

SBAG encourages NASA to work with relevant stakeholders to ensure that future budgets support the Near-Earth Object Surveillance Mission (NEOSM) at a level sufficient to achieve the mission's planetary defense goals as currently scheduled. SBAG congratulates NASA and its partners on bringing NEOSM to its present level of development. Past SBAG findings and the National Academies of Science, Engineering, and Medicine's *Finding Hazardous Asteroids Using Infrared and Visible Wavelength Telescopes* have emphasized the importance of a space-based near-infrared asteroid survey mission, and we reiterate that support here. NEOSM would provide a major contribution towards fulfillment of the George E. Brown Congressional goal of discovering 90% of the near-Earth asteroid (NEA) population larger than 140 meters in size, while characterizing the diameters of a significant fraction of that NEA population. Additionally, NEOSM would provide a dataset important for small-body science, human exploration, and resource utilization.

SBAG urges NASA to continue its efforts to broaden participation in the field and to develop a workforce that supports and understands the benefits of a diverse community. SBAG strongly approves of the efforts of NASA's Planetary Science Division to support early career researchers and individuals from historically underrepresented groups in their pursuit of successful planetary science careers. Examples include the PI Launchpad workshop and the trialing of dual-anonymous peer review during ROSES-2020.

SBAG expresses concern over insufficient investment by NASA on facilities and personnel essential to achieve the full benefit of analysis of samples returned by planetary missions. The recent report *Strategic Investments in Instrumentation and Facilities for Extraterrestrial Sample Curation and Analysis* from the National Academies of Sciences, Engineering, and Medicine underlined the need for future investments in funding analytical facilities and training the next generation of planetary sample scientists in the areas of organic materials and ice- and gas-based materials. The impending return of samples from OSIRIS-REx and Hayabusa2 underscores the urgency of the situation. Training the next generation to analyze samples returned a decade or more in the future has become difficult given the low funding levels for operating and maintaining facilities. If appropriate action from NASA is not undertaken, the scientific goals set by sample return missions will be jeopardized.

SBAG would like clarification of what targets will be permitted for the New Frontiers 5 call, particularly whether a comet nucleus sample return and a Trojan tour and rendezvous mission will remain options. Although the list of the most scientifically interesting targets will naturally change with time, there is confusion within the community about how the list of permitted targets was updated for the New Frontiers 4 call, and SBAG encourages NASA to establish and explain the procedure as early as possible.

SBAG remains troubled by the overall funding profile of Arecibo Observatory and is increasingly concerned about the availability of klystron transmitters for Goldstone and Arecibo. SBAG reiterates its advocacy for planetary radar observations of small bodies and greatly appreciates NASA's continued support of the Arecibo and Goldstone planetary radar systems. However, with National Science Foundation support of Arecibo decreasing substantially over the next three years and long-term replacement of those funds from federal or non-federal sources unclear, SBAG is concerned that Arecibo faces a dire shortfall in its annual budget by 2023.

Meanwhile, at Goldstone, the 70-m DSS-14 antenna currently has no klystrons. A single klystron may be available to DSS-14 by summer 2020, allowing low- or half-power observations later in the year, after a roughly two-year procurement process. At Arecibo, two klystrons are now on hand (with no spares) after a more than two-year procurement process. There is no guarantee these klystrons will last through October 2022 when the planetary radars will be indispensable to the validation of the Double Asteroid Redirection Test (DART) technology demonstration. Therefore, SBAG encourages NASA to initiate procurement of additional klystron hardware for both sites at the earliest opportunity. Return of the Arecibo and Goldstone planetary radar systems to optimal condition, or as optimal as feasible, including the planned re-alignment of the Arecibo primary surface, is paramount for participation in DART as well as providing invaluable ground-based reconnaissance of the Janus target, binary asteroid (175706) 1996 FG₃, in April/May 2022.

SBAG supports the effort by NASA to adopt a policy enabling more than 50 civil servants and 50 contractors to attend international meetings. Travel to international meetings is essential for scientific discussions and dissemination of NASA's research within the science and technology communities. We are grateful to James Green and his office for finding a solution for the 2019 DPS meeting in Geneva and for working to resolve this issue for foreign meetings in 2020 and beyond. However, we are concerned about both ensuring adequate attendance at foreign conferences and workshops as well as the compressed timeline for approval and notification of attendees, which occurred for DPS. SBAG supports NASA's ongoing efforts to implement a permanent easing of limits on attendees to international meetings along with sufficient lead time, post-approval, to plan travel and requests an update on the status as soon as possible.

SBAG strongly supports NASA-funded Participating Scientist and Guest Investigator programs for US and non-US science and planetary defense missions to small bodies. The success of Participating Scientist programs in making science missions more accessible to early-career scientists, and in increasing the science return of those missions, is well-documented. We urge NASA to include similar, appropriate programs on US planetary defense missions such as DART, NEOSM, as well, and to reach out early to international partners for non-US small bodies missions (such as Comet Interceptor, Hera, MMX, and DESTINY⁺, among others) to discuss US participation. We recognize preparations for such programs are time-consuming and require funding, and so we further urge that plans for such programs be undertaken early to allow for full participation in mission planning.

SBAG encourages NASA and NSF to support preparatory work dedicated to maximizing small-body science from both ground-based and space-based telescopes 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 its 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 science community to make full use of the data from these assets have not been developed, and there are insufficient plans to do so by these astrophysics projects.