

Tuesday, March 20, 2012

POSTER SESSION I: MARTIAN SPECTROSCOPY NITTY GRITTY

6:00 p.m. Town Center Exhibit Area

Rogers A. D. Bandfield J. L. Smith M. D. Christensen P. R.

[Maximizing Information Extraction from the Mars Global Surveyor Thermal Emission Spectrometer Data](#) [#1650]

MGS TES surface-atmosphere separation methods are improved by removing minor CO₂ and water vapor absorptions and working with an expanded spectral range. One of the new advantages is ability to assess global spectral variability at >1300 cm⁻¹.

Bell J. F. III Wolfe E. M. Horgan B. N. H. Joseph J. Araki S.

[Kilometer-Scale VIS-NIR Spectral Variations on Mars from Global Mapping and Analysis of Mars Express OMEGA Data](#) [#1739]

We report initial results from our work on global mapping and analysis of Mars Express OMEGA hyperspectral imaging data at approximately 1 km/pixel spatial resolution.

Schmidt F. Bourguignon S. Le Mouëlic S. Dobigeon N. Tréguier E.

[Constraining Martian Mineralogical Compositions Using Hyperspectral Images](#) [#1872]

Constraining the martian surface composition using hyperspectral images is a difficult task due to the high diversity of the potential minerals. Here we present hypothesis, rationale, and results in the Syrtis Major region.

Wiseman S. M. Arvidson R. E. Wolff M. J. Seelos F. P. Smith M. D. Humm D.

Murchie S. L. Mustard J. F.

[Retrieval of Atmospherically Corrected CRISM Spectra Using Radiative Transfer Modeling](#) [#2146]

Atmospheric correction of CRISM spectra of the martian surface is necessary for interpretation of mineralogy. We present an iterative radiative transfer procedure that overcomes difficulties to atmospheric correction presented by the CRISM dataset.

Glotch T. D. Arnold J. A. Wolff M. J. Lucey P. G.

[Exact Calculation of the Scattering Properties of Olivine in a Salt Matrix: Application to Mars and Trojan Asteroids](#) [#2652]

We use the Multiple Sphere T Matrix Model to calculate the scattering properties of olivine in a transparent matrix at mid-IR wavelengths. This work has implications for halite salt deposits on Mars and proposed salty surfaces of Trojan asteroids.

Sklute E. C. Glotch T. D. Dyar M. D.

[VNIR Optical Constant Determination of Synthetic Jarosites for Quantitative Abundance Analysis of Remote Sensing Datasets](#) [#1508]

Preliminary values for the wavelength-dependent, imaginary index of refraction, k , are calculated in the VNIR wavelength range for three compositionally distinct synthetic jarosites using Lucey's 1998 treatment of Hapke scattering theory.

Baldrige A. M. Bandfield J. L. Smith M. D.

[Effects of Dehydration on TIR Spectra of Chlorides and Implications for Mars](#) [#2250]

We measured emissivity spectra for samples from Death Valley to study the spectral characteristics of chlorides in natural environments. By comparison with remote sensing data, we hope to constrain the mineralogy of the putative martian chlorides.

Maturilli A. Helbert J. Roush T. L. D'Amore M.

[Influence of Moisture Content on Albedo Changes of JSC-Mars1 Martian Simulant: A Lesson for HiRISE?](#) [#1406]

Albedo depends upon the moisture level of the surface, but this relation is not fully understood. In the Planetary Emissivity Laboratory we measured VIS reflectance spectra of a JSC Mars-1 martian soil simulant under several different moisture contents.

Jo I. Elam J. Pokuri K. Garcia V.

[Thermal Model Comparison of Fine Grain Sized Sediments with Respect to Moisture Content](#) [#1336]

The goal of the Mars Outreach for North Carolina Students research program in 2011–2012 was to find the effects of water on the thermal inertias of fine grain size sediments to develop a model that could determine moisture saturation levels on Mars.

Pokuri J. Kelley K. Brownstein N. Jowell A. Storch J.

[Thermal Modeling of Fine Gravel at Different Saturation Levels](#) [#1800]

This study was performed in hope of exploring the possibility of significant amounts of water on Mars. By measuring and modeling the thermal inertia of typical martian sediments, we can potentially identify moisture on or below the surface of Mars.

Sharp T. G. Michalski J. R. Dyar M. D. Bish D. L. Friedlander L. R. Glotch T.

[Effects of Shock Metamorphism on Phyllosilicate Structures and Spectroscopy](#) [#2806]

Clays detected on Mars indicate formation in the early history of Mars. Because the surface of Mars is also heavily cratered, clays on Mars have experienced shock metamorphism. Here we describe shock experiments and structural and spectral characterization fo shocked clays.

Friedlander L. R. Glotch T. Michalski J. R. Sharp T. G. Dyar M. D. Bish D. L.

[Spectroscopic Studies of Nontronite After Impacts at Three Pressures](#) [#2520]

We exposed three phyllosilicate minerals to impacts at high pressure. We present structural and spectroscopic changes in the UV/vis and mid-IR spectra of nontronite. Our observations may explain variability among clay detections on Mars.

Rampe E. B. Lanza N. L.

[Application of Principal Component Analysis to NIR Spectra of Phyllosilicates: A Tool for Identifying Phyllosilicates on Mars](#) [#2570]

Principal component analysis (PCA) models of phyllosilicate NIR data demonstrate that PCA can be used to differentiate between types of phyllosilicates and can help identify phyllosilicate compositions on Mars.

Mann J. P. Cloutis E. A. Rice M. S. Craig M. A. Berard G. M.

[Variations in Reflectance Spectra Associated with Exposure of Hydrated Minerals to Simulated Mars Surface Conditions](#) [#2351]

This study was designed to have a better understanding of the stability of hydrated minerals on the surface of Mars and to quantify their spectral changes associated within their desiccation process.

Hardgrove C. Rogers A. D.

[Thermal Infrared Spectra of Microcrystalline Sedimentary Phases: Effects of Natural Surface Roughness on Spectral Feature Shape](#) [#1675]

Thermal infrared spectral features of common microcrystalline phases (chert, alabaster, micrite) are presented. Spectra are sensitive to mineralogy and micron-scale (~1–25 μm) surface roughness. Roughness is on the scale of the average crystal size.