

SBAG expresses gratitude to the Lunar and Planetary Institute, NASA, NRESS, and all the individuals who helped to organize and host the SBAG meeting despite the government shutdown. We also wish to thank all of the NASA employees and contractors who worked without pay during the shutdown to keep NASA missions alive and moving forward. The most serious impact of the shutdown has been on research funding, particularly for young investigators. We have also seen proposal timelines pushed back, and cancellation, postponement, or poor attendance of conferences. SBAG implores the federal government to recognize the necessity for the planetary community to be funded properly, be allowed to work, and receive funding on time.

SBAG endorses the recommendations of the recent report on [Strategic Investments in Instrumentation and Facilities for Extraterrestrial Sample Curation and Analysis](#) from the National Academies of Sciences, Engineering, and Medicine. A key conclusion from the report is that *“If future instrument funding decisions must be made under the constraint of flat or decreasing overall funding levels, then the several competing demands of sample return science will likely exceed available resources, necessitating a focus on a few highest priority needs.”* Indeed, the trend in investment in major facilities for sample analysis has been decreasing over the past 10 years. The situation is particularly critical as several sample return missions are ongoing, several are in the planning stages, and sample return missions will likely be emphasized in future decadal plans. The small bodies community is among the interested parties for that form of exploration. Hence, SBAG endorses the recommendations of the report in full, including an increase in investments to maintain and renew planetary equipment with the introduction of new capabilities, to sustain technical staff over the long term, and to train the next generation workforce.

SBAG reasserts the importance of including high-quality studies of potential small bodies missions as part of the pre-Decadal Survey process. These studies should include, but not be limited to, large or medium-sized missions to Ceres and the Pluto system, as recommended by the report of the Committee on Astrobiology and Planetary Science on [Getting Ready for the Next Planetary Science Decadal Survey](#).

SBAG congratulates NASA and its partners on the recent successes of several small body spacecraft missions, such as the completion of Dawn’s low altitude final extended mission at Ceres, Hayabusa2’s arrival and investigation at Ryugu, OSIRIS-REx’s arrival and investigation at Bennu, and New Horizons’s flyby of 2014 MU₆₉. These missions have produced valuable datasets that will be analyzed for decades, and have demonstrated the diversity of small bodies. SBAG looks forward to continued scientific discoveries coming from these datasets, and looks forward to continuing the exploration of small bodies with the Lucy, Psyche, and DART missions.

SBAG encourages NASA to support preparatory work dedicated to maximizing planetary science from both ground-based and space-based assets, including analysis tools and specialized workshops, and to

identify the programs in which such efforts will be supported. SBAG recognizes the historic and ongoing importance of astrophysics assets to small-body science, on the ground and in space, and thanks the NASA Committee for Planetary Science with Astrophysics Assets for their work aimed at optimizing future use of such assets. There is great near-term potential for small-body science with LSST, and longer-term prospects with TMT, GMT, WFIRST, and other facilities. We note that many of the tools that will allow the planetary community to make full use of the data from these assets have not been developed and there is no planned development by the astrophysics projects.

SBAG encourages NASA and the small bodies community to determine the science and planetary defense goals for the 2029 Earth flyby of (99942) Apophis, and evaluate the opportunities, both in space and on the ground, that the flyby affords. The 2029 close encounter by this potentially hazardous asteroid is a once-per-thousand year natural experiment that provides an opportunity for advancing small body knowledge for both science and planetary defense. During the Apophis flyby, observations by radar will provide a unique opportunity to understand potentially hazardous asteroids, and spacecraft could offer further understanding. With launch for missions to rendezvous with Apophis well before Earth encounter likely to occur circa August 2026, preparation time is running short. SBAG encourages NASA to sponsor relevant workshops and to invest in possible mission concept studies.

SBAG supports recent and on-going Interstellar Probe mission design studies that consider both heliosphere and planetary science products that could be generated by such a mission. We encourage collaboration between science communities, especially early in the mission design process, to maximize the science return of spacecraft missions.

SBAG urges NASA to encourage further applications of occultation techniques, both in support of specific missions, and more generally as a complement to other ground-based observations. The striking success of stellar occultation campaigns in characterizing the size, shape, and orbital characteristics of 2014 MU69, and the planned use of such campaigns in support of the Lucy mission, underscores the scientific potential of occultations for enabling small body science.

SBAG endorses NASA's efforts to improve diversity in mission teams and to encourage the demographics of the planetary science field to more closely resemble the demographics of the nation at large. Studies show that diverse teams lead to diversity of thought and better scientific outcomes. We believe that the small bodies community should lead by example and we urge our colleagues to be inclusive when putting together teams for science investigations at any scale, whether they are small research and analysis efforts, telescopic observation teams, impending Discovery proposals, or future New Frontiers opportunities.

SBAG reiterates its support for the NEOCam asteroid survey mission, which could provide a major contribution towards the fulfillment of the George E. Brown congressional goal of discovering 90% of the near-Earth asteroid population larger than 140 meters in size, while characterizing the diameters of a significant fraction of that NEA population. SBAG remains concerned that despite the fact that NEOCam was selected for Extended Phase A funding in the 2016 Discovery round and despite a

significantly increased FY19 budget for Planetary Defense, the full NEOCam mission has not yet received funding to enter Phase B with launch still many years away. SBAG notes that diameters and albedos of NEAs could be derived by a space-based infra-red survey such as NEOCam, with better accuracy than an optical survey, and would provide a dataset important for small-body science, human exploration, resource utilization, and planetary defense.