JPL Technical Support to the Planetary Science Decadal Survey

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Planetary Science Decadal Survey Steering Group Meeting, July 6-8, 2009

Topics of Discussion

• Overview of technical support to PS Decadal Survey	Kim Reh
• Rapid Mission Architecture (RMA) Capability	Robert Moeller
• Team X	Jim Kaufman
• In-depth mission studies and Wrap-up	Kim Reh
• General Discussion	All

JPL brings its rich experience in implementing increasingly challenging SS missions to the DS task

Flybys

Voyager 1,2: Multiple planets
Mariners 2, 5: Venus
Mariner 4, 6, 7: Mars
Mariner 10: Venus & Mercury

Voyager

1977

Landers

Surveyor
MER Airbag Lander
Phoenix
MSL Sky-Crane Lander

Mars Airbag Lander

2003

Orbiters, Probes

Cassini-Huygens

1997

Mariner 9: Mars
Magellan: Venus
Mars Orbiters
Galileo-Gal. Probe: Jupiter
Cassini-Huygens: Saturn/Titan

Planetary Rovers

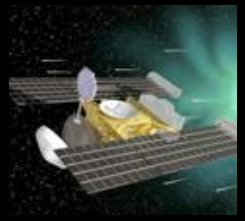
Mars Exploration Rovers

2003

Mars Pathfinder
MER
MSL

Deep Space Sample Rtn.

Stardust

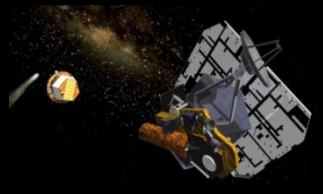


1999

Stardust
Genesis

Planetary Impactor

Deep Impact

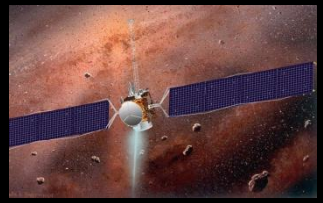


2005

Deep Impact

Multiple Small Body Orbiter

Dawn



2007

Dawn: Ceres, Vesta

The people at JPL who have designed and implemented these missions will be supporting your studies

What can JPL do to help the DS Panels?

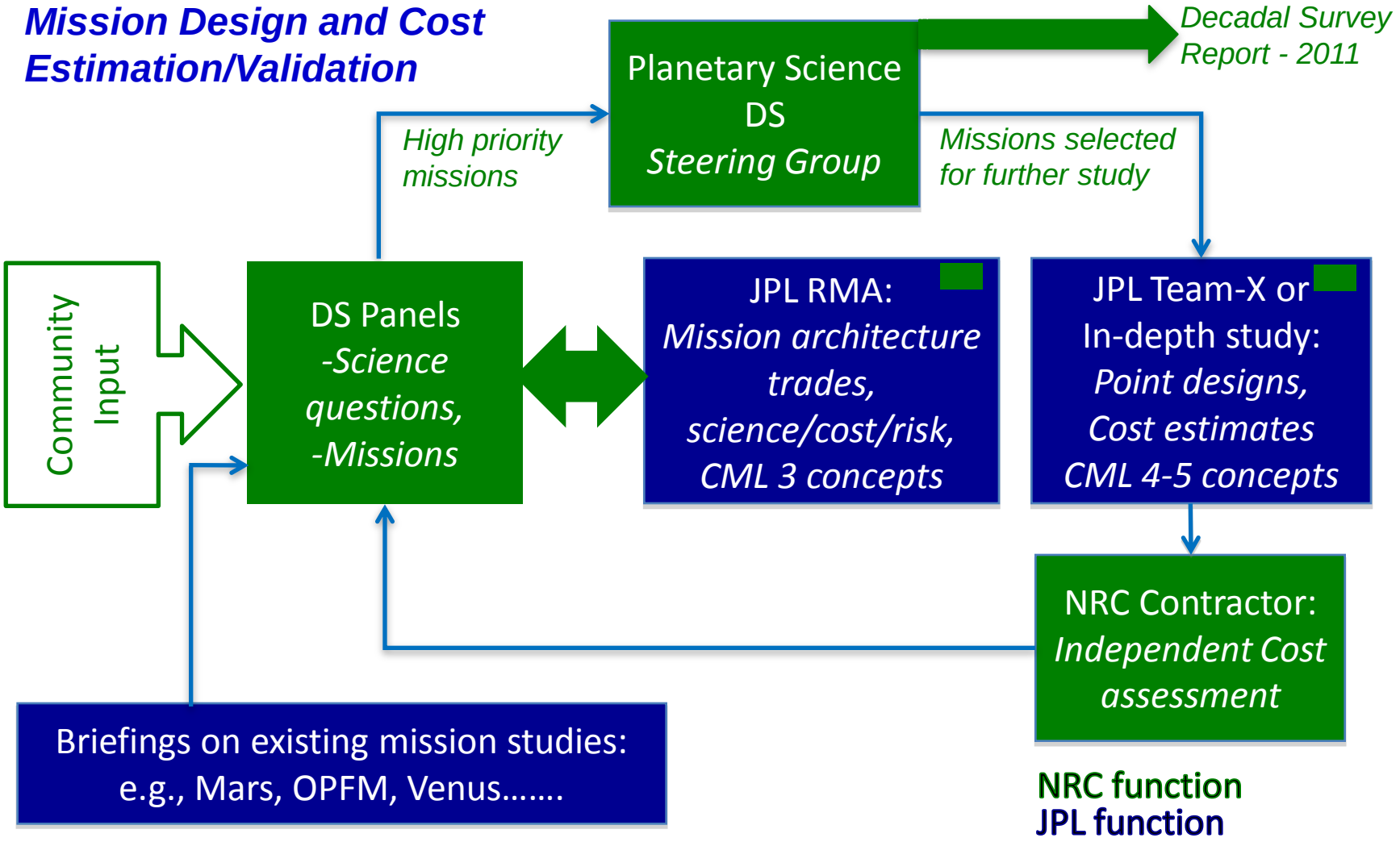
- Mission formulation and cost estimation support to assist the DS team in determining a balance of science missions that can be executed in the next decade within anticipated resources.
  - **Rapid Mission Architecture** provides for assessment of many alternative architectures and raising the maturity level of the most promising concepts to CML 3 for next level of study
  - **Team X** produces point designs and cost estimates at CML 4
  - **In-depth studies** produce higher fidelity results approaching CML 5

- Consistent approach that spans diverse concept maturity levels

- Input to DS on mission technology needs that are required to maximize the science return from flight mission investigations

- Comprehensive documentation of results to ensure that dependencies, assumptions and rationale underlying the products are well understood

JPL's formulation and costing capabilities directly meet the needs of PS DS



Summary of Capabilities

- Rapid Mission Architecture (RMA)
  - Assessment of many low maturity concepts over a broad trade space
  - Produces most promising architectures to proceed to detailed point design
  - Bring concepts of varying maturity (CML 1, 2) to common footing at CML 3
- Team X
  - Rapid-turnaround, low-cost mission concept development
  - Produces point design and total mission cost estimates
  - Raises concept maturity to CML 4
- In-depth studies
  - Multi-month, baseline mission concept development
  - Produces a more comprehensive understanding of mission implementation and total mission cost
  - Raises concept maturity toward CML 5 and lower cost uncertainty
- Technology assessments
  - Identification and readiness assessment of needed technologies

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- General Discussion — All