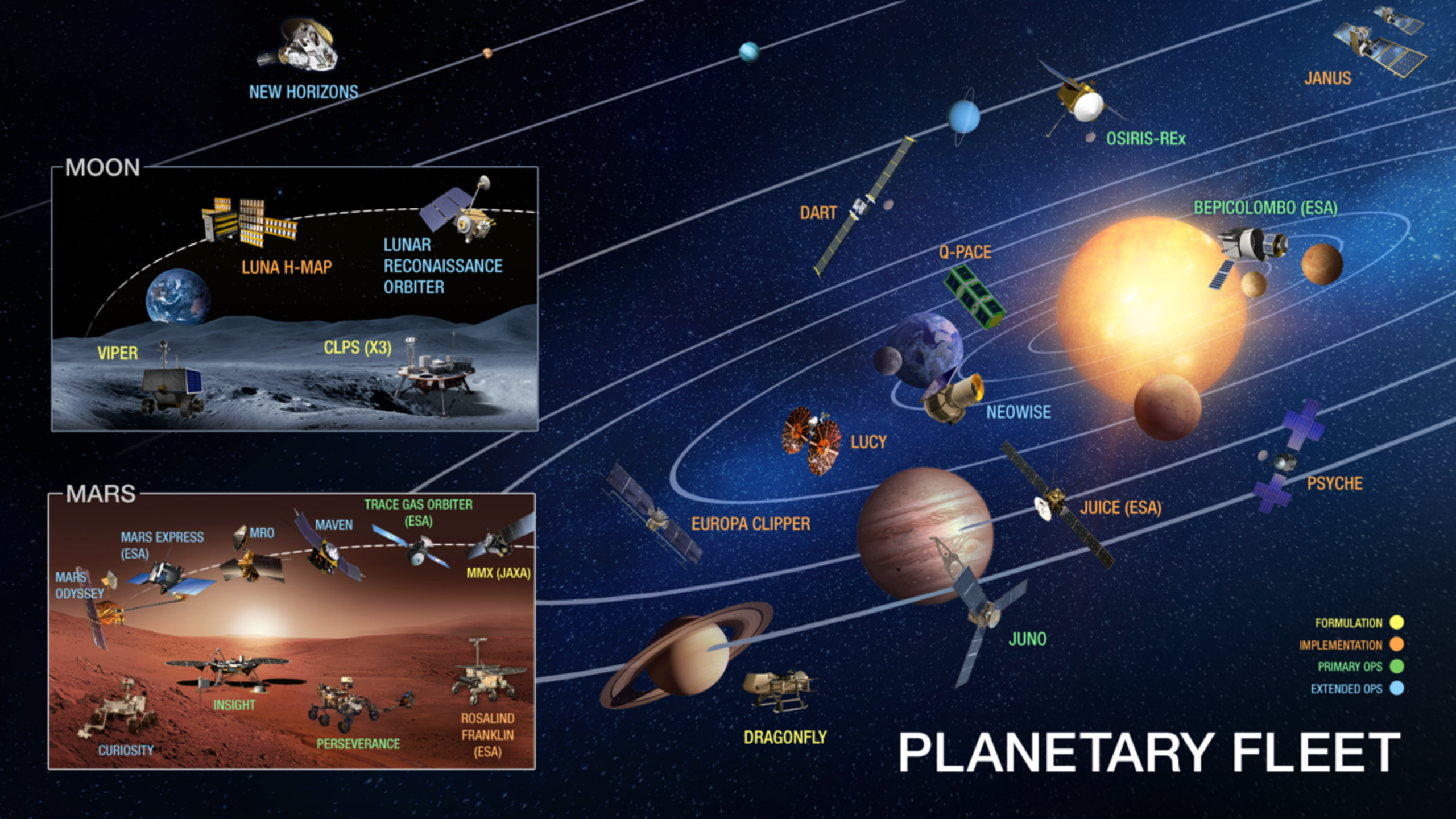
National Aeronautics and Space Administration

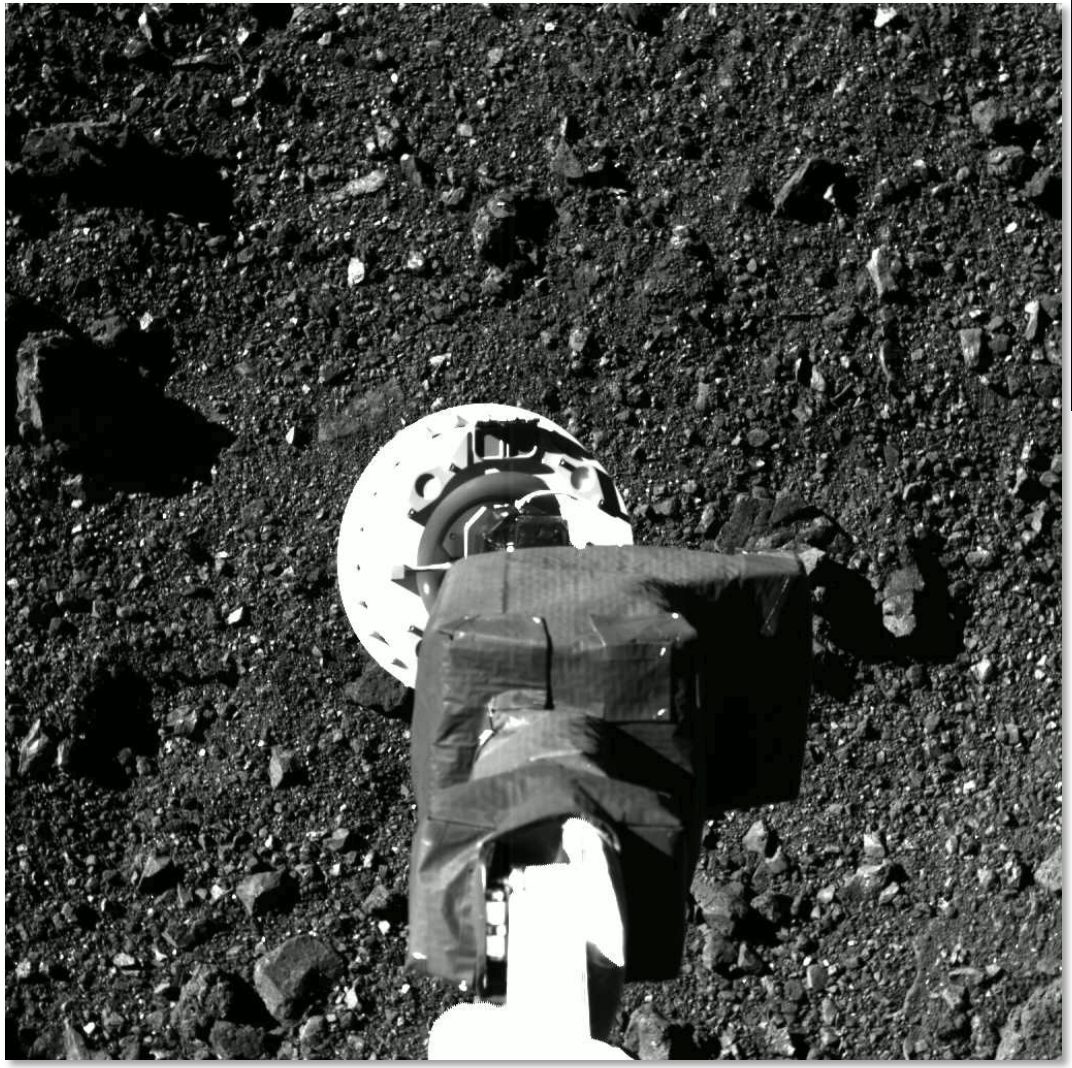
EXPLORE SOLAR SYSTEM&BEYOND

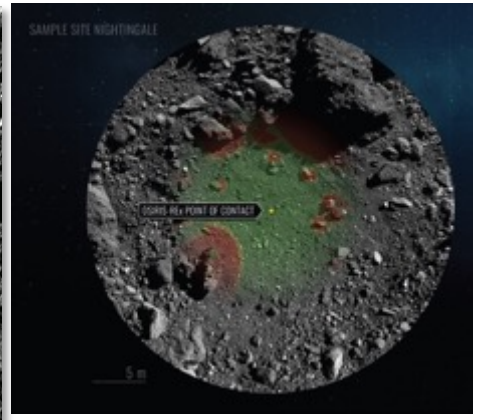
Lori S. Glaze, Ph.D.
NASA Planetary Science Division Director

PAC Meeting
November 30, 2020


NEW HORIZONS
JANUS
OSIRIS-REx
MOON
LUNA H-MAP
LUNAR RECONAISSANCE ORBITER
VIPER
CLPS (X3)
DART
BEPICOLOMBO (ESA)
Q-PACE
NEOWISE
LUCY
PSYCHE
EUROPA CLIPPER
JUICE (ESA)
MARS
TRACE GAS ORBITER (ESA)
MAVEN
MRO
MARS EXPRESS (ESA)
MARS ODYSSEY
MMX (JAXA)
INSIGHT
CURIOSITY
PERSEVERANCE
ROSALIND FRANKLIN (ESA)
JUNO
DRAGONFLY
FORMULATION
IMPLEMENTATION
PRIMARY OPS
EXTENDED OPS
PLANETARY FLEET

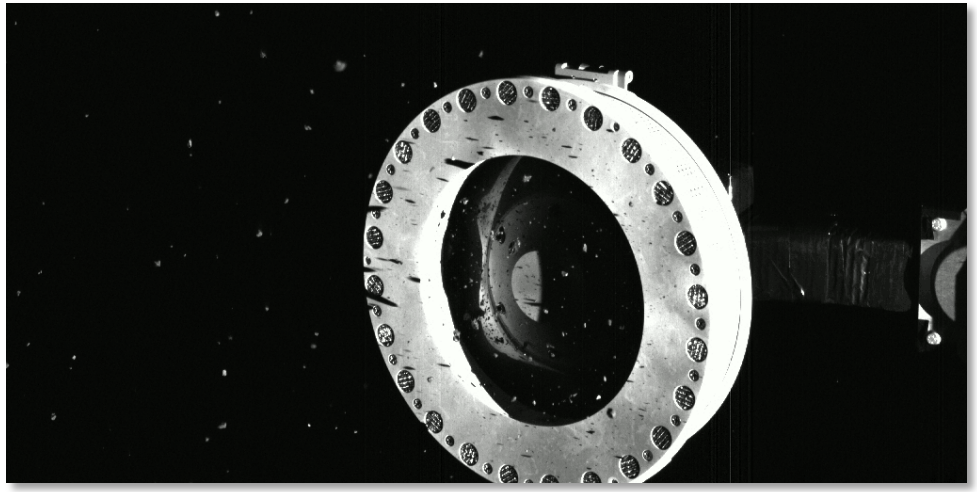
OSIRIS-REx

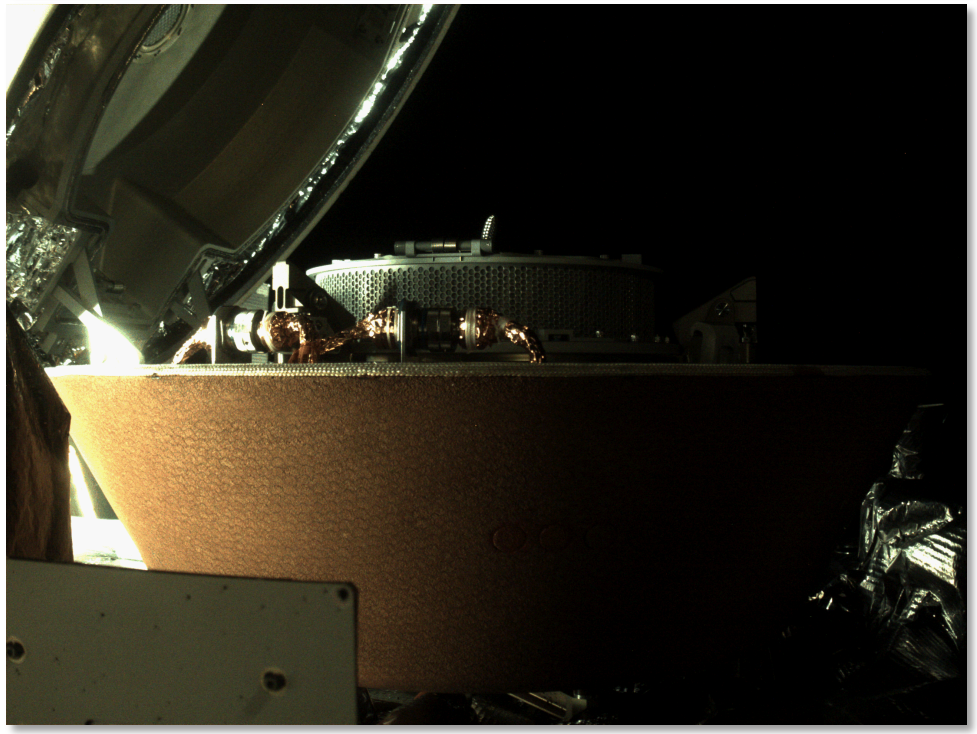




Touch-and-Go ('TAG') at Nightingale Crater Oct 20

Touch-and-Go Sample Acquisition Mechanism (TAGSAM) Oct 22

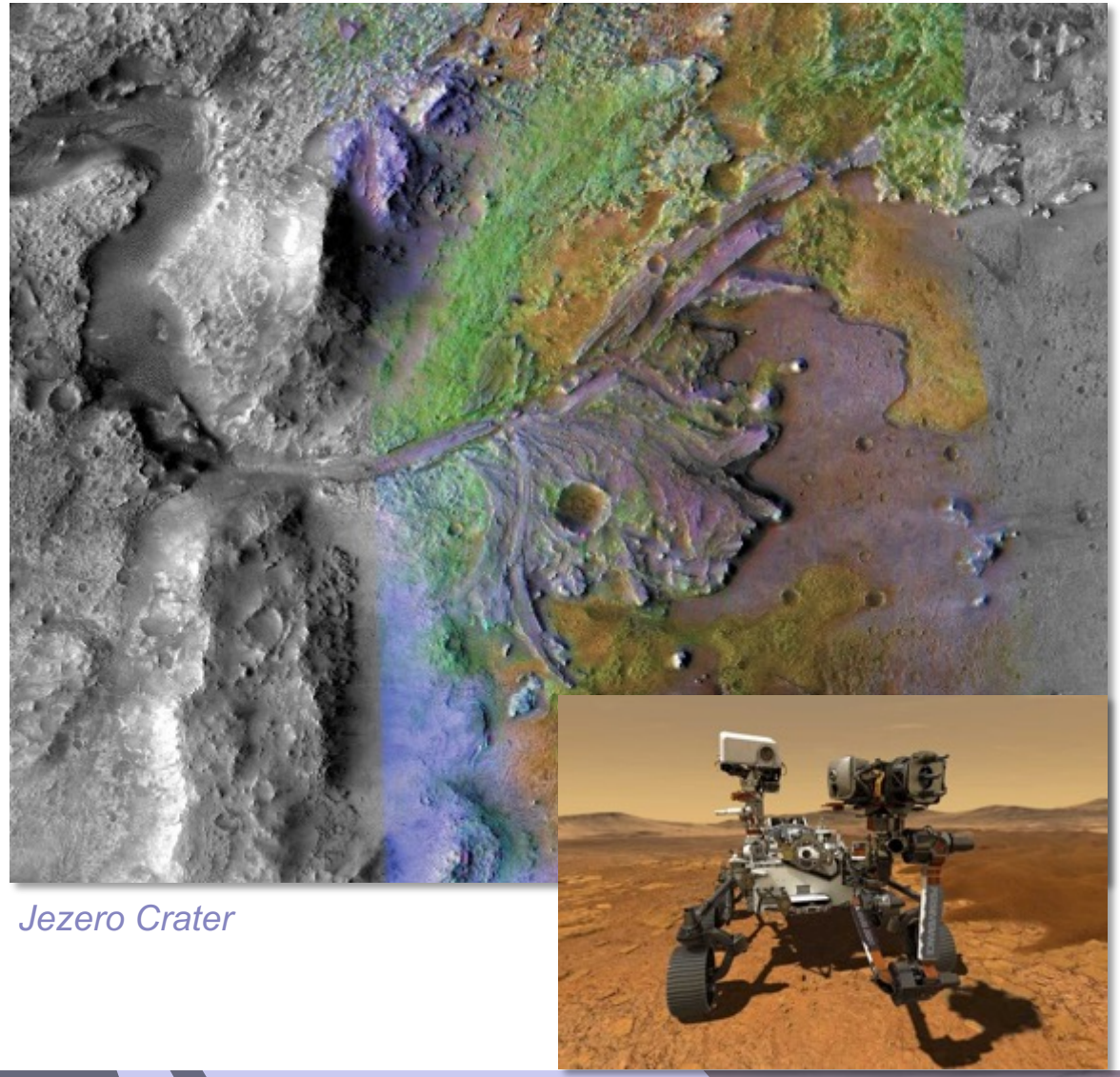




Sample stowed in Sample Return Capsule Oct 28

Upcoming

Mars 2020 / Perseverance Rover



Jezero Crater

More than halfway to Mars!

- Landing will be February 18, 2021 at Jezero Crater

Participating Scientists

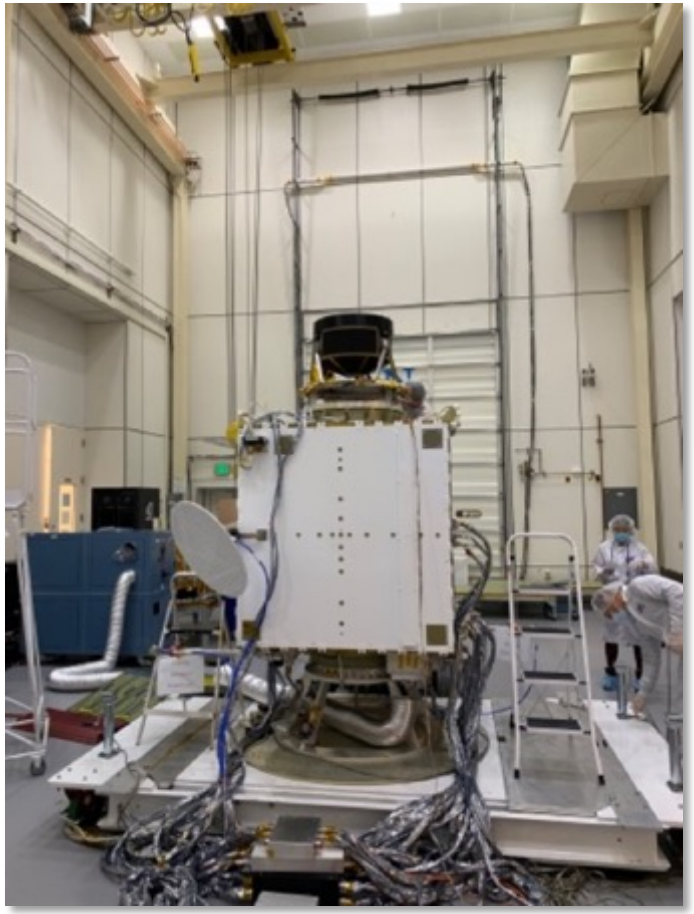
- 13 participating scientists recently selected

MSR efforts

- Terms of Reference to establish Caching Strategy Steering Committee has been signed by NASA and ESA
- This committee will plan and lead a science community workshop in January 2021 to formulate a sample caching strategy

DART and Lucy

ATLO continues for both missions – on track for launches in July (DART) and October (Lucy) 2021!

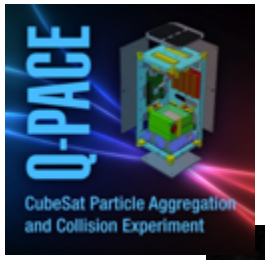


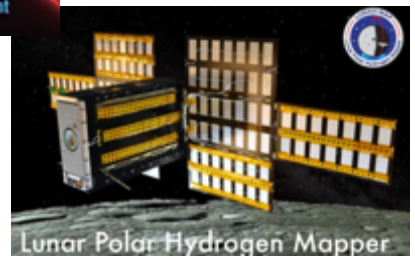
Above: *Close out of two of DART spacecraft panels*

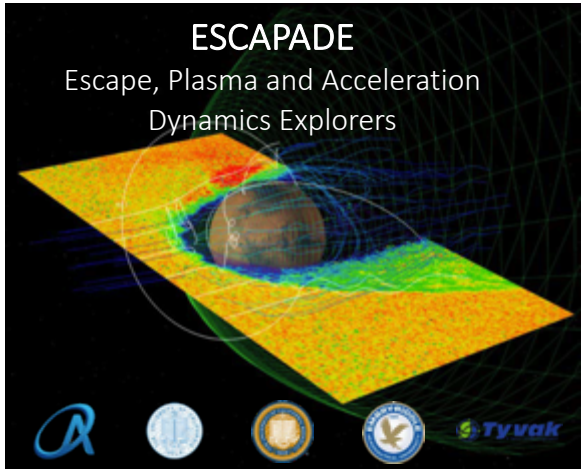
Left: *Installation of DART NEXT-C thruster*

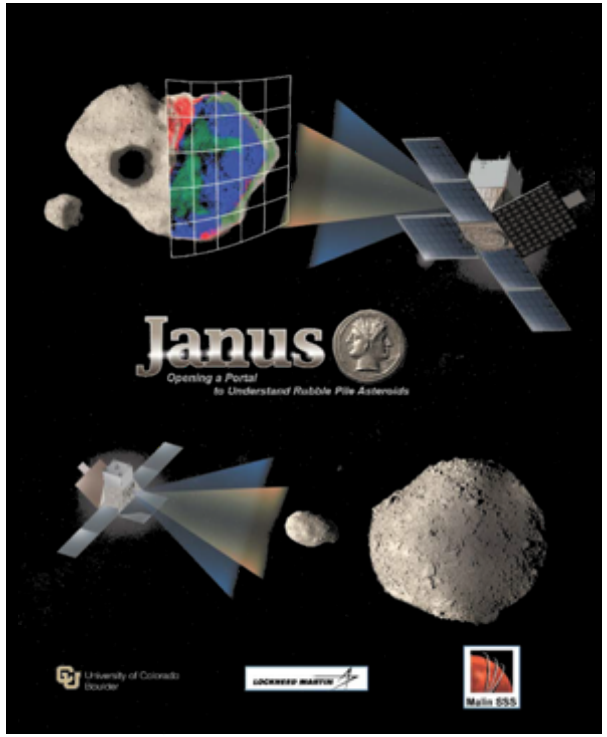
Right: *Lucy spacecraft after EM-PM mate*

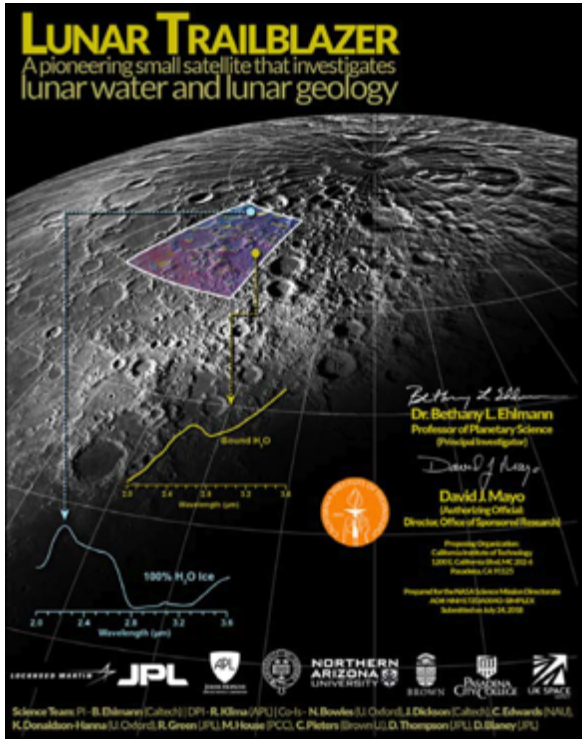
Below: *Fully deployed Lucy SA wing 1*











SIMPLEx

SIMPLEx-1

Q-PACE:

- Integrated on Virgin Orbit's LauncherOne
- Launch expected NLT end of 2020

LunaH-Map:

- Will launch on Artemis-1, NLT November 2021
- Delivery required January 2021

SIMPLEx-2

Janus (Psyche rideshare):

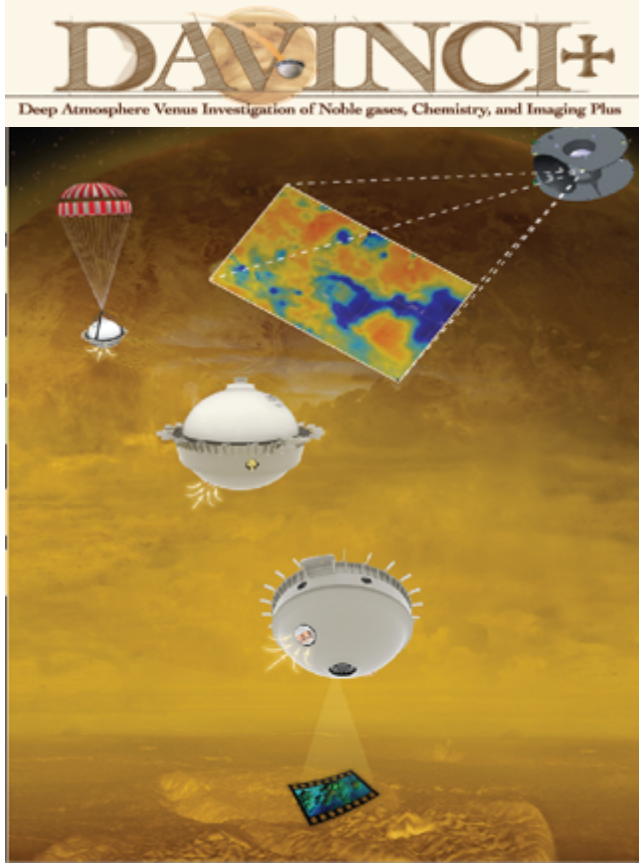
- PDR held in July; Passed KDP-C in September

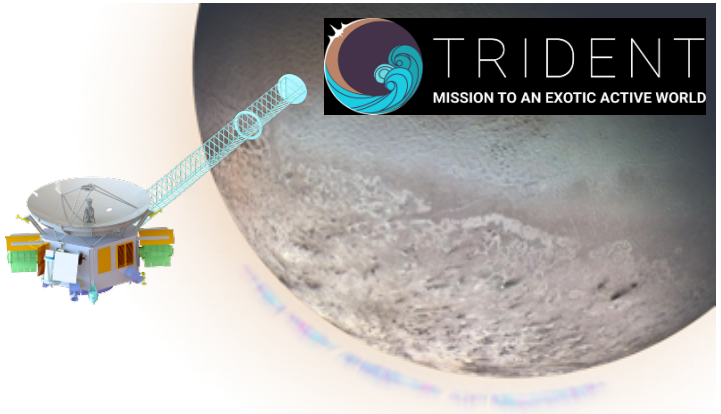
EscaPADE (TBD rideshare):

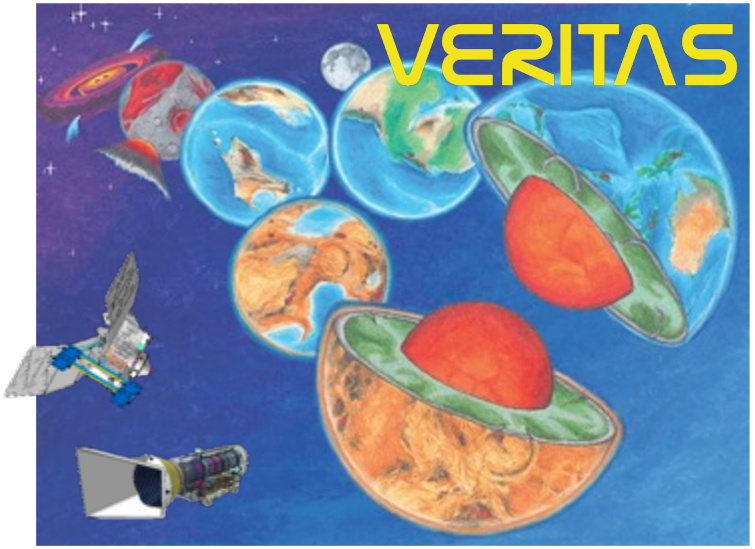
- PDR was in August, KDP-C will be April 2021

Lunar Trailblazer (IMAP rideshare):

- Passed KDP-C on November 24







Discovery and New Frontiers

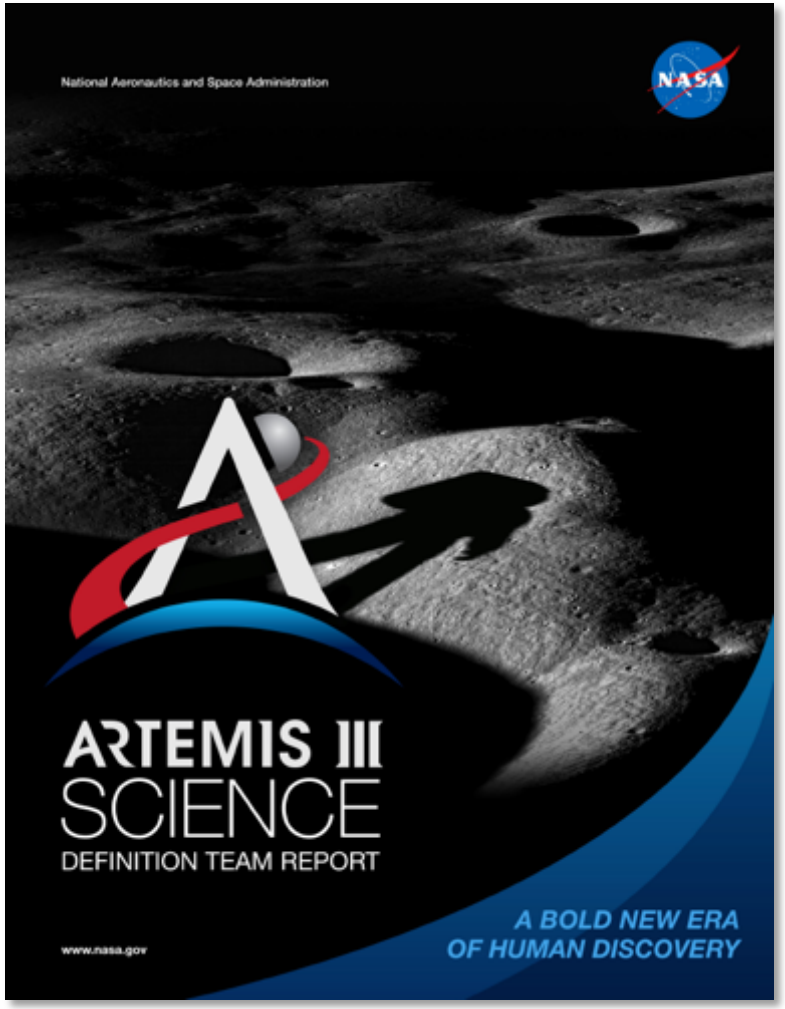
Discovery

- Discovery 2019 remains on schedule, despite COVID-19
- Step-2 Concept Study Reports are due November 2020
- Step-2 selections planned for NET April 2021

New Frontiers #5

- To be released Fall 2022 (current schedule), with community engagement beginning this fall
    - Community announcement with planning parameters released November 5

Artemis III Science Definition Report



- New Report will ensure that science priorities are understood and accounted for as HEOMD develops capabilities, mission requirements, and architecture for Artemis III
- SMD will also use the Report to:
  - Define scope of instrument calls for deployed and astronaut-utilized payloads
  - Ensure NASA curation is prepared to process returned samples
  - Inform next-generation of mission-enabling data products
- Put together by Science Definition Team (led by Renee Weber, MSFC), who sorted and prioritized existing science goals from the Moon (from community documents) plus findings from community papers, in context of Artemis III
  - Thank you to the team for their hard work!
- **Final report expected to be released this week, will be available online: https://www.lpi.usra.edu/Artemis/**
  - Community papers and links to townhalls also posted

Community

Community Initiatives

- Decadal Survey panel meetings are ongoing
- COVID-19 augmentations and funded extensions to existing SMD-funded grants
  - Will be prioritized to help graduate students and postdocs; soft-money, early-career researchers
  - Call for requests coming soon – please read carefully!
- Statement of Task sent to Space Studies Board of NASEM to address topic of increasing diversity and inclusion in the leadership of competed space missions
- As part of a PSD pilot study Psyche, Europa Clipper, and Dragonfly have provided the opportunity for early-career scientists to observe their next science team meetings
- Next PI Launchpad event being tentatively planned as a virtual workshop for early Summer 2021
  - Call for applications will be posted on NSPIRES in early 2021 (see 2019 Launchpad details for reference)

Mission PI Transitions

- MAVEN PI, Bruce Jakosky (LASP), is planning to retire and transfer his PI role by the end of 2021
- This change of PI is an opportunity to discuss with the community how such a transition should be handled and how the process can be improved in the future.
  - Mission PI changes occur infrequently
  - There is no written process for how such changes should be handled
- Encourage mission PIs to consider succession planning explicitly in extended mission proposals
- Will consider additional wording in AOs regarding process of replacing PIs

Response to August 2020 Findings

Finding 1: Equity, Diversity, Inclusiveness, and Accessibility (EDIA)

Finding: The PAC commends PSD for creating a statement of task for the Planetary Science and Astrobiology Decadal Survey that requested a detailed assessment of the state of the profession and actionable recommendations on improving equitable, diverse, and accessible representation in planetary science and astrobiology. The PAC is pleased to hear that SMD is sponsoring two additional NASEM studies on EDIA, and the PAC encourages these studies to similarly include experts in these areas. The PAC notes that holding all of these concurrently (and with the final stages of the Astronomy and Astrophysics Decadal Survey) may put increased pressure on EDIA experts associated with the Planetary Science community. At the August 2020 PAC meeting, many of the AG reports referenced ongoing EDIA efforts, including those coordinated by the cross-AG EDIA working group, highlighting the importance of these concerns. The PAC appreciated PSD's report on EDIA and looks forward to hearing updates on progress on this topic in future PAC meetings. The PAC would appreciate receiving regular reports from the cross-AG EDIA working group at its future meetings.

NASA Response: NASA appreciates this suggestion and will attempt to include a representative from the cross-AG EDIA working group at a future PAC meeting. Unfortunately, the short one-day format of this meeting means that it was not possible this time.

Finding 2: No Due Dates (NoDD)

Finding: While there are many challenges for NASA's peer-review process due to the current situation with COVID-19, there are also opportunities to re-think and re-engineer established policies and procedures with an eye to improvement. The PAC appreciated PSD's report on their efforts in this area. The PAC views the flexibility in the face of unexpected developments offered to proposers by a No Due Date (NoDD) submission policy for R&A proposals as potentially advantageous. However, there are risks of negative consequences that must be managed or eliminated during implementation. The PAC finds that PSD should continue to develop detailed implementation plans for NoDD, with feedback from a range of stakeholders, and then proceed with a judicious pilot effort. The PAC would appreciate a detailed report on PSD's NoDD implementation plans at a future meeting.

NASA Response: An implementation plan for NoDD is currently being developed by PSD. We are paying particular attention to understanding and mitigating potential risks. As part of our process, we will be conducting an internal process review within SMD and are planning to hold a community town hall to present the implementation plan to the community at the appropriate time. A brief NoDD update will be included in the R&A Update presentation at this PAC meeting.

Finding 3: Participating Scientist Programs

Finding: Participating Scientist Programs (PSPs) maximize scientific return from missions and broaden community involvement in missions. The upcoming Juno extended mission would provide an excellent opportunity for new scientists from the outer planets community to join the team, in particular those who study surface processes or satellites, since the primary mission had no such science goals. The PAC encourages continued support for PSP programs, and specifically encourages a PSP program for the Juno extended mission.

NASA Response: SMD recognizes the value that Participating Scientist Programs have in maximizing the scientific return from its missions and for extending participation in missions to the broader community. PSD is currently planning to run a PSP program for the Juno Extended Mission (EM), if the EM is approved through the Planetary Mission Senior Review (PMSR) process. The initial ROSES 2021 solicitation (to be released in February 2021) will include an announcement of this program and further details (including focus areas and due dates) will be included in a later amendment following the results of the PMSR.

Finding 4: PDCO Budget & NEOSM

Finding: The PAC has maintained unwavering support for the continuation of the Near-Earth Object Surveillance Mission (NEOSM), as well as for keeping its science team intact who have developed the concept and lead the project forward to selection. The President's FY21 budget request is not sufficient to move NEOSM towards construction. NEOSM is responsive to key goals of NASA's Congressionally-mandated program for planetary defense. Thus, the PAC supports funding the NEOSM at the level that maintains its intact science leadership team and moves this critical mission towards implementation.

NASA Response: NASA concurs on the importance of the NEO Surveyor mission and acknowledges the funding challenges that are still associated with its implementation.

Finding 5: Transparency of the Mars Ice Mapper Mission

Finding: The PAC is concerned that the process by which the Mars Ice Mapper (MIM) mission appeared in the Mars mission portfolio, its scope, and the plans for its funding were unclear. The PAC encourages greater transparency and community involvement in the formulation of this concept, in keeping with recommendations by MEPAG-sponsored science analysis groups and the Vision and Voyages document. In particular, the similarities between the MIM and a proposed Discovery concept are alarming since the proposing science team is not engaged in the MIM planning process, which sets a dangerous precedent. Consequently, the PAC finds that PSD/MEP should form a Mission Design Team (MDT), including scientists from the participating international partners and specialists from HEO, to review the M2M campaign requirements and to define appropriate instrumentation for the ice-as-a-resource mapper. To address the ice science objectives formulated by MEPAG through its science analysis groups (e.g., Ice and Climate Evolution Science Analysis Group [ICE-SAG], 2019) would require additional measurements (beyond the proposed SAR). The MDT could consider what additional instrumentation would be needed to realistically address the remaining ice science objectives. Should such objectives be included, the PAC would find that the instruments to meet those objectives be competed.

NASA Response: NASA is currently working to establish the framework for enabling international and potential commercial partnerships for the implementation of MIM. It is expected that a Science Definition Team (or an equivalent) will be formed for MIM to flesh out the scientific opportunities presented by the mission's architecture. There may also be other opportunities for the broader scientific community to participate in MIM. The MIM mission originates from NASA Agency-level objectives, as the Agency looked extensively at innovative options for sending humans to Mars in the 2030s. Exploring Mars ice reserves emerged as a focusing requirement, and the need to know 'where' was identified as a key early need.

Finding 6: Prominence of Astrobiology in Future PAC Meetings

Finding: The PAC noted that the tasking for the next Decadal Plan included an increased focus on astrobiology. In parallel, PAC noted that the presentations from both MEPAG and OPAG indicated that increased interest in astrobiology is also reflected across the national research community (>25% of DS white papers noted by MEPAG were for Goal 1, Life studies at Mars; >30% of white papers noted by OPAG were for studies of Ocean Worlds). By contrast, much less than 25–30% of the time available at the latest PAC meeting was dedicated to astrobiology discussions. Since NASA's Astrobiology program "resides" within PSD, PSD should consider how to redress this imbalance between community activity and discussions at future PAC meetings. Two suggested actions are: (1) PSD to include a presentation from NASA's Astrobiology Program at each meeting; (2) All AG chairs be requested to include discussion of astrobiology in each AG report. One possible "model" setting could be to recommend that AG chairs assign their allotted 20 min time-slots as: 10 min planetary science, 5 min astrobiology, 5 min preserved for Q&A.

NASA Response: NASA concurs on this finding and the importance of Astrobiology representation at PAC meetings. Mary Voytek, Senior Scientist for Astrobiology, will be giving a dedicated Astrobiology presentation at this PAC meeting and a representative from the Astrobiology Program will be invited to present at all future PAC meetings.

Finding 7: R&A Impact(s) of Selection Rates below 20%

Finding: The past several years have seen progress towards unsustainably low selection rates in R&A programs, including SSW and PSTAR. As missions end, a greater fraction of the science community relies on R&A programs for support. Low R&A selection rates place early career scientists in jeopardy. The impact of the practice of placing liens on future years and augmentations from COVID have both contributed to this issue. Every effort should be made to return all programs to healthy selection rates above 20%, with a target of 35%, maintaining annual calls for all programs including PSTAR and Habitable Worlds. Where funding shortfalls are anticipated to preclude >20% success rates, PSD should devise an equitable and transparent mechanism for deciding which programs to prioritize over others to ensure a balanced R&A program in terms of both research and community participation across the highest priority themes identified in the Planetary & Astrobiology Decadal Survey. The PAC finds that NASA PSD should redirect at least $10M to R&A programs from other programs that are lower priority in the Decadal Survey.

NASA Response: NASA agrees about the need to ensure stability to R&A programs and to be transparent about our selection processes, and we are working hard to achieve these things. This year changes have been made to address issues within specific programs. At this time we do not anticipate the need to cancel or substantially postpone additional R&A programs, but we acknowledge the need to address R&A budgets at a strategic level and challenges posed by increasing proposal numbers and costs.

EXPLORE
with us