

Summary of the presentations, discussion, and main outcomes of the 7th MEPAG virtual meeting (VM7) November 13th, 2019, 1:00-3:00PM PST

Posted agenda and presentation files: <https://mepag.jpl.nasa.gov/meetings.cfm?expand=vm7>
Notes primarily present an overview of discussion, with brief description of and links to presentation materials.

General MEPAG Announcements

- Please respond to all requests for general or meeting-specific MEPAG feedback via the email MEPAGmeetingOs@jpl.nasa.gov.
- To facilitate white paper collaboration, here are 2 sites:
 - MEPAG google doc for Mars-related white papers: <https://docs.google.com/spreadsheets/d/1EOQRc5kYn5ZgIhEuZfEXQVApBpKpXMu-KZaJdLm2GxI/edit?usp=sharing>
 - LPI site for any white papers: https://www.lpi.usra.edu/decadal_whitepaper_proposals/
- Current plans are to have the next face-to-face MEPAG meeting in Spring 2020.

Past and On-going MEPAG Activities

- MEPAG Chair R. Aileen Yingst [presented](#) the agenda for this meeting and an overview of recent MEPAG activities.
 - She presented an overview of materials she shared at the [September 11 CAPS](#) (Committee on Astrobiology and Planetary Sciences) and the [September 24 PAC](#) (NASA Planetary Advisory Committee) meetings.
 - She also recognized the 2 Mars mission concepts that had been [selected](#) for further study under the [ROSES call for Planetary Mission Concept Studies](#). Congratulations to PIs Wendy Calvin and Robert Lillis and their proposal teams! These two orbiter concepts are planned to be explored under one Study effort. Additionally, a concept for in situ geochronology (PI Barbara Cohen) was selected and has high-relevance for Mars.
- Dr. Yingst also [presented](#) on current thoughts about Decadal Survey preparation within the Mars community and how MEPAG can facilitate such work.
 - Based on comments by David Smith (National Academies of Science, Engineering, and Medicine / NASEM) at the recent [CAPS](#) meeting and other venues, white paper solicitation is expected to open formally in February and close end of May, 2020. (Note that this and all plans for the Planetary Decadal Survey are notional until official announcements are made.)
 - The MEPAG Executive Committee proposes to lead white papers (“by MEPAG”) on a few key topics such as overviews of Mars Science Goals, Objectives, and Priorities; Why Mars is a compelling science target; and the Importance of Mars Sample Return to the Mars and Planetary Science communities.
 - To facilitate collaboration and strategizing within the Mars community on white papers, a google doc is available for people to advertise white paper concepts and solicit for additional co-authors:
<https://docs.google.com/spreadsheets/d/1EOQRc5kYn5ZgIhEuZfEXQVApBpKpXMu-KZaJdLm2GxI/edit?usp=sharing>.
 - Additionally, the Lunar and Planetary Institute (LPI) had just released (during VM7) their Decadal Survey white paper collaboration forum:
https://www.lpi.usra.edu/decadal_whitepaper_proposals/.
- Don Banfield, MEPAG Goals Chair, [presented](#) on the ongoing MEPAG Goals revisions.
 - Initial revision plans within each Goal are outlined in the presentation slides.

- So as to produce a final document by LPSC 2020 (and kickoff of the next Planetary Decadal Survey), the Goals Committee plans to release a draft revised document before the winter holidays. The community will then be able to provide feedback through late January.

NASA Update

Michael Meyer, Lead Mars Scientist at NASA HQ, presented on activities at NASA. (*No slides were shown.*)

- Regarding recent and upcoming meetings:
 - At the PAC meeting, an overview was given on the five Mars missions' extended mission proposals that were under [Senior Review](#). PAC has accepted the findings of that Review and all five have been extended (most had very good/excellent review scores). (No further comment on the PAC meeting was possible as the full discussion and Findings from the PAC meeting were not yet official as of VM7.)
 - The Mars Sample Return (MSR) management, led by Thomas Zurbuchen (NASA Science Mission Directorate Director) and David Parker (ESA Director of Human and Robotic Exploration), have chartered a MSR Science Planning Group (MSPG), led by Michael Meyer (NASA) and Elliott Sefton-Nash (ESA) to deal with specific issues related to how to handle the samples once returned to Earth. Reports from their first two workshops are [online](#). A third document on the science management framework for the returned samples is in work and will be posted soon along with an executive summary.
 - On November 27–28, the ESA Ministerial will meet and decide, amongst other issues, whether they will support a joint MSR effort with NASA.
 - The [Mars Extant Life conference](#) was held in Carlsbad, New Mexico, on November 5–8. See the VM7 presentation by Dr. Carrier (below) for more on this.
- Dr. Meyer shared that the Announcement of Opportunity (AO) for 2020 MARS ROVER (M2020) Participating Scientists will be posted in December. The new AO for MSL Participating Scientists is expected to be posted in early 2020.
- Questions were asked about the status of the M2020 budget. M2020 has been allocated what they need to make launch in July 2020. While the increased budget for getting M2020 to launch has affected other Mars missions, their cuts have been allocated and no further adjustments are planned. (However, if Congress remains with a Continuing Resolution, then the financial situation will be difficult.)
- A question was also raised about a potential Finding from the NASA PAC (as reported by Amy Mainzer, co-chair of the NASA PAC, to the Space Studies Board) that the NASA Mars Exploration Program (MEP) and Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM) seem to be working in parallel rather than in collaboration regarding planning for the ground element of MSR, and that this should be remedied. Dr. Meyer affirmed that he and Jeff Grossman (person at NASA who oversees CAPTEM) are talking about MSR and what to do with samples when coming back.

Mars Architecture Strategic Working Group (MASWG)

Bruce Jakosky, Chair of MASWG, [reported](#) on this group's activities and solicited input from the community.

- The [NASEM Mid-Term Decadal Review](#) Committee was charged with doing an assessment of the Mars Exploration Program. One of its recommendations was that "NASA should develop a comprehensive [MEP] architecture, strategic plan ,... that addresses the science goals for Mars exploration outlined in Vision and Voyages." In response to that recommendation, NASA has formed a Mars Architecture Strategy Working Group (MASWG) to consider the possible elements and policies of a program architecture. As part of its deliberations, MASWG would like to understand the types of mission concepts that could be feasible to launch in the period 2020-2035, in parallel with or following Mars Sample Return.
 - Note that MASWG was initiated by NASA and is not a MEPAG activity.

- A question was asked if MASWG will look at new technologies, such as those required for sample analysis with Mars samples under containment. MASWG is discussing new technologies, but will not look into analysis of returned samples as this is part of the MSR program.
- The working group membership was shared in the slides.
 - Discussion yielded suggestions to include someone with a geophysics/deep interior specialization and someone from the sample community.
- MASWG is holding meetings and telecons through early Spring 2020, and expects to provide a PPT summary of findings/recommendations at the next in-person MEPAG meeting and then a full report delivered to NASA before summer.
- MASWG has requested community input in the form of one-page mission concepts, due November 22. See slides for more details.
 - Note that submitted mission concepts are for internal-MASWG discussion only and will not be shared. This is not a call to get into any kind of NASA mission queue.
 - Questions were asked about scope of the mission concept submissions – e.g., if tandem mission concepts could be submitted or if one could recommend a landing site. All mission concepts are welcomed, and considerations outside of a mission concept (such as a recommendation for a landing site) should not be submitted on their own but could be included within a mission concept.

Space Exploration in China

Jim Head (Brown University) [presented](#) on the Chinese Space Program. Highlights included:

- China has a long-term commitment to its implementation timeline. This is unlike US strategies that routinely change with the federal administration.
- The Chinese Space Program has plans for a Mars Mission (launching in July 2020) which includes an orbiter, lander, and rover component.
 - An online attendee shared this high-level article about the Mars mission: <https://cen.acs.org/physical-chemistry/astrochemistry/3-rovers-head-Mars-2020/97/i29>.
- Scientists can now apply to enter the taikonaut (Chinese astronaut) corps, which used to be restricted to only members of the military.
- China plans to send people to the Moon by the end of the 2020s.

Planetary Protection Independent Review Board (PPIRB)

Amanda Hendrix (PSI) [presented](#) on this NASA SMD-directed activity. The board was chaired by Alan Stern and had 11 members, including MEPAG Executive Committee member Wendy Calvin.

- One of the presented recommendations is that NASA should consider re-categorizing much of the martian surface from Class IV to II. The distinction between these is:
 - Class IV – poses significant chance of contamination
 - Class II – remote chance of contamination
- Several questions were asked about how this reclassification considers the potential for the wind to move material around the planet, potentially globally. This could mean that contamination of a low-priority site would possibly lead to contamination of high-priority sites. Or perhaps all sites are already possibly contaminated.
- To address this risk, improved models are needed to look at the survivability of organisms on the particles that will be blown around, and observations are needed to validate models of how materials are lofted from the surface and transported through the atmosphere.
- Included within the PPIRB Report was a recommendation that NASA should study transport and amplification to understand the level to which wind-transport of contamination materials could happen or already has happened.
- A question was also raised about how sample sterilization may adversely affect science measurements. It was pointed out that a detailed mapping of sterilization impacts on science objectives was performed by the [MSPG Workshop #1 Report](#).

Mars Extant Life Conference

Brandi Carrier (MPO/JPL) [presented](#) on the [Mars Extant Life conference](#), which took place November 5-8 in Carlsbad, NM. The conference report will be published in Astrobiology. Initial takeaways from the conference included:

- The identification of four candidate geologic environments that seem most promising for looking for extant life.
 - The candidates were identified based on submitted abstracts and in-conference discussion, but were not prioritized.
- Overall, conference presentations and discussion yielded a more optimistic view today towards the plausibility that there could be life on Mars. This is based on progress made over the last years in:
 - Mars observations and analysis (by e.g., MSL) that confirms Mars was once habitable and that the ingredients needed for origin of life (i.e., pre-biotic chemistry) are largely available on Mars.
 - Advances in our understanding of deep life on Earth and the difficulty in detecting it, which increase the plausibility of a yet-undetected deep martian biosphere.

Open Discussion

- Candy Hansen (PSI, HiRISE Deputy-PI) asked to give a “walk-on” presentation, to let the community know that the sun-synchronous orbit of MRO may move to a later local time (in March 2021) in support of M2020 by providing an extra hour or so each sol for surface mission operations. NASA HQ is evaluating this science trade.
 - This move would result in a number of negative consequences for science investigations relying on MRO optical instruments, including HiRISE, due to less light and more shadows, including:
 - Change detection and DTM construction (due to change in lighting conditions)
 - Polar studies and time for observing spring
 - Additionally, it would require ~5 yrs-worth of fuel to move the orbit (and MRO would likely not be moved back).
 - Questions were raised about the reason for changing the orbit, but there was neither time nor a M2020 representative online prepared to comment on this walk-on topic at VM7. The consensus was that more information was requested by the community to understand the science-trade being considered. There also was discussion about what could be appropriate MEPAG action on this.
 - The MEPAG Executive Committee will discuss it further, and look into possibly providing a forum for more information from all involved missions during a future MEPAG meeting.