

**Thursday, March 13, 2008**  
**POSTER SESSION II: MARS CRATERS: TINY TO HUMONGOUS**  
**6:30 p.m. Fitness Center**

Shopland M. L. Paige D. A. Willams J. P.

*Martian Microcrater Production at Low and High Elevation in Response to Obliquity-driven Atmospheric Pressure Variations* [#2385]

We characterize the potential effects of obliquity-driven climate variations on impact crater production rates through Monte Carlo simulations at mean martian surface elevations, and at elevations characteristic of high altitude Tharsis calderas.

Michikami T. Miura S. Haruyama J. Lykawka P. S.

*Impact Cratering Experiments to Targets with Cavity: Application to Cave Skylight on Mars* [#1593]

Impact cratering experiments to targets with cavity were carried out in order to constrain the formation of skylight entrance into subterranean caverns on Mars. This result suggests that the Martian skylight caves are produced by impact cratering.

Wille A. R. Herrick R. R.

*Categorization of Small Northern-Hemisphere Martian Impact Craters and their Ejecta* [#1511]

We present a survey of Martian impact craters from 1–5 km in diameter using primarily HRSC imagery. We cataloged the progression of craterforms with decreasing impact angle. There are some highly unusual forms at the lowest impact angles.

Buczowski D. L. Barnouin-Jha O. S. Seelos F. P. Seelos K. D. Malaret E. Hash C. CRISM Team

*Bright-Haloed Craters in Chryse Planitia* [#1032]

Bright-haloed craters have been observed in Chryse Planitia. We study these craters using (1) imaging data from Odyssey, MGS and Viking; (2) spectroscopic data from CRISM; (3) MOLA topographic data; and (4) the Northern Plains geologic map.

Chuang F. C. Weitz C. M. Dobreá E. N. HiRISE Team

*Light-toned Layered Deposits within Craters in Arabia Terra* [#2074]

We are currently identifying and characterizing the morphology of light-toned layered deposits within impact craters in Arabia Terra (5°–25°N, 340°–30°E).

Robbins S. J. Hynek B. M.

*Testing Formation Theories of NW Arabia Terra, Mars: New Clues from Old Craters* [#2417]

Northwest Arabia Terra has topography and crater populations indicating a unique history. We directly tested two proposed formation mechanisms. Crater size-frequency and d/D ratios suggest neither scenario is easily reconcilable with the new datasets.

Kadish S. J. Head J. W. III Barlow N. G.

*Pedestal Craters on Mars: Distribution, Characteristics, and Implications for Amazonian Climate Change* [#1766]

An analysis of 2422 pedestal craters on Mars shows preferential distribution at high latitudes and evidence that they formed during periods of snow and ice cover of at least tens of meters thickness at high latitudes during the Amazonian.

Suzuki A. Baratoux D. Kurita K.

*Volume Estimation of Fluidized Ejecta of Martian DLE Crater in Utopia Planitia* [#2028]

We estimate the ejecta volumes and its ratio of martian DLE craters in Utopia and evaluate the error by new concept. We also conducted the laboratory experiments focusing on the erosion/emplacement volumes.

Skok J. R. Mustard J. F. Murchie S. L. Roach L. H. Ehlmann B. L. Thollot P.

*Compositionally Distinct Ejecta Blankets in Syrtis Major: Implications for Environmental Change* [#1790]

Compositional mapping of the Syrtis Major region of Mars shows that many of the craters have ejecta enriched in high calcium pyroxene. We have recorded many of the properties of these craters in an attempt to understand their formation.

Ostrach L. R. Head J. W. III Kress A. M.

*Ring-Mold Craters (RMC) in Lobate Debris Aprons (LDA) In the Deuteronilus Mensae Region of Mars: Evidence for Shallow Subsurface Glacial Ice in Lobate Debris Aprons* [#2422]

Ring-mold shaped craters, interpreted to represent impacts into relatively pure ice and resulting spallation, are common in lobate debris aprons near the dichotomy boundary on Mars; their abundance suggests a debris-covered glacial origin for LDA.

Kress A. M. Head J. W. III

*Ring-Mold Craters on Lineated Valley Fill (LVF) and Lobate Debris Aprons (LDA) on Mars (I): Evidence for the Presence of Subsurface Ice* [#1273]

Experimental impacts into ice form "ring-mold craters" (RMC) due to spallation, in contrast to those in icy regolith and regolith; the presence of RMC on lineated valley fill and lobate debris aprons suggest the presence of an ice substrate there.

Boyce J. M. Barlow N. G. Tornabene L. L.

*Lunar Crater on Mars: Implications of its Unusual Morphology* [#1406]

We propose that the feathery edged outer ejecta layer of Lunar is a fine-grain deposit, cemented by ice, whose grains were transported and deposited as a dust laden density-driven flow.

Kagy H. M. Barlow N. G.

*Topography of Northern Hemisphere Martian Central Pit Craters* [#1166]

MOLA topographic profiles across 756 martian central pit craters reveal no evidence of floor updoming, unlike the case for central pit craters on Ganymede. This implies that central pits form over a wide range of target volatile contents.

Mest S. C. Crown D. A. Bleamaster L. F. III Mustard J. F.

*Morphology, Morphometry and Distribution of Craters in NW Hellas, Mars* [#1704]

The morphology, morphometry and distribution of impact craters ( $D > 15$  km) northwest of Hellas basin are being studied in order to evaluate their histories of modification and degradation, as well as the geologic evolution of the surrounding highlands.

Stepinski T. F. Urbach E. R.

*Raster Maps of Craters Depths in Southern Hemisphere of Mars: Potential Proxy for Spatial Distribution of Ground Ice* [#1272]

Maps of crater depths for the southern hemisphere of Mars show a striking spatial pattern interpreted in terms of spatial variations of the depth to the upper boundary of the cryosphere. This indicates existence of shallower ground ice south of 40°S.

Urbach E. R. Stepinski T. F.

*Automatic Detection of Sub-Kilometer Craters in High Resolution Images of Mars* [#2184]

A method for automatic detection of impact craters in high resolution images of Mars is presented. This new method enables detection of sub-kilometer craters that are too small to be cataloged by previous methods and too numerous for manual detection.

Knezevic H. Salamunićar G. Lončarić S.

*Crater Detection Algorithms Based on Prewitt, Abdou, Argyle, Macleod, Derivative-of-Gaussian and Canny Gradient Edge Detectors* [#1378]

Implementations of six different crater detection algorithms based on six different well-known gradient edge detectors are presented. They were analyzed and compared using the framework for evaluation of crater detection algorithms.

Salamunićar G. Lončarić S.

*Gradient Amplification and Gradient Orientation Improvements of Crater Detection Algorithms Based on Edge Detectors and Radon/Hough Transform* [#1375]

Six previously implemented crater detection algorithms were improved using better edge detection, gradient amplification and gradient orientation. The results were analyzed using the framework for evaluation of crater detection algorithms.

Pierazzo E. Ivanov B. A.

*Interaction of Large Impact Craters with the Martian Aquifer* [#1155]

Impact cratering has been proposed as a cause for local hydrothermal activity in impact craters on Mars. Here we discuss an extension of our previously published results for a crater around 25 km in diameter to craters about four times larger.

Kaplan M. S. Kiefer W. S. Frey H. V.

*Gravity Models of Large Impact Structures on Ancient Mars: Implications for Impact Processes and Crater Modification* [#1688]

Gravity observations of large impact structures on Mars indicate that most contain high density deposits. These may be due to post-impact flooding by volcanic flows or to super-isostatic uplift of the mantle.

Lillis R. J. Frey H. V. Roberts J. H. Kuang W. Manga M.

*Giant Impacts and the Death of the Martian Dynamo: Where Data Meet Models* [#1173]

Using four separate MGS data sets, we examine when and how the martian dynamo terminated and then probe, using dynamo and mantle convection models, the possible connection between this termination and ~15 giant impacts in the 100 m.y. preceding it.