



Small Bodies Assessment Group

Report to Planetary Science Subcommittee

April 8, 2010

Mark V. Sykes, SBAG Chair
Planetary Science Institute



Activities Since December 2009 PSS

- SBAG 3 scheduled for August 3-4, 2010 in Pasadena CA
- SBAG 4 scheduled for January 25-26, 2011 in Washington DC
- Organizing second International Primitive Body Exploration Working Group Meeting for mid-2011
- Ongoing efforts focusing on generating a Roadmap for Small Bodies Exploration document



Top Three Issues for PSS from SBAG

- 1) *Unpredictability and uncertainties in the Discovery program undermine its critical value as the workhorse for solar system missions and discourages proposers.*

Programmatic considerations do not seem to adequately include the fact that mission plans are built around specific targets that move. The instability in AO deadlines and corresponding launch windows seriously undermine and threaten significant investments in time and and money by scientists, industry partners, and centers. There should be regular, predictable AO calls that allow proposers sufficient time to respond to these mission opportunities.



Top Three Issues for PSS from SBAG

- 2) Plans for the allocation of \$20M to the NEOO program should be openly discussed and peer-reviewed, and the purpose for NEO characterization needs to be expanded beyond that required purely for hazard mitigation.*

NEO discovery and characterization are needed for baseline support of science missions (as direct and flyby targets), as well as their expanding value to human space activity (ISRU and potential destination).

Characterization should be systematic and cost-effective. Investments should be contemplated for ground based observations from a variety of aperture facilities (not just large) to determine composition, physical properties, and orbital state.



Top Three Issues for PSS from SBAG

3) *Maintaining our capabilities for the radar characterization of NEOs.*

Radar provides unique opportunities, short of a mission, to determine NEO shape, rotation state, surface density, and orbit refinement. As long as support for the continuation of this capability is unstable, the status and funding for the facilities necessary for this work (Arecibo and Goldstone) need to be monitored to ensure capabilities are being preserved.



Small Bodies Science Nugget: Catching an Asteroid Collision

Comet-like Asteroid P/2010 A2 • January 29, 2010

Hubble Space Telescope • WFC3/UVIS



Evidence for asteroid collisions
abound in the main belt – e.g.
families, dust bands. This is the first
time the event may have been
captured shortly after it occurred.



Small Bodies Science Nugget: Diverse Asteroid Composition?

2008 TC3 was the first asteroid discovered before it impacted Earth. Determined to be a spectral F-type, the asteroid created a debris field in the Nubian desert in Sudan.



The strewn field is mostly Ureolites, but includes Eucrites, Ordinary Chondrites, and Carbonaceous Chondrites!

This raises fundamental questions about some asteroids as inhomogeneous accumulates and the interpretation of asteroid spectra.