



Recent SBAG Meeting:

- June 29 – July 1, 2015: 13th SBAG Meeting, Washington, DC

Future SBAG Meetings:

- January 27 - 29, 2016: 14th SBAG Meeting, Pasadena, CA
- June 28 - 30, 2016: 15th SBAG Meeting, Washington, DC

Nancy Chabot, SBAG Chair

Planetary Science Subcommittee meeting: Oct 5-6, 2015



Findings abbreviated. Full SBAG 13 findings at:
<http://www.lpi.usra.edu/sbag/findings/>

Asteroid Redirect Mission (ARM)

SBAG appreciates NASA's efforts to engage and communicate with the small bodies community about 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, and SBAG supports the plans for the competed Formulation Assessment and Support Team and the succeeding Investigation Team. For science-driven missions, SBAG continues to support the priorities identified in the Decadal Survey to guide use of PSD resources and funds.

Discovery Program

The response from the planetary science community to the Discovery 2014 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. **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, selecting two missions would be a means of addressing the Decadal Survey guidelines and regaining the recommended cadence,** given that the previous Discovery AO was released in 2010.



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Research and Analysis Program and the Health of the Scientific Community

SBAG appreciates and encourages communication between PSD Research and Analysis (R&A) program officials and the scientific community via all possible avenues. **The recent R&A reorganization coinciding with a budget crunch has been a source of considerable anxiety in the scientific community.**

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, as such groups are particularly vulnerable to fluctuations in funding. 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.**



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Hayabusa2 Participating Scientist Program

After accepting Step 1 proposals, NASA delayed the Step 2 proposal due date (originally May 15, 2015) for the Hayabusa2 Participating Scientist Program. 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).**

The Value of Open Community Forums

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. 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. **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.**



Good progress is being made on producing an SBAG Goals Document

Community comments received after the SBAG 13 meeting. A revised document is in preparation for community comment at the SBAG 14 meeting.

- SBAG Goals Document: structured to have 3 high-level goals: Science, Planetary Defense, Enable Human Exploration
- SBAG Technology Roadmap: outlines high-priority technology needs that support any/all SBAG goals

<http://www.lpi.usra.edu/sbag/goals/>

Goal 1: Science (PDF)

Lead: Tim Swindle (Univ. Arizona)
Kieran Carroll (Gedex)
Julie Castillo-Rogez (JPL)
Will Grundy (Lowell Observatory)
Emily Kramer (JPL)
Joe Nuth (NASA Goddard)
Carol Raymond (JPL)
Heather Smith (NASA Ames)
tswindle@lpl.arizona.edu

Goal 2: Planetary Defense (PDF)

Lead: Tommy Grav (PSI)
James Arnold (NASA Ames)
Brent Barbee (NASA GSFC)
Steve Chesley (JPL)
Paul Chodas (JPL)
Leviticus A. Lewis (FEMA)
Paul Miller (LLNL)
Angela Stickle (APL)
Tim Titus (USGS)
tgrav@psi.edu

Goal 3: Human Exploration (PDF)

Lead: Paul Abell (NASA JSC)
Brent Barbee (NASA GSFC)
Josh Hopkins (Lockheed Martin)
Sam Lawrence (ASU)
Stan Love (NASA JSC)
Carrie Nugent (IPAC)
Andy Rivkin (APL)
Mark Sykes (PSI)
paul.a.abell@nasa.gov

Technology

Capability Inputs

Lead: John Dankanich (NASA MSFC)
Small Spacecraft Technology POC – Andrew Petro (NASA HQ)
Instruments POC – Michael Amato (NASA GSFC)
SmallSat Instruments POC – Julie Castillo-Rogez (JPL)
Mission Design Tools POC – Rob Falck (NASA GRC)
John.dankanich@nasa.gov



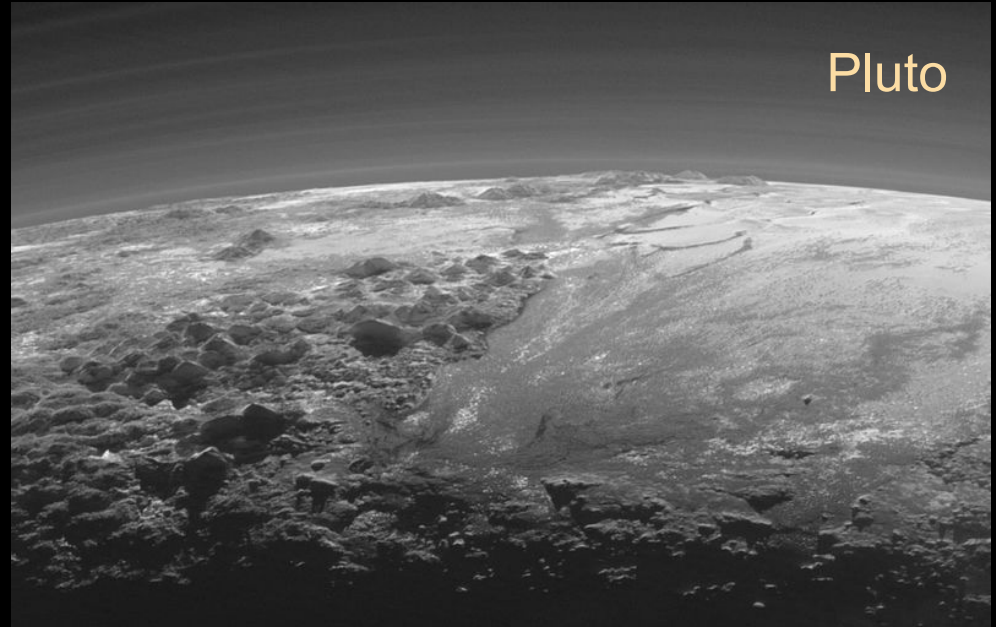
SBAG Steering Committee as of August 2015:

- Nancy Chabot (*JHU/APL*), Chair (8/13–8/16)
- Tim Swindle (*Univ. Arizona*), **Vice Chair (8/15–8/16)**
- Brent Barbee (*NASA Goddard*), **Human Exploration Lead (8/14-8/17)**
- James Bauer (*JPL*) (8/14-8/17)
- Beau Bierhaus (*Lockheed Martin*) (8/14-8/17)
- Dan Britt (*UCF*) (8/14-8/17)
- Bonnie Buratti (*JPL*) (8/13-8/16)
- **Lori Feaga (*Univ. Maryland*) (8/15-8/18)**
- Tommy Grav (*PSI*), Planetary Defense Lead (8/13-8/16)
- **Carolyn Mercer (*NASA Glenn*), Technology Lead (8/15-8/18)**
- **Angela Stickle (*JHU/APL*), Early Career Secretary (8/15-8/17)**

Question for PSS meeting: What do we need to do to get Tim Swindle on the PSS starting in August 2016?

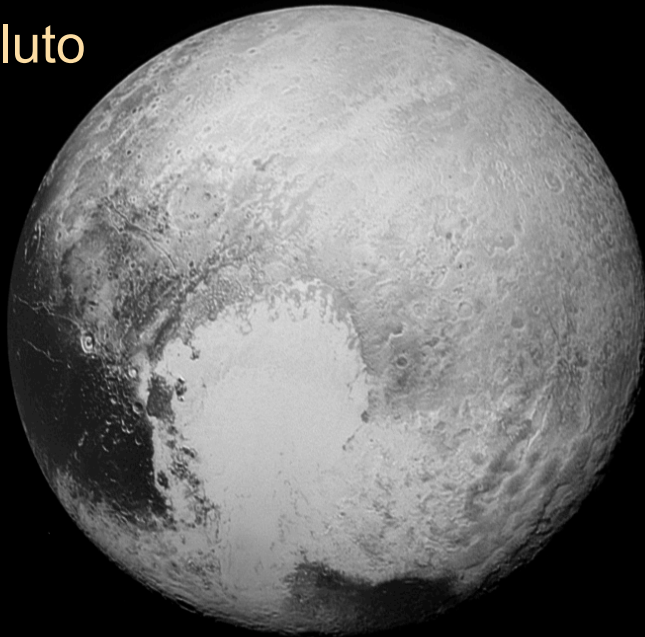
New Horizons Encounters Pluto

On July 15, 2015, New Horizons encountered the dwarf planet Pluto and its family of five moons. The flyby was the first investigation by a spacecraft of an object in the Third Zone, the collection of small icy bodies at the orbit of Neptune and beyond that are neither gaseous or terrestrial planets, but a third type of object that may represent the building blocks of the Solar System. A bright region informally named Tombaugh Regio dominates the surface. Pluto also has multiple haze layers in its atmosphere.



Pluto

Pluto

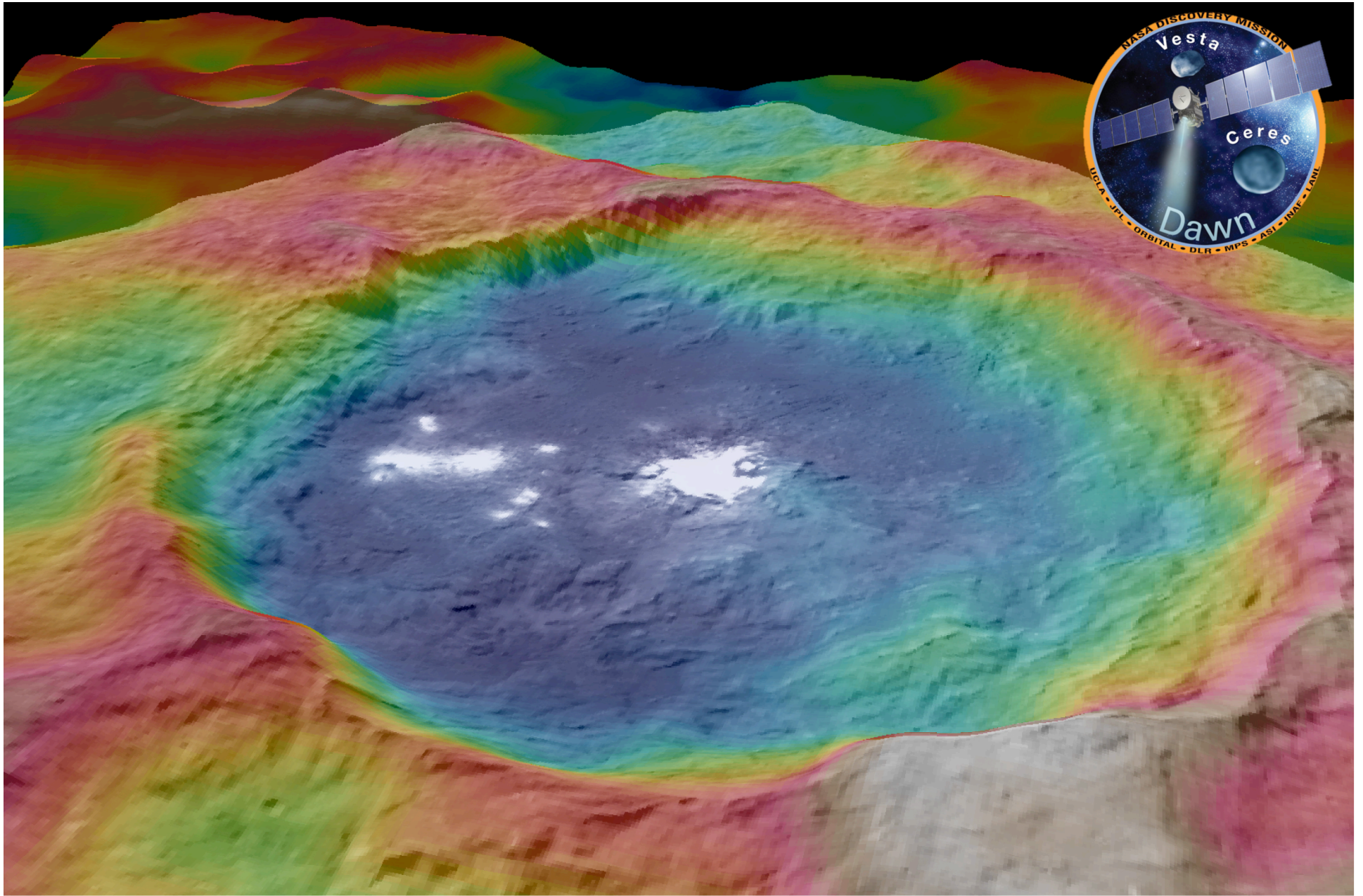


Charon



The figure above shows that Pluto exhibits a surprising range of geologic processes and landforms, including nitrogen glaciers, tall mountains, and chaotic regions. Many areas are crater-free, but a very dark equatorial region appears to be older and more cratered than the rest of Pluto.

Charon also is surprisingly geologically complex, with a dark polar region and many faults on its surface.

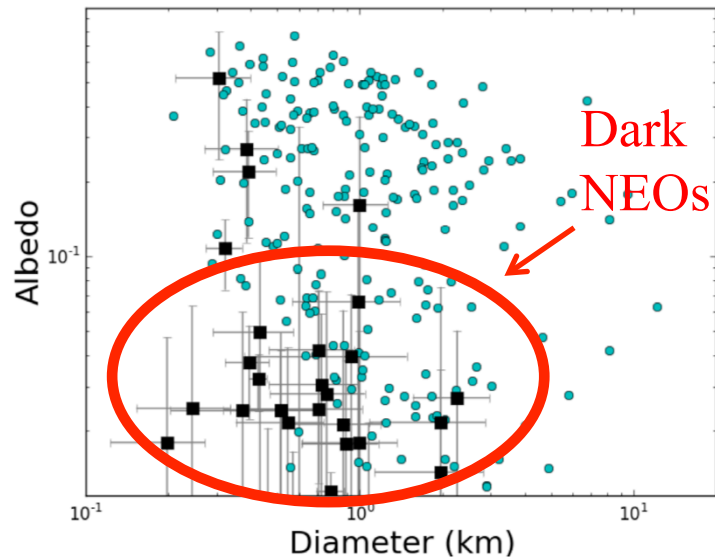


Mysterious bright spots in Ceres' 92-km Occator crater may be salt deposits from the interior.



NEOWISE Reactivation Highlights

NEOWISE-observed NEOs, known (cyan) and new discoveries (black).



Science Highlights:

- Year I asteroid survey diameters published. NEO discoveries are dark, and often large ($> 200\text{m}$ diameter).
- Largest CO+CO₂ survey of comets to date. Out of 65 which show significant 4.6mm signal, 39 show excess attributable to CO or CO₂ emission, with changes in average production rates beyond distances of 4 AU.
- Euphrosyne family may contribute to dark NEA populations when members cross a Main Belt resonance with Saturn.
- Irregular satellites shown to be darker on average than Trojan and Outer Main Belt populations.

Survey Status:

- Over 15695 solar system objects surveyed (including 392 NEOs & 80 comets).
- 215 New objects discovered, including 65 NEOs (25% on potentially hazardous orbits) & 4 comets.
- Successful year-I product release March 26th, 2015, including single-frame image & photometry data, with solar-system object search tools.

