

Summary of the presentations and discussion of MEPAG virtual meeting VM6 August 28, 2019, 12-2pm EDT

*Posted agenda and presentation files: <https://mepag.jpl.nasa.gov/meetings.cfm?expand=vm6>
The summary aims primarily to capture key ideas within the discussion; for presentations, a brief summary of materials and a link to the full presentation package are provided.*

General MEPAG Announcements

- Please respond to all requests for general or meeting-specific MEPAG feedback via the email MEPAGmeetingQs@jpl.nasa.gov.
- The Planetary Protection Independent Review Board (PPIRB), requests feedback from MEPAG regarding:
 - 1) Planetary protection (PP) as currently implemented for Mars
 - 2) Suggestions for how to improve PP for Mars
 - 3) What we need to learn or study in order to update our understanding of Martian "Special Regions"Comments were to be submitted via [google form](#) by **Wednesday, Sept 4**.
- Current plans are to have a virtual MEPAG meeting late this year and the next face-to-face MEPAG meeting in January or February 2020.

Past and On-going MEPAG Activities (Aileen Yingst)

R. Aileen Yingst, MEPAG Chair, gave a [brief overview of updates](#) since MEPAG Meeting 37. In particular:

- The Integration reports, along with oral plenary presentations, from the [Ninth International Conference on Mars](#) are posted.
- The MEPAG 37 [Summary and presentations](#) are posted, along with the [“Big Questions”](#) compilation that was sent to Lori Glaze.

Revisit Mars Special Regions (Wendy Calvin, David Beaty)

The Planetary Protection Independent Review Board (PPIRB), chaired by Alan Stern, aims to understand where challenges and hurdles exist within Planetary Protection. Towards this aim, the PPIRB has discussed the current definition of Special Regions and what landforms were considered candidate Special Regions on Mars in the [2014 SR-SAG2 Report](#), as well as potential implications of science advancement since then. Wendy Calvin (University of Nevada – Reno, and MEPAG Executive Committee member) is a member of the PPIRB and was tasked with gathering comments from the MEPAG community on this and other Mars-relevant Planetary Protection topics – hence this presentation, discussion at VM6, and [google form](#) (opened for comments through September 4). The PPIRB will brief NASA HQ in October.

David Beaty (Mars Program Office/JPL) [shared the presentation](#) that he'd given to the PPIRB, summarizing science advancements regarding gullies, RSLs, and slope streaks that indicated this present-day activity does not involve significant water. He also discussed studies of how far liquid water may move from an induced Special Region. Based on these advancements, he had proposed that an update to the logic used in defining and thinking about Special Regions was needed, which would potentially focus more on the sub-surface than on the surface.

Discussion included commentary from John Rummel (co-lead on the [2014 Special Regions study](#)) and Lisa Pratt (NASA, Planetary Protection Officer).

- John Rummel agreed that a definition of Special Regions and Planetary Protection considerations should seek to preserve the subsurface, and that a re-evaluation of specific surface features is warranted. However, he doesn't think we necessarily need to change all of our thinking about the surface. Additionally, he pointed out that a value of the current Special Regions concept is that it's a parameterized definition that can be applied to all areas (surface or subsurface). His recommendation was that MEPAG use the current definition of Special Regions and from that, based on current science knowledge, try to form a comprehensive policy.
- Lisa Pratt encouraged consideration of new or updated measurements of Mars that would help address key questions of relevance to Planetary Protection concerns, and then new orbit or landed assets that may be needed to acquire such measurements. She pointed out that considerations of potential new spacecraft should include small spacecraft possibilities, and all such ideas could be useful inputs to the upcoming Decadal Survey process.
- All agreed that **a re-evaluation of the Special Regions concept was warranted**. So when is the right time for doing such a re-evaluation? If completed very soon, it could be an input to the update to the Goals document. If completed before ~March 2020, then it could yield an input to the Decadal Survey Committee as well as to the COSPAR [Planetary Protection Panel's](#) (PPP) discussion at the [COSPAR meeting in summer 2020](#). This could be valuable as COSPAR creates "international policy" on Planetary Protection and thus results would feed into a much broader discussion. (As the COSPAR meetings occur every 2 years, the next opportunity for submitting an updated Mars science foundation to the COSPAR PPP discussion would be 2022.)
- Based on community comments, **it appeared there were two key areas for the PPIRB to think about:**
 - Although the movement of liquid water from an induced Special Region has been shown to likely be small and such water is likely to be present only very briefly, since terrestrial bacteria and spores have been observed to survive (in stasis) for thousands of years, the ability for such material to be transported over the surface (e.g., via aeolian processes) is a concern and is not yet well-constrained. Thus, **propagation and transport processes and rates** need to be considered.
 - The level of connectivity of the Martian surface (and subsurface) is an open question, and may depend on how close ground ice is to the surface within a particular area. Knowing the depth/purity of water ice within the near-surface is key missing information.
- Discussion also touched on:
 - The specific landforms in [David Beaty's presentation](#) that are now argued to be formed through dry processes. It was noted that water is still hypothesized to potentially initiate some present-day activity, and may have played a more active role in the past. However, a little water involved now isn't necessarily sufficient to propagate life, and only present-day water is a concern for Planetary Protection and Special Regions.
 - When thinking about induced Special Regions, it's important to remember that few missions have been sent to environments where this could have been an issue (Viking 2 and Phoenix). Thus, there are a lot of unknowns or not well-tested assumptions/models.

- While it is important to think about how human exploration of the martian surface will change “contamination” levels, large cargo deliveries that may occur before humans land are also likely to not be sufficiently “clean” from a planetary protection standpoint.
- When considering planetary protection concerns, it is important to think about extinct and extant life as well as prebiotic chemistry.

Prepare for Decadal Survey – webpage (Serina Diniega)

Serina Diniega (MPO) [described](#) a [newly-posted](#), initial compilation of resources for the community as they prepare for the upcoming Planetary Science Decadal Survey.

- This compilation of resources will be updated regularly.
- Suggestions for content can be set to MEPAGmeetingQs@jpl.nasa.gov.
- A question was asked about whether MEPAG would facilitate collaborations on white papers (as described in [Serina Diniega’s presentation](#) at [MEPAG 37](#)), and if such facilitation would also consider cross-AG efforts. MEPAG does intend to set up a google form and will be discussing options with the other AGs, but was waiting for the upcoming [CAPS meeting \(September 10-12, 2019\)](#) for more guidance on what may be looked for in the white papers and what may best serve the community.

New Frontiers (NF) (Rich Zurek)

This discussion was prompted by discussion occurring [within OPAG](#) and other AGs; there has been no official request for comments. This topic was brought to MEPAG to see if this community wished to make a statement about the current New Frontiers list and how that list may be generated/revised in the future, or if there should perhaps be no list (and NF would be openly competed).

Towards this aim, Aileen Yingst spoke with Curt Niebur (NASA, the NF discipline scientist) about the NF program and Rich Zurek (MPO/JPL) [presented](#) some [drafted](#) options for a Finding based on MEPAG Executive Committee discussion. [\[The final version of the Finding, developed based on VM6 discussion, is listed at the end of this Summary and \[posted\]\(#\), and will be shared with the other AGs at the CAPS meeting.\]](#)

- For Mars, this is a key concern as Mars is not included on the current NF list.
- In discussion about whether to retain a list, generally people agreed that having a list was good as it focuses community efforts and prevents down-selection from occurring at the key NASA Centers and institutions that support proposal generation (especially cost estimates).
 - The idea was also raised about changing the list from a focus on planetary body to a focus on science theme/questions. However, that can make it difficult to do costing estimates.
- Further discussion then focused on how such a list should be generated/revised. While there was no consensus on a specific process, there was general agreement that (1) keeping discussion of NF options within the Decadal Survey process makes sense for several reasons, and (2) there should be a mechanism to consider new discoveries and potentially revise the NF list outside of the Decadal Surveys, that should be clear/fair and openly communicated.
- Many questions circled around understanding what the present list contains and how it would relate to the upcoming call (NF5):

- Curt Niebur confirmed that, as the NF5 call would be announced before the next Decadal Survey process has completed, that list would not be affected by this discussion or the upcoming Decadal Survey.
- It was unclear whether comet sample return and ocean worlds (Enceladus) would remain on the list.
- There was agreement that we should invite Curt Niebur to speak to MEPAG at a future meeting.

Findings (Aileen Yingst)

R. Aileen Yingst presented the draft Findings from MEPAG meeting 37, as a chance for community comment before these were finalized. These findings include major topics of discussion at MEPAG 37, as well as updates to/progress on findings at the last face-to-face meeting, [MEPAG 36 \(April 3-5, 2018\)](#).

- A comment re-emphasized that the Mars community should consider the science that can be done with small spacecraft (included in *Finding 2.2*), and that this should include missions larger than the current SIMPLEX cap (\$55M) but smaller than Discovery-class
 - Some suggested that consideration of a cap of \$100M would enable a much broader group of missions to be proposed.
 - Additionally, it was noted that there are specific technologies that, if invested in, could help a small spacecraft mission achieve good science but individually cost less.
- Few other comments were made. [MEPAG 37 Findings were since finalized by the Executive Committee and are now [posted to that meeting website](#).]

Finding from MEPAG Virtual Meeting VM6

August 28, 2019

This document is posted at: <https://mepag.jpl.nasa.gov/meetings.cfm?expand=vm6>

1. **Finding:** The question of whether and how a candidate list for New Frontiers (NF) Announcements of Opportunity should be maintained is being debated in the science community. In support of the wider AG community discussion, MEPAG took the opportunity at its [6th Virtual Meeting \(August 28, 2019\)](#) to discuss this issue. While open competition can respond to rapidly changing priorities, NF proposals require significant time and resources, including extensive technical and financial scoping that can be provided by only a handful of institutions. In practice, this could lead to the choice of missions to be proposed being down-selected internally by the key NASA centers, based on their perception of success, rather than on more science-driven factors. A prioritized NF list enables the Decadal Survey to set scientific priorities across the most expensive classes of missions (NF and Flagships), while retaining many advantages of open competition. Additionally, it was broadly recognized that there should be a clear and fair method for evaluation/revision of the list between Decadal Surveys, so as to respond to new discoveries. While no Mars candidate is in the present NF list, MEPAG is confident that there are Mars missions which will be competitive in this class in future Decadal Surveys.

MEPAG supports the current process in which the Planetary Decadal Survey creates a New Frontiers Candidate List, and encourages NASA to clearly communicate the process for adding new candidates to this list between Decadal Surveys.