

Friday, March 15, 2002
MARS: FLOWING ICE, WATER, AND/OR CO₂
8:30 a.m. Salon B

Chairs: J. Grant
N. Hoffman

Hoffman N.* Tanaka K. L.

Co-Existing "Flood" and "Volcanic" Morphologies in Elysium as Evidence for Cold CO₂ or Warm H₂O Outbursts [#1505]

Athabasca Vallis is a 2003 MER target, interpreted as a site of recent liquid water outbursts and lava flows. Here, we examine unusual linear cone chains within the flow channels and find that CO₂ may have had a major role, either alone, or with H₂O.

Coleman N. M.*

Aqueous Flows Formed the Outflow Channels on Mars [#1059]

The role of water in carving the martian outflow channels has been questioned by a model based on CO₂. However, this model is inconsistent with martian observations and analog studies. The channels are monuments to the erosive power of aqueous floods.

Irwin R. P. III* Maxwell T. A. Howard A. D. Craddock R. A.

Topographic Controls on Martian Valleys and Lakes [#1705]

Through a funneling process, high ridges encouraged development of several large highland valleys. We present evidence for an extensive highland lake that may have overflowed periodically, creating Ma'adim Vallis through episodic flooding.

Stepinski T. F.* Marinova M. M. McGovern P. J. Clifford S. M.

The Fractal Characteristics of Martian Drainage Basins: Implications for the Timing, Intensity, and Duration of Rainfall [#1347]

We use properties of drainage networks on Mars as a measure of martian landscape morphology and an indicator of landscape evolution processes. Our results indicate that martian terrains evolved by combination of rainfall-fed erosion and impacts.

Parker T. J.* Grant J. A. Anderson F. S. Franklin B. J.

MOLA Topographic Evidence for a Massive Noachian Ocean on Mars [#2027]

If the topographic terraces described are coastal, an ocean upwards of 5 to 7 km deep would be required by the maximum elevation of terraces identified south of Elysium Planitia. The highest terrace identified to date is at 2200 m elevation.

Grant J. A.* Parker T. J.

Evolution of the Uzboi-Ladon-Margaritifer Valles Meso-Scale Outflow System, Mars [#1152]

Mapping results indicate that the Uzboi-Ladon-Margaritifer meso-scale outflow system was dominated by multiple, high magnitude discharge events that delivered water to Margaritifer Basin where it was stored and later released to form Ares Vallis.

Palmero A.* Sasaki S. Miyamoto H.

Geomorphic Evidence Supportive of Underground Conduits on Mars [#1418]

Complex underground conduit networks in the vicinities of the Ganges Chasma have been identified. These networks seem to have played an important role in the surface landscaping as well as the origin and evolution of some Chaotic terrains and Chasmata.

Russell P.* Head J. W. III

The Martian Hydrosphere/Cryosphere System: Implications of the Absence of Hydrologic Activity at Lyot Crater [#1688]

A martian cryosphere able to confine groundwater under hydraulic pressure implies that major disruption, as by impact, may allow effusion of water to the surface. Lack of hydrologic activity at Lyot Crater suggests possible refinements to the model.

Burr D. M.* McEwen A. S. Kesztheyli L. P. Lanagan P. D.

Extensive Aqueous Flooding from the Cerberus Fossae, Mars, and Its Implications for the Martian Hydrosphere [#1047]

Three aqueous flood channels are evidence for multiple floods around the Cerberus Plains, Mars. Two, possibly all three, of these flood channels originate at the Cerberus Fossae volcano-tectonic fissures.

Reiss D. Jaumann R.*

Characteristics of Groundwater Aquifers in the Nirgal Vallis Drainage Basin [#1606]

MOLA- and MOC-data have been used to estimate the topographic position of sapping pits and gully heads on the rim of Nirgal Vallis. The position of two aquifers have been identified and used to derive the dip and development of the groundwater level.

Metzger S. M.*

Paleodischarge Modeling of the Argyre Ridge Esker Model [#2045]

Throughout the past decade the sinuous ridges on the floor of the Argyre Basin have drawn considerable interest as potential remnants of processes that recorded key events in the ancient Martian climate. This report calculates paleoflow discharge that may have formed the Argyre ridges.

Milliken R. E.* Mustard J. F. Goldsby D. L.

Examination of Viscous Flow Features on the Surface of Mars [#1870]

MOC images reveal the presence of a surface material that exhibits viscous flow features. Stress-strain rate relationships show that an ice-dust mixture is a plausible composition for this observed flow material.

Arfstrom J. D.*

Proposed Martian Glaciers of Recent Age and A Model of Their Formation [#1092]

Similarities between proposed glaciers and active terrestrial alpine glaciers suggest that recent or active glaciers may exist in Dao Vallis, Mars. A model is presented to explain how the proposed glaciers could form on Mars under recent conditions.