Thursday, March 4, 2010
POSTER SESSION II: IGNEOUS AND VOLCANIC PROCESSES ON TERRESTRIAL BODIES IN THE SOLAR SYSTEM
7:00 p.m. Town Center Exhibit Area

Dominguez G. Wilkins G. Thiemens M. H.
Modeling the Isotopic Fractionation of Magnesium and Calcium in High Temperature Thermal Gradients from First Principles **[#2123]**
A fundamental model of isotope specific diffusion in high-temperature (T > 1000°C) systems was developed and tested. We find that differences in zero point energy of isotopes leads to isotopic fractionation in high-temperature thermal gradients.

Mikouchi T. Sugiyama K. Kato Y. Yamaguchi A. Koizumi E. Kaneda K.
Mineralogy of Calcium Silico-Phosphates in Angrites Compared with Related Phases in Heated Eucrite and Synthetic Analog **[#2343]**
We analyzed Ca silico-phosphates in angrites and found that they have a graserite structure by EBSD and Raman study. The related phases in experimentally heated eucrite and synthetic analog are slightly different in both composition and structure.

Stanley B. D. Mounier M. T. Hirschmann M. M.
Experimental Investigation of CO_2 Solubility in Martian Basalts with Varied Oxidation State and Applications to Martian Atmospheric Evolution **[#1667]**
We investigate the solubility of carbon dioxide in martian analogue basaltic melts at varying oxygen fugacities to constrain the magmatic outgassing fluxes of carbon dioxide during martian atmospheric evolution.

Jowell A. H. Davis S. J. Stein A. J. Erb Z. S. Oliver B. L. Eckert-Erdheim A. M.
Thermal Modeling of Mafic and Ultramafic Igneous Rocks **[#1740]**
Experimental data suggests the thermal inertias of tested rocks are in the following increasing order: vesicular basalt, massive basalt, altered peridotite. Weathered surfaces mask the thermal signatures of all rocks tested.

Wilson L. Head J. W.
Lunar Magmatism and Volcanism: Theory of Magma Generation, Ascent, Intrusion and Eruption **[#1100]**
We review current understanding of lunar volcanic processes to pinpoint issues needing theoretical and observational study. Contrasting eruption conditions of mare lava flows and sinuous rilles throw light on depths and volumes of magma sources.

Mikosz J. A. Dombard A. J.
A Global Search for Actively Forming Coronae on Venus **[#2037]**
By comparing geophysical and geologic maps, we identify 13 coronae that may currently be active. Extrapolating globally, there could be 26–32 coronae forming at present. Venus may lose a significant fraction of its heat via corona formation.

Leone G. Wilson L. Davies A. G.
The Geothermal Gradient of Io: Consequences for Lithosphere Structure and Volcanic Eruptive Activity **[#1130]**
We re-evaluate Io’s temperature structure with temperature-dependent thermal parameters to find the depths at which sulphur volatiles, buried by volcanic activity, melt to be mixed into later magmas, affecting eruption rates and intrusion depths.

Giacomini L. Carli C. Massironi M. Sgavetti M.
Morphological and Spectral Analysis for the Daedalia Planum Geological Mapping **[#1594]**
Our study has been focused on the Daedalia Planum geological mapping. THEMIS, MOC, HiRISE images were analyzed to perform a stratigraphic and morphological analysis. OMEGA data revealed spectral differences that permitted improvement of our mapping.

Ramsey M. S. Crown D. A.
Thermophysical and Spectral Variability of Arsia Mons Lava Flows **[#1111]**
Lava flows on the SW apron of Arsia Mons have a multitude of textures and thermophysical characteristics in THEMIS data. Despite moderately high albedo, the spectral diversity appears to be directly related to flow emplacement and composition.

Davies A. G. Keszthelyi L. P. Harris A. J. L.
The Thermal Signature of Volcanic Eruptions on Io and Earth — Implications for a Future Mission to Io **[#1396]**
We present a new methodology (which we term the "thermal signature") of classifying ongoing high-temperature volcanic eruptions in low spatial resolution remote sensing data which is effective for both Io and Earth observations.

Leverington D. W.
Volcanic Interpretations of the Martian Outflow Channels are Consistent with Surface Mineralogy **[#1282]**
Though not supportive of aqueous processes of outflow channel formation, the surface mineralogy of Mars appears consistent with volcanic mechanisms of system development.

Hurwitz D. M. Head J. W. Wilson L. Hiesinger H.
Lunar Sinuous Rilles: Analysis of Morphology, Topography, and Mineralogy, and Implications for a Thermal Erosion Origin **[#1056]**
Characteristic measurements of lunar sinuous rilles are used to determine flow velocity, erosion regime, and vertical/lateral erosion rates that occurred during rille formation. These parameters provide key insights into the origin of sinuous rilles.

Wilson L. Head J. W. III
Conditions in Lunar Eruptions Producing Sinuous Rilles **[#1101]**
We used Hulme's erosion model to analyze eight lunar sinuous rille channels to infer conditions in the volcanic eruptions forming them. Ten-fold smaller volume fluxes than for mare lava flows, plus steeper ground slopes, distinguish rilles from flows.

Giguere T. A. Wilson L. Hawke B. R.
Magmatic Origin for Rima Hyginus: Implications for Its Feeder Dike **[#1129]**
Our results strongly support the idea that all of the major structural features of the Hyginus rille are the direct consequences of a shallow dike intrusion.

Weber A. K. Head J. W. Saal A. E. Weinreich T. Wilson L.
Volatiles in Lunar Fire Fountaining Eruptions and the Effect of Rotation on Droplets in Free Flight **[#1208]**
This presentation deals with the rotational aspect of liquid magma droplets while in flight, during emplacement of fire fountaining eruptions. Samples from the Apollo 15 and 17 missions were analyzed for this research.

Kerber L. Head J. W. III Madeleine J. B. Wilson L. Forget F.
The Distribution of Ash from Ancient Explosive Volcanoes on Mars **[#1006]**
A martian explosive eruption model is combined with a global circulation model to simulate the dispersal of tephra from major martian volcanoes. Implications for friable layered deposits are discussed.

Farrell A. K. Lang N. P.
Distribution of Explosive and Effusive Volcanic Deposits at Apollinaris Patera, Mars **[#2072]**
We present our initial results on the distribution of explosive and effusive deposits at Apollinaris Patera, Mars.

Platz T. Kneissl T. Hauber E. Le Deit L. Michael G. G. Neukum G.
Total Volume Estimates of Volcanic Material of the Elysium Volcanic Region **[#2476]**
Our ongoing study comprises total volume estimates of material erupted at martian volcanic centers. Here, results for the Elysium volcanic region are presented with implications for its outgassing history.

Bleacher J. E. Richardson J. A. Richardson P. W. Glaze L. S. Baloga S. M. Greeley R.
Hauber E. Lillis R. J.
Updates to the Catalog of Tharsis Province Small Volcanic Vents, Mars **[#1615]**
This abstract reports on the ongoing efforts to catalog small volcanic vents in the Tharsis province of Mars, and the scientific implications of these observations for South Tharsis, Olympus Mons, and Syria Planum.

Stofan E. R. Glaze L. S.
Analysis of Flank Vents at Large Venusian Volcanoes **[#1337]**
Flank eruptions provide a window to a volcano's plumbing system. We assess flank vents on large volcanoes on Venus to determine the degree of randomness in their locations and use any systematic behavior to provide insight into formation mechanisms.

Baptista A. R. Craddock R. A.
The Galapagos and Hawaii Volcanoes: Two Analogues of Syria Planum on Mars **[#1768]**
This study will establish an analogous eruptive and emplacement history of the range of shield volcanos and volcanic provinces found both on Syria Planum, Mars, and on the Galapagos and Kilauea, Hawaii, volcanos on Earth.

Pasckert J. H. Hiesinger H. Reiss D.
Rheology and Age of Lava Flows on Elysium Mons, Mars **[#1903]**
We present results of our study of the rheologies and ages of lava flows on the Elysium Mons volcano, Mars.

Williams D. A. Keszthelyi L. P. Crown D. A. Geissler P. E. Schenk P. M. Yff J. Jaeger W. L.
Volcanism on Io: Results from Global Geologic Mapping **[#1351]**
Here we highlight some of the results from global geologic mapping of Io.

Dundas C. M. Keszthelyi L. Bray V. J. McEwen A. S.
The Cratering Record of Young Platy-ridged Lava on Mars: Implications for Material Properties **[#2486]**
Target properties can affect the cratering record of planetary surfaces. We investigate the implications of this effect for the cratering record of martian platy-ridged lava with varying crater densities.

Crown D. A. Ramsey M. S. Berman D. C.
Mapping Arsia Mons Lava Flow Fields: Insights into Flow Emplacement Processes and Flow Field Development **[#2225]**
This study utilizes high-resolution images combined with topographic and thermal infrared data to produce detailed maps of flow fields south of Arsia Mons that provide new insights into flow emplacement processes and flow field development.

Robbins S. J. Di Achille G. Hynek B. M.
Dating the Most Recent Episodes of Volcanic Activity from Mars' Main Volcanic Calderae **[#2252]**
We have dated the most recent volcanism on Mars through crater-counting with CTX mosaics of the calderae of Mars' major volcanic complexes.

Xiao L. Huang J. Christensen P. R. Williams D. A. Greeley R. Wang C. Z. Xu W. B. Yang J.
He Q. Ruff S.
The Possibly Oldest Volcanoes on Mars **[#1173]**
This study shows numerous Early Noachian (>4.0 Ga) small volcanoes preserved in the heavily cratered southern highlands. They are possibly the oldest shield volcanos on Mars.