



2016 Planetary Mission Senior Review



NASA HQ Planetary Science Division
Planetary Mission Senior Review (PMSR)

Briefing to PSS on 2016 PMSR

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2016 PMSR – Overarching Info



The 2016 PMSR consisted of two Panels:

- Solar System Exploration Panel
 - May 16 – 18, Burbank Marriott
 - Flight Projects: Dawn, LRO, New Horizons
- Mars Panel
 - May 23 – 27, Hilton Mission Valley, San Diego
 - Flight Projects: Curiosity/MSL, MAVEN, Odyssey, Opportunity/MER, MRO, MEX/Aspera-3
- Doug McCuiston served as Chair for BOTH of these Panels
 - Ray Arvidson (Wash U in St. Louis) was the Co-Chair for the SSE Panel
 - Ralph McNutt (JHU/APL) was the Co-Chair for the Mars Panel
- Two panelists attended both the SSE Panel and the Mars Panel, providing a “leveling” function in assessing and assigning grades across the two Panels
 - Ralph McNutt (JHU/APL)
 - Mark Sykes (PSI)



2016 PMSR – Review Panel



SSE Sub-panel

- Mike A' Hearn
- Ray Arvidson
- Dan Britt
- Lisa Gaddis
- Georgiana Kramer
- Amy Mainzer
- Ralph McNutt *
- Mark Sykes *

* Cross-panel support

Mars Sub-panel

- Stephen Bougher
- Nathan Bridges
- Michael Carr
- Robert Clancy
- David DesMarais
- Michael Hecht
- Paul Mahaffy
- Ralph McNutt *
- Hap McSween
- Moses Milazzo
- Michael Smith
- Mark Sykes *



2016 PMSR – Specifics on Conduct of Review



- Each Project was given the same amount of time to give their presentation
 - 2 hours per Project presentation
 - 1 hour Panel caucus
 - 1 hour Project call-back
 - 1 hour Panel caucus
- WebEx was set up to allow remote participation in the PMSR.
- Project attendance was limited to 5 people, with telecon access for others as needed.
- WebEx and telecon lines were dropped during Panel deliberations.
- When needed, a separate telecon line was established with HQ during panel deliberations for remote attendance of PE/PSs.



2016 PMSR – Definition of Adjectival Grades



Excellent

- A comprehensive, thorough, and compelling proposal of exceptional science/technical merit as documented by numerous or significant strengths and having no major weaknesses.

Very Good

- A fully competent proposal of very high science/technical merit whose strengths fully outbalance any weaknesses.

Good

- A competent proposal having neither significant science/technical strengths nor weaknesses, or, whose science/technical strengths and weaknesses essentially balance.

Fair

- A proposal whose science/technical weaknesses outweigh any perceived strengths.

Poor

- A seriously flawed proposal having one or more major science/technical weaknesses and no offsetting strengths.



2016 PMSR – Result Summary



Top Finding: “The Panel unanimously believes that all (missions) should be approved for extension.”

Project	Adjectival Rating
Curiosity/MSL	Excellent/Very Good
Dawn @ Adeona	Good/Fair
Dawn @ Ceres	Very Good/Good
LRO	Excellent/Very Good
New Horizons	Excellent
Mars Express	Good
MRO	Excellent
MAVEN	Excellent/Very Good
Mars Odyssey	Very Good/Good
Opportunity/MER	Excellent/Very Good



2016 PMSR – PSD Direction to Extended Missions



- All 9 missions have been directed to plan for continued operations through FY17 and FY18.
- Kuiper Belt Extended Mission (New Horizons) is extended to 2021 with target flyby to occur in January 2019
- The Dawn mission will remain at Ceres
- Final decisions are subject to the availability of appropriated funds and the outcome of the annual budget process.



- There should be one review panel, not two
 - “Resolved” with Sub-Panel chairs and two overlapping panel members
- Panel members require sufficient time to thoroughly review each proposal prior to the PMSR F2F Panels...at least 2 weeks to prepare questions
 - Discussed adequacy of time at the end of this PMSR process--some additional time was allotted but less than originally planned
- 2014 Panel meetings were too short and work was required afterwards by email; an entire day should be allocated at the end
 - The final day after each Sub-Panel was set aside for the Chair/Sub-panel Chairs to develop first draft.
- NRESS staff did an excellent job
 - Held true again for this PMSR
- More budget guidance was needed as overguide requests seemed to be focused on getting the science completed
 - Needed to be evaluated again for this PMSR
 - At least one Project complained about “peel the onion” de-scope



2016 PMSR – Lessons Learned from [This PMSR](#)



- The F2F presentations should have a pre-defined agenda AND a standardized presentation format for the Proposers to follow
- Panel Chair requested a short 20 minute presentation by each Project to discuss technical status/information
 - There should be 1 or 2 technical/operations reviewers on each Panel
- Breakout budgets to assess how much “science” or “payload” money is actually R&A is useful in assessing qualitative science value of an extended mission
- Conducting the review at a location away from home institutions was useful (few distractions)
- PMSR should be scheduled to allow more time between it and PPBE submission
- A single Review Panel is still preferable to multiple subpanels
- Presenters are hard pressed to provide opportunities for personnel development beyond mentoring and advancement of people already on their team



2016 PMSR



Questions?



2016 PMSR



Backup Material



2016 PMSR SSE Agenda – Burbank Marriott

(all times listed Pacific Daylight Time; Chair may accelerate/slow the schedule pace)



Day 1: Monday, May 16, 2016

- 11:30 – 12:30 Lunch
- 12:30 – 12:50 Knopf, McCuiston Welcoming remarks, Charge to the Panel
- 12:50 – 13:00 NRESS Support Overview and Logistics
- 13:00 – 15:00 LRO Team LRO Presentation
- 15:00 – 16:00 Panel Caucus
- 16:00 – 17:00 LRO Call-back
- 17:00 – 18:00 Panel Caucus
- 1800 End of Day 1 (tentative)

Day 2: Tuesday, May 17, 2016

- 07:00 – 08:00 Breakfast
- 08:00 – 10:00 NH Team New Horizons Presentation
- 10:00 – 11:00 Panel Caucus
- 11:00 – 12:00 New Horizons Call-back
- 12:00 – 13:00 Panel Caucus
- 13:00 – 14:00 Lunch
- 14:00 – 16:00 Dawn Team Dawn Presentation
- 16:00 – 17:00 Panel Caucus
- 17:00 – 18:00 Dawn Call-back
- 18:00 – 19:00 Panel Caucus
- 19:00 End of Day 2 (tentative)

Day 3: Wednesday, May 18, 2016

- 07:00 – 08:00 Breakfast
- 08:00 – 12:00 Panel Deliberations
- 12:00 – 13:00 Lunch
- 13:00 - ????
- ???? Panel deliberations, write up final evaluations, SSE Panel Report
- End of Day 3 – Adjourn



2016 PMSR Mars Agenda – Hilton Mission Valley

(all times listed Pacific Daylight Time; Chair may accelerate/slow the schedule pace)



Day 1: Monday, May 23, 2016

- 07:00 – 08:00 Breakfast
- 08:00 – 08:50 Knopf, McCuiston Welcoming remarks, Charge to the Panel
- 08:50 – 09:00 NRESS Support Overview and Logistics
- 09:00 – 11:00 ODY Team ODY Presentation
- 11:00 – 12:00 Panel Caucus
- 12:00 – 13:00 Lunch
- 13:00 – 14:00 ODY Call-back
- 14:00 – 15:00 Panel Caucus
- 15:00 – 17:00 MRO Team MRO Presentation
- 17:00 – 18:00 Panel Caucus
- 18:00 – 19:00 MRO Call-back
- 19:00 – 20:00 Panel Caucus
- 20:00 End of Day 1 (tentative)

Day 2: Tuesday, May 24, 2016

- 07:00 – 08:00 Breakfast
- 08:00 – 10:00 MER Team MER Presentation
- 10:00 – 11:00 Panel Caucus
- 11:00 – 12:00 MER Call-back
- 12:00 – 13:00 Panel Caucus
- 13:00 – 14:00 Lunch
- 14:00 – 16:00 MSL Team MSL Presentation
- 16:00 – 17:00 Panel Caucus
- 17:00 – 18:00 MSL Call-back
- 18:00 – 19:00 Panel Caucus
- 19:00 End of Day 2 (tentative)



2016 PMSR Mars Agenda – Hilton Mission Valley

(all times listed Pacific Daylight Time; Chair may accelerate/slow the schedule pace)



Day 3: Wednesday, May 25, 2016

- 07:00 – 08:00 Breakfast
- 08:00 – 10:00 MAVEN Team MAVEN Presentation
- 10:00 – 11:00 Panel Caucus
- 11:00 – 12:00 MAVEN Call-back
- 12:00 – 13:00 Panel Caucus
- 13:00 – 14:00 Lunch
- 14:00 – 16:00 MEX Team MEX Presentation
- 16:00 – 17:00 Panel Caucus
- 17:00 – 18:00 MEX Call-back
- 18:00 – 19:00 Panel Caucus
- 19:00 End of Day 3 (tentative)

Day 4: Thursday, May 26, 2016

- 07:00 – 08:00 Breakfast
- 08:00 – 12:00 Panel Deliberations, write up final evaluations, Mars Panel Report
- 12:00 – 13:00 Lunch
- 13:00 – ??:?? Panel deliberations, write up final evaluations, PMSR Report
- ??:?? End of Day 4 - Adjourn



2016 PMSR Review Form Criterion: Science Merit



Evaluated the proposed extended mission based on factors such as:

- Depth and breadth of the PSD objectives (as described in “Vision and Voyages for Planetary Science in the Decade 2013-2022” questions and objectives) addressed by the proposed extended mission
 - See
(http://solarsystem.nasa.gov/docs/PSD_response_to_DS_Final.pdf)
- Potential for groundbreaking science and its relationship to the Decadal Survey
- Scientific significance, productivity and uniqueness of investigation(s)
- Emphasis on past performance in archiving data in Planetary Data System (PDS), as well as identifying existing data products that may be new candidates for archiving
- Opportunities for new investigators, where possible, including any opportunities for aspiring PI/PS
- Extent to which the science community beyond the mission science team utilizes data and conducts research
- Capability of instruments and spacecraft to collect the proposed data



Other factors considered:

- Cost effectiveness in supporting science and infrastructure
- Merit of any proposed demonstration of new capabilities or functionality, including future applicability
- Generally, Panel assumed that the current capabilities will persist through the end of the review period of performance, except for known limitations (e.g., fuel, instrument degradation), however:
 - A technical summary was requested to inform the panel of likelihood of implementing the science proposed, e.g., degradations/limitations in instrument/spacecraft performance:
 - Spacecraft health and known risks (estimate useful lifetime of spacecraft in each of its various roles)
 - Significant degradation in instrument/spacecraft performance
 - Robustness of the proposed mission operations plan to unexpected events
 - We did not evaluate operational efficiency



2016 PMSR - Details for Criteria



- Rationale for Merit Evaluation
- Merit Evaluation (adjectival grade)
- Each criterion covers areas from Guidelines
 - Major Strength (with sub-areas)
 - Major Weakness (with sub-areas)



2016 PMSR – Additional Comments



- We did **NOT** rate one mission (Science Proposal) against the other. Each one was evaluated and graded on its stand-alone science/technical/cost merits
- We had robust conversation on each proposal, but conflicted members were instructed to restrain from being “too robust”.
 - NRESS provided a nice space in which to take a time-out if needed
- Panel conducted the discussions with the Projects and within the Panel with professionalism, courtesy and fairness. We expected the same in return from the Projects.
- Only Panel members, PEs/PSs for the specific mission discussed, PMSR Leads (Bill Knopf & Michael Meyer) and NRESS attended Panel deliberations; **NO Project or Program folks**
- Handling of conflicts is always difficult, particularly within the Mars community of scientists. As a result, it is quite difficult to get reviewers for the panel. Those who are available are often conflicted.
 - ***How to minimize conflict?*** – Approach was to form a “highly cross-conflicted” panel of Mars scientists.
 - Approach was vetted by NASA HQ OGC, and deemed acceptable since the PMSR is not a “procurement action”. It is a programmatic review of existing Projects that provides findings to help PSD Management in determining level of funding going forward.



2016 PMSR SSE Panel Member List



Chair: Doug McCuiston		Co-Chair: Ray Arvidson	
Name	Primary Reviewer for	Also Reviewing	Conflicts
A' Hearn, Mike	Dawn	LRO, NH	
Arvidson, Ray	LRO	Dawn, NH	
Britt, Dan		Dawn, LRO	NH
Gaddis, Lisa		LRO, NH	
Kramer, Georgiana		Dawn, LRO, NH	
Mainzer, Amy	NH		(Dawn)*
McNutt, Ralph		Dawn, LRO	NH
Sykes, Mark		LRO, NH	Dawn

* - Institutional conflict only



2016 PMSR Mars Panel Member List



Chair: Doug McCuistion Co-Chair: Ralph McNutt

Name	Primary Reviewer for	Also Reviewing	Conflicts
Bougher, Stephen	MEX	ODY, MRO	MAVEN
Bridges, Nathan	ODY	MER	MRO, MSL
Carr, Michael	MRO	MSL	
Clancy, Robert	MAVEN	MEX	MRO
DesMarais, David		ODY, MAVEN	MER, MRO, MSL
Hecht, Michael	MER	MSL	
Mahaffy, Paul		MEX, MER, MRO	MAVEN, MSL
McNutt, Ralph		MAVEN	
McSween, Hap	MSL	MRO	ODY, MER
Milazzo, Moses		MER, MSL	MRO
Smith, Michael		MEX, MAVEN	MER, MRO, MSL, ODY
Sykes, Mark		ODY	(MRO)*

* - Institutional conflict only