



March 2023 Heliophysics Community Town Hall

Peg Luce

Acting Heliophysics Division Director, NASA

Heliophysics Division Community Town Hall



**Submit your questions
throughout the Town Hall!**

Congratulations to Dr. Nicola Fox on her appointment to Associate Administrator for the Science Mission Directorate!



Thank you for your service to the Heliophysics Community!

NASA Heliophysics Division Leadership



Peg Luce, Acting Division Director



Nicole (Nicki) Rayl, Associate Director for Flight

Heliophysics Missions

Heliophysics Mission Fleet

Heliophysics missions are strategically placed throughout our solar system, working together to provide a holistic view of our Sun and space weather, along with their impacts on Earth, the other planets, and space in general. NASA's heliophysics mission fleet includes 19 operating missions using 26 spacecraft, 13 missions in development, 1 mission under study, a robust sounding rocket program and a variety of CubeSat missions.

- ESA = European Space Agency
- JAXA = Japan Aerospace Exploration Agency

*Numbers in parentheses indicate how many spacecraft each mission includes.

● UNDER DEVELOPMENT

- AWE (ISS)
- Carruthers Geocorona Observatory
- ESCAPEDE (2)
- EUVST (JAXA)
- EZIE (3)
- GDC (6)

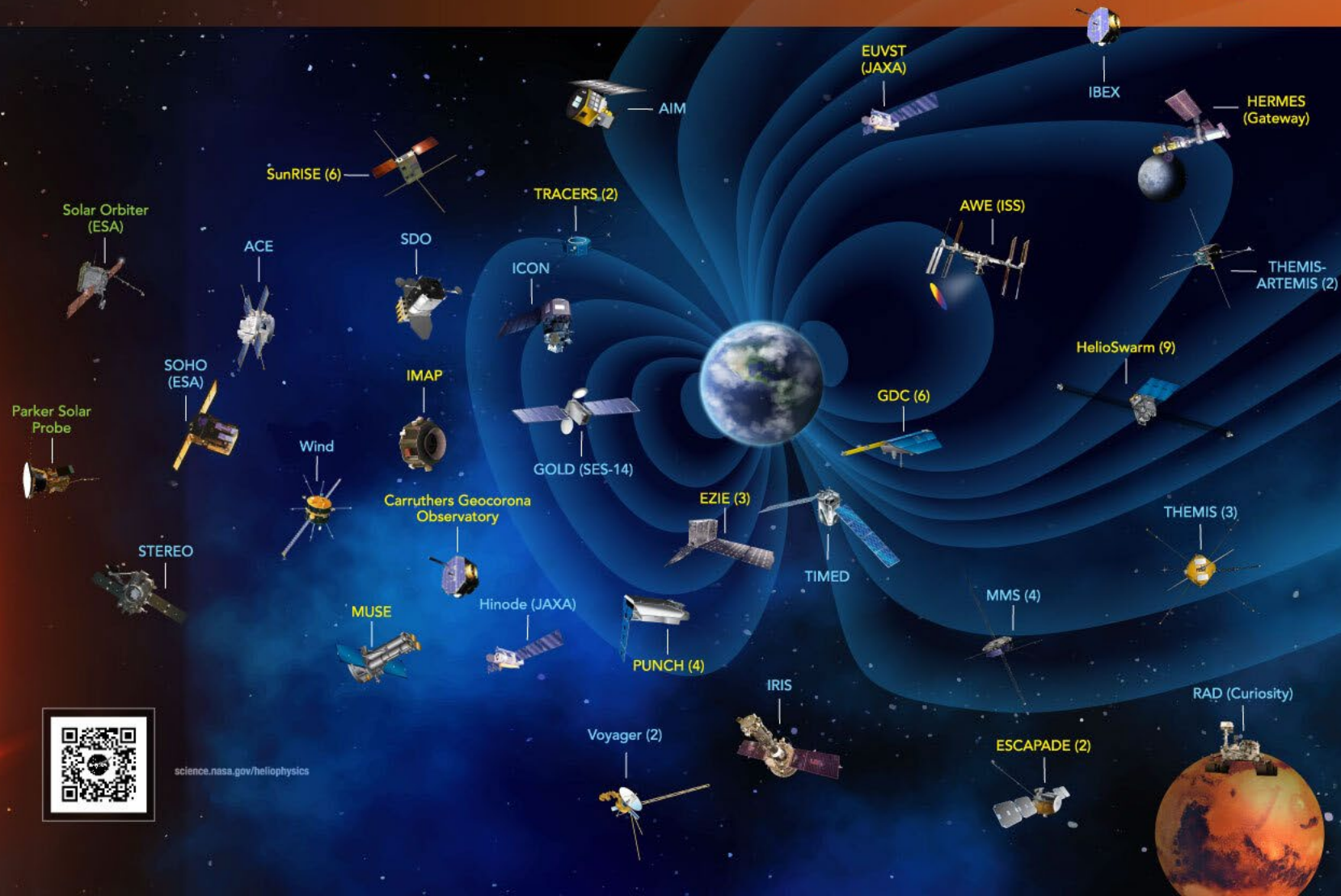
- HelioSwarm (9)
- HERMES (Gateway)
- IMAP
- MUSE
- PUNCH (4)
- SunRISE (6)
- TRACERS (2)

● PRIMARY OPERATION

- Parker Solar Probe
- Solar Orbiter (ESA)

● EXTENDED OPERATION

- ACE
- AIM
- GOLD (SES-14)
- Hinode (JAXA)
- IBEX
- ICON
- IRIS
- MMS (4)
- RAD (Curiosity)
- SDO
- SOHO (ESA)
- STEREO
- THEMIS-ARTEMIS (2)
- THEMIS (3)
- TIMED
- Wind
- Voyager (2)



science.nasa.gov/heliophysics

Geospace Dynamics Constellation (GDC)

Mission Science Team



Project Scientist
Doug Rowland



Deputy Project Scientist
Larry Kepko



Deputy Project Scientist
Katherine Garcia-Sage



Interdisciplinary Scientist
Rebecca Bishop



Interdisciplinary Scientist
Yue Deng



Interdisciplinary Scientist
Jeff Thayer



MoSAIC PI
Mehdi Benna



CAPE PI
Dan Gershman



AETHER PI
Laila Andersson



TPS PI
Phillip Anderson



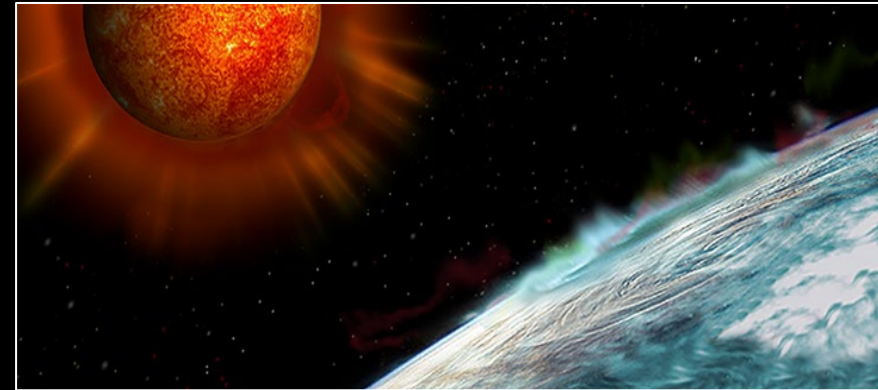
NEMESIS PI
Mark Moldwin

Geospace Dynamics Constellation (GDC)

- GDC will provide key advances in our understanding of Earth's ionosphere-thermosphere system, including providing the scientific foundation for our ability to quantify and forecast space weather effects both on Earth and in space.
- NASA is happy to announce the start of the GDC mission science team!
 - Project Scientist – Dr. Doug Rowland
 - Deputy Project Scientists – Dr. Larry Kepko & Dr. Katherine Garcia-Sage
 - Interdisciplinary Scientists - selected Nov 2021
 - Dr. Rebecca Bishop (The Aerospace Corp.), Prof. Yue Deng (Univ. Texas, Arlington), Prof. Jeffrey Thayer (CU Boulder)
 - Investigations, delivering science instruments—selected Apr 2022
 - Modular Spectrometer for Atmosphere and Ionosphere Characterization (MoSAIC): Dr. Mehdi Benna, UMBC
 - The Comprehensive Auroral Precipitation Experiment (CAPE): Dr. Daniel Gershman, NASA GSFC
 - Atmospheric Electrodynamics probe for THERmal plasma (AETHER): Dr. Laila Andersson, CU Boulder
 - Thermal Plasma Sensor (TPS): Dr. Phillip Anderson, University of Texas, Dallas
 - Near Earth Magnetometer Instrument in a Small Integrated System (NEMISIS): Dr. Mark Moldwin, University of Michigan
- Spacecraft procurement via GSFC-managed RFP, proposals received Feb. 10, 2023

Dynamical Neutral Atmosphere-Ionosphere Coupling (DYNAMIC)

- DYNAMIC is a Solar Terrestrial Probes mission to resolve key science objectives about how lower atmosphere variability affects geospace, including:
 - Day-to-day and longer-term variations of lower atmosphere forcing
 - Multi-scale upper atmosphere responses to energy inputs from below
 - Preconditioning the upper atmosphere in magnetosphere-ionosphere interactions
- DYNAMIC has strong synergy with GDC, both scientifically and in terms of implementation details
 - Altitude profiles of the thermosphere and ionosphere
 - Provided by DYNAMIC
 - In situ measurements of thermosphere and ionosphere
 - Provided by GDC



Formulating DYNAMIC with GDC achieves decadal-priority science in a cost-effective manner

Tentative timeline

- Dec 2022 Community Announcement, updated planning information
- Mar 2023 Draft AO release (target)
- May 2023 Final AO release (target)

For additional information see: <https://soma.larc.nasa.gov/STP/DYNAMIC/>

Mission Updates

Atmospheric Waves Experiment (AWE)

- Successfully completed its critical space environment tests. AWE Launch to ISS in Dec. 2023.
- <https://blogs.nasa.gov/awe/>

Interstellar Mapping and Acceleration Probe (IMAP)

- Successfully completed its critical design review.
- <https://blogs.nasa.gov/imap/2023/01/31/nasas-imap-mission-successfully-completes-critical-design-review/>

Escape and Plasma Acceleration and Dynamics Explorers (ESCAPADE)

- Blue Origin will provide launch services for ESCAPADE NET than late 2024.
- <https://www.nasa.gov/press-release/nasa-selects-blue-origin-to-launch-mars-magnetosphere-study-mission>



This image taken from the International Space Station shows swaths of airglow hovering in Earth's atmosphere. NASA's new Atmospheric Waves Experiment will observe airglow from a perch on the space station. **Credits: NASA**

Space Weather Program

Space Weather Research to Operations / Operations to Research (R2O2R)

- ROSES-23 focused topics:
 - Data Assimilation for Neutral Density Forecasting
 - Open Call

Space Weather Grand Challenge

- Identify the next low-latency data stream to enable a significant advancement in space weather forecasting

HERMES & Gateway

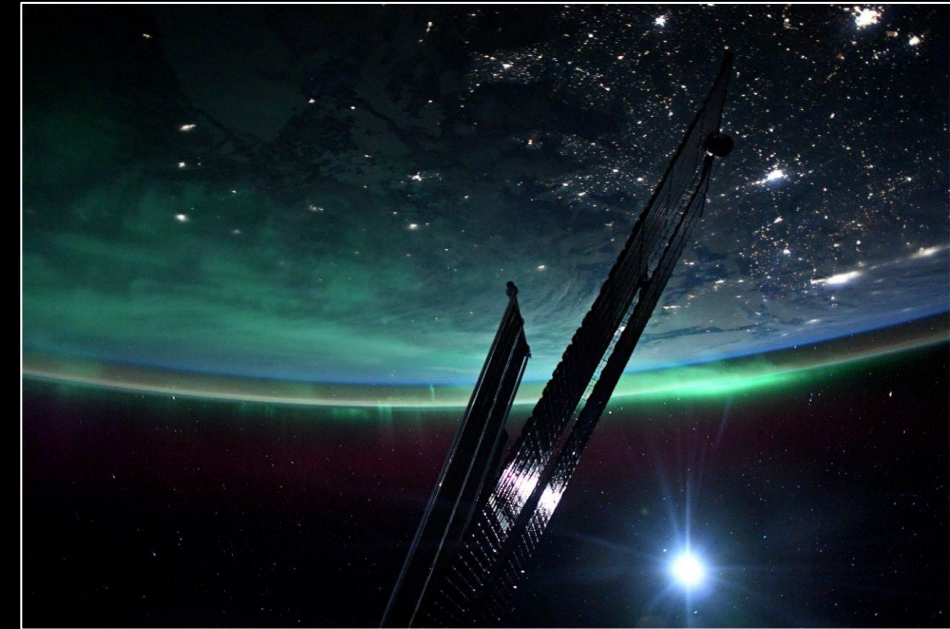
- HERMES: space weather instrument suite led by HPD will observe solar particles and the solar wind.
- HERMES Payload I&T is expected to begin in April/May 2023
 - LRD for the first Gateway launch (which will include HERMES) is Oct 2025.
 - HPD working with the Gateway Program on future opportunities for competitive science payloads.

Space Weather Pipeline

- Constructing four instruments, SPAN-E, SST, ECP-Lite, Faraday Cup for future flight opportunities

Vigil

- Vigil AO will be released soon with updates based on feedback from Draft AO



This photo was taken from the ISS on Feb. 28th and shows the sweeping scale of the aurora during a geomagnetic storm **Credits: NASA/Josh Cassada**

Research and Analysis Update

- Heliophysics R&A Programs have grown significantly since DRIVE Initiative was recommended by 2013 Decadal Survey
- ROSES-2022 selection rates are healthy
 - Space Weather Centers of Excellence selections are imminent
 - Eclipse 2024 element in ROSES 2022
 - Three DRIVE Science Centers selected in 2022 have kicked off Phase 2 activities
- ROSES-2023 solicitation provides the greatest scope ever offered for NASA Heliophysics
 - New Technology Program and Space Weather Program
 - Growing number of Cross-Divisional programs
 - New opportunities with AI/ML aspects (MDRAIT and H-ARD)

ROSES 2022 Selections to date

ROSES 2022 Selections					
ROSES Element	# Proposals Received	# Proposals Selected	% Selected	# New PI	% New PI
SWR202R	17	4	23%	2	50%
HGIO	87	25	28%	15	60%
HTIDS	24	11	45%	5	45%
HFOS	7	4	57%	2	50%
H-TM	10	6	60%	3	50%

2023 Research and Analysis Program Elements

- HSR: Supporting Research (Dual Anonymous Format)
- HGIO: Guest Investigator (Dual Anonymous Format)
- Living With a Star (LWS) Science
- Space Weather R2O2R (+Transition)
- HTIDS: Technology and Instrument Development for Science
- HLCAS: Low Cost Access to Space
- HFOS: Flight Opportunity Studies
- HFORT: Flight Opportunities for Research and Technology
- HITS: Heliophysics Innovation in Technology and Science
- H-ARD: Heliophysics AI/ML-Ready Data
- H-TM: Heliophysics Tools and Methods
- H-CSI: Heliophysics Citizen Science
- SOGI: Solar Orbiter Guest Investigator
- Multi-Disciplinary:
 - Habitable Worlds
 - FINESST
 - MDRAIT: Multidomain Reusable Artificial Intelligence Tools
 - XRP: Exoplanets
- In-Development: Two new Space Weather Offerings!

<https://science.nasa.gov/researchers/solicitations/robes-2023/research-opportunities-space-and-earth-science-robes-2023-released>

Heliophysics Updates

- The Heliophysics Division Science Data Management Policy has been updated to address additional guidance on the open sharing of publications, data, and software per the Scientific Information Policy for NASA's Science Mission Directorate (SPD-41a).
 - https://science.nasa.gov/science-red/s3fs-public/atoms/files/HPD_Data_Policy_Final_20230202_0.pdf
- Decadal Survey 2024
 - New Steering Committee and Panel Members have been announced.
 - For more information, including on upcoming panel meetings, see the NASEM website: <https://www.nationalacademies.org/our-work/decadal-survey-for-solar-and-space-physics-heliophysics-2024-2033>
- Budget Update
 - Expect the President's Budget Request for FY 2024 to be released this month
 - This will kick off the FY25 budget planning process

THE HELIOPHYSICS BIG YEAR

Eclipse Efforts

Science, Missions,
Engagement



Citizen Science

<https://solarsystem.nasa.gov/solar-system/sun/helio-big-year/>

HELIOPHYSICS
BIG YEAR

SMD Updates

Submit your questions
throughout the Town
Hall!



Third Principal Investigator (PI) Launchpad workshop

- Planned for July 24-27, 2023. Applications are due May 30.
- <https://tinyurl.com/2yu998ps>

Learn more about NASA's Transform to Open Science (TOPS) initiative

- <https://science.nasa.gov/open-science/transform-to-open-science>
- Sign up for the TOPS newsletter: <https://tinyurl.com/3hrum52s>

SMD Artificial Intelligence (AI) Initiative

- The 3rd SMD/GSFC Workshop on AI and Data Science: Leaping Toward our Future Goals, will be hosted from March 21-23, 2023, at NASA's GSFC.
- This event is open to all but in-person attendance is limited to 125 attendees, so register now: <https://emg-wd.wixsite.com/ai-ml-meeting-2023/registration>

Get Involved and Stay Informed!

Stay in touch and help us find new ways to highlight your work and keep you in the loop!

Sign up for the NASA Eclipse Newsletter to receive updates on eclipse activities!

- <https://tinyurl.com/ym9epkfy>

Stay up to date with what's happening at Headquarters:

- <https://science.nasa.gov/researchers/virtual-townhall>

Let us know what you've been working on:

- <https://bit.ly/SubmitHelioScience>

Learn more about the next solar eclipse:

- <https://solarsystem.nasa.gov/eclipses/home/>

Join us for our next Community Town Hall:

- <https://science.nasa.gov/researchers/virtual-townhall>



NASA.gov/sunearth



blogs.nasa.gov/sunspot



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IT'S A GREAT TIME TO BE A HELIOPHYSICIST



Question & Answer



Please submit your questions using the QR code!

