Thursday, March 17, 2005
POSTER SESSION II: ASTEROIDS, COMETS, AND SMALL BODIES
7:00 p.m. Fitness Center

Clark P. E. Clark C. S.
Constant Scale Natural Boundary Mapping as Tool for Characterizing Asteroids **[#1432]**
We are exploring the Constant Scale Natural Boundary (CSNB) approach to mapping and modeling asteroids in terms of morphological insight that can be gained in the context of traditional flat (2D) map projections and regular plate (3D) models.

Wilson L. Head J. W. III
Dynamics of Groove Formation on Phobos by Ejecta from Stickney Crater: Predictions and Tests **[#1186]**
We examine the dynamics of groove formation on Phobos by ejecta from Stickney Crater, and make predictions and formulate tests of this hypothesis.

Benna M. Mahaffy P. R.
Three Dimensional Multi-Fluid Simulation of Comet Halley **[#2257]**
We present some results of the 3D multi-fluid simulations generated by our MHD code CASIM for the atmosphere of a Halley-type comet with an outgassing dominated by water molecules.

Kadish J.
Implications of Internal Fragmentation on the Structure of Comets **[#1788]**
It is shown that a monolith can become internally fractured due to a perturbation in its stress field. The resulting breakup produces the same pattern of fragmentation as that observed during the splitting of comets.

Rivkin A. S. Pierazzo E.
Investigating the Impact Evolution of Hydrated Asteroids **[#2014]**
We use hydrocode simulation to investigate shock dehydration in low-velocity impacts to evaluate the relative proportions of dehydrated and still hydrated material in the impact ejecta.

Kirk R. L. Duxbury T. C. Hörz F. Brownlee D. E. Newburn R. L. Tsou P. The Stardust Team
Topography of the 81/P Wild 2 Nucleus Derived from Stardust Stereoimages **[#2244]**
A detailed, stereo-derived topographic model of the visible half of the Wild 2 nucleus reveals a remarkably ellipsoidal overall shape with rugged topography dominated by craters having depth/diameter ratios near 0.2. Photometric modeling is next.

Vilas F.
Negative Searches for Evidence of Aqueous Alteration on Asteroid Surfaces **[#2033]**
ECAS NEA photometry, and the SDSS Moving Object Catalog, were searched for the 0.7-µm absorption feature due to oxidized iron in phyllosilicates. The feature is absent in the ECAS photometry; the SDSS search was inconclusive.

Flynn G. J. Durda D. D.
Catastrophic Disruption of Hydrated Targets: Implications for the Hydrated Asteroids and for the Production of Interplanetary Dust Particles **[#1152]**
Impact experiments were performed on three hydrated, metamorphic rock targets. It required less specific energy to disrupt the hydrated targets than anhydrous targets of similar mass, and the hydrated targets produced more fine-grained debris.

Durda D. D. Bottke W. F. Nesvorny D. Asphaug E. Richardson D. C.
Size-Frequency Distribution of Fragments from SPH/N-Body Simulations: Comparison with Observed Asteroid Families **[#1876]**
We investigate the morphology of size-frequency distributions (SFDs) resulting from impacts into 100-km diameter parent asteroids, represented by a suite of 160 SPH/N-body simulations, and compare with SFDs of observed main-belt asteroid families.

Cintala M. J. Durda D. D. Housen K. R.
Large-Scale Experimental Planetary Science Meets Planetary Defense: Deorbiting an Asteroidal Satellite **[#2160]**
Intentionally deorbiting an asteroidal satellite and monitoring the resulting collision between it and the primary asteroid, a capability that is well within the limitations of current technology, would provide data valuable to asteroid science and to planetary-defense missions.

Nazzario R. C. Hyde T. W.
Numerical Investigations of Kuiper Belt Binaries **[#1254]**
Observations of the Kuiper Belt indicate that a larger than expected percentage of KBO's (approximately 8 out of 500) are in binary pairs. This paper investigates the stability, development and lifetimes for Kuiper Belt binaries by tracking their orbital dynamics and subsequent evolution.

Moroz L. V.
Flat Spectral Curves of Low-Albedo Asteroids: Thermal Metamorphism or Space Weathering? **[#2056]**
Possible reasons for spectral mismatch between primitive carbonaceous meteorites and dark asteroids are discussed. Recent laboratory experiments suggest that space weathering could have produced flat spectral curves of C-, B-, F-, and G-type asteroids.

Mayne R. G. McCoy T. J. McSween H. Y. Jr.
Unbrecciated Eucrite MAC 02522: Petrology of a "Typical" Eucrite and Implications for Spectroscopy **[#1791]**
MAC 02522, is in many respects a "typical" eucrite, however when considering factors that may contribute to spectral features, its petrology may offer some interesting implications.

Sasaki T. Sasaki S. Watanabe J. Sekiguchi T. Yoshida F. Ito T. Kawakita H. Fuse T. Takato N. Dermawan B.
Difference in Degree of Space Weathering on the Newborn Asteroid Karin **[#1590]**
Here we report a near-infrared spectroscopy of the newborn asteroid Karin. For different rotational phases, we derived different spectra such as reddened spectrum like that of S- type asteroid and un-reddened spectrum like that of ordinary chondrite.

Neumann G. A. Barnouin-Jha O. S.
Joint Crossover Solutions of Altimetry and Image Data on 433 Eros **[#2267]**
Improved solutions both for asteroid-wide topography and NEAR's orbit locations will enhance our current views on the geodesy and thereby the internal properties of the asteroid 433 Eros as well as reveal much about the surface processes acting on small airless bodies.

Lim L. F. Nittler L. R. Starr R. D. McClanahan T. P.
Elemental Composition of 433 Eros: New Calibration of the NEAR-Shoemaker XRS Data **[#2031]**
Relative elemental abundances for six elements (Mg, Al, Si, S, Ca, Fe) in the surface layer of 433 Eros have been derived from a new calibration of the solar-induced fluorescence measured by the NEAR-Shoemaker X-ray Spectrometer (XRS).

Binzel R. P. Rivkin A. S. Thomas C. A. DeMeo F. E. Tokunaga A. Bus S. J.
The MIT-Hawaii-IRTF Joint Campaign for NEO Spectral Reconnaissance **[#1817]**
We announce a joint observing program for obtaining near-Earth object spectra. All data are being made available immediately via http://smass.mit.edu. We welcome broad community participation in target selection, observing, and data utilization.

Abe S. Borovicka J. Maeda K. Ebizuka 0. Watanabe J. I.
First Results of Quadrantid Meteor Spectrum **[#1536]**
The Quadrantid meteor shower is one of the most intense annual meteor showers. However, the parent body of Quadrantids is still in controversy. In this paper, we shall focus on the physical properties of the Quadrantid meteoroids and its parent body by means of Quadrantid meteor spectra.

Fauerbach M. Bennett T.
Photometric Lightcurve Measurements of Asteroids **[#1095]**
Photometric measurements of asteroids provide a great opportunity for small telescopes to collaborate with researchers at larger telescope facilities in astronomical research. Lightcurve data from our fall/winter observing campaign will be presented.

Haack H. Bidstrup P. R. Michelsen R. Andersen A. C. Jørgensen J. L.
Why Small is Beautiful — and How to Detect Another 10 Billion Small Main Belt Asteroids **[#1302]**
Estimates of the size distribution of main belt asteroids suggest that there is a population of approximately 10 billion objects in the meter to km range. We have explored the possibilities to build a fully autonomous spacecraft that can detect and study these objects from within the main belt.

Venechuk E. M. Franzen M. A. Sears D. W. G.
Radiation Resistance of a Silicone Polymer Grease Based Regolith Collector for the HERA Near-Earth Asteroid Sample Return Mission **[#1492]**
We investigated the effects of solar and galactic radiation on a silicone polymer grease's ability to collect imitation regolith for the HERA near-Earth asteroid sample return mission's proposed touch-and-go impregnable pad collector.

Franzen M. A. Roe L. A. Buffington J. A. Sears D. W. G.
Sample Collection from Small Airless Bodies: Examination of Temperature Constraints for the TGIP Sample Collector for the Hera Near-Earth Asteroid Sample Return Mission **[#1467]**
Here we describe experiments used to determine the temperature constraints for the TGIP collector designed for the Hera Near-Earth Asteroid Sample Return Mission. Equilibrium temperatures were calculated for potential target asteroids.

Buffington J. A. Franzen M. A. Azouggagh-McBride S. Roe L. A. Sears D. W. G.
Simulation of Extraterrestrial Sample Acquisition **[#1452]**
Here we describe a sampling mechanism intended to acquire surface samples from a near Earth asteroid. This device, named TGIP, was conceived and built to satisfy the science demands (within the engineering constraints) of the Hera Mission.

Azouggagh-McBride S. Roe L. A. Franzen M. A. Buffington J. A. Sears D. W. G.
Simulation of Recovery Impacts for the Prototype Hera Asteroid Sample Collector **[#1464]**
A series of experimental tests has demonstrated that asteroid surface samples collected by the proposed Hera Mission sample collector could survive a parachute-less Earth entry and subsequent impact.

Franzen M. A. Kracher A. Sears D. W. G. Cassidy W. Hapke B. W.
Space Weathering: A Proposed Laboratory Approach to Explaining the Sulfur Depletion on Eros **[#1461]**
The Near Shoemaker mission showed sulfur depletion on asteroid Eros. Potential mechanisms for sulfur loss are discussed as well as a proposed space weathering sputtering experiment that may contribute to the explanation of sulfur depletion on Eros.

Nishihara S. Abe M. Hasegawa S. Ishiguro M. Kitazato K. Miura N. Nonaka H. Ohba Y. Okyudo M. Ozawa T. Sarugaku Y. Ueno M.
Ground-based Lightcurve Observation of (25143) Itokawa, 2001–2004 **[#1833]**
The asteroid of 25143 Itokawa is a target of the Japanese sample return mission, Hayabusa. The optical observation of Itokawa had performed from March 2001 until October 2004. We report its absolute magnitude, slope parameter, and rotational period.

Kobayashi S. Demura H. Asada N. Furuya M. Hashimoto T. Kubota T. Saito J.
Shape Modeling for the Asteroid (25143) Itokawa, AMICA of Hayabusa Mission **[#1982]**
We report current status of shape modeling of (25143) Itokawa that is target asteroid of Hayabusa mission. Our method is adopted image-based modeling with multiview epipolar geometry.

Yoshimitsu T. Sasaki S. Yanagisawa M.
Current Status and Readiness on In-Situ Exploration of Asteroid Surface by MINERVA Rover in Hayabusa Mission **[#2289]**
This paper describes the current status of the MINERVA rover boarded on the Japanese asteroid explorer Hayabusa. Also the plan and the strategy to acquire surface images of the asteroid are presented.

Abe M. Takagi Y. Kitazato K. Hiroi T. Abe S. Vilas F. Clark B. E. Fujiwara A.
Observations with Near Infrared Spectrometer for Hayabusa Mission in the Cruising Phase **[#1604]**
NIRS is a near infrared spectrometer on-board the spacecraft Hayabusa. After the launch, we performed the observations of some bright stars and planets in the cruising phase toward the asteroid. We report the results of these observations.

Nemoto E. Asada N. Demura H. Kobayashi S. Furuya M. Kubota T. Hashimoto T. Saito J.
Preliminary Design of Visualization Tool for Hayabusa Operation **[#2050]**
When the tool for visualization asteroid is finished and implemented, it will be possible to project data acquired by some equipments to irregular shape polygon model. As a result, the tool will contribute to Hayabusa sample-return mission.

Teramoto K. Yano H.
Measurements of Sound Speed in Granular Materials Simulated Regolith **[#1856]**
We have measured sound speeds in regolith simulants in the 40–220 μm range. These results suggest the possibility of using velocity measurement of elastic waves in order to investigate major regolith size near asteroidal surfaces.

Byrne C. J.
Gravity Focusing of Swarms of Potential Impactors **[#1262]**
This abstract describes the effect on a swarm of potential impactors (debris from a comet for instance), as it passes by a large body such as Earth. The gravity field of the target body deflects the incoming swarm through a line of focus.