Why the Outer Solar System?

**Finding 1: Compelling Science** – Important scientific discoveries continue to be made in the outer solar system through NASA missions and research programs. OPAG affirms the findings of the NRC Decadal Survey and NASA’s 2006 Roadmap that the outer solar system provides critical clues to unraveling the mysteries of **how solar systems form and evolve, how planetary systems become habitable, and how life has evolved in our solar system.**
How? Generally

Finding 2: Steady, Balanced Strategy – Addressing these scientific questions requires a balanced strategy of outer solar system exploration that includes steady support for vigorous programs of basic research, data analysis, and technology development. Fundamental new discoveries are best made with a mixture of mission sizes that includes large flagship missions, along with small and medium-sized missions. A stable budget is crucial for continuity of scientific and technical capability. Such a strategy is most efficiently implemented as a coherent Outer Planets Exploration Program.

How? Specifically

Findings on:
- R&A
- Mission Concept Studies
- Technology
- New Frontiers program
- Discovery program

Flagships

- Support Cassini extended mission & Cassini Data Analysis Program.
- Recognizing the recent trends of escalating costs of large missions within NASA’s SMD, OPAG advocates that all studies of missions involve scientists working closely with mission engineers and that these studies must be subject to a review of technical, management and cost by an independent body. OPAG is concerned that any delays and/or cost over-runs of the next flagship mission might jeopardize the long-term goals for scientific exploration of the outer solar system.

PSS July letter

Flagship missions will be required to address many of the most fundamental scientific objectives of solar system exploration and must be accommodated within any long-range strategy for the Planetary Science Division. The New Frontiers Program, too, is critical to the accomplishment of solar system exploration objectives. The New Frontiers Program should therefore not be expanded in an attempt to accommodate the goals and objectives of flagship-class missions.

Do BOTH flagships AND New Frontiers
NASA's Science Plan calls out Europa, Titan, and Enceladus as key targets for exploration of the outer solar system. To make progress on those elements of the Science Plan

The PSS recommends that in-depth studies to evaluate mission concepts and technologies for potential outer solar system missions should be completed as soon as feasible.

The scientific goals for these missions have been defined in the NASA Science Plan and developed by the NRC, OPAG, and a variety of "focus groups." On the basis of current understanding of the highest-priority scientific goals, these missions would involve a Europa orbiter, a Titan aerial vehicle, and an Enceladus lander. The mission definition studies should involve broad scientific community involvement and multiple institutions. We envision mission concept studies for each of the three bodies to be funded at approximately $1M per study to address specific science goals within the scope of the NASA Science Plan, namely a flagship-class (~$2-3B) mission to be accomplished within a ~15-year time frame. The study results should be reviewed independently for their potential scientific return, technical feasibility, and cost. Moreover, NASA should work with OPAG and the science focus groups to develop an ongoing program of advanced mission concepts and technologies that will permit the full implementation of Science Plan objectives.

Next Meeting: November 7-8th, 2006 in Tuscon, Arizona

- Mission status
  - Cassini
  - New Horizons
  - Juno
- Flagship studies
- RPS issues
- R&A status

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