

**Wednesday, July 23, 2003**  
**POSTER SESSION II: EARLY MARS, EARLY WATER, STRATIFIED DEPOSITS,**  
**VOLCANISM, AND SURFACE MATERIALS**  
**11:00 a.m.–1:30 p.m. Dabney Garden**

**Early Water**

Ghatan G. J. Head J. W.

*South Circumpolar Ice Sheet on Mars: Regional Drainage of Meltwater Beneath the Hesperian-aged Dorsa Argentea Formation* [#3034]

We examine the head regions of two of the five drainage channels that lead away from the Dorsa Argentea Formation. We find evidence for basal drainage of meltwater beneath the DAF, and drainage of this water away from the area along the external channels.

Ansan V. Mangold N.

*Warrego Valles Revisited Using MGS and Odyssey Data: Valleys Formed by Precipitations?* [#3045]

New THEMIS data show that Warrego Vallis consists of a more developed network than seen by Viking images. Slopes and geometry of valleys favor their formation by runoff due to precipitation.

Coleman N. M. Dinwiddie C. L. Casteel K.

*High Channels on Mars Indicate Hesperian Recharge at Low Latitudes* [#3071]

We identify two Hesperian outflow channels that issued from a 750-km-long fault zone west of Ganges Chasma. One channel stands at ~2600 m, too high to be explained by discharge from a global aquifer. Recharge from Tharsis was required.

Ogawa Y. Yamagishi Y. Kurita K.

*Melting of the Martian Permafrost by Hydrothermal Convection Associated with Magmatic Intrusion* [#3095]

We quantitatively assessed the effect of thermal convection on enhancing and focusing heat transfer in melting of the permafrost. The substantial amount of meltwater could exist close to the surface, which should affect the hydrothermal systems.

Stepinski T. F. Collier M. L.

*Drainage Densities of Computationally Extracted Martian Drainage Basins* [#3100]

Drainage densities of 0.06–0.11 km<sup>-1</sup> are calculated for martian drainage basins computationally extracted from the dissected Noachian surfaces. These findings are inconsistent with the origin of martian valley networks by means of surface runoff.

Webb V. E. McGill G. E.

*Evaluating Putative Shoreline Adjacent to the Dichotomy Boundary near Arabia Terra* [#3108]

Here, we provide support for a shoreline interpretation of the Arabia and Deuteronilus trends contiguous to northern Arabia Terra. Shoreline recognition strengthens the validity of the past presence of a global ocean within the lowlands.

Woodworth-Lynas C. Guigné J. Y.

*Ice Keel Scour Marks on Mars: Evidence for Floating and Grounding Ice Floes in Kasei Valles* [#3128]

We present new observations from analyses of MOC images of surficial trough-like features made by floating ice masses on submerged sediment. These ice keel scour marks are present in large reaches of the Kasei Valles system.

Niles P. B. Leshin L. A. Guan Y.

*The Nature of the Martian Aqueous Environments Recorded by ALH84001 Carbonates* [#3140]

New ion microprobe carbon isotopic data are used to further constrain the formation conditions of the ALH84001 carbonates. In view of these data, three possible aqueous environments for early Mars are proposed.

Painter S. L.

*MarsFlo: A General Tool for Simulating Hydrological Processes in the Subsurface of Mars* [#3161]

A three-phase, two-component computer code (MarsFlo) is being developed as a general tool for simulating hydrological processes in the subsurface of Mars. Theory, implementation, and initial applications are described.

Stockstill K. R. Baldrige A. Ruff S. Moersch J. Farmer J.

*Global Search for Evaporite Deposits in Putative Paleolake Basins on Mars Using TES Data* [#3183]

An intensive, detailed examination of 45 putative paleolake basins using TES emissivity data at  $3 \times 6$  km/pixel resolution has not turned up any evidence for evaporate deposits.

Salamunicar G.

*From Topography Profile Diagrams to the Evolution of Oceanus Borealis: Proposal of a Strategy that may Result in the Formal Proof of Martian Ocean Recession, Timing and Probability* [#3187]

A mathematical theory of stochastic processes based strategy using recently published topography profile diagrams was proposed that may result in the formal proof of martian ocean recession, timing and probability.

Leovy C. B. Armstrong J. C.

*Wind and Water at the Surface of Mars* [#3200]

We review and interpret evidence that wind has played a larger role and water has played a smaller role in the evolution of the surface than is widely assumed and argue that Mars has been cold and dry with only modest amounts of water near the surface since the early Noachian.

Crumpler L. S.

*Physical Characteristics, Geologic Setting, and Possible Formation Processes of Spring Deposits on Mars Based on Terrestrial Analogs* [#3228]

Spring deposits are predicted as a result of former aquifers on Mars. This study examines the large-scale morphology and their physical processes of formation, growth, and evolution in terms that relate to the search for former aqueous environments on Mars.

Newsom H. E. Barber C. A. Schelble R. T. Hare T. M. Feldman W. C. Sutherland V.

Livingston A. Lewis K.

*Fluvial and Lacustrine Processes in Meridiani Planum and the Origin of the Hematite by Aqueous Alteration* [#3233]

The presence of fluvial channels and lacustrine basins in close proximity to the hematite deposits at Meridiani Planum supports an origin for the hematite due to the presence of liquid water.

Segura T. L. Toon O. B. Colaprete A.

*Time-dependent Calculations of an Impact-triggered Runaway Greenhouse Atmosphere on Mars* [#3247]

Large impacts on early Mars produced warm temperatures and deep global water layers from melting and precipitation. Given a sufficiently rapid supply of this water to the atmosphere it will initiate a temporary "runaway" greenhouse state, significantly extending the warming period.