

Wednesday, March 9, 2011

MARS ALTERATION: PHYLLOSILICATES, SULFATES, AND SOILS

1:30 p.m. Waterway Ballroom 1

**Chairs: Janice Bishop
Elizabeth Rampe**

- 1:30 p.m. Arvidson R. E. * Squyres S. W. Murchie S. L. Athena Science and CRISM Teams
[*Mars Exploration Rover Opportunity Mission Recent Results for Meridiani Planum*](#) [#1492]
Opportunity has been traversing the Meridiani plains since January 2004 and after reaching Santa Maria crater on December 16, 2010, had traveled over 26.5 km (based on wheel odometry). This abstract focuses on recent key scientific results.
- 1:45 p.m. Rampe E. B. * Kraft M. D. Sharp T. G. Golden D. C. Ming D. W. Christensen P. R. Ruff S. W.
[*Detection of Allophane on Mars Through Orbital and In-Situ Thermal-Infrared Spectroscopy*](#) [#2145]
Models of TES and Mini-TES spectra with libraries containing allophanes and gel suggest these weathering products occur in several regions of Mars. The presence of allophane indicates that weathering has proceeded under moderate pH conditions.
- 2:00 p.m. Brückner J. * Fleischer I. Gellert R. Klingelhofer G.
[*On the Geochemistry of Soils at Gusev Crater and Meridiani Planum, Mars: Similarities and Differences*](#) [#1702]
The general similarity in the composition of the soils is indicating that surrounding regions have comparable compositions. Only at Meridiani, hematitic spherules occur. Similar Cl/S ratios in the soils point to a global component on Mars.
- 2:15 p.m. McGlynn I. O. * McSween H. Y. Fedo C. M.
[*Integrating Physical and Chemical Alteration Mechanisms of Soil Formation on Mars from the Mars Exploration Rovers*](#) [#2021]
Models of soil formation by chemical weathering must also incorporate physical processes including impact gardening and aeolian transport to remove and concentrate olivine and explain the compositional scatter of soils along the olivine-feldspar join.
- 2:30 p.m. Hausrath E. M. * Tu V.
[*Reactive Transport Modeling of Phosphate Mobility Under Mars-Like Conditions*](#) [#2353]
Phosphate is an important nutrient and indicator of water-rock interactions. Here we report reactive transport modeling of phosphate mobility under Mars-like conditions.
- 2:45 p.m. Marcucci E. C. * Hynke B. M. McCollom T. M.
[*Acid-Sulfate Weathering Experiments and the Effects of Fluid:Rock Ratio: An Early Mars Analog*](#) [#1521]
We completed a series of experiments that reacted sulfuric acid with basaltic minerals at various fluid to rock ratios to characterize the changes in secondary mineralogy and, ultimately, to provide insights into conditions on early Mars.
- 3:00 p.m. Goetz W. * Hecht M. H. Hviid S. F. Madsen M. B. Pike W. T. Stauffer U. Velbel M. A.
[*Detection of a Minor Alteration Phase in Soils at the Phoenix Landing Site, Mars*](#) [#2710]
Microscopic images acquired during the Phoenix mission reveal the presence of small amounts of particles with unusual spectral properties (VIS/NIR). The particles cannot be identified, but appear to be neither water ice nor perchlorate.

- 3:15 p.m. Tosca N. J. * Hurowitz J. A.
[*Neof ormation, Diagenesis and the Clay Cycle on Early Mars*](#) [#2031]
An examination of major sources of newly formed clay on early Mars highlights major differences between clay cycles on Mars and Earth. The overall importance of each to the sedimentary “clay mineral budget” is assessed.
- 3:30 p.m. Carter J. * Poulet F. Ody A. Bibring J.-P. Murchie S.
[*Global Distribution, Composition and Setting of Hydrous Minerals on Mars: A Reappraisal*](#) [#2593]
Global mapping of hydrated exposures on Mars based on the OMEGA and CRISM instruments has revealed over 900 sites, mostly Fe-Mg rich phyllosilicates associated with southern highland crater impact structures.
- 3:45 p.m. Bishop J. L. * Saper L. Beyer R. A. Lowe D. Wray J. J. McKeown N. K. Parente M.
[*Possible Sedimentary Features in Phyllosilicate-Bearing Rocks at Mawrth Vallis, Mars*](#) [#2374]
Discordant layering in phyllosilicate deposits at Mawrth Vallis may indicate sedimentary processes. We present analyses of CRISM and HiRISE data of these features.
- 4:00 p.m. Milliken R. E. * Bristow T. Bish D. L.
[*Diagenesis of Clay Minerals on Mars and Implications for the Mars Science Laboratory Rover*](#) [#2230]
Here we examine the possibility that previously reported smectite deposits on Mars may in fact represent mixed-layered clays. Implications for understanding diagenetic processes and preservation of organics on Mars will be discussed.
- 4:15 p.m. Battler M. M. * Osinski G. R. Lim D. S. S. Davila A. F. Michel F. A. Craig M. A. Izawa M. R. M. Leoni L. Slater G. F. Fairén A. G. Starratt S. W.
[*The Golden Deposit in the Canadian Arctic as an Analogue for Jarosite Deposition at Meridiani Planum and Mawrth Vallis, Mars*](#) [#2759]
The Golden Deposit, in the semi-arid Arctic desert, contains jarosite precipitating from cold, acidic, microbe-hosting groundwater seeps. It is chemically similar to jarosite at Meridiani Planum and Mawrth Vallis, and thus a new depositional analog.
- 4:30 p.m. Smith M. R. * Bandfield J. L. Gillespie A. R.
[*Felsic and Altered Mineral Suite in Antoniadi Crater, Mars as a Future Rover Landing Site*](#) [#1671]
We investigate Antoniadi Crater, Mars as a site for a future rover mission. It has basaltic and quartzofeldspathic rocks, along with altered minerals (hydrated silica, clays, zeolites), ideal for future geological and astrobiological investigation.