Thursday, March 4, 2010
IGNEOUS AND VOLCANIC PROCESSES ON TERRESTRIAL BODIES IN THE SOLAR SYSTEM
8:30 a.m. Waterway Ballroom 5

Chairs: **Thomas Prettyman**
Ernst Hauber

8:30 a.m. Farkaš J. * Huang S. Jacobsen S. B.
Mass-dependent Calcium Isotope Composition of Solar System Objects **[#2266]**
This study discusses Ca isotope compositions, $^{44}Ca/^{40}Ca$ and $^{44}Ca/^{42}Ca$ ratios, of various terrestrial materials (basalts, dunite, mantle pyroxenes, accessory apatites), igneous rocks from Moon, Mars and Vesta, and Ca-Al-rich inclusions from Allende.

8:45 a.m. Prettyman T. H. * McSween H. Y. Jr. Raymond C. A. Feldman W. C. Li J.-Y. McFadden L. A. Russell C. T. Tricarico P.
Dawn's GRaND to Reveal the Complex Geochemistry of Vesta **[#2299]**
Is Vesta's composition more diverse than implied by the HED meteorites? Find out what the NASA Dawn mission's gamma ray and neutron detector (GRaND) can reveal about planetary igneous processes on a virtual visit to Vesta.

9:00 a.m. Michaut C. *
Dynamics of Laccolith Intrusions, with Applications to Earth and Moon **[#1084]**
The dynamics of magma spreading below an elastic crust is modeled and predicts three different intrusion morphologies. Laccoliths on Earth and candidate intrusive domes on the Moon are well explained by the morphology predicted in the elastic regime.

9:15 a.m. Karlstrom L. * Manga M. Matsuyama I.
Martian Magmatic Plumbing and the Spacing Between Tharsis Montes Shield Volcanoes **[#2339]**
We present a model for the development of discrete volcanic centers via melt focusing by magma chambers. We apply this model to the spacing of Tharsis Montes shield volcanoes, and test the effects of Tharsis loading and True Polar Wander stresses.

9:30 a.m. Zolotov M. Yu. *
Chemistry of Magmatic Volatiles and Explosive Volcanism on Mercury **[#1246]**
Solubilities of S, C, Cl and N in reduced magmas and potential degassing mechanisms are discussed with application to Mercury's volcanism. Nitrogen could be a major volcanic gas on Mercury and other gases are S_2, CS_2 and CO.

9:45 a.m. Glaze L. S. * Baloga S. M. Wimert J.
Volcanic Eruptions from Linear Vents on Earth, Venus and Mars: Comparisons with Central Vent Eruptions **[#1147]**
Vent geometry plays a significant role in the ability of an explosive eruption to sustain a buoyant, convective plume. Only the Earth's atmosphere can sustain convective plumes reaching tens of kilometers in altitude over a broad range of eruptive conditions.

10:00 a.m. Filiberto J. * Gross J. Treiman A. H.
Basaltic Pyroclastic Deposits on Earth and Mars: Constraints for Robotic Exploration of Martian Pyroclastic Deposits **[#1936]**
We investigate the Trailbridge basaltic ignimbrite, compare it to several possible basaltic pyroclastics on Mars, and place constraints on types of data we would need to recognize a pyroclastic deposit on Mars.

10:15 a.m. Zimbelman J. R. * Garry W. B. Crumpler L. S. Bleacher J. E. Self S.
Field Investigation of Inflated Pahoehoe Basalt Lava Flows, with Application to Lava Flows on Other Planets **[#1826]**
Field studies of the 1859 Mauna Loa lava flow in Hawaii and the McCartys lava flow in New Mexico were conducted to document topographic and textural aspects of inflated lava flows. The results should be helpful for identifying inflated flows on other planetary surfaces.

10:30 a.m. Bleacher J. E. * de Wet A. P. Garry W. B. Zimbelman J. R. Trumble M. E.
Volcanic or Fluvial: Comparison of an Ascraeus Mons, Mars, Braided and Sinuous Channel with Features of the 1859 Mauna Loa Flow and Mare Imbrium Flows **[#1612]**
A channel on Ascraeus Mons, previously suggested to indicate fluvial activity, is shown in its entirety. Distal portions indicate that this feature is of a volcanic origin despite similarities in the proximal sections to fluvial features.

10:45 a.m. Keszthelyi L. P. *
Formation of Sinuous Rilles on the Moon and Mars **[#2385]**
Recent lessons from HiRISE observations of Mars suggest that sinuous rilles were not formed by giant turbulent floods of lava. Instead, sustained flow over a mechanically weak substrate may be the key.

11:00 a.m. Hurwitz D. M. * Fassett C. I. Head J. W. Wilson L.
A Lava Channel Within an Elysium Planitia Impact Crater: Mechanics of Flow and Origin **[#1021]**
We describe a channel observed in an Elysium Planitia impact crater and constrain the viscosity and velocity of the lava that formed the channel. We can thus explore whether thermal or mechanical erosion was responsible for channel formation.

11:15 a.m. Richardson J. A. * Bleacher J. E. Baptista A. R.
Identification of Volcanic Ridge in Northern Syria Planum, Mars: Constraint on Geologic History of Syria **[#1427]**
We identify a new volcanic feature in north Syria Planum that is composed of 17 small vents together forming a northeast-trending ridge at the summit of the plateau. This feature represents a migration of Syria volcanism or a unique magma production event.

11:30 a.m. Hauber E. * Brož P. Jagert F.
Plains Volcanism on Mars: Ages and Rheology of Lavas **[#1298]**
Ages of plains volcanism in Tharsis, Mars, range from <<100 Ma to ~ 3 Ga, with most ages being clustered in the very late Amazonian. Rheologic analyses based on lava flow morphometry indicate fluid lavas with low viscosities and low yield strengths.