



**H·I·S**  
HARARE INTERNATIONAL SCHOOL

66 Pendennis Rd, Harare, Zimbabwe

# ZIMUN XI

*The Cost of Innovation:*

*Navigating the Ethical Responsibilities of Technological  
Advancements and Societal Change for Inclusive, Sustainable  
Development in a Globalised World*



*Commission on Science and Technology for Development:  
Evaluating the Ethical Implications of Space Colonization*

**Committee: CSTD**

**Issue: Evaluating the Ethical Implications of Space Colonization**

**Student Officer: Ruvarashe Maturure**

**Position: Co-Chair**

## **INTRODUCTION**

As current trends in world population growth have shown a substantial incline, the population has jumped from 1.65 billion to over 8.2 billion people today in just the 20th century alone. The rapid population growth has created the drastic issue of overpopulation affecting humanity and Earth for many years and as time goes it will or already has taken a toll. At the current rate of population growth, it is expected that the carrying capacity of Earth will exceed, This would result in surpassing Earth's ability to satisfy human needs. The scientist then came up with the theory of space colonisation which would mitigate the proposed impacts of overpopulation on Earth such as resource shortages. This then raises the question of the ethical implications of space colonisation.

## **DEFINITION OF KEY TERMS**

- **Space Colonization**: The process of establishing permanent human settlements on other planets or celestial bodies, often motivated by resource extraction, scientific exploration, or ensuring human survival. (Malik) (Britannica)

- UNOOSA-United Nations Office for Outer Space Affairs. Office of the UN secretariat that promotes and facilitates peaceful and international cooperation in outer space
- The Outer Space Treaty- “international agreement of 1967 in which signers agreed to use outer space only for peaceful purposes; based on draft treaties written by U.S. and Soviet Union in 1966 and reconciled by United Nations Committee on the Peaceful Uses of Outer Space; went into effect Oct. 10, 1967; ratified by U.S., Soviet Union, United Kingdom, and several other nations; weapons of mass destruction not to be placed on moon, in space vehicles, or on space stations(Britannica)
- The Bogota Declaration-” The Declaration of the First Meeting of Equatorial Countries, also known as the Bogotá Declaration, is a declaration made and signed in 1976 by eight equatorial countries, and was an attempt to assert sovereignty over those portions of the geostationary orbit that continuously lie over the signatory nations' territory”.(Wikipedia)
- Artemis Accords-A series of non-binding agreements that happened between the USA and other nations regarding their plans to return humans to the moon by the year 2027 and expand their exploration of Mars and potentially beyond that
- Space Resource Exploration Utilization Act: “The Act is intended to promote the private exploration and utilization of space natural resources and to remove governmental barriers to the development of an economically profitable and stable space resources industry. “(Tronchetti)
- Ethical Implications: These refer to the moral consequences and considerations that arise from space colonization, including issues of resource ownership, environmental impact, fairness in the distribution of benefits and risks among different groups(Malik)

- Utilitarianism: A philosophical approach that advocates for actions maximizing overall happiness or well-being. In the context of space colonization, it questions whether colonizing other planets would truly increase net happiness without harming Earth further(Malik)
- Justice and Fairness Approach: Focuses on ensuring equitable outcomes for all affected parties in decisions regarding space colonization, addressing issues like unequal access to resources or disproportionate impacts on certain groups(Malik)
- Environmental Ethics: Concerned with the moral obligations towards non-human entities (e.g., ecosystems) potentially affected by human activities in space(Munro)
- Resource Allocation Ethics: Examining how resources extracted from other celestial bodies should be distributed fairly among nations or private entities involved in their extraction(Segobaetso and Ottawa)

## BACKGROUND ON THE ISSUE

This issue first began in 1957 following the launch of the Soviet Union satellite Sputnik and the widespread publication of pictures of the Earth that were taken from space in the 1960s. This resulted in a lot of attention from philosophers and scientists. As the issue of overpopulation continues to grow the idea of space colonisation has escalated greatly over time, inspiring more studies on its ethical implications and possibilities. This issue affects all of humanity as this raises the question about its future and how space colonisation could affect it. On a more specific level, it affects people who are astronauts and space travellers due to the decisions regarding safety and health issues that are affected due to the living conditions in space. How we approach this situation will affect future generations, both on Earth and potentially the solar system as they

will be in the time of spatial colonisation. This issue is a pressing matter and relevant to the international community as space colonisation affects the survival of the human race and international cooperation would ensure an equitable distribution of the risks and benefits.

“Making sure it's managed ethically would help guide global policies and agreements such as the ones facilitated by UNOOSA (United Nations Office for Outer Space Affairs.” (Munro)

(Brettschneider)

## CURRENT CONTEXT

The current context on this issue involves key elements such as how resources are to be managed and ownership of them. There is a growing debate among countries on how these resources are used in space and who can claim ownership of them. This includes equitable access to resources on the Moon and or Mars. Concerns about environmental contamination have also been raised about both Earth and other planets as private companies like SpaceX increase their involvement in space exploration. Human rights and selection criteria questions about who gets to participate in these activities due to the harsh conditions needed for both travellers and future generations born in colonies. Some also argue that space colonisation is needed to ensure humanity's survival and is a moral duty of humanity, while others suggest that it could perpetuate existing societal issues if not done properly. Organisations like UNCOPUOS( United Nations Committee on the Peaceful Uses of Outer Space)are working on structuring proper guidelines for lunar activities through initiatives like the Action Team of Lunar Activities Consultation.

## MAJOR COUNTRIES AND ORGANIZATION INVOLVED

- **The United States of America**-The US due to NASA has been one of the countries most involved with the issue of space colonisation and exploration. They play a significant role and have had discussion on the ethical implications such as planetary protection policies. Private companies like SpaceX, which is owned by Elon Musk generally contribute to this discussion greatly.
- **NASA**-(National Aeronautics and Space Administration). NASA is a US government agency that is responsible for science and tech related topics related to air and space
- **SpaceX**-Space Exploration Technologies is an American company owned by Elon Musk and designs and builds reusable rockets and spacecrafts.
- **UNCOPUOS**-(United Nations Committee on the Peaceful Uses of Outer Space) plays an important role in promoting peaceful use of outer space. It is the primary forum for discussing ethical and legal issues related to space activities
- **China** -China is very much involved in this topic and has even shown ambitions in space exploration and has rapidly been expanding its space programs with significant investments like landing on the far side of the moon as well as sending probes to Mars. They also participate in international forums like the United Nations committee COPUOS where ethical frameworks are discussed.
- **Russia**-Russia has established a legal framework that focuses on promoting security, and national well-being that also solves global problems. This law

emphasizes on compliance with international treaties and principles of ecological security.

- **ESA**-(European Space Agency) has been involved in evaluating the ethical implications for space through various initiatives and collaborations and has expressed a commitment to ensuring ethical implications are integrated into its decisions and programs.
- **UNOOSA**- Facilitate most international principles which guide outer space activities. They promote adherence to the 1966 Outer Space Treaty which sets principles for peaceful exploration and that outer space is free from national appropriation and claim

## TIMELINE OF KEY EVENTS

- **1967**-The Outer Space Treaty handled by UNOOSA was signed by over 100 countries. This treaty stated that outer space would never be subject to national appropriation and would be used to benefit all of humanity
- **1976**-The Bogotá Declaration which was signed by every equatorial country. This declaration was meant to challenge the dominance of geostationary orbit nations and raised important concerns about resource access in space
- **2023**-Research publications like “The Bio-ethics of Space Exploration” discussed some major ethical complications such as population ethics as well as potential life in outer space colonies
- **2025**: “The UN Working Group on Legal Aspects of Space Resource Activities released an initial draft of recommended principles for space resource activities.

These principles aim to address ethical and legal challenges in space colonization”.(Subcommittee)

- **2025 to current**-Ongoing efforts to develop more efficient launch technologies as well as reducing monetary cost of accessing orbit.

## RELEVANT UN RESOLUTIONS, TREATIES, & EVENTS

- [Agreement on the Rescue and Return of Astronauts and the Return of Objects Launched into Space](#)
- [Convention on International Liability for Damage Caused by Space Objects](#)
- [The Outer Space Treaty](#)

## PREVIOUS ATTEMPT TO SOLVE THE ISSUE

- In 1983 COMEST set up a special study on the ethical implications of exploring outer space. Its purpose was to better understand the social and ethical dimensions of scientific advancements
- In 2000 UNESCO and ESA (European Space Agency) did a joint report examining ethical issues related to the exploration of extra-atmospheric space
- In 2023 the United Kingdom introduced a draft resolution titled “Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviour”. This



resolution was aimed to prevent an arms race in outer space through responsible behaviour.

## **POSSIBLE SOLUTIONS**

- Enforce strict regulations on space exploration that apply to all member-state countries
- Establishing a review board managed by the UN that handles the ethical side of space exploration and colonisation.

## WORKS CITED

- "Artemis Accords." Wikipedia, Wikimedia Foundation, 1 Feb. 2025, [en.wikipedia.org/wiki/Artemis\\_Accords](https://en.wikipedia.org/wiki/Artemis_Accords). Accessed 19 Feb. 2025.
- "Bogota Declaration." Wikipedia, Wikimedia Foundation, 7 June. 2024, [en.wikipedia.org/wiki/Bogota\\_Declaration](https://en.wikipedia.org/wiki/Bogota_Declaration). Accessed 19 Feb. 2025.
- Brettschneider, Emily. "Exploring the Ethics of Human Space Travel: Navigating the Challenges and Implications of Missions Past, Present, and Future." *Encompass*, [https://encompass.eku.edu/cgi/viewcontent.cgi?article=2034&context=honors\\_theses](https://encompass.eku.edu/cgi/viewcontent.cgi?article=2034&context=honors_theses). Accessed 15 February 2025.
- Carlo, Zambaldo. "Guidelines for an Ethical Space Colonization." *ResearchGate*, 24 May 2024, [www.researchgate.net/publication/384865018\\_Guidelines\\_for\\_an\\_Ethical\\_Space\\_Colonization](https://www.researchgate.net/publication/384865018_Guidelines_for_an_Ethical_Space_Colonization).
- "China's Space Dream: No Limits, No End." *The Diplomat*, 20 Feb. 2025, <https://thediplomat.com/2025/02/chinas-dream-of-space-exploration-with-no-end/>.
- "China's Space Program: A 2021 Perspective." China National Space Administration, 2021, <https://www.cnsa.gov.cn/english/n6465645/n6465648/c6813088/content.html>.
- Detsis, Emmanuel. "Ethics in Space: The Case for Future Space Exploration." *PubMed*, edited by Dónal O'Mathúna and Ron Iphofen, Springer, 3 Nov. 2022, [www.ncbi.nlm.nih.gov/books/NBK589344/](https://www.ncbi.nlm.nih.gov/books/NBK589344/).

- Evans, Justin, et al. "Ethical Dilemma of Space Colonization." *Discovery Day - Prescott*, Mar. 2020,  
[commons.erau.edu/pr-discovery-day/2020/posters-and-presentations-demonstrations/44/](https://commons.erau.edu/pr-discovery-day/2020/posters-and-presentations-demonstrations/44/).
- Konrad Szocik. "Space Bioethics, Population Ethics, and Space Colonization." *Oxford University Press EBooks*, May 2023, pp. 122-C8P66,  
<https://doi.org/10.1093/oso/9780197628478.003.0008>. Accessed 22 Jan. 2024.
- Malik, Nakul. "Space Colonization and Why Humanity Is Better off Not Pursuing It - Viterbi Conversations in Ethics." *Viterbi Conversations in Ethics*, 11 Nov. 2024,  
[vce.usc.edu/featured/space-colonization-and-why-humanity-is-better-off-not-pursuing-it/](https://vce.usc.edu/featured/space-colonization-and-why-humanity-is-better-off-not-pursuing-it/).
- Munro, Daniel. "If Humanity Is to Succeed in Space, Our Ethics Must Evolve." *Centre for International Governance Innovation*, 4 Apr. 2022,  
[www.cigionline.org/articles/if-humanity-is-to-succeed-in-space-our-ethics-must-evolve/](http://www.cigionline.org/articles/if-humanity-is-to-succeed-in-space-our-ethics-must-evolve/).
- NASA. "Space Colonization - NASA." *NASA*, 27 Sept. 2023,  
[www.nasa.gov/headquarters/library/find/bibliographies/space-colonization/](http://www.nasa.gov/headquarters/library/find/bibliographies/space-colonization/).
- Orta, Anna, et al. "Ethical Implications of Space Colonization." *Young Scientists and Philosophers on the Border*, vol. 1, no. 1, 2024,  
[scholarworks.utep.edu/cgi/viewcontent.cgi?article=1003&context=border\\_sci\\_phi](https://scholarworks.utep.edu/cgi/viewcontent.cgi?article=1003&context=border_sci_phi).
- Pompidou, Alain. "The Ethics of Space Policy." *Unesco.org*, 2020,  
[unesdoc.unesco.org/ark:/48223/pf0000120681](https://unesdoc.unesco.org/ark:/48223/pf0000120681).
- Rummel, J. D., et al. "Ethical Considerations for Planetary Protection in Space Exploration: A Workshop." *Astrobiology*, vol. 12, no. 11, Nov. 2012, pp. 1017–23,  
<https://doi.org/10.1089/ast.2012.0891>.

- Rummel, John. *Some Ethical Considerations in Space Exploration: With Illustrations from Environmental Ethics*. 2017,  
[www.hbs.edu/faculty/Shared%20Documents/conferences/2017-business-and-economics-of-space/John%20Rummel.pdf](http://www.hbs.edu/faculty/Shared%20Documents/conferences/2017-business-and-economics-of-space/John%20Rummel.pdf).
- Segobaetso, Benjamin, and Canada Ottawa. *Ethical Implications of the Colonization, Privatization and Commercialization of Outer Space*. 2018,  
[ruor.uottawa.ca/server/api/core/bitstreams/07f3cb66-a895-4799-88ae-4f14ba9d253a/content](http://ruor.uottawa.ca/server/api/core/bitstreams/07f3cb66-a895-4799-88ae-4f14ba9d253a/content).
- Seylani, Allen, et al. "Ethical Considerations for the Age of Non-Governmental Space Exploration." *Nature Communications*, vol. 15, no. 1, June 2024, p. 4774,  
<https://doi.org/10.1038/s41467-023-44357-x>.
- Subcommittee, Legal. Committee on the Peaceful Uses of Outer Space Draft Report of the Chair and Vice-Chair of the Working Group on Legal Aspects of Space Resource Activities. 22 May 2024, [documents.un.org/doc/undoc/gen/v24/035/89/pdf/v2403589.pdf](https://documents.un.org/doc/undoc/gen/v24/035/89/pdf/v2403589.pdf). Accessed 24 Feb. 2025.
- The Editors of ProCon. "Space Colonization". Encyclopedia Britannica, 9 Jan. 2025,  
<https://www.britannica.com/procon/space-colonization-debate>. Accessed 15 February 2025.
- The European Space Agency. "The Ethics of Outer Space." *Esa.int*, 2025,  
[www.esa.int/Newsroom/Press\\_Releases/The\\_ethics\\_of\\_outer\\_space](http://www.esa.int/Newsroom/Press_Releases/The_ethics_of_outer_space). Accessed 16 Feb. 2025.
- Tronchetti, Fabio. "The Space Resource Exploration and Utilization Act: A Move Forward or a Step Back?" *Space Policy*, vol. 34, Nov. 2015, pp. 6–10,  
<https://doi.org/10.1016/j.spacepol.2015.08.001>.

United Nations. "Consensus Scuttled in First Committee over Two Competing Draft Resolutions on Space Security, Creating Parallel Processes, Polarization, Say Speakers | UN Press."

*Press.un.org*, 31 Oct. 2023, [press.un.org/en/2023/gadis3730.doc.htm](https://press.un.org/en/2023/gadis3730.doc.htm).

"COPUOS." *Unoosa.org*, 2019, [www.unoosa.org/oosa/en/ourwork/copuos/index.html](http://www.unoosa.org/oosa/en/ourwork/copuos/index.html).

Orta, Anna K.; Lopez, Jose; and Ontiveros, Carlos (2024) "Ethical Implications of Space Colonization," *Young Scientists and Philosophers on the Border: Vol. 1: No. 1, Article 2*.

"Outer Space Treaty." *Britannica School, Encyclopædia Britannica*, 3 Feb. 2025.

[school.eb.com/levels/high/article/Outer-Space-Treaty/332230](https://school.eb.com/levels/high/article/Outer-Space-Treaty/332230). Accessed 18 Feb. 2025.

---. "Outer Space Must Be a Place for Peace and Cooperation, Not an Arms Race, Speakers Affirm, as Fourth Committee Takes up Space Matters | UN Press." *Press.un.org*, 24 Oct. 2023, [press.un.org/en/2023/gaspd788.doc.htm](https://press.un.org/en/2023/gaspd788.doc.htm).

United Nations Office for Outer Space Affairs. "The Outer Space Treaty." *UNOOSA*, 1967, [www.unoosa.org/oosa/en/ourwork/spacelaw](http://www.unoosa.org/oosa/en/ourwork/spacelaw) United Nations Office for Outer Space Affairs . "National Space Law Collection: Russian Federation." *Www.unoosa.org*, [www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/russian\\_federation/decrees\\_5663-1\\_E.html](http://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/russian_federation/decrees/5663-1_E.html)./treaties/introouterspacetreaty.html.

Wikipedia Contributors. "Space Colonization." *Wikipedia*, Wikimedia Foundation, 22 Apr. 2019, [en.wikipedia.org/wiki/Space\\_colonization](https://en.wikipedia.org/wiki/Space_colonization).

