

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.