

Thursday, March 10, 2011
POSTER SESSION II: CRUSTY MARS AND THE ANTARCTIC:
BRINES, CLATHRATES, HYDRATES, SALTS, GULLIES, AND METHANE
6:00 p.m. Town Center Exhibit Area

Lanza N. L. Newsom H. E. Osterloo M. M.

[*The Systematic Effects of Martian Gravity on Hillslope Materials and Mass Movement Processes*](#) [#2383]

Martian gravity is lower than that of Earth, and this difference will cause subtle shifts in the relationships between friction, cohesion, and pore pressure, which in turn will lead to slight differences in hillslope processes and resultant landforms.

Price M. C. Conway S. J. Towner M. C. Burchell M. J.

[*Hydrocode Modelling of Fluvial Flow with ANSYS CFX: Comparison with Martian Analogue Lab-Scale Experiments*](#) [#1771]

Martian fluvial flow analogue experiments are used to develop an accurate hydrodynamic computer model to enable constraints to be placed on the volume of liquid water required for the formation of martian gullies.

Ojha L. McEwen A. Dundas C. Mattson S. Byrne S. Wray J.

[*Transient Slope Lineae on Mars: Observations by HiRISE*](#) [#2101]

Transient Slope Lineae (TSL) are relatively dark albedo markings with sharp margins, extending downhill on steep slopes, that are narrow (typically up to 2 m wide) and have lengths up to hundreds of meters. In this abstract we describe the observations of TSL.

de Mijolla G. M. Howe K. L. Dixon J. C.

[*Experimental Simulation of Martian Slope Streak Formation.*](#) [#1142]

Slope streaks are currently forming on Mars, but the means of their formation is uncertain. We have been using viscous fluid flows at different temperatures and in different substrates to try and assess the validity of the wet flow theory.

Jouannic G. Gargani J. Costard F. Ori G. G. Marmo C. Schmidt F.

[*Geomorphic Study of Debris Flows on the Russell Dune \(Mars\): Comparison of Debris Flows and Present Flows Activity*](#) [#1734]

Recent work shows that the gullies of the Russell Dune are not only extremely youthful but seem to be still active. This study aims to compare the debris flows and present flows activity using morphologies and estimated physical flows properties.

Dundas C. M. Diniega S. McEwen A. S. Byrne S.

[*Observations of Present-Day Gully Activity on Mars*](#) [#2709]

We report on HiRISE observations of activity observed in martian gullies, including significant morphologic changes.

Raack J. Reiss D. Hiesinger H.

[*Absolute Model Ages and Stratigraphic Relationships of Gullies in the Northwestern Argyre Basin, Mars*](#) [#2596]

We present absolute model ages for the dust/ice mantle in the northwestern Argyre basin and the stratigraphic relationships on the basis of a detailed morphologic map with other glacial, aeolian, and fluvial units (gullies).

Manthey A. Hiesinger H. Reiss D. Bauch K. E.

[Possible New Constraints on Gully Formation in Nirgal Vallis from High Resolution Thermal Inertia Data](#) [#2467]

We derive thermal inertia data from THEMIS infrared images to put more constraints on gully-formation processes in Nirgal Vallis, Mars.

Schon S. C. Head J. W.

[Observations of Gully Development in Gasa — A Rayed Crater](#) [#2546]

A young rayed crater (Gasa) has prominent gullies in its pole-facing wall. We suggest that these gullies formed due to orientation- and insolation-dependent melting of local ice and snow deposits.

Levy J. S. Fountain A. G. Nylén T. H. Head J. W. Dickson J. L.

[Rapid Growth of Mars-Analog Gullies in a Buried Ice Substrate: Gullies as a Disequilibrium Landform in Garwood Valley, Antarctica](#) [#1432]

Gullies in Garwood Valley, Antarctica, form in buried ice that may be highly analogous to martian gullies forming in the latitude-dependent mantle. Ice melt and sublimation are the main drivers of alcove growth, rather than sediment erosion.

Johnsson A. Reiss D. Zanetti M. Johnson M. D. Hauber E. Hiesinger H.

[Geologically Recent Debris Flows in a Well-Preserved Impact Crater, Mars: Insights from Terrestrial Analogs in Spitsbergen, Svalbard](#) [#2541]

We compare the morphology of terrestrial debris flow analogs from Svalbard with pristine debris flows in an unusual crater environment on Mars and investigate the model of sieve-deposition for their formation.

Cedillo Y. Craddock R. A.

[Martian Gullies: Morphologies and Possible Processes in their Formation](#) [#1331]

Martian gullies are often morphologically similar to terrestrial gullies and also appear young. The current environment on Mars does not support liquid water. Several processes may have been involved in their formation. At least some gullies were formed by dry mass wasting.

Rivera-Valentin E. G. Chevrier V. F. Ulrich R. Roe L.

[Effects of Freezing Point Depression on Martian Paleolake Stability](#) [#1074]

We model the freezing process and the effects of initial lake salinity on a martian paleolake, specifically observing the possible creation of a brine residue and its longevity.

Carvajal-Ortiz H. Pratt L. M.

[Influence of Salts and Clay Minerals on Stable Isotopic Signatures of Methane and Hydrogen Sulfide in Gas Hydrates](#) [#2375]

The origin of gases trapped within hydrates (e.g., methane) can be assessed by analyzing their stable isotopes. Here, we evaluate the use of stable isotopes of gases in hydrates as reliable source-signatures in the exploration for life beyond Earth.

Stillman D. E. Grimm R. E.

[Heterogeneous Adsorbed and Salty Liquid Water at the Phoenix Landing Site, Mars](#) [#2578]

Laboratory dielectric measurements were used to interpret the TECP data. These data are consistent with a salty (NaClO_4 and/or MgCl_2) liquid solution with a eutectic temperature near 239 K and the presence of adsorbed water in the regolith.

Leeman J. R. Elwood Madden M. E.

[Rapid Heat Induced Clathrate Dissociation Events — A Planetary Context](#) [#1769]

Heat induced dissociation of clathrates on planetary bodies is evaluated and constrained by experimental data. Bodies such as Mars, Titan, Europa, and Enceladus are believed to support clathrates and dissociation of clathrate could account for gas releases observed.

Gainey S. R. Elwood Madden M. E. Leeman J. R. Guttery B. M.

[*Kinetics of Methane Hydrate Formation and Dissociation Under Mars Relevant Conditions*](#) [#2094]

Methane hydrate formation and dissociation rates under Mars relevant conditions were determined through the differential method. The data will be used to evaluate the methane source on Mars.

Root M. J. Elwood Madden M. E.

[*The Effects of Obliquity on Geothermal Gradients and Methane Hydrate Stability Zones on Mars*](#) [#2454]

This work models the location of the methane hydrate stability zone using geothermal gradients on Mars. By examining the system kinetics, the potential volume of hydrate dissociated through temperature changes with obliquity can be better understood.