

National Aeronautics and
Space Administration



EXPLORE SCIENCE


SMD Community Townhall

August 17, 2022

Dr. Thomas H. Zurbuchen

Associate Administrator

NASA Science Mission Directorate

 @Dr_ThomasZ



NEWS &
UPDATES



PROGRAMS &
RESEARCH



DIVISION
HIGHLIGHTS

NASA and SMD Thank You for 33 Years of Service



Mr. Gregory L. Robinson
Retired Director, James Webb Space Telescope Program



Dr. Julie Robinson
Deputy Director
Earth Science Division



Dr. Brad Bailey
Assistant Deputy Associate
Administrator for Exploration

Dr. Mark Clampin

Director, Astrophysics Division

- Dr. Clampin joined SMD as the Director of the Astrophysics Division August 15, 2022
- Dr. Clampin has more 30 years of leadership experience at NASA's Goddard Space Flight Center (GSFC) and the Space Telescope Science Institute (STScI)
- Most recently, he served as the Director of the Sciences and Exploration Directorate (SED). Previous roles include Astrophysics Division Director at GSFC, and JWST Observatory Project Scientist
- Research interests include the formation and evolution of planetary systems, and instrumentation for space science



Introducing the Senior Advisor

- Paul Hertz has moved from the Astrophysics Division to the SMD Front Office as Senior Advisor to the AA
- The Senior Advisor
 - Provides expert technical and policy
 - Conducts special studies
 - Serves as liaison between communities
- Some of the Senior Advisor initial activities include
 - A study on how mission formulation for smaller missions, including AO-selected missions, can be accelerated
 - A review of the NASA Postdoctoral Program
 - Mitigating the impacts of LEO mega-constellations on SMD science missions



WEBB

SPACE TELESCOPE

NASA's James Webb Space Telescope's first full-color images and spectroscopic data were released on Tuesday, July 12, 2022. Webb's first observations were selected by a group of representatives from NASA, ESA, CSA, and the Space Telescope Science Institute. They reveal the capabilities of all four of Webb's state-of-the-art scientific instruments.

SMACS 0723 –
Webb's First
Deep Field



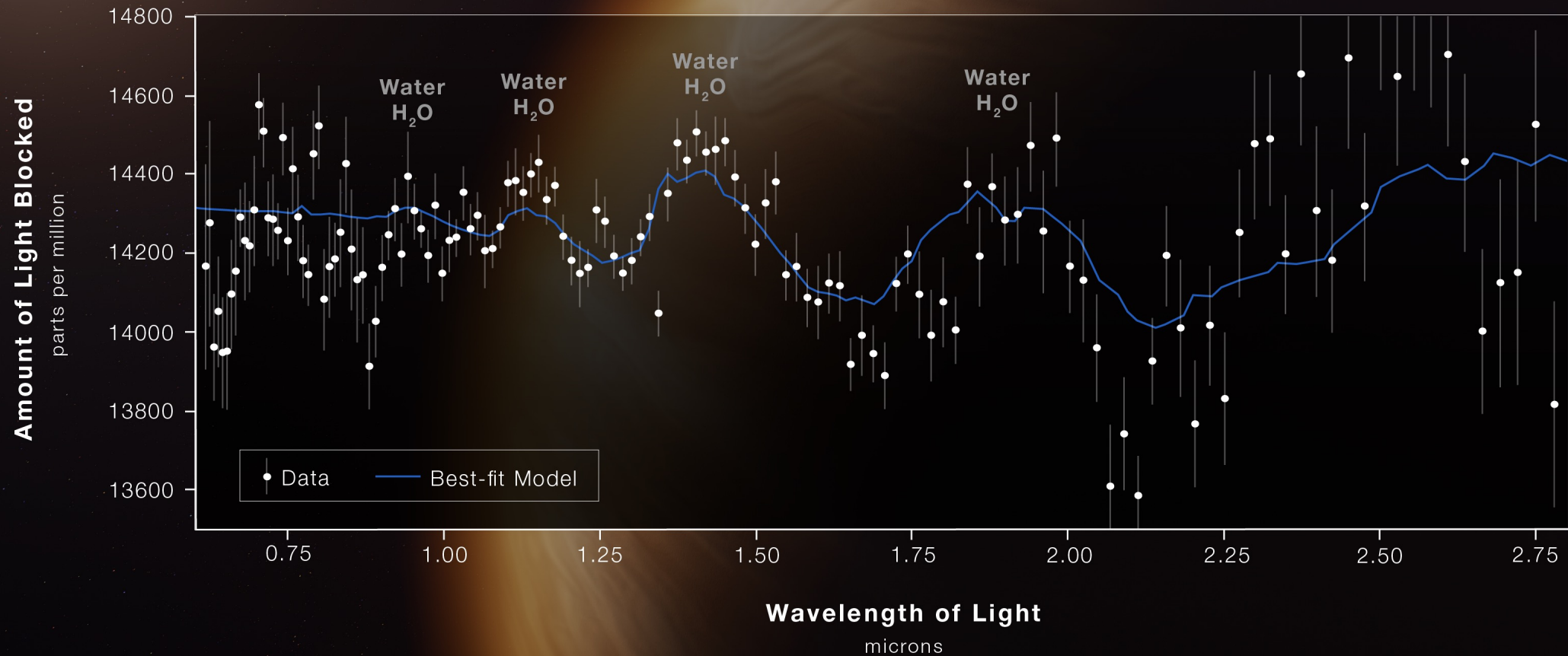






ATMOSPHERE COMPOSITION

NIRISS | Single-Object Slitless Spectroscopy



Artemis I Moves Forward to Launch

NASA is currently targeting no earlier than Monday, August 29, for the launch of the Space Launch System rocket to send the Orion spacecraft around the Moon and back to Earth. The mission will take place over the course of about six weeks to check out systems before crew fly aboard on Artemis II.



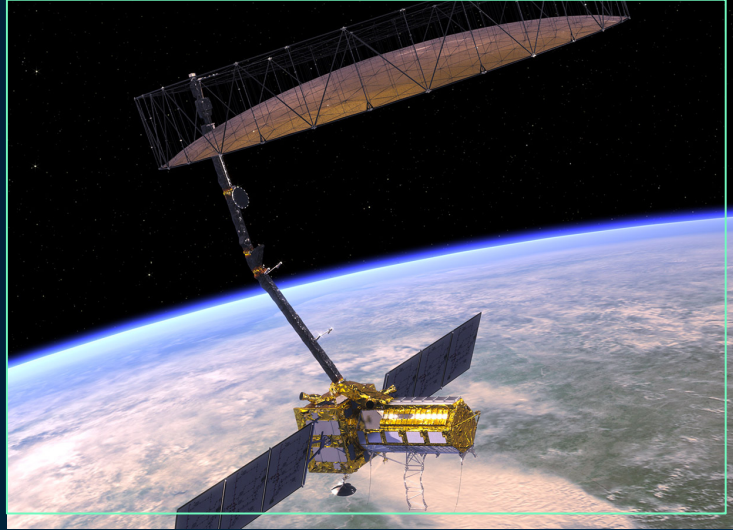
Independent Review Boards

Psyche



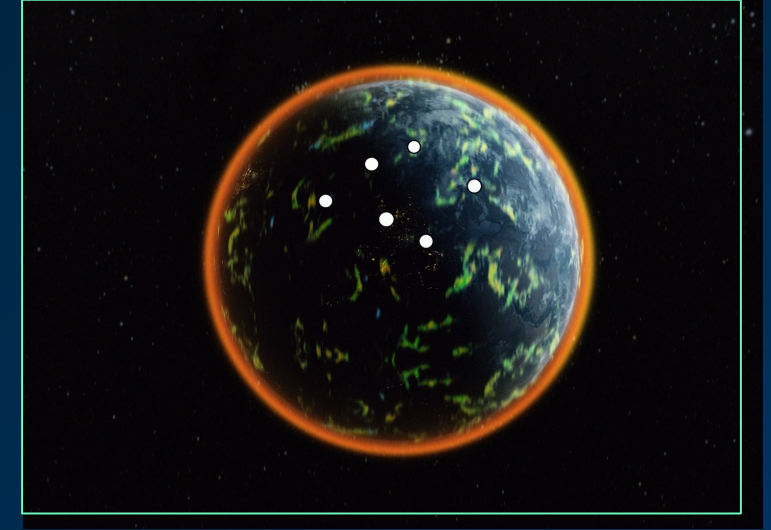
- Psyche's launch has been postponed to no earlier than 2023
- NASA has commissioned an Independent Review Board to examine project and institutional issues that led to the Psyche mission missing its planned 2022 launch opportunity, and to review the mission's path forward

Earth System Observatory



- NASA has established an Independent Review Board to assist with the development of the Earth System Observatory (ESO)
- ESO will guide efforts related to climate change, disaster mitigation, forest fires, weather and air quality forecasts, and real-time agricultural processes

Geospace Dynamics Constellation



- NASA has chartered an Independent Review Board to review the overall architecture and technical concept for NASA's Geospace Dynamics Constellation (GDC)
- GDC will study how the magnetosphere interacts with Earth's upper atmosphere



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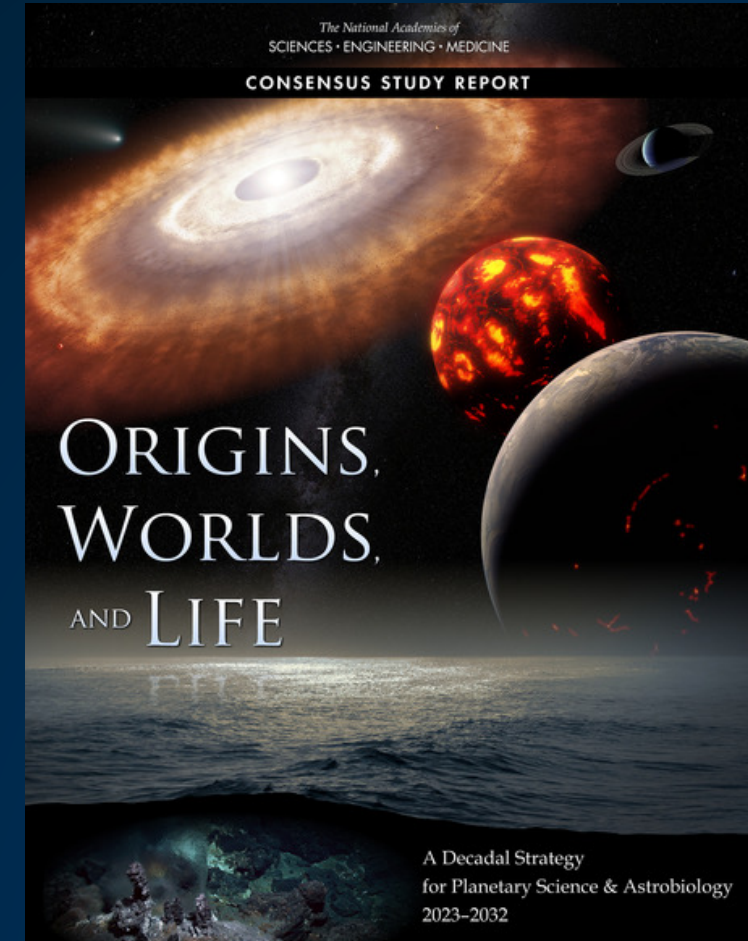
SMD FY23 Budget Status

| | | FY23 President's Budget Request | FY23 draft House approp | <i>Delta to FY22 Enacted</i> | <i>Delta to FY23 PBR</i> | FY23 draft Senate approp | <i>Delta to FY22 Enacted</i> | <i>Delta to FY22 PBR</i> |
|---------------------------|-------------------------|--|--|--------------------------------------|------------------------------|---|--------------------------------------|------------------------------|
| \$M | FY22 Enacted | | | | | | | |
| Earth Science | 2,064.7 | 2,411.5 | 2,334.8 | 270.1 | (76.7) | 2,346.1 | 281.4 | (65.4) |
| Planetary Science | 3,120.4 | 3,160.2 | 3,200.0 | 79.6 | 39.8 | 3,209.8 | 89.4 | 49.6 |
| Astrophysics (incl. JWST) | 1,568.9 | 1,556.0 | 1,525.0 | (43.9) | (31.0) | 1,561.0 | (7.9) | 5.0 |
| Heliophysics | 777.9 | 760.2 | 760.2 | (17.7) | - | 828.4 | 50.5 | 68.2 |
| BPS | 82.5 | 100.4 | 85.0 | 2.5 | (15.4) | 100.4 | 17.9 | - |
| Total Science | 7,614.4 | 7,988.3 | 7,905.0 | 290.6 | (83.3) | 8,045.7 | 431.3 | 57.4 |

- Both House and Senate draft appropriations show strong support for Science by increased budgets well over the FY22 Enacted level
- Both House and Senate versions support Mars Sample Return and Earth Science priorities such as the Earth System Observatory and the Earth Information Center

Planetary Science and Astrobiology Decadal Survey 2023-2032

- 90-day initial response complete
- NASA Science appreciates the hard work of the National Academies
- Ratification the program is generally going in the right direction, acknowledge work to be done
- Currently reviewing report, from the State of the Profession through to the mission suggestions and priorities



UAP Independent Study: Key Points

- On June 9, 2022, NASA announced an Independent Study to examine Unidentified Aerial Phenomena
- The Independent Study Team will be chaired by Dr. David Spergel (President, Simons Foundation)
- The study will focus on identifying available data, how best to collect future data, and how NASA can use that data to move the scientific understanding of UAPs forward
- SMD and the Aeronautics Research Mission Directorate (ARMD) is appointing members from across the scientific, aeronautics, and data analytics communities
- Ongoing consultation and coordination with DoD and multiple Congressional stakeholders



August 3 UAP coordination meeting between Hon. Ron Moultrie, Under Secretary of Defense for Intelligence and Security and NASA Administrator Sen. Bill Nelson

Toward a New Generation of Suborbital Research

- SMD is excited by the emergence of new commercial suborbital platforms that complement NASA's existing capabilities
- Beginning this year, SMD will open up new suborbital research avenues by fully offering commercial capabilities alongside traditional NASA-provided platforms
- Partnership between SMD and STMD's Flight Opportunities Program
- The first ROSES solicitation to offer commercial platforms will be APRA-22, which will be released imminently
- SMD also plans for a series of events to showcase these new commercial capabilities as well as to encourage new investigators to get involved in suborbital research



SMD-STMD Innovation Corps Pilot



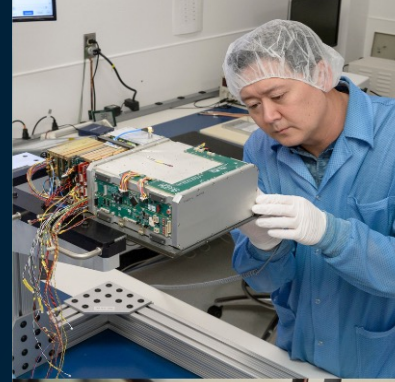
Are you ready for your innovation to take off?

Join NASA's Innovation Corps Pilot today:

- An immersive entrepreneurship training for your idea to go from the lab to the deep space marketplace. A program designed for not-for-profit entities, such as academia & nonprofit research institutions. Apply today!

Build Your Capabilities through the NASA Innovation Corps:

- Informed decision-making to facilitate research and/or technology transitions and new NASA funding opportunities
- Facilitated focus and inspiration on the commercial potential of proposed research and/or technology
- Advanced workforce development opportunities in science missions and space technology by preparing students with a foundational education in entrepreneurship
- Enhanced entrepreneurial mindsets



Interested in exploring potential customers? Form your team and apply today for a **\$10k grant** to support your team & customer discovery. Subsequent funding up to **\$40k** will also be available

Easy lift proposal - 6 pages or less - due to NSPIRES by:

- September 16, 2022
- November 17, 2022
- January 20, 2022

Stay Connected

Create a NSPIRES account and subscribe to the newsletters for reminders and updates and read the full solicitation for the most accurate and up-to-date information

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Dominic Hart; Joel Kowsky; Frank Michaux*

Status of SMD Programs

- **The state and health of the SMD Flight Portfolio is Good**
- **SMD has a total of 134 missions:** 9 – Formulation, 48 – Implementation, 20 – Primary Operations, 57 – Extended Operations
- **Launch Status:**
 - EMIT successfully launched 14 July 2022
 - TROPICS – upper stage failure resulted in the lost of 2 CubeSats on 12 June 2022 (remaining 4 CubeSats launches are being rescheduled)
 - Psyche launch delayed
 - JPSS-2 (early November) and SWOT (early December)
- **Portfolio Management:**
 - SMD SRB Implementation Guide released
 - SMD Class D Implementation Guide and Class D Compliance Matrix release coming soon
- **Areas of Concerns:** workforce availability/retention, inflation rates, supply chain reliability, and loss of niche capabilities
- **Recently Completed Studies**
 - COVID-19 Impact
 - SMD Assessment Performance
 - Class C/Sub-Class C (follow-up to the Constellation Risk Classification study)



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Division Highlights

- Exploration Science Strategy and Integration Office (ESSIO) – Brad Bailey
- Astrophysics – Mark Clampin
- Biological and Physical Sciences (BPS) – Craig Kundrot
- Heliophysics – Nicky Fox
- Planetary Science – Lori Glaze
- Mars Sample Return Program Office – Jeffrey Gramling
- Earth Science Division – Julie Robinson

ESSIO Highlights

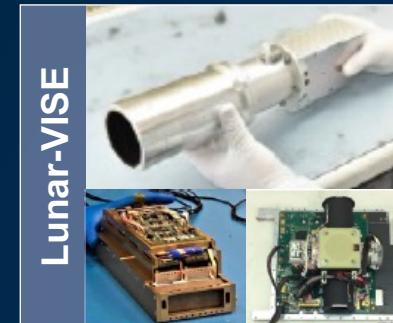
- CLPS contract (CP-12) awarded to Draper for Schrödinger Basin in 2025
- *Payloads and Research Investigations on the Surface of the Moon* (PRISM-2)
 - Lunar Vulkan Imaging and Spectroscopy Explorer (Lunar-VISE) will land at Gruithuisen Domes, to study geologic processes preserved on the Moon, by investigating rare lunar volcanism | PI: K. Donaldson Hanna
 - Lunar Explorer Instrument for space biology Applications (LEIA) will land near south pole to study the biological response of yeast to the environment and determine how partial gravity and deep space radiation influence biological processes | PI: A. Settles
- PRISM-3 draft solicitation text was released via ROSES-22 on 8/4
- Updates on CLPS task orders 19C and 20A:
 - VIPER landing delayed to 2024 for additional testing on Astrobotic Griffin lander
 - Masten XL-1 lander in 2023 may be affected by Masten business operations; if Masten is unable to complete the task order, NASA will manifest its payloads on other CLPS flights
- LRO photography successfully used to detect recent events on the Moon
 - On 6/16, the LROC team identified a new lunar impact crater(s) that formed from a spent booster impact that occurred 3/4; the impact at 5.2 N, 234.4 E appears to have created conjoined craters



Draper's SERIES-2 lunar lander



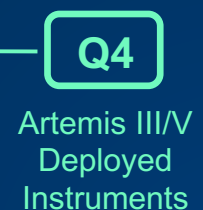
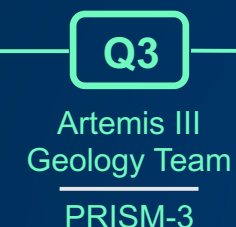
Feb 28: Pre-impact point imaged
May 21: Post-impact shows crater



Lunar-VISE

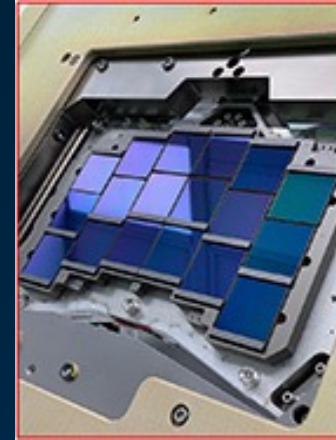


LEIA



Astrophysics Division Highlights

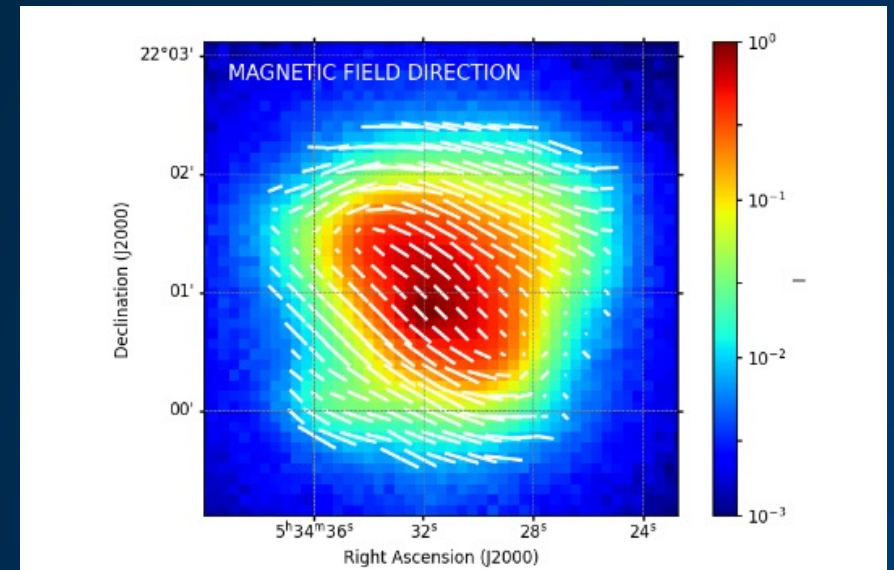
- The Nancy Grace Roman Space Telescope's 300-megapixel infrared detector array – the world's largest – has been assembled for flight.
- The Roman Coronagraph Instrument (CGI) passed System Integration Review (SIR) successfully on June 14 – 15, 2022
- SOFIA deployed to New Zealand for final southern hemisphere campaign; mission will successfully conclude by September 30.
- Successful Australia sounding rockets launch - establishing a new launch range capability in the southern hemisphere.
- All Astrophysics missions participating in the Senior Review were extended.
- IXPE first science results were delivered at the Summer AAS



Roman's IR FPA



Sounding Rocket Launch



IXPE x-ray image of Crab Nebula showing x-ray polarization

BPS Division Highlights

Fundamental firsts:

- UF scientists grew plants in Lunar regolith collected during the Apollo missions
- Cold Atom Lab (CAL) formed ultracold quantum bubbles aboard the space station

Solicitations and selections:

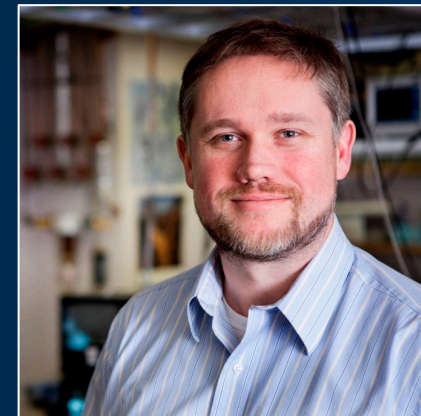
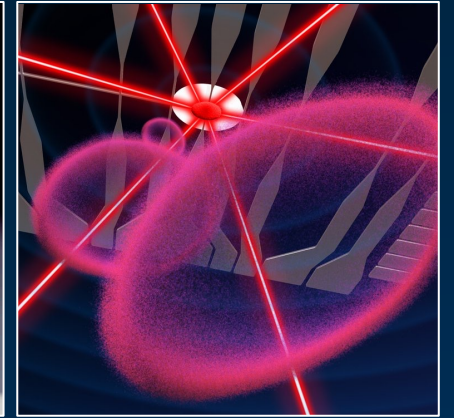
- Lunar Explorer Instrument for space biology Applications (LEIA) investigation selected for NASA's Payloads and Research Investigations on the Surface of the Moon (PRISM)
- Released Commercially Enabled Rapid Space Science (CERISS) RFI soliciting input on developing capabilities to accelerate the pace and productivity of research

Recognition:

- Shawn Reagan, MSFC physical sciences portfolio manager, selected as a Space Flight Awareness Honoree
- Dr. Rob Ferl, UF/IFAS professor and assistant vice president of horticultural research, received NASA's Exceptional Public Service Medal
- Nathan Lundblad, prof. of physics at Bates College, represented his team and JPL ops in receiving Physical Sciences Research Award at the ISS R&D conference

Welcome:

- Dr. Michael Robinson is the new BPS Fundamental Physics Program Scientist

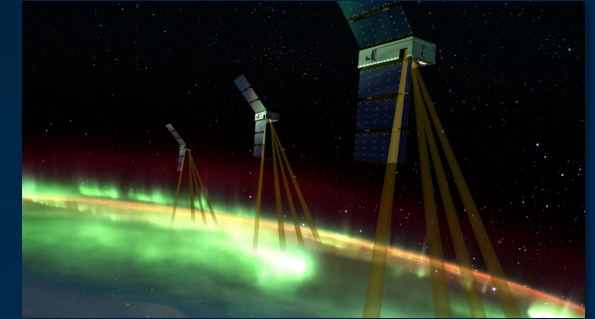


Heliophysics Division Highlights

- Geospace Dynamics Constellation (GDC) investigations/instruments selected April 26. GDC IRB Final Report Presentation held August 3.
- Division Director Nicky Fox presented at the Amazon re:MARS event June 23
- All three Sounding Rockets (XQC, SISTINE, DEUCE) from the Australia campaign have been successfully launched
- **Congratulations EZIE!** – Confirmed for flight (KDP C) June 28
- Voyager was on the cover of July's *Scientific American*
- Get ready for the [Heliophysics Big Year](#)! Join us from October 2023 to December 2024.
- 2024 Decadal Kickoff August 22-23; [White papers](#) due to NASEM August 24



Nicky Fox and Adam Savage at Amazon re:MARS



Artist's conception of EZIE
Credit: NASA/Johns Hopkins APL



July cover of Scientific American featuring Voyager

Planetary Science Division Highlights

InSight:

- Available power continues to drop – science operations expected to cease sometime late this summer or fall
- Current SEIS strategy: ~30 hrs on/~16 hrs off
- After mid September, available energy will stress SEIS on-time
- For latest updates: <https://blogs.nasa.gov/insight/>

Lucy:

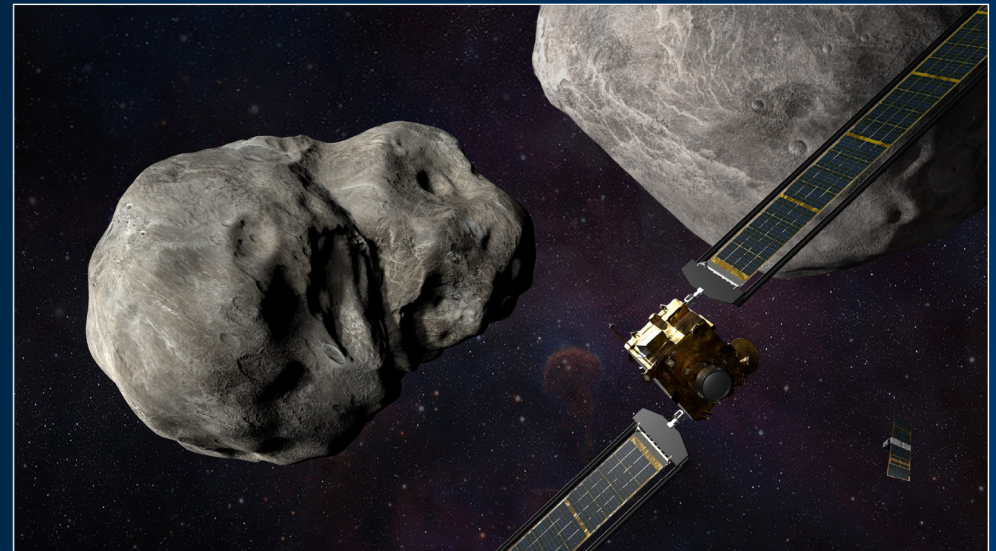
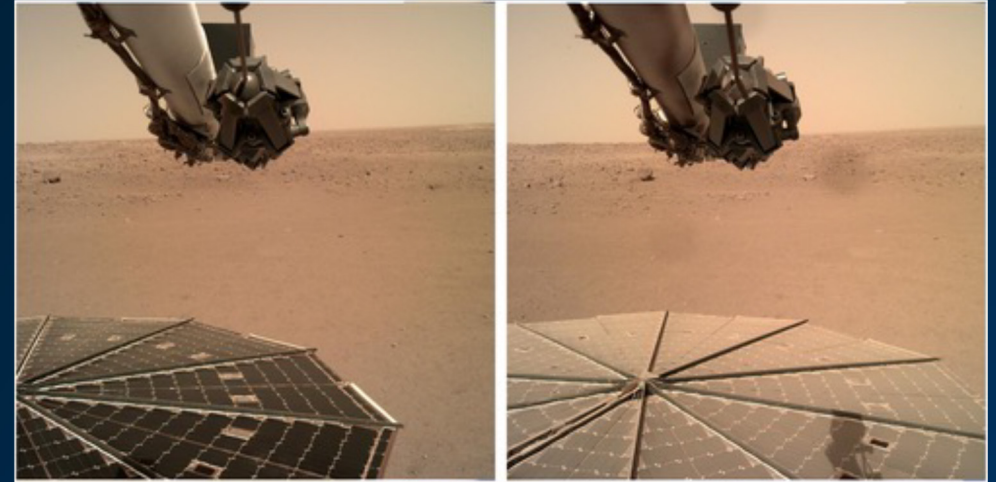
- Recently completed multi-stage effort to further deploy unlatched solar array – now open between 353° and 357°
- Team is confident it is stable enough to meet mission needs, including Earth-gravity assist in October

DART:

- Dimorphos impact will be September 26 at 7:14 pm!

Decadal Survey:

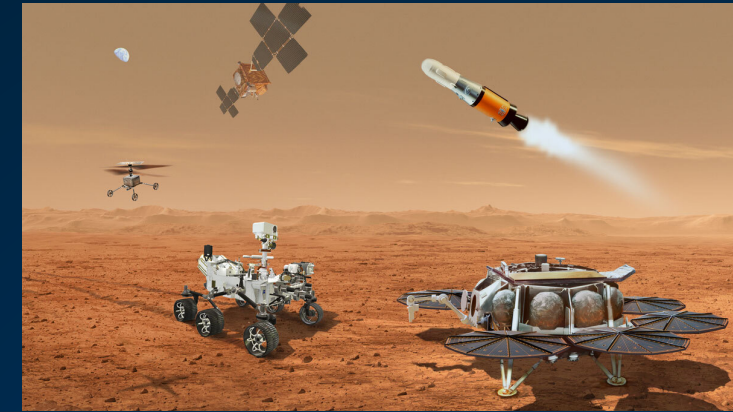
- Preliminary PSD response has been provided to NASEM
- Initial public response will be provided in a virtual Community Townhall, Thursday August 18, 2–4 pm (Eastern)



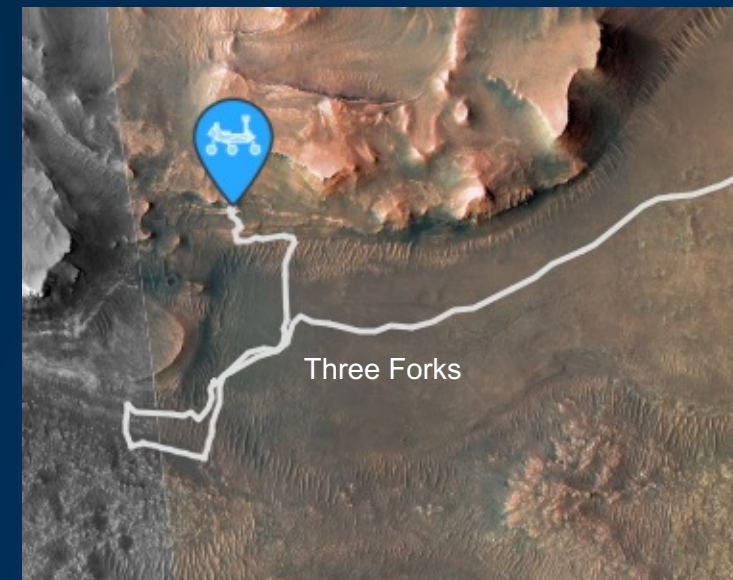
Mars Sample Return (MSR) Highlights



- The MSR Program completed the System Requirements Review and Mission Definition Review of the refined system architecture being developed to return the scientifically-selected samples that the Perseverance rover is collecting at Jezero Crater as it continues its successful exploration mission
 - Based on updated assessment of the rover's expected longevity, Perseverance will be the primary means of transporting samples to the Sample Retrieval Lander (SRL)
 - As a backup to Perseverance, in the single-lander architecture, SRL will bring along two sample recovery helicopters in addition to the Mars Ascent Vehicle and ESA's Sample Transfer Arm
 - Sample Recovery Helicopters will be based on the design of the Ingenuity helicopter that has successfully demonstrated the technology in Mars atmosphere
 - The ESA Earth Return Orbiter with NASA's Capture, Containment, and Return System payload remain unchanged
 - The mission architecture was presented in a press briefing on July 27th
- Perseverance is preparing to deposit one set of the sample core pairs collected to date at the "Three Forks" area in Jezero Crater as early as November, making it a potential landing site for the SRL
- Established the MSR Campaign Science Group (Phase 1)
 - Members selected through an open, international, competitive call (80 applicants, 16 selected)
 - Supports development of: MSR science R&D roadmap; selection criteria for science team; MSR Sample Management Plan; Data Management Plan; and Communication Plan
- A Science community workshop is scheduled for September 28th & 30th to help establish what constitutes a Scientifically Return Worthy (SRW) sample cache and strategy for depot formation in preparation for establishment of the first depot



Mars Sample Return Flight Elements



Initial Sample Cache Depot Location



MARS
2020
PERSEVERANCE

Sample Collection Map: Cores 1-12



Earth Science Division Highlights

Mission Updates

- EMIT first light images of mineral dust; will study effects on climate from ISS
- ESO missions (MC, AOS, SBG) passed mission concept reviews
- Airborne campaigns underway; student science flights resumed

Earth Science Highlights

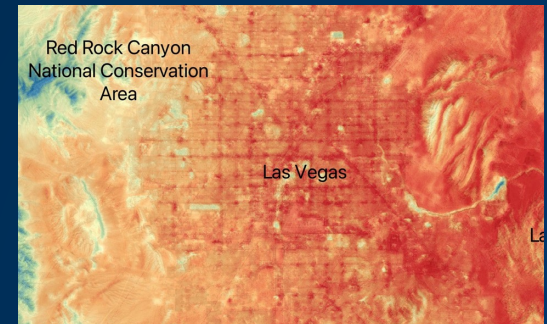
- Milestones: Landsat 50 years/10 million images; Aqua 20 years; EOSDIS broke the 1 billion records mark on June 18
- Results: GEDI first near-global estimate of aboveground forest biomass and its stored carbon; MODIS sea ice and polar bear genetics; Climate patterns/ground radar and bird migration; Ozone around the Great Lakes; New FIRMS dashboard makes wildfire data available in seconds

Of Note

- Cynthia Rosenzweig of GISS wins 2022 World Food Prize
- In memoriam: Shelby G. Tilford (1937-1922), former NASA Acting Associate Administrator of Mission to Planet Earth



EMIT launch



ECOSTRESS captured record-high temperatures in Las Vegas.

A young girl with long dark hair, wearing a red, white, and blue striped tank top with white stars, is looking down at a glass jar she is holding. The jar contains several fireflies, some of which are glowing. She is standing in a field of tall grass. In the background, there are mountains and a night sky with a full moon and many stars. A boy is visible in the distance, also looking at the sky. A bird is flying in the sky. The overall scene is magical and serene.

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