Thursday, March 10, 2011
POSTER SESSION II: IGNEOUS PROCESSES: LAVAS, VOLCANOS, AND GEOCHEMISTRY
6:00 p.m. Town Center Exhibit Area

Dufek J. Telling J. Manga M.
Multiphase Explosions on Mars: Numerical Studies of Phreatomagmatic Blast Dynamics **[#2237]**
The landforms generated during phreatomagmatic events on Mars provide clues to both the magmatic and environmental conditions in the near surface. We study the dynamics of these explosions for different atmospheric conditions.

Bleacher J. E. Richardson P. W. Garry W. B. Zimbelman J. R. Williams D. A. Orr T. R.
Identifying Lava Tubes and Their Products on Olympus Mons, Mars and Implications for Planetary Exploration **[#1805]**
Olympus Mons displays a vast lava tube network. We present a group of morphologic criteria used to identify these features. Observing a combination of these morphologies is important as all can form individually through non-lava tube processes.

Brož P. Hauber E.
A Unique Volcanic Field in Tharsis, Mars: Monogenetic Cinder Cones and Lava Flows as Evidence for Hawaiian Eruptions **[#1379]**
We describe the morphology and morphometry of a unique volcanic field in Tharsis, Mars. The landforms are interpreted as well-preserved cinder cones and associated lava flows. We infer that they were formed by Hawaiian eruptions.

Farrell A. K. Lang N. P.
Continued Mapping of Apollinaris Mons, Mars **[#2361]**
We continue our mapping of Apollinaris Mons and its associated crater, Apollinaris Patera. We have determined a basic geologic history of the volcano, and will use crater counting and volume estimates to elaborate on our prior results.

Grincius A. Lang N.
An Overview of the Volcanic Evolution of Amphitrites Patera, Mars **[#2209]**
A brief overview of the volcanic history and evolution of Amphitrites Patera.

Hynek B. M. Robbins S. J. Sramek O. Zhong S.
Geological Evidence for a Migrating Tharsis Plume on Early Mars **[#1603]**
Geological evidence suggests that the plume responsible for the largest igneous province in the solar system, Tharsis, migrated from near the south pole to its current location on the equator about 3.7 Ga, consistent with recent modeling efforts.

Jozwiak L. M. Isherwood R. J. Andrews-Hanna J. C.
The Formation History of Olympus Mons from Paleo-Topography **[#2202]**
We use lava flows on the flanks of the flexural trough surrounding Olympus Mons to reconstruct the history of volcanic loading and flexure. We constrain the eruption history and rates using paleo-topography, flexural modeling, and crater counting.

Platz T. Michael G. G.
Eruption History of the Elysium Volcanic Centre, Mars **[#2687]**
We present the first eruption frequency record for a volcanic centre on Mars. Based on our data, it is probable that Mars is still active in the Elysium region.

Lang N. P. Kelley R. Farrell A. K.
An Examination of the Contact Between Apollinaris Patera and the Medusae Fossae Formation, Mars: Implications for Apollinaris' Volcanic Evolution **[#1329]**
We examine the contact between Apollinaris Patera and the Medussa Fossae Formation (MFF) on Mars with the goals of better understanding (1) the timing between Apollinaris and the MFF and (2) the volcanic evolution of Apollinaris Patera.

Leverington D. W.
A Volcanic Origin for the Outflow Channels of Mars: Key Evidence and Major Implications **[#2159]**
Available data support volcanic origins for the outflow channels of Mars. Volcanic interpretations are of significance to the study of Mars geology and climate history, and the study of ancient igneous processes on bodies of the inner solar system.

Fleck J. R. Weeraratne D. S.
Tharsis Formation from Density Driven Thermo-Chemical Plumes During Planetary Differentiation **[#2522]**
We propose a new model for Tharsis formation as a thermo-chemical plume that forms during differentiation processes on Mars. Fluid experimentsusing liquid gallium suggest a buoyant anomaly may postdate a Borealis-sized impact and core-forming event.

Brand B. D. Clarke A. B.
The Dynamics of Pyroclastic Density Currents on Mars: Implications for Interpreting Martian Surface Deposits **[#2140]**
We've developed a model that predicts runout distance, sedimentation rate and bedform wavelength with distance from source under Mars conditions. Results show longer runout distances and bedform wavelengths on Mars due to slower sedimentation rates.

Chadwick J. McGovern P.
Modelling Subsidence due to the Olympus Mons Load Using Paleo-Slope Indicators **[#2688]**
We study lava flow orientations on the smooth plains around southern Olympus Mons, determining differences between paleo-flow directions and the current downhill, and comparing to flexure models to constrain edifice and lithosphere properties.

Diniega S. Smrekar S. E. Anderson S. Stofan E.
Lava Flow Dynamics Driven by Temperature-Dependent Viscosity Variations **[#1538]**
Pahoehoe flows begin as a uniform sheet then develop preferred flowpaths. We model the formation of dynamics-driven flow "fingers" caused by viscosity variations, which arise from differences in temperature and crystallization or volatile content.

Byrne P. K. Holohan E. P. Kervyn M. van Wyk de Vries B. Murray J. B. Troll V. R.
A Sagging-Spreading Continuum for the Structure of Large Volcanoes on Terrestrial Planets **[#2791]**
We use a series of scaled analog models to develop a sagging-spreading continuum for large volcanoes, into which we place natural examples from Earth and other planets based on their surface structures.

Kerber L. Head J. W. Madeleine J.-B. Forget F. Wilson L. Levine J. S.
Explosive Volcanic Eruptions into the Martian Atmosphere: Tracking Ash and Water Ice **[#2015]**
The combination of a Mars global circulation model and a explosive volcanic eruption plume model is used to track the dispersal of ash and water vapor into the martian atmosphere during a volcanic eruption.

de Moor J. M. King P. L. Sharp Z. D. Fischer T. P.
A Model for Sulfur Speciation and Sulfur Isotope Fractionation During Magmatic Degassing on Earth and Mars **[#1238]**
Our model results suggest that (1) H2S and S_2 are the main S gases exsolved from martian magmas, (2) degassing fractionation cannot explain the range in $\delta^{34}S$ of martian meteorites, and (3) the $\delta^{34}S$ value of the bulk martian surface is ~0 to +2‰.

Burger P. V. Papike J. J. Shearer C. K. Sutton S. R. Newville M. Choi Y. Lanzirotti A.
Sulfides from Martian and Lunar Basalts: Comparative Chemistry for Ni, Co, Cu, and Se. Average Sample Analyses and WDS Mapping of Grains **[#1007]**
This study examines the average trace element chemistry for planetary sulfide grains from the Moon and Mars to provide a means of distinguishing samples from those bodies based on sulfide trace element chemistry.

Burger P. V. Shearer C. K. Papike J. J. Le L. Jones J. Sutton S. R. Newville M.
An Experimental Study of the Effects of Plagioclase Crystallization on REE Behavior and Eu Valence Oxybarometry in Pyroxene **[#1173]**
This study characterizes the effect of plagioclase crystallization on pyroxene REE chemistry and the interpretation of the pyroxene oxybarometer.

Martin A. M. Righter K. Keller L. P. Médard E. Devouard B. Rahman Z.
Fayalite Oxidation Processes: Experimental Evidence for the Stability of Pure Ferric Fayalite? **[#2716]**
We report experimental results on the stability of pure Fe^{3+} fayalite end-member and on fayalite oxidation processes, using microscopic and nanoscopic analyses.

Teng F.-Z. Dauphas N. Helz R. T. Gao S. Huang S.
A New Petrogenetic Tool Based on Kinetic Isotope Fractionation Associated with Mg-Fe Interdiffusion in Olivine **[#2660]**
Kinetic isotope fractionation during Mg-Fe interdiffusion in zoned olivine can be used to constrain the nature of mineral zoning in igneous and metamorphic rocks.