National Aeronautics and Space Administration

NASA SMD Key Science Issues and Priorities

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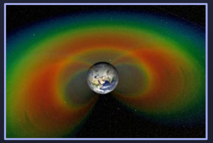
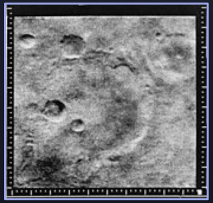
NASA Science: The Agency's Pathfinder

Groundbreaking Advances in US Space Science
Innovative Mission Designs and Technology

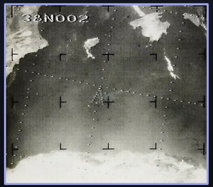
National Aeronautics and Space Administration



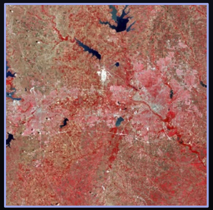
Explorer 1
1958: Discovery of the Van Allen radiation belts



Mariner 4
1964: First successful flyby of another planet



NIMBUS 1
1964: 1st weather satellite, and precursor to NOAA missions.



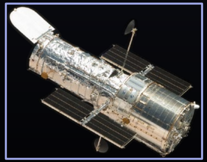
Landsat 1
1972: 1st satellite to monitor earth and provide data for commerce

Pioneer 10
1972: 1st flyby of an outer planet (Jupiter)

Viking 1
1975: NASA's Viking 1 was the first to land on Mars

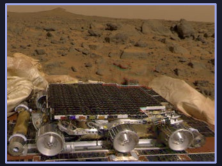
Voyager 1
1977: Most distant human-made object from earth

COBE
1989: Measured cosmic microwave background temperature and anisotropy
→ **Nobel Prize**



Hubble
1990: Changes our understanding of the early Universe, and helps discover Dark Energy
→ **Nobel Prize**

5 Hubble Servicing Missions
1993: 1st major astronaut work in space and precursor to the construction of ISS



First Exploration of Mars
1997: Sojourner Rover is first wheeled vehicle to explore another planet

First Powered Flight on Mars
2020: 1st powered flight on another plane by the helicopter Ingenuity

JWST
2021: Largest (6-m) deployable, cryogenic space telescope ever flown

Lunar Landing
2025: NASA's return to the moon with a successful landing via a commercial partnership

Budget Authority ($M)	FY 2024 Operating Plan[1/]	FY 2025 Enacted[2/]	FY 2026 Request				
			FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Science	**7,325.4**	**7,334.2**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**
Earth Science	2,138.9		1,035.9	1,055.9	1,081.9	1,106.9	1,077.9

1/ - FY 2024 reflects amounts in Public Law 118-42, Consolidated Appropriations Act, 2024, adjusted by NASA's September 2024 Operating Plan.
2/ - FY 2025 reflects the funding amount specified in Public Law 119-4, Full-Year Continuing Appropriations and Extensions Act, 2025.

https://www.nasa.gov/fy-2026-budget-request/

- Prioritizes missions such as NISAR, SWOT, SMAP, PACE, and GRACE-Continuity that provide information on natural hazards and environmental conditions that support various industries and users beyond the science community.
- $70M within Sustainable Land Imaging to ensure continuity of Landsat data, as NASA restructures the Landsat Next mission and studies more affordable mission architectures in collaboration with the U.S. Geological Survey.
- $154M for competitively awarded research to enhance scientific understanding, maintain U.S. leadership, provide economic benefits to industry, protect taxpayers through better environmental monitoring, and stimulate innovation in commercial Earth observation.
- $111M for the Responsive Science Initiatives and Applied Science programs to support high priority integrated science and applications relevant to users and decisionmakers, including agriculture and wildfires.
- $51M for the Earth Science Technology Program, to develop advanced technologies that enable new science capabilities, enhance measurements, and reduce costs and risks for future Earth science instruments.

Budget Authority ($M)	FY 2024 Operating Plan[1/]	FY 2025 Enacted[2/]	FY 2026 Request				
			FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Science	**7,325.4**	**7,334.2**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**
Biological and Physical Sciences	87.5		25.0	25.0	25.0	25.0	25.0

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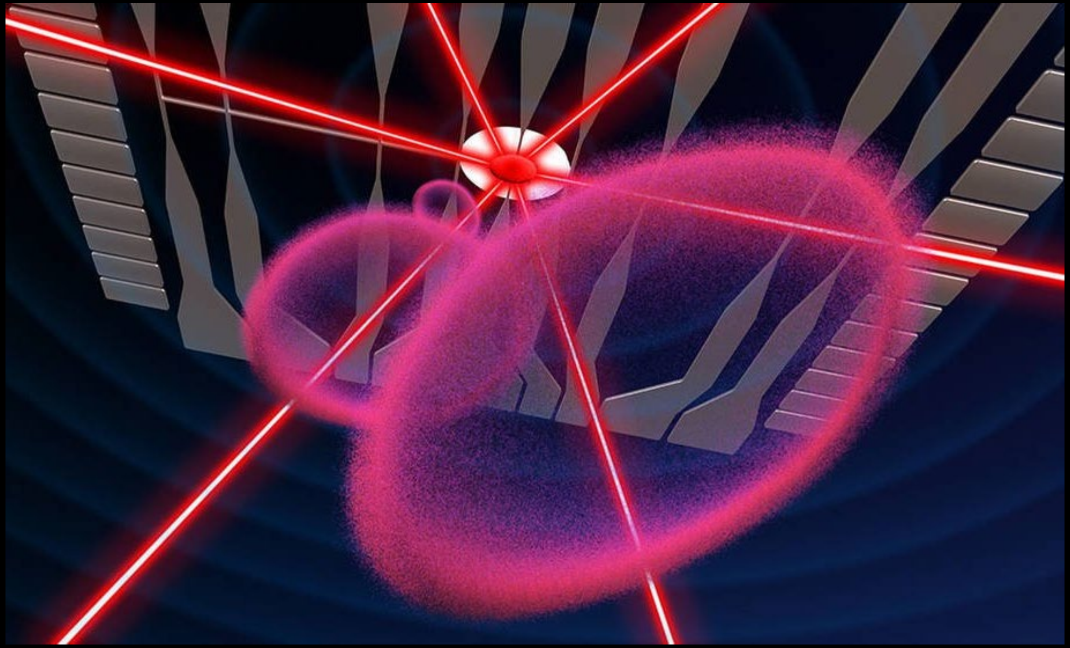
- BPS conducts research in space to obtain critical insights into how biological and physical systems function by taking advantage of the unique, extreme conditions found in space, such as altered gravity and deep-space radiation.
- $4M for Space Biology investigations, including the first organ-chip experiment which will fly on Artemis II to study aging and disease mechanisms in deep space and the LEAF payload on Artemis III to study plant growth and photosynthesis on the lunar surface to enable sustainable food production for long-duration missions.
- $13M for Physical Science investigations, including Cold Atom Lab upgrades to achieve record-cold atoms for improved atom interferometry and fundamental physics tests including dark energy research, and the Flammability of Materials on the Moon-2 experiment to study material flammability in lunar gravity conditions.



- $4M for Commercially Enabled Rapid Space Science, supporting efforts with commercial industry to modify existing lab equipment for on-orbit analysis capabilities, for use on future commercial suborbital and orbital research platforms.

Budget Authority ($M)	FY 2024 Operating Plan[1/]	FY 2025 Enacted[2/]	FY 2026 Request				
			FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Science	**7,325.4**	**7,334.2**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**
Planetary Science	2,764.3		1,891.3	1,861.3	1,867.3	1,822.3	1,851.3

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https://www.nasa.gov/fy-2026-budget-request/

- $271M for Mars Exploration for continued operations of existing missions like Perseverance and Mars Science Lab, while establishing a new regular cadence of lower-cost science missions and hosted instruments that will both expand our knowledge of Mars as a dynamic planetary system and strategically prepare for human exploration of the Martian surface.
- $494M to continue development of Dragonfly, a rotorcraft lander mission to study Titan, the largest moon of Saturn.
- $304M for Planetary Defense, including $266M to continue development of the Near-Earth Object Surveyor mission for launch in 2028, a planetary defense mission that will detect, track, and characterize impact hazards from asteroids and comets.
- $137M for Lunar Discovery and Exploration missions and research which will produce new and complementary lunar datasets to aid in scientific research and exploration of the Moon and beyond, including sending payloads to the lunar surface with commercial entities. Transfers the Commercial Lunar Payload Service program to ESDMD.
- $179M for planetary science research and analysis to support scientists who use NASA mission data to make discoveries about our solar system and to inform and inspire future scientific investigations of our solar system.
- $130M to support operations of Europa Clipper, Psyche, and Lucy as they continue on their journey to Jupiter and the asteroid belt.
- The multi-billion dollar Mars Sample Return mission is canceled.

Budget Authority ($M)	FY 2024 Operating Plan[1/]	FY 2025 Enacted[2/]	FY 2026 Request				
			FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Science	**7,325.4**	**7,334.2**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**
Astrophysics	1,529.7		523.0	543.0	501.0	521.0	521.0

https://www.nasa.gov/fy-2026-budget-request/

1/ - FY 2024 reflects amounts in Public Law 118-42, Consolidated Appropriations Act, 2024, adjusted by NASA's September 2024 Operating Plan.
2/ - FY 2025 reflects the funding amount specified in Public Law 119-4, Full-Year Continuing Appropriations and Extensions Act, 2025.

- $225M to support the operation of the James Webb and Hubble Space Telescopes which help us in our search for answers to the biggest questions about our universe and its origins.
- $157M to support final integration and testing of the Roman Space Telescope.
- $49M supports Astrophysics research and analysis to use NASA mission data to explore a vast range of astronomical phenomena, from the formation of the first stars, black holes, and distant galaxies to the nature of exoplanets.
- $45M supports the Astrophysics Explorer program, including the recently launched SPHEREx mission, which enables frequent flight opportunities for competitive, scientist-led missions, allowing rapid response to emerging scientific priorities through streamlined development cycles.

Budget Authority ($M)	FY 2024 Operating Plan[1/]	FY 2025 Enacted[2/]	FY 2026 Request				
			FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Science	**7,325.4**	**7,334.2**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**	**3,907.6**
Heliophysics	805.0		432.5	422.5	432.5	432.5	432.5

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https://www.nasa.gov/fy-2026-budget-request/

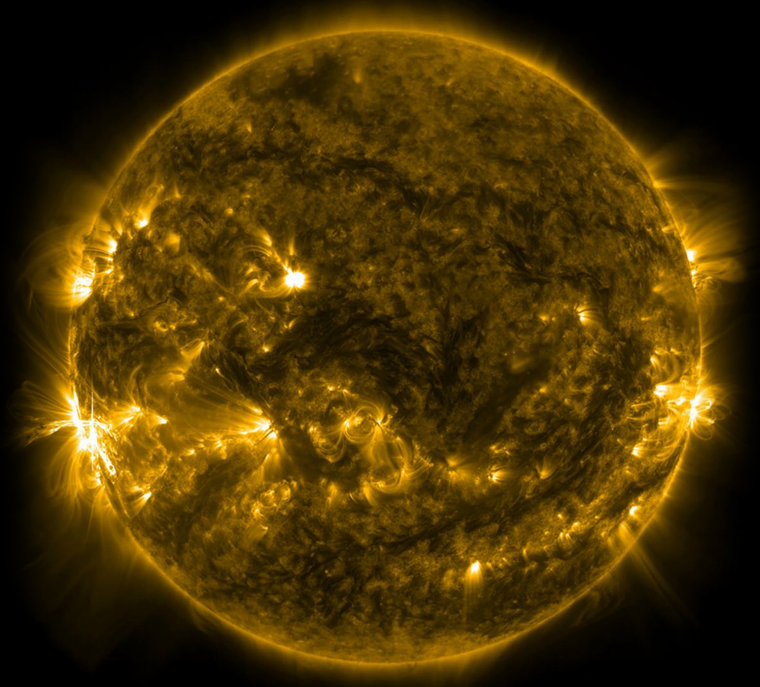
- $60M for Heliophysics research and analysis, to investigate the Sun and its influence on the entire solar system, studying solar processes, solar wind, magnetic fields, and interactions with Earth and other planets to understand how the Sun varies, how planetary environments respond, and how these processes affect human activities and technologies.

- $125M for the Heliophysics Explorer Program, including development of the MUSE mission, enabling competitive small and medium-class missions that complement strategic research with responsive, focused investigations.

- $55M, the highest amount ever proposed, for the Space Weather Program which plays a vital role in the national space weather enterprise by supporting space weather applied research and applications, enhancing understanding of orbital debris, advancing modeling capability to enable successful forecasting, and providing unique and useful observations to protect life on Earth and astronauts in space.

- $68M supports the Living With a Star program, including the Parker Solar Probe mission which has revolutionized our understanding of the corona and our knowledge of the origin and evolution of the solar wind; and Solar Dynamics Observatory, which gathers data to help explain the creation of solar activity, which drives space weather.

- $42M to support the IMAP and Carruthers missions, launching in FY 2026; IMAP will help researchers better understand the boundary of the heliosphere and Carruthers will study variability in Earth's exosphere.



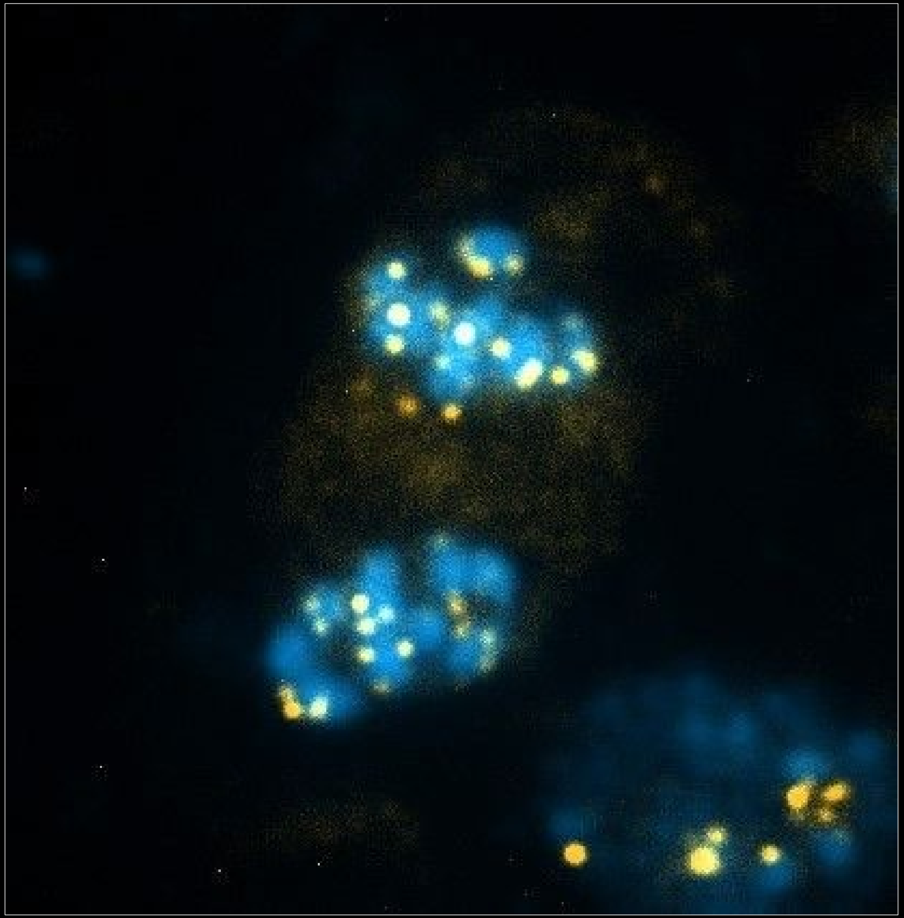
NASA Disasters Response Coordination System (DRCS) activated in Texas

GPM overpass of the Texas storm on July 4, 2025 at 11:00am CT

Aircraft equipped with the DyNAMITE (Day/Night Airborne Motion Imager for Terrestrial Environments) sensor.

Credits: NASA/Morgan Gridley

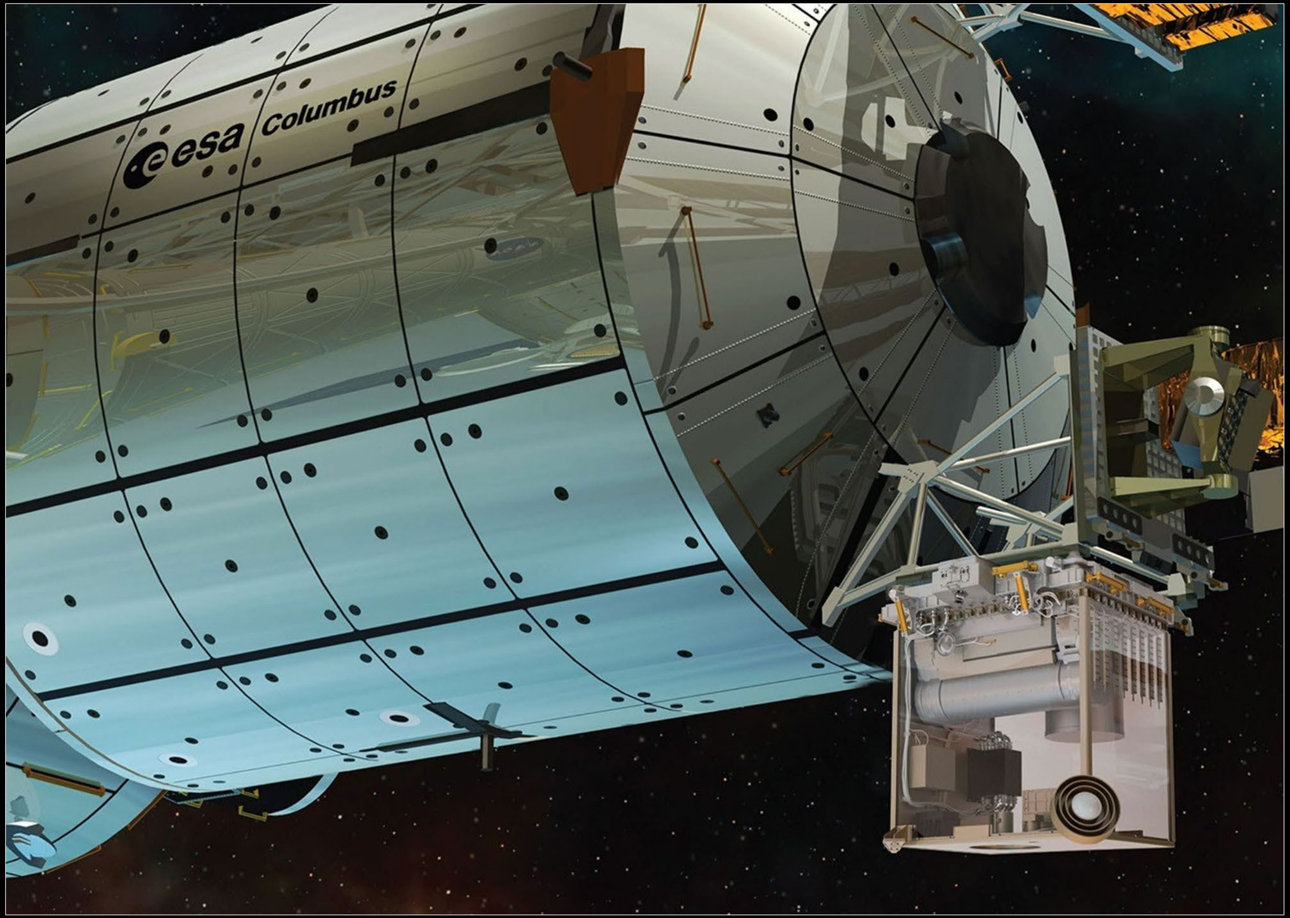
APEX-12 (Advanced Plant EXperiment-12)



A microscopic image of plant telomeres taken under a fluorescent microscope. The chromosomes are highlighted in blue. The telomeres are highlighted in yellow.

Credits: Texas A&M University

ACES (Atomic Clock Ensemble in Space)



A robotic arm will attach ACES to the Columbus Laboratory module aboard the International Space Station.

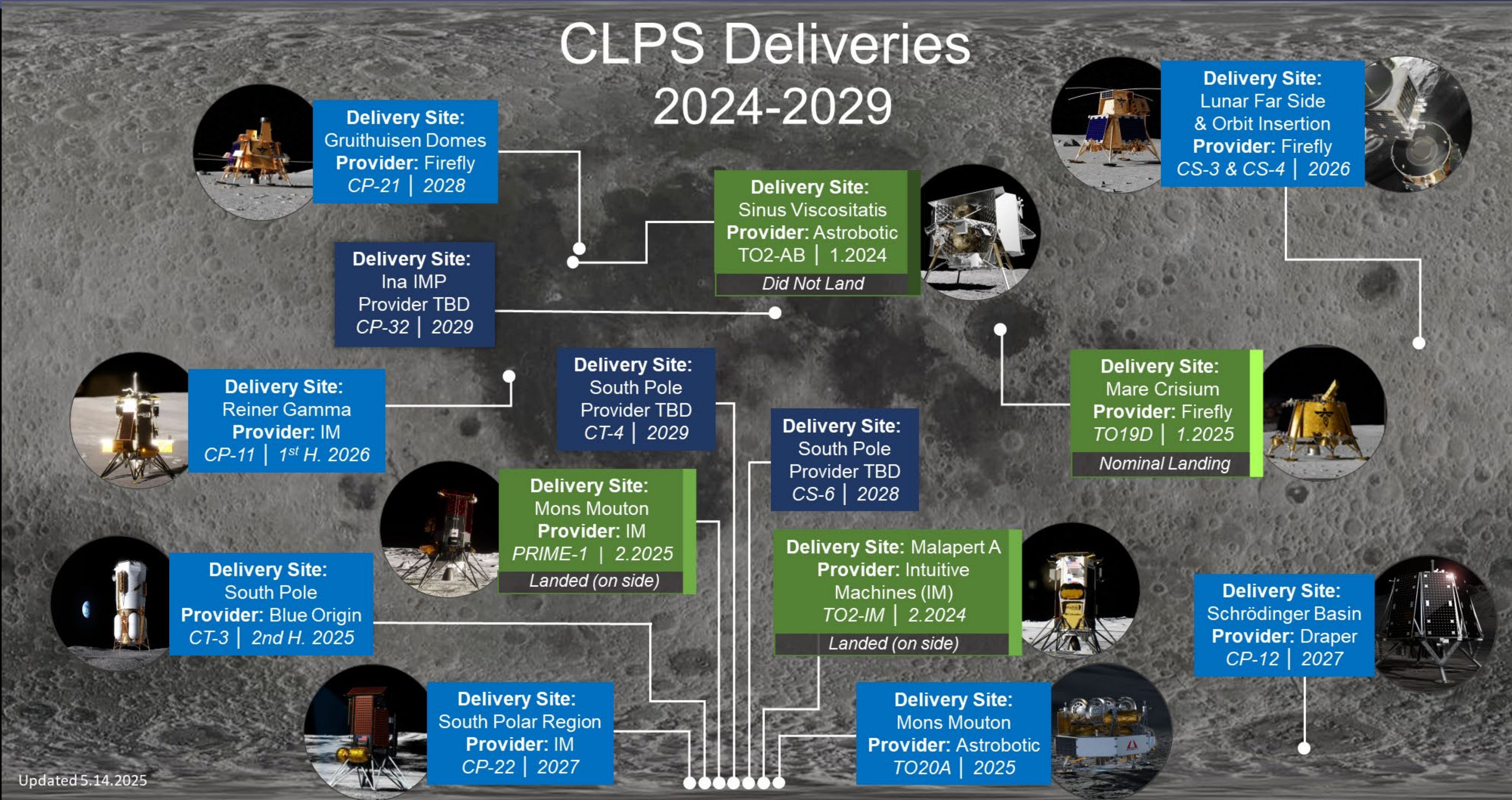
Credits: ESA

The Artemis II Lunar Science Team runs a simulation of lunar observation operations in the new Science Evaluation Room (SER) that serves as a backroom to Mission Control.

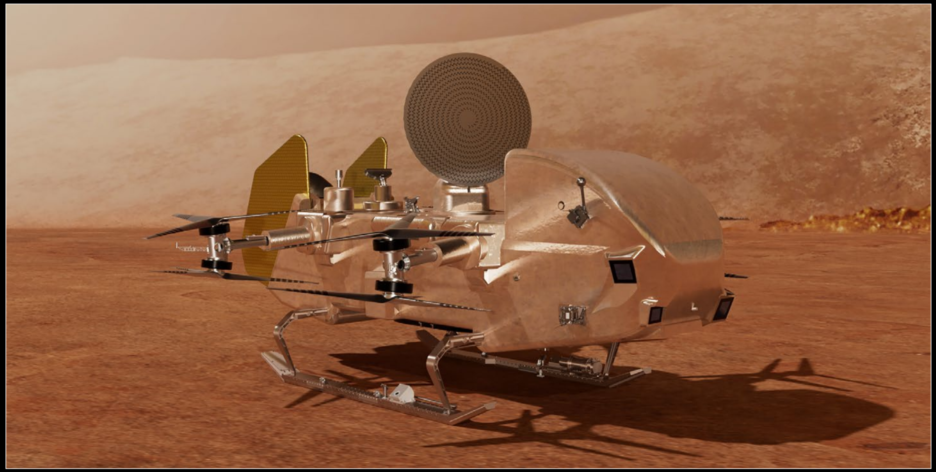
Credits: NASA/Robert Markowitz

Scientists and engineers test NASA's LEMS (Lunar Environment Monitoring Station) instrument suite in a "sandbox" of simulated Moon regolith at the Florida Space Institute's Exolith Lab at the University of Central Florida in Orlando.

Credits: NASA/UCF/University of Arizona

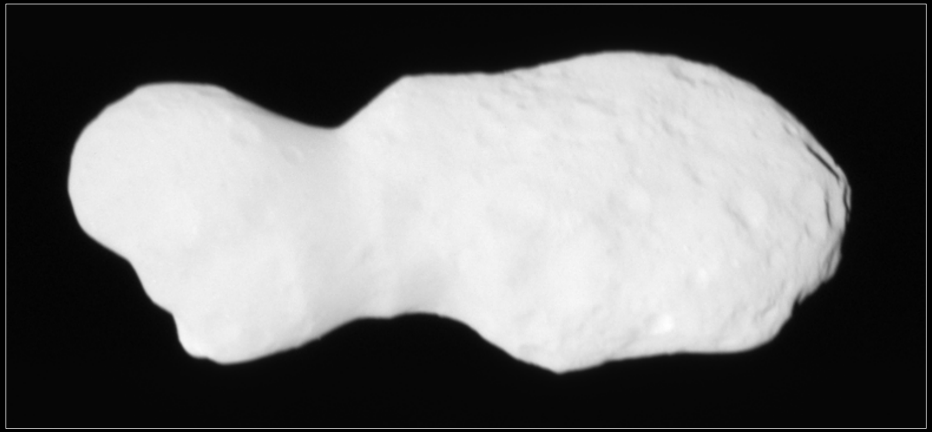


CLPS Deliveries
2024-2029
Delivery Site: Gruithuisen Domes
Provider: Firefly
CP-21 | 2028
Delivery Site: Sinus Viscositatis
Provider: Astrobotic
TO2-AB | 1.2024
Did Not Land
Delivery Site: Lunar Far Side & Orbit Insertion
Provider: Firefly
CS-3 & CS-4 | 2026
Delivery Site: Ina IMP
Provider TBD
CP-32 | 2029
Delivery Site: Reiner Gamma
Provider: IM
CP-11 | 1st H. 2026
Delivery Site: South Pole
Provider TBD
CT-4 | 2029
Delivery Site: South Pole
Provider TBD
CS-6 | 2028
Delivery Site: Mare Crisium
Provider: Firefly
TO19D | 1.2025
Nominal Landing
Delivery Site: Mons Mouton
Provider: IM
PRIME-1 | 2.2025
Landed (on side)
Delivery Site: Malapert A
Provider: Intuitive Machines (IM)
TO2-IM | 2.2024
Landed (on side)
Delivery Site: South Pole
Provider: Blue Origin
CT-3 | 2nd H. 2025
Delivery Site: Schrödinger Basin
Provider: Draper
CP-12 | 2027
Delivery Site: South Polar Region
Provider: IM
CP-22 | 2027
Delivery Site: Mons Mouton
Provider: Astrobotic
TO20A | 2025
Updated 5.14.2025



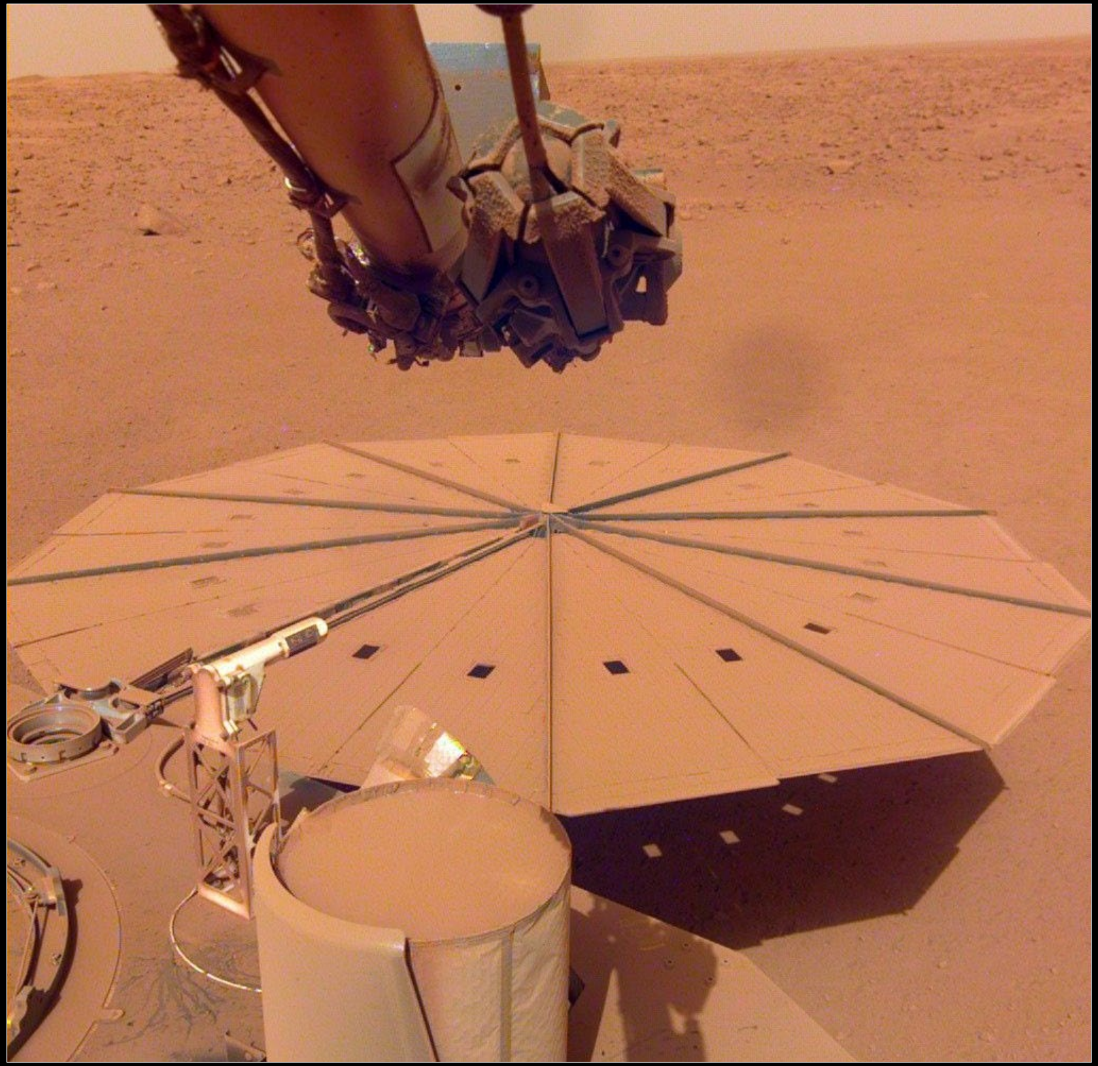
Artist's concept of NASA's Dragonfly on the surface of Saturn's moon Titan.

Credits: NASA/Johns Hopkins APL



Asteroid Donaldjohanson as seen by the Lucy spacecraft minutes before closest approach on April 20, 2025.

Credits: NASA/Goddard/SwRI/Johns Hopkins APL

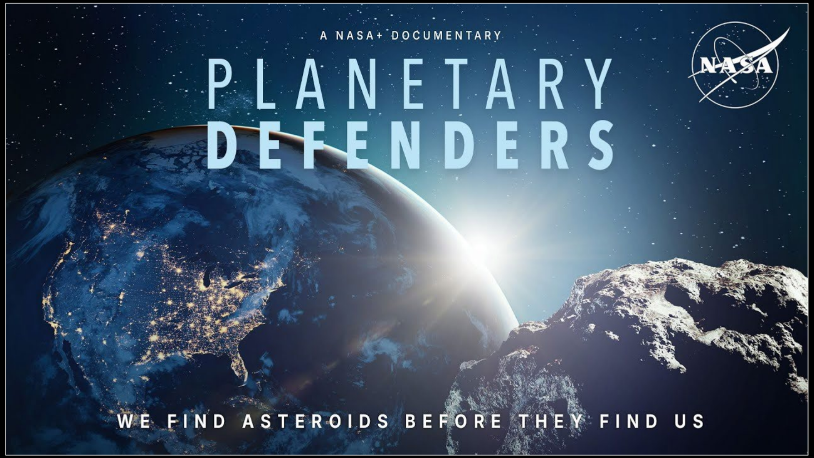


Dust accumulation on the Insight lander's solar panel caused power reduction and end of mission

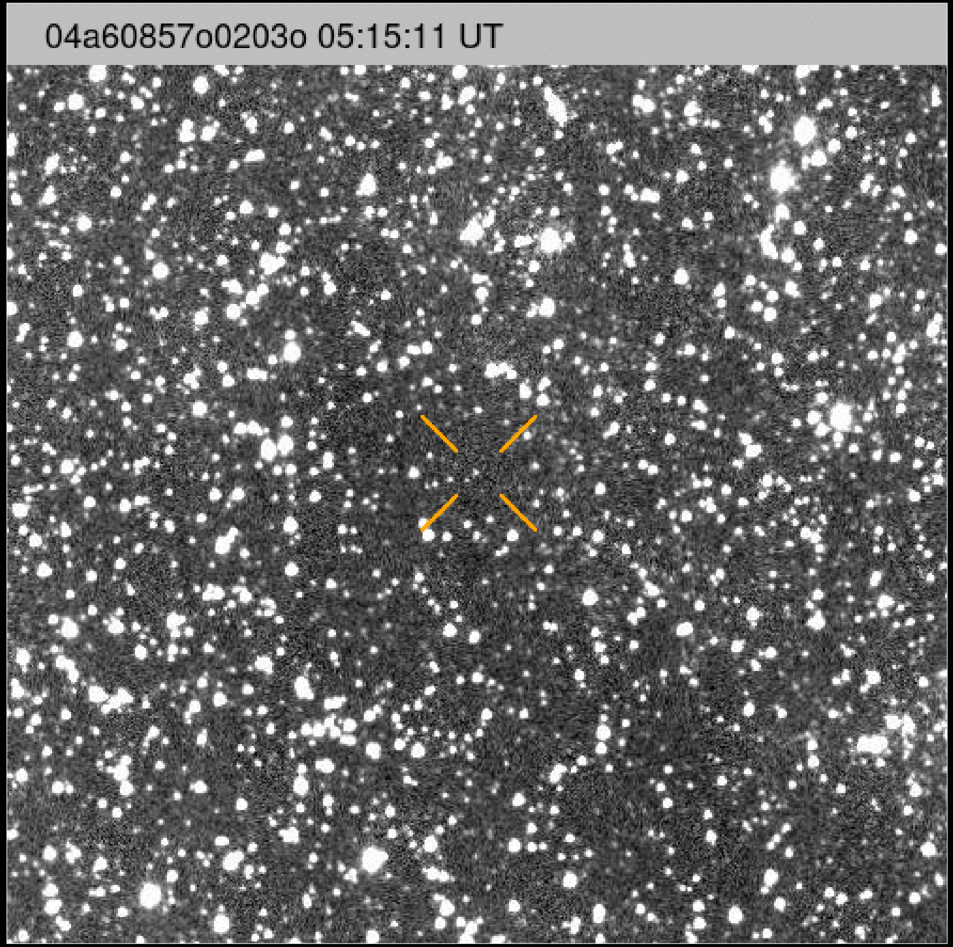
Credits: NASA/JPL-Caltech

A technician operates articulating equipment to rotate Near-Earth Object (NEO) Surveyor's aluminum optical bench in a clean room at NASA's Jet Propulsion Laboratory.

Credits: NASA/JPL-Caltech

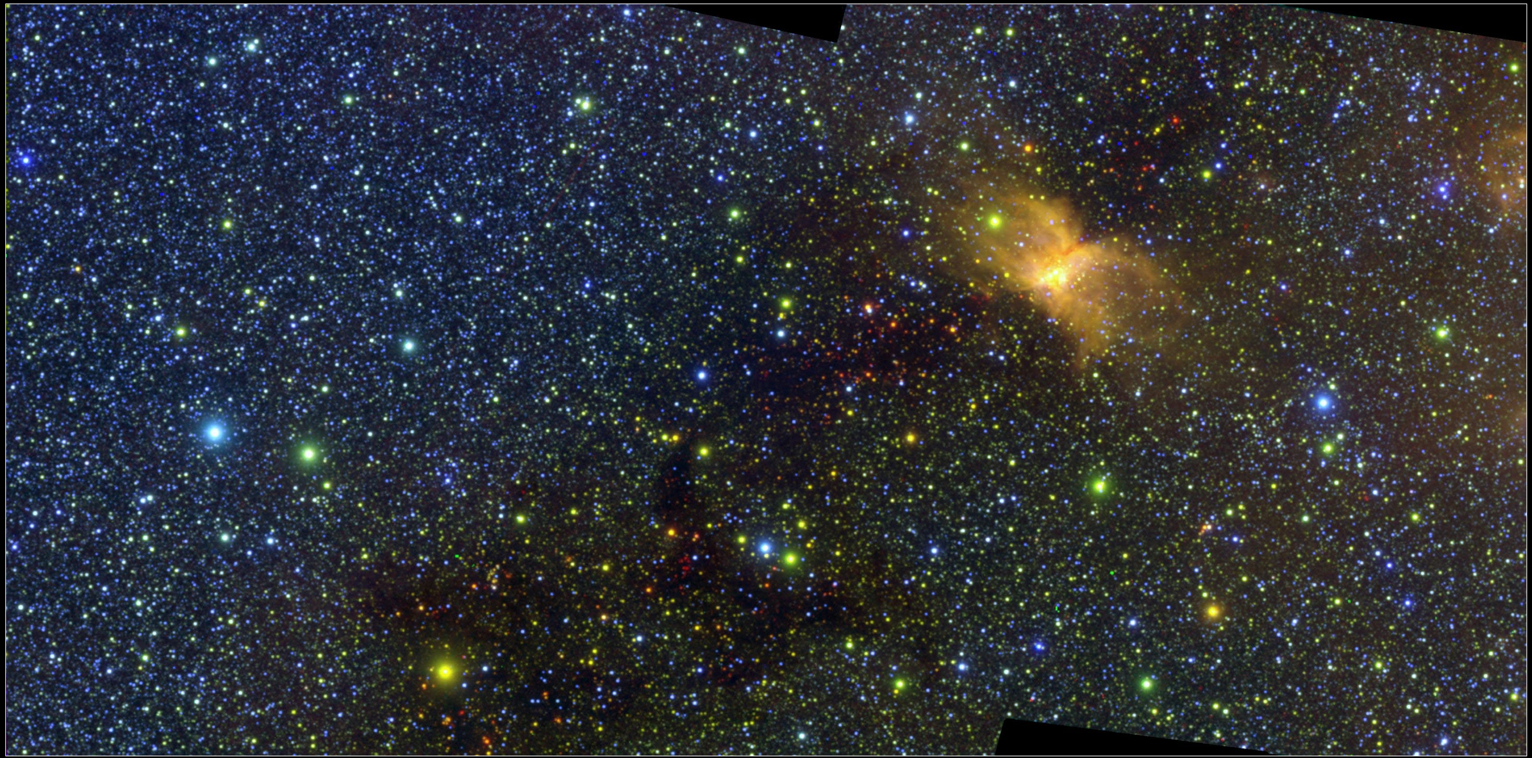


Planetary Defenders (NASA+ Original Documentary)



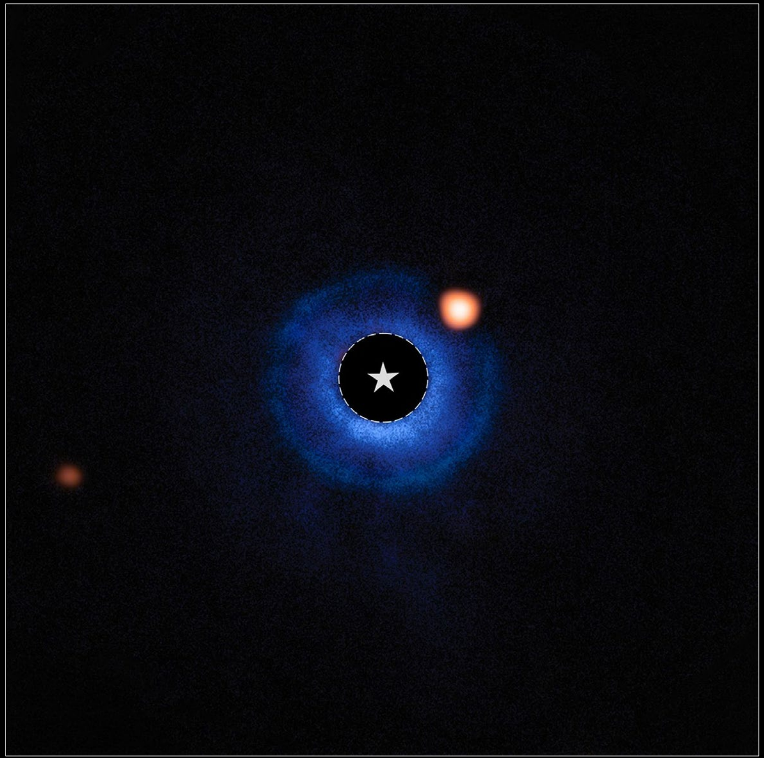
This animation shows the observations of comet 3I/ATLAS when it was discovered on July 1, 2025.

Credit: ATLAS/University of Hawaii/NASA



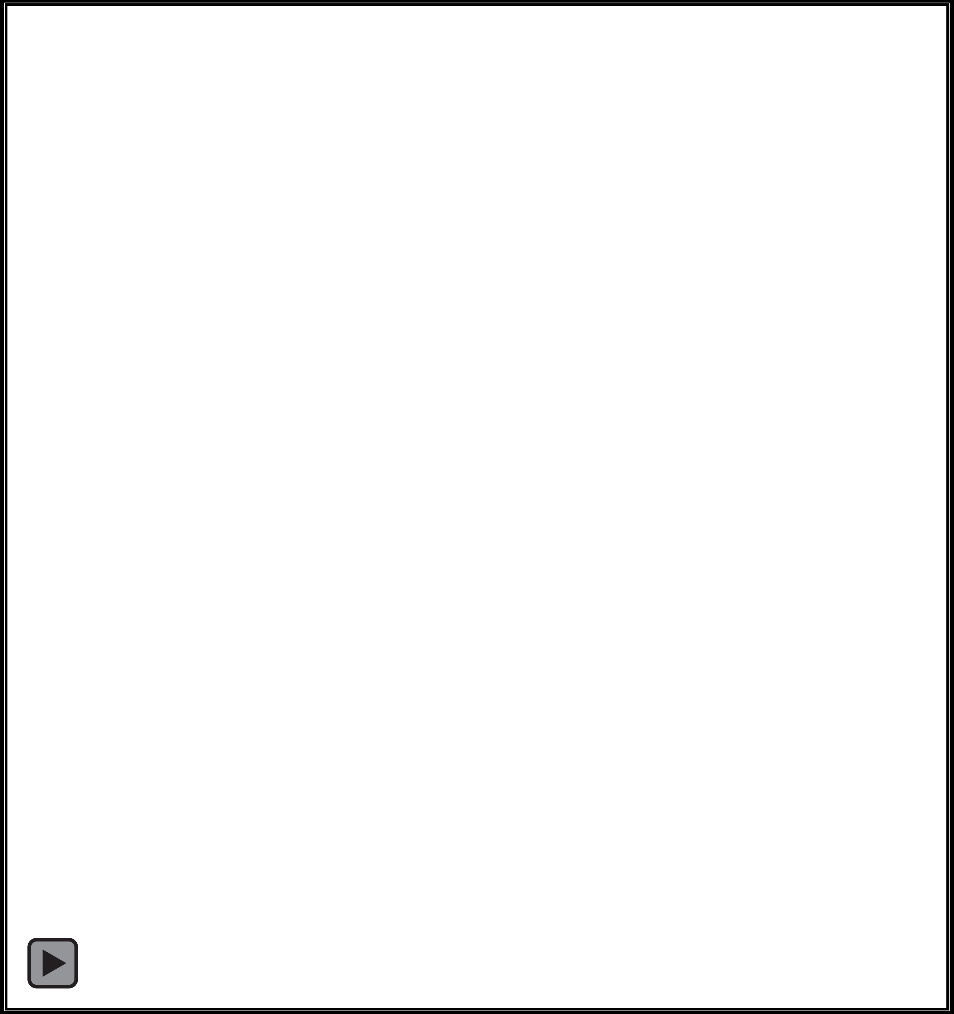
This image of the Vela Molecular Ridge was captured by SPHEREx and is part of the mission's first ever public data release. The yellow patch on the right side of the image is a cloud of interstellar gas and dust that glows in some infrared colors due to radiation from nearby stars.

Credits: NASA/JPL-Caltech



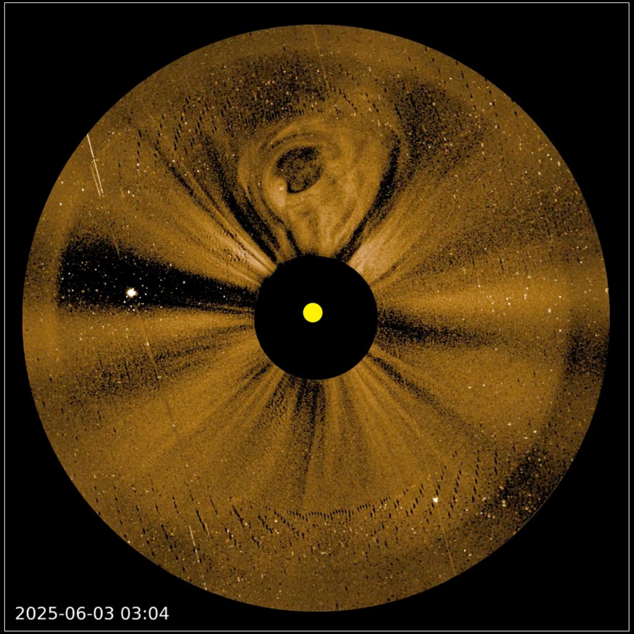
Likely Saturn-Mass Planet Imaged by NASA Webb

Credits: NASA, ESA, CSA, Anne-Marie Lagrange (CNRS, UGA), Mahdi Zamani (ESA/Webb)



This video, made from images taken by Parker Solar Probe's WISPR instrument, shows the solar wind racing out from the Sun's outer atmosphere, the corona.

Credit: NASA/Johns Hopkins APL/Naval Research Lab



Large coronal mass ejection (CME) imaged by the Narrow Field Imager (NFI) camera on NASA's PUNCH mission. The CME can be seen rising in the center of the image, above the blocked-out Sun.

Credits: NASA/SwRI

A technician performs tests on the Compact Dual Ion Composition Experiment (CoDICE) instrument of NASA's IMAP (Interstellar Mapping and Acceleration Probe) observatory.

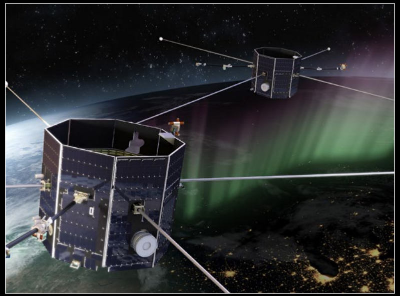
Credits: NASA/Johns Hopkins/APL/Ed Whitman


Thank you!

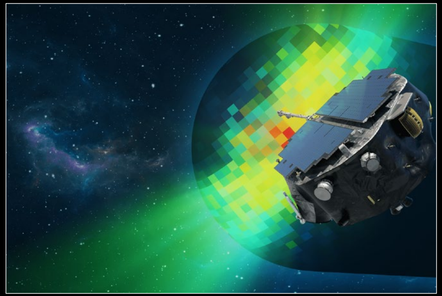
Backup

2025 Heliophysics Upcoming Launches

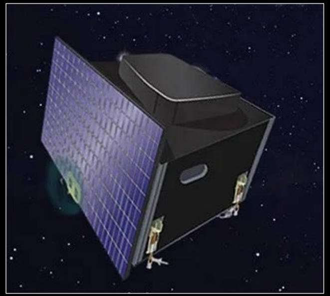
MISSION LAUNCHES



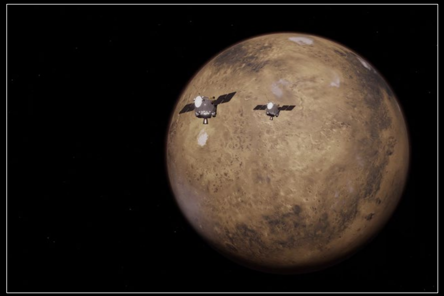
TRACERS
July 2025



IMAP
September 2025



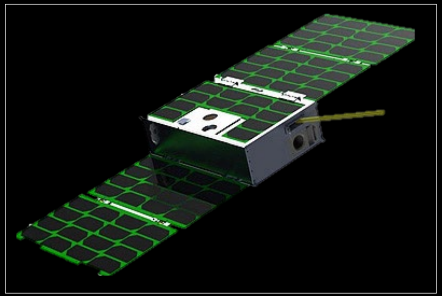
CARRUTHERS
September 2025



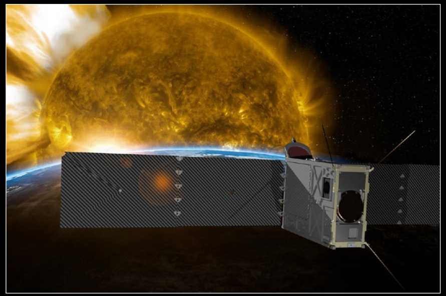
ESCAPADE
Fall 2025

CUBESAT LAUNCHES

REAL
July 2025



AEPEX
TBD 2025



SUNCET
October 2025