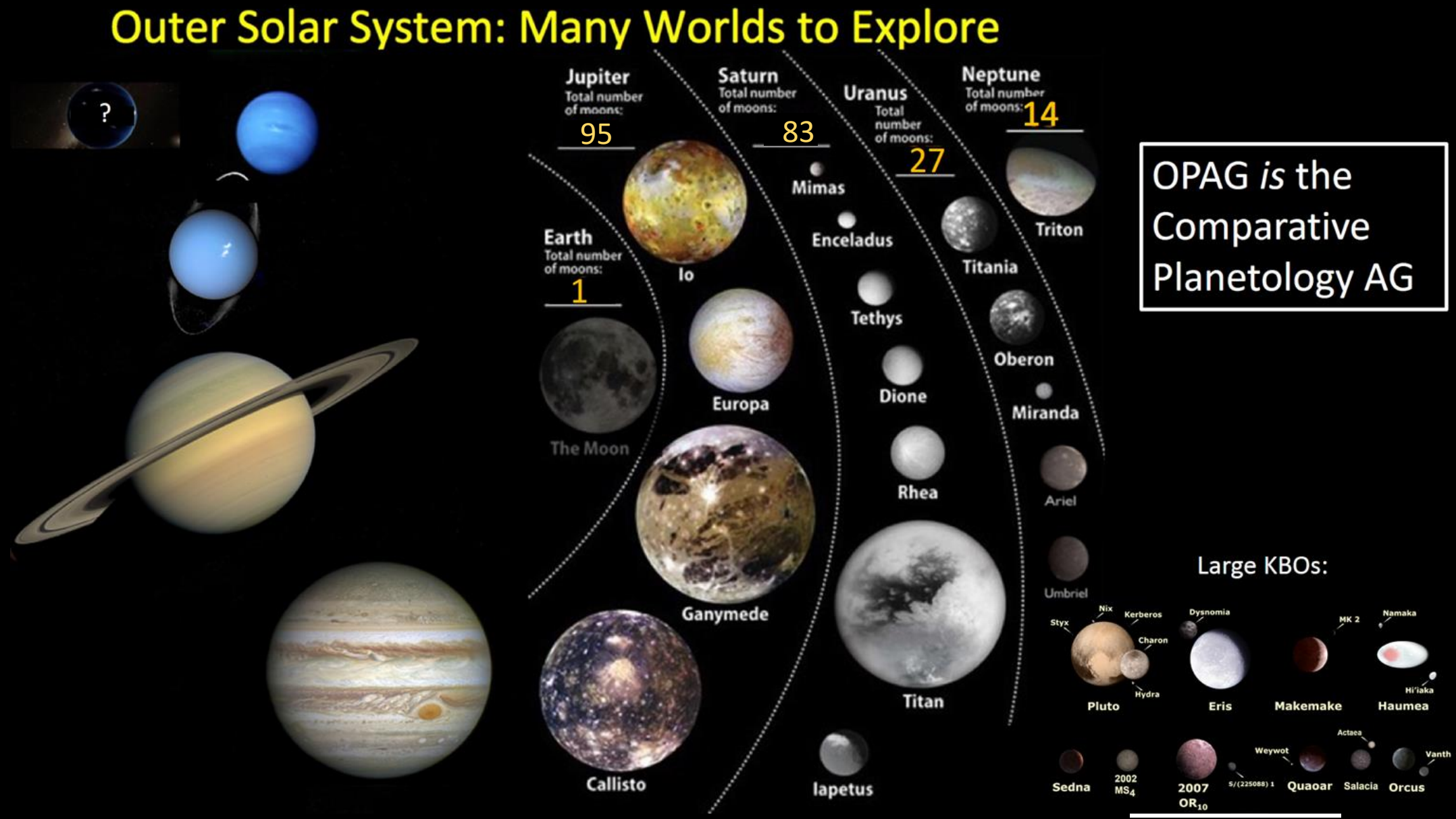
OPAG Update to the Planetary Science Advisory Committee (PAC)

Amanda Hendrix, OPAG Chair, PAC Meeting, 05 March 2024



OPAG *is* the Comparative Planetology AG

Findings from November 2023 OPAG community meeting (1)

1. PSD budget advocacy.

Research and Analysis (R&A) funding is critical for maintaining a vibrant early career community, and is particularly important to the entire community during this challenging budgetary environment. Furthermore, a balanced Planetary Science Directorate (PSD) portfolio is a significant priority.

Finding. OPAG thanks Dr. Glaze for her commitment to prioritize the funding of R&A at no less than 10% of the PSD budget. The OPAG community stands behind Dr. Glaze's efforts to maintain a balanced PSD portfolio, and strongly supports Dr. Glaze's dedication to maintaining a balanced program and budget, with Mars Sample Return not exceeding more than 35% of the PSD budget in any given year, per the *Origins, Worlds, and Life* (OWL) Decadal Survey's recommendation.

2. UOP Core Science Team.

The Uranus Orbiter and Probe (UOP) mission should get started in earnest, in line with OWL prioritization as the highest-ranked next flagship for this decadal period. While science goals for a UOP mission have been laid out in several mission studies and OWL, the prioritization of these goals needs to be accomplished in order to move forward with decisions on instrument payloads and mission timing. In particular, because some of these goals may impose requirements on arrival timing, studies (e.g., on trajectories, launch windows and Uranus arrival) need to be performed in the near-term in parallel with science goal prioritization to assess feasibility.

Finding. OPAG supports establishment of a funded UOP core science team to be selected and begin work as soon as possible. The core science team should be selected from scientists from a diverse suite of institutions and from a range of career levels, with the function to outline prioritized science goals for the UOP mission. OPAG fully supports a transparent process and clear understanding of the roles of the core science team as well as how the core science team would be selected and what their potential roles will be in the long-term during instrument selections, and mission development/operation.

Findings from November 2023 OPAG community meeting (2)

Finding 3. New Frontiers.

Considering the most recent delay, the final New Frontiers 5 (NF5) Announcement of Opportunity (AO) is slated for No Earlier Than (NET) 2026, placing final selection (end of Step 2) NET 2028. OPAG shares the HQ concerns that NF5 currently reflects the priorities of the *Visions and Voyages* (V&V) Decadal Survey even though the NET time for selection occurs halfway through the purview of the current OWL Decadal Survey. **OPAG endorses the current HQ plan to ask the Committee on Astrobiology and Planetary Science (CAPS) to augment the NF5 mission list with OWL-recommended mission concepts from the NF6 lists as soon as possible, and strongly encourages that NF7 targets also be considered.** For instance, Triton was not included on the OWL NF6 list solely because the assumed NF6 launch window did not align with a Jupiter Gravity Assist; the delays, advances, and developments since then have potentially invalidated this constraint.

The NF5 delay has been very challenging on the OPAG community, and it should be noted that NF is the primary—and potentially only—funding path for competed outer planets missions.

It is also important to highlight that, according to OWL, the recommended NF6/7 mission concepts will necessitate an increased cost cap. Furthermore, the most recent NF5 community announcement stated a potential cost cap that represented a significant reduction (inflation-adjusted) as compared to NF4, and that makes it difficult to propose a mission to ***almost*** any of the targets on the current list. Launch window opportunities for outer planets targets additionally need strong consideration given the shift in timelines.

In addition, relaying critical AO parameters, such as target list, radioisotope power systems (RPS) availability, cost cap, international (e.g., ESA) contribution policies, launch vehicle options with performance curves and costs, and launch readiness date (LRD) range, to the community as early as possible is extremely important to proposal teams.

Finding. The NF5 AO should include considerations for 1) an upward-adjusted cost cap and 2) inclusion of outer planets targets from the New Frontiers 6 and 7 target lists from the OWL Decadal Survey. The NF5 opportunity has been delayed enough that targets on the NF7 list may have launch opportunities not previously considered. OPAG strongly encourages NASA to release likely AO parameters through community announcements as soon as possible, even if that means that AO parameters would be released gradually or in stages. OPAG also encourages NASA to release the draft and final AOs as soon as possible so that the release does not get pushed far into 2026 or beyond, given the importance of NF to the outer planets workforce.

Findings from November 2023 OPAG community meeting (3)

Finding 4. Research Coordination Networks.

Research Coordination Networks (RCNs) are a mechanism for community collaboration designed to accelerate astrobiology research by facilitating communication, coordination, and synergy among NASA-funded research teams. In order for these efforts to be effective, financial support for both leadership and its members is essential.

Finding. OPAG encourages NASA to provide stand-alone, sustained, and flexible financial support to RCN co-leads, alongside administrative assistance as recommended by the Planetary Science Advisory Committee (PAC) in their November 2023 meeting. We further recommend explicit guidance be given in ROSES calls that funding can be included for RCN participation as part of proposal budgets.

Statements of Support & Concern from November 2023 OPAG community meeting (1)

- **Strong support for Europa Clipper.** OPAG continues to strongly endorse Europa Clipper and commends the team - and NASA HQ support - on tremendous progress as it moves to launch in October 2024. There is concern within the OPAG community that overages in the Phase E operations budget might adversely affect the science budget during cruise. It is important that investigation teams are supported sufficiently during cruise to prepare for science operations and analysis during tour; pre-launch science investigation development has been inadequately supported, making support during cruise crucial to ensure optimum science once tour begins.
- **Strong support for Dragonfly.** OPAG was pleased to hear from Dr. Glaze and Dr. Turtle that Dragonfly passed their Preliminary Design Review (PDR) in March 2023 and received strong support during the recent Agency Program Management Council (APMC) briefing held on November 16, 2023, authorizing the project to proceed with Phase C activities. We recognize that NASA HQ is postponing formal confirmation until release of the FY25 President's Budget in mid-2024, and **strongly urge the final confirmation review to be held as soon as possible after that release.** The OPAG community is concerned that any further delays may continue to adversely affect Dragonfly's launch readiness date, which has now slipped three times post- selection, to July 2028.
- **Strong support for Radioisotope Power Systems.** RPS is an enabling technology without alternatives for a number of high priority PSD missions - especially for outer planets missions such as UOP. Thus, we request NASA to continue to work with the Department of Energy (DOE) to ensure that sufficient RPS units will be constructed and fueled in a timely manner in support of these missions to match their power needs.

Statements of Support & Concern from November 2023 OPAG community meeting (2)

- **Support for Thermal Protection Systems.** TPS technologies fulfill critical needs for outer planet atmospheric entry probes to Saturn and Uranus, and could enable an aerocapture-based mission architecture for UOP. Furthermore, TPS plays a critical role on sample return missions, protecting the return capsule during Earth atmospheric entry. We support NASA's investments to date in developing this TPS capability and in particular maturing Heatshield for Extreme Entry Environment Technology (HEEET) to Technology Readiness Level (TRL)-6. OPAG recognizes that development and production of woven-TPS such as HEEET are carried out in close collaboration between NASA and industry partners. Significant delays in probe missions introduce time gaps that could adversely impact or atrophy production capabilities of our industry partners. Losing production capability would have a significantly negative impact on the readiness of this mission enabling capability, and possibly a decline in TRL.
- **Concern about potential future merger of SSW, EW and SSO into SSS.** The OPAG community was concerned about the idea of potentially merging Solar System Workings (SSW), Emerging Worlds (EW) and Solar System Observations (SSO) into a Solar System Science (SSS) program, and is glad to hear that such a merger will not occur in ROSES24. Concerns included how the review panels for such a program would be structured and the need for transparency in the review process. Furthermore, the community is aware that the No Due Date (NoDD) experiment has not been resolved yet, nor the issue of why proposal submission rates have dropped in recent years, and whether they will continue to do so. The community feels that introducing another large alteration to the ROSES program would be disruptive at this time.

Statements of Support & Concern from November 2023 OPAG community meeting (3)

Workforce Initiatives. OPAG thanks Dr. Christina Alston for her presentation on the Colorado Diversity Initiative, that demonstrates how an individual or group dedicated to Equity, Diversity, Inclusion, and Accessibility (EDIA) can help make a difference.

• OPAG endorses the PAC finding (June 20223) that advocates for an outward-facing EDIA- coordination position at NASA. OPAG supports the concept that EDIA efforts could be most effective if guided and managed from a central EDIA expert or office; having a designated person at the SMD or PSD level responsible for EDIA programs would project a sense of long- term priority for EDIA values and would also provide a clearly identified externally-facing responsible authority.

• OPAG notes that the OWL Decadal Survey recommended workforce surveys every 3-5 years, and that it has been three years since the last workforce survey of the planetary science community (the 2020 survey funded by the DPS). The OPAG steering committee would be pleased to work with NASA and the Cross-AG IDEA WG to coordinate the next survey as appropriate. Such a survey should be funded; if NASA cannot support this effort, perhaps the DPS can do so again. [See also the related PAC finding from June 2022.]

Statements of Support & Concern from November 2023 OPAG community meeting (4)

Concern about Ocean World technology. OPAG looks forward to coordinating with the Planetary Exploration Science Technology Office (PESTO), the Network for Ocean Worlds (NOW), and the Ocean Worlds Working Group (OWWG) to prioritize technologies of importance and timelines for development. OPAG stands ready to provide inputs on formulation and strategy to develop technologies highlighted by the OWL Decadal Survey for future missions. OPAG suggests that further conversations be planned between PESTO, NOW, and OWWG to coordinate and provide the best inputs.

A specific recommendation gathered so far from OPAG is that PESTO should consider more specificity within instrumentation for life detection/astrobiology for their drafted prioritization of technology gaps. OPAG would benefit from not only instrumentation development but also sample collection/handling/preparation technology developments, especially as applied to downstream chemical analyses of liquids/ices. Furthermore, the development of subsurface access technologies to 10m and beyond, including simulation/testing facilities, should start early, as these are closely linked with life detection/astrobiology measurements and are long-lead technology development efforts.