40th LUNAR AND PLANETARY SCIENCE CONFERENCE
Highlighted Abstracts

ORAL PRESENTATIONS:

* *Asterisks denote speakers*

Monday, March 23, 2009

SPECIAL SESSION: VENUS ATMOSPHERE: VENUS EXPRESS AND FUTURE MISSIONS
Waterway Ballroom 6

5:15 p.m. Bullock M. A. * Senske D. A. Balint T. S. Benz A. Campbell B. A. Chassefiere E. Colaprete A. Cutts J. A. Glaze L. Gorevan S. Grinspoon D. H. Hall J. Hashimoto G. L. Head J. W. Hunter G. Johnson N. Kerzhanovich V. V. Kiefer W. S. Kolawa E. A. Kremic T. Kwok J. Limaye S. S. Mackwell S. J. Marov M. Y. Ocampo A. Schubert G. Stofan E. R. Svedhem H. Titov D. V. Treiman A. H.
A Venus Flagship Mission: Report of the Venus Science and Technology Definition Team **[#2410]**
The Venus STDT has defined the goals, objectives, mission architecture, science investigations and payload for a Flagship-class mission to Venus. The mission puts advanced exploration capabilities in orbit, in the atmosphere, and on the surface.

Tuesday, March 24, 2009

MARS POLAR CAPS: PAST AND PRESENT
Waterway Ballroom 1

9:00 a.m. Smith I. B. * Holt J. W. Christian S. W. Safaeinili A.
Evidence for Spiral Trough Migration and Evolution from SHARAD Radar Observations of Stratigraphy within the Northern Polar Layered Deposits, Mars **[#1423]**
Unconformities found in the NPLD of Mars resemble slopes and V shapes that we interpret as former trough locations. Evidence supports the idea that the troughs have migrated both northward and upward as deposition took place.

SPECIAL SESSION: LUNAR MISSIONS:
RESULTS FROM KAGUYA, CHANG'E-1, AND CHANDRAYAAN-1, PART I
Waterway Ballroom 4

8:30 a.m. Goswami J. N. * Annadurai M.
Chandrayaan-1: India's First Planetary Science Mission to the Moon **[#2571]**
The first Indian planetary exploration mission, Chandrayaan-1, was launched on 22 October, 2008. We will present a brief summary of the science objectives, various payloads, mission details and observational plans.

9:00 a.m. Gopala Krishna B. * Amitabh Sanjay S. Srivastava P. K. Kiran Kumar A. S.
Digital Elevation Models of the Lunar Surface from Chandrayaan-1 Terrain Mapping Camera (TMC) Imagery — Initial Results **[#1694]**
Initial results of digital elevation model obtained from the stereo triplet images acquired by the Terrain Mapping Camera onboard the Chandrayaan-1 spacecraft are discussed.

9:15 a.m. Kiran Kumar A. S. * Roy Chowdhury A. Murali K. R. Sarkar S. S. Joshi S. R. Patel V. D. Dave A. B. Shah K. J. Banerjee A. Mathew K. Sharma B. N.
The Terrain Mapping Camera on Chandrayaan-1 **[#1584]**
The Terrain Mapping Camera on Chandrayaan-1, acquires stereo triplet images of Moon in visible band. With the successful launch, spacecraft reached the 100 kilometer polar orbit around the moon and has since been returning images of Moon.

9:30 a.m. Dachev Ts. P. * Tomov B. T. Matviichuk Yu. N. Dimitrov Pl. S. Angelis G. De. Spurny F. Vadawale S.
Monitoring of the Earth and Moon Radiation Environment by the RADOM Instrument on Indian Chandrayyan-1 Satellite. Preliminary Results **[#1274]**
This paper describes preliminary scientific results from the measurements of the Earth and Moon radiation environment by RADOM instrument since 22nd October 2008.

9:45 a.m. De Angelis G. * Dachev Ts. P. Tomov B. Matviichuk Yu. Dimitrov Pl. Spurny F. Vadawale S.
Modeling of the Moon Radiation Environment at the Altitude of the Indian Chandrayaan-1 Satellite and a Comparison with the RADOM Experiment Data **[#1310]**
These results for the moon radiation environment as well as for the cruise phase have been obtained in the framework of the Radom investigation that is on-board the Chandrayaan-1 mission by the Indian Space Agency ISRO.

10:00 a.m. Spudis P. D. * Bussey D. B. J. Butler B. Carter L. Gillis-Davis J. Goswami J. Heggy E. Kirk R. Misra T. Nozette S. Robinson M. Raney R. K. Thomson B. Ustinov E.
The Mini-SAR Imaging Radar on the Chandrayaan-1 Mission to the Moon **[#1098]**
The Mini-SAR is an imaging radar instrument on the Indian Chandrayaan-1 mission to the Moon. It will map both lunar poles, revealing terrain in permanently dark areas and characterizing the backscattering properties of these areas, looking for evidence of ice.

10:15 a.m. Senthil Kumar A. Kiran Kumar A. S. * Goswami J. N. Krishna B. G. Chauhan P.
Lunar Orientale Basin: Topology and Morphology of Impact Melt Region from Chandrayaan-1 TMC and HYSI **[#1505]**
Initial results of Chandrayaan-1 Terrain Mapping Camera and Hyperspectral Imager data acquired the Orientale Basin of lunar surface are presented.

10:30 a.m. Kamalakar J. A. * Laxmi Prasad A. S. Bhaskar K. V. S. Selvaraj P. Sridhar Raja V. L. N. Goswami A. Kalyani K. Ravikumar K. Jain Y. K. Daniel D. A. Gopinath N. S.
Laser Ranging Experiment Aboard Chandrayaan-I: Instrumentation and Preliminary Results **[#1487]**
This paper presents the instrumentation details, end-to-end testing of the Lunar Laser Range Instrument (LLRI) aboard Indian lunar mission Chandrayaan-1 and focus on the present status and preliminary results obtained by the instrument.

10:45 a.m. Grande M. * Kellett B. J. Maddison B. J. Sreekumar P. Huovelin J. Howe C. J. Crawford I. A. Narendranath S.
Initial Results from the C1XS X-Ray Spectrometer on Chandrayaan-1 **[#1840]**
C1XS in flight calibration shows the instrument is performing well. C1XS observed the Moon during an A class flare on 12-12-2008; characteristic X-ray lines at Mg, Al and Si are clearly resolved. Analysis shows that C1XS easily meets spec.

11:00 a.m. Pieters C. M. * Moon Mineralogy Mapper Team
Mineralogy of the Lunar Crust in Spatial Context: First Results from the Moon Mineralogy Mapper (M^3) **[#2052]**
Mineralogy across the Orientale Basin measured with initial M^3 data indicate the peak ring exposed a massive crustal layer of almost pure anorthosite. This is underlain by noritic materials. More mineralogy data of the lunar crust is being acquired.

11:15 a.m. Green R. O. * Pieters C. M. Boardman J. Barr D. Bruce C. Bousman J. Chatterjee A. Eastwood M. Essandoh V. Geier S. Glavich T. Green R. Haemmerle V. Hyman S. Hovland L. Koch T. Lee K. Lundeen S. Motts E. Mouroulis P. Paulson S. Plourde K. Racho C. Robison D. Rodriguez J. Rothman P. Sellar G. Smith C. Sobel H. Stamp J. Tseng H. Varanasi P. Wilson D. White M.
The Moon Mineralogy Mapper (M^3) Imaging Spectrometer: Early Assessment of the Spectral, Radiometric, Spatial, and Uniformity Characteristics **[#2307]**
The Moon Mineralogy Mapper is a high uniformity and high signal-to-noise ratio NASA imaging spectrometer that is a guest instrument on the Indian Chandrayaan-1 Moon Mission. We present an early assessment of the M^3 science measurement performance.

11:30 a.m. Li C. L. * Liu J. J. Mu L. L. Ren X. Zou Y. L. Zhang H. B. Lu C. Liu J. Z. Zuo W. Su Y. Wen W. B. Bian W. Zou X. D. Ouyang Z. Y.
A New Global Image of the Moon by Chinese Chang'E Probe **[#2568]**
Mapping procedure of the global image of the Moon is described, including introduction of data, data processing and map-making. The results shows that the Chinese global image map provides new and highly precise data for lunar topographic demonstration and research.

11:45 a.m. Liu J. J. * Ren X. Mu L. L. Zhao B. C. Xiangli B. Yang J. F. Zou Y. L. Zhang H. B. Lu C. Liu J. Z. Zuo W. Su Y. Wen W. B. Bian W. Zou X. D. Li C. L.
Automatic DEM Generation from CE-1's CCD Stereo Camera Images **[#2570]**
The goal of the CCD Stereo Camera is to acquire 3D-images of lunar surface between 70S and 70N. We describe the process of the images acquired, configuration of imaging system, camera sensor model, camera trajectory model and EFP photogrammetric triangulation algorithm.

SPECIAL SESSION: ICY SATELLITES OF JUPITER AND SATURN: COSMIC GYMNASTS
Waterway Ballroom 6

9:30 a.m. Roberts J. H. * Nimmo F.
Tidal Dissipation Due to Despinning and the Equatorial Ridge on Iapetus **[#1927]**
The equatorial ridge on Iapetus cannot be formed by despinning stresses alone. However, heat dissipated by despinning may promote the formation of a degree-2 convective upwelling and positive dynamic topography at the equator.

9:45 a.m. Melosh H. J. * Nimmo F.
An Intrusive Dike Origin for Iapetus' Enigmatic Ridge? **[#2478]**
The symmetry and linearity of Iapetus' equatorial ridge suggest an extensional dike origin. Tidal despinning may provide both the heat and stress necessary to guide fluid intrusion from its interior.

10:15 a.m. Johnson T. V. * Castillo-Rogez J. C. Matson D. L. Thomas P. C.
Phoebe's Shape: Possible Constraints on Internal Structure and Origin **[#2334]**
We address the origin of Phoebe's shape and discuss the potential constraints on the internal structure and thermal evolution of Phoebe that can be inferred from Cassini observations.

11:00 a.m. Kieffer S. W. * Lu X. McFarquhar G. Wohletz K. H.
Ice/Vapor Ratio of Enceladus' Plume: Implications for Sublimation **[#2261]**
The ice/vapor ratio for the Enceladus' plume, using the originally reported data ISS and UVIS data should be 0.2, not 0.4. The corrected data are compatible with sublimation. Conclusions about the need for a liquid reservoir need to be reexamined.

MARS: GROUND ICE AND CLIMATE CHANGE
Waterway Ballroom 1

1:30 p.m. Safaeinili A. * Holt J. Plaut J. Posiolova L. Philips R. Head J. W. Seu R.
New Radar Evidence for Glaciers in Mars Phlegra Montes Region **[#1988]**
There is new radar evidence for the presence of debris-covered glacier at 36°N latitude in the Phlegra Montes region of Mars. The depth of the glacier is estimated at about 180 m. This is the closest glacier to the equator found by SHARAD to date.

SPECIAL SESSION: LUNAR MISSIONS:
RESULTS FROM KAGUYA, CHANG'E-1, AND CHANDRAYAAN-1, PART II
Waterway Ballroom 4

1:30 p.m. Sobue S. S. * Sasaki S. S. Kato M. K. Maejima H. M. Minamino H. M. Nakazawa S. N. Ootake H. O. Konishi H. K. Tateno N. T. Yonekura K. Y. Hoshino H. H. Kimura J. K.
The Project Highlight of Japan's Lunar Explorer Kaguya (SELENE) **[#1224]**
Kaguya (SELENE) was successful launched on September 14, 2007 at Tanegashima Space Center of JAXA. This paper describes the overview of Kaguya system, highlight of operation, public promotion result and future expected operation plan.

1:45 p.m. Kato M. * Takizawa Y. Sasaki S. SELENE Project Team
The Kaguya (SELENE) Mission and Its Lunar Science **[#1226]**
The lunar orbiter Kaguya has completed steady observation for ten month. We would like to talk on science results and mission summary.

2:00 p.m. Ohtake M. * Matsunaga T. Yokota Y. Haruyama J. Miyamoto H. Arai T. Hirata N. Takeda H. Nakamura R. Morota T. Honda C. Ogawa Y. Kitazato K. LISM Team
Anorthosite with 100% Plagioclase on the Moon Detected by the SELENE Multiband Imager **[#1557]**
We find exceptionally feldspathic rock with ~100% Fe-bearing plagioclase at the base of central peak of Tycho by using Multiband Imager data on board SELENE. We are conducting similar analyses at other locations.

2:15 p.m. Matsunaga T. * Ohtake M. Haruyama J. Ogawa Y. Nakamura R. Yokota Y. Morota T. Honda C. Torii M. Abe M. Nimura T. Hiroi T. Arai T. Saiki K. Takeda H. Hirata N. Kodama S. Sugihara T. Demura H. Asada N. Terazono J. Otake H.
Current Status and First Scientific Results of SELENE Spectral Profiler **[#2133]**
Spectral Profiler (SP) is a visible — near infrared spectrometer onboard Japanese SELENE spacecraft. Its spectral specifications are optimized for lunar surface mineral survey. In this paper, SP's status and first scientific results are presented.

2:30 p.m. Yamashita N. * Hasebe N. Shibamura E. Kobayashi M.-N. Karouji Y. Hareyama M. Kobayashi S. Okudaira O. Takashima T. d'Uston C. Maurice S. Gasnault O. Forni O. Diez B. Reedy R. C. Kim K. J. Arai T. Ebihara M. Sugihara T. Takeda H. Hayatsu K. Iwabuchi K. Nemoto S. Takeda Y. Tsukada K. Nagaoka H. Hihara T. Maejima H. Nakazawa S. Otake H.
Precise Observation of Uranium, Thorium, and Potassium on the Moon by the SELENE GRS **[#1855]**
The SELENE GRS revealed the global distribution of U on the lunar surface for the first time. The U distribution and its trend with K and Th are discussed to help understand thermal history of the Moon.

2:45 p.m. Gasnault O. * Forni O. Diez B. d'Uston C. Maurice S. Hasebe N. Okudaira O. Yamashita N. Kobayashi S. Karouji Y. Hareyama M. Shibamura E. Kobayashi M. N. Reedy R. C. SELENA GRS Team
Preliminary Analysis of SELENE GRS Data — The Iron Case **[#2253]**
The lunar compositional poles can be seen in the SELENE gamma-ray data through statistical processing of the spectra. Independent component analysis leads to a map of Th and a preliminary map of Fe, which can be normalized with Lunar Prospector data.

3:00 p.m. Namiki N. * Sugita S. Matsumoto K. Goossens S. Ishihara Y. Noda H. Sasaki S. Iwata T. Hanada H. Araki H. Kurosawa K. Matsumura M. Yokoyama M. Kamata S. Kubo N. Mori A. Sato M.
Comparative Study of Compensation Mechanism of Lunar Impact Basins from New Gravity Field Model of SELENE (Kaguya) **[#1519]**
Based on the gravity model of the Moon by SELENE, we propose new classification and compensation mechanism of lunar impact basins. Impact basins on lunar far side are classified into two types depending on free-air and Bouguer gravity anomalies.

3:15 p.m. Ishihara Y. * Namiki N. Sugita S. Matsumoto K. Goossens S. Araki H. Noda H. Sasaki S. Iwata T. Hanada H.
Localized Gravity/Topography Correlation and Admittance Spectra on the Moon **[#1623]**
We show the results of localized correlation and admittance analysis using new lunar gravity and topography models from Kaguya mission.

3:30 p.m. Araki H. * Tazawa S. Noda H. Ishihara Y. Goossens S. Kawano N. Sasaki S. Kamiya I. Otake H. Oberst J. Shum C. K.
The Lunar Global Topography by the Laser Altimeter (LALT) Onboard Kaguya (SELENE): Results from the One Year Observation **[#1432]**
A global and precise topographic map of the Moon has been derived by the laser altimeter (LALT) onboard the Japanese lunar explorer Kaguya (SELENE). Results of the one year observation and implications from the LALT topography will be presented.

3:45 p.m. Antonenko I. * Cooper B. L. Yamaguchi Y. Ono T. Kumamoto A. Osinski G.
Preliminary Regional Analysis of the Kaguya Lunar Radar Sounder (LRS) Data Through Eastern Mare Imbrium **[#2406]**
We processed preliminary Kaguya Lunar Radar Sounder data to form a coarse 3D voxel grid model. This model shows topography, a regional boundary at ~3.8 km depth (but dipping to ~4.4 km in SE Mare Imbrium), and the probable detection limits of the instrument at ~6.3 km depth.

4:00 p.m. Honda R. * Yamazaki J. Mitsuhashi S. Tachino J. Yamauchi M. Shirao M.
Results of High-Definition Television System (HDTV) On Board SELENE (Kaguya) **[#2540]**
The current status of the HDTV, recent data obtained, and ongoing data analysis of HDTV images such as the creation of digital elevation model (DEM) from the moving images are reported.

4:15 p.m. Haruyama J. * Ohtake M. Matsunaga T. Morota T. Honda C. Yokota Y. Ogawa Y. LISM Working Group
SELENE (Kaguya) Terrain Camera Observation Results of Nominal Mission Period **[#1553]**
We will overview observation results of the 10 m-resolution stereo-camera, Terrain Camera, aboard SELENE (Kaguya) during its nominal mission period of about one-year.

4:30 p.m. Hirata N. * Haruyama J. Ohtake M. Matsunaga T. Yokota Y. Morota T. Honda C. Ogawa Y. Sugihara T. Miyamoto H. Demura H. Asada N.
Morphological Analyses of Tycho Crater with Kaguya Data **[#1514]**
We investigated a large lunar crater Tycho with Kaguya/LISM data to reconstruct the impact event forming the crater from distributions of its ejecta and other associated features.

SPECIAL SESSION: ICY SATELLITES OF JUPITER AND SATURN: SALUBRIOUS SURFACES
Waterway Ballroom 6

2:30 p.m. Kirk R. L. * Howington-Kraus E. Redding B. L. Becker T. L. Lee E. M. Stiles B. W. Hensley S. Hayes A. G. Lopes R. M. C. Lorenz R. D. Mitchell K. L. Radebaugh J. Paganelli F. Soderblom L. A. Stofan E. R. Wood C. A. Wall S. D. Cassini RADAR Team
Three-Dimensional Views of Titan's Diverse Surface Features from Cassini RADAR Stereogrammetry **[#1413]**
Cassini RADAR has returned high resolution stereo images of dozens of areas on Titan. Digital topography extracted from the images provides new insight into lakes, dunes, mountains, flows, and other features including the enigmatic Ganesa Macula.

2:45 p.m. Nelson R. M. * Kamp L. W. Lopes R. M. C. Matson D. L. Kirk R. L. Hapke B. W. Boryta M. D. Leader F. E. Smythe W. D. Mitchell K. L. Baines K. H. Jaumann R. Sotin C. Clark R. N. Cruikshank D. P. Drossart P. Lunine J. I. Combes M. Bellucci G. Bibring J.-P. Capaccioni F. Cerroni P. Coradini A. Formisano V. Filacchione G. Langevin Y. McCord T. B. Mennella V. Nicholson P. D. Sicardy B. Irwin P. G. J. Pearl J. C.
Cassini Evidence for Active Cryovolcanism on Saturn's Moon Titan **[#2262]**
We report evidence for surface morphology changes on the surface of Saturn's satellite Titan from information returned by the Visual and Infrared Mapping Spectrometer (VIMS) aboard the Cassini Orbiter spacecraft. This is strong evidence for active cryovolcanism on Titan.

3:45 p.m. Sotin C. * Mielke R. Choukroun M. Neish C. Barmatz M. Castillo J. Lunine J. Mitchell K.
Ice-Hydrocarbon Interactions Under Titan-like Conditions: Implications for the Carbon Cycle on Titan **[#2088]**
A Titan chamber has been set up in order to investigate the physical and chemical behavior of drops of liquid methane and ethane with substrates of water ice. They imply that Titan's subsurface must be saturated with liquid hydrocarbons.

Wednesday, March 25, 2009

SPECIAL SESSION: MESSENGER AT MERCURY:
A GLOBAL PERSPECTIVE ON THE INNERMOST PLANET
Waterway Ballroom 4

8:30 a.m. Solomon S. C. * Freed A. M. Hauck S. A. II Head J. W. III Kerber L. Phillips R. J. Robinson M. S. Watters T. R. Zuber M. T.
MESSENGER's Newly Global Perspective on Mercury: Some Implications for Interior Evolution **[#1750]**
MESSENGER's first two flybys of Mercury have revealed a planet with a richer history of magmatism, deformation, and impact basin modification than heretofore appreciated, placing new constraints on the planet's formation and interior evolution.

8:45 a.m. Purucker M. E. * Johnson C. L. Anderson B. J. Korth H. Uno H. Blewett D. T. Sabaka T. J. Solomon S. C. Head J. W.
Mercury's Internal Magnetic Field from MESSENGER **[#1277]**
The internal magnetic field at Mercury is overwhelmingly of core origin, although small-scale fields of crustal origin may yet be shown to exist. None of the craters profiled during the MESSENGER flybys exhibit any magnetic signature.

9:00 a.m. Zurbuchen T. H. * Raines J. M. Gloeckler G. Slavin J. A. Krimigis S. M. Killen R. M. Sprague A. L. McNutt R. L. Jr. Solomon S. C.
First Ion Plasma Measurements in the Mercury Magnetosphere **[#2141]**
This paper discusses results from the two 2008 MESSENGER flybys. It addresses the relative importance of surface sputtering, chemical sputtering and micrometeoroid impact for the creation of Mercury's ionized exosphere.

9:15 a.m. Vervack R. J. Jr.* McClintock W. E. Bradley E. T. Killen R. M. Sprague A. L. Mouawad N. Izenberg N. R. Kochte M. C. Lankton M. R.
MESSENGER Observations of Mercury's Exosphere: Discoveries and Surprises from the First Two Flybys **[#2220]**
The MESSENGER flybys have provided excellent opportunities to probe the tenuous exosphere of Mercury, have led to the discovery of magnesium, and have revealed unexpected and puzzling structure in the spatial distributions of several species.

9:30 a.m. Lawrence D. J. * Feldman W. C. Goldsten J. O. Solomon S. C.
Identification of Neutron Absorbing Elements on Mercury's Surface Using MESSENGER Neutron Data **[#1761]**
Thermal neutrons provide a sensitive measure of elements such as Fe, Ti, Gd, and Sm. We present MESSENGER Neutron Spectrometer data along with an initial modeling analysis; implications for the abundance of neutron absorbing elements are described.

9:45 a.m. Izenberg N. R. * McClintock W. E. Holsclaw G. M. Blewett D. T. Helbert J. Solomon S. C. MESSENGER Team
Resolved Ultraviolet to Infrared Reflectance Spectroscopy of Mercury from the Second MESSENGER Flyby **[#1663]**
MESSENGER's MASCS instrument obtained resolved reflectance spectra from the ultraviolet to near-infrared (115–1450 nm) during the second Mercury flyby, sampling a variety of geologic terranes and units.

10:00 a.m. Denevi B. W. * Robinson M. S. Blewett D. T. Domingue D. L. Head J. W. III McCoy T. J. McNutt R. L. Jr. Murchie S. L. Solomon S. C.
MESSENGER Global Color Observations: Implications for the Composition and Evolution of Mercury's Crust **[#2247]**
A near-global view of Mercury from MESSENGER provides the first opportunity to perform a planet-wide assessment of Mercury's major geologic units and their significance.

10:15 a.m. Ernst C. M. * Murchie S. L. Barnouin-Jha O. S. Robinson M. S. Denevi B. W.
Exposure of Red Material by Impact Craters on Mercury: Implications for Buried Plains Material **[#1900]**
Occurrences of the red unit associated with impact craters on Mercury are examined using MESSENGER data to determine their extent, burial depth, and origin. The examination of one small area on Mercury reveals a complex local stratigraphy.

10:30 a.m. Blewett D. T. * Kerber L. Head J. W. Denevi B. W. Robinson M. S. Murchie S. L. Gillis-Davis J. J. Solomon S. C.
Mercury Pyroclastics: Color, Morphology, and Volatile Content **[#1793]**
We examine potential pyroclastic deposits with Mariner 10 and MESSENGER images. The best candidates have high reflectance and red spectral slope. Eruption physics calculations place constraints on magma volatile content, and suggest 1000s of ppm CO.

10:45 a.m. Zuber M. T. * Farmer G. T. Hauck S. A. II Ritzer J. A. Phillips R. J. Solomon S. C. Smith D. E. Head J. W. III Neumann G. A. Robinson M. S. Watters T. R. Johnson C. L. Oberst J. Barnouin-Jha O. McNutt R. L. Jr.
Observations of Ridges and Lobate Scarps on Mercury from Messenger Altimetry and Imaging and Implications for Lithospheric Strain Accommodation **[#1813]**
Ridges and scarps profiled by the Mercury Laser Altimeter on MESSENGER display offsets that significantly exceed those of martian wrinkle ridges. The structures can be used to constrain the early lithospheric structure and thermal state of Mercury.

11:00 a.m. Smith D. E. * Zuber M. T. Phillips R. J. Solomon S. C. Lemoine F. G. Neumann G. A. Head J. W. III Torrence M. H.
Does Mercury Have Lunar-like Mascons? **[#1802]**
In 2008 MESSENGER conducted two flybys of Mercury and experienced greater perturbation than expected. We investigated the possibility of gravity anomalies associated with surface features being the cause.

11:15 a.m. Prockter L. M. * Watters T. R. Chapman C. R. Denevi B. W. Head J. W. III Solomon S. C. Murchie S. L. Barnouin-Jha O. S. Robinson M. S. Blewett D. T. Gillis-Davis J.
The Curious Case of Raditladi Basin **[#1758]**
Raditladi Basin was imaged by MESSENGER during its flyby of Mercury. The basin appears to be very young – perhaps less than 1 Ga – and exhibits unusual extensional troughs. The presence of the troughs is at odds with Raditladi's apparent youth.

11:30 a.m. Head J. W. III* Solomon S. C. McNutt R. L. Jr. Blewett D. T. Chapman C. R. Domingue D. L. Gillis-Davis J. J. Hawkins S. E. III Helbert J. Holsclaw G. M. Izenberg N. R. McClintock W. E. Merline W. J. Murchie S. L. Phillips R. J. Prockter L. M. Robinson M. S. Denevi B. W. Sprague A. L. Strom R. G. Vilas F. Watters T. R. Zuber M. T.
The MESSENGER Mission to Mercury: New Insights into Geological Processes and Evolution from the First Two Encounters **[#2198]**
The first two Mercury MESSENGER mission encounters imaged much of the surface unseen by Mariner 10, establishing the widespread nature of volcanism, the presence of pyroclastic deposits, and the volcanic filling of impact craters and basins.

MERCURY: EVOLUTION AND TECTONICS
Waterway Ballroom 4

1:45 p.m. Wieczorek M. A. * Le Feuvre M. Rambaux N. Laskar J. Correia A. C. M.
Evidence for a Pre-Caloris Synchronous Rotation of Mercury **[#1276]**
The distribution of ancient impact basins on Mercury is decidedly non-uniform. Both the magnitude and direction of this asymmetry are consistent with this planet having been in a state of synchronous rotation when the ancient basins formed.

Thursday, March 26, 2009

CHONDRITE ACCRETION AND EARLY HISTORY
Waterway Ballroom 5

2:30 p.m. Weiss B. P. * Carporzen L. Elkins-Tanton L. T. Ebel D. S.
Evidence for Internally Generated Magnetic Fields on the CV Chondrite Parent Planetesimal **[#2237]**
Paleomagnetic analyses of Allende suggest that the CV parent body generated a dynamo field in a convecting metallic core. This would imply that the parent planetesimal is partially differentiated and has a relic, chondritic surface.

Friday, March 27, 2009

SEEK OUT AND EXPLORE: UPCOMING AND FUTURE MISSIONS
Waterway Ballroom 6

9:00 a.m. Newsom H. E. * Ollila A. M. Lanza N. L. King P. Gallegos Z. Osinski G. R. Clegg S. M. Wiens R. C. Vaniman D. Lee P. Glass B. J. Walker E. Thackrey S. Parnell J.
Simulated Rover Field Test at the Haughton-Mars Project Impact Crater Field Station **[#1446]**
Initial results from a field test for several Mars Science Laboratory instruments at the Haughton impact structure.

9:15 a.m. Chicarro A. F. *
MARS-NEXT — A Future Major Step in the European Exploration of Mars **[#1271]**
The Mars-NEXT mission represents a new concept for a three-lander network on Mars within ESA's Exploration Programme, to investigate the interior of the planet, its atmospheric dynamics, and the geology of each landing site.

10:00 a.m. Colaprete A. Briggs G. Ennico K. Wooden D. Heldmann J. L. Sollitt L. Asphaug E. Korycansky D. Schultz P. Christensen A. Galal K. Bart G. D. LCROSS Team
An Overview of the Lunar Crater Observation and Sensing Satellite (LCROSS) Mission — An ESMD Mission to Investigate Lunar Polar Hydrogen **[#1861]**
The primary objective of the Lunar Crater Observation and Sensing Satellite (LCROSS) is to confirm the presence or absence of water ice in a permanently shadowed polar region.

11:30 a.m. Lebreton J-P. * Niebur C. Cutts J. Falkner P. Greeley R. Lunine J. Blanc M. Coustenis A. Pappalardo R. Matson D. Clark K. Reh K. Stankov A. Erd C. Beauchamp P.
Joint NASA-ESA Outer Planet Mission Study Overview **[#2383]**
This presentation is an overview of the Outer Planet Mission [Europa Jupiter System Mission (EJSM) or Titan Saturn System Mission (TSSM)] selected by NASA and ESA and outlines the next steps toward implementation.

MARS ANALOGS I: CHEMICAL AND SPECTRAL
Waterway Ballroom 4

1:30 p.m. Gough R. V. * Tolbert M. A. McKay C. P. Toon O. B.
Methane Adsorption on Martian Soil Analogs: A Possible Abiogenic Explanation for Methane Variability **[#1968]**
We report laboratory results of methane adsorption onto JSC-Mars-1. Uptake coefficient values are small; however, atmospheric methane can access a large mineral surface area in the regolith. Significant methane may be temporarily lost in a season.

4:30 p.m. Murphy N. W. * Jakosky B. M. Mellon M. T. Budd D. A.
Thermophysical Properties of Martian Duricrust Analogs **[#1420]**
We measured thermophysical properties of samples of terrestrial duricrust from a gypsum deposit in New Mexico and Lunar Lake Playa. Our results suggest that well-indurated materials may cover a significant portion of the Mars surface.

POSTER PRESENTATIONS:

Tuesday, March 24, 2009

TANTALIZING TITAN
6:30 p.m. Town Center Exhibit Area

Stofan E. R. Farr T. Kirk R. L. Lopes R. M. Lorenz R. Lunine J. I. Mitchell K. L. Paillou P. Radebaugh J. Wall S. W. Wood C. A. Cassini Radar Team
Morphology of Four Flow Fields on Titan: Implications for Modes of Origin **[#1043]**
We describe four flow fields associated with channels that have been observed in Cassini Radar data of Titan.

Lorenz R. D. Hayes A. Callahan P. Gim Y. Janssen M. Wall S. Le Gall A. Mitchell K. Zebker H. Wye L. Lunine J. Aharonson O. Kirk R. Wood C. Alberti G.
Ontario Lacus: Brilliant Observations of a Titan Lake by the Cassini Radar Altimeter **[#1990]**
Rad altimetry, Ontario, truly flat, Glints like a mirror..

MARS: GEOCHEMISTRY AND ALTERATION PROCESSES
6:30 p.m. Town Center Exhibit Area

Needham A. W. Tomkinson T. Howard K. T. Grady M. M.
Clay Minerals in Nakhlites and on Mars **[#1969]**
Clay minerals, known to be present both in martian meteorites and on the surface of Mars, contain unique information about the planet's climate history. Analyses of terrestrial analogues and clay minerals in nakhlite meteorites are underway.

Annex A. Marion-Spencer M. Jones M. Guthrie S. Grigsby B. Turney D.
CRISM Analysis of Graben in Terra Tyrrhena; A Search for Water in Equatorial Mars **[#1453]**
High school students lead CRISM and HiRISE study of Graben in Terra Tyrrhena, answering previous hypotheses about the formation of the graben and the presence of possible laccoliths.

Tornabene L. L. Osinski G. R. McEwen A. S.
Parautochthonous Megabreccias and Possible Evidence of Impact-induced Hydrothermal Alteration in Holden Crater, Mars **[#1766]**
Using CRISM with HiRISE, we report on the detection of phyllosilicates correlated with dikes within parautochthonous megabreccias originating from the well exposed basement of Holden Crater.

Thursday, March 26, 2009

MISSIONS: APPROACHES, ARCHITECTURES, ANALOGS, AND ACTUALITIES
6:30 p.m. Town Center Exhibit Area

Clark K. Stankov A. Pappalardo R. T. Greeley R. Blanc M. Lebreton J.-P. Van Houten T.
The Europa Jupiter System Mission **[#2338]**
The two sister spacecraft of the EJSM — the Jupiter Europa and Jupiter Ganymede Orbiters — perform a choreographed dance exploring the Jupiter system and studying the processes that led to the diversity and interactions of its associated components.

Coustenis A. Lunine J. Matson D. Hansen C. Reh K. Beauchamp P. Lebreton J.-P. Erd C.
The Joint NASA-ESA Titan Saturn System Mission (TSSM) Study **[#1060]**
The NASA-ESA Titan Saturn System Mission designed for an in-depth exploration of Titan and Enceladus. The mission comprises both remote (orbiter dedicated to Titan) and *in situ* (montgolfiere, lander) elements. Launch would be around 2020.

Gilyén A. Szvoboda P.
Development of the Hungarosphere: The Husar-11 Rover Within a Transparent Spherical Space Probe Model with Special Planetary Surface Activities **[#1170]**
We built a spherical Hungaroszféra (Husar-11) rover: with transparent plexy body, camera can see bottom, it moves by inner driving, no spur outsteming from the sphere, can move on fluids, all instruments are defended from dust pollution.

Chicarro A. F.
Mars Express — Science Summary After Five Years in Orbit **[#1392]**
ESA's Mars Express has been orbiting Mars for over five years, providing unprecedented results on the interior, subsurface, surface, atmosphere and space environment of the Red Planet, allowing Europe to chart a future Mars exploration program.

McEwen A. Keszthelyi L. Spencer J. Thomas N. Johnson T. Christensen P. Wurz P. Glassmeier K.-H. Shinohara C. Girard T. Heinsohn G. Furfaro R. Gardner T. Cheeseman D. Beatty R. Ludwinski J. Kowalkowski T. Yen C. Elliot T. Turtle E. Strohbehn K. Janesick J. Falco C. Evans R.
Io Volcano Observer (IVO) **[#1876]**
IVO is a concept mission for Discovery, and would make multiple fast polar flybys of Io and acquire remote sensing and *in situ* measurements to address key questions about volcanic processes, tidal heating, and affects on the Jupiter environment.

Blome H.-J. Wilson T. L.
Hyperbolic Orbits and the Planetary Flyby Anomaly **[#1704]**
The virial theorem in astrophysics is used to show that energy is not being conserved during the gravity assist procedure used in planetary flybys. These involve hyperbolic trajectories. So the so-called flyby anomaly exists at a very fundamental level.

NOT JUST SKIN DEEP: ELECTRON MICROSCOPY,
HEAT FLOW, RADAR, AND SEISMOLOGY INSTRUMENTS
6:30 p.m. Town Center Exhibit Area

Asphaug E. Safaeinili A. Belton M. J. S. Scheeres D. J. Chesley S. Yeomans D.
Deep Interior: High-Resolution Volumetric Radar Imaging of a Comet Nucleus **[#2109]**
Deep Interior uses a SHARAD-type radar to acquire 10 Tb of global echoes from a comet nucleus, a data set that will resolve the whole-body geology to better than 10 m in 3D.