

DRAFT – for SBAG Community Review

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Findings from the 13th Meeting of NASA’s Small Bodies Assessment Group (SBAG)

The simultaneous spacecraft exploration of Ceres, the Pluto system, and comet Churyumov-Gerasimenko is focusing public attention on small bodies science as never before and *provides a spectacular opportunity to communicate the value of our work*. SBAG encourages the small bodies community to make extra efforts to engage with the public over these active missions, sharing the results of decades of work to build an exciting and healthy future for small bodies exploration.

Asteroid Redirect Mission

SBAG appreciates NASA’s efforts to engage and communicate with the planetary defense and small bodies science communities about the Asteroid Redirect Mission (ARM) and the extent to which modifications in mission design have been responsive to concerns from those groups. In particular, the reference target asteroid 2008 EV₅ offers well-documented opportunities, having been previously the sample return target for ESA’s MacroPolo-R candidate mission. SBAG encourages continued engagement between mission planners and the small bodies community as the mission moves forward and supports the plans for the competed Formulation Assessment and Support Team (FAST) and the succeeding Investigation Team (IT). However, it is important to note that for science-driven missions, SBAG continues to support the priorities identified in the Decadal Survey to guide use of Planetary Science Division (PSD) resources and funds.

Discovery Program

SBAG sees the continuation of an active and healthy Discovery Program as an utmost priority and as a key program to enable the exploration of small bodies in the Solar System. SBAG is therefore heartened by the 2014 Discovery AO and views this as a major step to achieving the strategy stated in the Decadal Survey. The response from the planetary science community to the Discovery AO has been noteworthy and indicative of the enthusiasm for the fundamental contributions to future scientific exploration of the Solar System that the Discovery Program uniquely provides. *To this end, SBAG reiterates the importance of the Decadal Survey recommendation of a ≤ 24 month average launch cadence as an essential guideline.* Given the large number of compelling and mature concepts submitted to the AO, selecting two missions from the 2014 Discovery Mission AO is a means of addressing the Decadal Survey guidelines and regaining that initiative. In addition, the selection of two missions for the 2014 AO would utilize the considerable efforts spent generating the AO, preparing the proposals, and evaluating the submissions in a potentially cost-effective manner.

Hayabusa2 Participating Scientist Program

The Hayabusa2 Participating Scientist Program provides opportunities for the U.S. planetary science community to participate in JAXA’s Hayabusa2 sample return mission to asteroid 1999 JU₃. Participation from NASA-funded scientists will include providing input for mission planning, asteroid physical characterization, sample site selection, and sample analysis. This

participation is important for small body science and is vital for future cooperation between JAXA's Hayabusa2 and NASA's OSIRIS-REx asteroid sample return missions. It is also important for NASA's Asteroid Initiative since 1999 JU₃ is a possible ARM target and a potentially hazardous asteroid.

After accepting Step 1 proposals, NASA delayed the Step 2 proposal due date (originally May 15, 2015) for the Hayabusa2 Participating Scientist Program. Spacecraft instrument teams and working groups are being organized, and decisions regarding spacecraft mission operations are being formulated for the upcoming encounter. Unfortunately, it is already clear that 2015 Hayabusa2 science team meetings will occur without NASA-funded Participating Scientists as a result of the delay. SBAG is encouraged that a new due date of October 5, 2015 has been set for the Hayabusa2 Participating Scientist Program but remains concerned that this delay is jeopardizing the potential for NASA-funded scientists to effectively provide input into Hayabusa2 mission plans. ***SBAG urges NASA to expedite the selection of Hayabusa2 Participating Scientists so that they may be integrated into the Hayabusa2 team in as timely a manner as is possible (i.e., early 2016).***

Research and Analysis Program and the Health of the Scientific Community

SBAG appreciates and encourages communication between the Planetary Science Division (PSD) Research and Analysis (R&A) program officials and the scientific community via all possible avenues. Valuable venues include town hall meetings, the Assessment Groups, and the SARA office and website. Uncertainty and misinformation can be especially prevalent and damaging during times of constrained budgets or changes of program direction, and ***the recent R&A reorganization coinciding with a budget crunch has been a source of considerable anxiety in the scientific community.*** Rumors are best crowded out by facts. Open communication of the status and evolving directions of PSD's R&A programs is vital, along with the metrics used to assess progress in meeting these objectives.

SBAG endorses the pending NRC Space Studies Board activity to assess PSD's R&A reorganization and hopes that it will ***address the broader issue of identifying the elements of a healthy scientific community capable of supporting NASA's needs, and what should be done to maintain that community,*** and does not merely confine its attention to the traceability between R&A program elements and NASA's strategic goals.

In particular, SBAG is concerned about small PI-led laboratories. These have larger capital costs for equipment compared to many R&A-funded projects, and the equipment can be expensive to maintain and operate, requiring people with highly specialized skills. Among R&A-supported research groups, laboratory groups are thus particularly vulnerable to fluctuations in funding during times of low grant award rates, with loss of key people being highly disruptive. At a time when several missions are working to return samples that will need specialized laboratory analyses to achieve their scientific goals, ***it is crucial to maintain within the scientific community a strong cohort of laboratory practitioners and capabilities.***

Near-Earth Object Survey Telescope

NASA has asteroid-based activities across multiple directorates as a cornerstone of future objectives for human exploration, planetary defense, resource utilization, and science. ***SBAG reiterates its previous findings that a space-based NEO survey telescope would be a foundational asset to most efficiently achieve the goals of NASA's Asteroid Initiative.*** In 2005, Congress passed the George E. Brown, Jr. Near-Earth Object Survey Act, which set the goal of

discovering >90% of NEOs >140 m by 2020 (Public Law 109-155 Sec.321). A dedicated space-based NEO survey telescope would be capable of completing the congressionally recommended survey for NEOs much more quickly (on the order of several years) than using only ground-based survey systems (on the order of several decades). ***As an asset critical to agency-wide objectives, the survey telescope should have cross directorate support from all three of NASA's major space exploration directorates and not just from the resources available to the Planetary Science Division (PSD) of the Science Mission Directorate (SMD), or the Near-Earth Object Observations (NEOO) program within PSD.***

The Value of Open Community Forums

Collectively, the Assessment/Analysis Groups (AGs) represent an opportunity for regular, open, and broad dialogue between all members of the planetary science community. Furthermore, the AG meetings are forums unique from traditional conferences because they address a spectrum of programmatic, technical, and scientific topics, enabling an intersection of people that does not otherwise occur. This dialogue is essential to ensure a complete communications link between the stakeholders of the planetary science community. The classification of the AG meetings as conferences does not accurately capture the full extent or informational structure of the meetings, nor does it provide an accurate framework for the support logistics of the AG meetings. ***SBAG strongly endorses a return of the AG meetings to their previous classification or that an alternate solution is found other than treating AG meetings as scientific conferences.***