

Thursday, March 21, 2013

[R726]

**POSTER SESSION: MARTIAN WATER AND SECONDARY MINERALOGY**  
**6:00 p.m. Town Center Exhibit Area**

Harner P. L. Gilmore M. S. Greenwood J. P. **POSTER LOCATION #461**  
[Laboratory Simulations of Potential Martian Evaporites and Their Spectral Signatures](#) [#2714]

We create and evaporate theoretical brines and analyze the resultant salts to determine effects on their visible and near-infrared spectral signatures.

Tomkinson T. Lee M. R. Mark D. F. Stuart F. M. Smith C. L. **POSTER LOCATION #462**  
[Quantifying the Timescales of Fluid-Rock Interaction on Mars Using the Nakhlite Meteorites](#) [#1206]

Etch pits within olivine grains from the nakhlite meteorites reveal the magnitude and timescale of water-mediated alteration of the martian crust.

Poulet F. Carter J. Wang A. Ruff S. W. **POSTER LOCATION #463**  
[Integrating In Situ and Orbital Data of Mars: A Water Story at Gusev Crater](#) [#1414]

To reconcile analyses from orbital and rover-based observations for the purpose of relating the aqueous episodes that occurred at Gusev Crater, Mars.

Gainey S. R. Hausrath E. M. Hurowitz J. A. **POSTER LOCATION #464**  
[Clay Mineral Precipitation and Implications for Mars](#) [#2954]

Clay mineral precipitation and igneous rock alteration, implications for martian stratigraphy.

Catalano J. G. Beehr A. R. **POSTER LOCATION #465**  
[Theoretical and Experimental Constraints on the Formation and Alteration of Iron-Bearing Phyllosilicates on Mars](#) [#1294]

Modeling and experiments demonstrate that ferric smectites observed on Mars may be oxidation products of precursor ferrous clays formed during the Noachian.

Che C. Glotch T. D. **POSTER LOCATION #466**  
[Dehydrated and Dehydroxylated Phyllosilicates on Mars: Assessment of Post-depositional Alteration of Martian Sedimentary Deposits](#) [#2261]

We examined multiple remote sensing datasets for evidence of the existence of thermally altered phyllosilicates on Mars.

Adeli S. Hauber E. Le Deit L. Jaumann R. **POSTER LOCATION #467**  
[Different Phyllosilicate-Rich Materials on the Terra Sirenum Region, Mars](#) [#2752]

Using the CRISM data and high-resolution images, we have studied the morphology and the mineralogical composition of chaotic materials in Terra Sirenum.

Bultel B. Quantin C. Andreani M. Clenet H. **POSTER LOCATION #468**  
[Identification of Phyllosilicates in Crustal Outcrops Between Hellas and Isidis Basins \(Mars\) Using Combination of Near 2.3–2.5  \$\mu\text{m}\$  Absorptions on Crism Data](#) [#2078]

Smectite, serpentine, chlorite are detected on CRISM data suggesting an alteration driven by a pressure/temperature gradient.

Buczowski D. L. Seelos K. D. Murchie S. L. Seelos F. P. Malaret E. et al. **POSTER LOCATION #469**  
[Evidence for Multiple Widespread Buried Phyllosilicate-Bearing Layers Between Argyre and Valles Marineris](#) [#2331]

Widespread phyllosilicate-bearing layers have been identified in northwest Noachis Terra: two separate layers of Fe/Mg-smectites bracketing a Al-smectite layer.

Viviano C. E. Murchie S. L. Johnson J. R. Seelos F. P. **POSTER LOCATION #470**  
[\*The Distribution and Mineralogy of Hydrated Minerals in Wall and Floor Material of Valles Marineris\*](#) [#2909]  
 Fe/Mg-phyllsilicate in western Valles Marineris wall rock suggests surface clays were buried by Hesperian lava and do not plunge below the surface to the west.

Al-Samir M. Nabhan S. Winkler A. Fritz J. Greshake A. et al. **POSTER LOCATION #471**  
[\*Experimental Leaching Processes and the Formation of Sulfates with Sulfuric Acid on Terrestrial Rocks, Martian-Like Rocks and the Martian Meteorite Tissint Related to the Formation of ILD's on Mars\*](#) [#2014]  
 An experimental design of chemical reaction between sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) and rocks at elevated temperatures related to massive sulfate deposits on planet Mars.

Grindrod P. M. Warner N. H. Schwartz C. Gupta S. **POSTER LOCATION #472**  
[\*Fans and Phyllosilicates in Coprates Catena, Mars\*](#) [#1901]  
 We have studied two stepped fan systems, probably Hesperian in age, and associated light-toned deposits that contain phyllosilicates in Coprates Catena, Mars.

Tangari A. C. Marinangeli L. Piluso E. Pompilio L. Scarciglia F. **POSTER LOCATION #473**  
[\*Pedogenetic Processes on Mars and Terrestrial Analogues\*](#) [#2018]  
 Reconstruction of the alteration processes responsible of the formation of clay-rich soils on Mars based on the study of terrestrial analogues.

Ferguson R. L. Gaddis L. R. Rogers A. D. **POSTER LOCATION #474**  
[\*Hematite-Bearing Materials in Candor Chasma, Mars: Identification of New Localities, Analysis, and Implications\*](#) [#2618]  
 This work describes the association between low albedo deposits, light-toned material, and hematite-bearing material in Candor Chasma, Mars.

Jain N. Bhattacharya S. Chauhan P. Ajai **POSTER LOCATION #475**  
[\*Study of Carbonates, Hydrous Sulfates and Phyllosilicates from the Capri Chasma Region of Valles Marineris on Mars Based on MRO-CRISM Observations\*](#) [#1388]  
 Spectroscopic study of Capri Chasma has been carried out based on MRO-CRISM hyperspectral data. The presence of carbonates and hydrous sulfates has been confirmed.

Liu Y. Arvidson R. E. Catalano J. G. **POSTER LOCATION #476**  
[\*Spectral Identification and Stratigraphic Study of Phyllosilicates and Hydrated Sulfates in the Southwestern of Melas Chasma and Environmental Implications on Mars\*](#) [#1645]  
 We identified interbedded monohydrated sulfate and Fe-smectite deposits unconformably overlain by monohydrated sulfates over the southwestern of Melas Chasma.

Weitz C. M. Noe Dobrea E. Z. Wray J. J. **POSTER LOCATION #477**  
[\*Gypsum, Jarosite, and Other Minerals Associated with a Blocky Deposit in Western Melas Chasma\*](#) [#2076]  
 We have identified several minerals associated with a blocky deposit in western Melas Chasma, including gypsum, jarosite, and other sulfates.

Noel A. J. Bishop J. L. **POSTER LOCATION #478**  
[\*CRISM Analyses of Juventae Chasma: Mineralogy and Morphology of Interior Layered Deposits at Mound B\*](#) [#1736]  
 The use of additional CRISM images and updated calibration allows us to build upon previous analyses and better identify the sulfates present.

Goudge T. A. Mustard J. F. Head J. W. Salvatore M. R. **POSTER LOCATION #479**  
[\*Integrating CRISM and TES Hyperspectral Data to Characterize a Massive Kaolin-Group Mineral Deposit in Kashira Crater, Mars\*](#) [#1377]  
 We present results integrating TES and CRISM data to estimate the quantitative abundance of a kaolin-group mineral within a deposit in Kashira Crater, Mars.

Sun V. Z. Milliken R. E. **POSTER LOCATION #480**  
[\*Geologic and Mineralogic Mapping to Determine the Origin of Clay Minerals in Ritchey Crater, Mars\*](#) [#2675]  
We present geologic and mineralogic maps of post-Noachian Ritchey Crater, Mars, to determine detrital or authigenic origin of clays in the crater.

Wilhelm M. B. Bishop J. L. Wray J. J. Ojha L. **POSTER LOCATION #481**  
[\*Structural Variations in the Ancient Phyllosilicates at Mawrth Vallis, Mars\*](#) [#2440]  
We seek to investigate variations in the structure of mineralogically distinct phyllosilicate strata at Mawrth Vallis, Mars to constrain depositional processes.

Flahaut J. Poulet F. Carter J. Bibring J.-P. Murchie S. L. **POSTER LOCATION #482**  
[\*Embedded Phyllosilicates and Sulfates in Eastern Meridiani: An Other Gale Crater?\*](#) [#2035]  
We report the occurrence of mixed clays and sulfates within the etched terrains of Meridiani. Their stratigraphy is similar to the one observed in Gale Crater.

Di Achille G. Popa C. Silvestro S. Wray J. J. Carrozzo F. G. et al. **POSTER LOCATION #483**  
[\*High Resolution Morphometry and Mineralogy of the Shalbatana Paleolacustrine Deposits \(Mars\) Using MRO HiRISE and CRISM Data\*](#) [#3027]  
We report on the analysis of data recently acquired by the Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) over the Shalbatana Vallis paleolake.

Chatzitheodoridis E. Haigh S. Lyon I. **POSTER LOCATION #484**  
[\*Crystalline Clays in an Intriguing Ovoid Structure in Nakhla\*](#) [#2040]  
Ovoid in Nakhla, crystalline clays shown by TEM in walls. Different possible origins of the structure including exobiological are evaluated.

Melwani Daswani M. Schwenzer S. P. Wright I. P. Grady M. M. **POSTER LOCATION #485**  
[\*Low Temperature Near-Surface Thermochemical Modelling of the Alteration Assemblage in Martian Meteorite ALH 84001\*](#) [#2712]  
Models of aqueous alteration at low temperature produced secondary mineralogy resembling the observed minerals in early martian meteorite ALH 84001.

Robertson K. M. Milliken R. E. Ruff S. Farmer J. Shock E. **POSTER LOCATION #486**  
[\*Can Vis-NIR Reflectance Spectra be used to Assess Formation Environments of Opaline Silica on Mars?\*](#) [#1612]  
Opaline silica deposits from different environments are analyzed. We assess whether VIS-NIR spectral properties can distinguish between formation environments.

Horgan B. Smith R. Mann P. Stromberg J. Cloutis E. A. et al. **POSTER LOCATION #487**  
[\*New Evidence for a Weathering Origin for the High-Silica Component of TES Surface Type 2 on Mars\*](#) [#3032]  
The high-silica component of TES Surface Type 2 is shown to be consistent with leached glass, based on lab spectra and global correlation with near-IR spectra.

Bandfield J. L. Amador E. S. Thomas N. H. **POSTER LOCATION #488**  
[\*Extensive Hydrated Silica Materials in Western Hellas Basin, Mars\*](#) [#1323]  
High concentrations of hydrated silica are present along a 650-km section of Hellas Basin. Neutral pH groundwater is a potential source of the deposits.

Ruff S. W. Hamilton V. E. **POSTER LOCATION #489**  
[\*Amorphous Mars: Interpreting Growing Evidence for Poorly/Non-Crystalline Phases in Martian Materials\*](#) [#1753]  
A growing list of observations of amorphous phases identified in martian materials motivates a reexamination of rocks seen by Spirit that bear such phases.

Tu V. Hausrath E. M.

**POSTER LOCATION #490**

[\*Dissolution of Amorphous Al- and Fe-Phosphates: Implications for Phosphate Mobility on Mars\*](#) [#2577]

In this study, we measure the dissolution rates of and phosphate release from amorphous Al- and Fe-phosphates, to shed light on phosphate mobility on Mars.

Adcock C. T. Hausrath E. M.

**POSTER LOCATION #491**

[\*Interpretation of Phosphate Mobility on Mars Based on Terrestrial Mars-analog Basalts and Reactive Transport Modeling\*](#) [#2727]

We examine phosphate mobility in a Mars analog environment and use a reactive transport model informed by analog observations to model Mars phosphate mobility.

Moyano-Camero C. E. Trigo-Rodríguez J. M. Mestres N.

Fraxedas J. Alonso-Azcárate J.

**POSTER LOCATION #492**

[\*Studying Carbonate Globules in Allan Hills 84001 to Better Understand Aqueous Alteration in Early Mars\*](#) [#2063]

The carbonate globules contained in ALH 84001 can provide interesting information about the early aqueous processes on Mars, as they were formed 3.9 Gyr ago.

Bishop J. B. Lane M. D. Brown A. J. Hiroi T. Swayze G. A. et al.

**POSTER LOCATION #493**

[\*Spectral Properties of Ca-, Mg- and Fe-bearing Carbonates\*](#) [#1719]

Spectral analyses are presented of several carbonates with variable Ca, Mg, and Fe to improve carbonate chemistry determinations on Mars through remote sensing.

Thomas N. H. Bandfield J. L.

**POSTER LOCATION #494**

[\*Identification of Spectral Endmembers in CRISM Data Using Factor Analysis and Target Transformation\*](#) [#1325]

We tested CRISM data for the presence of carbonates using target transformation. Our methods also identified phyllosilicates and reduced spectral noise.

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

**POSTER LOCATION #495**

[\*Jezero Crater Paleolake, Mars: Assessing the Nature and Provenance of Alteration Minerals and Carbonates\*](#) [#1376]

The morphology and mineralogy of the Jezero crater paleolake and watershed have been investigated to assess the origin of hydrated minerals within the basin.

Wiseman S. M. Mustard J. F. Ehlmann B. L.

**POSTER LOCATION #496**

[\*Assessing Variability Among Carbonate-Bearing Deposits on Mars\*](#) [#2865]

We further characterize spectral diversity and geologic context of carbonate deposits on Mars with a focus on Nili Fossae. Small-scale variation is evident.

Edwards C. S. Ehlmann B. L.

**POSTER LOCATION #497**

[\*The Nili Fossae Carbonate Plains as Viewed by TES, THEMIS, and CRISM: Alteration of Ultramafic Rocks and Clay-Carbonate Stratigraphy\*](#) [#2424]

We provide a linked view of geologically significant units in Nili Fossae using multiple compositional datasets to constrain the geologic history of the region.

Liberi F. Pompilio L. Marinangeli L. Piluso E. Rosatelli G. et al.

**POSTER LOCATION #498**

[\*The Search of Carbonates on Mars: Volcanic Versus Sedimentary Origin\*](#) [#1997]

We compare the mineralogy of carbonates on Mars and terrestrial carbonatites using XRD and reflectance spectroscopy to unravel the origin of carbonates on Mars.

Carrozzo F. G. Bellucci G. Altieri F. D'Aversa E.

**POSTER LOCATION #499**

[\*Detection of Carbonate Bearing-Rocks in Craters Uplifts of Tyrrhena Terra, Mars\*](#) [#2241]

In this work we report the putative orbital detection of carbonates in the uplift of two unnamed craters in Tyrrhena Terra using CRISM data.

McHenry L. J. Ruffini J. M. Gerard T. L. Walters G. L. **POSTER LOCATION #500**  
[Secondary Minerals in Basaltic Caves: Analog for Mars Surface and Subsurface Mineralogy](#) [#2758]  
Basaltic caves in Idaho, California, and Hawaii preserve secondary hematite, silica, and soluble sulfates, similar to those observed at Meridiani Planum, Mars.

Salvatore M. R. Mustard J. F. Head J. W. III **POSTER LOCATION #501**  
Cooper R. F. Marchant D. R. et al. **POSTER LOCATION #501**  
[Oxidative Weathering on Mars and Implications for Chemical Alteration During the Amazonian Epoch](#) [#1339]  
Oxidative weathering products are modeled at high abundances across the martian surface, implying cold and dry alteration processes during the Amazonian epoch.

Yant M. H. Rogers A. D. Nekvasil H. Zhao Y.-y. S. **POSTER LOCATION #502**  
[Spectral Characterization of Acid Weathering on Martian Basaltic Glass](#) [#1543]  
Synthetic martian basalt geochemical experiments linked with IR spectral measurements, in order to understand surface weathering on Mars.

Leftwich K. M. Bish D. L. Chen C. H. **POSTER LOCATION #503**  
[Crystal Structure of a New  \$\text{Na}\_2\text{Mg}\(\text{SO}\_4\)\_2 \cdot 16\text{H}\_2\text{O}\$  Hydrate Phase Measured Under Mars-Relevant Conditions](#) [#2795]  
This work describes the crystal structure of a new, low-temperature phase in the  $\text{Na}_2\text{Mg}(\text{SO}_4)_2\text{-H}_2\text{O}$  system that is stable under most martian conditions.

Nuding D. L. Gough R. V. Chevrier V. F. Tolbert M. A. **POSTER LOCATION #504**  
[Deliquescence of Calcium Perchlorate: An Investigation of Stable Aqueous Solutions Relevant to Mars](#) [#2584]  
To understand the phase of  $\text{Ca}(\text{ClO}_4)_2$  on the martian surface, we report the humidity where deliquescence and efflorescence occur over a range of temperatures.

Cull S. Kennedy E. Clark A. **POSTER LOCATION #505**  
[Complex Distribution of Perchlorate at the Mars Phoenix Landing Site](#) [#1593]  
Multispectral mapping of the Mars Phoenix landing site shows perchlorate salt widely distributed in concentrated patches, both on the surface and subsurface.

Quinn R. C. Pacheco D. J. **POSTER LOCATION #506**  
[Production of Chlorinated Hydrocarbons During the Thermal Decomposition of Metal Carbonates and Perchlorate Salts](#) [#2664]  
We show that the thermal decomposition of carbonates in the presence of metal catalysts and perchlorates can result in the formation of  $\text{CH}_3\text{Cl}$  and  $\text{CH}_2\text{Cl}_2$ .

Toner J. D. Catling D. C. Light B. **POSTER LOCATION #507**  
[Reanalysis of Wet Chemistry Laboratory Data with Implications for Parent Salt Assemblages at the Phoenix Site](#) [#1639]  
Investigation of data from the Mars Phoenix Wet Chemistry Laboratory experiment using improvements to original analyses, including Kalman noise filtering.

Ruesch O. Poulet F. Vincendon M. Erkeling G. Reiss D. et al. **POSTER LOCATION #508**  
[Chloride-Fe/Mg Clays Deposits on Mars: Morphologic and Age Constraints from a Selected Site](#) [#2210]  
Insights into the formation processes and the timing of chloride-Fe/Mg clay-bearing deposits on Mars.

Hanley J. Chevrier V. F. Mellon M. **POSTER LOCATION #509**  
[Distribution, Detection, and Implications of Chlorine Salts on Mars](#) [#2923]  
Chlorine is on Mars / May be oxidized or not / Crucial for water.

Applin D. M. Cloutis E. A. Izawa M. R. M. **POSTER LOCATION #510**  
[Spectral Reflectance Properties of Common Metal-Oxalates Exposed to Simulated Mars Surface Conditions: Implications in the Search for Extinct or Extant Life on Mars](#) [#2839]

Spectral reflectance (0.35–5.2  $\mu\text{m}$ ) properties of Ca and Mg-oxalates when exposed to simulated Mars surface conditions are investigated.

Rivera-Hernández F. Bandfield J. L. Ruff S. W. **POSTER LOCATION #511**  
[Mid-Infrared Spectral Effects of Thermally Isolated Dust Coated Surfaces](#) [#2674]

Laboratory measurements and modeling are combined to understand the behavior and underlying physics of how thin dust coatings can affect TIR spectral data.

Robertson K. M. Li S. Milliken R. E. **POSTER LOCATION #512**  
[Estimating Mineral Abundances of Clay-Gypsum Mixtures Using Visible-Near Infrared Radiative Transfer Models](#) [#1614]

The efficacy of both the Hapke and Shkuratov models is assessed in estimating modal mineralogy of montmorillonite-gypsum mixtures in the VNIR wavelength range.

Pitman K. M. Wolff M. J. Cloutis E. A. **POSTER LOCATION #513**  
[Radiative Transfer in Clusters of Regolith Particles: Fundamental Scattering Unit?](#) [#2337]

We present numerical models to assess quantitatively how wrong it is to assume that Mars minerals do not clump and whether it misleads spacecraft identifications.

Roush T. L. Brown A. Bishop J. Blake D. Bristow T. F. **POSTER LOCATION #514**  
[Initial Estimates of Optical Constants of Mars Candidate Materials](#) [#1297]

We estimated visible and near-infrared optical constants of  $\text{H}_2\text{O}$ - and OH-bearing materials to enable their quantitative abundance determination on Mars.

Sklute E. C. Glotch T. D. Woerner W. **POSTER LOCATION #515**  
[Visible and Near Infrared Optical Constants of Synthetic Jarosite](#) [#2142]

VNIR data for three grain sizes of a synthetic K-jarosite were processed using a Hapke inversion to obtain the wavelength dependent optical constants  $n$  and  $k$ .

Teodoro L. F. A. Elphic R. C. Eke V. R. Feldman W. C. Sylvestre M. **POSTER LOCATION #516**  
[A Global High Resolution Map of the Martian Hydrogen Distribution](#) [#2623]

We will apply a PIXON reconstruction technique to the MONS epithermal data over the full surface of Mars to produce an accurate H distribution map.

Audouard J. Poulet F. Vincendon M. Bibring J. -P. Gondet B. et al. **POSTER LOCATION #517**  
[Reappraisal of Mars 3 \$\mu\text{m}\$  Water Spectral Feature Using OMEGA/Mex](#) [#2127]

We study the 3- $\mu\text{m}$  water spectral feature using four martian years of OMEGA data. We intent to discriminate the different contributors to this ubiquitous absorption.

Yin J. Ayhan B. Kwan C. Wang W. Li S. et al. **POSTER LOCATION #518**  
[Enhancement of JMARS](#) [#1273]

JMARS stands for Java Mission-planning and Analysis for Remote Sensing. We will develop a chemical composition detection tool and implant it in JMARS.

Seelos F. P. Seelos K. D. Viviano C. E. Morgan F. Humm D. C. et al. **POSTER LOCATION #519**  
[CRISM Hyperspectral Targeted Observation Local Area Mosaics](#) [#2563]

We report on a CRISM hyperspectral targeted observation mosaicking procedure that supports the generation of scientifically compelling local area mosaics.

McGuire P. C. Arvidson R. E. Bishop J. L. Brown A. J. Cull S. et al. *POSTER LOCATION #520*  
[Mapping Minerals on Mars with CRISM: Atmospheric and Photometric Correction for MRDR Map Tiles, Version 2, and Comparison to OMEGA](#) [#1581]

We assess a new version (version 2, v2) of photometric and atmospheric corrections applied to 72-band multispectral mapping data from the CRISM instrument.

Rohani N. Parente M. *POSTER LOCATION #521*  
[Endmember Detection in CRISM Images Using Graphs](#) [#2894]

Endmembers, the boundary points of the data cloud, have the smallest value of betweenness centrality. The spectra of endmembers detected for two images are given.