National Aeronautics and Space Administration

Mars Exploration Program Science
MEPAG March 17, 2010

Michael Meyer
Lead Scientist

Mars Exploration Program 2010 Senior Review

The Mars Exploration Program conducts a biennial review of those projects with spacecraft and instruments currently in operation in orbit or on the surface of Mars. As part of the 2010 review, four projects (ODY, MER, MEX, MRO) submitted proposals for extended mission operations for the periods of FY11 and FY12:

- Senior Review process so that an integrated evaluation of the total set can be performed
- Each proposal should provide a 'menu' of activities that can be used for 'value' comparison with other proposals.
  - For ODY and MRO, there is a 'base' of performing relay functions for the surface missions and to provide data for landing site characterizations and/or atmospheric information for EDL of upcoming missions.
  - Each project should articulate and justify the specific benefits of its proposed scientific investigations and/or engineering demonstrations activities with attendant budget information that allows assessment of the value added

Criteria

- Science
  - Scientific significance, productivity and uniqueness of investigation
  - Criticality of investigation to future missions, e.g. risk mitigation
  - Opportunities for new investigators
  - Value of extended observational record
  - Significant degradation in instrument/spacecraft performance.
- Operations
  - Proposed role in infrastructure of Mars program, e.g. communications link, critical events coverage, environmental information
  - Cost effectiveness in supporting science and infrastructure
  - Spacecraft health and known risks (estimate the useful life of spacecraft in each of its various roles)
  - Robustness of mission operation approach proposed

- The Senior Review Panel made its recommendations to the Mars Exploration Program in a written report.

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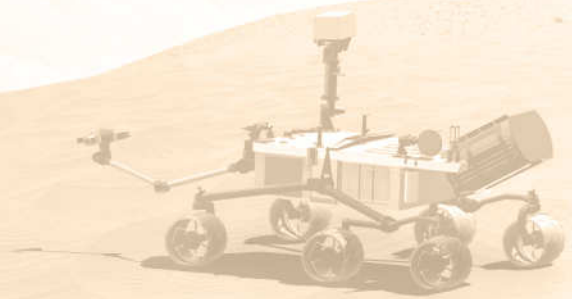
Major Recommendations

- *If possible, ODY should remain in its current local mean solar time orbit and its in-guide budget augmented somewhat to reap the full benefit for science of THEMIS observations at the current more favorable local time.*
- *Spirit, hopefully alive after winter, should be treated as a stationary platform with priority within the in-guide budget given to a fully mobile Opportunity rover.*
- *With the current programmatic funding for operating missions, further cuts in the MEX analysis activities seem unavoidable (but commensurate with the science support of other extended missions), but the subsurface sounding should be preserved at essentially its present capabilities.*
- *MRO funding should not be reduced significantly below its in-guide amount in order to retain its ability to achieve both science goals and programmatic mission support.*

2016 Opportunity
NASA-ESA Collaboration – 1st Mission

- Within the context of the 2016 joint mission, it is the purpose of the SALMON announcement to solicit proposals for the ExoMars Trace Gas Orbiter's scientific instruments.
- It should be noted that this announcement is released jointly by NASA and ESA. The intention of the two agencies is to conduct a joint evaluation and a coordinated selection process leading to a mutually agreed payload.
- Proposals will be reviewed by both U.S. reviewers and by reviewers from ESA participating states. All reviewers will sign nondisclosure Agreements.



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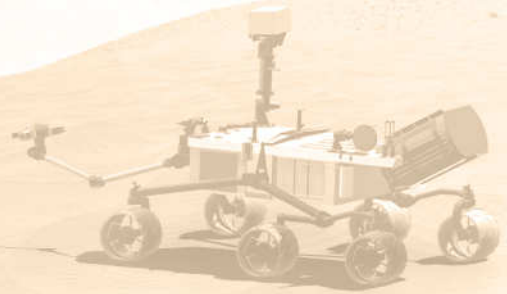
SCIENCE GOALS

1. Detect a broad suite of atmospheric trace gases and key isotopes;
2. Characterize the spatial and temporal variation of methane and other key species, ideally representing families of photochemically important trace gases (HOx, NOx, hydrocarbons, etc.) and their source molecules (e.g. H_2O);
3. Localize the sources and derive the evolution of methane and other key species and their possible interactions, including interactions with atmospheric aerosols and how they are affected by the atmospheric state (temperature and distribution of major source gases; e.g. water); and
4. Image surface features possibly related to trace gas sources and sinks.



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Program Element Appendix (PEA) H6: EXOMARS TRACE GAS ORBITER INSTRUMENTS

- Due date for the proposals
  11:59 p.m. Eastern Time on April 15, 2010
  (04:59 GMT on April 16, 2010)

- Web site for SALMON AO additional information
  http://salmon.larc.nasa.gov/

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- Dr. Raymond S. Colladay, Chair, Aeronautics and Space Engineering Board, National Academies
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SMD/PSD E/PO Update

- **Bolden is responding to the call from the Obama Administration to focus on Science, Technology, Engineering, and Mathematics (STEM) Education**
  - **not only for attracting next generation NASA workforce**
  - **US students rank 21st in science and 25th in math compared to other nations**
  - **investment seen as vital to US technological and economic competitiveness**
- **within SMD, E/PO funding has been restored to the 1% level**
- **OMB is increasingly looking for evidence of results from its investments in E/PO using sound education-research-based methodologies**
- **at the next MEPAG meeting, Michelle Viotti (Manager, MEP Public Engagement Program) has been asked to share information on new trends, policies, best practices, and Mars results that will be helpful to this community in implementing or proposing E/PO in this environment**

Stay Tuned

- NASA/ESA Joint Mars Program
- Decadal Survey deliberations
- Potential partnering on precursor missions for human space flight