

Committee on the peaceful use of outer space



Measures to Regulate the Safe Disposal of Space Debris and to Prevent Generating further Orbital Debris

-Committee guide-

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I. Introduction

a. COPUOS:

The Committee on the peaceful uses of outer space is a subsidiary organ of the United Nations General Assembly, established in 1959 as a permanent body. Currently, COPUOS consists of 102 Member States, making it one of the largest committees of the United Nations. COPUOS operates through two permanent subcommittees: the Scientific and Technical Subcommittee and the Legal Subcommittee. The committee reports to the General Assembly and takes its decisions by consensus rather than by vote, reflecting the cooperative nature of international space governance. The main responsibilities of the COPUOS committee include reviewing international cooperation in the peaceful uses of outer space, identifying space-related activities that could be undertaken by the UN, organizing the mutual exchange and dissemination of information on outer space research, and studying legal problems arising from the exploration of outer space. COPUOS has been instrumental in the development of five major international space law treaties, including the Outer Space Treaty of 1967, which forms the foundation of international space law and established that outer space shall be free for exploration and use by all states and cannot be claimed by national sovereignty. The Committee's secretariat is provided by the United Nations Office for Outer Space Affairs (UNOOSA) headquartered in Vienna, Austria.

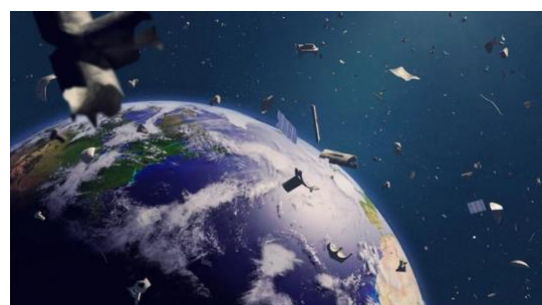
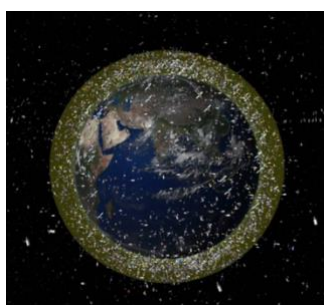
b. Topic Introduction:

For many years now, humanity has a Problem near their home planet, which has been resulted by themselves, the space Debris. Ever since the launch of Sputnik 1 on October 4th in 1957, we have left behind not only satellites, and space probes, but also big amounts of waste of all sizes in orbit. This debris thrifts in the earth orbit for decades, or even longer , posing a threat to human activities in space. Space travel benefits us in many Areas, such

as science, economy but also our daily life. We rely on them as weather satellites for accurate broadcasting, navigation satellites as improvement for transportation and much more.

In other words, it provides enormous value here on Earth. At the same time, environmental problems are catching up with us in space, much as they have on Earth. In addition to hundreds of satellites, millions of fragments of all sizes orbit our planet — collectively known as space debris. These fragments can take many forms: decommissioned satellites, lost components, burned-out rocket upper stages, and more. A significant portion of this debris was created during military tests of so-called anti-satellite weapons.

Fortunately, most fragments are destroyed within days, weeks, or months as they re-enter Earth's atmosphere, where the thin upper layers gradually slow them down until they fall toward the surface. Parts of large objects — such as upper stages or very large satellites — are not always completely incinerated during re-entry and can indeed impact the Earth's surface. Despite this natural disposal mechanism in the atmosphere, the amount of debris surrounding Earth continues to grow — and with it, the risks to space travel are steadily increasing.



II. Background

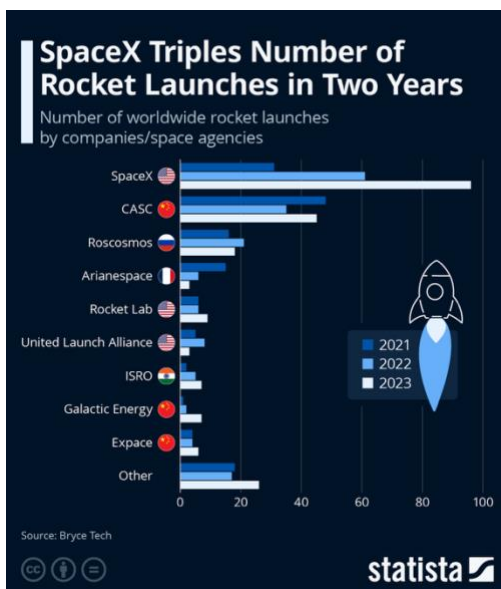
Numbers:

- Number of rocket launches since 1957: about 7,210 (excluding failures)
- Number of satellites these rocket launches have placed into earth orbit: about 25,920

- -> number of these still in space: about 17,610
- Number of these still functioning: about 15,200
- Number of space objects regularly tracked by Space Surveillance Networks and maintained in their catalogue: about 44,870
- Estimated number of break-ups, explosions, collisions, or anomalous events resulting in fragmentation: more than 660
- Total mass of all space objects in Earth orbit: **more than 16,200 tons**

Facts:

- Satellites should be safely removed from orbit after their mission ends to prevent new space debris.
- Rocket stages are emptied of remaining fuel to avoid explosions that could create more debris
- Old satellites in geostationary orbit are moved into a “graveyard orbit“.
- Collisions in space can trigger a chain reaction that creates even more debris
- Active satellites perform avoidance maneuvers to prevent collisions with space debris.



<https://www.statista.com/chart/29410/number-of-worldwide-rocket-launches-by-companies-and-space-agencies/?srsItd=AfmBOorbf80EVSH8oWq3cFKMqvD3ORZHOHbr1TgO2wnYzIvrkPa6M9nF>

III. Current situation

The biggest contributor to the current space debris problem is explosions in orbit, caused by left-over energy, fuel and batteries, onboard spacecraft and rockets. International guidelines and standards now exist, making it clear how we can reach sustainable use of space. Rockets and spacecraft are being designed to minimize the amount of `shedding` (material becoming detached during launch and operation, due to the harsh conditions of space). Also, the prevention of explosions has resulted through releasing stored energy, stabilizing spacecraft once at the end of their lives. Beyond explosion prevention, two further key measures are being implemented to actively manage the debris environment. Defunct missions are increasingly being moved out of the way of working satellites, either by de-orbiting them, causing them to burn up in the Earth`s atmosphere, or by relocating them to a designated `graveyard orbit` far from operational zones. Additionally, in-space crashes are being prevented through careful choice of orbits during mission planning as well as by performing collision avoidance maneuvers, in which active satellites adjust their trajectories when a potential collision is detected.

IV. The major parties involved

- a. **The United states:** The US is a major contributor to earth`s orbital debris, accounting for an estimated 40% of junk in orbit. Using data from the U.S. Space Force`s [Space-Track.org](https://space-track.org), engineering component supply company Accu determined there are currently 33,269 trackable objects in orbit. Of those, 17,682 are satellites. The US has also taken significant legislative and regulatory steps to address the issue of space debris. In 2019, the Federal Communications Commission (FCC) updated its orbital debris migration rules, requiring satellite operators to deorbit their spacecraft within five years of completing their mission, a significantly stricter standard than the previously

recommended 25- year guideline. Furthermore, NASA has been a leading force in developing international debris mitigation standards, having published its own orbital Debris Migration Standard Practices (ODMSP) as early as 1995, which have since served as a foundation for global guidelines.

- b. Russia, China and India:** The most significant state contributors to the orbital debris environment are China, Russia and India, each playing a major role in both the creation of and response to the growing space debris crisis. China is responsible for one of the most damaging single debris-generating events in history. In 2007, China deliberately destroyed its own Fengyun-1C weather satellite through an anti-satellite missile test, creating over 3,500 trackable fragments, described by NASA as "the largest debris-generating event in history." As of today, China operates the second-largest satellite constellation in orbit, with over 700 active satellites according to UNOOSA. Despite its significant contribution to the debris environment, China has increasingly engaged with international mitigation efforts, submitting technical reports to COPUOS and committing to the IADC Space Debris Mitigation Guidelines. Russia, as the successor state to the Soviet Union, carries the longest legacy of space debris generation. According to ESA, Russian and Soviet objects account for the largest share of tracked debris in orbit. In 2021, Russia conducted a destructive anti-satellite test, destroying its own Cosmos 1408 satellite and generating over 1,500 trackable fragments, forcing the crew of the International Space Station to take emergency shelter. This event prompted the UN General Assembly to pass Resolution 77/41 in 2022, calling on all states to commit to a moratorium on destructive anti-satellite tests. India, as an emerging space power, conducted its first anti-satellite test in March 2019, known as Mission Shakti, destroying one of its own satellites in low Earth orbit. NASA Administrator Jim Bridenstine publicly stated that the test created 400 pieces of trackable debris. However, India deliberately chose a low orbit to ensure most fragments would decay and re-enter the atmosphere within weeks, demonstrating a degree of environmental awareness. India is a member of the IADC and has since published its own national Space Debris Mitigation Guidelines through ISRO in 2021, underlining its commitment to the long-term sustainability of outer space.

V. Definition: Key terms of the topic:

1.Space debris: Space debris, also known as orbital debris, includes all human-made objects that are in Earth orbit but which have no function. Typical examples of space debris are disused rocket upper stages and decommissioned satellites, but they also include astronauts' lost tools. However, the largest contribution is debris caused by explosions, the break-up of spacecraft or collisions in orbit.

2.Orbit/Orbiting: An orbit is the curved path that an object in space (like a star, planet, moon, asteroid or spacecraft) follows around another object due to gravity.



3.Space debris mitigation: Space debris mitigation consists of all efforts to reduce the generation of space debris through measures associated with the design, manufacture, operation, and disposal phases of a space mission.

4.Compendium: a collection of concise but detailed information about a particular subject, especially in a book or other publication.

VI. Past international actions:

Since the Space Age began in 1957, the amount of space debris has increased rapidly, especially in the last decade. It has therefore come to our attention that

this cannot be left unaddressed. We must take action now to prevent the collapse of the space system. Many different institutions, including the UN, have already attempted to find solutions to this issue.

One of the main bodies involved in this matter is the European Space Agency (ESA). Their Zero Space Debris approach, first adopted in 2025, aims to significantly limit the production of space debris in Earth and lunar orbits by 2030. They intend to achieve this by ensuring the successful disposal of debris, improving orbital clearance, avoiding in-orbit collisions and internal break-ups, preventing the intentional release of debris, improving on-ground casualty risk assessment, guaranteeing dark and quiet skies, and implementing this beyond protected regions (read more through the link below).

Additionally, the United Nations Office for Outer Space Affairs (UNOOSA) has developed various approaches to limiting space debris. One of these is the Compendium of Space Debris Mitigation Standards adopted by states and international organisations (read the explanation below).

Furthermore, the German Space Agency (DLR) is involved in finding solutions to this issue, especially with regard to satellite crashes.

VII. Current Challenges:

Earth's orbit is filled with defunct satellites, spent rocket parts, and other debris that pose a serious danger to current and future space missions. The scale of the problem is growing rapidly: launch rates today are ten times higher than they were ten years ago, but compliance with space debris mitigation guidelines has not kept up. What makes the situation especially difficult is that it cannot be solved simply by launching fewer rockets. Even if no new missions were launched today, the number of debris objects in orbit would still continue to grow, as broken-apart debris keeps creating new fragments. This chain reaction, known as the Kessler syndrome, can make certain orbits unsafe and unusable over time. ESA studies show that some orbital regions could become entirely unusable, threatening our shared future in space.

A further challenge is the lack of global compliance. The adherence to space debris' mitigation standards is slowly improving, but it is not enough to stop the increase in the amount of space debris. Since space is a shared resource, no single agency or country can solve this problem alone yet binding international enforcement mechanisms are still largely absent.

Finally, technologies needed for a responsible and sustainable use of space do not yet fully exist, meaning that even the political will to act is currently outpacing the technical capabilities available to do so.

VIII. Guiding questions for the debate:

1. How active is my country in the space unit?
2. How much space debris is produced because of my country?
3. What has my country done related to that issue?
4. What will my country be doing regarding that topic?
5. Has my country signed any treaties or is it part of any resolutions regarding that topic?
6. Is my country willing to cooperate with other countries regarding space related questions?
7. Is my country benefiting financially because of the space sector?
8. Does my country have its own rules regarding the use and disposal of space debris?
9. Is my country in favor of obligated measures or against it and therefore supporting voluntary guidelines?
10. Are there any guidelines my country is strongly against/ would never agree on?

IX. Useful links:

https://www.esa.int/Space_Safety/Clean_Space/ESA_s_Zero_Debris_approach

<https://www.dlr.de/en/ar/topics-missions/space-safety/space-debris>

<https://www.nasa.gov/headquarters/library/find/bibliographies/space-debris/>

X. Sources:

https://www.esa.int/Space_Safety/Clean_Space/ESA_s_Zero_Debris_approach

<https://www.unoosa.org/oosa/en/ourwork/topics/space-debris/compendium.html>

<https://www.dlr.de/en/ar/topics-missions/space-safety/space-debris>

https://www.esa.int/Space_Safety/Space_Debris/Mitigating_space_debris_generation

<https://www.dlr.de/en/ar/topics-missions/space-safety/space-debris>

https://www.esa.int/Enabling_Support/Space_Transportation/Types_of_orbits

https://www.iadc-home.org/documents_public/file_down/id/4127

<https://languages.oup.com/google-dictionary-en>

https://www.unoosa.org/documents/pdf/copuos/stsc/2026/COPUOS_Intro_6_November.pdf

https://de.wikipedia.org/wiki/Ausschuss_für_die_friedliche_Nutzung_des_Weltraums

https://www.esa.int/Space_in_Member_States/Germany/Weltraummuell_Ein_ueberirdisches_Problem

<https://www.nasa.gov/headquarters/library/find/bibliographies/space-debris/>

<https://dpskmun.com/committees>

<https://www.britannica.com/story/how-much-trash-is-in-space>

<https://www.dlr.de/en/ar/topics-missions/space-safety/space-debris>

<https://www.space.com/16518-space-junk.html>

<https://www.twinkl.de/teaching-wiki/orbit>

