial bodies strictly for peaceful purposes, naming space as 'the province of all mankind' (declaring it open for exploration for every human) and that no nation can claim anything in outer space as their own.

However, this treaty was created at the height of the Cold War[15] when only the United States and the Soviet Union had space programs. It was created for gradual innovation and launches, not for the rapidly evolving 21st century, in which thousands of satellites are being launched every single year. It falls short in addressing key issues such as space traffic management, debris removal, mining in space, equitable access to space resources, etc. Moreover, it has no means for verification of its compliance or enforcement.

[14] https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html
[15] A historically important period of intense geopolitical rivalry between the US and the USSR

Representatives of the US and USSR at the signing of the Outer Space Treaty on January 27, 1967[16]

The Liability Convention:

The Liability Convention, formally known as the Convention on International Liability for Damage Caused by Space Objects, came into force in 1972. It elaborates on the 7th article of the Outer Space Treaty, which holds a nation liable for damaging another nation's space object.

- It has nearly 100 state parties.
- It lays down rules for compensation when a space object is damaged. According to the treaty, when an object is damaged by another country's space object on the Earth's surface, the damage-causing country is absolutely liable and when the damage occurs in space, a country is only liable if it was due to its fault, not just accidental.

This convention provides the only formal mechanism for space damage claims and yet it has the Convention has rarely been invoked and has produced very few practical compensation cases.. It has various functional gaps as well, such as no provision for private companies or individuals to file a claim or to be held accountable directly. It also has no enforcement mechanisms to make sure that a country pays its due amount and fails to address the commercial aspect (activities of private companies) of space.

Need for Binding Technical Standards:

One notable issue with the two frameworks discussed above was that they were all voluntary and hence lacked proper enforcement. Countries and companies, right now, comply with all such initiatives towards STM out of their own will and for the sake of space sustainability, but even if they don't, there won't be any consequences. To understand the importance of a binding law, let's take the example of a non-binding one.

[16] https://www.thespacereview.com/article/3155/1

The United Nations Committee on the Peaceful Use of Space (COPUOS) Long-Term Sustainability Guidelines of 2019:

- This is a set of 21 detailed and well-designed guidelines aimed at space sustainability[17]
- Applies to both states and private companies.
- They include comprehensive provisions on space traffic management, space debris removal, collision avoidance and international cooperation, to name a few.

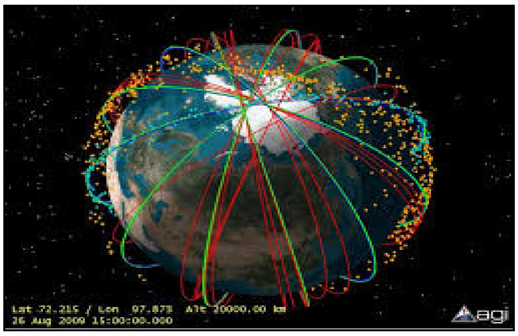
But the problem is that these guidelines are completely voluntary. Some countries have stepped up to show their commitment by making their implementation compulsory in their own nations, but it hardly makes an impact. When we speak of **binding** technical standards, we also talk about the need for an upgrade in the current space law to make it uniform. For example, the primary system of tracking space objects is currently under the control of the United States and they share this data with other countries and companies selectively. The companies and countries that are building their own tracking systems also don't have the full picture yet.

So to prevent such guidelines from serving a merely decorative purpose, the core question that the international community needs to address is: Are voluntary frameworks actually enough or do we need binding technical standards?

17 https://www.unoosa.org/documents/pdf/PromotingSpaceSustainability/Publication_Final_English_June2021.pdf

CASE STUDY

The Iridium-Cosmos Collision (2009):



The Iridium-33 satellite[18] *The debris cloud created because of the collision*[19]

The most striking example of the dangers of space crowding is the collision of two satellites. Iridium-33 and Cosmos 2251. It was the first accidental crash of two intact spacecraft in orbit. This changed the perception of the world to the threat of space debris. The satellites involved were Iridium-33, which was an active commercial communication satellite owned by an American company and Cosmos 2251, a Russian military communication satellite that had stopped working years earlier and was drifting through space completely unpowered.

On 10 February 2009, the two satellites collided at a speed of about 11.7 km/s over Siberia[20]. Because tracking systems were less advanced at that time, there was no active warning to prevent the impact, and both spacecraft were instantly destroyed. The high-speed impact shattered both the satellites into a thousand pieces of junk, instantly creating more than 2,000 large trackable fragments and hundreds of thousands of smaller pieces of space junk.

[18] https://spacenews.com/u-s-satellite-destroyed-in-space-collision/

[19] https://www.researchgate.net/figure/Current-Iridium-Constellation-and-Collision-Debris-Clouds_fig1_266017226

[20] https://www.esa.int/Space_Safety/Space_Debris/About_space_debris

This collision serves as a practical warning for the exact challenges currently facing the international community. The wreckage from the crash did not clear out because the collision occurred in low Earth orbit. The debris remained in orbit around Earth for years, and other nations launching new satellites have had to spend fuel and redirect their spacecraft just to avoid colliding with leftover junk from this single incident. The event showed the risk of a chain reaction, which is a concept called the Kessler syndrome. This could slowly make all orbital paths completely risky. If one accidental crash years ago created a permanent problem, it explains why developing nations face such a high risk today, with thousands of new commercial satellites entering orbit continuously. The possibility of another major crash increases, which threatens the safety of any new country trying to launch its first rocket into space.

The Tonga Satellite Slot Controversy:

In the late 1980s and early 1990s, the Kingdom of Tonga, a small island nation in the Pacific with limited space capabilities, applied to reserve a number of geostationary orbital slots through the International Telecommunications Union (ITU). Geostationary orbital spots are highly important for communications, television broadcasting, weather monitoring and other satellite-based services. In addition, the number of interference-free orbital positions is limited into geostationary orbit without them disrupting each other.

The use of these orbital slots by Tonga generated major international controversy. Critics said the country was not holding the slots for the immediate operation but planned to let them out to private satellite companies for a profit. Many highly technological states raised concern that the potential for countries to hold orbital positions without active use would lead to the "holding" of space resources, a decline in the availability of orbital slots for other users and mistakes in the management of an overcrowded orbital space. Tonga, yet, defended its decision, saying that developing countries must have equal access to outer space and not be forbidden access simply because they did not have the resources or technological ability to put satellites into orbit at that time. For Tonga, the reservation of orbital positions was a way of protecting future development opportunities and of preventing valuable space resources from being restricted by a few powerful nations.

This controversy shows the need for transparency in international laws made regarding the use of orbital resources and the development of standardized management systems related to space traffic. It also shows that we need to have fair ways to give out space resources, stop people from holding onto space slots that they do not use and have solid ways to resolve conflicts because the fight for space resources is not far from becoming a catastrophic race.

HOW TO RESEARCH

Researching for any MUN involves three aspects:

1. **Country/Portfolio-specific research**: This is when you research all about the foreign policy, history, geography and stance of your country on the agenda, which includes the allies and enemies of your country, its background and how it is being affected by the agenda at hand. **If your portfolio is a company or a private actor**, instead of a country, there would not be a lot of difference in the research; you would just be looking into the position and past actions of your company in the global market and in relation to the agenda. For example, if your portfolio is Meta, in a human rights committee discussing artificial intelligence, you would advocate for user privacy and awareness, along with regulations over strict bans.
2. **Agenda-specific research**: This is the research you do on all aspects of the agenda, which will help you in the actual preparation of what you will speak on in the committee. The agenda research will start with the study guide, but delegates must do a thorough and comprehensive analysis of other aspects as well. Some trusted sites are linked below for your convenience.
3. **Committee-specific**: A delegate needs to be thorough with the committee background as well. This is where you get to know about what comes under your committee's instruction and what doesn't. An introduction to the committee has been provided in the guide for you to start.

Here are some trusted websites you can use:
1. UNOOSA'S official website: https://www.unoosa.org/
2. European Space Agency's website: https://www.esa.int/
3. NASA'S website: https://www.nasa.gov/
4. Britannica: https://www.britannica.com/
5. And all the official UN websites

Here are some websites that should not be used at all:
1. Wikipedia
2. Personal blogs (A type of website that provides the author's personal opinion on a certain topic)
3. WikiLeaks
4. Magazines

Delegates must note that while researching, the use of any AI platform like ChatGPT, Copilot, Gemini, Claude, etc., while writing your speeches and plagiarism, which is directly copying content from a website, into your speech, is strictly prohibited. **If a speech by any delegate is found to have plagiarism or AI content, he/she will face severe repercussions.**

CONCLUSION AND EXPECTATIONS

As the bureau of UNOOSA, it is our sincere duty to remind a curious space enthusiast such as yourself that all the space-related issues discussed above are not as distant as they seem. The problems of space traffic and debris that look so unrelated to life on land, at first glance, are actually very closely tied to us, humans. If a Kessler-syndrome-like scenario is to happen because of the increasing mass of debris, and if orbital slots really are at risk of permanent congestion, then, we hate to break it to you, but you may never see the face of the internet again. You may never have access to any distant and unknown location facilitated by GPS, and not to mention, you might want to forget about weather forecasting. We say this because all these activities are made possible due to the hovering mega-constellations and satellites in various orbits, and with the current scenario, it's not a question of *if*, it's a question of *when* they are hit by a flying piece of debris. Everything debated in this committee affects life on Earth directly and will become the future of anything and everything that happens in the very orbits our committee is trying to protect.

The complexity and diversity of this agenda demand thoroughness and in-depth research, which we expect from all our delegates. This study guide has been carefully prepared to include all aspects that will be covered in the committee in detail and hence it is a wonderful base for you to start your research with. It is also required that all of you explore the agenda aside from the guide as well. After all, delegates are the ones who make the committee fruitful and interesting.

So get in the shoes of good researchers first, then play your role as a good delegate by keeping in mind that all solutions are welcome!

QUESTIONS A RESOLUTION MUST ANSWER

1. How can the existing international space laws be updated to ensure execution and better adherence universally?

2. How can Active Debris Removal mechanisms be developed and diversified to address sovereignty concerns while ensuring efficient debris clearance?

3. What measures can be taken at the international level to manage the growing congestion in the Low Earth Orbit?

4. How can UNOOSA prevent private companies and wealthier nations from space mining and the misuse of valuable space resources such as water - ice on the moon?

5. How should legal liability be assigned under international law when automated, AI-driven collision-avoidance systems execute independent maneuvers that unintentionally cause a crash or hazard with a third-party satellite?

6. How can we make sure that global space tracking data is only used to keep satellites safe and isn't weaponized for military spying or targeting?

7. How can developing countries gain a more equitable access to space resources and orbital slots and block the influence of spacefaring nations and private actors?

8. What are some measures that the international community can take to address the legal loopholes relating to private companies and governments in space?

9. How can the capabilities of private companies and space agencies be collectively utilized and combined for the improvement of Space Situational Awareness (SSA) and traffic management systems?

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