

Thursday, March 26, 2009
POSTER SESSION II: MARS: VOLCANISM
6:30 p.m. Town Center Exhibit Area

Hamilton C. W. Fagents S. A.

[*The Tartarus-Colles Cone Group and Its Implications for Explosive Lava-Water Interactions in the Grijota Valles Region of Mars*](#) [#1924]

Terrestrial volcanic rootless cones (VRCs) are the products of explosive-lava water interactions. We describe the Tartarus-Colles cone group on Mars and provide morphological and geospatial evidence to support the interpretation that these landforms are VRCs.

Lanz J. K. Saric M. B.

[*Possible Traces of Hydrothermal Venting in Aeolis Planum, Mars*](#) [#1014]

We have studied pitted cones and ridges north of Aeolis Planum that show striking differences to other cone complexes on Mars. We propose that they were formed by hydrothermal venting processes similar to hydrothermal vent complexes on Earth.

Kerber L. Head J. W. Madeleine J. B. Forget F. Wilson L.

[*The Dispersal of Pyroclasts from Apollinaris Patera, Mars*](#) [#2176]

Using a Mars global circulation model, we model the dispersal of ash from Apollinaris Patera, varying parameters such as plume height, grain size, and season. We test the hypothesis that Apollinaris could be a source for the Medusae Fossae formation.

Lang N. P.

[*Another Look at the Summit Caldera of Apollinaris Patera*](#) [#2370]

This project focuses on documenting the structural and volcanic evolution of the summit caldera on Apollinaris Patera.

Fagan A. L. Sakimoto S. E. H.

[*Formation Constraints on Martian North Polar Volcanic Edifices*](#) [#1976]

Comparisons of topographic characteristics between Icelandic volcanoes and martian north polar edifices imply that many of the latter may be of subglacial origin and thus suggest a potential former ice sheet with a minimum thickness of 80–550 m.

Tyson S. Wilson L. Gilbert J. S. Lane S. J.

[*A New Mechanism for Caldera Formation Resulting from Interactions Between Magmatic Heat and Cryospheric Ice*](#) [#1716]

We propose a new mechanism of caldera formation that does not require local removal of magma.

Tyson S. Wilson L. Lane S. J. Gilbert J. S.

[*Hecates Tholus: Defrosting a Volcano*](#) [#1158]

We explore how magmatic heat influences the survival of the cryosphere and any possible snowpack at the summit of Hecates Tholus.

Byrne P. K. van Wyk de Vries B. Murray J. B. Troll V. R.

[*An Overview of Volcano Flank Terraces on Mars*](#) [#2192]

Using MOLA, HRSC, and CTX images, and laboratory analogue modelling, we report on the nature, origin, and context of volcano flank terraces on Mars.

Spagnuolo M. G. Pio Rossi A.

[*Analog Modelling for Pit Craters and Its Relation to Extensional Features on Mars*](#) [#1307]

We performed analog modelling to study pit crater formation on Mars. Preliminary results show that pit craters in fact form in the presence of unconsolidated material over hard layers but no faults are developed.

Cushing G. E. Titus T. N.

[*Kilauea Pit Craters as Mars Analogs: A New Direction for Cave-Detection Techniques*](#) [#1203]

Some Kilauea pit craters provide access to extensive cave networks, and from the outside, appear morphologically similar to anomalous pit craters found on Mars. Thermal comparisons may enable future studies to indirectly identify caves on Mars.

Lopez T. Baratoux D. Rabinowicz M. Antoine R. Ayoub F. D'Uston L.

[*What Does Control the Thermal Behaviour of the Pits Near Arsia Mons?*](#) [#1912]

The THEMIS instrument onboard Mars Odyssey imaged deep pits, localised North of Arsia Mons, in the visible and infrared channels. We present a detailed thermal study of these pits to evaluate several hypotheses that could explain their thermal behavior.

Leverington D. W.

[*Reconciling Channel Formation Processes with the Nature of Elevated Hesperian Outflow Systems at Valles Marineris*](#) [#1469]

A volcanic origin for relatively small outflow systems at uplands adjacent to Valles Marineris is in accord with channel characteristics, regional geological context, and solar system analogs.

Basilevsky A. T. Neukum G. Kneissl T. Dumke A.

[*Geologic Analysis of HRSC Images of the Area East of the Mangala Valles Head Graben, Mars*](#) [#1833]

This study shows that the lava flows associated with a graben being the continuation to the east of the head graben of the Mangala Valles formed around ~0.5 Ga ago and thus correlate with one of the episodes of the Mangala Valles flood activity.

Crown D. A. Berman D. C. Rivas R. Ramsey M. S.

[*Arsia Mons Lava Flows: Insights into Flow Field Emplacement and Stratigraphy from CTX and HiRISE Images*](#) [#2252]

This research focuses on lava flows south of Arsia Mons and utilizes high-resolution images as well as topographic and thermal infrared data to examine development of channel and levee systems, local sequences of flow emplacement, and degradation of flow field surfaces.

Hiesinger H. Pasckert J. H. Reiss D.

[*Rheology of Lava Flows on Elysium Mons, Mars*](#) [#1983]

We have mapped 25 individual lava flows in the Elysium Mons region and measured their dimensions. On the basis of these measurements, we have calculated the yield strengths, effusion rates and viscosities of the lava flows.

Hiesinger H. Rohkamp D. Sturm S. Thiessen F. Reiss D.

[*Geology, Ages, Morphology, and Morphometry of Thumbprint Terrain in Isidis Planitia, Mars*](#) [#1953]

We constructed a map of thumbprint terrain and measured the heights, lengths, basal diameters, and the diameters of the central depressions. We dated the geologic units on which the thumbprint terrain occurs and superposed rampart craters.

Milazzo M. P. Keszthelyi L. P. Jaeger W. L. Rosiek M. Mattson S. Verba C. Beyer R. A.

Geissler P. E. McEwen A. S. HiRISE Team

[*The Distribution of Columnar Lavas on Mars as Seen by HiRISE*](#) [#2159]

On Mars, water floods mix with hot lavas; joints form. HiRISE sees from space.

Korteniemi J.

[*Interpreting Remote Sensing Data: Martian Dikes vs. Other Features*](#) [#2084]

Examples of structures which may be (mis)interpreted as magmatic dikes or their surface manifestations.

Pedersen G. B. M. Head J. W. III Wilson L.

[*Early Amazonian Dike Swarms in Utopia Basin, Mars: Nature of Substrate and Estimates of Effusion Rates*](#) [#1541]

Hundreds of narrow, linear ridge segments are found in the transition zone between Elysium Rise and Utopia Basin. The linear ridges are interpreted to be dikes and the multiple ridge systems are interpreted to be dike swarms.

Woerner W. R. Coraor E. K. McCubbin F. M. Nekvasil H. Lindsley D. H.

[*The Effect of Pressure on Residual Liquid Compositions from Crystallization of a Humphrey-like Magma: Implications for Crustal Stratigraphy in Martian Volcanic Provinces*](#) [#2203]

Experiments indicate that Humphrey-like liquids ponding at the base of a thickened crust in major volcanic provinces on Mars would produce a pigeonite-rich cumulus layer at depth and highly silica-undersaturated sodic residual liquids.

Usui T. McSween H. Y. Jr. Clark B. C. III

[*CO₂-related Noachian Alkaline Magmatism on Mars: Evidence from High-Phosphorous Wishstone-Class Rocks in Gusev Crater*](#) [#1055]

We demonstrate that high-phosphorous tephrites (Wishstone class) in Gusev crater formed in association with carbonatitic melt/fluid. This could yield insights into the effects of CO₂ (an effective greenhouse gas) on Noachian magmatism.

Hutchins K. I. Agee C. B. Draper D. S.

[*Experimental Constraints on the Source Regions of the Shergottites and Gusev Basalts*](#) [#1845]

Rover data from rocks sampled at Gusev Crater on Mars combined with data from the martian basaltic meteorites (shergottites) suggest there are at least two distinct basalt source regions in the martian mantle.

Boisson J. Heggy E. Clifford S. M. Frigeri A. Plaut J. J. Farrell W. M. Putzig N. Picardi G. Orosei R. Lognonné P. Gurnett D. A.

[*The Geoelectrical Properties of Athabasca Broken-Rafted Plate Terrain as Derived from the MARSIS Radar Sounding Data*](#) [#2001]

To test the volcanic or fluvial formation hypothesis of Athabasca rafted plate terrain, we investigate the geoelectrical properties of the subsurface in this zone derived as derived from MARSIS radar data.