

Wednesday, March 17, 2004
MARS: GULLIES, FLUIDS, AND ROCKS
8:30 a.m. Salon B

Chairs: P. Lee
R. A. Yingst

- 8:30 a.m. Heldmann J. L. * Mellon M. T.
Gullies on Mars and Constraints Imposed by Mars Global Surveyor Data [#1355]
 Mars Global Surveyor spacecraft data has been analyzed to uncover trends in the dimensional and physical properties of the martian gullies and their surrounding terrain. This data is used to test the validity of several proposed gully formation mechanisms.
- 8:45 a.m. Lee P. * Cockell C. S. McKay C. P.
Gullies on Mars: Origin by Snow and Ice Melting and Potential for Life Based on Possible Analogs from Devon Island, High Arctic [#2122]
 Gullies on Devon Island, High Arctic, which form by melting of transient surface ice and snow covers and offer morphologic and contextual analogs for gullies reported on Mars are reported to display enhancements in biological activity in contrast to surrounding polar desert terrain.
- 9:00 a.m. Ishii T. * Sasaki S.
Formation of Recent Martian Gullies by Avalanches of CO₂ Frost [#1556]
 The formation mechanism of gullies by avalanches of CO₂ frost can explain the distribution, orientation and morphologic features of gullies. We calculate CO₂ frost thickness on each slopes orientation and confirm a possibility of CO₂ avalanches.
- 9:15 a.m. Treiman A. H. * Louge M. Y.
Martian Slope Streaks and Gullies: Origins as Dry Granular Flows [#1323]
 Streaks and gullies on Martian slopes have been interpreted as water-bearing flows. Water is not necessary. Nearly all features of slope streaks and gullies are known in, and consistent with theories of, flows of dry granular materials.
- 9:30 a.m. Gilmore M. S. * Goldenson N.
Depths and Geologic Setting of Northern Hemisphere Gullies (and Comparison to Their Southern Counterparts) [#1884]
 Northern gullies correspond to cliff-formers ~250 m below the surface.
- 9:45 a.m. Kargel J. S. * Marion G. M.
Mars as a Salt-, Acid-, and Gas-Hydrate World [#1965]
 Gas hydrates, acid hydrates, and salt hydrates probably are abundant on Mars and may constitute a large fraction of the crust. Some of these phase assemblages melt/freeze at very low temperatures. Surface ponds/marshes of acid brines may be stable.
- 10:00 a.m. BREAK
- 10:15 a.m. Bullock M. A. * Moore J. M. Mellon M. T.
Composition of Simulated Martian Brines and Implications for the Origin of Martian Salts [#1722]
 We report on laboratory experiments that have produced dilute brines under controlled conditions meant to simulate past and present Mars. Brines formed under a present-day Mars-like atmosphere have elemental abundances similar to those found in martian fines.

- 10:30 a.m. Sears D. W. G. * Chittenden J. Moore S. R. Meier A. Kareev M. Farmer C. B.
Evaporation Rates of Brine on Mars [#2159]
The evaporation rate for brine on Mars has been determined under Martian conditions, with and without advection.
- 10:45 a.m. Komatsu G. * Rossi A. P. Di Lorenzo S.
Hydrogeology of the Valles Marineris-Chaotic Terrain Transition Zone, Mars [#1197]
The Valles Marineris-chaotic terrain transition zone on Mars is rich in landforms indicative of past water and volcanic activities. Complex interactions of such activities are represented by features at Gangis Chasma and its surroundings.
- 11:00 a.m. Kieffer S. W. * Brown K. L. Simmons S. F. Watson A.
Measured Fluid Flow in an Active H₂O-CO₂ Geothermal Well as an Analog to Fluid Flow in Fractures on Mars: Preliminary Report [#1856]
A PTQ-probe was inserted into a flowing H₂O-CO₂ geothermal well 1300 m in depth. The well was flowing under (variable) production conditions. The spinner data (Q) have been converted to velocities, and a preliminary model for the flow is presented.
- 11:15 a.m. Heslop E. E. M. Viles H. A. * Bourke M. C.
Understanding Rock Breakdown on Earth and Mars: Geomorphological Concepts and Facet Mapping Methods [#1445]
We review recent conceptual improvements in understanding rock breakdown on Earth that might be usefully applied to boulder morphologies on Mars. We outline a new field technique (facet mapping) and report on a pilot data set from the hyper-arid Atacama Desert.
- 11:30 a.m. Yingst R. A. * Biederman K. L. Monhead A. M. Haldemann A. F. C. Kowalczyk M. R.
Classification and Distribution of Mars Pathfinder Rocks Using Quantitative Morphologic Indices [#1272]
Rock morphologies can be assessed quantitatively and compared with spectral data to classify rock surface types at the MPF landing site. Here we report on the creation of a database of morphologic indices calculated for the Rock Garden region.
- 11:45 a.m. Keszthelyi L. * Burr D. M. Herkenhoff K. Gaddis L.
Systematic Rock Classification in a Data-poor Environment: Application to Mars [#1663]
We propose a technique for classifying rocks on Mars when the process used by field geologists on Earth fails due to a dearth of observations.