

A banner for the Mars Exploration Program Analysis Group (MEPAG). The background is a dark blue, textured surface, possibly representing Mars terrain, with a portion of the reddish-orange planet Mars visible on the right side. The text is white and bold.

Mars Exploration Program Analysis Group (MEPAG)

chartered by NASA HQ to assist in planning the scientific exploration of Mars

***MEPAG Report to the Planetary Science
Subcommittee***

John Mustard, *MEPAG Chair*

Vicky Hamilton, *Presenter*

Major Events Since Last PSS Meeting

- **MSO SAG-2 (W. Calvin, Chair) submitted report, outlining 3 possible scenarios for a 2013 Mars Science Orbiter**
- **MEPAG Meeting at 7th International Mars Conference**
 - Conference attendees addressed by Alan Stern, NASA AA for SMD
 - Stern responded to issues raised at evening MEPAG meeting by inviting to meet with members of the Mars community for further discussions (see below)
- **Response to a possible Mars Sample Return lander launch by 2020:**
 - *MSL Cache Science Analysis Group* formed in partnership with NASA Astrobiology Institute to assess what questions can--and--cannot--be addressed by the recently developed cache system to be flown on the 2009 Mars Science Laboratory
 - *Next Decade MSR Science Analysis Group* formed to define sample characteristics needed to address various science questions (MEPAG goals and investigations) and then to address what other science should be addressed by MEP
- **Response to NOSSE regarding opening New Frontiers to Mars Missions**
- **MEPAG-sponsored meeting of scientists with A. Stern on Sept. 24**

MSO SAG-2 Report

- **MSO SAG-2 (W. Calvin, Chair) submitted report, outlining 3 possible scenarios for a 2013 Mars Science Orbiter**
 - Plan A was selected for consideration by a Science Definition Team, now being formed.
 - **Plan A would:**
 - Monitor and characterize surface changes
 - Characterize atmospheric state (thermal structure, dynamics, and circulation)
 - Characterize atmospheric composition (distribution and transport) and surface sources and sinks of targeted species
 - *Would deploy instrumentation with the sensitivity to detect a suite of possible atmospheric trace gases having geochemical and/or astrobiological implications for the surface/subsurface*
 - **MSO would include:**
 - *Long-lived telecom system for relay support to future missions*
 - *High-resolution imaging for science and landing site certification*

MEPAG at 7th Mars Conference

- **MEPAG meeting at 7th Mars Conference**
 - It was announced that Plan A had been selected for consideration by a Science Definition Team, now being formed, for a 2013 Mars Science Orbiter
 - However, Dr. Stern indicated that MSO is under consideration in light of the MSR directions
 - Report by Goals Committee (Jeff Johnson, Chair) outlined plans for revision of the goals document. Comment opportunities included one via the web, which closed Sept. 28--inputs are being assessed
 - MEPAG discussed Dr. Stern's comments (made July 10th at the conference) in its evening session. This discussion was summarized in a letter to the PSS Chair. There was enthusiasm for a MSR commitment. Concerns focused on:
 - Impact of the cache addition to MSL on that mission's own science (this concern has intensified given the recent MSL budget problems and announced descopes)
 - What must be done for MSR to return samples that are scientifically selected and are in a scientifically useful state?
 - What is the program architecture that will sustain the financial commitment to MSR while addressing the broader Mars science program?

MEPAG at 7th Mars Conference

- **MEPAG response:**
 - MSL Cache SAG formed with NASA Astrobiology Institute to assess MSL cache ability *as designed* to address science questions (MEPAG goals and investigations)
 - Telecon held on Sept. 26 to hear presentation on MSL Cache Design (Project held Cache PDR on Sept. 21.)
 - Key meeting will be led by Andrew Steele at Carnegie Institution, Oct. 8-9
 - Report to follow by end of October (input will be provided to Next Decade SAG)
 - Next Decade MSR SAG (ND-SAG) formed with two objectives
 - Analyze questions related to the kinds of samples and their condition, necessary to answer MEPAG's high priority science objectives
 - Analyze the primary non-sample objectives that can be achieved in a set of missions that leads to MSR
 - Group has had three telecons and is continuing to meet on an almost weekly basis
 - There is overlap in membership between the two SAGs. Lars Borg and Dave DesMarais, chairs of the ND-SAG, are on Steel's group and vice

Revision of MEPAG Goals Document

- **Goals Document 2007 revision process:**
 - Goals Chair (J. Johnson) presented revision process at 7th Mars Conference in July
 - Draft revision of Goals Document and community survey were available on web for comments from Aug. 24 to Sept. 28
 - ~ 3 dozen community members provided responses
 - Goals Committee will incorporate survey comments and provide revised draft to MEPAG Executive Committee (EC) on Dec. 3
 - Goals Committee will incorporate EC comments and present penultimate draft at Feb. 2008 MEPAG for additional community input via breakout sessions chaired by Goal Representatives
 - Goals Committee will finalize Goals Document based on MEPAG inputs
 - Goals Document to be released at LPSC 2008

Response to NOSSE Request

- **MEPAG response:**

- To the extent that it represents an *additional* opportunity, opening New Frontiers (N/F) to Mars missions would advance Mars science, especially in areas that would otherwise be delayed until after (the first) MSR
- If the N/F opportunity is meant to offset *deletion* of strategic missions from MEP, such opening would be a loss overall and would slow the pace of Mars exploration and make cross-mission objectives and support difficult to achieve
- MEPAG has not *prioritized* the list of strategic missions possible for Mars
- MEPAG does recommend that, if it is decided that N/F selection be more directed (than a wide-open competition), a Mars Network mission is a suitable candidate
 - It has the backing of the previous Decadal Survey
 - It has been consistently deemed important enough to be included as an option in previous MEP next decade studies
 - It represents an investigation likely to have cross-cutting and far-ranging implications for planetary science in general, as well as for Mars

September 24 Meeting with SMD AA

- **Following the 7th Mars Conference, Dr. Stern invited MEPAG to select a delegation of scientists to meet with him and to exchange views**
 - Three-hour meeting at NASA Headquarters
 - MEPAG was represented by J. Mustard, J. Johnson, J. Grant, V. Hamilton, H. McSween, L. Pratt
 - Wide-ranging discussion that focused on:
 - Mars as a program: Rationale, efficiency and success
 - MSR and MSL cache
 - Strategic Missions: MSO or other?
 - Impact of MSL descopes on science and international relations (esp. ChemCam)
 - **Final Impressions & Actions**
 - MSR should be considered the first sample return from Mars
 - MEPAG will consider--most likely through ND-SAG--candidates for a strategic mission other than MSR; this consideration to include MSO
 - SAG membership may be broadened for that part of the discussion
 - Concerns about impacts on international collaborations continue
 - Some thought/discussion needed as to how MEPAG can continue to provide an independent perspective on the process as MEP evolves

Descopes to MSL Payload, Impact on Science

- MSL estimated needs of approximately \$75M. Sources of growth and expected areas of future growth included:
 - **Instruments; SAM, CheMin, ChemCam, Malin Space Science Systems cameras.**
 - **Mechanical Design of Rover body, Corer/drill, Sample Acquisition/Sample Processing and Handling**
- Descope MASTCAM zoom capability:
 - *Diminished imaging capability*
- Eliminate MARDI:
 - *Landing site characterized less well (HiRISE mitigates)*
- Replace Surface Removal Tool with a brush:
 - *Effects of alteration rinds*
- No additional funds to ChemCam:
 - *Loss of only remote geochemical capability on MSL*
- Descope Tunable Laser Spectrometer re-integration capability:
 - *Loss of a capability to measure atmospheric isotopes*
- Cost Cap SAM and CheMin:
 - *Added risk for completion of two essential instruments*

Forward Planning

- **By the end of 2007, the following things will converge:**
 - Selection of the 2011 Scout mission announced early 2008
 - Revision of the MEPAG Goals Document
 - Report of the HEM-SAG, with an updated analysis of the required pre-human robotic program
 - Report from MSO SDT
 - Preliminary findings from MSR-ND and MSL Cache planning teams sponsored by MEPAG
- **Major MEPAG meeting Feb. 20-21 2008, in Monrovia, CA (near JPL) to discuss the above results and plan future activities**