

National Aeronautics and
Space Administration



EXPLORE SCIENCE

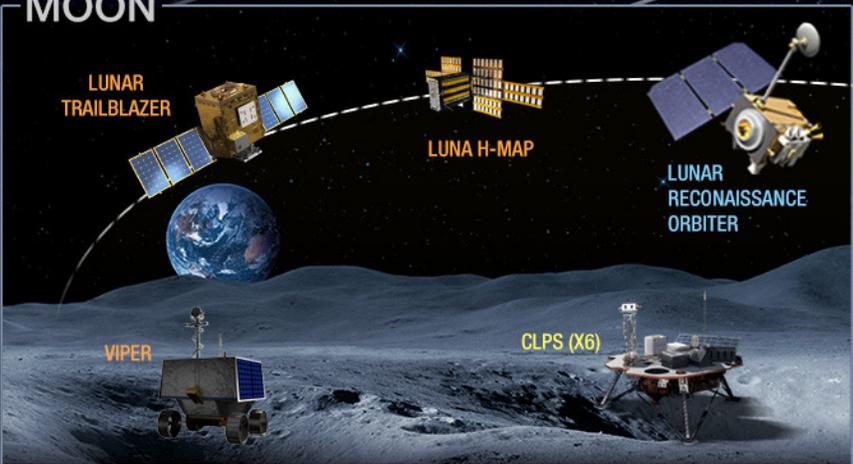
Lori S. Glaze, Ph.D.
NASA Planetary Science Division Director
Committee on Astrobiology and Planetary
Sciences (CAPS)
March 23, 2022

NEW HORIZONS

JANUS

OSIRIS-REx

MOON



DART

BEPICOLOMBO (ESA)

NEO SURVEYOR

VERITAS

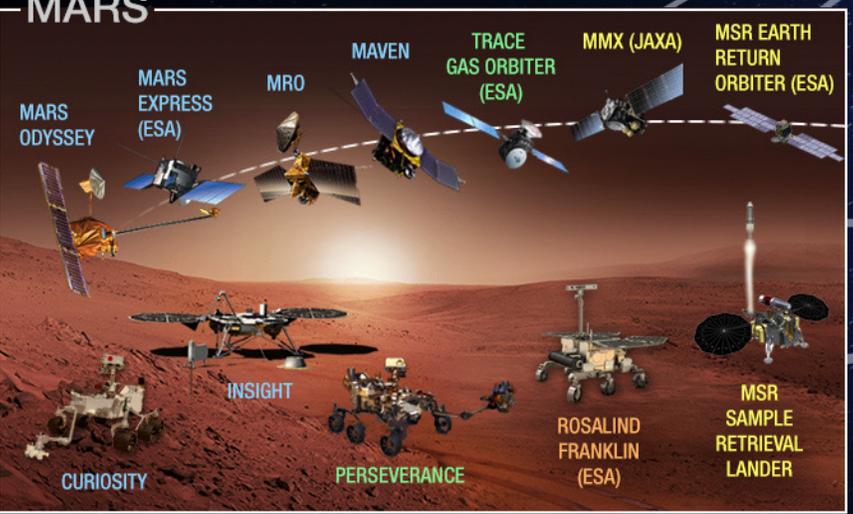
ENVISION (ESA)

DAVINCI

NEOWISE

LUCY

MARS



PSYCHE

EUROPA CLIPPER

JUICE (ESA)

JUNO

DRAGONFLY

- FORMULATION ●
- IMPLEMENTATION ●
- PRIMARY OPS ●
- EXTENDED OPS ●

PLANETARY FLEET

Mission Updates

The background is a vibrant space-themed composition. On the left, a glowing blue and green nebula swirls. In the center, a dark silhouette of a person's head is shown in profile, looking upwards. On the right, a bright star cluster with a prominent planet is visible against a dark blue background filled with stars.



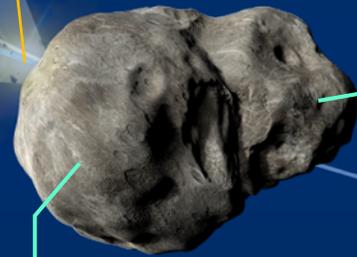
Vandenberg Space Force Base
Nov 24, 2021

IMPACT: Sep 26, 2022

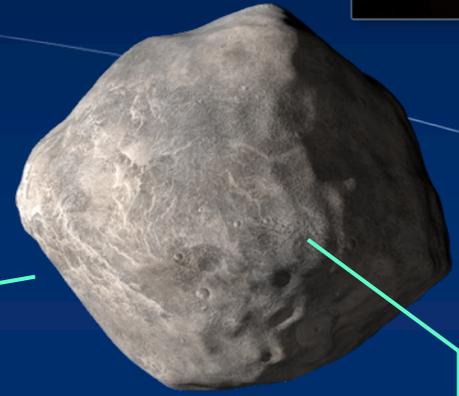


DART Spacecraft
15,000 miles per hour

LICIACube
(Light Italian Cubesat
for Imaging of
Asteroids)
Italian Space Agency
contribution



Dimorphos
160 meters
11.92-hour orbital period



Didymos
780 meters

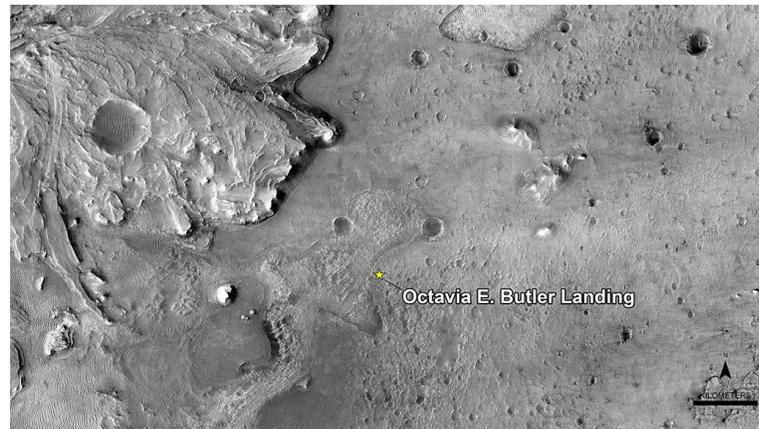
1,180-meter separation
between centers



Earth-Based Observations
6.8 million miles (0.07 AU) from
Earth at DART impact

Mars2020

- Perseverance recently celebrated one year on Mars!
- Wrapping up first science campaign on Jezero Crater floor
- Cached rock samples will provide key chronology for formation of the crater
 - Eight rock cores have been obtained to date
 - One witness and one atmospheric sample have also been collected
- Ingenuity has now completed >20 flights and continues to partner Perseverance in its science operation phase
- Rapid traverse for second science campaign started March 14 – with Perseverance on its way to the ancient delta deposit, to the west of the Octavia E. Butler landing site



Above: Navcam image of Issole showing the triple tailing mounds at Robine, Pauls and Malay.

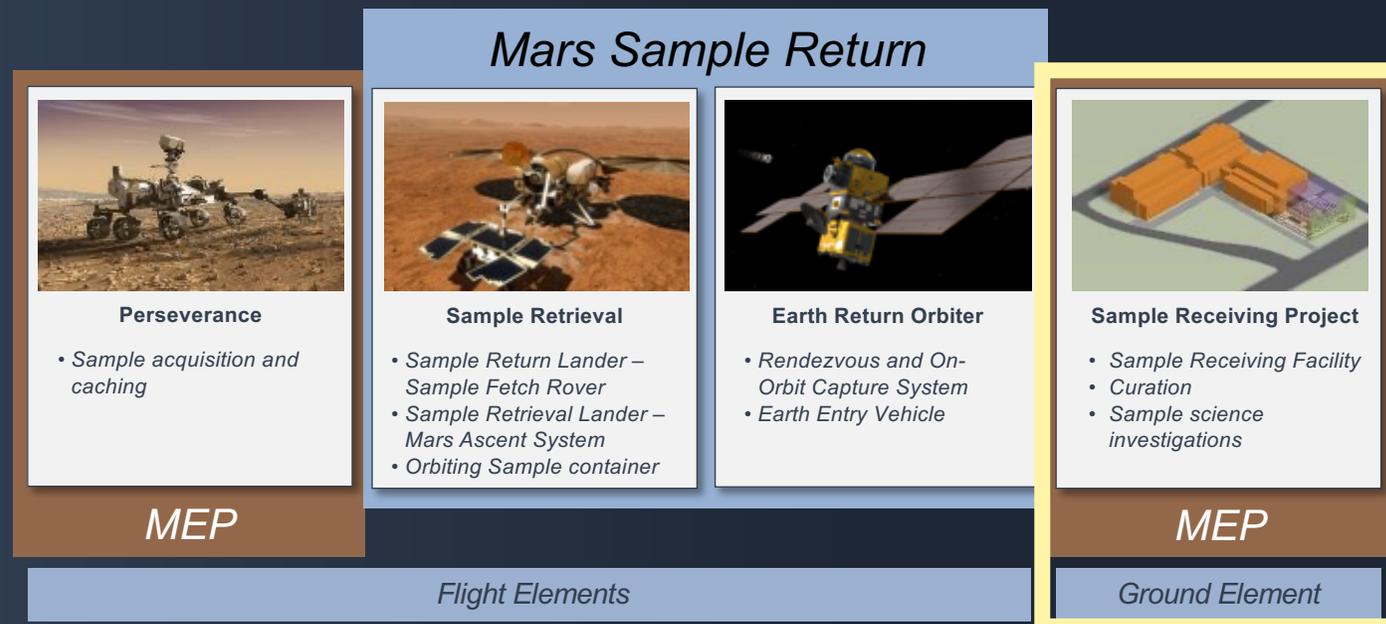
Below: 'Santa Cruz' hill (image taken April 29, 2021)



Mars Sample Return

Sample Receiving Project (SRP)

- Objective: safely secure the samples upon return to Earth and release the samples to the science community as quickly as possible
- JSC will select a Project Manager to lead the SRP effort
- High-level plan and schedule for SRP development will be completed in FY23
- Sample receiving facility progress:
 - Astromaterials Acquisition and Curation Office RFI/Sources Sought, released in Sept 2021
 - RFP release to select vendors expected in spring 2022



Psyche

- Despite some COVID challenges, making good progress toward 2022 launch
- Installation of spacecraft components is complete; environmental testing is underway
- Pre-Ship Review (PSR) will be mid-April and spacecraft delivery to launch site early May
- Science team has almost completed a Psyche Spacecraft Overview special paper collection
- **Janus** (SIMPLEx-2) will launch with Psyche as a rideshare



Above: Psyche on shaker table for dynamics testing



Right: Psyche being moved 'up the hill' to TVAC testing



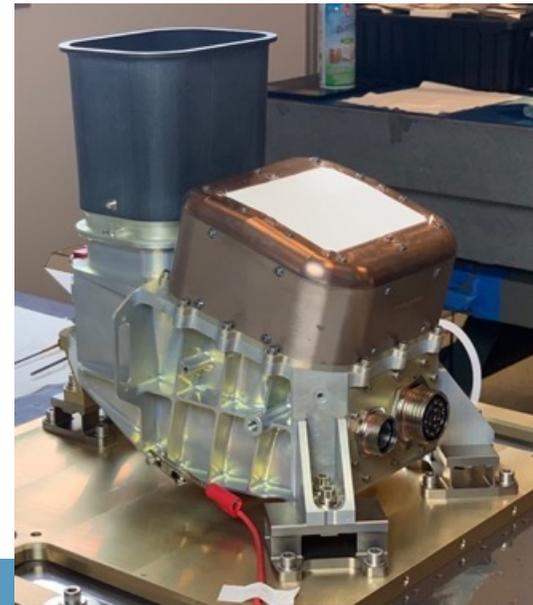
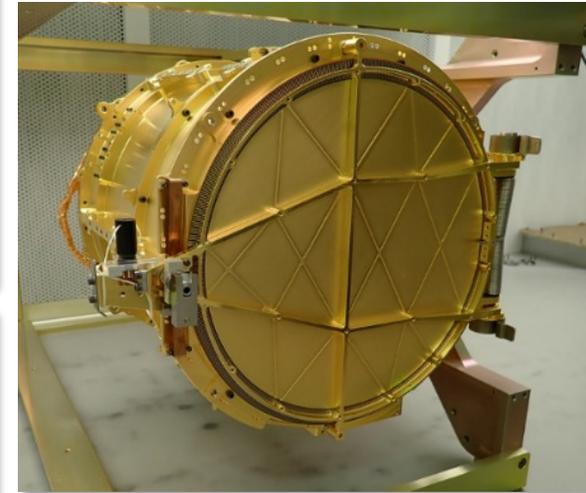
Europa Clipper



- Recent accomplishments:
 - EIS (Europa Imaging System) achieved flight wide-angle camera (WAC) sensor head 'first light'
 - E-THEMIS (Europa Thermal Imaging System) completed flight sensor assembly vibration testing
 - First instrument delivered late February: E-UVS (Europa Ultraviolet Spectrograph), PI: Kurt Retherford (SwRI)
- KDP-D completed March 2022
- ATLO started March 2022

Cost Performance

- The Agency Baseline Commitment was increased from \$4.25B to \$5B to provide sufficient funds to maintain the 2024 launch data and conduct Phase E
- The increase is driven by updated Phase-E cost estimate, increased Phase-D cost, COVID impacts, and replenishing HQ UFE



Top left: FM propulsion module with RF module installed
Top right: E-UVS delivered
Lower left: E-THEMIS FM integrated sensor assembly
Lower right: Surface Dust Analyzer (SUDA) FM sensor assembly

OSIRIS-REx and Hayabusa2



OSIRIS-REx:

- Arrives back at Earth September 2023
- ROSES-21 C.30 **OSIRIS-REx Sample Analysis Participating Scientist Program** (Dual Anonymous Peer Review): Step-1 proposals due February 28 (Step-2 proposals due April 25)

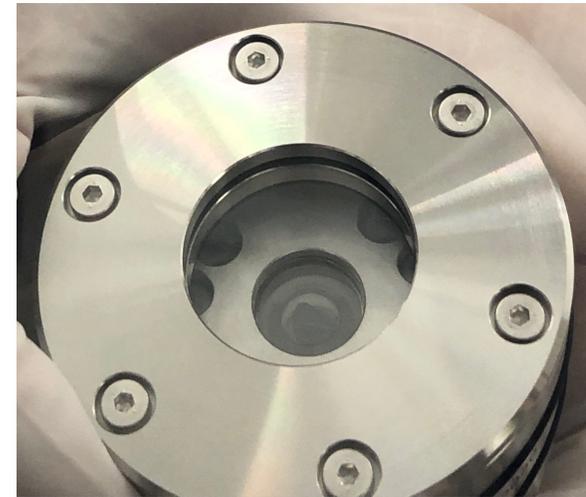
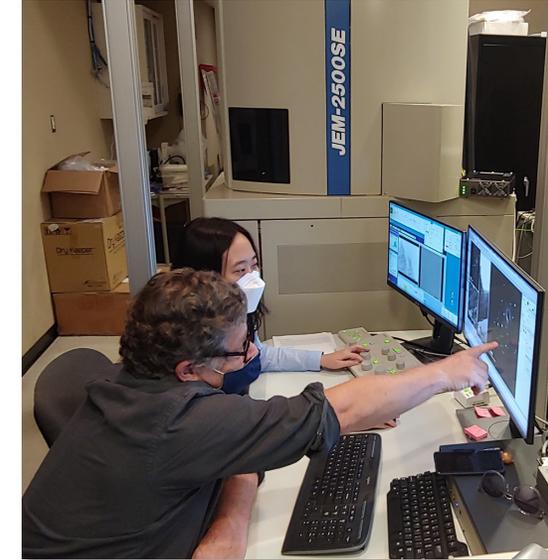
Hayabusa2:

- NASA allocation of Hayabusa2 samples delivered to JSC in early December
- Proposals to study JAXA-catalogued Hayabusa2 samples can now be submitted to LARS
- Catalog of U.S. sample share (10% / 0.5 g) will be posted by late spring 2022 and opened to loan requests

Left: Hayabusa2 NASA Participating Scientists analyzing a Ryugu grain in the laboratory

Bottom left: NASA-allocated Hayabusa2 grain at JSC

Bottom right: Hayabusa2 sample container



Dragonfly



Mission Plan

- Launch June 2027; arrive at Titan by 2034
- More than 3 years of exploration, traversing up to ~180 km with 20+ unique landing sites

Status

- Preparing for Mission PDR in October 2022
- Focus on preliminary design, technology maturation, and hardware testing
- Receipt and preparation of Titan chamber
- Production of PICA-D heat shield material has begun
- Preparing for test in LaRC Transonic Dynamics Tunnel this spring
- International agreement with CNES signed, DLR and JAXA agreements in progress



Dragonfly testbed flights. Credit: JHUAPL ([Video](#))



Titan chamber arriving at APL

CLPS Deliveries

2022–2025



Delivery Site: Oceanus Procellarum
Provider: Intuitive Machines (IM)
Task Order (TO)2-IM | 2022



Delivery Site: Lacus Mortis
Provider: Astrobotic
TO2-AB | 2022

Delivery Site: Gruithuisen Domes
Provider: TBD
PRISM-2b | 2025

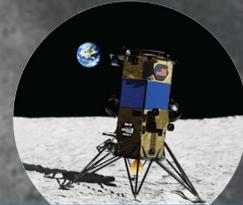
Delivery Site: Reiner Gamma
Provider: IM
PRISM-1a | 2024



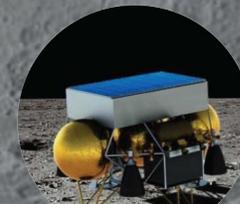
Delivery Site: Mare Crisium
Provider: Firefly
TO19D | Q3 2023



Delivery Site: South Pole
Provider: IM
TO PRIME-1 | Nov 2022



Delivery Site: South Pole
Provider: Astrobotic
VIPER | Nov 2023



Delivery Site: Schrödinger Basin
Provider: TBD
PRISM-1b | 2025

Delivery Site: South Pole
Provider: TBD
PRISM-2a | 2025

Delivery Site: South Pole
Provider: Masten
TO-19C | Nov 2023



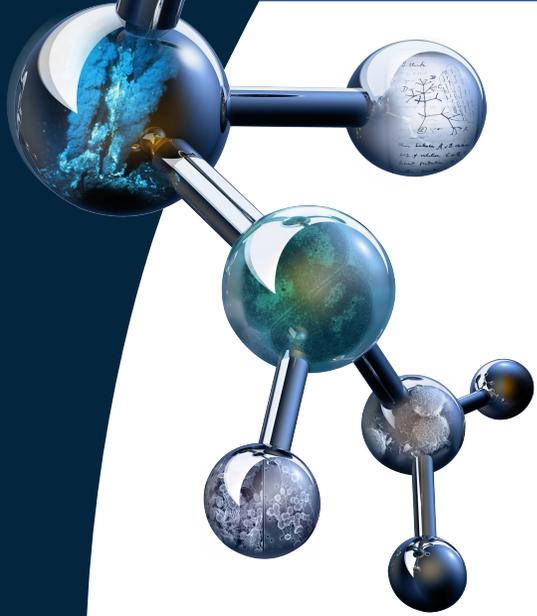
Senior Review

- Senior Reviews for missions are held on a three-year cadence
- PMSR22 is ongoing
- Missions being reviewed:

MRO	Mars Odyssey
InSight	MSL
MAVEN	New Horizons
LRO	OSIRIS-REx
- Except for OSIRIS-REx, all missions are being reviewed for three-year extensions
- OSIRIS-REx proposed a visit to Apophis, with an encounter starting in 2029 (after Earth close approach)
- Each mission is reviewed independently (by a separate panel for each mission) and they are not compared with each other
- Decision on extending missions expected by April 2022

Astrobiology





Astrobiology

Standards of Evidence

- NfoLD and NExSS Research Coordination Networks (RCNs) hosted a joint virtual workshop on biosignature standards of evidence and reporting protocols in July 2021
 - Current draft of workshop white paper report: <https://www.nfold.org/soe-report-in-progress>
- In January 2022, NASEM convened the Committee on Astrobiology and Planetary Sciences (CAPS) to conduct an independent review of the white paper and issue a short report

Early Cells to Multicellularity RCN

- Last of five original RCNs to be proposed
- ECM RCN co-leads have been identified and are standing up the RCN:
 - Developing charter and website, coordinating with other related RCNs, and preparing activities, including a launch, at AbSciCon.
- Steering Group will be comprised of NASA-funded PIs, to be invited in coming weeks
- NASA Point of Contact: Becky McCauley Rench (rebecca.l.mccauleyrench@nasa.gov)

Community



R&A Updates

- **No Due Date** (NoDD) programs are open – submit your proposal at **any time**
 - <https://science.nasa.gov/researchers/NoDD>
- **Dual-Anonymous Peer Review** is being used for all Data Analysis (as well as other) programs
 - <https://science.nasa.gov/researchers/dual-anonymous-peer-review>
- Proposal pressure is down significantly in ROSES-21
 - Many programs had at least 30% reduction in submitted proposals
 - Some exceptions: XRP (up 20%), DALI (flat)
- Previous Planetary Major Equipment & Facilities (PMEF) call has been replaced with the new **Planetary Science Enabling Facilities (PSEF)** call in ROSES-22
 - See [ROSES-22 C.17](#) for full information
- Under ROSES-22, [C.4 Planetary Data Archiving and Restoration](#) will not accept proposals for development or validation of tools (i.e., usually relevant under PDART)
- Second Annual [NASA Planetary Data System \(PDS\) Customer Satisfaction Survey](#) is open until September 30, 2022

Inclusion, Diversity, Equity and Accessibility (IDEA) in PSD

- New internal PSD IDEA team is collecting, tracking, and communicating the many IDEA initiatives in PSD
 - Collaborating with SMD IDEA Working Group on the SMD IDEA strategic plan
- Recent/upcoming PSD IDEA presentations:
 - LPSC 2022
 - Advancing IDEA in Planetary Science conference (April 2022)
 - AbSciCon (May 2022)
- Topics include:
 - No Due Date (NoDD)
 - Dual-Anonymous Peer Review (DAPR)
 - Inclusion Plan pilot (PRISM, SSERVI)
 - Here To Observe (H2O) Pilot Program
 - Community-wide Exploration and Analysis Groups
 - Proposal Review Panels
 - NASA Internships
 - ROSES demographics analysis
- Presentations at future PAC meetings and other conferences will be provided, to keep the community informed about IDEA activities being implemented across PSD





Planetary Science and Astrobiology Decadal Survey 2023–2032

- Latest input from NASEM:
 - On track to deliver the report to NASA and NSF at the end of March/beginning of April
 - Public release will be middle of April
- Timeline for a response to the Decadal will be set by SMD and PSD
 - Initial PSD public response to the Decadal within 90 days, as a community townhall
 - Full written response provided later, within a year of release

A surreal landscape featuring a glowing, ethereal river that flows through a valley. The sky is a deep, dark blue, filled with stars and a large, pale moon in the upper left. A vibrant aurora borealis in shades of green and blue dances across the upper right portion of the sky. In the distance, a range of jagged, snow-capped mountains is silhouetted against a soft, golden light that suggests a sunrise or sunset. The foreground shows a grassy field with a rustic wooden fence and some purple flowers. The overall atmosphere is dreamlike and otherworldly.

EXPLORE

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