Revolutionary Research & Results

The Heliophysics community is preparing to kick off its next Decadal Survey. Seed funding in FY23 is required to prepare the community to address the highest priority open science questions and implement the bold, new mission required to answer them.

Peer-reviewed awards, for CubeSats, sounding rockets, and research and analysis are all based on the scientific merit and breadth of impact of proposed research. Such funding supports early career development, IDEA initiatives, and basic research that expands our understanding and maximizes the scientific return of missions.

Maintaining the Decadal-recommended schedule for implementing Decadal-priority large-scale missions including IMAP, GDC, and DYNAMIC is critical to advancing our understanding of how the Sun interacts with near-Earth space. Funding is required to support a 2027 launch for the GDC mission and enable a new start for DYNAMIC.

There is a need for investment to **develop enabling technology for high-priority bold Decadal missions** as well as to **formulate concepts for new dedicated space weather missions and instruments** to help fill critical observational gaps.

To ensure U.S. preeminence in progress & innovation, we ask that Congress fund sustained, robust growth for science agencies, including the NASA Science Mission Directorate and NSF. These agencies fund students and researchers in all 50 states across academic, industry, government, and nonprofit sectors.

AAS and AGU request FY23 funding that will allow NASA & NSF to support balanced, coordinated, and world-leading heliophysics programs that advance top scientific and technological priorities.

Account	FY22 Omnibus	FY23 PBR	FY23 AAS/AGU Ask
NASA	24.0	26.0	--
-SMD	7.61	7.99	9.00
--Heliophysics	0.778	0.760	0.935
NSF	8.84	10.50	11.00

All values are given in billions of USD.

Credit: Time Magazine

The 2017 total solar eclipse across the U.S. offered a rare opportunity for science and STEM outreach. Another eclipse in April 2024 offers a chance to recreate that experience.

Credit: NASA

Heliophysics

Space is not empty, but filled with a diffuse sea of charged particles and electromagnetic fields that flow between and interact with the Sun and the planets and their atmospheres. Understanding these plasmas and how they originate, evolve, and interact is relevant to all aspects of space science as well as laboratory plasma physics on Earth.

Heliophysics is a fundamental science discipline that studies the very nature of plasmas throughout space, originating with our own Sun and solar wind and extending to planetary atmospheres and magnetospheres, stellar atmospheres and astrospheres, and interstellar space.

Enabling Human Exploration

As humanity seeks to explore beyond Earth, both robotically and in-person, it is critical that we understand the space environment into which we venture. Learning more about the Sun, interplanetary and interstellar space, and the near-space environments around the planets before we venture there is the same as early explorers understanding weather before setting sail on the open seas.

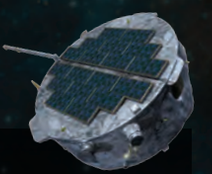
Space Weather

Heliophysics is also unique in that it has practical relevance for humanity. Solar activity and resulting geospace responses can have extreme effects on our technological systems - e.g., satellites (GPS), the power grid, aviation, communications - with potentially significant societal, economic, and national security ramifications.

Parker Solar Probe: NASA's most recent major Heliophysics mission has smashed records as the closest human-made object to the Sun and has already revealed answers to major outstanding questions about the solar wind.
(Operating since 2018)

Voyager: The Voyager spacecraft have given us our first glimpses of the interaction of the Sun with the rest of the galaxy and whetting our appetites for future exploration.
(Operating since 1977)

HERMES: An instrument package funded for the Lunar Gateway platform as part of the Heliophysics Living With a Star (LWS) Program to help better undersand the lunar radiation environment before astronauts land.
(In development, launch expected in 2023)



IMAP: NASA's next Solar Terrestrial Probes Program mission will investigate particle acceleration in the solar wind while also mapping the boundary where the solar wind meets the local interstellar medium.
(In development, launch expected in 2025)

PUNCH & TRACERS: These two upcoming Small Explorer missions will respectively investigate the dynamics of magnetic reconnection and how the upper atmosphere of the Sun converts into the solar wind.
(In development, launches expected in 2023 and 2024, respectively)

***Artist's impression**

GDC: The next planned Living With a Star Program mission is a multi-spacecraft global LEO constellation that will look at the coupling between the Earth's magnetosphere and upper atmosphere.
(In development, launch no earlier than 2027)