

**Tuesday, March 16, 2004**  
**POSTER SESSION I: ASTEROIDS, METEORS, COMETS**  
**7:00 p.m. Fitness Center**

Scholl H. Marzari F. Tricarico P.

*Long Term Stability of Mars Trojans* [#1107]

We study the long term stability of Mars Trojans over 4.5 Gyr. By using the Frequency Map Analysis method we outline a limited number of orbits with higher stability. The subsequent N-body long-term integration allows us to test their survival over the solar system age.

Connors M. Veillet C. Brassier R. Wiegert P. Chodas P. W. Mikkola S. Innanen K.

*Horseshoe Asteroids and Quasi-satellites in Earth-like Orbits* [#1565]

Newly found asteroid 2003 YN107 is the first and only known current quasi-satellite of the Earth. Asteroid 2002 AA29 is in a horseshoe orbit but has periods of QS behavior. Both asteroids closely follow Earth's orbit and this class could be best for sample return missions.

Sakai T. Nakamura A. M.

*Effect of Roughness on Visible Reflectance Spectra of Planetary Surface* [#1731]

We performed laboratory measurements of visible reflectance spectra of powdery surfaces. In order to investigate the effect of the surface roughness on the reflectance, we prepared three type powdery layers.

Sasaki T. Sasaki S. Watanabe J. Kawakita H. Fuse T. Takato N. Sekiguchi T.

*SUBARU Spectroscopy of Asteroid (832) Karin; Determining Time Scale of Space Weathering* [#1513]

We present a near infrared spectroscopy of the new-born asteroids (832) Karin performed by Subaru telescope to determine time scale of space weathering.

Sasaki S. Ueda Y. Kurahashi E. Loeffler M. Hiroi T.

*Change of Asteroid Reflectance Spectra by Space Weathering: Pulse Laser Irradiation on Meteorite Samples* [#1538]

We show spectral changes of meteorite samples using nanosecond pulse laser irradiation. As of olivine and pyroxene, reflectance spectra of ordinary chondrites are darkened — reddened. Reflectance spectra of carbonaceous meteorites are also changed.

Moroz L. V. Hiroi T. Shingareva T. V. Basilevsky A. T. Fisenko A. V. Semjonova L. F. Pieters C. M.

*Reflectance Spectra of CM2 Chondrite Mighei Irradiated with Pulsed Laser and Implications for Low-Albedo Asteroids and Martian Moons* [#1279]

We present reflectance spectra of a CM2 chondrite irradiated with a microsecond pulsed laser simulating micrometeoritic bombardment. We discuss possible effects of space weathering on surface optical properties of dark asteroids and Martian moons.

Britt D. T. Consolmagno G. J.

*Meteorite Porosities and Densities: A Review of Trends in the Data* [#2108]

Among the most fundamental physical characteristics of any planetary body are its density and porosity. Our data base of meteorite and density measurements have some interesting implications for future meteorite and asteroid studies.

Bierhaus E. B. Chapman C. R. Merline W. J.

*Small Craters in the Inner Solar System: Primaries or Secondaries or Both?* [#1963]

There is significant evidence to suggest that secondary craters are a large fraction of the small crater distribution on planetary-scale solid surfaces, as a result the lunar crater distribution cannot be a robust estimator of the small near Earth asteroid (NEA) population.

Cintala M. J. Hörz F. See T. H. Morris R. V.

*Generation of an Ordinary-Chondrite "Regolith" by Repetitive Impact* [#1911]

Approximately 460g of the L6 ordinary chondrite ALH85017 were subjected to 50 impacts by alumina spheres at a nominal speed of 2 km/s. Comparison with basalt and gabbro targets demonstrates that the chondrite yielded finer debris. Those fines were enriched in silicates over metallic Fe-Ni.

Lawrence S. J. Lucey P. G.

*Asteroid Modal Mineralogy Using Hapke Mixing Models: Validation with HED Meteorites* [#2128]

We evaluate the ability of a Hapke mixing model to reproduce spectra of HED meteorites.

Okada T.

*Particle Size Effect in X-Ray Fluorescence at a Large Phase Angle: Importance on Elemental Analysis of Asteroid Eros (433)* [#1927]

Laboratory experiments have been performed to show that microscopic roughness in the uppermost layer of planetary surface results in remarkable alteration of intensities and spectral profiles of X-ray fluorescence, especially at large phase angles.

Dukes C. A. Chang W. Y. Loeffler M. J. Baragiola R. A. McFadden L. A.

*An Investigation into Solar Wind Depletion of Sulfur in Troilite* [#1873]

Recent measurements by the NEAR x-ray/gamma ray spectrometer system have shown the surface of 433 Eros to be depleted in sulfur. We have done laboratory simulations to investigate the role of the solar wind in the reduction of sulfur, relative to iron, on the surface of troilite.

Kitazato K. Abe M. Mito H. Tarusawa K. Soyano T. Nishihara S. Sarugaku Y.

*Photometric Behaviour Dependent on Solar Phase Angle and Physical Characteristics of Binary Near-Earth-Asteroid (65803) 1996 GT* [#1623]

We had taken photometric observations of the binary near-Earth-asteroid 1996 GT. We had derived the color index and predicted the taxonomic type of the object.

Hasegawa S. Hiroi T. Ishiguro M. Nonaka H. Takato N. Davis C. J. Ueno M. Murakawa K.

*Spectroscopic Observations of Asteroid 4 Vesta from 1.9 to 3.5 micron: Evidence of Hydrated and/or Hydroxylated Minerals* [#1458]

We report that the existence of a 3- $\mu$ m absorption feature at about the 1% level on the surface of 4 Vesta by simultaneous 3- $\mu$ m spectroscopic observations. This result indicates that hydrated minerals are present in this region of Vesta.

Clark B. E. Shepard M. Bus S. J. Vilas F. Rivkin A. S. Lim L. Lederer S. Jarvis K. Shah S. McConnochie T.

*Multi-Wavelength Observations of Asteroid 2100 Ra-Shalom: Visible, Infrared, and Thermal Spectroscopy Results* [#1120]

Spectral data are used in conjunction with a physical model developed from lightcurves and radar images to investigate compositional and textural properties on the near surface of asteroid 2100 Ra Shalom as a function of rotation phase.

Filonenko V. S. Churyumov K. I.

*New Peculiarities of Cometary Outburst Activity* [#1076]

On the basis of investigations of photometric evolution of comets the four new peculiarities of cometary outburst activity had been found. These phenomena are new observational criterions for the development of a mechanism of cometary activity.

Demura H. Kobayashi S. Murai Y. Nishiyama K. Hashimoto T. Saito J.

*Preliminary Shape Modeling for the Asteroid (25143) Itokawa, AMICA of Hayabusa Mission* [#1666]

We show preliminary results of image-based shape modeling for Hayabusa (MUSES-C) mission, which is a sample return program of ISAS/ JAXA to the asteroid (25143) Itokawa [Launch: May 9, 2003; Arrival: Summer of 2005].

Yoshimitsu T. Sasaki S. Yanagisawa M. Kubota T.

*Scientific Capability of MINERVA Rover in Hayabusa Asteroid Mission* [#1517]

A tiny rover called MINERVA is onboard the Japanese Hayabusa asteroid explorer. This paper describes the MINERVA rover and its expected scientific capabilities.

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

*Characteristics and Current Status of Near Infrared Spectrometer for Hayabusa Mission* [#1724]

NIRS is a near infrared spectrometer for the spacecraft HAYABUSA, which aims to return samples from an asteroid, Itokawa. We measured initial property of NIRS before the launch. I mention about this result and current status after the launch.

Yano H. Fujiwara A. Abe M. Hasegawa S. Kushiro I. Zolensky M. E.

*Sampling Strategy and Curation Plan of "Hayabusa" Asteroid Sample Return Mission* [#2161]

Launched in May 2003, "Hayabusa" spacecraft is on its course to the NEO Itokawa for conducting the world's first asteroid sample return in 2007. This paper describes its sampling strategy and sample curation and initial analysis plan, following the international AO for detailed analysis.

Jarvis K. S. Vilas F. Kelley M. S. Abell P. A.

*Visible/Near-Infrared Spectral Properties of MUSES C Target Asteroid 25143 Itokawa* [#2111]

Extensive spectral observations were made to address compositional variation across the surface of MUSES C target asteroid 25143 Itokawa; effects of variation in phase angle on spectra; and performance of the NIRS and AMICA instrumentation.

Lim L. F. Nittler L. R. Starr R. D. McClanahan T. P.

*Calibration of the NEAR XRS Solar Monitor* [#1295]

New calibration work on the NEAR-Shoemaker XRS solar monitor will lead to improved precision in the fluorescence-derived elemental ratios for 433 Eros.

Burbine T. H. Bergstrom P. M. Jr. Trombka J. I.

*Modeling Mosaic Degradation of X-Ray Measurements of 433 Eros by NEAR-Shoemaker* [#2009]

We model the mosaic degradation of X-ray measurements of 433 Eros by NEAR-Shoemaker.

Izenberg N. R.

*Scattered Light Remediation and Recalibration of near Shoemaker's NIS Global Dataset at 433 Eros* [#1579]

NEAR's Near Infrared Spectrometer data at 433 Eros is recalibrated to remove internal scattered light. Improvements are inserted into the the calibration pipeline and applied to the raw global dataset. Results are compared to earlier versions.

Weber I. Stephan T. Jessberger E. K.

*Evaluation of Preparation and Measuring Techniques for Interplanetary Dust Particles for the MIDAS Experiment on Rosetta* [#1500]

Preparation and measuring techniques were evaluated to assemble a dataset on morphology, microstructure, mineralogy, and chemistry of individual IDPs in order to generate a database for the upcoming results of the MIDAS experiment on Rosetta.

Floyd S. R. Keller J. W. Dworkin J. P. Mildner D. F. R.

*"Chiron" a Proposed Remote Sensing Prompt Gamma Ray Activation Analysis Instrument for a Nuclear Powered Prometheus Mission* [#1361]

"Chiron", a proposed remote sensing prompt gamma ray activation analysis instrument. This instrument would collimate neutrons directly from the Prometheus spacecraft nuclear reactor for remote prompt gamma ray activation analysis (PGAA) of a solid planetary body surface.

Clark P. E. Curtis S. A. Rilee M. Cheung C.

*From Present Surveying to Future Prospecting of the Asteroid Belt* [#1099]

Requirements are analyzed for application of future mission architecture, the Autonomous Nano-Technology Swarm (ANTS), to proposed in situ prospecting, of the asteroid belt, the Prospecting Asteroid Mission (PAM) as part of a NASA 2003 Revolutionary Aerospace Concept (RASC) study.

Ai H. A. Ahrens T. J.

*Asteroid Physical Properties Probe* [#1962]

Experimental study of physical properties of asteroidal and cometary nuclei.

Franzen M. A. Preble J. Schoenoff M. Halona K. Long T. E. Park T. Sears D. W. G.

*Microgravity Testing of a Surface Sampling System for Sample Return from Small Solar System Bodies* [#1716]

The sampling mechanism we are investigating involves an adhesive pad that makes contact with the planetary surface for just a few seconds. The experiments were designed to determine if microgravity conditions altered sample collection.

Braun D. F. Heinrich M. Ai H. A. Ahrens T. J.

*Penetrator Coring Apparatus for Cometary Surfaces* [#2052]

Initial coring experiments in low-temperature (~153 K – polycrystalline ice) and porous rock demonstrate that simultaneous with impact coring, measurements of both the penetration strength and frictional properties of surface materials can be obtained upon core penetration.