



Position Paper

National Space Society Position on Potential NASA Science Budget Cuts

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Space Science as a Driver of U.S. Leadership and Economic Growth

NASA's science program and missions are an integral part of American global leadership and prowess. The National Space Society (NSS) urges Congress to take a strategic approach to NASA's Science Mission Directorate (SMD) budget. While budgetary discipline is necessary, drastic cuts to space science funding would undermine America's leadership in space exploration and jeopardize the burgeoning space-based economy.

While NSS does not support drastic reductions in NASA's science budget, we recognize the need for cost-effective investments that maximize scientific, educational, and economic returns. With this in mind, we urge Congress to adopt a strategic approach that protects the most critical and promising scientific programs and missions while ensuring fiscal responsibility. NASA's science initiatives extend far beyond exploration—they serve as powerful Science, Technology, Engineering and Math (STEM) education inspirations and economic engines that drive technological innovation, expand commercial opportunities, and solidify U.S. leadership in the global space economy. Any adjustments to NASA's science budget should support high-impact investments that sustain America's competitive advantage in space exploration and development. Congress must ensure that NASA's science funding remains a cornerstone of U.S. space, educational, and economic policy, fostering long-term growth in America's STEM workforce and commercial space sector and securing the nation's leadership in space exploration and development.

We highlight the following key points for consideration:

1. Space Science is Fundamental to the Space Economy

- NASA’s scientific research directly fuels commercial space enterprises. Private sector companies—including those engaged in space tourism, space resource prospecting and mining, and satellite development—rely on NASA’s scientific missions to provide foundational knowledge and reduce risk for sustainable commercial development and expansion.
- The growth of private space missions, in-space manufacturing, deep-space exploration, and the establishment of private orbital space stations and future lunar and Mars bases and settlements is being enabled by NASA’s continued investment in planetary science, heliophysics, and astrophysics.

2. U.S. Space Leadership and Global Competitiveness are at Stake

- China has announced an aggressive science-driven space exploration program, including China-led international lunar bases, planetary missions, and a growing low-Earth orbit (LEO) orbital infrastructure with space stations. A significant reduction in NASA’s science budget risks ceding U.S. leadership to China. China is, for example, moving forward with a Mars Sample Return (MSR) science mission while the U.S. has paused its own MSR effort. NSS acknowledges that the US-led MSR mission as recently presented is insufficiently compelling, both scientifically and technologically, given its estimated cost of \$7B-\$11B and its implementation timeline of close to a decade. However, MSR should remain a high priority scientific and technological milestone in the context of implementation via U.S. missions to land humans on Mars.
- Failure to invest in space science now will have long-term consequences for America’s STEM educational, technological and economic leadership in the coming decades.

3. Prioritizing Key Scientific Areas to Maximize Return on Investment

NSS supports a targeted approach to protecting NASA’s most valuable scientific programs:

A. Space-Based Astronomy and Astrophysics (Essential for Space Leadership & National Interest)

- Space-based telescopes and research in astronomy and astrophysics drive the innovation cycle—developments in optical systems, imaging, and sensor technology developed for astrophysics often lead to commercial and military applications.
- The search for exoplanets and life in the universe continues to capture the public’s imagination and continues to drive STEM education growth and public and private sector interest in space exploration, development, and settlement.

- NSS has endorsed expanded funding for space-based astronomy, which is the greatest part of the NASA astrophysics budget.¹ We recommend not cutting the space-based astrophysics and astronomy budget.
- The National Academies' Astronomy and Astrophysics decadal surveys have served NASA well in identifying priorities for astronomy and astrophysics² and should continue to be a basis for NASA science research and planning.
- Congress should fully protect the astronomy and astrophysics budget to ensure continued leadership in this field.

B. Heliophysics and Space Weather Research (Critical for Infrastructure Protection and Space Expansion)

- The economic risks of solar storms are growing with increased use of vulnerable electronic technology—the power grid, communications networks, and GPS systems are vulnerable to space weather events.
- The booming satellite and space commerce industry requires accurate space weather forecasting to avoid catastrophic failures.
- The National Academies' Heliophysics Decadal Survey³ has served NASA well in setting priorities for heliophysics and should continue to be a basis for NASA science research and planning.
- Congress should fully fund NASA's heliophysics research to protect national security and commercial space investments.

C. Planetary Defense (A National Security and Economic Imperative)

- Planetary defense against the potentially devastating impacts of asteroids and comets on our planet is not just a scientific concern; it is a national security issue. Polling shows that Americans overwhelmingly support funding for Near-Earth Object (NEO) tracking and asteroid and comet impact mitigation.⁴
- The NEO Surveyor mission is a cost-effective and essential program that not only protects Earth but identifies resources that could be commercially valuable in asteroid mining ventures. It is vital that it stay on schedule for a 2027 launch.
- Congress should not reduce NASA's planetary defense budget. Rather, they should consider it one of the top priorities in NASA's science budget.

D. Balancing Cost and Sustainability in Planetary Exploration

- As planetary exploration missions increase in complexity (flybys → orbiters → landers → rovers → sample returns), costs rise significantly. To sustain planetary science and exploration, Congress should prioritize:
 - Complete currently in-progress outer solar system planetary missions while focusing research on low-cost, fast-transfer, next-generation technologies and strategies.
 - Leverage commercial partnerships to drive down costs for Moon, Mars and asteroid exploration, using lessons learned from programs like NASA's Commercial Orbital Transportation Services/Commercial Resupply Services, (COTS/CRS) and NASA's Commercial Lunar Payload Services (CLPS), which enable affordable planetary science. We should regard recent initial failures in some of the CLPS Moon landing missions as necessary initial risks and growing pains, not as a fundamental flaw in strategy.
 - Focus new planetary science efforts on the Moon, Mars, and asteroids, prioritizing research that could be impacted by upcoming human exploration and commercial development—ensuring that key scientific objectives are achieved before significant human presence and industrial activities begin.
 - Focus on large numbers of well-tested identical or very similar probes aimed at a variety of targets on the Moon, Mars, and the asteroids; we should reduce or even eliminate the number of “flagship” missions with multi-billion-dollar costs. NASA's Mars helicopter and rotorcraft program, however, should continue to be supported, as they will dramatically expand both Mars mission exploration range and speed and enable human landing site scouting. NSS also supports the prioritization of a detailed water mapping mission on Mars that can identify where Americans should land to extract water for rocket fuel production.
 - The U.S. has made clear its goal to return, this time to stay, to the Moon and to forge onward to Mars. By establishing permanent bases on the Moon and Mars with reusable infrastructure, as opposed to landings at different locations with no on-going infrastructure, the associated incremental operational costs will be reduced. This makes long-term scientific research on the Moon and Mars more financially sustainable. Permanent bases will allow scientists to explore and study different planetary regions and features over an extended period using surface mobility options. Human scientists will work on the surface using standard scientific equipment as opposed to extremely expensive one-of-a-kind robotic systems that operate under the control of operators on the Earth, allowing for more precise experimentation and the ability to adapt to unexpected findings in real time. This synergy boosts the efficiency and outcomes of research.

- Recent National Academies' Planetary Sciences and Astrobiology decadal surveys⁵ are not in alignment with the above priorities and goals as they are premised on a different strategic direction assuming and emphasizing only robotic missions. While the National Academies' Planetary Science and Astrobiology Decadal Survey has guided past mission planning, its emphasis on robotic-only exploration is no longer aligned with current U.S. goals. With the return to the Moon and the path to Mars now clearly focused on sustained human presence and commercial development, NSS recommends that Congress support the creation of a new or supplemental decadal effort aligned with the strategy NSS recommends.

A Strategic Approach to NASA Science Funding

As noted, the National Space Society does not support drastic reductions in NASA's science budget. We strongly urge Congress to adopt a strategic approach that protects key scientific investments in astronomy, astrophysics, heliophysics and space physics, planetary defense, and astrobiology, while optimizing costs by making strategic choices in planetary science aligned with the nation's near term space exploration plans for the Moon, Mars, and asteroids.

NSS remains available to further advise the U.S. government on the formulation of an optimal strategy that would help reduce NASA's costs where necessary, and identify programs and missions to imperatively preserve or expand.

¹ <https://nss.org/wp-content/uploads/NSS-Position-Paper-Long-Term-Astronomy-Strategy.pdf>

² <https://nap.nationalacademies.org/catalog/26141/pathways-to-discovery-in-astronomy-and-astrophysics-for-the-2020s>

³ <https://science.nasa.gov/heliophysics/heliophysics-decadal-survey/>

⁴ <https://www.pewresearch.org/science/2023/07/20/americans-views-of-space-u-s-role-nasa-priorities-and-impact-of-private-companies/>

⁵ <https://nap.nationalacademies.org/catalog/26522/origins-worlds-and-life-a-decadal-strategy-for-planetary-science>