

Space Exploration Should be Emphasized Over Earth

Ganesh Paudel

Marshall University

ENG 101

Patnaik Sumeeta

18 November 2024

Space Exploration Should be Emphasized Over Earth

Imagine a world where Earth's resources are stretched to their limits, where our planet struggles under the weight of rising temperatures, dwindling biodiversity, and environmental degradation. The challenges we face—climate change, natural disasters, and the fragility of our ecosystems—paint an uncertain picture of our future. As the Earth struggles to sustain its growing population, humanity is left vulnerable to threats both within and beyond our planet. Amid these challenges, space exploration offers a beacon of hope—a pathway to solutions that not only address our terrestrial struggles but also secure our survival against existential threats. Yet, the question remains: Should we invest in space exploration when Earth itself seems to be at a breaking point? The answer is we must. Space exploration is not a distraction from Earth's challenges but a critical investment in addressing them. By expanding out from earth, we can secure us from any existential threats, stimulate economic growth, technological innovation, and safeguard our planet and future.

Existential Threats

One of the most compelling arguments for Space exploration is its role in addressing existential threats. Humanity faces numerous dangers, both natural and extraterrestrial. Climate change, for example, has already raised atmospheric carbon dioxide levels by 50% in just under 200 years, while Earth's surface temperature reached its highest ever recorded level in 2023 (NASA, n.d., Climate Change). Space research provides tools for combating these challenges. Satellites track greenhouse gas emissions, monitor global temperatures, and even offer early warnings for natural disasters like hurricanes and earthquakes (ESA, n.d.). Similarly, space exploration has equipped us to defend against extraterrestrial threats. NASA's Double Asteroid Redirection Test (DART) successfully redirected an asteroid, proving that we have the capability to prevent catastrophic impacts (Bullseye! NASA's DART Mission, n.d.). Without continued public funding, the development of such life-saving technologies would stall, leaving Earth vulnerable to unforeseen disasters.

Economic Impact – The Apollo Program and Modern Challenges

NASA's 2023 budget of \$25.4 billion generated \$76 billion for the U.S. economy, demonstrating an impressive return on investment (Jones, 2024). However, the less investment in the past has led to halt the technologically. For example: The Apollo program exemplifies how space exploration can achieve extraordinary feats. Between 1969 and 1972, six successful moon landings showcased not only the technological prowess of the United States but also its ability to lead the world in innovation. However, following the Apollo 17 mission in 1972, lunar exploration came to a standstill. As Jeffrey Kluger: member of NASA's research and communication team, (2023) explains, this abrupt halt was primarily due to dwindling public interest, shifting political priorities, and significant funding cuts. While Apollo had once been a national priority during the Cold War, subsequent missions were repeatedly postponed as budgets were redirected to other areas. Compounding this stagnation, technological advancements did not progress at the same pace, further delaying humanity's return to the moon. Kluger notes, "For decades, lunar exploration took a backseat, and the Apollo era's momentum was lost as funding dried up and missions were shelved" (Kluger, 2023).

This historical example highlights how the lack of consistent funding can derail progress. The prolonged gap in lunar missions serves as a stark reminder of the importance of sustained public investment in space exploration to ensure economic and technological growth.

Technological Advancements

Space exploration has been a wellspring of technological innovation, benefiting humanity in ways far beyond its original intent. Everyday technologies like GPS, satellite communication, and MRI scanners were born out of space research. NASA's eye-tracking technology, developed for astronauts, now helps individuals with disabilities communicate more effectively (NASA, n.d., Seeing is Communicating).

The Veggie Vegetable Production System aboard the International Space Station (ISS) is another remarkable example. Designed to grow food in space, it has profound implications for addressing food security challenges on Earth. By developing sustainable agricultural methods for space missions, scientists are uncovering solutions for food production in resource-scarce regions (Massa et al., 2021). These advancements highlight how space research leads to transformative technologies that improve lives worldwide.

Safeguarding the Planet

Space technology is instrumental in protecting our planet and its inhabitants. Earth-observing satellites provide critical data on deforestation, rising sea levels, and global temperatures, enabling policymakers to make informed decisions to combat climate change (ESA, n.d.). In disaster response, space-based tools offer real-time data that helps coordinate relief efforts during crises like wildfires, earthquakes,

and hurricanes (UNOOSA, 2024). Without these technologies, the ability to respond effectively to natural disasters would be significantly diminished. It safeguards humanity's future against environmental and extraterrestrial threats.

Conclusion and Final Thoughts

In conclusion, Space exploration is not just an investment in science—it is an investment in the future of humanity. It drives innovation, fuels economic growth, and protects against existential threats. The benefits of space exploration are not abstract; they are tangible, shaping our lives and securing a safer, more advanced future for all. I urge you to support policies and initiatives that promote public investment and focus in space exploration. Let us not limit our potential by neglecting the opportunities above us. Instead, let us continue to reach for the stars, ensuring that humanity thrives both on Earth and beyond.

SPACE EXPLORATION OVER EARTH

References:

- *Bullseye! NASA's Dart Mission Impacts Asteroid Target in world first.* Johns Hopkins University Applied Physics Laboratory. (n.d.). <https://www.jhuapl.edu/news/news-releases/220926-nasa-dart-mission-strikes-asteroid-target>
- Jones, A. (2024, October 28). *NASA generated \$76 billion for US economy in 2023, report says.* Space.com. <https://www.space.com/nasa-economic-impact-us-2023-report>
- NASA. (n.d.). *Climate change - NASA science.* NASA. <https://science.nasa.gov/climate-change/>
- NASA. (n.d.). *Seeing is communicating.* NASA. https://spinoff.nasa.gov/Seeing_Is_Communicating
- *Earth observation.* ESA. (n.d.). https://www.esa.int/About_Us/Earth_observation
- National Aeronautics and Space Administration (NASA). (2023). *The Benefits of the International Space Station (ISS) for Humanity.* https://www.nasa.gov/mission_pages/station/research/benefits/index.html
- United Nations Office for Outer Space Affairs (UNOOSA). (2024). *Space Technologies for Sustainable Development.* <https://www.unoosa.org/oosa/en/benefits-of-space/benefits.html>
- Kluger, J. (2023, September 27). *Why Is It So Much Harder for NASA to Send People to the Moon Now Than It Was During the Apollo Era?* Scientific American. <https://www.scientificamerican.com/article/why-is-it-so-much-harder-for-nasa-to-send-people-to-the-moon-now-than-it-was-during-the-apollo-era/>
- NASA. "NASA Achieves Water Recovery Milestone on International Space Station." NASA, 2024. <https://www.nasa.gov/missions/station/iss-research/nasa-achieves-water-recovery-milestone-on-international-space-station/>
- Massa, Gioia, et al. "Testing of the Veggie Vegetable Production System on the International Space Station." 43rd COSPAR Scientific Assembly, 2021.
- NASA. (2021). FY 2021 Economic Impact Report https://www.nasa.gov/wp-content/uploads/2022/10/nasa_fy21_economic_impact_report_brochure.pdf