



*Olympus Mons as seen by 2001 Mars Odyssey THEMIS  
NASA/JPL-Caltech/ASU*

## ***MEPAG Update***

Vicky Hamilton, MEPAG Chair  
Planetary Science Advisory Committee Meeting  
9-11 March 2024  
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- Activities since last report (March 2024)
  - *Connecting Community Scientific Hypotheses to Mars Sample Science* workshop convened jointly with ExMAG, held 22-23 April 2024 in Washington, DC (and virtual)
    - Presentations and draft hypotheses document to be posted on MEPAG website
  - MEPAG #41 held in Washington, DC and virtual
- Congratulations to the 2001 Mars Odyssey team on reaching 100,000 orbits!
- Upcoming: *10<sup>th</sup> International Conference on Mars* 22-25 July in Pasadena, CA

## MSR – Architecture Re-assessment (1/2)

- MEPAG reaffirms its support for the solar system-wide science of Mars Sample Return (MSR) as the top priority for the Mars program in the first Planetary Decadal report (2003) and the top priority overall of the last two Planetary Science Decadal Surveys and concurs with the most recent Decadal recommendations that:
  - (1) MSR be executed as soon as practicable with no increase or decrease in scientific scope, and
  - (2) if the cost is greater than the value or budget fraction adopted in the Planetary Decadal Survey report, the Administration work with Congress to secure the budget needed to ensure the success of this strategic mission.
- MEPAG commends the MSR Independent Review Board Response Team (MIRT) for their hard work and thoughtful deliberations in responding to the IRB-2 report and developing a proposed path forward for MSR.
- MEPAG understands the need for NASA to find an acceptable architecture, schedule, and cost for MSR and welcomes NASA leadership's continuing affirmation of the Agency's support for the tremendous scientific advances that MSR will enable in understanding our Solar System's origin and evolution.

## MSR – Architecture Re-assessment (2/2)

- MEPAG strongly supports NASA's stated intent to independently assess the science, cost, schedule, capability, and risk posture associated with the results of the mission design studies; the stated intention to receive study reports by October and announce plans forward in early 2025 will help to avoid further delays to progress on the Mars 2020/Perseverance and MSR missions and the Sample Receiving Project.
- **MEPAG reaffirms that science must be a driving priority for MSR and therefore strongly supports NASA's stated intent to evaluate the results of funded mission design studies on the diversity and number of samples they enable to be returned (next slide).**
- As NASA evaluates the best path forward for MSR, MEPAG urges NASA to maintain key capabilities of the specialized and world-leading U.S. workforce at NASA centers and industry partners, including unique capabilities for landing on Mars and Martian surface operations. This will enable NASA to conduct MSR and future exploration missions in a manner that sustains U.S. global leadership and international partnerships.

## MSR – Returning a High-Value Cache

- MEPAG concurs with the MIRT's (and IRB-2's) assessment of the importance of:
  - 1) returning the greatest number of samples possible (30) and encouraging M2020 to expand the quality and diversity of the returned sample suite by driving Perseverance up and out of Jezero crater to access strata from earlier in Mars history and formed by different geologic processes, as well as
  - 2) the science being conducted by Perseverance along its traverse, which provides critical regional context for the samples and further aids our understanding of Mars through in situ exploration.
- MEPAG reaffirms that the cache presently on the Perseverance rover is scientifically superior to the contingency cache deposited at Three Forks because it contains more diverse and higher-quality samples; collection of additional samples will further increase the scientific value of the rover cache.
- To ensure the maximum science return is enabled by any revised MSR mission design, multiple members of the MEPAG science community, particularly those with mission implementation experience, should be fully involved in the evaluation of mission designs, and decision-making having an influence on the science return of MSR. This should be an active, on-going dialog: close partnerships between scientists and engineers as one evaluation team will provide the best chance for identifying architecture solutions that maximize science return while minimizing cost, schedule, and risk.

## Looking Ahead

- The Ingenuity helicopter is a successful example of a higher, but considered, risk posture approach that may provide a means of realizing additional cost savings for the class of small, low-cost science missions at Mars envisioned in the forthcoming SMD/MEP Mars future plan.
- MEPAG is excited to see a substantial investment (~\$40M) in Mars technology development and looks forward to contributing to determining priorities for that work, e.g., as outlined in the Mars Concurrent Exploration Science Analysis Group (MCE-SAG) report.
- MEPAG seeks to enhance collaboration with the astrobiology community, including through Research Coordination Networks (RCNs) such as PCE3 and NfoLD, with enhanced Mars astrobiology focus, and looks forward to further interaction through mechanisms such as the upcoming Search For Life Science Analysis Group (SFL-SAG).
- MEPAG encourages SMD (via MEP, ESSIO, and the Senior Scientist for Mars Exploration) and ESDMD to continue identifying pathways for regular communication between the Moon to Mars architecture team and the Mars science community to incorporate science input into decisions that guide the architecture. Towards this goal, the MEPAG community expressed its strong support for initiating a series of human exploration-related workshops like the Lunar Surface Science Workshops (LSSW).

## Programmatic

- As described in the Decadal Survey, the Antarctic Search for Meteorites program (ANSMET) is a valuable source of extraterrestrial materials, including Martian meteorites. These materials provide returned sample analogues and opportunities for connecting the sample science and Mars science communities with each other and MSR. MEPAG strongly encourages NASA to work with NSF to continue support for the ANSMET program and infrastructure.
- IDEA programs are important to the growth and diversity of our community; MEPAG encourages NASA to continue to provide funding for programs offering opportunities for engagement in missions (e.g., Here to Observe, InSight Seers) and consider adding support to mission budgets to enable these interactions.
- MEPAG is pleased to learn that the Planetary Science Division (PSD) has achieved the Decadal Survey recommendation of allocating 10% of the PSD budget to Research & Analysis programs and encourages PSD to maintain this level of support.