

43rd Lunar and Planetary Science Conference

March 19–23, 2012

Highlighted Abstracts

ORAL PRESENTATIONS —

* Asterisks denote speaker

Monday Morning, March 19, 2012

SPECIAL SESSION: A SEASON IN THE SATURN SYSTEM I, Waterway Ballroom 1

- 8:30 a.m. Spilker L. J. *
[*Cassini: Science Highlights from the Equinox and Solstice Missions*](#) [#1358]
The Cassini exploration of the Saturn system has returned a wealth of scientific data. Even after more than seven years of close study, the Cassini spacecraft still unveils new scientific discoveries that continue to captivate us.
- 9:00 a.m. West R. A. * Ovanessian A. Turtle E. P. Ray T. Balloch J. Dumont P. Lavvas P. Lorenz R. Rannou P.
[*Titan's Detached Haze and Polar Vortex: Large-Amplitude Seasonal Variations*](#) [#2897]
We present observations of Titan's detached haze showing large-amplitude seasonal variations. These observations and future observations from Cassini provide strong tests of dynamical and microphysical processes in Titan's atmosphere.
- 9:15 a.m. Teanby N. A. * Irwin P. G. J. Nixon C. A. de Kok R.
[*Seasonal Change at Titan's Poles*](#) [#1500]
We use seven years of data from Cassini to look for seasonal changes in the atmosphere of Saturn's largest moon — Titan. In particular we focus on the implications for atmospheric circulation as Titan moves from northern winter to northern summer.
- 9:30 a.m. Turtle E. P. * Perry J. E. Barnes J. W. McEwen A. S. Barbara J. M. Del Genio A. D. Hayes A. G. West R. A. Lorenz R. D. Schaller E. L. Lunine J. I. Ray T. L. Lopes R. M. C. Stofan E. R.
[*Evolution of Titan's Weather Patterns and Accompanying Surface Changes in the Wake of the Seasonal Shift of the Intertropical Convergence Zone*](#) [#2555]
After springtime rain / Titan's weather's quiet as / Northern summer looms.
- 9:45 a.m. Barnes J. W. * Buratti B. J. Turtle E. P. Bow J. Dalba P. A. Perry J. Rodriguez S. LeMouelic S. Baines K. H. Sotin C. Lorenz R. D. Malaska M. J. McCord T. B. Brown R. H. Clark R. N. Jaumann R. Hayne P. Nicholson P. D. Soderblom J. M. Soderblom L. A.
[*Cassini/VIMS Spectra and Time-Evolution of Precipitation-Associated Surface Brightenings on Titan*](#) [#2762]
Large areas of Titan's surface brightened at all wavelengths as seen from Cassini/VIMS for several months, then faded. The brightenings occurred after a large storm and rainfall event, and may relate to volatile refreezing due to evaporative cooling.

Monday Morning, March 19, 2012 (continued)

SPECIAL SESSION: A SEASON IN THE SATURN SYSTEM I, Waterway Ballroom 1

- 10:00 a.m. Mitchell K. L. * West R. D. Stiles B. W. Pappalardo R. T. Anderson Y. Lopes R. M. C. Wall S. D. Janssen M. A. Cassini Radar Team
[*The First High-Resolution SAR Observation of Enceladus by Cassini Radar*](#) [#2760]
We present SAR imagery and initial interpretations from the Cassini E16 fly-by of Enceladus. Different tectonic/radiometric domains are interpreted as the result of tectonic resurfacing and partial obfuscation by cryovolcanic plume deposition.
- 10:15 a.m. Hurford T. A. * Helfenstein P. Spitale J. N.
[*Tidal Control of Jet Eruptions Observed by Cassini ISS*](#) [#2154]
We examine the stresses on the Tiger Stripe active source regions to see how well diurnal tidal stress caused by Enceladus' orbital eccentricity may possibly correlate with and thus control the observed eruptions.
- 10:30 a.m. Buratti B. J. * Schenk P. M. Khurana K. Moore J. M.
[*Dione: The Evidence for Activity*](#) [#1713]
Several lines of evidence suggest that Dione is currently geologically active or has been recently.
- 10:45 a.m. Teolis B. D. * Waite J. H.
[*Cassini Measurements Show Seasonal O₂—CO₂ Exospheres and Possible Seasonal CO₂ Frosts at Rhea and Dione*](#) [#2923]
We will present the recent finding of an O₂-CO₂ Dione exosphere by Cassini, and discuss modeling of the different north-south CO₂ density at Rhea, and the CO₂ abundance at Dione, indicating strongly seasonal CO₂ exospheres and polar frosts.

Monday Afternoon, March 19, 2012

SPECIAL SESSION: A SEASON IN THE SATURN SYSTEM II, Waterway Ballroom 1

- 2:30 p.m. Matson D. L. * Johnson T. V. Davies A. G. Castillo-Rogez J. C. Lunine J. I.
[*Enceladus' Gas Budget and Ocean Temperature*](#) [#2411]
The relationships between water, carbon dioxide, and heat in Enceladus are used to obtain the temperatures of water in the plume-formation chambers and in the subsurface ocean.
- 2:45 p.m. Blackburn D. G. * Goguen J. D. Buratti B. J. Clark R. N. Howell R. R. Spencer J. R.
[*Detection of Thermal Emission from Enceladus' Tiger Stripes with Cassini VIMS*](#) [#1532]
We announce the detection of thermal emission from Damascus and Cairo with the Cassini VIMS in the 4–5 μm region of the spectrum. These new spectra put strong constraints on the emitting area at the hottest temperatures.
- 3:00 p.m. Ducci M. * Iess L. Armstrong J. W. Asmar S. W. Jacobson R. A. Lunine J. I. Racioppa P. Rappaport N. J. Stevenson D. J. Tortora P.
[*The Geodesy of the Main Saturnian Satellites from Range Rate Measurements of the Cassini Spacecraft*](#) [#2200]
During Cassini's eight-year tour in the saturnian system, the gravity field of the main satellites was inferred from range rate measurements of the spacecraft. Here we present our latest results and an overview of our analysis methods.

Monday Afternoon, March 19, 2012 (continued)

SPECIAL SESSION: A SEASON IN THE SATURN SYSTEM II, Waterway Ballroom 1

- 3:45 p.m. Castillo-Rogez J. C. * Lunine J. I.
[*Tidal Response of Titan's Interior Models Consistent with Cassini-Derived Constraints*](#) [#1707]
The goal of this paper is to identify to what extent tidal Love number and dissipation factor data can help distinguish between the models proposed so far to explain Titan's moment of inertia derived from Cassini Radio Science observations.
- 4:30 p.m. Kirk R. L. * Howington-Kraus E. Redding B. Callahan P. S. Hayes A. G. LeGall A. Lopes R. M. C. Lorenz R. D. Lucas A. Mitchell K. L. Neish C. D. Aharonson O. Radebaugh J. Stiles B. W. Stofan E. R. Wall S. D. Wood C. A. Cassini Radar Team
[*Topographic Mapping of Titan: Latest Results*](#) [#2759]
High resolution topomapping of Titan's surface reveals a mystery among the dunes and a fresh central peak crater. High precision elevations on the shores of Ligeia Mare and a host of maps of the southern hemisphere are in the works.

Tuesday Morning, March 20, 2012

NEW MARTIAN METEORITES AND NEW PERSPECTIVES ON OLD FAVORITES, Waterway Ballroom 6

- 8:30 a.m. Irving A. J. * Kuehner S. M. Tanaka R. Herd C. D. K. Chen G. Lapen T. J.
[*The Tissint Depleted Permafic Olivine-Phyric Shergottite: Petrologic, Elemental and Isotopic Characterization of a Recent Fall in Morocco*](#) [#2510]
The first witnessed martian meteorite fall in 49 years is a primitive olivine-phyric shergottite.
- 8:45 a.m. Agee C. B. * Wilson N. V. McCubbin F. M. Sharp Z. D. Ziegler K.
[*Basaltic Breccia NWA 7034: New Ungrouped Planetary Achondrite*](#) [#2690]
NWA 7034 is a basaltic breccia with petrology and geochemistry that resembles SNC meteorites, however its oxygen isotope values are anomalous compared to SNC meteorites. Aqueous alteration or a non-martian origin could account for this discrepancy.

Tuesday Afternoon, March 20, 2012

MARTIAN HYDRATED MINERALS AND VOLATILES FROM MANTLE TO SURFACE, Waterway Ballroom 6

- 1:45 p.m. McCubbin F. M. * Hauri E. H. Elardo S. M. Vander Kaaden K. E. Wang J. Shearer C. K. Jr.
[*Hydrous Melting of the Martian Mantle Produced Both Depleted and Enriched Shergottites*](#) [#1121]
Water contents of apatite from a depleted and an enriched shergottite indicate that hydrous melting of the martian interior occurred for both sources. Elevated water contents in the depleted source indicate early storage of water in Mars' interior.
- 2:00 p.m. Jones J. H. * Usui T. Alexander C. M. O'D. Simon J. I. Wang J.
[*Provenance and Concentration of Water in the Shergottite Mantle*](#) [#2560]
H₂O and Na₂O abundances in shergottite Y980459, coupled with simple melting models, imply that the water content of the depleted shergottite source region is 16–33 ppm. The D/H ratio of this water is approximately chondritic, or "Earthlike."

Tuesday Afternoon, March 20, 2012 (continued)

MARTIAN HYDRATED MINERALS AND VOLATILES FROM MANTLE TO SURFACE, Waterway Ballroom 6

- 2:15 p.m. Usui T. * Alexander C. M. O'D. Wang J. Simon J. I. Jones J. H.
[*Evidence from Olivine-Hosted Melt Inclusions that the Martian Mantle has a Chondritic D/H Ratio and that Some Young Basalts have Assimilated Old Crust*](#) [#1341]
Olivine-hosted melt inclusions from a depleted shergottite (Y-980459) possess undegassed water with near-chondritic δD of ~275‰. In contrast, a melt inclusion from an enriched shergottite (LAR 06319) exhibits an atmospheric/surficial δD of ~5000‰.
- 3:45 p.m. Bishop J. L. * Rampe E. B.
[*Allophane Identified at Mawrth Valles in CRISM and TES Datasets and Implications for the Ancient Phyllosilicate-Rich Rocks*](#) [#2277]
Allophane has been identified at Mawrth Vallis in the upper Al/Si-rich clay unit using CRISM data and in the region at ~10% through modeling of TES data. This implies the presence of young, well-drained soils in neutral to mildly acidic conditions.

ICE IS NICE: ICY SATELLITE LANDFORMS, PROCESSES, AND STRUCTURE, Waterway Ballroom 1

- 3:45 p.m. Bland M. T. * Singer K. N. McKinnon W. B. Schenk P. M.
[*Crater Relaxation on Enceladus: Tales of High Heat Fluxes in Unexpected Places*](#) [#2168]
Enceladus craters aren't deep, modified by slow viscous creep. High heat flows, they say, relax craters away, so thermal gradients must have been steep.

Wednesday Morning, March 21, 2012

SPECIAL SESSION: MESSENGER'S FIRST YEAR IN ORBIT ABOUT MERCURY, Waterway Ballroom 1

- 8:45 a.m. Purucker M. E. * Johnson C. L. Winslow R. M. Nicholas J. B. Anderson B. J.
Korth H. Head J. W. III Zuber M. T. Solomon S. C. Slavin J. A. Alexeev I. I. Phillips R. J.
Paige D. A.
[*Evidence for a Crustal Magnetic Signature on Mercury from MESSENGER Magnetometer Observations*](#) [#1297]
Magnetic fields from low-altitude MESSENGER observations over the northern pole reveal an anomaly that can be reproduced with a crustal layer magnetized in a direction opposite to that of the present main field. We present possible interpretations.
- 10:15 a.m. Byrne P. K. * Şengör A. M. C. Klimczak C. Solomon S. C. Watters T. R.
[*Large-Scale Crustal Deformation on Mercury*](#) [#2118]
We map laterally extensive sets of contractional landforms on Mercury as fold-and-thrust belts. In places these belts correlate to regions of high topography, and may play a role in the distribution of thicker crustal blocks on the innermost planet.

Wednesday Afternoon, March 21, 2012

ROVING ON MARS: CURRENT AND FUTURE SITES, Waterway Ballroom 6

- 1:30 p.m. Squyres S. W. * Athena Science Team
[Initial Opportunity Rover Results at Endeavour Crater, Mars](#) [#1892]
Initial findings from the Mars Exploration Rover Opportunity at Endeavour Crater include a variety of impact breccias in the crater rim, and gypsum veins emplaced by aqueous fluids.
- 1:45 p.m. Crumpler L. S. * MER Science Team
[Field Geologic Context of Gypsum Veins and Impactites on the Rim of Endeavour Crater, Cape York, MER Opportunity Rover](#) [#1258]
Rocks at the geologic unconformity between the rim of Endeavour crater and the Meridiani plains are separated significantly within the global stratigraphic sequence. We now have direct outcrop evidence of conditions existing early in martian geologic time.

Thursday Morning, March 22, 2012

SMALL BODY STUDIES II: EARTH-CROSSING TO MAIN BELT, Waterway Ballroom 5

- 9:00 a.m. Nakamura E. * Makishima A. Moriguti T. Kobayashi K. Tanaka R. Kunihiro T. Tsujimori T. Sakaguchi C. Kitagawa H. Ota T. Yachi Y. Yada T. Abe M. Fujimura A. Ueno M. Mukai T. Yoshikawa M. Kawaguchi J.
[Space Environment of an Asteroid Preserved on Micro-Grains Returned by the Hayabusa Spacecraft](#) [#1375]
In this paper, we summarize the results of our comprehensive initial analysis of the sizes, morphology, mineralogy, and geochemistry of five lithic grains from Itokawa.
- 9:15 a.m. Zolensky M. E. * Nakamura T. Mikouchi T. Hagiya K. Ohsumi K. Tanaka K. Noguchi T. Kimura M. Tsuchiyama A. Nakato A. Ogami T. Ishida H. Uesugi M. Yada T. Shirai K. Fujimura A. Okazaki R. Ishibashi Y. Abe M. Okada T. Ueno M. Mukai T. Yoshikawa M. Kawaguchi J.
[The Shock State of Itokawa Samples](#) [#1477]
We made a determination of the impact shock state of the recovered Itokawa samples.
- 11:15 a.m. Barucci M. A. * Belskaya I. Fulchignoni M. Fornasier S. Leyrat C.
[Surface Composition of Asteroid \(21\) Lutetia: Lesson Learned from the Rosetta Flyby](#) [#1586]
During the close encounter of the Rosetta spacecraft with (21) Lutetia on July 10, 2010, the instruments OSIRIS, VIRTIS, ALICE, and MIRO were turned on to characterize the surface properties of the asteroid.

Thursday Afternoon, March 22, 2012

SPECIAL SESSION: DAWN OVER VESTA I, Waterway Ballroom 5

- 2:00 p.m. Raymond C. A. * Asmar S. W. Konopliv A. S. Park R. S. Jaumann R. Preusker F. Russell C. T. Smith D. E. Toplis M. J. Zuber M. T.
[Geophysical Exploration of Vesta](#) [#1007]
Dawn's data have determined the shape and gravity field of Vesta, revealing correlations between topography and gravity anomalies and providing evidence for a significant iron core.

Thursday Afternoon, March 22, 2012 (continued)

SPECIAL SESSION: DAWN OVER VESTA I, Waterway Ballroom 5

- 2:30 p.m. Fu R. R. * Weiss B. P. Li L. Suavet C. Gattacceca J. Lima E. A.
[*Magnetic Fields on 4 Vesta as Recorded in Two Eucrites* \[#1946\]](#)
We conduct paleomagnetic studies on two eucrites, believed to originate from asteroid 4 Vesta. We find evidence of magnetic fields on Vesta most consistent with the existence of a past dynamo.
- 3:15 p.m. Schenk P. * Marchi S. O'Brien D. P. Buczkowski D. L. Jaumann R. Yingst A. McCord T. Gaskell R. Roatsch T. Keller H. E. Raymond C. A. Russell C. T.
[*Mega-Impacts into Planetary Bodies: Global Effects of the Giant Rheasilvia Impact Basin on Vesta* \[#2757\]](#)
Vesta has been hammered by large impacts, including two large (400–500 km) basins at the South Pole, the largest basins in proportion to target radius so far seen in the solar system. Here we examine the global effects of impacts at planetary scales.
- 4:15 p.m. Bottke W. F. * Marchi S. Vokrouhlicky D. Cohen B. A.
[*Reconciling Asteroid Collision Ages with the Late Heavy Bombardment* \[#2191\]](#)
Most main belt asteroids hit each other too slowly to produce much heat or reset Ar-Ar ages. Instead, we show LHB-era impact heating events likely came from asteroids pushed onto deep Earth-crossing orbits by late giant planet migration.

Friday Morning, March 23, 2012

SPECIAL SESSION: DAWN OVER VESTA II: THE HED-VESTA CONNECTION, Waterway Ballroom 5

- 8:45 a.m. De Sanctis M. C. * Ammannito E. Capria M. T. Capaccioni F. Carraro F. Fonte S. Frigeri A. Magni G. Marchi S. Palomba E. Tosi F. Zambon F. McCord T. B. McFadden L. A. McSween H. Y. Jr. Mittlefehldt D. W. Pieters C. M. Raymond C. A. Russell C. T.
[*Overview of Vesta Mineralogy Diversity* \[#1444\]](#)
Vesta's spectrum has strong absorption centered near 0.9 and 1.9 μm , indicative of Fe-bearing pyroxenes. Data from the Dawn VIR characterize and map the mineral distribution on Vesta, providing new insights into Vesta's formation and evolution.
- 9:00 a.m. Prettyman T. H. * Beck A. Feldman W. C. Forni O. Joy S. P. Lawrence D. J. McCoy T. J. McFadden L. A. McSween H. Y. Mittlefehldt D. W. Polanskey C. A. Rayman M. D. Raymond C. A. Reedy R. C. Russell C. T. Titus T. N. Toplis M. J. Yamashita N.
[*The GRaND Geochemistry of 4 Vesta: First Results* \[#2389\]](#)
We present first results of the analysis and interpretation of geochemical data acquired by the NASA Dawn mission's Gamma Ray and Neutron Detector in the low-altitude mapping orbit around 4 Vesta.
- 9:45 a.m. McSween H. Y. Jr. * Mittlefehldt D. W. Beck A. W. McCoy T. J. Marchi S. De Sanctis M. C. Ammannito E. Raymond C. A. Russell C. T.
[*Dawn and the Vesta-HED Connection* \[#1433\]](#)
The hypothesis that Vesta is the parent body of HED meteorites is consistent with, and strengthened by, the geologic context for HEDs provided by Dawn.

Friday Morning, March 23, 2012 (continued)

SPECIAL SESSION: DAWN OVER VESTA II: THE HED-VESTA CONNECTION, Waterway Ballroom 5

- 11:00 a.m. Sarafian A. R. * Roden M. F. Patiño-Douce A. E.
[The Nature of Volatiles in Vesta: Clues from Apatite in Eucrites](#) [#1175]
We used the electron and ion probe to measure the volatile content of apatite in eucrites. We found several distinct volatile reservoirs in eucrites: degassed and undegassed basalts and two possible late-stage fluids.

MARS AEOLIAN PROCESSES: PREPARE TO BE BLOWN AWAY!, Waterway Ballroom 6

- 8:45 a.m. Bridges N. T. * Ayoub F. Avouac J-P. Leprince S. Lucas A. Mattson S.
[High Sand Fluxes and Abrasion Rates on Mars Determined from HiRISE Images](#) [#1322]
We derive the reptation and saltation sand fluxes in Nili Patea, Mars. The dunes have unexpectedly high fluxes that are like those in Victoria Valley, Antarctica, implying that rates of landscape modification on Mars and Earth are similar.
- 9:15 a.m. Bourke M. C. *
[Seasonal Change in Polar Dune Morphology](#) [#2885]
Cryo-aeolian processes play an important role in the North Polar dune morphology changes observed between Mars year 29 and 30.

MARS POLAR PROCESSES: VERY COLD AND REALLY COOL, Waterway Ballroom 6

- 11:15 a.m. Hansen C. J. * Bourke M. C. McEwen A. Mellon M. Pommerol A.
Portyankina G. Thomas N.
[Year 3 HiRISE Observations of Sublimation of the Northern Seasonal Polar Cap on Mars](#) [#2386]
HiRISE has imaged the sublimation of Mars' northern seasonal polar cap for three years. The processes by which the dunes are reshaped every year are explored with high-resolution color images of the same locations as spring progresses.

Friday Afternoon, March 23, 2012

SPECIAL SESSION: DAWN OVER VESTA III: REGOLITH OF A TRANSITIONAL PLANET, Waterway Ballroom 5

- 1:30 p.m. Denevi B. W. * Blewett D. T. Capaccioni F. De Sanctis M. C. Garry W. B. Li J. Y. Marchi S. McCoy T. J. Nathues A. Petro N. E. Raymond C. A. Russell C. T. Schenk P. Scully J. E. C. Sunshine J. M. Williams D. A. Yingst R. A.
[Dawn Observations of Marcia Crater, Vesta](#) [#2308]
We present observations of geologic features associated with Marcia, a young, irregularly shaped crater ~70 km in diameter on Vesta.
- 2:15 p.m. Li J.-Y. * Mittlefehldt D. W. Pieters C. M. De Sanctis M. C. Schroder S. E. Hiesinger H. Blewett D. T. Russell C. T. Raymond C. A. Keller H. U.
[Investigating the Origin of Bright Materials on Vesta: Synthesis, Conclusions, and Implications](#) [#2381]
We report the synthesis analysis and preliminary results to investigate the origin of relatively bright areas on Vesta.

Friday Afternoon, March 23, 2012 (continued)

SPECIAL SESSION: DAWN OVER VESTA III: REGOLITH OF A TRANSITIONAL PLANET, Waterway Ballroom 5

- 3:15 p.m. McCord T. B. * Combe J.-Ph. Jaumann R. Palomba E. Reddy V. Blewett D. T. McSween H. Y. Jr. Raymond C. A. Williams D. Dawn Team
[Dark Material on Vesta: Synthesis and Interpretations from Dawn Observations](#) [#1352]
Dark material on Vesta is interpreted to be one of only two endmember materials, when mixed in various proportions, that are needed to model most of Vesta's surface. The material is likely from infall of carbonaceous chondrite material and from impact melt.
- 3:45 p.m. Capria M. T. * Tosi F. Capaccioni F. De Sanctis M. C. Palomba E. Ammannito E. Titus T. N. Combe J.-Ph. Toplis M. Sunshine J. Russell C. T. Raymond C. A.
[Thermal Inertia Variations on the Surface of Vesta from the Dawn Data](#) [#1863]
Temperature information has been obtained from the VIR spectra. When combined with a thermophysical model, these temperatures can be used to derive surface thermal properties, thus leading to the characterization of surface and regolith properties.

Poster Presentations —

Tuesday Evening, March 20, 2012

POSTER SESSION I: EXOBIOLGY: FROM WORLDS WE KNOW TO OTHER STARS

6:00 p.m. Town Center Exhibit Area

Papineau D.

[Organic Matter Associated with Apatite in Martian Meteorite Chassigny](#) [#1549]

Associations between organic matter and hydroxylated apatite have been found in the Chassigny meteorite. Data suggest precipitation from a low-temperature hydrothermal fluid and organic matter production from FTT synthesis on Mars.

Poster Location 569

Wimmer-Schweingruber R. F. Hassler D. M. Zeitlin C. Böttcher S. Martin C. Andrews J. Böhm E. Weigle G. Brinza D. Posner A. Burmeister S. Epperly M. Seimetz L. Reitz G. Kortmann O. Köhler J. Ehresmann B. Neal K. Rafkin S. Peterson J. Tyler Y. Smith K. Bullock M. Cucinotta F.

[Determining the Martian Radiation Environment — The Radiation Assessment Detector \(RAD\) on Mars Science Laboratory \(MSL\)](#) [#2460]

The Radiation Assessment Detector (RAD) onboard the Mars Science Laboratory (MSL) is performing radiation measurements en route to Mars. On Mars it will measure the broad particle spectrum and determine the dose and dose rate on the martian surface.

Poster Location 571

Brock L. S. Melosh H. J.

[Impact Exchange of Material Between Planets of Gliese 581](#) [#2467]

Gliese 581 d resides close to the "habitable zone" and has sparked debate on the existence of potential life. We evaluated the possibility for transfer of material between planet d and its sister planets and discovered an exchange was unlikely.

Poster Location 580

Thursday Evening, March 22, 2012

POSTER SESSION II: DAWN OVER VESTA: GLOBAL MAPPING

6:00 p.m. Town Center Exhibit Area

Yingst R. A. Mest S. Garry W. B. Williams D. A. Berman D. C. Jaumann R. Pieters C. M. Ammannito E. Buczkowski D. L. De Sanctis M. C. Frigeri A. Le Corre L. Preusker F. Raymond C. A. Reddy V. Russell C. T. Roatsch T. Schenk P. M. Dawn Team

[*A Preliminary Global Geologic Map of Vesta Based on High-Altitude Mapping Orbit Data*](#) [#1359]

We here report on a 1:500,000-scale preliminary global map of Vesta, based on data from Dawn's high-altitude mapping orbit (HAMO). This map is part of an iterative mapping effort; the geologic map is refined with each improvement in resolution.

Poster Location 5

POSTER SESSION II: DAWN OVER VESTA: COMPOSITION OF A TRANSITIONAL WORLD

6:00 p.m. Town Center Exhibit Area

Tarduno J. A. Cottrell R. D.

[*Single Crystal Paleointensity Analyses of Olivine-Diogenites: Implications for a Past Vestan Dynamo*](#) [#2663]

Preliminary rock magnetic and paleointensity analyses of olivine-diogenite meteorites are presented. These data indicate that olivine hosting magnetic inclusions is a suitable magnetic recorder, and suggest Vesta once had a dynamo.

Poster Location 33

Lawrence D. J. Prettyman T. H. Feldman W. C. Bazell D. Mittlefehldt D. W. Peplowski P. N. Reedy R. C.

[*Geochemistry at 4 Vesta: Observations Using Fast Neutrons*](#) [#1837]

Fast neutrons provide a measure of the average atomic mass of planetary surface material. The GRaND instrument on the Dawn spacecraft is measuring fast neutrons from 4 Vesta and will provide constraints of Vesta's surface composition.

Poster Location 35

POSTER SESSION II: DAWN OVER VESTA: SURFACE AND CRATERING

6:00 p.m. Town Center Exhibit Area

Ivanov B. A. Melosh H. J.

[*The Rheasilvia Crater on Vesta: Numerical Modeling*](#) [#2148]

The impact cratering two-dimensional numerical model is presented aimed to reproduce Rheasilvia crater formation on Vesta. The model is tuned to reproduce the prominent central mound in the crater.

Poster Location 87

Marchi S. Bottke W. F. Cohen B. A. De Sanctis M. C. Wuennemann K. McSween H. Y. O'Brien D. P. Schenk P. Raymond C. A. Russell C. T.

[*A New Interpretation of \$^{40}\text{Ar}\$ - \$^{39}\text{Ar}\$ Ages of Eucrites and Implications for Vesta's Collisional History*](#) [#2167]

In this work we provide a new interpretation of Ar-Ar ages of HED meteorites that may significantly affect their implications for the collisional evolution of Vesta.

Poster Location 90

Hiesinger H. Ruesch O. Jaumann R. Nathues A. Raymond C. A. Russell C. T.

[*Smooth Pond-Like Deposits on Asteroid 4 Vesta: Preliminary Results from the Dawn Mission*](#) [#2487]

We have identified smooth pond-like deposits on the surface of asteroid 4 Vesta, which might have several origins, including volcanism, impact sedimentation, impact melt deposition, dust levitation and transport, seismic shaking, or landslides.

Poster Location 93