

Wednesday, March 25, 2009

ANCIENT MARTIAN CRUST: PRIMARY MINERALOGY AND AQUEOUS ALTERATION
8:30 a.m. Waterway Ballroom 1

Chairs: Joseph Michalski
Janice Bishop

- 8:30 a.m. Mustard J. F. * Murchie S. L. Ehlmann B. L. Milliken R. E. Bibring J-P. Poulet F. Head J. W.
[Stratigraphy of Noachian-aged Crust in the Nili Fossae-Syrtis-Isidis Region](#) [#2115]
 A section of well-exposed Noachian crust exists surrounding the Isidis Basin. Over thousands of km it is largely a breccia consisting of blocks of sedimentary and primary igneous rocks in a phyllosilicate-bearing matrix, and capped by impact melt.
- 8:45 a.m. Skok J. R. * Mustard J. F. Murchie S. L.
[Identification of Primary Noachian Crustal Blocks on Mars with CRISM Observations](#) [#2180]
 The early Noachian crust of Mars has been obscured by impacts, alteration, and resurfacing, resulting in the earliest crust exposed as breccia blocks across the planet. We use spectral observations to constrain the mineralogy of these crustal blocks.
- 9:00 a.m. Tosca N. J. * Knoll A. H.
[Juvenile Chemical Sediments and the Duration of Aqueous Activity on Ancient Mars](#) [#1538]
 A general lack of diagenetic maturation among martian chemical sediments suggests that liquid water could not have persisted at these localities much beyond initial precipitation.
- 9:15 a.m. Chevrier V. F. *
[Early Martian Surface Conditions from Thermodynamics of Phyllosilicates](#) [#2515]
 Thermodynamic equilibria are used to determine the geochemical conditions during the Noachian era. Results show that CO₂ pressure and temperature can explain observations of various phyllosilicates and carbonates.
- 9:30 a.m. Velbel M. A. *
[Mechanisms of Pyroxene Alteration to Smectite: Implications for Inferring Elemental Mobility in Martian Paleoenvironments](#) [#1415]
 Pyroxene and smectite compositions are an observational basis for inferring former chemical conditions that facilitated differential elemental mobility in systems in which the water that mediated the weathering reactions is no longer present.
- 9:45 a.m. Carter J. * Poulet F. Bibring J.-P. Murchie S. Langevin Y. Mustard J. F. Gondet B. Seelos F.
[Phyllosilicates and Other Hydrated Minerals on Mars: 2. Detailed Analysis](#) [#2058]
 This abstract focus on the spectral diversity and the geological setting of phyllosilicate-bearing deposits detected on Mars.
- 10:00 a.m. Michalski J. R. * Poulet F. Bibring J.-P. Mangold N.
[Combined Visible/Near Infrared and Thermal Infrared Analyses of the Nili Fossae Region, Mars](#) [#1365]
 We present evidence for two main classes of phyllosilicate minerals in the Nili Fossae region of Mars based on the combined use of TES and OMEGA data. Both dioctahedral Fe³⁺ and trioctahedral Fe/Mg²⁺ clay minerals exist together.

- 10:15 a.m. Bishop J. L. * McKeown N. K. DesMarais D. J. Noe Dobrea E. Z. Parente M. Seelos F. Murchie S. L. Mustard J. F.
[*The Ancient Phyllosilicates at Mawrth Vallis and What They Can Tell Us About Possible Habitable Environments on Early Mars* \[#2239\]](#)
Phyllosilicates observed at Mawrth Vallis indicate a wide range of past aqueous activity. The phyllosilicate stratigraphy, possible formation scenarios, and possible links to prebiotic chemistry and biosignatures are presented.
- 10:30 a.m. Ruff S. W. * Hamilton V. E.
[*New Insights into the Nature of Mineralogic Alteration on Mars from Orbiter, Rover, and Laboratory Data* \[#2160\]](#)
TES spectra now appear to support the identification in some places of phyllosilicates observed by OMEGA/CRISM. Enigmatically, spectra from Mini-TES in Gusev crater show no such phases on rocks that clearly are altered. Amorphous phases are implicated.
- 10:45 a.m. Gavin P. * Chevrier V.
[*Thermal Alteration of Nontronite and Montmorillonite: Implications for the Martian Surface* \[#1027\]](#)
We investigate the spectral properties of thermally altered nontronite and montmorillonite and compare them to those of clays detected in impact crater ejecta on Mars.
- 11:00 a.m. Dyar M. D. * Murad E. Sklute E. C. Bishop J. L. Muirhead A. C.
[*Mössbauer and Reflectance Spectroscopy of Iron Oxide Mixtures* \[#2209\]](#)
Mössbauer spectroscopy is used to identify and quantify abundances of iron oxide and hydroxide minerals in mixtures that are analogs for martian rocks and soils.
- 11:15 a.m. Ehlmann B. L. * Mustard J. F. Murchie S. L.
[*Detection of Serpentine on Mars by MRO-CRISM and Possible Relationship with Olivine and Magnesium Carbonate in Nili Fossae* \[#1787\]](#)
Reports the first orbital detection of serpentine on Mars' surface, made by CRISM in the Thaumasia and Nili Fossae regions. Evidence for serpentinization of an olivine-magnesium carbonate-serpentine bearing rock unit in Nili Fossae is discussed.
- 11:30 a.m. Glotch T. D. * Rogers A. D.
[*Reexamination of Global Carbonate Abundances Using TES Data* \[#1605\]](#)
In this study, we reexamine global carbonate abundances in the TES data set. Results of the study generally support previous work indicating that carbonates are not widely present on Mars at the outcrop scale.