
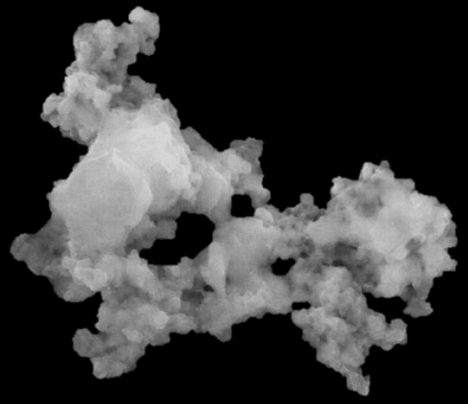
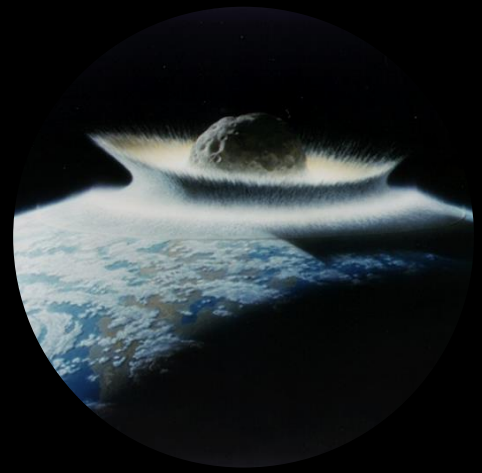



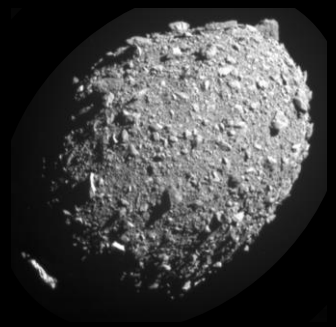


SBAG

SMALL BODIES ASSESSMENT GROUP

Lori Feaga, SBAG Steering Committee Chair
Department of Astronomy, University of Maryland, College Park

March 5, 2024

NASA Planetary Science Advisory Committee (PAC)

www.lpi.usra.edu/sbag/

Government funding acknowledged

Summary of recent SBAG activities for the PAC

- International Steering Committee member solicited and selected from applicants
  - Announcement made during January community meeting
  - Motoo Ito (Japan, with Hayabusa, Hayabusa 2, MMX, and Destiny+ experience)

- Revising the SBAG Goals Document (last revision was 2020)

- Held our community meeting (SBAG #30) January 30 – February 1, 2024 in hybrid format at the Drake Building at the Univ of Arizona
  - 84 in-person attendees over 3 days, with additional 90-100 online per session
  - Large early career (EC) turnout
    - 2 EC invited talks, 10 EC lightning talks, 8 EC travel stipends
  - 10 findings (3 immediate priority concerns raised here, 4 others with potential inter-disciplinary relevance, and 3 more specific to the SBAG community)

Finding #1 – DSN Criticality, Maintenance, and Upgrades

SBAG urges NASA to take immediate action to ensure the long-term maintenance and expanded future capacity of the Deep Space Network.

NASA's Deep Space Network (DSN) provides critical communications support for an increasing number of spacecraft beyond near-Earth orbit for science and exploration. As spacecraft instrument technology advances and human spaceflight to the Moon resumes, the requests for usage of this aging infrastructure and the requested uplink and downlink data volumes will grow. Yet, DSN capacity is not currently planned to increase in concert. While the Lunar Exploration Ground Sites (LEGS) facilities are expected to reduce the load on DSN from Artemis, DSN capacity is still anticipated to be insufficient compared to future demands. Additionally, deferred system maintenance for existing DSN assets poses a risk to the network's current capacity. The long-term health and capability of the DSN are critical to current and future planetary science, including small body science, and SBAG supports expanding the capabilities of this national resource as soon as possible.

Finding #2 – Capitalize on Apophis's Earth Flyby Opportunities

SBAG advocates that NASA prioritize efforts to observe and characterize asteroid 99942 Apophis (2004 MN4) before, during, and after its April 13, 2029 close approach with the Earth, including leveraging domestic partnerships and international collaborations, along with ground-based observational campaigns, to collect pre-, during, and post-Earth encounter data to the greatest extent possible.

Apophis' close Earth flyby provides a once-in-a-7,500 year naturally occurring opportunity to investigate, quantify, and understand the consequences of planetary tides on the evolution of asteroids and glean important information about Apophis' interior structure, which is otherwise impossible to obtain. The opportunity to observe Apophis prior to this historic event is important to complement the data that will be collected by OSIRIS-APEX after Apophis' close approach to Earth, thus substantially improving our understanding of asteroid dynamics and structure. Addressing these knowledge gaps is crucial for defending the Earth from a future impactor.

Finding #3 – Launch Opportunities for Janus

SBAG urges NASA to find a launch opportunity to scientifically compelling targets for the Janus mission.

NASA SMD is now in the custody of the capable Janus spacecraft pair, and it is in NASA's hands to decide how the spacecraft, originally designed to fly by near-Earth binary asteroid systems, should be used. Janus represents an important and exciting scientific resource for our community. In addition to promising science return, Janus will demonstrate the capabilities of low-cost spacecraft for small body exploration. We urge NASA to explore all avenues for possible launch opportunities, taking advantage of already designed and built spacecraft. More broadly, we reiterate the request for NASA to communicate the criteria required for missions in storage to be returned to an active flight program status.

Findings of potential cross-AG interest

#7. SBAG urges NASA and other agencies to continue working together on a plan for new and upgraded radar facilities for planetary science to replace the loss of Arecibo considering the capability gaps and facility needs identified in the Interagency Deep Space Radar Study Report.

#8. SBAG requests that NASA promptly conveys the New Frontiers and Discovery program opportunities, including their relative prioritization, as decisions are made.

#9. SBAG strongly advocates for NASA to continue and expand its programs for training the next-generation planetary science workforce.

#10. SBAG encourages NASA to continue and expand its support for open science by enhancing infrastructure, providing clear guidance on data and software archiving, and engaging the community through training and feedback opportunities.

Other SBAG updates

- Our full list of SBAG #30 Findings can be found at: https://www.lpi.usra.edu/sbag/findings/

- The Technology Lead and 2 at large members are rotating off the Steering Committee in August. Steering Committee member applicants will be solicited over the coming months through various channels. Selections will be announced at SBAG #31 (Summer 2024).

Summary

- SBAG appreciates the support from the PAC and NASA on the various findings and initiatives we bring forth as a voice of the small bodies community.
- SBAG is behind the Decadal Report 100% and will continue echoing the scientific priorities and needs of the community in accordance with OWL.
- SBAG supports the efforts of cross-AG IDEA and Ocean Worlds Working Groups.
- Finding #1 – SBAG urges NASA to take immediate action to ensure the long-term maintenance and expanded future capacity of the Deep Space Network.
- Finding #2 – SBAG advocates that NASA prioritize efforts to observe and characterize asteroid 99942 Apophis (2004 MN4) before, during, and after its April 13, 2029 close approach with the Earth.
- Finding #3 – SBAG urges NASA to find a launch opportunity to scientifically compelling targets for the Janus mission.

Supporting slides

The Steering Committee

Justin Atchison (JHU/APL), Technology Lead
Olivier Barnouin (JHU/APL)
Dani DellaGiustina (Univ of AZ)
Lori Feaga (Univ of MD), Chair
Henry Hsieh (PSI)
Motoo Ito (JAMSTEC), International Rep
Prajkta Mane (LPI)
Joe Masiero (IPAC/Caltech), Planetary Defense Lead
Dan Mazanek (NASA LARC), Human Exploration Lead
Darryl Seligman (Cornell Univ), Early Career Secretary
Timothy Titus (USGS, Flagstaff)
Flaviane Venditti (Univ of Central FL)
Anne Verbiscer (Univ of VA)

Thomas Statler NASA Headquarters Liaison

Steering Committee selects the Chair and Steering Committee members from among nominations & applications. Requests go out to national and international newsletters and the SBAG listserv. General membership is open to anyone.
Next call for Steering Committee Members will be in late spring 2024.

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#4. SBAG encourages NASA to prepare for and support international collaborations, especially through Participating Scientist Programs, with other ongoing and future international small body and planetary defense missions.

#5. SBAG encourages NASA to develop an opportunity within the mission program structure or planetary R&A programs to support precursor science investigations to further the understanding of critical topics in small body exploration in advance of the arrival of several small body missions at their targets.

#6. SBAG encourages NASA to release a SIMPLEx lessons learned document to the community.