



National Aeronautics and
Space Administration

2026 NASA SCIENCE

2026 National Science Foundation Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop

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June 23, 2026



Agenda

- 01** **HELIOPHYSICS UPDATES**
2025 Recap & 2026 Updates
- 02** **HELIOPHYSICS VISION**
- 03** **SPACE WEATHER**
Vision, Goals & Strategy
- 04** **RESEARCH REALIGNMENT**
Science Goals & Strategy
- 05** **ANNOUNCEMENTS & RESOURCES**



SCIENCE MISSION DIRECTORATE
HELIOPHYSICS DIVISION LEADERSHIP

National Aeronautics and
Space Administration



DR. JOSEPH (JOE) WESTLAKE
Division Director



NICOLE (NICKI) RAYL
Deputy Division Director



DR. ASAL NASERI
Associate Flight Director (Acting)



DR. THERESE MORETTO JORGENSEN
Research Program Director



JAMIE FAVORS
Space Weather Program Director

HPD 2025 RECAP

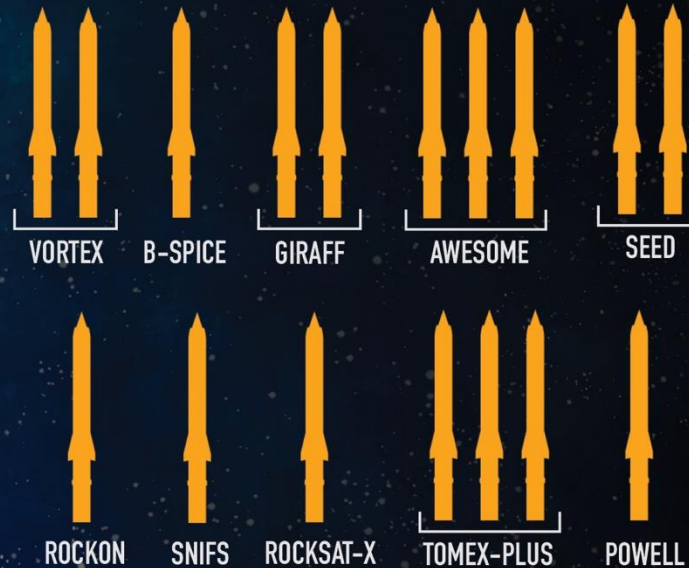


HELIOPHYSICS 2025

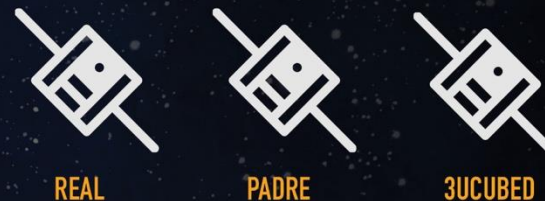
7 MISSIONS LAUNCHED
13 SPACECRAFT + 1 INSTRUMENT



10 SOUNDING ROCKET CAMPAIGNS WITH 17 ROCKETS

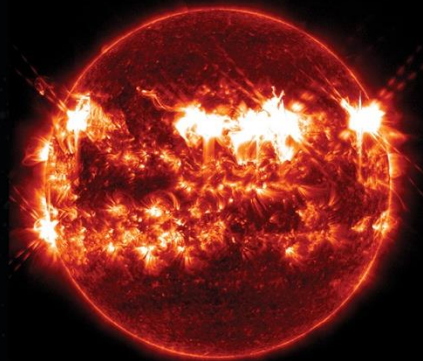


3 CUBESATS DEPLOYED

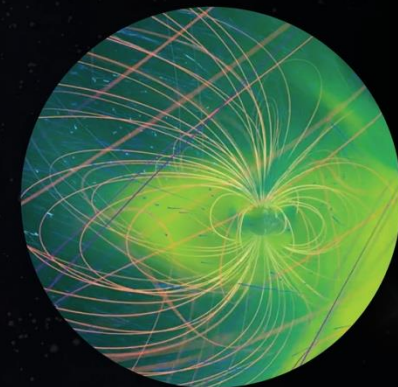


415 SOLAR FLARES
INCLUDING **17 X-CLASS**
FLARES AS OF DEC 8

A blended
composite image
of all six X-class
flares from
November 2025

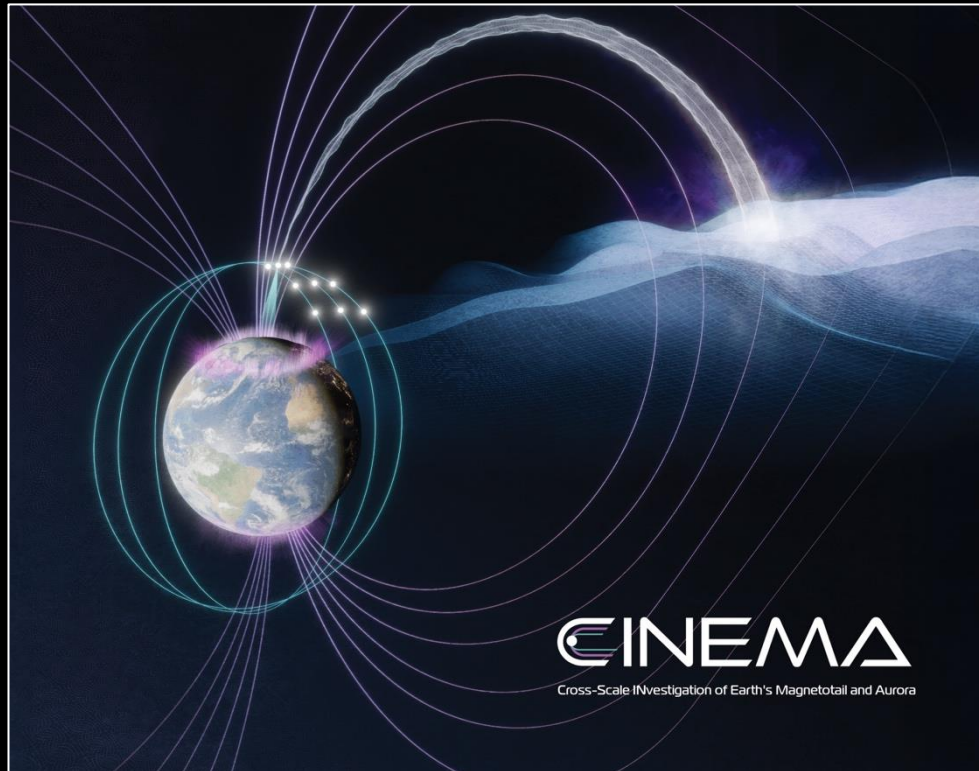


22 GEOMAGNETIC STORMS



The most powerful
geomagnetic
storm of the
year was a G4
recorded on
November 12

Small Explorer (SMEX) Selections



Advanced to Phase B
Flight Design and Mission Operations



Extended Phase A Study
Mission Design Refinement

Heliophysics Is a Word

Dictionary

Definition

Word History

Entries Near

Related Articles

Show More ▾

Save Word 📌+

heliophysics

noun, plural in form but singular or plural in construction

he·lio·phys·ics (hē-lē-ə-ˈfi-ziks)

: a branch of [astrophysics](#) that deals primarily with the behavior of the sun and its effects on other celestial bodies in the solar system

... in *heliophysics*, ongoing and future studies are exploring the floods of charged particles emanating from the Sun.

— Alexandra Witze

Despite plenty of advances in *heliophysics* and atmospheric science, much about the northern lights remains a mystery.

— Daisy Dobrijevic and Stephanie Waldek

Using a free app ... citizen scientists can help advance *heliophysics* research by capturing as many images of the Sun as possible just before and after the solar eclipse.

— Sharmila Kuthunur

Merriam-Webster®

HPD 2026 UPDATES



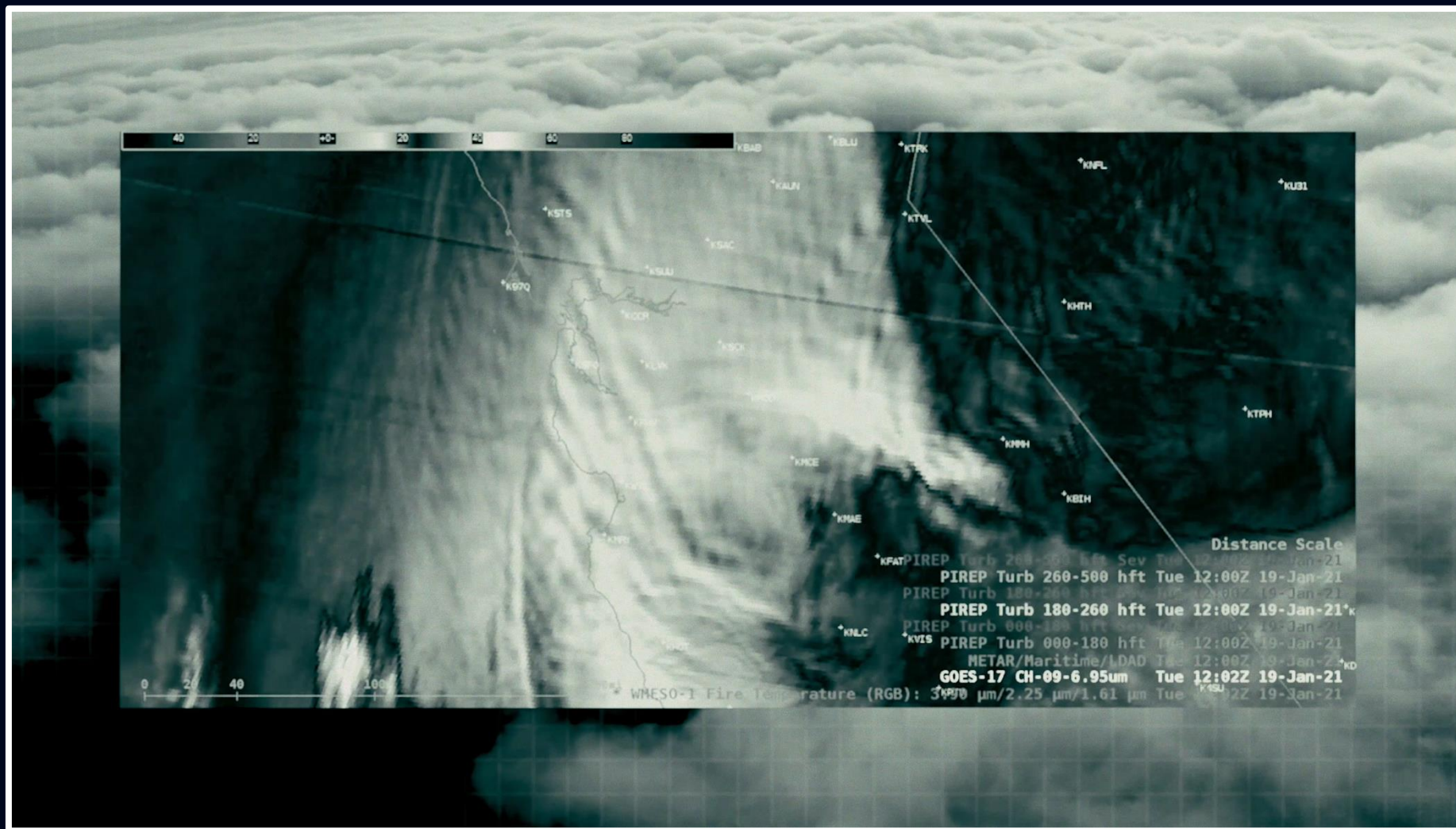
A BADASS Sounding Rocket Launch





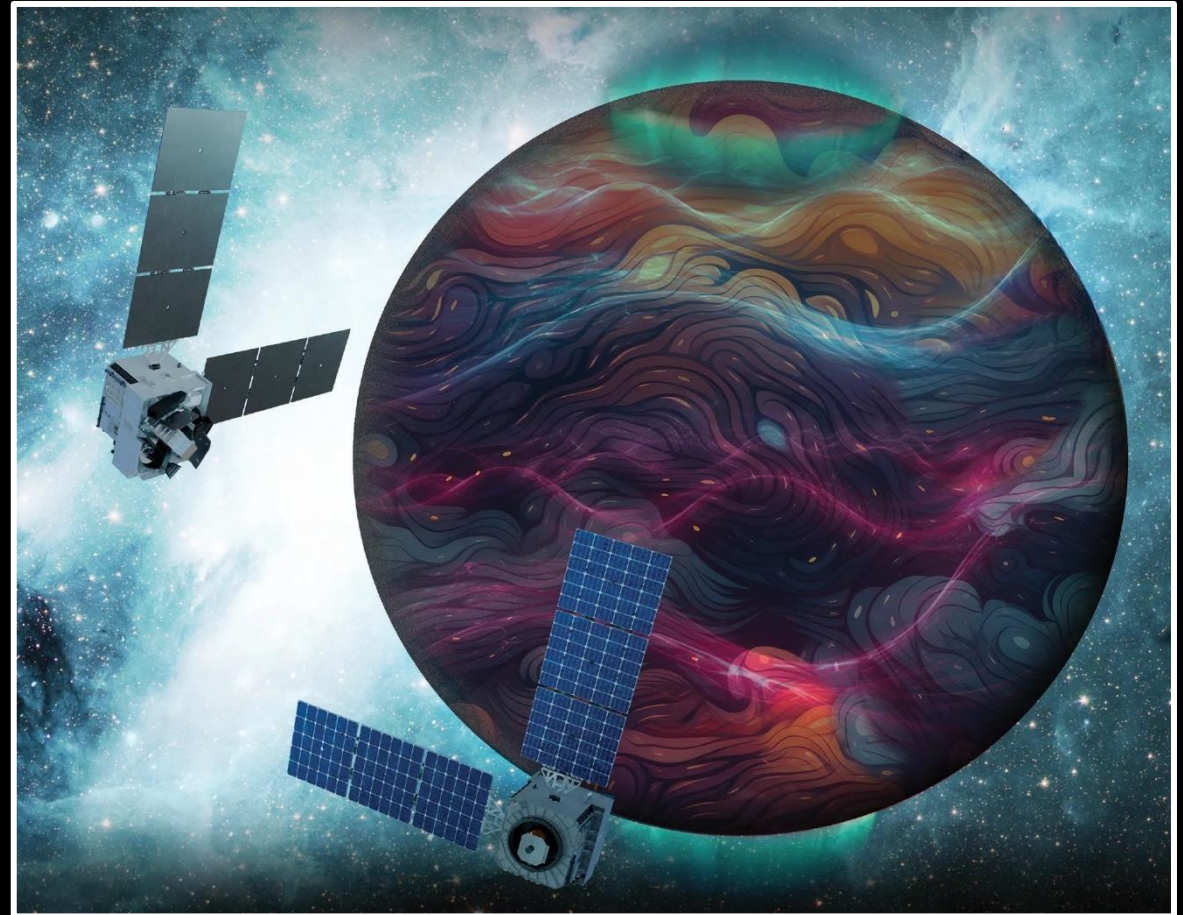
Launching Dreams

What An AWESome Journey



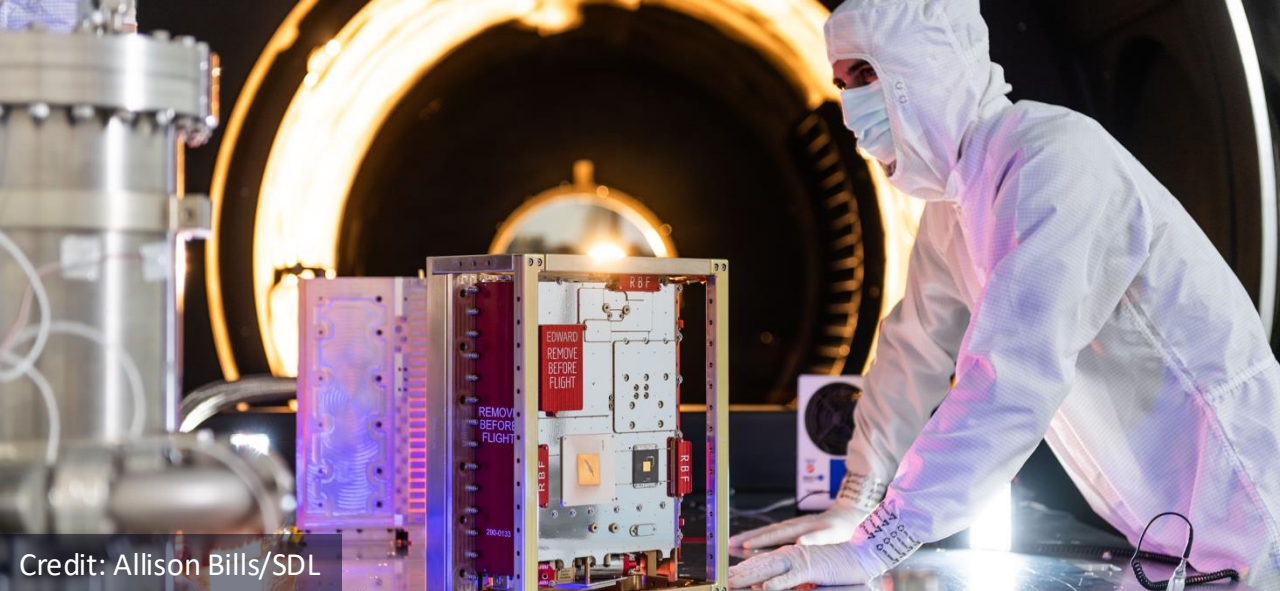
DAPHNE Mission Concept

- Low-risk high-return mission concept that will provide coordinated, multi-point measurements of neutral winds, temperature, and composition in the thermosphere.
- Identical twin satellites will study how changes in Earth's lower atmosphere influence our planet's upper atmosphere, where space weather is manifested.
- Fundamental observations and physical insights from DAPHNE will incorporate lower-atmospheric energy data to advance space weather predictive capabilities.

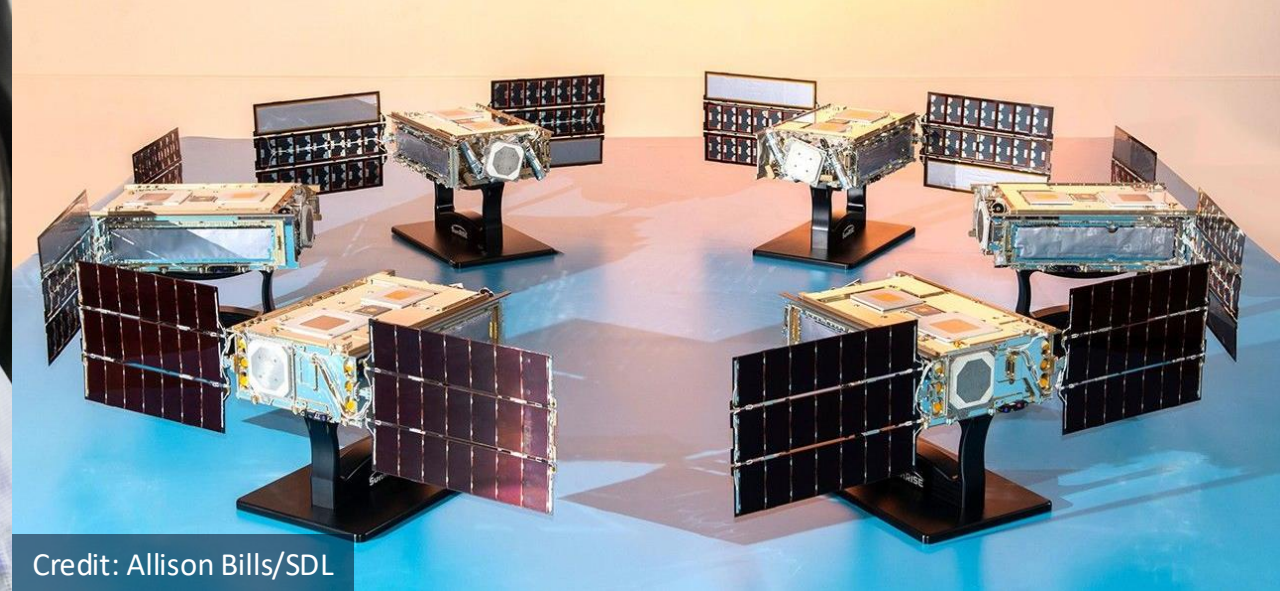


UP NEXT





Credit: Allison Bills/SDL



Credit: Allison Bills/SDL

Mission Description

- Six toaster-sized CubeSats will observe solar radio wavelengths invisible from Earth.
- The spacecraft will orbit within 6 miles of each other above Earth's atmosphere and will function as a single-aperture radio telescope.



SUNRISE

SUN RADIO INTERFEROMETER SPACE EXPERIMENT

Mission Highlights

- SunRISE will provide insight into how space weather and geomagnetic storms are generated.
- The mission will help improve future forecasting capabilities and help protect astronauts and space assets.

HELIOPHYSICS VISION



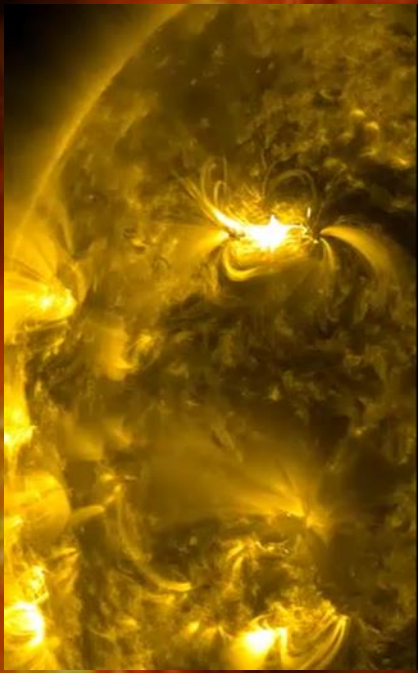
Science is our Foundation. Society is our Customer.



A Strategic Flight Portfolio

Space Weather

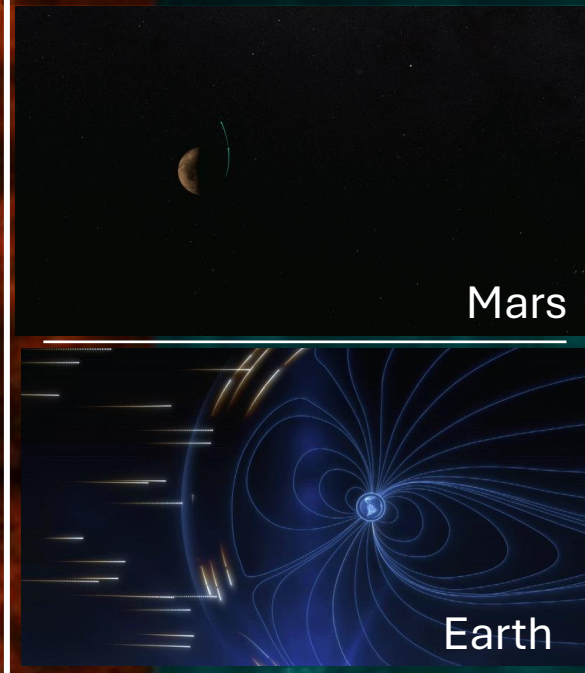
Solar Activity



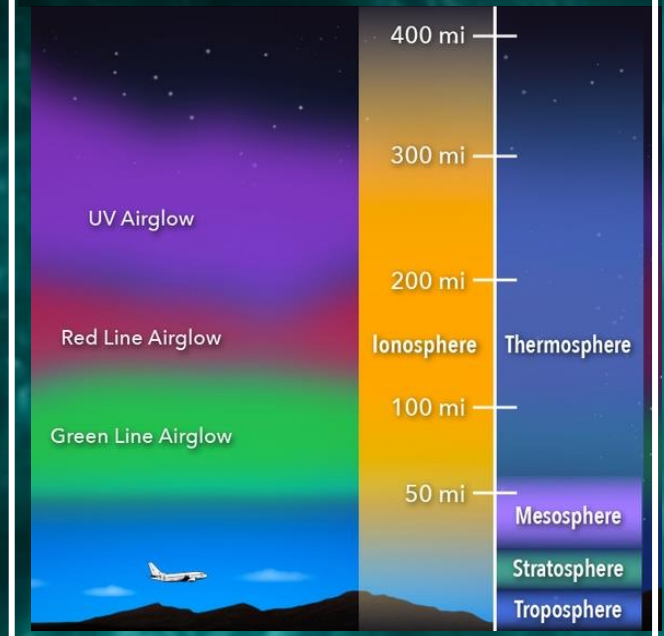
Heliosphere



Magnetospheres



Ionosphere, Thermosphere, Mesosphere (ITM)



Operating Missions



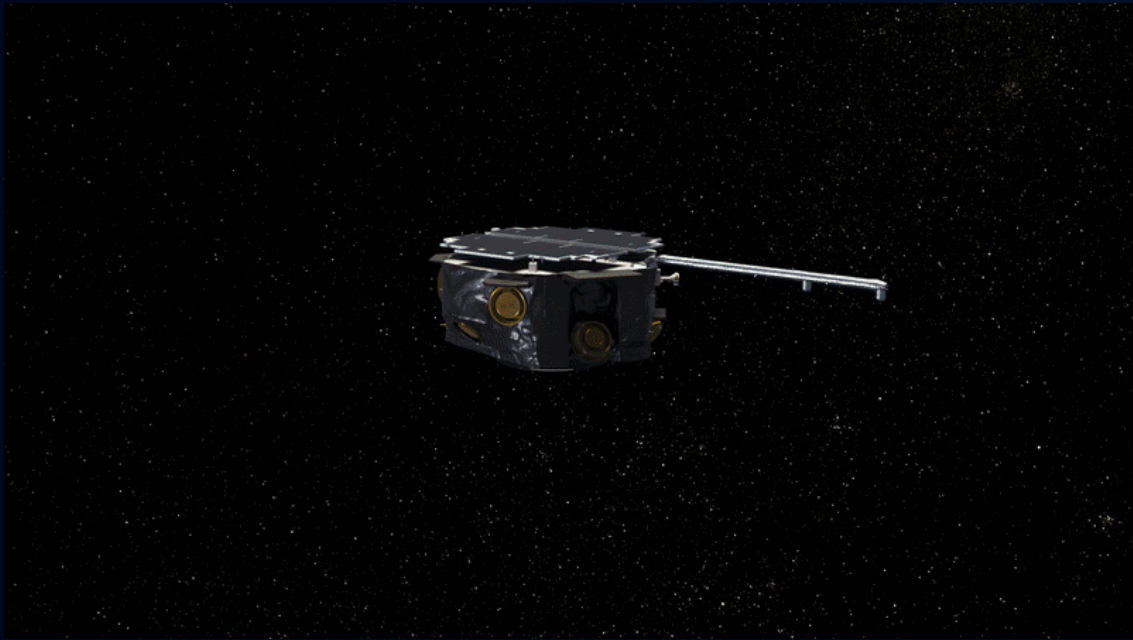
Time-lapse video of IMA
instrument integration

Missions In Development

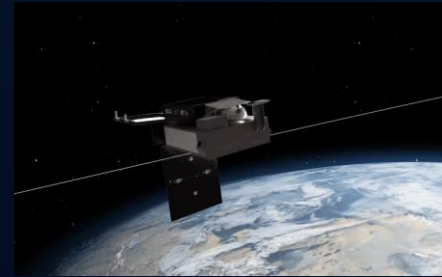


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Science Missions & User Benefit



IMAP



PUNCH



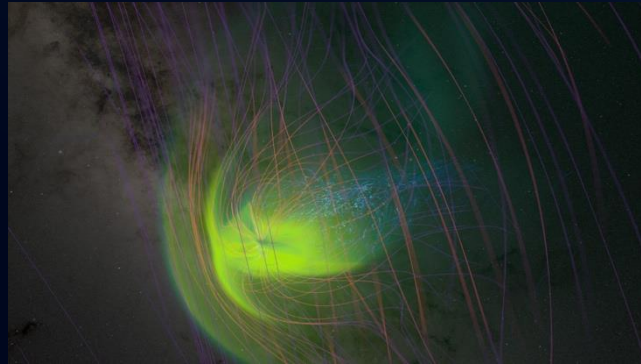
Space Weather for Astronauts

A diversified toolkit to ensure crew safety in space



MODELING

Using decades of data from dozens of missions, space weather models provide a pathway to predict how solar events could impact Earth or astronauts traveling in space.

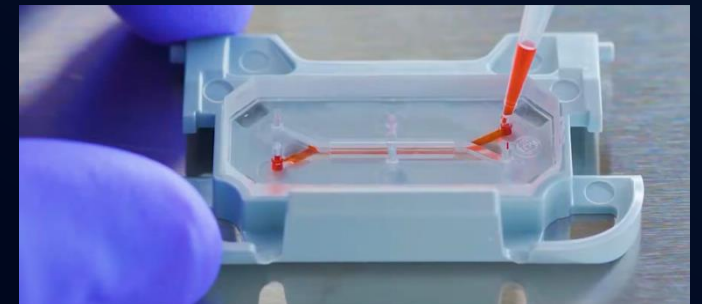
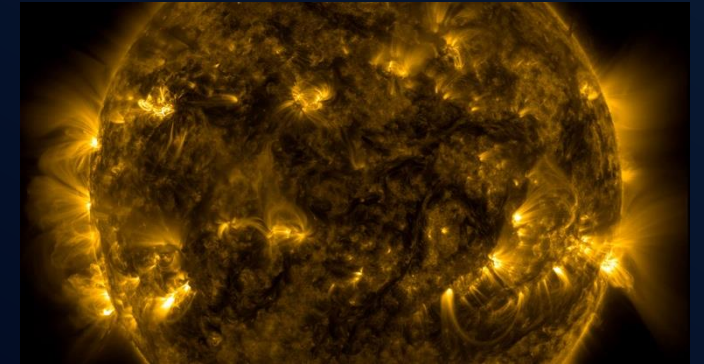


IN-SITU MONITORING

Monitoring active dosimeters aboard the International Space Station and Orion + AVATAR tissue chips on Artemis II.

PREDICTION

Leveraging models, real- and near-time data from missions like the Solar Dynamics Observatory and Interstellar Mapping and Acceleration Probe (IMAP).





The NASA Artemis II crew had a very eventful April 6. After breaking Apollo 13's record for the farthest distance humans have ever been from Earth, the crew captured this beautiful eclipse photo.

RESEARCH PROGRAM



HELIOPHYSICS RESEARCH BY THE NUMBERS

For NASA's ROSES 2024, Heliophysics Research and Analysis participated in 17 Program Elements that solicited proposals during the period February 2024 through April 2025.

879

PROPOSALS
SUBMITTED



SELECTION
RATE
16%

PROPOSALS
SELECTED

138



UNIVERSITIES • 76 SELECTIONS 67%



NONPROFIT • 15 SELECTIONS 13%



NASA • 10 SELECTIONS 9%



OTHER GOVERNMENT • 8 SELECTIONS 7%

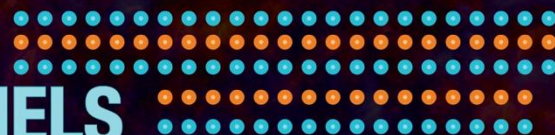


FOR PROFIT • 5 SELECTIONS 4%

534 PANELISTS

90

PANELS



134

DISTINCT
INVESTIGATORS
AWARDED

WITH AN AVERAGE OF

1.95

 CO-INVESTIGATORS
PER PROPOSAL



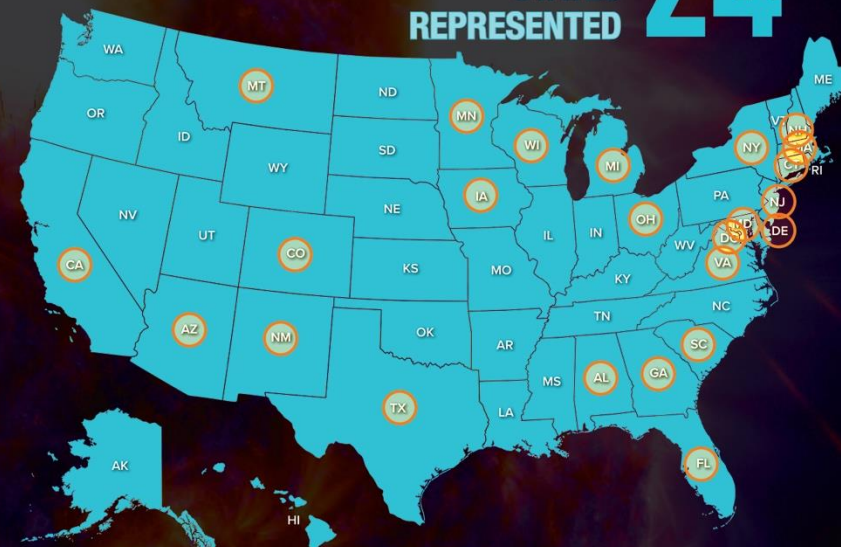
AVERAGE
TEAM SIZE

4.07



STATES
REPRESENTED

24

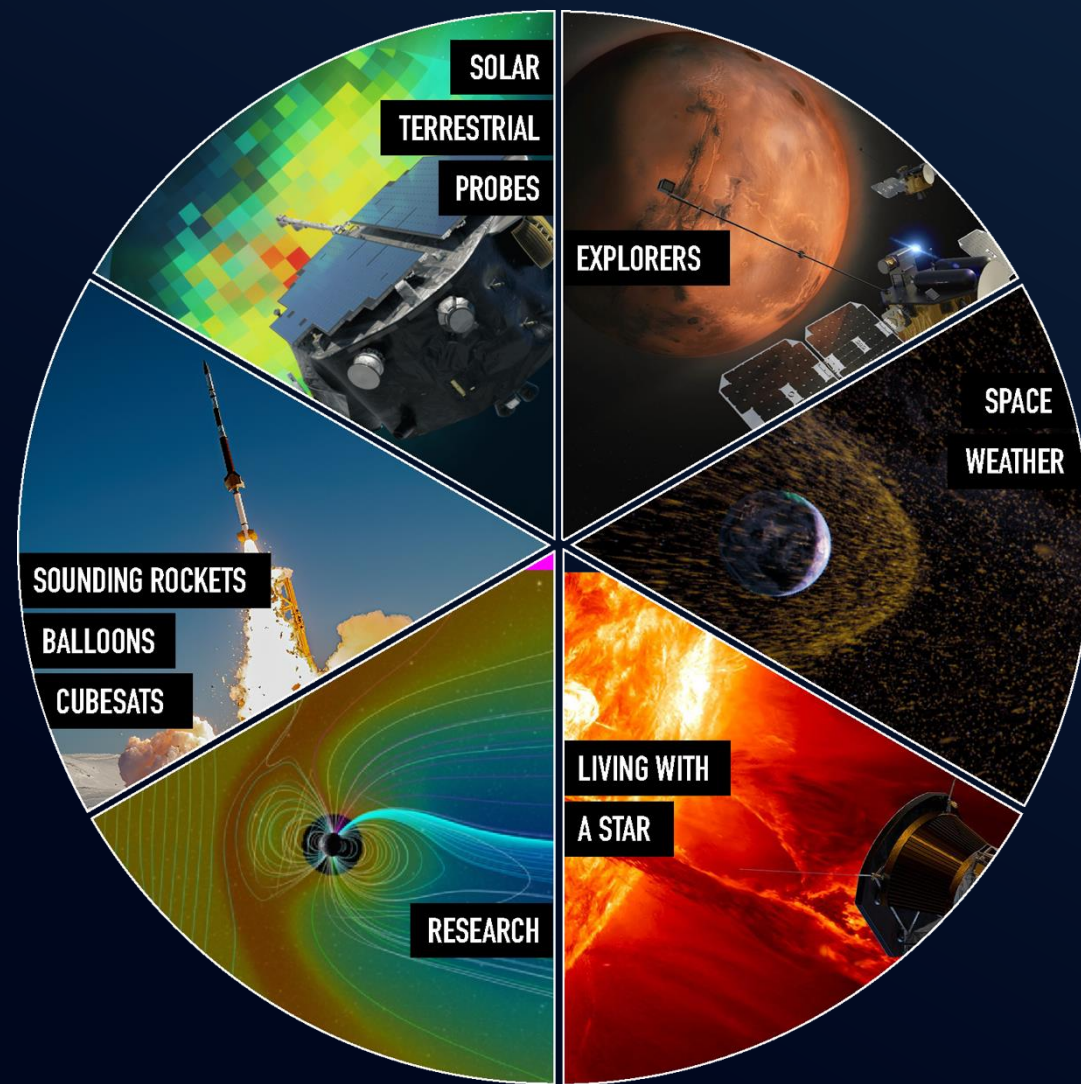


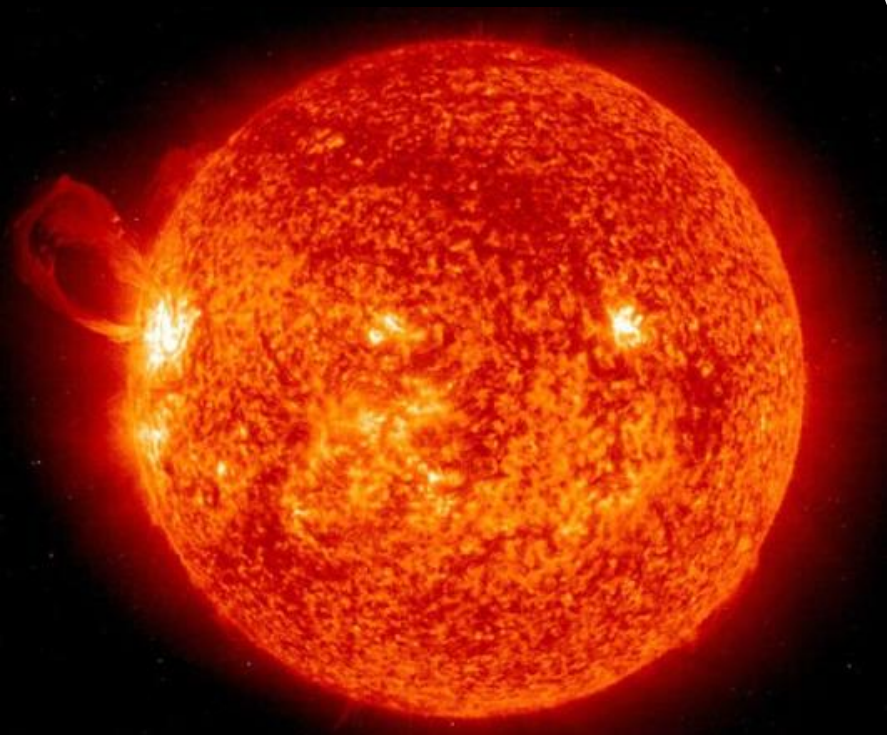
Alabama	3	Georgia	1	New Jersey	7
Arizona	1	Iowa	1	New Mexico	4
California	20	Massachusetts	10	New York	2
Colorado	17	Maryland	20	Ohio	1
Connecticut	1	Michigan	6	South Carolina	2
District of Columbia	5	Minnesota	1	Texas	11
Delaware	1	Montana	3	Virginia	2
Florida	2	New Hampshire	3	Wisconsin	1

MORE
ROSES
DATA



Heliophysics Research





The Shift

From vision to implementation

Traditional Focus	2026 Strategic Focus	Benefit
Disciplinary & Mission Silos	Strategic Purpose Themes	Alignment with NASA and National Priorities
Curiosity-Driven Investigations	Outcome-Driven Research	Actionable "Environmental Intelligence"
Fragmented Theory, Knowledge Building, Operations	Integrated Knowledge Chain	Faster Transition to Application

Heliophysics R&A Reorganization

GOALS

- Simplify and streamline structure to enable innovative Heliophysics research for the taxpayer
- Modernize approach to align research with National Priorities, Agency Priorities, NASA Heliophysics goals, and Decadal Survey science

ELEMENTS

- Programs organized by strategic, results-driven purpose rather than science discipline
- Strategic alignment, scalability, and metrics
- Collaborative, longer-term research
- Strengthened connections between different parts of Heliophysics portfolio, including the transition to applications

BENEFITS

- Emphasis on system-level and interdisciplinary science
- More opportunities for early- and mid-career scientists to explore different roles
- Reduced time spent writing and reviewing proposals

Bold Science in Action

Overarching strategic goals

1

Master the Heliosphere

Solve the fundamental mysteries of our Sun and its domain.

2

Shield the Homefront

Build the predictive foundation for Earth's space weather resilience.

3

Secure the Journey

Safeguard human exploration from the Moon to Mars and beyond.

4

Fuel the Space Economy

Power a sustainable, secure, and data-driven orbital future.

Bold Science in Action

Critical Path Science Objectives

1

Physical Drivers of Thermosphere Variability

To secure the Orbital Economy

2

Cross-Scale Energy Transfer & Geospace Response

To Fortify Infrastructure

3

Solar Eruption Mechanics & Particle Acceleration

To Protect the Artemis Generation

4

Plasma Interactions in Planetary Environments

To Enable Exploration

Bold Science in Action

Additional Frontier Objectives

1

The Solar Dynamo

- Characterize the long-term drivers of the solar cycle.
- Characterizing the solar cycle's influence on the long-term dynamics of the Sun-Earth system is vital for multi-decadal planning.

2

The Interstellar Boundary

- Resolve the fundamental physics of the heliosheath to understand how our solar system interacts with the local galactic environment.
- This is a fundamental mystery that defines the boundaries of our home in the galaxy.

3

Cross-Disciplinary Discovery

Advance interdisciplinary and system-level studies, such as the impact of solar variability on planetary atmospheres.

A Targeted & Purposeful Research Engine

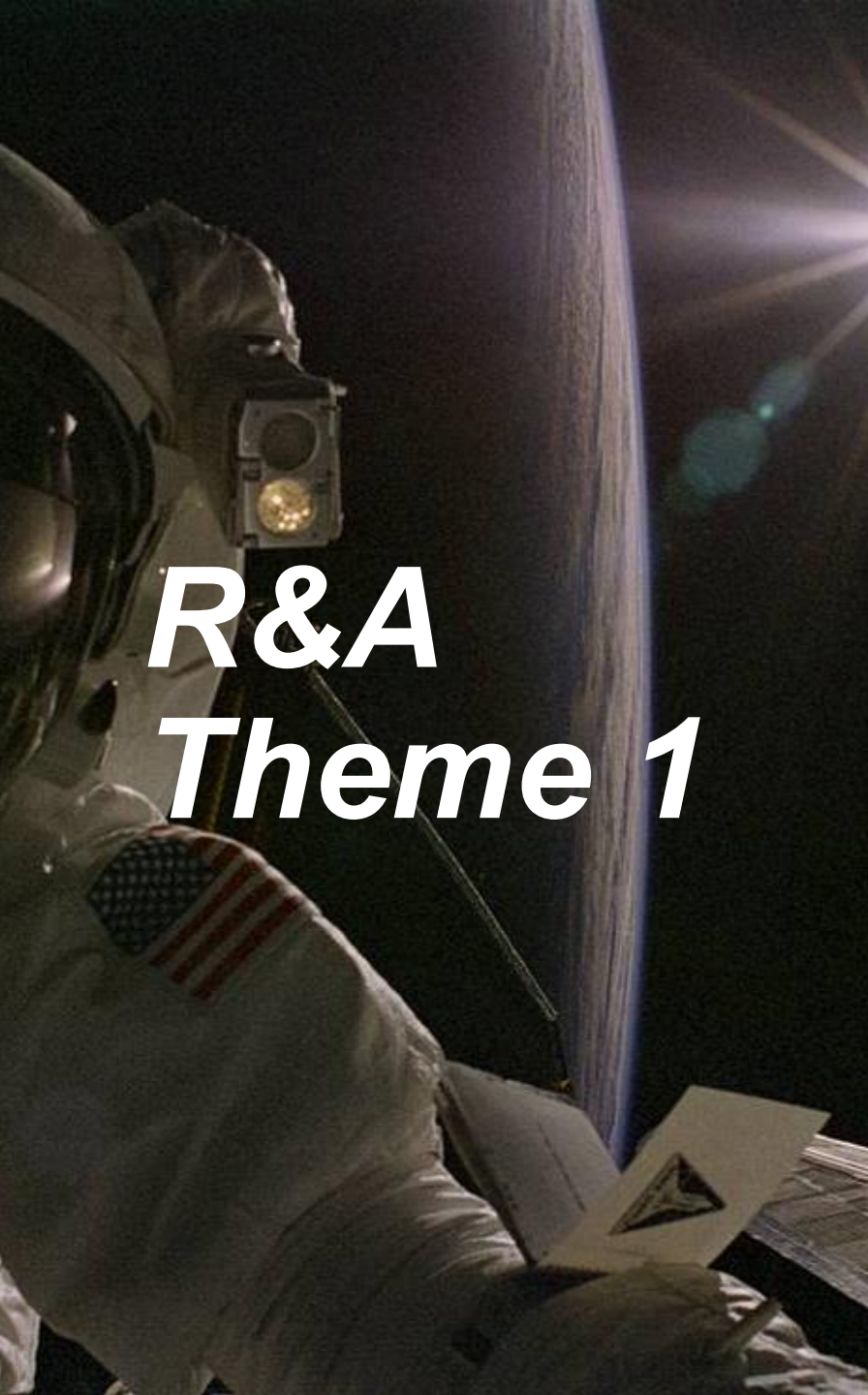
1 Bigger Science
Prioritizing larger teams and broad collaboration to tackle Decadal-scale challenges.

2 Purposeful Science
Aligning investments to results rather than disciplinary boundaries.

3 Integrated Knowledge Chain
Everything from fundamental theory to final application is linked through common program goals.

4 Faster Science
Accelerating the transition from theory to application to meet the urgency of the space economy.

5 Stability
Providing longer, more stable awards to allow researchers to spend more time on discovery and less on proposal writing and reviewing.

A close-up of an astronaut in a white space suit, wearing a helmet with a communication device. The astronaut is holding a small, rectangular object. The background shows the curvature of the Earth from space, with a bright light source creating a lens flare effect.

R&A Theme 1

Preparation for Spaceflight

Develop the scientific foundation for future spaceflight activities and explore future scientific directions

This theme includes

- Identification of new targets on the frontier of heliophysics
- Closure on knowledge gaps in preparation for a strategic spaceflight investigation
- Closure on knowledge gaps relevant to space weather, human exploration programs



R&A Theme 2

Focused Science Objectives and Foundational Research

Achieve priority science with existing data and capabilities

This theme includes

- Fundamental physical processes
- Integrated system-level science
- Immediate strategic needs



R&A Theme 3

Strategic Capabilities

*Advance capabilities needed for priority
heliophysics science*

This theme includes

- New reference data, data products
- Analytical tools
- Model development



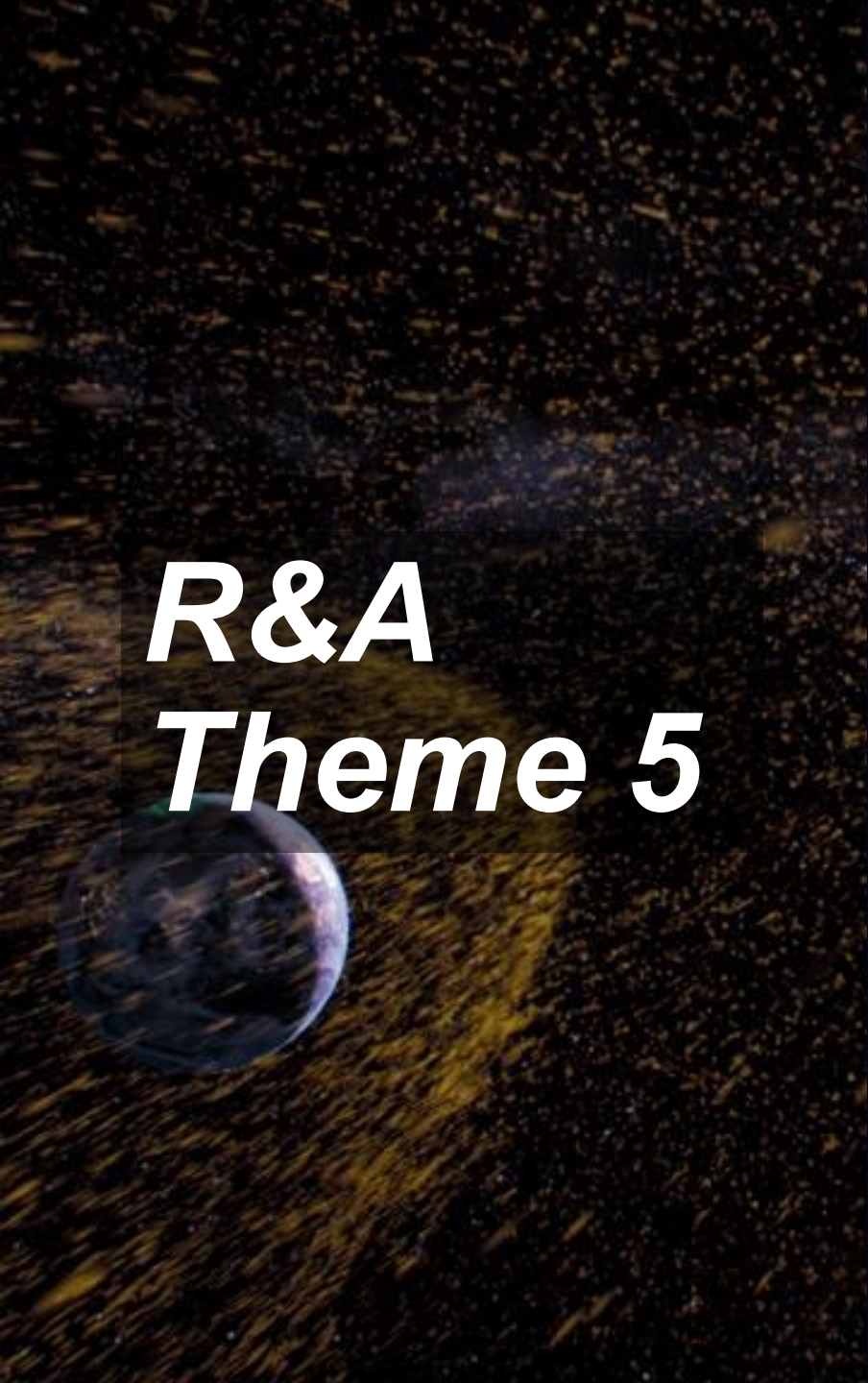
R&A Theme 4

Rapid Access to Space

Mature heliophysics technology on the ground and demonstrate in space

This theme includes

- Instrument development
- Sub-orbital, CubeSat activities



R&A Theme 5

Space Weather Applications

Apply heliophysics science to improve space weather forecasting and decision-making capabilities

This theme includes

- Operational space weather research
- Research to operations transition



R&A Theme 6

Workforce Development

Foster and support a healthy pipeline of heliophysics scientists and future leaders

This theme includes

- Multiple methods for workforce training
- Supporting outstanding early-career professionals
- Developing innovative research initiatives and scientific leadership

Key Takeaways

New HPD R&A Program structure prioritizes innovative strategic advances by:

- Building on existing processes, including large team efforts (DRIVE, CoE, LWS FST teams)
- Progressing from foundational research to applications by addressing big questions and system-of-systems science.
- Introducing more opportunities for multidisciplinary multi-method investigations with increased award duration and size
- Promoting active portfolio management to drive progress forward using science-based metrics for success

Announcements & Resources



NASA Heliophysics Community Meeting Materials

Meeting Recording & Presentation slides





October 20-22, 2026

NASA Ames Research Center



NASA Space Weather Program is hosting...

Mars L1 Workshop

User Needs, Existing Capabilities, & Science Opportunities
Driving a **Space Weather Mission** to the Red Planet

**Explore the Sun from your
inbox —it's safer that way.**

**Subscribe to the NASA
Heliophysics Newsletter**

We will never share your email address.



Earth to Scale

A small, stylized icon of the Earth, showing blue oceans and white clouds, positioned to the left of the text "Earth to Scale".

A wide-angle night photograph of a city, likely Reykjavik, Iceland, viewed from a high vantage point. The city's lights are reflected in the water of a harbor or fjord. In the foreground, a bridge or pier extends into the water. The sky is dark, filled with stars, and features vibrant green bands of the Aurora Borealis (Northern Lights) stretching across the horizon. A white rectangular box with a thin border is centered in the upper half of the image, containing the word "QUESTIONS?".

QUESTIONS?

