

OPAG Outer Planets Assessment Group

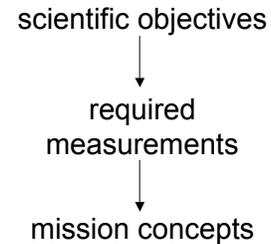
Fran Bagenal, OPAG Chair
University of Colorado, Boulder

Meetings ~ 100 attendees
2005 - Feb, Jun, Oct
2006 - May, Nov
2007 - May, Nov

<http://www.lpi.usra.edu/opag>

Scientific Priorities for the Outer Solar System

July 2006



Scientific Goals and Pathways for
Exploration of the Outer Solar System
A report of the Outer Planets Assessment Group (OPAG)
July 2006



•OPAG enthusiastically received Jim Green's announcement that NASA HQ plans to implement Science and Technology Definition Teams (STDTs) to study flagship missions to icy moons, specifically Europa, Titan, Enceladus and Ganymede. Such mission studies have been a major priority of OPAG:

Finding 3: Mission Studies – OPAG encourages NASA to begin comprehensive mission studies toward destinations in the outer solar system in order to assess the technical feasibility, realistic cost and time frame of viable missions. OPAG affirms the findings of the Decadal Survey, COMPLEX, and SSES, that Europa is the top-priority science destination in the outer solar system. Titan and Enceladus are also important science destinations and OPAG urges NASA to evaluate potential missions to these targets. (Pathways document, p.2)

•It must be recognized that the scientific goals and potential mission concepts for these additional objects are not as mature as those for Europa.

•We note that the addition of Ganymede to the list accommodates interests of scientists in Europe and that a mission to Ganymede may address broader goals of the jovian system.

- PSD detailed studies for flagship-class missions and assignments:
 - Europa - Jet Propulsion Laboratory
 - Titan - Applied Physics Laboratory
 - Enceladus - Goddard Space Flight Center
 - Ganymede (with additional focus on Jovian system science) - Jet Propulsion Laboratory
- Science community participation via Science Definition Teams (SDT)
 - Call for participation ended December 22, 2006 - **325 people volunteered!**
 - Teams selected in January 2007 and announced
- Kickoff meeting at NASA Headquarters on February 9, 2007
- Studies will be completed fall 2007
 - Results will undergo independent external review
 - Presented to OPAG and at a variety of science meetings
- Study results will be used as input to near term NASA strategic planning for a Flagship mission

- OPAG supports an AO for the 3rd New Frontiers mission (NF3) in the 2008 timeframe and encourages NASA to make the scope of the AO broad. OPAG notes that there are several targets in the outer solar system that might be accommodated with New Frontiers missions and encourages NASA to allow such missions within the next AO for New Frontiers missions.
- *Await response from COMPLEX study....*

- OPAG's charter encompasses the whole outer solar system and includes objects of all sizes. Scientists studying small bodies are welcome to OPAG.
- Key to understanding the rapidly-increasing inventory of primitive bodies in the solar system is a survey of their diversity. There currently are or have recently been several missions to small bodies – Deep Impact, Stardust, Dawn, New Horizons, Rosetta – suggesting an evaluation of small-body science in light of these missions would be timely and appropriate.
- To this end, the OPAG primitive body working group is tasked to evaluate what (a) current/planned missions and (b) ground-based studies, are likely to have told us 5-10 years hence.
- OPAG notes that COMPLEX is chartered to conduct rigorous studies of scientific issues. We urge COMPLEX to consider a study such as described above and to evaluate the outstanding scientific issues. Such a study is vital for assessing the next steps in exploration of primitive bodies of the outer solar system.

- At the November meeting we were briefed on the current status of radioisotope power systems, a key component of flagship missions to the outer solar system. Specific findings on technology from the meeting are:
 - OPAG welcomes Jim Green's announcement that Alan Harmon will be joining NASA HQ to lead PSS' technology development.
 - OPAG appreciates the collaboration with Idaho National Labs and welcomes a report on their spring workshop
 - OPAG notes that Stirling Generators offer potential for improved efficiency of power generation and requests a briefing on the progress of their development at the next OPAG meeting.
 - Aerocapture is a key technology for some future missions (e.g. Titan orbiter, giant planet orbiters). NASA's Planetary Science Division is urged to inform NASA's technology division that testing of aerocapture technologies with the next New Millennium mission is a high priority for outer solar system exploration.
 - OPAG reiterates that planetary science missions require reliable communication systems and is highly dependent on maintenance of the Deep Space Network.

*Ices, Oceans, and Fire:
Satellites of the Outer Solar System*

August 13-15, 2007, at the Hotel
Boulderado, Boulder, Colorado.

<http://www.lpi.usra.edu/meetings/icysat2007/>