OPAG Update December 15, 2008
http://www.lpi.usra.edu/opag/

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1. Report of November OPAG Meeting

Outer Planets Assessment Group
November 6-7, 2008 Meeting
Tempe, Arizona

The Outer Planets Assessment Group is a NASA-supported forum for scientists and engineers to discuss exploration of the outer solar system and to enhance communication between community and NASA.

The meeting of OPAG held in Tempe, Arizona, was attended by ~50 people. We heard presentations as follows:

- HQ Update Jim Green (NASA HQ)
- EJSM - EJSM Team
- TSSM - TSSM Team
- New Frontiers to Neptune Candice Hansen (JPL) & Heidi Hammel (SSI)
- Enceladus results from Cassini – Carolyn Porco (SSI)
- Outer Planets program and Mission Studies status - Curt Niebur (NASA HQ)
- Cassini Data Usability - Claudia Alexander (JPL)
- Science Talk – Adam Showman
- Decadal Survey & Future Missions - Bill McKinnon (Washington Univ), Ron Greeley (ASU)

These presentations are available at the OPAG website: http://www.lpi.usra.edu/opag/reports.html

At the conclusion of the meeting OPAG made the following findings:

I. **Outer Planet Flagship**
   A. Both the Europa-Jupiter System Mission (EJSM) and the Titan-Saturn System Mission (TSSM) concepts contain excellent science.
   B. Studies have shown the tremendous value of joint international mission and this collaboration should be strengthened after the downselect; the whole (combined mission) will be greater than any sum of separate parts.
   C. For the non-selected mission, there should be a path forward (see next finding) to leverage investment and recognize science value of both missions.

II. **Flagship Line**
   A. OPAG sees the need for a sustained Planetary Science Flagship line. With this line sustained identification of – and funding for – technology that will enable future flagships. There are three elements to such a program: (i) studies of mission concepts; leading to (ii) technology development to enable a mission; leading to (iii) flying the mission. OPAG recognizes the need for flagship missions throughout the solar system but points out that the distances from both the Sun and the Earth pose extra challenges to exploration of the outer planets which in most cases requires flagship missions.

III. **New Frontiers Program**

A. The New Frontiers Program is critical for outer planet exploration. Opportunities for outer planets missions in the Discovery class are very limited (see finding below). It is critical that NF4 be open to radioisotope power systems. It is also critical that the NF4 line be open to new outer solar system targets. OPAG recommends that NASA expand mission list beyond the NOSSE list and updated for each AO.

B. OPAG encourages sufficient funds be included in Phase A to allow technology development, *specifically aimed and the needs of specific missions*, since NASA has indefinitely postponed most technology development programs.

IV. **Radioactive Power Systems**

A. A continuous supply of radioisotope fuel (plutonium) is critical for outer solar system exploration, particularly beyond Saturn. OPAG urges NASA to work with other AGs, DoD, and DOE to continue to explore innovative ways to make plutonium available. For example, we strongly urge that the Discovery 13 AO to include ASRG technology (see next finding).

V. **Technology Flight Validation**

A. Aerocapture is enhancing technology for the outer solar system, particularly for some Gas Giant planets, and attractively augments Titan missions. OPAG asks NASA what is the proper path to permit use of aerocapture at Titan and other solar system targets? How much risk will be retired by MSL and CEV flight tests? OPAG recommends that the NASA Chief Engineer charter a group to evaluate the readiness of aerocapture.

B. OPAG encourages NASA to develop a process to validate technology for flight and that follows through with opportunities for flight of that technology. The DSMCE program is a good first step in identifying candidate missions. The next required step is that Discovery 13 should be opened to permit this specific class of mission (ASRG) to compete (contingent upon DMSCE studies identifying viable missions). More generally, we encourage NASA to initiate a new effort, analogous to DSMCE, for the next critical technology; then commit that a future Discovery mission will be open to that specific technology.

VI. **Ground Infrastructure**

OPAG is concerned about the future of the Deep Space Network. While optical communication is an interesting technology for inner solar system missions, OPAG is unaware of any assessment of its difficulty/feasibility for outer solar system missions and is skeptical of it. OPAG wants to ensure a deep space communications capability for outer planets missions. There are also science impacts to abandoning RF communications (such as atmospheric occultations).

Other Issues:

A. Expanding the Cassini Team - Long duration missions have special challenges in managing the team membership.
   - There needs to be a pathway for early career scientists to be brought in for extended mission participation
   - The missions need flexibility to promote junior team members (e.g. to Co-I status) with time.
   - OPAG emphatically urges the Cassini Project to regularly add more people to teams via competition (e.g., IDS, participating scientist) as has been done in the past with many missions (e.g., MER, ODY)

B. OPAG supports the formation of a working group to investigate issues with Cassini data usability and provide recommendations on improving it

C. PSS should examine these issues for PDS as a whole. Is PDS a research tool to help scientists conduct research or a simple archive to preserve raw data for posterity?

The next OPAG meeting will be held in the DC area Monday-Tuesday March 9-10th.