

OPAG Special Findings March 13 2019

The ICEMAG Descope Process

On March 5, 2019, NASA Associate Administrator Thomas Zurbuchen released a letter to the science community about his decision to terminate the Interior Characterization of Europa using Magnetometry (ICEMAG) experiment on Europa Clipper, to be replaced by a facility magnetometer investigation. The loss of ICEMAG will adversely affect the science return of the Europa Clipper mission. We support NASA's decision to fly a magnetometer experiment on Europa Clipper, and we urge the facility team to continue to try to address the key question of ocean salinity. The letter explained that the termination decision was the result of "... a process to monitor resource usage of each Europa Clipper instrument. As part of the process, cost triggers were defined for each instrument with the understanding that exceeding the trigger would escalate the situation...until a resolution was found." This appears to be a new process for how NASA HQ makes PI-experiment termination decisions, which is not well-understood by the science community. It would be helpful for NASA to provide a full explanation in writing about this new process. We suggest NASA ask that the Committee for Astrobiology and Planetary Science (CAPS) to examine this process and potentially recommend how NASA might more clearly and transparently conduct such terminations. Here are a few suggested questions to address:

1. How and when is the initial cost trigger defined?
2. How are cost increases due to spacecraft accommodation and requirements compliance accounted for?
3. What mission phases (A, B, C, D) does the cost trigger process apply to?
4. Will all NASA Science Mission Directorate missions follow the cost trigger process, and if not, what are the criteria for those choices?
5. What is the process to develop an objective cost-benefit and risk analysis of any alternate plans considered, such as converting a PI-led investigation into a facility investigation?
6. How will metrics and requirements be developed for a new facility investigation?
7. How will potential conflicts of interest be handled throughout the cost trigger decision process?
8. What is the process for changing the Level-1 science requirements and assessing the value of the descoped mission?
9. Is there any appeal process after the Associate Administrator announces a decision?

In addition, OPAG wishes to express the community's shock over this decision. To those not involved in the process, this news came as a complete surprise. An important aspect of the community's reaction is the perception of unfairness in the process. Recent social scientific research shows that members of underrepresented groups, including women, are subjected to overly harsh consequences when not meeting expectations (e.g., Rudman & Phelan, 2008; Dovidio & Gaertner, 2000). We encourage NASA to ensure that this or any other termination decision is transparent, and avoid the perception that this PI-led experiment team received a seemingly punitive decision that is disproportionate to the challenges faced by the team.

Finding. OPAG urges NASA to request the Committee on Astrobiology and Planetary Science (CAPS) of the National Academies to investigate the ICEMAG termination process and rationale, and to potentially access and make recommendations to NASA SMD about how to define a clear and transparent process for potential termination of PI-led flight experiments.

Refs:

Rudman, L. A., & Phelan, J. E. (2008). Backlash effects for disconfirming gender stereotypes in organizations. *Research in organizational behavior*, 28, 61-79.

Dovidio, J. F., & Gaertner, S. L. (2000). Aversive racism and selection decisions: 1989 and 1999. *Psychological science*, 11(4), 315-319.

Cassini Funding Termination

The Cassini-Huygens mission has returned a wealth of new data on the Saturn system. Its 13 years in orbit yielded important insights not only into seasonal and temporal changes, but also into coupling of the various parts of the Saturn system. During the final year of the mission, Cassini flew closer to the rings and planet than ever before, diving through the gap between the rings and planet before plunging into Saturn to vaporize in its atmosphere. Many of our preconceived ideas about Saturn and its environs were overturned during those final orbits. The Cassini Grand Finale mission produced many hundreds of gigabits of fundamentally new data, including: unique near-field gravity and magnetic field measurements; first time in-situ sampling of unique atmospheric constituents, ring particles, and plasmas; and the highest resolution imaging of the rings, ring moons, and Saturn. Funding in fiscal 2019 focused on completing the calibration and analysis of that final year of science data, generating higher order data products for the Planetary Data System (PDS) to be used by future scientists, and supporting young researchers including graduate students, postdocs, and early to mid-career scientists.

Unfortunately, because of changing NASA priorities, Acting Planetary Science Division Director Lori Glaze recently informed the Cassini project that the additional funding anticipated in the remainder of fiscal 2019 will be limited to a small transition amount. This abrupt change in funding profile will have an adverse and detrimental impact on young scientists and researchers surviving on soft money unless bridge funding is provided to smooth this transition. It also impacts the final calibration and analysis of the Grand Finale data, and the timeliness of delivering higher order products to PDS. Some planned PDS products may simply not be developed.

Finding:

OPAG encourages NASA to provide sufficient transition funding to support an adequate closeout of the Cassini project that will minimize the impact on young scientists and other investigators who would be disproportionately impacted by this large, abrupt funding cut. OPAG welcomes NASA's efforts to work with the Cassini project to provide the needed funds for impacted scientists, as well as almost completed higher-order archival products, and to develop a smooth transition plan that does not force researchers to seek their funding outside of the planetary program.

Expansion of Cassini Data Analysis Program

The Cassini Data Analysis Program (CDAP) supports a large portion of the OPAG community. This program is vital for enhancing the science return of the Cassini mission by funding the work of researchers who were and were not members of the Cassini team. An increase in CDAP funding will also ease the transition of Cassini researchers as they now turn to CDAP as their main source of funding. The abrupt end in the funding negatively impacts many Cassini team members who were not allowed to submit proposals to CDAP in the last two cycles, even if they proposed a CDAP research project completely different from that being funded by the Cassini project.

Findings:

OPAG applauds the spectacular success of the Cassini mission at Saturn and asks NASA to adequately support CDAP to ensure optimum science output from this mission. In addition:

- 1) Augmentation in the CDAP budget is needed as a large cadre of Cassini researchers now begin to rely on CDAP funding to support their work.
- 2) Given the abrupt cessation of new Cassini funding, moving the CDAP proposal cycle earlier in 2019 will help ameliorate this large reduction, bridging the gap created by Cassini's decreased funding.
- 3) Cassini, with its 13 years of archived Saturn system data, should have a continued dedicated data analysis program for many years to come, helping to bridge the large gap before the next large Outer Solar System mission and ensuring that a knowledgeable cadre of outer planet scientists will be ready to analyze data from the Europa Clipper mission, as well as other future outer planet missions.