

Thursday, March 10, 2011  
POSTER SESSION II: MARS ALTERATION:  
CARBONATES, SULFATES, CHLORIDES, AND PHYLLOSILICATES  
6:00 p.m. Town Center Exhibit Area

Saper L. M. Bishop J. L.

[\*Reflectance Spectroscopy of Nontronite and Ripidolite Mineral Mixtures in Context of Phyllosilicate Unit Composition at Mawrth Vallis\*](#) [#2029]

Spectroscopic analyses of phyllosilicate mixtures are applied to understanding the stratigraphic units at Mawrth Vallis. Mixtures of Fe<sup>2+</sup> clays such as ripidolite could be present in between the nontronite and montmorillonite type units.

Farrand W. H. Glotch T. D. Rice J. W. Hurowitz J. A.

[\*Non-Linear Unmixing of CRISM Spectra over the Mawrth Vallis Region: Implications for Level of Alteration\*](#) [#1952]

Non-linear unmixing of CRISM data over the Mawrth Vallis region indicates higher fractions of alteration minerals in the Al phyllosilicate unit versus the Fe/Mg smectite unit.

Annex A. M. Howard A. D.

[\*Phyllosilicates Related to Exposed Knobs in Sirenum Fossae, Ariadnes Colles\*](#) [#1577]

Summary of findings in Ariadnes Colles regarding light-toned deposits underneath "Electris" deposit using CRISM full-resolution targets; and resulting implications regarding paleolake hypothesis for formation of Ma'adim Valles.

Wintzer A. E. Allen C. C. Oehler D. Z.

[\*Phyllosilicate Deposits in Shalbatana Vallis\*](#) [#1557]

We contribute to the understanding of the geologic history of Shalbatana Vallis using data from the MRO spacecraft, evaluating the mineralogy, origin, and placement of Fe/Mg-rich and Al-rich phyllosilicates in the region.

Goudge T. A. Mustard J. F. Head J. W. Fassett C. I.

[\*Open-Basin Lakes on Mars: A Study of Mineralogy Along a Paleolake Chain\*](#) [#2244]

The mineralogy of deposits in six connected open-basin lakes from CRISM data show that all six are dominated by a mafic-rich material (olivine and HCP), with two also showing unique phyllosilicate mineral signatures (kaolinite and Fe/Mg-smectite).

Roush T. L. Marzo G. A. Fonti S. Orofino V. Blanco A. Gross C. Wendt L.

[\*Assessing Spectral Evidence of Aqueous Activity in Two Putative Martian Paleolakes\*](#) [#1181]

We report on our investigation of CRISM observations of putative paleolakes on Mars to evaluate the evidence for the presence of mineral spectral signatures indicative of the past presence of water at these sites.

Tu V. Baumeister J. Metcalf R. Olsen A. Hausrath E.

[\*Serpentinite Weathering and Implications for Mars\*](#) [#2303]

Near-surface soil environments may be important habitats for life on Mars accessible to future missions. Weathered serpentinites indicate the formation of Al-rich surfaces and smectites, and the presence of Fe-oxidizing bacteria.

Hahn B. C. McSween H. Y. Tosca N. J.

[\*Constraints on the Stabilities of Observed Martian Secondary Mineral Phases from Geothermal Gradient Models\*](#) [#2340]

We attempt to place thermal constraints on the stability of exposed secondary mineral phases on Mars based on heat flow and geothermal gradients modeled at the time of mineral formation and burial.

Baldrige A. M. Lane M. D. Wray J. J.

[\*The Earlier Mars Odyssey Orbit Time Reveals Aqueous Mineralogy in Mid-IR Data\*](#) [#1663]

The Thermal Emission Imaging System (THEMIS) in orbit at Mars since early 2002, recently moved to an earlier, warmer orbit time. The new data reveal aqueous surface mineralogy in regions coinciding with VNIR detections.

Hong J. K. Herd C. D. K. Cavell R. G.

[\*Applications and Limitations of Synchrotron X-Ray Radiation Methods in the Study of Jarosite in Martian Meteorites\*](#) [#1936]

Synchrotron XRF and XRD analyses were conducted on jarosite occurrences in the MIL 03346 martian meteorite in order to characterize the mineral *in situ* and provide insights into the depositional environment of Mars in the past.

Lane M. D. Mertzman S. A. Dyar M. D. Bishop J. L.

[\*Phosphate Minerals Measured in the Visible-Near Infrared and Thermal Infrared: Spectra and XRD Analyses\*](#) [#1013]

Phosphate mineral spectra are presented for visible-near infrared and thermal infrared techniques. Samples are being analyzed using XRD to verify their mineralogy.

Horgan B. Mann P. Stromberg J. Cloutis E. A.

[\*Acid Alteration of Basalts, Andesites, and Anorthosites: Near-IR Spectra and Implications for Martian Soil Formation\*](#) [#2415]

Laboratory experiments indicate that acid alteration causes pH-dependent, observable changes to the near-IR spectra of mafic minerals, likely due to differences in solubility. Observations suggest that this process may have occurred in martian soils.

Filiberto J. Schwenzer S. P.

[\*Hydrothermal Alteration Mineralogy of Home Plate: Thermochemical Constraints for Their Formation Conditions\*](#) [#2072]

Our results imply intermediate to high W/R and low to intermediate temperatures during alteration of the Home Plate region.

Jänchen J. Brettschneider T.

[\*Hydration and Dehydration Properties of  \$MgSO\_4\$ ,  \$FeSO\_4\$  and  \$Fe\_2\(SO\_4\)\_3\$  Close to Martian Surface Conditions\*](#) [#1369]

The water vapor interaction of Mg- and Fe-sulfates identified in the martian soil has been determined quantitatively by adsorption methods to support evaluation of spectroscopic data from orbit or future surface missions by rovers.

Hanley J. Chevrier V. F. Dalton J. B. Jamieson C. S.

[\*Reflectance Spectra of Low-Temperature Chloride and Perchlorate Hydrates Relevant to Planetary Remote Sensing\*](#) [#2327]

Spectra of hydrated chlorides and perchlorates show strong temperature-dependent features that should allow for their identification on other planetary bodies.

Zhao Y. McLennan S. M.

[\*Experimental Evaluation of Photochemical Influences on Bromine and Chlorine Geochemistry on Mars\*](#) [#1667]

Experimentally evaluate of possible photochemical influences on halogen elements Br and Cl behavior and distribution on the martian surface.

Hanley J. Chevrier V. F. Berget D. Adams R. D.

[Thermodynamic Properties of Aqueous Chlorate Solutions and Their Applications to Mars](#) [#2545]

Intermediate oxidation species of chlorine salts are investigated to determine their thermodynamic parameters and stability diagrams.

Hughes C. G. Ramsey M. S.

[Super-Resolution of Martian Chloride Sites](#) [#2248]

Super-resolved THEMIS data show the border of the putative chlorides to be a less-well defined area, with surrounding material located within apparently pure areas. These exposures are collocated with lower albedo areas seen in HiRISE and CRISM data.

Jensen H. B. Glotch T. D.

[Investigation of the Near Infrared Spectral Character of Putative Martian Chloride Deposits](#) [#2099]

To greater understand the NIR spectral character of proposed chloride-bearing regions of Mars in ratioed CRISM data, spectra of mixtures of halite or pyrite with silicate minerals and rocks were collected to replicate the featureless red slope.

Gordon S. Hanley J. Chevrier V. F. Teng F.-Z.

[Isotope Fractionation of Magnesium Chloride During Crystallization: Applications to Mars](#) [#2719]

Our goal is to determine the relationship between fractionation and temperature, if any, for magnesium, and to use our findings to analyze any future martian samples for possible previous water-conducive conditions on Mars.

ten Kate I. L. Stern J. Malespin C. A. Glavin D. P.

[Interaction of Perchlorate with JSC Mars-1 During Evolved Gas Analysis](#) [#1011]

Within the context of the recent findings of perchlorates on Mars and the implications for organic detection using evolved gas analysis (EGA), we have analyzed JSC Mars-1 spiked with Na-perchlorate using EGA. First results are presented.

Sutter B. Ming D. W. Boynton W. V. Niles P. B. Morris R. V.

[\(Ca,Mg\)-Carbonate and Mg-Carbonate at the Phoenix Landing Site: Evaluation of the Phoenix Lander's Thermal Evolved Gas Analyzer \(TEGA\) Data Using Laboratory Simulations](#) [#2351]

Re-evaluation of the Phoenix Lander's Thermal Evolved Gas Analyzer (TEGA) data using laboratory simulations suggest that TEGA results are consistent with the detection of (Ca,Mg)-carbonate and Mg-carbonate.

Perry K. A. Bishop J. L. Dyar M. D. Blake D. F. Peel S. Brown A. J.

[Spectral Analysis of Nontronite-Magnesite-Olivine Mixtures and Implications for Carbonates on Mars](#) [#1554]

This study evaluates the character of magnesite in mixtures with nontronite and forsterite. Carbonate bands dominate mixtures above 3.2  $\mu\text{m}$  while phyllosilicates dominate below 3.2  $\mu\text{m}$ . This implies there may be more carbonates on Mars than estimated.

Wendt L. Gross C. Kneissl T. Sowe M. Combe J.-Ph. LeDeit L. McGuire P. C. Neukum G.

[Mineralogy and Stratigraphy of Sulfates and Ferric Oxides in Ophir Chasma, Mars](#) [#1775]

We analyze sulfates and ferric oxides in the light-toned deposits in Ophir Chasma using data from OMEGA and CRISM combined with imagery and digital elevation models.

Dehouck E. Chevrier V. Gaudin A. Mangold N. Mathé P.-E. Rochette P.

[Role of Sulfide-Weathering in the Formation of Sulfates or Carbonates on Mars](#) [#1715]

Experimental weathering of silicate/sulfide mixtures shows that this process can reproduce the mineralogy of the martian sulfate-bearing deposits, suggesting that martian sulfates may have formed from sulfide-rich basalts in local acidic conditions.

Volk K. E. Niles P. B. Socki R. A.

[\*Covariant C and O Isotope Trends in Some Terrestrial Carbonates and ALH 84001: Possible Linkage Through Similar Formation Processes\* \[#1975\]](#)

In this study we sought to identify discrete micro-scale isotopic variation within the carbonate crusts in Sunset Crater to see if they resembled the micro-scale isotope variation found in ALH 84001 carbonates.

Kounaves S. P.

[\*The Production of L-Dominant Biotic and Abiotic Chirality on Mars\* \[#2377\]](#)

Homochirality on Mars may have its genesis in (1) exogenous delivery during formation and post-bombardment and (2) ongoing irradiation by CP-UV. Presence of L-amino acids on Mars suggests that nonracemic chirality may not allow definitive tests for biology.

Berger J. A. King P. L. Kunkel T. S. Spilde M. N. Crisp J. A.

[\*Thermal Infrared Spectroscopy of Halite-Coated Glasses — An Evaluation of Continuous Versus Discontinuous Coatings\* \[#1574\]](#)

This study examines the effects of thin (~100  $\mu\text{m}$ ) chloride salt coatings on the thermal infrared energy of underlying substrates as a function of both the coating coverage (discontinuous vs. continuous) and coating thickness.