



In-depth Mission Study Support to the Planetary Science Decadal Survey

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In-depth studies produce a more comprehensive understanding of the mission and its cost

- Produce higher fidelity technical baseline and cost estimate
- Provide valuable insight into missions with potentially high science impact and/or high technical risk and complexity
 - High mission complexity
 - Challenging implementations – mission environments, architectures
 - Significant technology requirements
 - High cost (e.g. Flagship)
 - New types of missions that are “out-of-family” with past experience
- Result in decreased risk and cost uncertainty



Study Teams are organized to address the challenges of specific mission concepts

- In-depth study teams will be formed at the request of the Planetary Science DS Steering Group for specific missions
- Dedicated study team would be formed with full complement of science, technical, management, and cost experts
 - DS panel member would be science lead
- Study anticipated to run ~ 4-6 months
- Study output approaches CML 5
 - Extension and enhancement of Team X products
 - Focus on specific significant technical challenges (e.g., EDL, extreme environments.....)
 - Results in refined technical definition and costs



Products are tailored to the needs of more comprehensive in-depth studies

- Example product extensions include:
 - Full science and requirements traceability
 - Technology detailed assessment
 - Mission planning/ops scenario development
- Product enhancements include:
 - Refined cost (further, selected use of grass roots)
 - Comprehensive risk identification/mitigation
 - Schedule developed to lower levels of WBS
 - Higher fidelity mission traj/nav design
 - Refined mission parameter set
- Fully documented in comprehensive report





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WRAP-UP OF JPL CAPABILITIES



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

- People who are experienced in the design and implementation of planetary flight projects develop the mission concepts with DS Panel scientists, and produce accurate and defensible cost estimates commensurate with concept maturity level
- Studies will result in products of consistent quality across the expected range of concept maturity levels
 - RMA will take concepts to CML 3 – starting point for “Team X” studies
 - Team X will produce point designs and costs to CML 4
 - In-depth Studies will produce baseline concepts that approach CML 5 and have further reduced cost uncertainty
- Our team is prepared to assist the Planetary Science Decadal Survey group in responding to the broad needs of the NRC Statement of Task



Topics of Discussion

- Overview of technical support to 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