

Thursday, March 17, 2005
MARTIAN FLUVIAL LANDFORMS AND PROCESSES
1:30 p.m. Marina Plaza Ballroom

Chairs: K. P. Harrison
J. L. Heldmann

- 1:30 p.m. Williams R. M. E. * Malin M. C. Edgett K. S.
Remnants of the Courses of Fine-Scale, Precipitation-Fed Runoff Streams Preserved in the Martian Rock Record [#1173]
Remnants of precipitation-fed streams, similar in scale and topology to terrestrial creeks (and including first-order tributaries), are preserved in the martian rock record and exposed by erosion around the Valles Marineris.
- 1:45 p.m. Fassett C. I. * Head J. W. III
New Evidence for Fluvial Sedimentary Deposits on Mars: Deltas Formed in a Crater Lake in the Nili Fossae Region [#1098]
We present new observations of distributary fan deposits in a 40-km crater. We then analyze the formation of these deposits, which we argue was in a lacustrine environment, and discuss the implications of these findings for Martian climate history.
- 2:00 p.m. Cull S. C. * McGovern P. J.
Evidence for Extensive Fluvial Erosion Around Olympus Mons: A Multi-Resolution Survey [#1154]
This survey supports the hypothesis that an extensive groundwater system exists beneath Olympus Mons, and that its interactions with tectonism have produced much of the fluvial activity observed around the volcano.
- 2:15 p.m. Stepinski T. F. * Stepinski A. P.
Inferring Early Mars Climate from Comparison of Drainage Basins' Morphologies on Mars and Earth [#1392]
A similarity map constructed for 94 Martian and terrestrial drainage basins reveals a systematic difference between the two planets. This difference is explained by climatic differences with Martian basins developing in extremely dry climate.
- 2:30 p.m. Zimbelman J. R. * Williams S. H. Irwin R. P. III Rivera E. J. Graves L. Ghatan G.
Shorelines in the Western United States as Analogs for Hypothesized Shoreline Features on Mars [#1733]
Differential Global Positioning System surveys of shorelines in the western United States reveal distinctive topographic attributes that should aid in evaluating hypothesized shoreline features on Mars.
- 2:45 p.m. Quantin C. * Allemand P. Mangold N. Dromart G. Delacourt C.
Evidences for Fluvial and Lacustrine Activity on Interior Layered Deposits of Valles Marineris [#1356]
We report evidences for a fluvio-lacustrine system supplied by atmospheric precipitations located on Interior Layered Deposits (ILD) of Valles Marineris. Liquid water could have played a role in the erosion of the ILD.
- 3:00 p.m. Heldmann J. L. * Toon O. B. Pollard W. H. Mellon M. T. Pitlick J. McKay C. P. Andersen D. T.
Formation of Martian Gullies by the Action of Liquid Water Flowing Under Current Martian Environmental Conditions [#1270]
We examine the flow of water on Mars to determine what conditions are consistent with the observed gully features. Gully formation is consistent with the action of relatively pure liquid water flowing under current Martian environmental conditions.

- 3:15 p.m. Bridges N. T. * Lackner C. N.
Age-Orientation Relationships of Northern Hemisphere Martian Gullies and “Pasted-On” Mantling Unit: Implications for Near-Surface Water Migration in Mars’ Recent History [#1764]
We have evaluated characteristics of northern hemisphere Martian gullies and compared them to predictions for an origin by snowpack melting. We find that the characteristics are consistent with a snowpack model that is driven by recent obliquity cycling.
- 3:30 p.m. Bleamaster L. F. III* Crown D. A.
Morphologic Characterization of Wall Slopes Along Dao and Harmakhis Valles, Mars: Mantle and Gully Associations [#1469]
Dao and Harmakhis Valles provide a unique opportunity to evaluate gully features with respect to latitude, elevation, slope orientation, and geologic unit in a single, distinct geologic setting.
- 3:45 p.m. Berman D. C. * Hartmann W. K. Crown D. A. Baker V. R.
Arcuate Ridges and Gullies in Martian Craters: Dependence on Orientation and Latitude [#1213]
Arcuate ridges and gullies are commonly found in 2–30 km diameter craters in the Phaethontis Quadrangle. The majority of them have pole-facing orientations, however at latitudes higher than 44°S, equator-facing orientations are more prevalent.
- 4:00 p.m. Treiman A. H. *
Martian Gullies and Groundwater: A Series of Unfortunate Exceptions [#1713]
For groundwater to participate in gully formation, it must be available at gully sites. Also, the bedrock must contain impermeable layers that do not tilt away from the gullies. Lamentably, nearly all gully sites fail these requirements.
- 4:15 p.m. Sears D. * Roe L. Moore S.
Stability of Water and Gully Formation on Mars [#1496]
Experimental work, theory, the size and frequency of gullies and sand dune characteristics in a region of Nirgal Vallis, suggests that the major factor in determining the stability of water on Mars is the presence of wind.
- 4:30 p.m. Harrison K. P. * Grimm R. E.
Tharsis Recharge and the Martian Outflow Channels: Observations and Recent Modeling [#1211]
Improved simulations of martian groundwater flow demonstrate the effects of Tharsis recharge on circum-Chryse outflow channel discharge for different initial conditions and aquifer properties, and are supported by observational evidence.

Thursday, March 17, 2005
POSTER SESSION II: LUNAR POTPOURRI
7:00 p.m. Fitness Center

Lowman P. D. Jr.

Origin of the Lunar Highland Crust [#2215]

Surface photographs, remote sensing data, and returned sample analyses indicate that the lunar highland crust was formed by eruptions of high aluminum hypersthene basalt.

Gaddis L. R. Skinner J. A. Hare T. M. Tanaka K. Hawke B. R. Spudis P. Bussey D. B. J.
Pieters C. Lawrence D. J.

Lunar Geologic Mapping: Preliminary Mapping of Copernicus Quad [#2021]

We describe preliminary 1:2.5 M scale geologic map results of the Copernicus quad as part of a new pilot program for systematic, global lunar geologic mapping.

Matsumoto M. Asada N. Demura H.

Automatic Crater Recognition on Digital Terrain Model [#1995]

This goal is a software development to detect craters automatically with following parameters; diameter, coordinates, depth, and direction of incidence. Verifications with ideal ellipsoids showed that this tool detected them exactly in diverse cases.

Archinal B. A. Rosiek M. R. Redding B. L.

Unified Lunar Control Network 2005 and Topographic Model [#2106]

We describe our effort to merge the existing Unified Lunar Control Network and the Clementine Lunar Control Network to form a new improved global lunar network, including a true 3-D lunar topographic model, the Unified Lunar Control Network 2005.

Anderson R. C. Buehler M. Seshardi S. Kuhlman G. Schaap M.

Dielectric Constant Measurements for Characterizing Lunar Soils [#1969]

The return to the Moon has ignited the need to characterize the lunar regoliths using fast, reliable *in situ* methods. Determining the dielectric constant of lunar materials can be very important in characterizing surface deposits, especially those that contain titanium, iron, and water.

Ebel D. S. Fogel R. A. Rivers M. L.

Tomographic Location of Potential Melt-bearing Phenocrysts in Lunar Glass Spherules [#1505]

Apollo 17 orange glass spherules contain olivine phenocrysts with melt inclusions from depth. Tomography (<2 $\mu\text{m}/\text{pxl}$) of >200 spherules located 1 phenocryst. We will try to find melt inclusions and obtain original magma volatiles and compositions.

Bérczi Sz. Cech V. Józsa S. Szakmány Gy. Fabriczy A. Földi T. Varga T.

How We Used NASA Lunar Set in Planetary Material Science Analog Studies on Lunar Basalts and Breccias with Industrial Materials of Steels and Ceramics [#1282]

Two main rock types of NASA Lunar Set were used in analog studies of processes and textures with selected industrial material samples: for breccias and basalts on the lunar side, ceramics and steels were analogs on the industrial side.

Kim K. J. Reedy R. C. Gasnault O.

Calculations of the Fluxes of 10–250 keV Lunar Leakage Gamma Rays [#1900]

The fluxes of 10–250 keV gamma rays from the Moon were calculated for a range of compositions and shown to be useful for some lunar studies. The shapes of the continuum <100 keV and its magnitude >100 keV vary systematically with composition.

Honda C. Fujimura A.

Formation Process of Lunar Sinuous Rilles by Thermal Erosion of Basaltic Lava Flow [#1562]

We examined the thermal erosion mechanism of basaltic lava flow for explaining the formation of sinuous rilles on the Moon. Appropriate conditions of candidate basaltic lavas enable us to interpret the formation condition of lunar sinuous rilles.

Skinner J. A. Jr. Gaddis L. R. Keszthelyi L. P. Hare T. M. Howington-Kraus E. Rosiek M.

Alphonsus-type Dark-Halo Craters — Morphometry and Volume Reassessments and Implications for Eruptive Style [#2344]

We use digital reproductions and analysis of past topographic datasets to update geomorphic and volumetric measurements for the Alphonsus-type dark-halo craters.