

Thursday, March 15, 2007

POSTER SESSION II: ASTEROIDS AND COMETS: MODELS, DYNAMICS, AND EXPERIMENTS
6:30 p.m. Fitness Center

Castillo-Rogez J. C. McCord T. B. Davies A. G.

Ceres: Evolution and Present State [#2006]

We develop thermal modeling of Ceres, using sophisticated models and new observational information in order to match the observed shape.

Stooke P. J.

Improved Cartography of Asteroid 433 Eros [#1167]

A new mosaic of NEAR images of asteroid 433 Eros is being compiled to provide improved base maps. The resulting mosaic in Simple Cylindrical Projection can be rectified to fit any of the projections now in use with irregular objects.

Buczowski D. L. Barnouin-Jha O. S. Prockter L. M.

433Eros Interior Structure and Formation History: An Analysis of Global Lineament Mapping [#1112]

Lineaments have been mapped on the Eros surface which suggest that different parts of the asteroid may have undergone different stress histories. We present different evolutionary scenarios based on interpretations of surface lineament formation.

Conrad A. R. Dumas C. Merline W. J. Drummond J. D. Campbell R. D. Goodrich R. W. Le Mignant D. Chaffee F. H. Kwok S. H. Knight R. I.

Comparison of Three Asteroid Limb Profiles [#1492]

Keck AO observations of three asteroids have been analyzed to extract limb profiles. We identify a large facet on 511 Davida that may be the signature of giant craters seen edge-on, reminiscent of those seen on Mathilde. Preliminary analysis shows that similar facets may exist on 52 Europa and 7 Iris.

Hiroi T. Abe M. Kitazato K. Abe S. Sasaki S. Ishiguro M. Takagi Y. Clark B. E.

Barnouin-Jha O. S. Nimura T.

Meteorite Analogs of Asteroid 25143 Itokawa: Seeing Beyond the Effects of Grain Size and Space Weathering [#1048]

As a result of applying the Modified Gaussian Model to data taken by the Near-Infrared Spectrometer (NIRS) onboard Hayabusa spacecraft and ordinary chondrite samples, it is suggested that Itokawa's surface is made of materials similar to LL6 chondrites.

Sasaki S. Ishiguro M. Hirata N. Hiroi T. Abe M. Abe S. Miyamoto H. Saito J. Yamamoto A. Demura H. Kitazato K. Nakamura R.

Origin of Surface Albedo/Color Variation on Rubble-Pile Itokawa [#1293]

S-type asteroid Itokawa is heterogeneous in albedo and color. Also from surface morphology and experiments, we conclude darker-redder zones experienced more space weathering than brighter-bluer. The variation may be produced by seismic shaking.

Miyamoto H. Yano H. Nakamura A. M. Scheeres D. J. Nakamura R. Ishiguro M. Abe S.

Hashimoto T. Hirata N. Kubota T. Michikami T. Nakamura T. Noguchi T. Saito J. Sasaki S.

Tsuchiyama A. Yokota Y.

Rock Piles on Itokawa Observed by the Highest Resolution Images [#1614]

During the later phases of the Hayabusa mission, we succeeded in obtaining close-up images of Itokawa with unprecedentedly high resolutions up to 6 mm/pixel. These images vividly reveal Itokawa's appearance that is considerably different from any other images previously obtained of asteroids.

Hirata N. Honda C. Nakamura R. Miyamoto H. Sasaki S. Demura H. Nakamura A. M. Michikami T. Barnouin-Jha O. S. Gaskell R. W. Saito J.

Survey of Craters and Impact Structures on the Asteroid Itokawa [#1572]

Craters on the asteroid 25143 Itokawa were surveyed. Their morphologies show a wide variation, including a saddle-shaped floor plan, lack of uplifting rim, both rough and smooth floor, exposure of un-weathered materials and lineaments.

Okada T. Shirai K. Yamamoto Y. Arai T. Ogawa K. Inoue T. Kato M.

Elemental Composition of Asteroid Itokawa by Hayabusa XRF Spectrometry [#1287]

Major elemental composition ratios of Ca/Si and Fe/Si as well as Mg/Si and Al/Si of the near-Earth asteroid 25143 Itokawa was investigated through X-ray spectrometry using X-ray spectrometer, XRS, onboard Hayabusa.

Abe M. Vilas F. Kitazato K. Abell P. A. Takagi Y. Abe S. Hiroi T. Clark B. E.

In-Flight Calibration of the Hayabusa Near Infrared Spectrometer (NIRS) [#2051]

We simulated NIRS spectra using Hapke parameter obtained by NIRS observation of asteroid Itokawa. Comparing simulated spectra with groundbased observational data, we obtained correction factor of NIRS spectra.

Abe M. Kitazato K. Sarugaku Y. Kawakatsu Y. Kinoshita D.

Ground-based Observation of Post-Hayabusa Mission Targets [#1638]

In 2006, we have observed 14 near-Earth asteroids as the candidate object of the post-Hayabusa mission, using Kiso and Lulin Observatory. Including our previous observation, we found that five asteroids are classified in C-type Group.

Hamada Y. Demura H. Hirata N. Asada N.

Preliminary Study of Stereo Vision with Fisheye Lens Cameras on Asteroids [#1519]

This research shows advantages of stereovision with fisheye lens cameras for close-observation missions to asteroids, and a method to determine three-dimensional locations of objects on the asteroid surface from stereo pair images taken by the camera.

Fujii Y. Hirata N. Demura H. Asada N.

Visualization Tool for 3D GIS Data [#1521]

We develop a tool for visualization of a 3D figure, which is modeled with polygons. Several kinds of physical values (e.g., slope) are attributed to the polygons. The displayed model can be rotated and moved by mouse operation.

Asphaug E.

Asteroid Surfaces as Expressions of Seismic Interiors [#2432]

Asteroid surface morphologies are expressions of the acoustic properties of their interiors. That is a hypothesis that, if proven true, might allow us to know how a particular small asteroid responds to collisions just by looking at it, and motivates some simple *in situ* experiments.

Durda D. D. Enke B. L. Asphaug E. Richardson D. C.

Examining the Formation of Satellites in Large Cratering Events Via Numerical Simulations with Accurate Shape Models [#1742]

We examine satellite formation in large cratering impacts by conducting SPH simulations of impacts into realistic, irregularly-shaped targets and computing the N-body phase of the simulations using a new code that preserves the irregular shapes of the reaccumulated fragments.

Takeda T. Ohtsuki K.

Angular Momentum Transfer Efficiency in Collisions Between Rubble Pile Objects [#1473]

We report the results of N-body simulations of oblique impacts of rubble-pile asteroids, showing that the spin-up efficiency during a collision is very low, because ejected fragments carry away large amount of angular momentum.

Bottke W. F. Vokrouhlický D. Chapman C. R. Nesvorný D.

Gaspra's Steep Crater Population Was Produced by a Large Recent Breakup in the Main Asteroid Belt [#2165]

The freshest craters on (951) Gaspra, which have a surprisingly steep size frequency distribution, were mostly produced by fragments from the nearby Baptistina family-forming event that took place ~150 Myr ago.

Tagle R. Goderes S. Claeys Ph.

On the Nature of S-type Asteroids and the Terrestrial Impactor Population [#2216]

Based on composition and abundance of projectiles in terrestrial craters, it could be suggested that a certain proportion of the S-type asteroids are parent bodies of non-NMI meteorites.

Setoh M. Nakamura A. M. Hiraoka K. Onose N. Hasegawa S. Michel P.

Impact Experiments of Sintered Glass Beads Targets at Low and High Velocities [#1263]

We performed impact disruption experiments of porous sintered glass beads targets. The results of these experiments and comparing with previous study suggested that not only the porosity but also the impact velocity strongly influence the outcome.

Malanoski S. A. Izenberg N. R.

Laboratory Simulations of Surface Alteration on Small Bodies Through Seismic Activity [#1947]

The experiments presented seek to clarify and explore the role of impact-induced seismic shaking in the process of surface modification on small solar system bodies. We present the basis, observations, and conclusions of current testing.

Murray J. B.

Alternative Explanation for the Clustering of Long-Period Comet Aphelion Distances [#2192]

The 50k clustering of comet aphelia is most simply explained as a predictable artifact of the limitation that known LP comets all have perihelion passage in the past few hundred years. This line of argument leads to a novel explanation for cometary origin.

Boice D. C. Wegmann R.

Cometary Water Chemistry in Support of Recent Spacecraft Missions [#1507]

Water chemistry is central to understanding physico-chemical mechanisms in comets. *In situ* measurements of comet Borrelly by the PEPE instrument onboard the Deep Space 1 spacecraft challenge our accepted notions of comet comae chemistry.

Byram S. M. Scheeres D. J. Combi M. R.

Implications of Outgassing Jets for the Comet Dynamical Environment [#1694]

We define and explore a simple model for an outgassing jet of a comet while considering its implications, define a methodology for the *in situ* estimation of jet structures, and investigate particle and rotational dynamics of comet 81/P Wild 2.

Grimes S.

Search for Planets in the M34 Open Cluster [#1465]

A search for extrasolar planets in the M34 Open Cluster using the transit technique. HD 209458b was used as a control as it has a known planet. The search turned up null, but this and other searches may show that planets do not form in open clusters.