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Enabling Astronomy and Planetary Science through Policy

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With the space policy world focused on emerging commercial and international space actors, let's not overlook planetary science and astronomy missions. For those passionate about scientific exploration, this post is for you.

Pitching astronomy and planetary science

Many of us have a curiosity for the universe: enough to motivate us to support scientific space missions. However, not everyone shares that perspective. Here are three other reasons to support planetary science and astronomy missions:

- (1) Research and development (R&D) produces new technologies, and in turn supports the commercial industry and military capabilities. R&D may not have a rapid and obvious financial return, requiring federal institutions to fund it. For some examples of space technologies that are now being used in other ways, visit [NASA Spinoff](#).
- (2) National leadership is an excellent motivator for supporting science missions. By constantly pushing the boundaries of technology and exploration, and by leading international collaborations to do so, NASA missions put the United States in a position of influence.
- (3) Space missions and associated educational programs provide inspiring opportunities for the next generation. NASA's [STEM Engagement](#) page, for example, shares education resources and student opportunities.

NASA's budget

NASA's structure and budget can be confusing, with multiple [directorates](#) dedicated to different activities. For enabling astronomy and planetary science missions, we focus on the Science Mission Directorate (SMD); however, science is central throughout NASA's other programs as well. NASA receives approximately \$25 billion/year. That may sound like a lot, but this is only 0.5% of federal spending. Of that 0.5%, roughly 30% goes to SMD, or \$7.5 billion. The [Planetary Society](#) does a good job summarizing how this money is broken down each year. For some, space exploration seems a waste of money in light of the crises we face here on Earth (an understandable perspective), but cutting funding for space science would be a small drop in the bucket (and NASA's SMD includes Earth science programs, too!).

Does the growing commercial space industry benefit astronomy and planetary science?

There are pros and cons to the expanding commercial space industry. Decreasing launch costs can somewhat reduce the overall cost of a mission. The increasing frequency of launches expands access to orbital experiments and may enable large structures, such as massive space telescopes, to be constructed from pieces launched separately. The science world can get more



creative about what to do with added launch capabilities. With private space actors providing access to Low Earth Orbit (LEO), NASA may be freed up to focus on space beyond LEO. However, increasing commercial launches also mean large numbers of satellites cluttering the night sky. This clutter corrupts ground-based telescope observations and makes space traffic management more challenging. Commercial space can benefit science, but it *must* be mindful of how much is launched into Earth's orbit and proactive about solving space traffic.

How does the Artemis program benefit astronomy and planetary science?

Motivations for the [Artemis](#) lunar exploration program are not purely scientific – the economic benefits and positioning of the US as a leader in space are significant. For that reason, Artemis is particularly compelling to many policymakers. But what does it do for science (other than plentiful lunar science, of course!)? Artemis is a method for proving that space infrastructure beyond LEO is possible. With the development of new technologies, it may become more feasible to construct large structures, service space-based instruments, and conduct further experiments. One perspective is that a politically and economically motivated Artemis program aimed at human presence on the Moon is not an efficient use of funds for answering big science questions. However, there may still be long-term benefits for non-lunar scientists.

What now?

You can all advocate for NASA and for science! Anyone can contact the offices of congressional representatives and show their support for science. With a little persistence, you are likely to be given a short meeting/call with the offices of representatives from your own state/district. These resources may also be useful:

- The Planetary Society's [Space Advocacy 101](#)
- [Find your representative](#)



Author Bio Lindsey Wisler is an astrophysics Ph.D. candidate at Arizona State University and Lead of the US Task Force. Her scientific research focuses on characterizing exoplanet atmospheres with space telescopes, including JWST, Hubble, and Spitzer. She aims to combine her backgrounds in science, policy, and engineering, for science mission development.