NASA Heliophysics Update
Science Space Week 2017
Committee on Solar and Space Physics

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NASA Heliophysics Updates

- Science Highlights
- Missions in Development
- Future Mission Opportunities
- Communications & Outreach
- Division Staff Update
- International Partnerships
- FACA
- ISFM

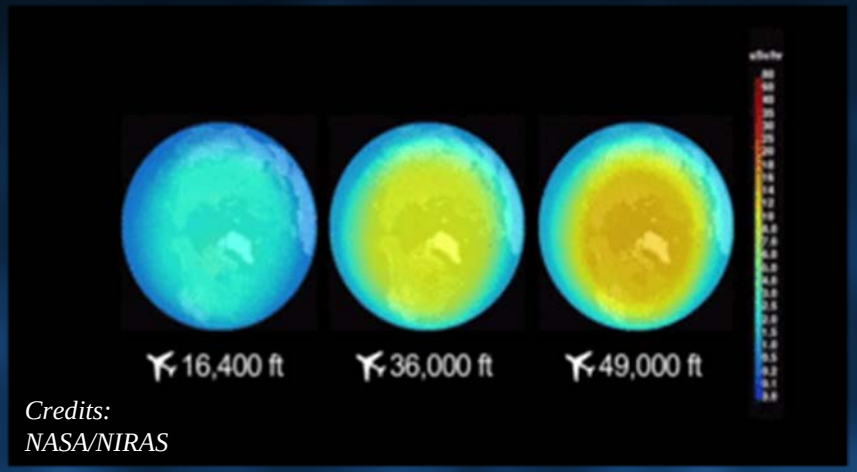
Heliophysics Science Highlights

Rad-X First Results

Some of the FIRST spectral dose measurements of *cosmic radiation* at HIGH ALTITUDES in Earth's stratosphere

Findings

- A steady increase in the dose equivalent rate – a measurement of how cosmic radiation can harm biological tissue – occurred as the altitude increased
- There is a greater risk of cosmic radiation affecting life at high altitudes than previously thought



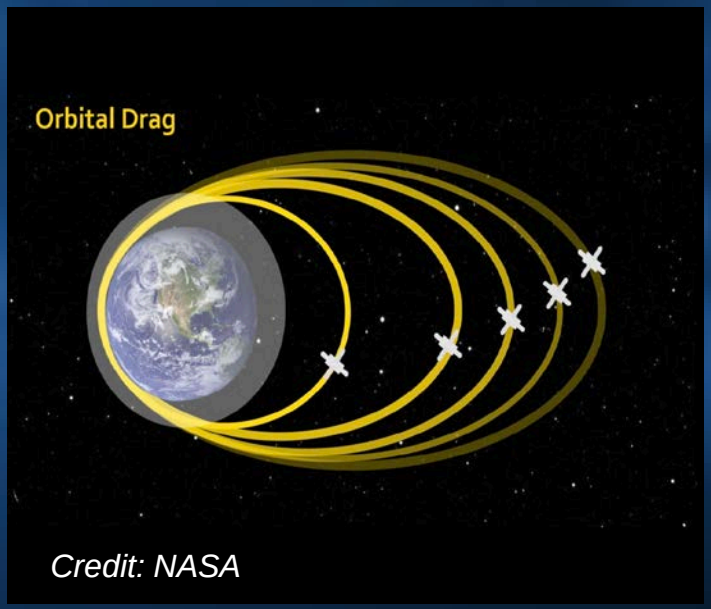
Credits: NASA/NIRAS

Credits: RaD-X

TIMED Data and Orbital Drag

Dolores Knipp, et al., published a paper using TIMED SABER data in *Space Weather* on 10 February 2017 finding:

That the most energetic solar storms **led to shorter swelling times** in the upper atmosphere *due to increased production of nitric oxide*, a cooling agent



Space weather can → Earth's upper atmosphere to swell and expand

A larger upper atmosphere can envelope satellites and create orbital drag

Response times for the thermosphere to return to normal vary greatly

This is surprising because it was thought intense expansion in Earth's upper atmosphere caused heating not cooling.

National Aeronautics and Space Administration

HELIOPHYSICS MISSIONS IN DEVELOPMENT

Helio Program Highlights

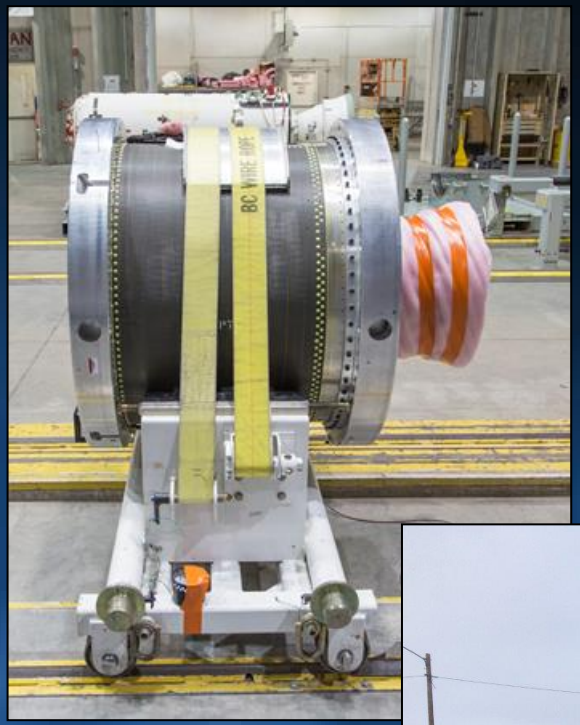
- Avionics Redundant Electronics Module installed on observatory
- Solar Array Cooling System successfully completed functional testing and was shipped to Goddard for further testing

- Heavy Ion Sensor (HIS) Pre-Ship Review successfully completed on March 14
- Solar Orbiter Heliospheric Imager (SoloHI) Pre-Ship Review held on March 17; action closure expected by March 30
- Launch readiness date now February 2019

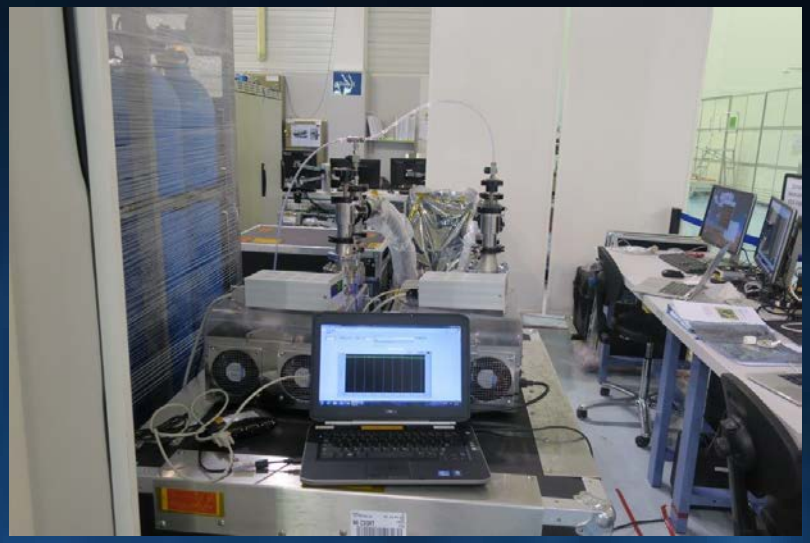
- Observatory thermal vacuum testing continues
- Pegasus Stage 2 motor ultrasonic and x-ray inspections continue

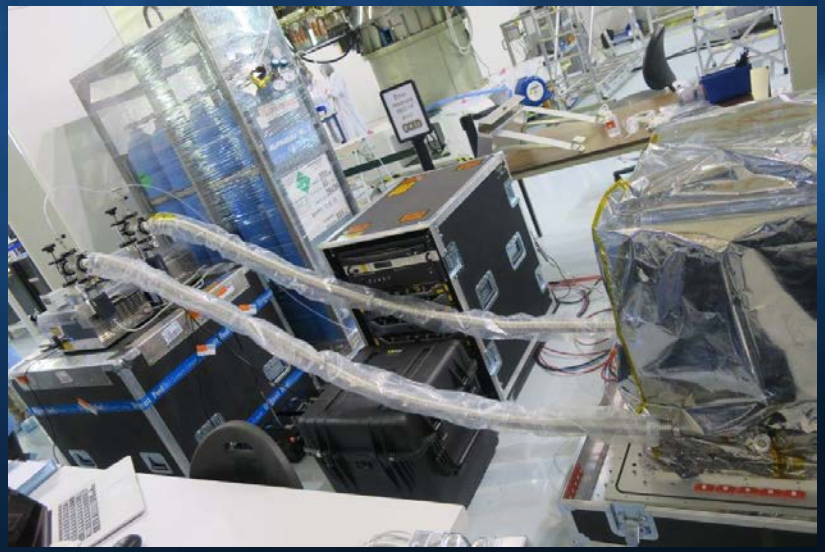
- GOLD instrument at SES/Airbus, Toulouse, France
- All instrument tests successful
- Integration begins 11-12 April 2017

ICON Pegasus LV Shock Event



GOLD @ Airbus in Toulouse, France





GOLD dedicated work area during detector HV test and backfill operation

Solar Orbiter

SACS being moved into the GSFC SES Chamber

Sounding Rocket Manifest

#	Vehicle Type	Veh. No.	Experimenter	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
			WALLOPS ISLAND												
1	Black Brant IX	36.317 GP	HESH/NASA-GSFC-SRPO (SUBTEC7)					△							
2	Terrier Imp Malemute	46.015 GT	HALL/NASA-GSFC-SRPO						△						
3	Terrier Imp Orion	41.121 UO	KOEHLER/UNIV. OF CO (ROCKON)							△					
4	Terrier Imp Malemute	46.017 UO	KOEHLER/UNIV. OF CO (ROCKSAT-X)									△			
			PFRR												
5	Black Brant IX	36.302 UE	BAILEY/VIRGINIA TECH.		▲										
6	Black Brant IX	36.301 UE	PFAFF/NASA-GSFC			△									
7	Black Brant IX	36.303 UE	LYNCH/DARTMOUTH COLL.			△									
8	Black Brant IX	36.304 UE	LYNCH/DARTMOUTH COLL.			△									
9	Black Brant IX	36.306 UE	PFAFF/NASA-GSFC			△									
			WSMR												
10	Black Brant IX	36.309 US	HASSLER/SWRI				△	→	→						
11	Black Brant IX	36.307 DS	TUN/NAVAL RESEARCH LAB						△						
12	Black Brant IX	36.323 UG	FRANCE/U. COLORADO							△					
13	Black Brant IX	36.281 UG	BOCK/UC BERKLEY									△			
14	Black Brant IX	36.262 UG	KAISER/JHU										△		
15	Black Brant IX	36.311 UG	GREEN/U. COLORADO											△	
16	Black Brant IX	36.322 GS	DAW/NASA;GSFC												△
			KWAJALEIN												
17	Terrier Malemute	29.042 UE	HYSELL/CORNELL									△			
18	Black Brant IX	36.321 UE	HYSELL/CORNELL									△			
			REIMBURSABLE MISSIONS												
19	Test Vehicle	12.080 DR	CHRISLEY/ZOMBIE (WSMR)	▲											
20	Test Vehicle	12.085 DR	CHRISLEY/ZOMBIE (WSMR)						△						
21	Test Vehicle	12.086 DR	CHRISLEY/ZOMBIE (WSMR)						△						
22	Black Brant IX	36.326 NR	CLARK/NASA; JPL (WFF)									△			
23	Black Brant IX	36.327 NR	CLARK/NASA; JPL (WFF)												△

Future Mission Opportunities

Explorer mission AO/MO in FY16

Award expected in July

STP-5 (IMAP) mission AO/MO in FY17

Draft AO release in April; MO in July/August

LWS-7 (GDC) mission AO/MO in late FY18

STDT will be established and started in FY17

STDT to assess STP-6 & -7 science objectives to be established and started in FY18

Who:

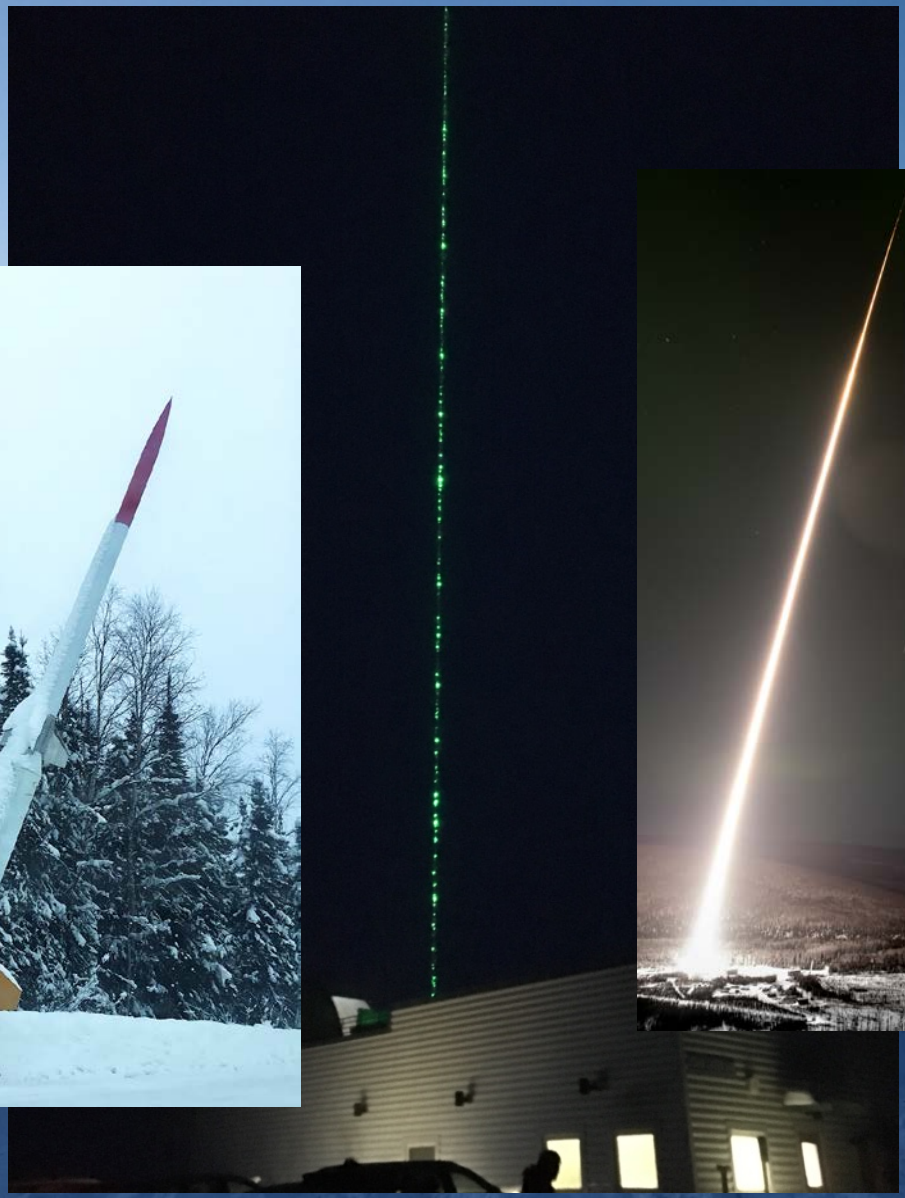
- Science Communities
- Research Institutions
- Congress
- International partners
- Other Agencies

Products

- Information-packed HQ-based Email Newsletters
- Posts to SPA/SPD
- New Helio Connects Talk Series
- Helio Connects page: https://science.nasa.gov/heliophysics
- Social Media:
  - Facebook - Steve Clarke
  - Twitter – @NASASun
  - NASA Snapchat channel
  - NASA Tumbler Blog: https://nasa.tumblr.com/
- Local News Coverage (in development)

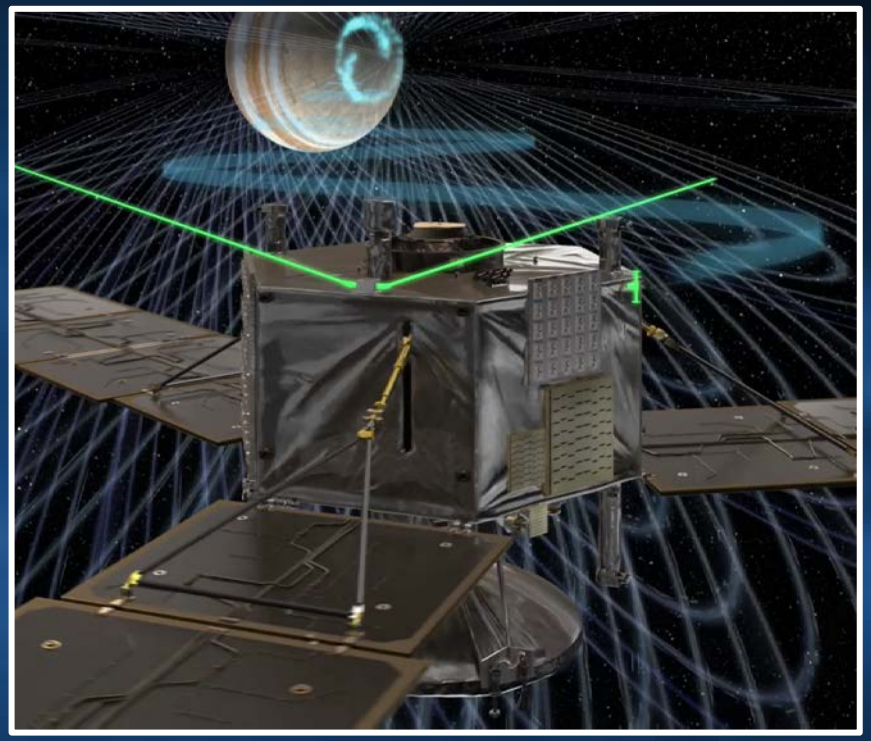
How Heliophysics Connects: Utqiaġvik and Kodiak, Alaska

How Heliophysics Connects: Poker Flat Research Range



How Helio Connects

Planetary's Juno Mission and Solar Wind-Magnetospheric Interactions



Increased opportunity to perform Heliophysics Decadal Survey Science:

Solar Wind-Magnetosphere Interactions

- Magnetic reconnection
- Comparative magnetospheres

Atmosphere-Ionosphere-Magnetosphere Interactions

- Night-time aurora
- Plasma sources and processes
- Occultations

HPD is interested in joint Participating Scientist opportunities to engage Heliophysics scientists as a part of the Juno Science Team

Heliophysics Division Staff Updates

Chief Scientist Selection: Dr. Elsayed Talaat

- Work with Division Director/Deputy Director to develop and implement Division science strategy in conjunction with the Heliophysics community
- NASA lead for National Space Weather Action Plan
- Lead the DRIVE implementation

New Program Scientists

- Jeff Morrill (from NRL)
- Jared Leisner (ASRC); on board beginning 03 April
- Janet Kozyra, IPA

New Program Executive: Alan Zide

New Integration Support Specialist: Heather Futtrell (BAH)

New Communications & Outreach Specialist: Aaluk Edwardson (ASRC)

Heliophysics International Partnerships

- NASA-ESA Bilats in Paris
- NASA-Space Situational Awareness (SSA) discussions (re: L5 mission)

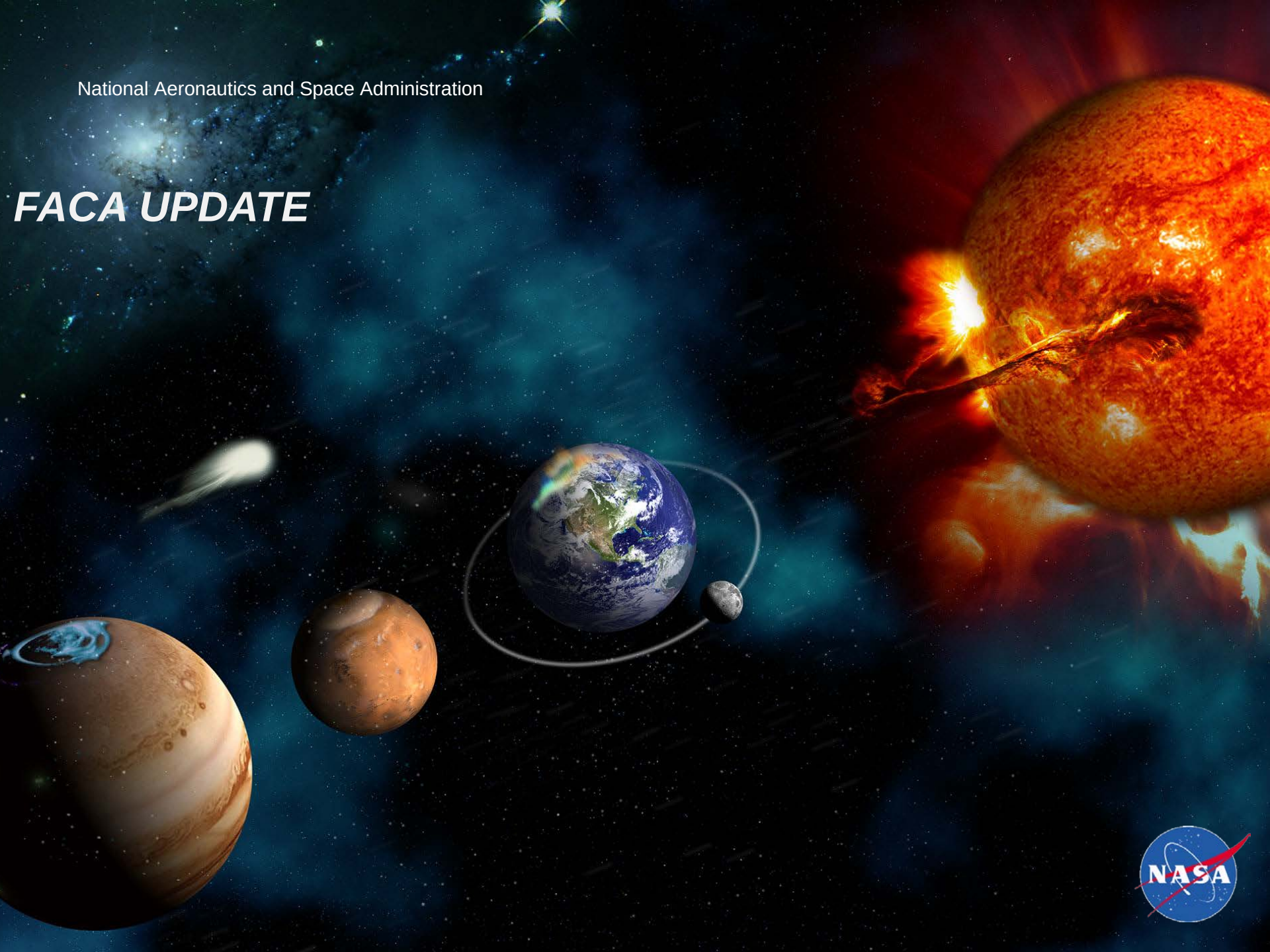
- Continued discussions concerning flying prototype coronagraph on a balloon flight in 2019
- Next face-to-face meeting in D.C. March/April

- Next Generation Solar Physics Mission (NGSPM) Science Objectives Team (SOT) draft report due in April; final in July

- First working group meeting held via VITS on 06 February
- 3 sub-working groups established - 1) Aditya-1 mission collaboration, 2) space weather modeling, 3) long-term strategic collaboration focus areas

National Aeronautics and Space Administration

FACA UPDATE



Evolution of the Heliophysics Subcommittee

NASA has chartered four science advisory Committees, replacing our four science Subcommittees, including the Heliophysics Subcommittee.

Many community-based studies (e.g., Senior Reviews, Science and Technology Definition Teams) will now have a chartered Federal Advisory Committee to which to report.

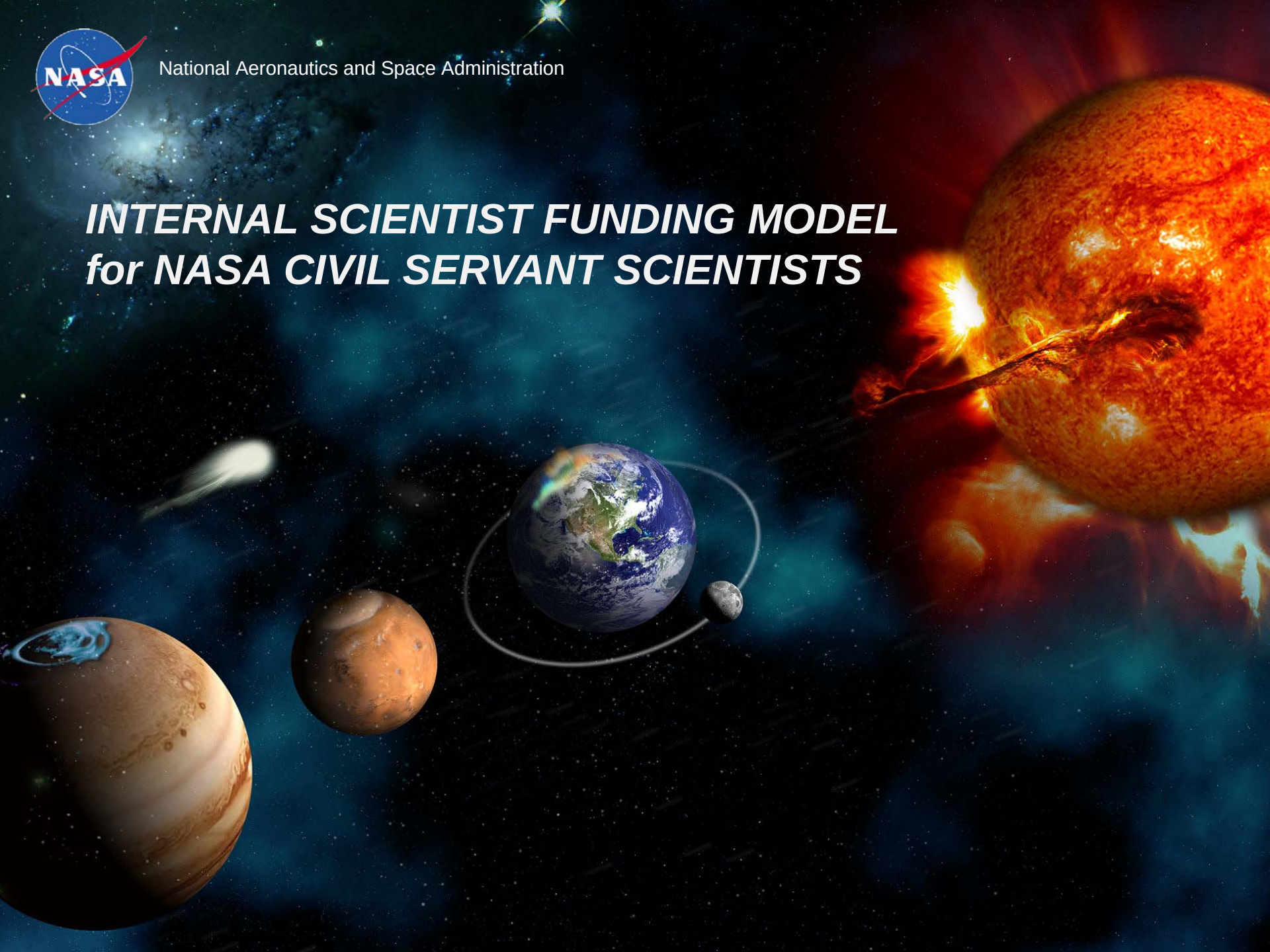
All charters have been signed and the Heliophysics Advisory Committee (HPAC) is in the process of being established.

Once established HPAC will direct the following:

- Senior Review (already in process; now delayed)
- GDC STDT
- DYNAMIC/MEDICI STDT

National Aeronautics and Space Administration

INTERNAL SCIENTIST FUNDING MODEL for NASA CIVIL SERVANT SCIENTISTS



ISFM Context

NASA has approximately 1000 civil servant scientists (this does not include JPL)

The role of NASA's civil servant scientists is to

- Contribute to the Agency's many missions by serving as program and project scientists, instrument scientists, mission planners, scientific data archivists and analysts, and leading researchers in their fields
- Conduct a broad variety of activities in original research, in technology development, and in service to the outside scientific community, bringing to bear the unique facilities and capabilities of NASA Centers
- Participate with their community colleagues in competition and peer review to keep NASA scientists up-to-date and on the forefront of their respective fields

It is in the national interest that these activities be conducted and supported in a way that optimizes the NASA workforce's productivity and realizes its leadership potential

Of the 1000 scientists, ~150 FTE (spread over ~350 scientists) are funded through competed research awards

- The majority of the funding for civil servant scientists comes from other sources, such as flight projects and instruments, science teams, community service, directed supporting research and technology, and Center internal funding

ISFM Changes

NASA is adjusting its internal funding model for civil servant scientists to include more directed work for critical-sized groups

- This is an internal realignment to use NASA civil servant scientists more efficiently
- It focuses on work that can best be done or only be done at NASA Centers
- It does not affect the balance between internal and external funding
- All directed work will be externally reviewed

Objectives and benefits of this new model

- Enhance the value of Agency funds by having the NASA civil servant scientists work on tasks that are substantial, strategic, focused, and that enable the broader science community, rather than compete with the external science community
- Ensure that NASA civil servant scientists advance tasks that meet NASA objectives and can best/only be done at NASA Centers, resulting in science, technology, capabilities, and missions that are tightly integrated
- Ensure a critical mass of selected capabilities necessary to conduct complex research on key topics
- Adopt a strategic implementation that will reduce the number of proposals written by NASA civil servant scientists and improve the efficiency of inherently governmental work

There will be no change in the balance of the research budget allocated between NASA civil servant scientists and the external community

- The new funding model is designed to be neutral regarding the fraction of funding going to the external scientific community

ISFM Goals

The amount of directed Research and Analysis (R&A) work at the Centers will be increased

- This will result in a decrease in R&A proposals from NASA Center scientists
- NASA civil servant scientists may still compete for R&A, but in reduced numbers
- Mission AOs and mission-funded guest observer (GO) programs will not be directed

All directed R&A work will be collaboratively planned between the Centers and HQ/SMD Divisions

- The amount and type of directed work will vary between individual Centers and Divisions

All directed R&A work will be peer reviewed

- This will include both initial and periodic external peer reviews

The fraction of R&A funding going to the Centers will remain consistent with historical levels and the increase in directed R&A work at the Centers will not impact the balance between internal and external funding

Thank You

Questions? Comments? Email us at HQ-HelioConnects@hq.nasa.gov