National Aeronautics and Space Administration

NASA

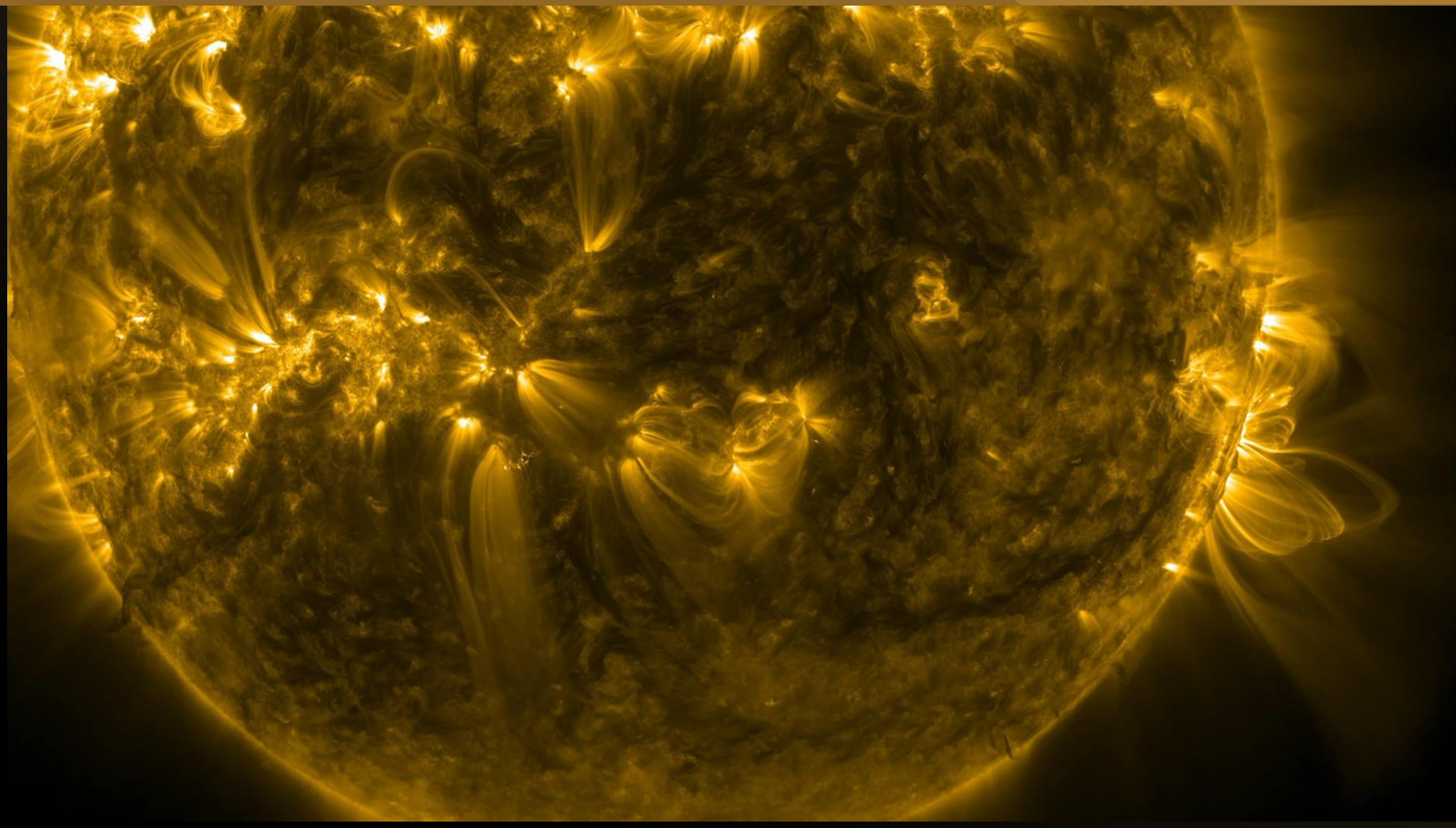
2024 NASA SCIENCE

Heliophysics Town Hall

Dr. Joseph Westlake
Heliophysics Division Director
June 18, 2024

Welcome!

The Heliophysics Town Hall Will Begin Shortly



During the week of May 10 to May 16, 2024, NASA's Solar Dynamics Observatory (SDO) observed nine X-class solar flares erupting from the Sun, including the largest in this solar cycle to date on May 14 that peaked at X8.7.Credit: NASA Goddard Space Flight Center. Music Credit: Music credit: "Collab Alert" by Ellis Kent [PRS] from Universal Production Music

Welcome to the Heliophysics Town Hall!

Town Hall Agenda

State of the Union

NASA Heliophysics Division Leadership

Dr. Joseph (Joe) Westlake
Division Director

Margaret (Peg) Luce
Deputy Division Director

Nicole (Nicki) Rayl
Associate Director for Flight

Dr. Therese Moretto Jorgensen
Director of Research

New Division Members

- **Dr. Joseph (Joe) Westlake** – Division Director
- **Michele Cash** – Program Scientist
- **Sabrina Savage** – Program Scientist
- **Ennio Sanchez** – Program Scientist
- **Lisa Winter –** Program Scientist
- **Venessa Salazar** – Research Analyst
- **Erin Mahoney** – Communications Manager
- **Carolina Ravinskas** – Communications Strategist
- **Kennedy Novak** – Executive Officer

Farewell

- **Jim Spann** – Space Weather Director
- **Denise Hill** – Communications Manager
- **Ezinne Uzu-Okoro** – Program Executive
- **Maria Busuioceanu** – Program Executive
- **Kate Peterson** – Flight Missions Support
- **Johnny Grady** – Mission Services Integrator
- **Rachel Morrow** – Operations Support

Organizational Changes

- **Peg Luce** – Deputy Division Director, *Previously Acting Division Director*
- **Therese Moretto-Jorgensen** – Research Program Director, *Previously Acting Deputy Director & Transitional Leadership Support*
- **Jamie Favors** – Space Weather Director, *Previously Deputy Lead for the Space Weather Program and Program Executive*
- **Kennedy Novak** – Executive Officer, *Previously Knowledge Management Strategist*
- **Paulette Woods** – Senior Mission Services Integrator, *Previously Program Support Specialist*

Awards

- **Thomas Woods** – Outstanding Public Leadership Medal
- **Vassilis Angelopoulos** – Outstanding Public Leadership Medal
- **Jared Leisner** – Exceptional Service Medal
- **Jim Spann** – Outstanding Leadership Medal
- **NASA's 2023 Annular Eclipse Live Broadcast Team** – Excellence in Collaboration Award

Heliophysics Budget Updates

Explore, Innovate, Partner, & Inspire

- Maintain a **balanced mission portfolio –** ensuring the success of missions currently in development, stewarding the operating Heliophysics System Observatory, and enabling future missions to the extent possible
- Nurture a vibrant and inclusive **R&A** program (CubeSats & open science initiatives)
- Support **partnerships** with international space agencies
- Support **National priorities** in Space Weather, Orbital Debris, and Space Situational Awareness
- Advances ESCAPADE, EZIE, SunRISE, TRACERS, PUNCH, Carruthers, and IMAP toward launch in 2024 – 2025
- Supports a healthy cadence of PI-led Explorer missions
- Supports continued scientific discovery through the Heliophysics DRIVE Science Centers

Heliophysics Recent Events

Credit: NASA/Keegan Barber

APRIL 8, 2024: TOTAL SOLAR ECLIPSE

400+ NASA employees across **14** locations engaging with the public

12,328,645
NASA Broadcast viewers – English

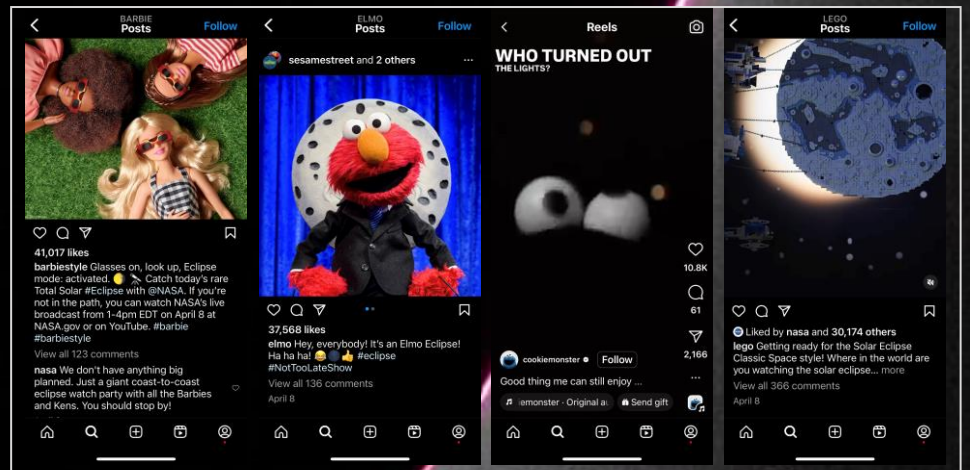
HD 1080p

LIVE

4,603,238
NASA Broadcast viewers – Spanish

17,535
News stories with an estimated publicity value of **$54.5 million**

2M+
glasses distributed



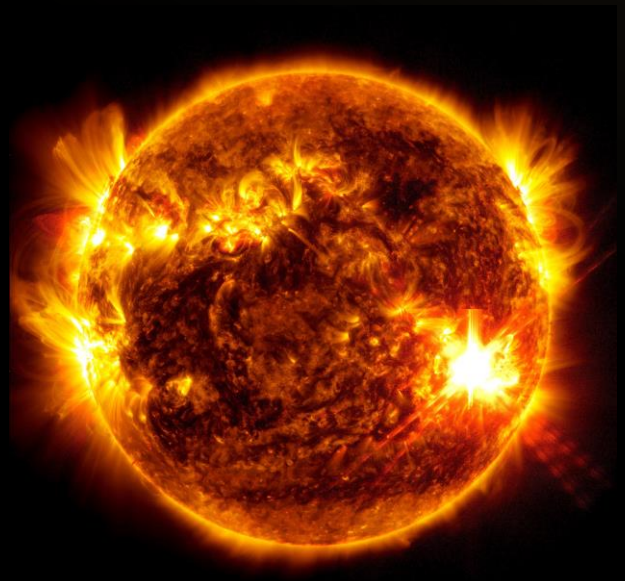
Tens of Thousands
Of engagements with Barbie, Cookie Monster, Elmo, Snoopy, LEGO and more

AP News
https://apnews.com › hub › eclipses
Eclipses
Looking at a solar eclipse can be dangerous without eclipse glasses. Here's ... About 20,000 eclipse chasers have witnessed a ra…

Space.com
https://www.space.com › news › s...
Solar eclipse 2024: Live updates
May 22, 2024 — On Oct. 2, 2024, an annular solar eclipse will be visible across parts of the South Pacific, southern Chile and Southern…

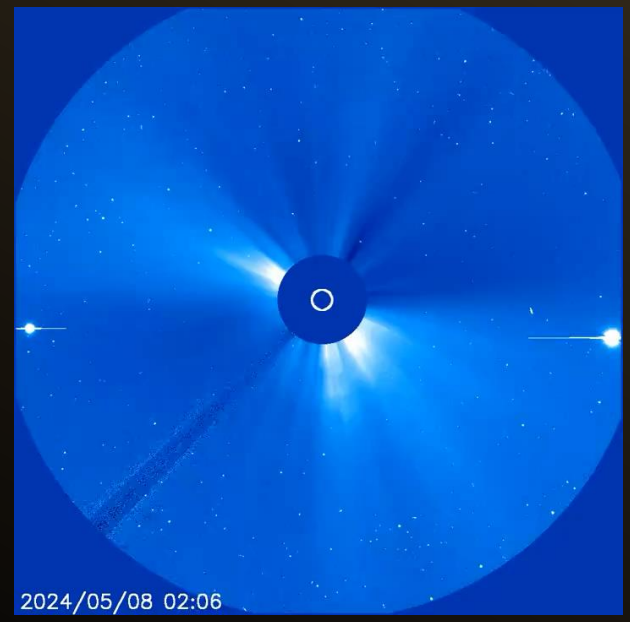
NBC News
www.nbcnews.com
Total solar eclipse 2024 highlights: Live coverage,...
Apr 8, 2024 — News and updates from the 2024 total solar eclipse: Tens of millions of people were treated to stunning views as the moon passed between ...

Geomagnetic Solar Storm



NASA's Solar Dynamics Observatory (SDO) captured this image of an X5.8 solar flare peaking at 9:23 p.m. EDT on May 10, 2024. The image shows a subset of extreme ultraviolet light that highlights the extremely hot material in flares.
Credit: NASA SDO

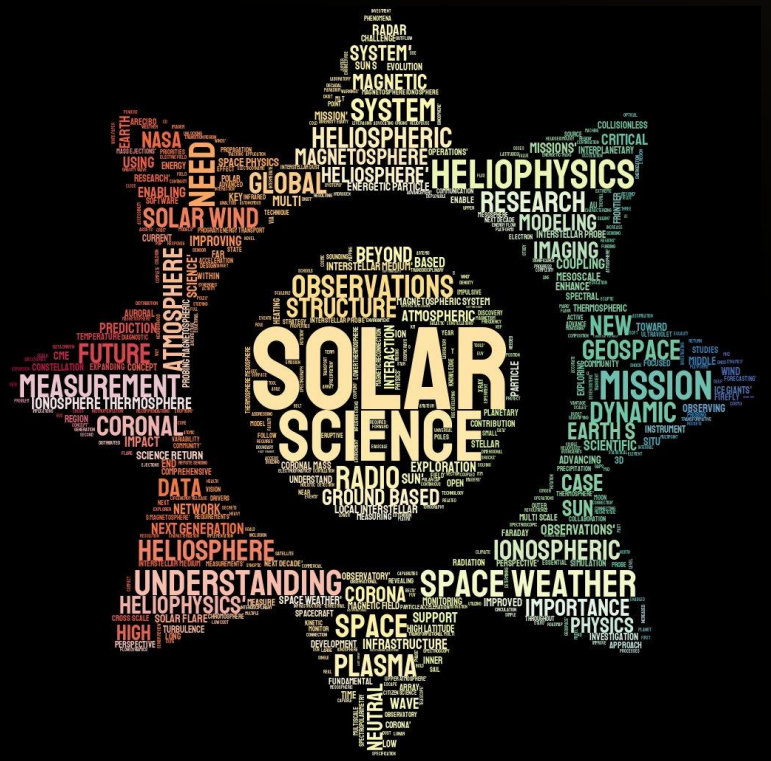
A coronal aurora appeared over southwestern British Columbia on May 10, 2024.
Credit: NASA/Mara Johnson-Groh



A series of CME's are launched from the Sun on May 8th, as captured by SOHO's LASCO instrument
Credit: NASA SOHO

2024 Decadal Survey is Coming Soon

250 white papers submitted!



Word cloud of the Heliophysics Decadal White Paper titles.
Credit: James Paul Mason

Expected Summer 2024

*The importance of the Decadal Survey cannot be overstated. This is **the** opportunity to set a vision for the next decade and beyond!*

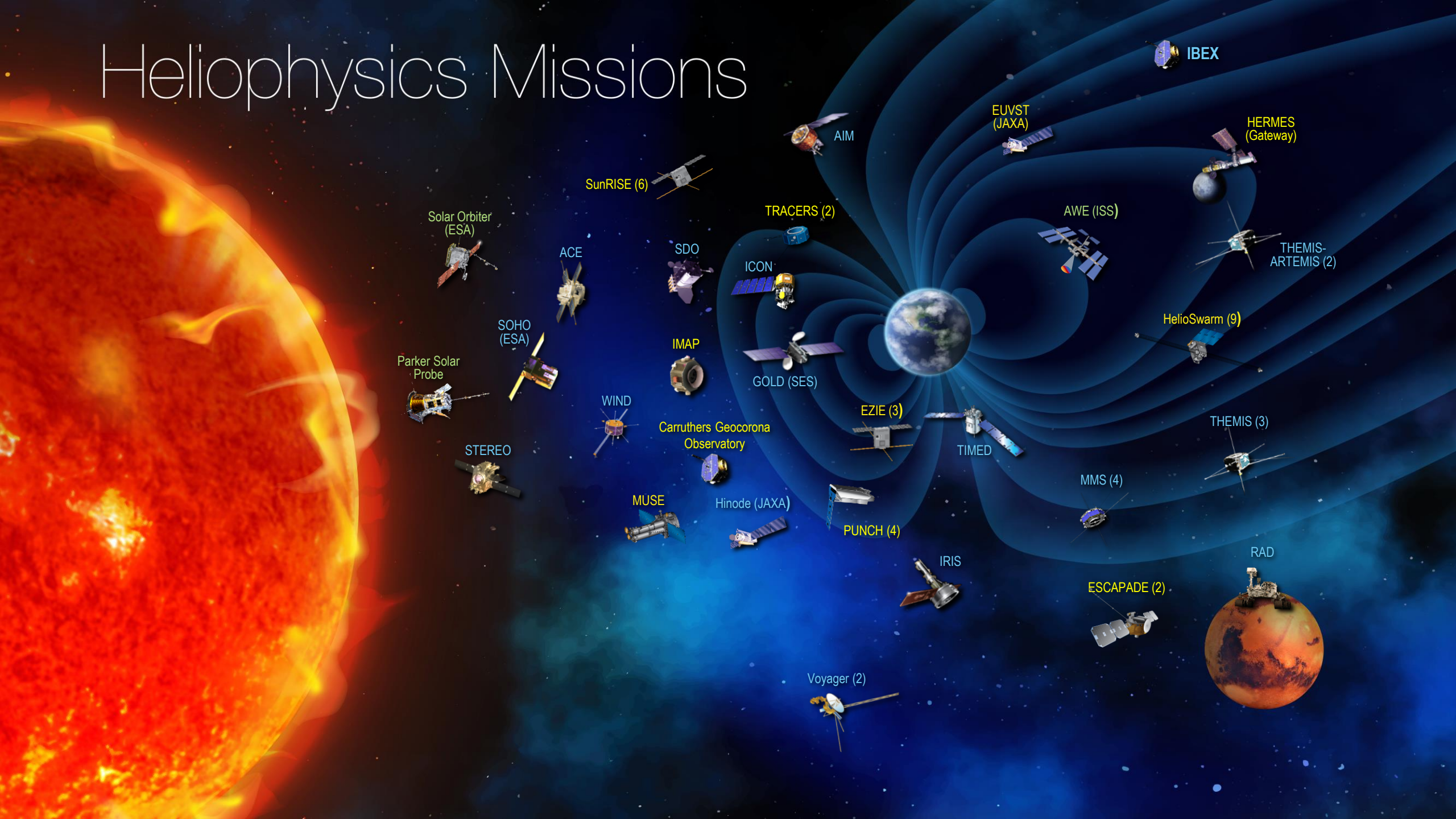
The Decadal Survey is charged to "generate consensus recommendations to **advance and expand the frontiers of solar and space physics** in the current decade and **lay the groundwork for continued advances in future decades**." [Decadal Survey, Statement of Task]

For more information, visit the NASEM website: https://nas.edu/ssphdecadal

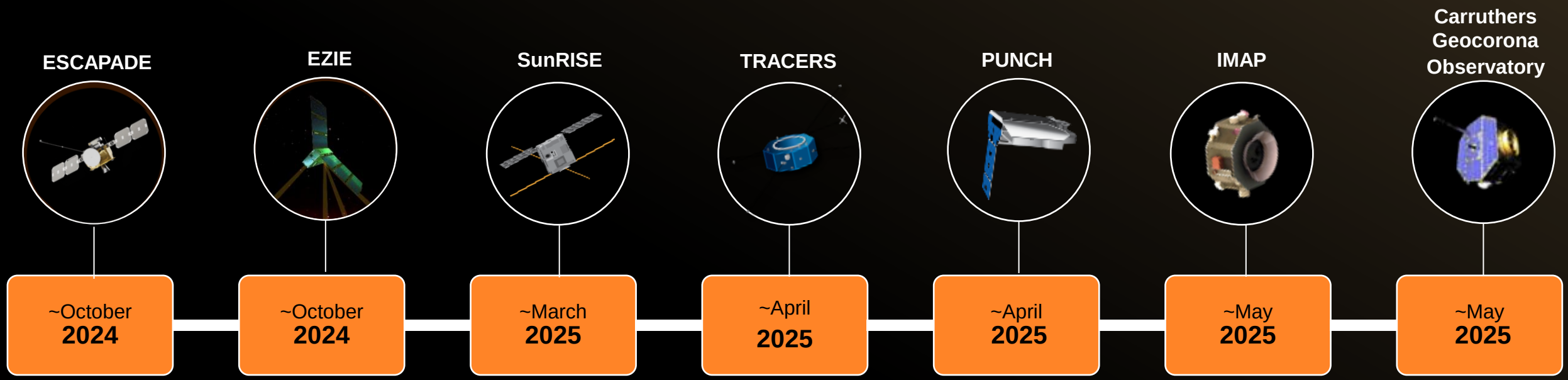
To see supporting information delivered to the Decadal Survey, visit: https://go.nasa.gov/HelioDecadal (Resources → Supplemental Information)

Image credit: National Academies of Science website

Heliophysics Missions



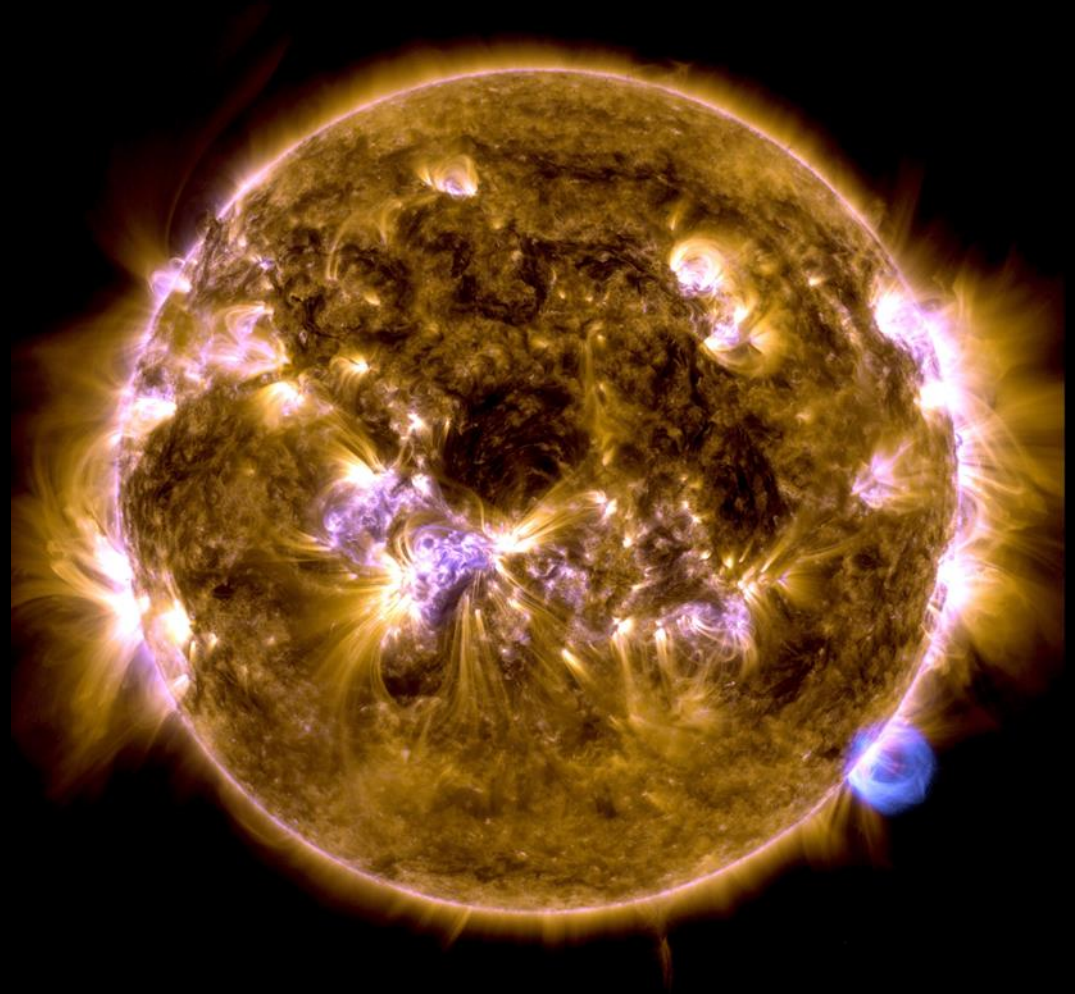
Helio Mission Launch Timeline



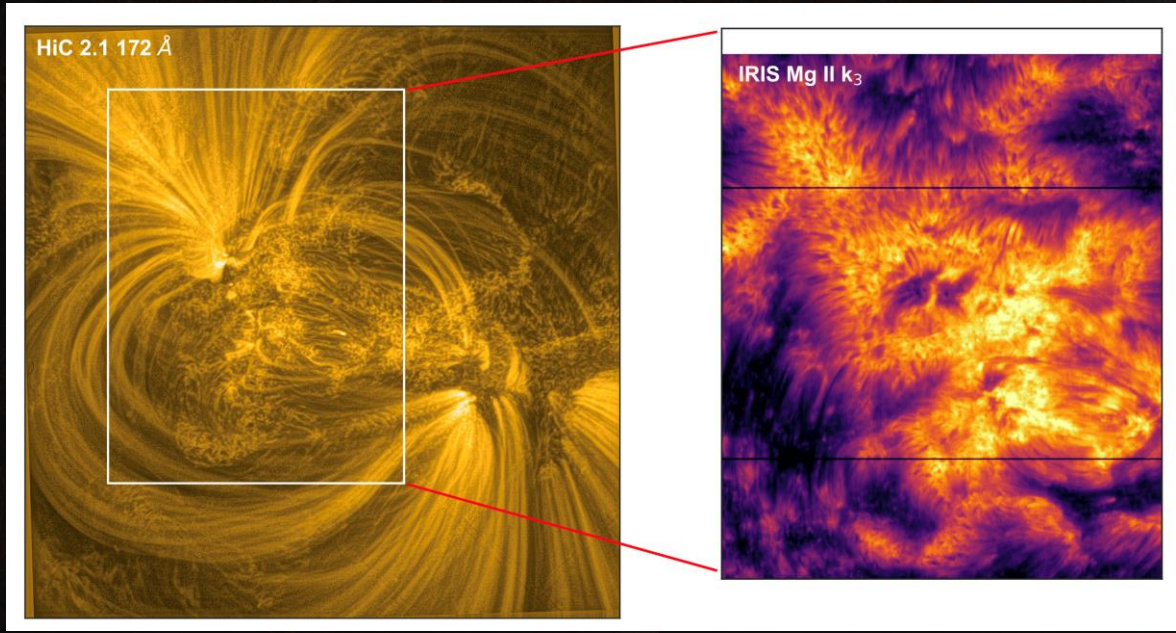
Science Storytelling

- Share your science!
- We want to advocate for compelling "science nuggets" from the Heliophysics community
- Pull science results and captivating images from reports that can be easily shared

HQ-HelioHighlights@mail.nasa.gov



Science Nugget: Solar Moss



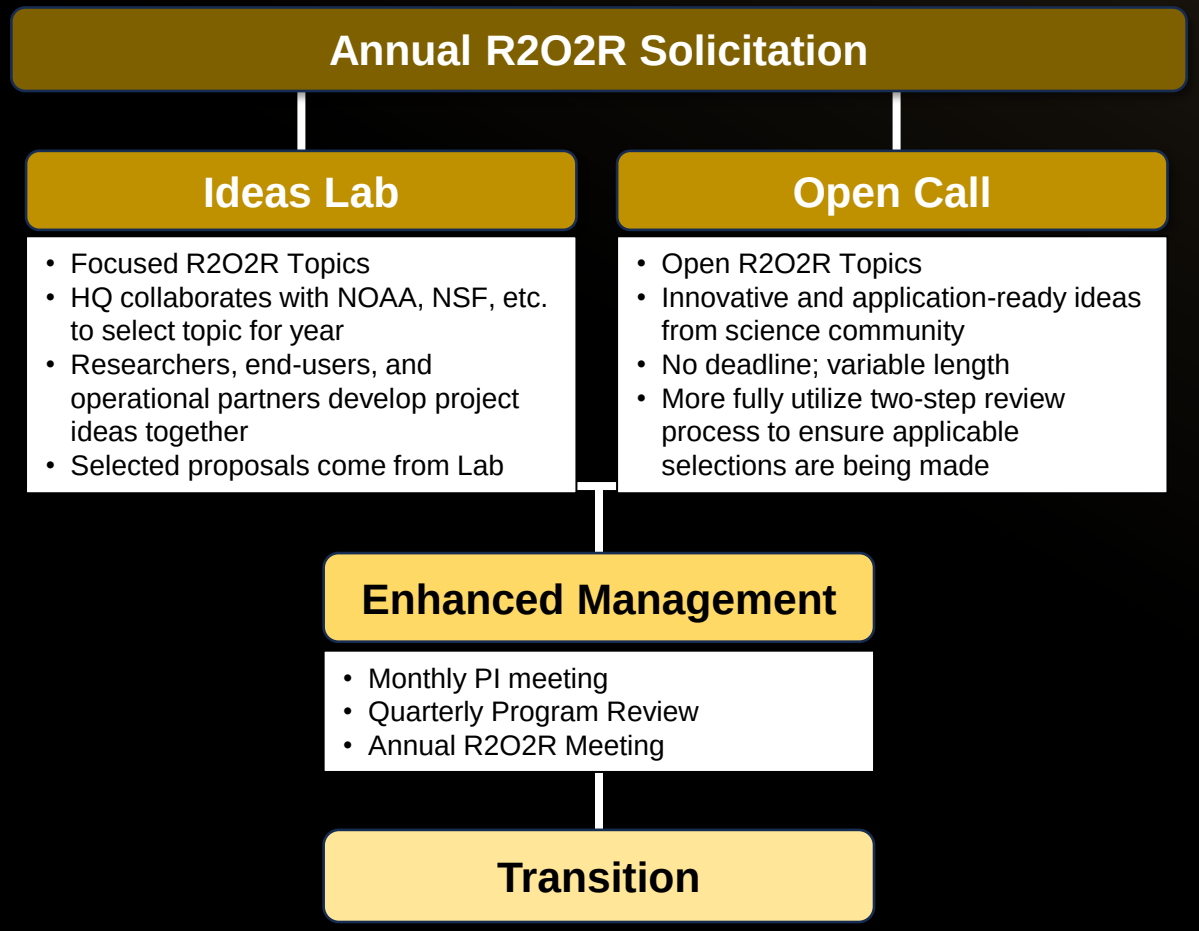
Read the Paper: https://www.nature.com/articles/s41550-024-02241-8

IRIS and HI-C take a closer look at super heating mechanisms within sunspots

Scientists have named a small-scale, bright, patchy structure made of plasma in the solar atmosphere “moss.” The moss blossoms around the center of a sunspot group, where magnetic conditions are strong. Observations from IRIS and HI-C combined with complex 3D simulations have now revealed that electrical currents may contribute to heating the moss. Throughout this region there is a mess of magnetic field lines, like invisible spaghetti. This tangle of magnetic spaghetti creates electrical currents that can help heat material to a wide range of temperatures from 10,000 to 1 million degrees Fahrenheit.

Space Weather Update

NASA Space Weather Program
R2O2R Program Element – New Approach



New approach **continues to meet NASA's responsibilities** as defined in PROSWIFT Act, National Space Weather Strategy & Action Plan, etc.

New approach **addresses issues & actions** identified by NASA, NOAA, NSF, DoD, and the science community. **Truly interagency approach**.

New **approach leverages successful pilot efforts and lessons learned** from similar programmatic activities (i.e., UK SWIMMR and NASA Applied Sciences)

NASA Lead: Dr. Lisa Winter, Program Scientist (on detail from NSF)
NASA Deputy Lead: Dr. Esayas Shume, Program Scientist

Heliophysics System Observatory (HSO)

Extended Mission Policy Activities

2023 Senior Review Findings

> **Individual extended mission proposals lacked system-level coherence and perpetuated closed communities.**

The following would strengthen the HPD portfolio and engage broader community:

- Develop opportunities for HSO science working groups
- Expand HSO Guest Investigator funding opportunities
- Expand HSO community frameworks to share and leverage the development of code, team science efforts, and coordination with HDRL

Results **12 missions proposed, 4 designated project-funded, 6 designated infrastructure, 2 terminated due to technical feasibility**

Framework Development

- Address terminology and definition concerns
- Establish research funding transition and competition processes for missions phasing out of prime phase
- Outline Senior Review criteria for transitioning missions

Stakeholder Feedback

- Solicit feedback from internal and advisory stakeholders on:
  - Overall framework
  - Terminology
  - Metrics for evaluation

Policy Development

- Draft written policy to foster open science, healthy competition, and opportunities for early career scientists
  - Incorporate stakeholder feedback
  - Address concerns raised in HDP feedback form

Community Feedback

- Share framework at Sept. HPD Town Hall
- Answer questions and accept live feedback
- Identify format/method and timeline for formal feedback submission

Finalize & Release Policy

- Finalize written policy based on feedback
- Issue policy and guiding direction to operating missions
- Leverage appropriate communication channels to ensure awareness across the community
- Feed into 2026 Senior Review and ROSES

GDC & DYNAMIC

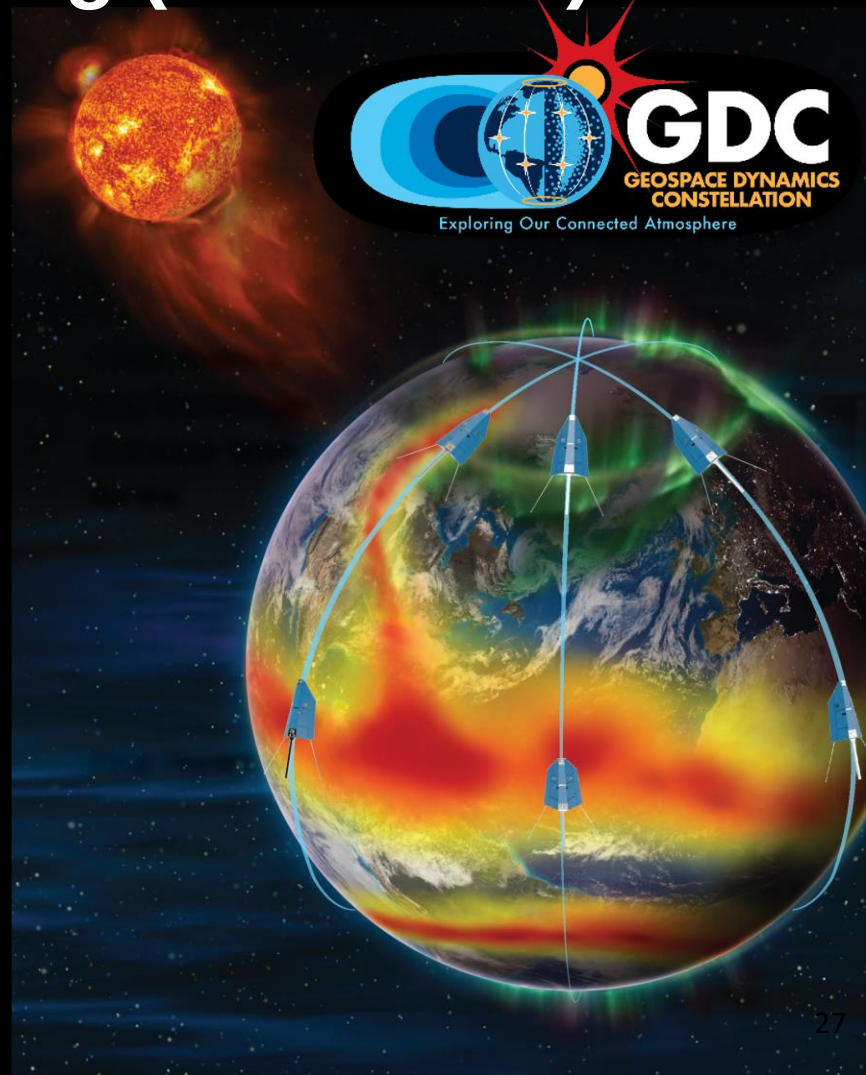
Geospace Dynamics Constellation (GDC) and Dynamical Neutral Atmosphere-Ionosphere Coupling (DYNAMIC)

GDC and DYNAMIC provide a whole-system study of upper atmospheric dynamics by combining their scientific and technical capabilities

- **Science**
  - GDC: Understand the upper atmosphere's internal processes and dynamics, and response to energy inputs from Earth's space environment (*energy from above*)
  - DYNAMIC: Understand the effect of lower atmosphere variability on the processes and dynamics of the upper atmosphere (*energy from below*)
- **Architecture**
  - GDC: Provides in situ measurements above 300 km
  - DYNAMIC: Provides remote sensing of vertical profiles below 300 km altitude, leverages GDC measurements

DYNAMIC AO

- AO released May 2023
- Selections in June 2024



IT'S A GREAT TIME TO BE A HELIOPHYSICIST

www.nasa.gov

Get Involved & Stay Informed!

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

Submit science highlights to us here:
HQ-HelioHighlights@mail.nasa.gov

NASA.gov/sunearth

facebook.com/NASASunScience

blogs.nasa.gov/sunspot

@NASASun

Questions & Answers

Question: 1

Received 53 Upvotes

What is the status of the Space Weather pipeline (SWx) instruments? Can you provide an update on their launch opportunity?

Question: 2

Received 48 Upvotes

The Goddard Center Director recently made the claim that the budget is likely to improve after budget caps expire in 2026. Can you comment on what budget figures Helio will be asking NASA for if this is true? Confidence in continued funding is dropping dramatically with recent selection rates.

Question: 3

Received 41 Upvotes

What kind of interest is there for a Lower Thermosphere, Upper Mesosphere Mission? How would you expect that this would fit in as a compliment to the GDC and DYNAMIC missions?

Question: 4

Received 36 Upvotes

When should we expect a community announcement for next year’s MIDEX AO giving the mission cost cap and other details?

Question: 5

Received 34 Upvotes

Many missions moved to HSO infrastructure. This can lead to lot of proposals in the Helio AOs. Any increase in budget for science AOs?

Question: 6

Received 2 Upvotes

What is the status of the VERY distance heliospheric mission "follow-on" to the Voyagers (..and the relatively nearby New Horizons)?

Question: 7

Received 1 Upvote

What are the chances of having a gamma-ray detection instrument on-board to make good use of that enormous baseline distance (..with a lot of buffer for storing numerous Gamma-Ray Burst (GRB) profiles for likely-infrequent downloads)?

Head Over to the Heliophysics Advisory Committee Meeting!

Head on Over to the Heliophysics Advisory Committee Meeting!

- **Join by WebEx Link:** https://nasaenterprise.webex.com/nasaenterprise/j.php?MTID=mc76ea47ded81629fb5746fc3b2d9a9e2
- **Join by Phone:**
  - 1-929-251-9612 or 1-415-527-5035
  - Meeting #: 2827 630 2015
  - Password: HPACSummer2024$ (47227866 from phones and video systems)
- **Next Agenda Topic:**
  - Open Comment Period – 1:05 PM – 2:00 PM