2012 Planetary Mission Senior Review (PMSR) Out Briefing

Ed Grayzeck
Bill Knopf
September 18, 2012
Agenda

• Guidelines to Flight Projects
• Selection of the Review Panel
• Review Panel Members
• Interim Panel Preparations
• Conduct of the Review
• Final Adjectival Grades
• Extended Mission Critical Science
• Post Review Status
• Next Steps
Guidelines to Flight Projects

• Distributed January 31, 2012
  – Budget targets distributed on February 4, 2012
• Identified what needed to be in the Proposal
  – Format of the Proposal
  – Traceability Matrix
  – WBS Template
• Criteria for Evaluation
  – Science Merit
  – Technical Merit
• Schedule
  – Proposals submitted to NSPIRES by May 30, 2012
Selection of the Review Panel

• Involved PEs and PSs of the affected Projects
• Discussed Panel Candidates and areas of expertise
  – Iterative process starting in Sept 2011, through March 2012
• Jim Green solicited Panel Chair
  – Ray Walker (UCLA) selected
• Panel candidates vetted by Jim Green and Review Panel Chair
Review Panel Members

• **Ray Walker – UCLA – Panel Chair**
  • MESSENGER and Heliophysics SR, PDS PPI node – fields/particles

• **Nadine Barlow – NAU**
  • Chair of last PDS Senior Review, Mars cratering, maps

• **Andy Cheng – JHU/APL**
  • NEAR Program Scientist, SMD Chief Scientist, Small Bodies, lidar

• **Mark Dahl – NASA HQ (retired)**
  • Retired HQ Program Executive, Cassini, MSL

• **Karl Hibbits – JHU/APL**
  • IR techniques, Outer Planets, volatiles on the Moon

• **Tom Jones – IHMC; NASA Astronaut Corps (retired)**
  • GRAIL SR, human spaceflight representative, Small Bodies

• **Rosemary Killen – GSFC**
  • MESSENGER PSP - exosphere of Mercury and the Moon

• **Dave Kusnierkiewicz – JHU/APL**
  • GRAIL SR, APL Space Department Chief Engineer, systems engineering

• **Mike Mumma – GSFC**
  • Senior Scientist GSFC, Mars atmosphere, comets, Astrobiology Institute

• **Clive Neal – Notre Dame**
  • GRAIL SR chair, geologist, lunar research

• **Marilyn Newhouse – CSC**
  • GRAIL SR, ground/mission operations systems, MSFC

• **James Slavin – Univ of Michigan**
  • MESSENGER Co-I, magnetic fields
Interim Panel Preparations

• Kick-off telecon on June 1, 2012 with the 12 Panelists (plus 3 External Reviewers)
  – Preliminary assignments of Proposals to review and generate questions for the Projects
• Pre-review telecon on June 12, 2012
  – Discussed the questions that the Panel had generated
• Informed Projects of what needed to be in their presentations by June 15
  – Include Project updates and answers to Panel questions
Conduct of the Review

• Meeting held June 26-29, Doubletree Hotel, Columbia, MD
  – Project presentations on June 26-28
    • Mars Projects (including MEP Overview/Into) given on Day 1, plus MRO at start of Day 2
    • LRO (remainder of Day 2)
    • Cassini and DI-3 on Day 3
  – Each Project proposal/presentation discussed for ~1 hour after presentation
    • Projects called back to Panel room for additional questions/clarifications
    • Initial vote taken

• Panel wrap-up on June 29
  – Panel review of each evaluation
  – Final votes
## Final Adjectival Grades (by overall ranking)

<table>
<thead>
<tr>
<th>Mission</th>
<th>Science (Adjectival)</th>
<th>Technical (Adjectival)</th>
<th>Overall (Adjectival)</th>
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</thead>
<tbody>
<tr>
<td>Cassini</td>
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<td>VG</td>
<td>E/VG</td>
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<td>LRO</td>
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<td>MEX</td>
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<td>MER</td>
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<td>VG/G</td>
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<td>MEX/ASPERA-3</td>
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<td>DI-3</td>
<td>G/F</td>
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## Proposed Extended Mission Critical Science

<table>
<thead>
<tr>
<th>Mission</th>
<th>Critical Science</th>
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<tbody>
<tr>
<td>Cassini</td>
<td>Search for evaporation of Titan’s northern lakes and wave action; investigate formation of atmospheric storms (Saturn &amp; Titan); study time variability of plume jets at Enceladus; investigate effects of solar max on Saturn’s magnetospheric interactions with the moon</td>
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<td>LRO</td>
<td>Lower perilune with the south pole to augment previous ground-breaking discoveries; potential additional major discoveries such as improved constraints on heat flow values based on cold temps of crater floors near the poles</td>
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<tr>
<td>MEX</td>
<td>Proposed atmospheric/ionospheric investigations have potential to produce ground-breaking results during 2013 solar max; provide insight on escape of atmospheric components; context for MAVEN mission; improved estimates of water sequestered in surficial and subsurface deposits</td>
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<td>MRO</td>
<td>Investigate the diversity of aqueous environments spatially and with time; measure extent of groundwater discharge with elevated temperature and favorable pH; quantify how large the interannual variability of non-uniform distributions of dust with altitude which is critical to understanding radiative forcing of atmospheric circulation</td>
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<tr>
<td>MER</td>
<td>Investigate geologic context of exposures of ancient and aqueously altered materials at Endeavour Crater</td>
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<tr>
<td>MEX / ASPERA-3</td>
<td>Extend the study of Martian atmosphere response to the solar wind to a time of maximum solar activity</td>
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<td>THEMIS spectral data are complementary to spectral ranges of CRISM and OMEGA, enabling better distinction of surface mineralogies; HEND data will continue investigations of radiation environment above Martian atmosphere during 2013 solar max, and will also be compared with radiation analysis by MSL on the surface, providing simultaneous measurements for the first time of radiation above and below the Martian atmosphere</td>
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<tr>
<td>DI-3</td>
<td>Hibernation required for flyby of near-Earth asteroid 163249 (2002 GT) on January 4, 2020</td>
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Post Review Status

• Sent out budget letters to Projects
• Incorporate into PPBE FY14 Budget Submission
  • DD Briefed OMB/OSTP on September 11, 2012
• An EPO update was requested on September 21
  • Project plan for EPO budget of 1%
  • Identify how Project intends to leverage 50th anniversary of Solar System Exploration or Eyes of the Solar System
• Send update to Kristen Erickson, PSD Chief of Strategic Communications
• Inputs desired by October 15.
Next Steps

• Post results of Chairman’s summary and Panel Findings
• Conduct and document Lessons Learned, for example, science merit criteria could include incremental science