

January 24, 2007

Dr. Michael Meyer  
Lead Scientist for Mars  
NASA Headquarters  
Washington, DC 20546

Dear Michael,

## **Introduction**

On behalf of the Mars Exploration Program Analysis Group (MEPAG) Executive Committee I hereby summarize key results from the MEPAG meeting held in the Washington, D.C. area from January 9-10, 2006.

The goals of the January 2007 MEPAG meeting were for the community to listen to and provide comments on:

- Updates from NASA and JPL Managers on the current status of the NASA Mars Exploration Program and associated flight projects.
- Recent scientific results from the MER, MRO, and MEx missions, the current state of planning of the future PHX, MSL, and ExoMars missions, and highlights from recent scientific meetings that focused on Mars.
- Possible scientific objectives associated with the NASA 2013 Mars Science Orbiter (MSO), given the upper atmospheric foci of the 2011 Scout selections.
- Plans for organic “calibration” blanks for Phoenix, MSL, and ExoMars
- Feed forward from lunar exploration to Mars exploration
- Plan for updating the MEP Goals Document.

This remainder of this letter is a brief summary of the primary actions from the two day meeting.

The next MEPAG Meeting is planned as a “Mars NASA Night” (tentatively, Tuesday, July 10, 2007) during the 7<sup>th</sup> International Mars Conference at Caltech in Pasadena, CA.

## **Science Analysis Groups**

MEPAG will charter an MSO SAG-2 to reconsider the science objectives and measurements for the 2013 Mars Science Orbiter. The original MSO-SAG and resultant report focused on upper atmospheric processes and trace gases [http://mepag.jpl.nasa.gov/reports/MEPAG%20Goals\\_2-10-2006.pdf](http://mepag.jpl.nasa.gov/reports/MEPAG%20Goals_2-10-2006.pdf). Given that the two 2011 Scouts selected for Phase A studies are both focused on the upper atmosphere it is necessary to reconsider the most important science opportunities. The MSO SAG-2 will be asked to frame a set of multiple candidate mission concepts that respond to recent discoveries, are consistent with MEPAG’s priorities, and that support programmatic needs. The SAG will specifically be encouraged to include options for atmospheric trace gases, orbital camera(s) (for both science and future landing site certification needs), one or more

landed geophysical elements, a polar landed element, and scientific investigations that may have a relevancy to MEPAG Goal IV (preparation for human exploration). This new SAG will complete its work over a time-span of several months to be able to feed the information forward to a NASA Headquarters-sponsored Science Definition Team for detailed planning of the MSO objectives and measurements.

MEPAG will also charter a SAG to examine science objectives and measurement strategies that could be associated with the 2016 and 2018 Mars opportunities. Possibilities range from flying an Astrobiology Field Laboratory, implementing a network of small landers for geophysical measurements, and landing two mid-size rovers on the surface to continue the type of geological observations pioneered by the Spirit and Opportunity missions. A Scout could be considered for the second launch window. The intent is to have this SAG's work begin this summer, once the results from the MSO SAG-2 are in place and can be used to better understand any linkages between the 2013 and 2016-2018 opportunities.

### **Updating the MEPAG Goals Document**

The current version of the MEPAG Goals document is posted on the MEPAG web site at [http://mepag.jpl.nasa.gov/reports/MEPAG%20Goals\\_2-10-2006.pdf](http://mepag.jpl.nasa.gov/reports/MEPAG%20Goals_2-10-2006.pdf). Given the continuing results from Spirit, Opportunity, Odyssey, Mars Express, and the new data being received from the Mars Reconnaissance Orbiter, MEPAG feels that it is time to revise the document. This work will start this spring with soliciting community members to help out, under the leadership of Jeffrey Johnson, USGS, Flagstaff. The detailed work will begin this summer, using the 7<sup>th</sup> International Conference on Mars as an anchor point to consider new results for Mars.

### **Mars Feed Forward from the Lunar Program**

During 2006, MEPAG chartered a SAG to analyze the specific ways in which the presently considered objectives of the lunar program would be of relevance to the exploration of Mars, and the relative priority (from a Mars perspective) of those objectives. During the latter half of 2006, the SAG analyzed the objectives spreadsheet currently being maintained by the LAT (Lunar Architecture Team), and they presented to MEPAG a draft set of priorities, which were discussed at length. The SAG had also prepared a draft white paper that described the rationale for why some of these objectives are considered more relevant to Mars than others. On the basis of the discussion before and during the January 2007 MEPAG meeting, the SAG has been asked to consider the following feedback, and to make its final revisions.

- The spreadsheet needs to be modified to separate the "prepare for Mars" and "understand Mars" priorities.
- Consider changing the "Geology" category to "Planetary Science". In addition, the "grading scale" for science linkages in this category may be somewhat too generous.
- Be sure to convey that carrying out any of these investigations at Mars is higher priority than carrying them out at the Moon.
- There were several comments about specific ratings that should be considered.

## **Organic Blank for Astrobiology Investigations**

Three upcoming landed missions plan to search for organic carbon in martian surface materials (PHX, MSL, ExoMars). In each case, the credibility of the investigation is dependent on having an effective strategy to avoid false positives (i.e. a positive result from an instrument caused by Earth-sourced contamination, rather than Mars organics). All three missions are considering as part of their strategy the inclusion of a 'zero'-organic standard material, which is prepared on Earth, and sent to Mars with the spacecraft. The purpose of the MEPAG discussion of this topic was to inform and get feedback from the community on plans for these blanks, e.g., type of materials and their preparation, together with operational uses. A second purpose was to engender inter-mission discussions about blanks. Since this was an informational and idea-generating discussion (with lots of discussion), there were no formal MEPAG action items or decisions.

## **Mars-themed Workshops & Conference Summaries**

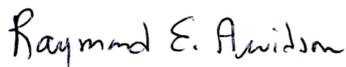
Since the past MEPAG meeting, there have been four important Mars-themed scientific workshops/conferences:

- Surface Ages and Histories: Issues in Planetary Chronology, May, 2006
- 4th Int'l Conf. on Mars Polar Science and Exploration, October, 2006
- Martian Sulfates as Recorders of Atmosphere-Fluid-Rock Interactions, October, 2006
- Early Planetary Differentiation, December, 2006

MEPAG recognizes that although there is great value in these focused discussions of different sectors of Mars science, it is impossible for all of the members of the community to attend all of these meetings. MEPAG has therefore traditionally encouraged representatives from meetings of this type to use the occasion of MEPAG meetings to present a summary that allows the information to be more widely disseminated and discussed. Reports on the above four conferences were presented and enthusiastically discussed. MEPAG would like to specifically acknowledge the critical role played by the Lunar and Planetary Institute (LPI) in supporting these important meetings.

Please don't hesitate to contact me if I can provide any further details on any of the issues discussed here.

Sincerely,



Raymond E. Arvidson  
Chair, MEPAG

cc: Doug McCuiston, NASA HQ  
Fuk Li, JPL  
John McNamee, JPL  
Michael Meyer, NASA HQ

David Beaty, JPL  
Sean Solomon, Carnegie Institution, PSS Chair  
Michael New, NASA Headquarters, PSS Executive Secretary  
Daniel McCleese, JPL  
Noel Hinners, MEPAG Executive Committee  
Bruce Jakosky, University of Colorado  
Jeffrey Johnson, USGS, Flagstaff  
Albert Haldemann, JPL  
Clive Neal, LEAG Chair  
Sushil Atreya, University of Michigan, VEXAG Co-Chair  
Janet Luhmann, University of California, Berkeley, VEXAG Co-Chair  
Fran Bagenal, University of Colorado, OPAG Chair  
Debbie Calderon, JPL  
MEPAG e-mail distribution list