Friday, March 21, 2003
MARS GEOLOGY AND ANALOG STUDIES
8:30 a.m. Salon B

Chairs: K. S. Edgett
J. M. Moore

Haldemann A. F. C. * Golombek M. P.
Mars Pathfinder Near-Field Rock Distribution Re-Evaluation **[#2029]**
We have completed analysis of a new near-field rock count at the Mars Pathfinder landing site and determined that the previously published rock count is incorrect. We detail the new rock database and the new statistics.

Edgett K. S. * Malin M. C.
The Layered Upper Crust of Mars: An Update on MGS MOC Observations After Two Mars Years in the Mapping Orbit **[#1124]**
MOC images reveal a third north polar layered unit; evidence that Athabasca Valles source is buried; large craters are interbedded with layered rock in Sinus Meridiani; and Valles Marineris interior layers are exposed from beneath the adjacent plains.

Soderblom L. A. * Kirk R. L.
Meter-scale 3-D Models of the Martian Surface from Combining MOC and MOLA Data **[#1730]**
High-resolution (1–10-m horizontal, 0.1–1-m vertical) digital elevation models are derived by using MGS MOLA topographic models to control photoclinometric inversion of MGS MOC Narrow Angle images, accounting for scattering, transmission, surface photometry, and albedo variation.

Crown D. A. * McElfresh S. B. Z. Pierce T. L. Mest S. C.
Geomorphology of Debris Aprons in the Eastern Hellas Region of Mars **[#1126]**
Viking, MGS, and Odyssey datasets are used to characterize the morphology, morphometry, and distribution of debris aprons in the eastern Hellas region of Mars in order to provide constraints for models of apron formation and styles of highland degradation.

Irwin R. P. III* Watters T. R. Howard A. D. Maxwell T. A. Craddock R. A.
Dichotomy Boundary at Aeolis Mensae, Mars: Fretted Terrain Developed in a Sedimentary Deposit **[#1824]**
Fretted terrain in Aeolis Mensae, Mars, developed in a sedimentary deposit. A thick, massive unit with a capping layer or duricrust overlies a more durable layered sequence. Wind, collapse, and minor fluvial activity contributed to degradation.

Moore J. M. * Howard A. D.
Ariadnes-Gorgonum Knob Fields of North-Western Terra Sirenum, Mars **[#1402]**
We propose two alternative mechanisms for knob field erosion. Knobs have been eroded by wind abrasion, or the bulk of knob erosion was caused by dissolution weathering. Knob-materials may have formed under a strong gravity-control, such as a fluid.

Mustard J. F. * Kreslavsky M. A. Head J. W. III Milliken R. E.
Correlating Meter-Scale Morphology and Kilometer-Scale Topography: Evidence for a Degraded Mid-Latitude Surface Layer on Mars **[#1289]**
Evidence for a meters-thick, latitude-dependent surface layer, possibly ice-rich has been collected from a MOC image data base and statistical analysis of MOLA data. Here we directly compare these approaches and show a high degree of correspondence.

Bish D. L. * Carey J. W. Fialips C.-I.
Water-bearing Minerals on Mars: Source of Observed Mid-Latitude Water? **[#1786]**
Data for H_2O in chabazite, $(Ca_2Al_4Si_8O_{24}\cdot 12H_2O)$, demonstrate that its equilibrium hydration state under martian conditions is such that its high-T H_2O site is essentially full, whereas the low-T H_2O site may hydrate and dehydrate on a daily scale.

ten Kate I. L. * Ruiterkamp R. Botta O. Lehmann B. Gomez Hernandez C. Boudin N. Foing B. H. Ehrenfreund P.
Simulations of Martian Surface and Subsurface Processes **[#1313]**
Laboratory investigations on organic chemical processes occurring in the martian surface and subsurface using a Mars Simulation Chamber.

Thomson B. J. * Schultz P. H.
Analogs of Martian Surface Components: Distinguishing Impact Glass from Volcanic Glass **[#1416]**
Quantitative analysis of the surface texture of vesicular glasses may allow for discrimination between impact and volcanic glasses. This will be an important task for future Mars sample returns missions.

Quinn R. C. Grunthaner F. J. * Taylor C. L. Zent A. P.
Mars Redox Chemistry: Atacama Desert Soils as a Terrestrial Analog **[#1951]**
Eh-pH diagrams for soils collected along a north-south transect in the Atacama Desert will be presented. The major redox couples in these systems will be discussed in relation to the reactive soil chemistry seen in the Viking Biology Experiments.

Tosca N. J. * McLennan S. M. Lindsley D. H. Schoonen M. A. A.
Acid-Sulfate Weathering of Synthetic Martian Basalt: The Acid Fog Model Revisited **[#1325]**
The acid fog model, proposed to explain the present nature of the Martian soil, is experimentally revisited using more relevant basaltic analogs synthesized in the laboratory.

Gibson E. K. * McKay D. S. Wentworth S. J. Socki R. A.
Zeolite Formation and Weathering Processes Within the Martian Regolith: An Antarctic Analog **[#1244]**
Weathering processes operating in Antarctica's Dry Valleys produce an abundance of alteration products, including zeolites. Zeolites must be considered a candidate for storage of significant quantities of subsurface waters or other fluids on Mars.