

Tuesday, March 20, 2012

POSTER SESSION I: MATERIAL ANALOGS IN THE FIELD AND IN THE LABORATORY

6:00 p.m. Town Center Exhibit Area

Rull F. R. Klingelhofer G. Martinez Frias J. Rodriguez J. A. Medina J. Lalla E.
[*A Combined Raman and Mössbauer Analysis of Altered Basalts in Tenerife Island: Analogies with Mars*](#) [#2882]

A combined Raman and Mössbauer study has been performed in different areas of Tenerife to analyze the water alteration processes of volcanic materials and the possible analogy with Mars.

McHenry L. J. Chevrier V. F. Schröder C.
[*Spatial vs. Temporal Distribution of K-Jarosite in a Saline-Alkaline Paleolake Deposit: Implications for the Distribution and Longevity of Jarosite on Mars*](#) [#2010]

A range in jarosite abundance from 0.4 to 7.9% within a single layer in an altered tuff in an East African saline-alkaline paleolake deposit suggests a spatial rather than temporal control for this unusual jarosite occurrence, with implications for Mars.

Sharma S. K. McKay C. P. Misra A. K.
[*Time-Resolved Raman and Laser-Induced Native Fluorescence Investigations of Carbonate Rocks as an Analogue for Martian Carbonates*](#) [#1312]

Martian analog carbonates are investigated with time-resolved bio-imager, and Raman and LINF spectroscopy, to understand the organic and bio-signatures.

Englert P. Bishop J. L. Hunkins L. D. Koeberl C.
[*Martian Soil Analogs from Antarctica: Chemical and Mineralogical Weathering Scenarios*](#) [#1743]

This investigation of chemical and mineralogical weathering of Antarctic Dry Valleys soils found more extensive physical than chemical alteration. This may provide insights into weathering scenarios on Mars.

Sobron P. Amundsen H. E. F. Bauer A. Bishop J. L. Jordan F. Josset J-L. Josset L. Leveille R. Pugh S. M. Schmitz N. Steele A. Wang A.
[*In-Situ Investigation of Devonian Redbed Sediments in Bockfjord \(Svalbard, Norway\) as a Martian Analogue*](#) [#2631]

We performed in-situ imaging and spectral analysis of redbeds in Svalbard using prototypes of mission instruments. We evaluated synergies between optical/spectroscopic instruments and characterized red sandstones in a Mars analogue site.

Stoker C. R. Clarke J. D. A. Valdivia-Silva J. Foing B.
[*Subsurface Profiles of Organics Obtained by Core Drilling in Jurassic Sediments at a Mars Analog Site in Utah*](#) [#2850]

We obtained rock cores (0.6–1.6 m depth) from ancient (150 m.y. old) sediments at a Mars analog site in Utah using a prototype Mars drill. We report the depth profile of organics from these samples to illustrate the utility of drilling on Mars.

Salvatore M. R. Mustard J. F. Head J. W. III Marchant D. R. Wyatt M. B. Seeley J.
[*Linking Orbital, Field, and Laboratory Analyses of Dolerites in the McMurdo Dry Valleys of Antarctica: Terrestrial Studies and Planetary Applications*](#) [#1590]

Primary igneous and secondary alteration signatures can be resolved using orbital spectroscopy over mafic regions of the McMurdo Dry Valleys. We assess the nature of these signatures and their link to surface stability and regional microclimates.

Salvatore M. R. Mustard J. F. Head J. W. III Cooper R. F. Marchant D. R. Wyatt M. B.
[*Characterizing Widespread Oxidation Processes on Mars: Alteration Rind Development and Effects on Spectroscopic Investigations*](#) [#1597]

The chemical, mineralogical, and spectral products of oxidation are characterized using a variety of laboratory techniques. Orbital and in situ observations of the martian surface suggest that this process is widespread and spectrally significant.

Mandt K. E. Patrick E. L. Mitchell E. J. Seifert C. Mitchell J. N. Libardoni M. Younkin K. N.
[*In-Situ Mass Spectrometer Measurements of Cave Atmospheres as an Analogue to Future Planetary Cave Missions*](#) [#1442]

We built a portable mass spectrometer to survey the composition of local cave atmospheres as early instrument development for future missions to caves on the Moon and Mars. Measurement results are used in support of current Earth science research.

Rutledge A. M. Christensen P. R.

[*Infrared Spectroscopy and Geochemistry of Cold Weathering Products in a Terrestrial Icy Environment: Implications for Weathering on Mars*](#) [#2715]

Cold weathering processes on Earth and Mars are poorly understood, despite both having an abundance of ice in contact with geologic material. We use TIR spectroscopy and geochemistry to characterize weathering processes in an icy analog environment.

McGlynn I. O. Fedo C. M. McSween H. Y. Jr.

[*Physical Modification of Synthetic Basaltic Sediment Compositions: Implications for Interpreting the Geochemistry of Martian Soils*](#) [#1251]

Synthetic sediment produced from the sorting of shattered basalt bedrock demonstrates the possibility for hydrodynamic compositional modification of sediment on Mars and must be considered when interpreting the composition of martian sediment.

Hallis L. J.

[*Weathering in Terrestrial Samples from the Miller Range and Elephant Moraine Regions of Antarctica: Comparisons with Weathering in Antarctic Martian Meteorites*](#) [#2819]

We compared the secondary alteration minerals in Antarctic terrestrial samples with those of the Miller Range nakhlite martian meteorites to determine the origin of the sulphates in the latter.

Brown A. J. Bishop J. L. Roush T. L. Hunkins L. Bristow T. Blake D.

[*Controlled Study for Quantitative Clay Abundance on Mars*](#) [#1747]

We report on a laboratory-controlled study of four well-characterized martian analog samples. We have conducted SEM analysis and derived grain size distributions and shape information. We will report on VNIR spectra and RT models of these samples.

Zhou Y. Z. Wang A. W.

[*Potential Existence of Al-Bearing Sulfates on Mars and Their Spectral Characteristics*](#) [#2289]

We anticipate a great potential existence of Al-bearing sulfates on Mars based on the evidences of extensive weathering observed by recent missions. We conducted spectroscopic characteristics of two typical Al-sulfates, alunogen and alum-(K).

Liu Y. Wang A.

[*Dehydration of Na-Jarosite, Ferricopiapite, and Rhomboclase at High T and Implications on Martian Ferric Sulfates*](#) [#2791]

Our dehydration experiments of ferric sulfates show that OH-bearing Na-jarosite is relatively stable at 95°C and RH ≤ 11%, while H₂O/OH-bearing ferricopiapite and rhomboclase have converted entirely to anhydrous phases.

Lu Yanli. Wang A.

[*Synthesis and Spectral Characterization of OH-bearing Ferric Sulfates*](#) [#2514]

We report the synthesis of three jarosites, FeOHSO₄, paracoquimbite, and their Raman, MIR-ATR, VIS-NIR-DF spectral characterizations, which is the first step to start a study of their stability field and phase transition pathways.

Graff T. G. Morris R. V. Achilles C. N. Agresti D. G. Ming D. W. Hamilton J. C.

Mertzman S. A. Smith J. G.

[*Chemical and Mineralogical Characterization of Acid-Sulfate Alteration of Basaltic Material on Mauna Kea Volcano, Hawaii: Jarosite and Hydrated Halloysite*](#) [#2639]

We characterized the chemical and mineralogical properties of basalt subjected to acid-sulfate weathering under natural conditions on Mauna Kea Volcano, Hawaii. Alteration products include jarosite and hydrated halloysite.

Lauer H. V. Jr. Archer P. D. Jr. Sutter B. Niles P. B. Ming D. W.

[Thermal and Evolved Gas Analysis of "Nanophase" Carbonates: Implications for Thermal and Evolved Gas Analysis on Mars Missions](#) [#2299]

We characterize the thermal and evolved gas properties of carbonates of varying particle size, evaluate the CO₂ releases from CO₂ treated CaO samples, and examine the secondary CO₂ release from reheated calcite of varying particle size.

Sakatani N. Ogawa K. Iijima Y. Honda R. Tanaka S.

[Thermal Conductivity of Glass Beads as a Model Material of Regolith](#) [#2000]

Thermal conductivity of glass beads as a model material of regolith was measured with changes in temperature. Our results indicate that the solid conductivity is dependent on the number of contact per unit volume and contact conductance.

Moroz L. V. Starukhina L. V. Rout S. S. Sasaki S. Leroux H. Helbert L. Baither D. Bischoff A. Hiesinger H.

[Space Weathering of Fe-Poor Silicate Regoliths: Experimental and Theoretical Simulations](#) [#1488]

We present spectral and SEM/TEM studies of a natural plagioclase irradiated with a nanosecond pulsed laser. We also employed theoretical modeling to assess optical modification of Fe²⁺-poor regoliths due to formation of nanophase iron inclusions.

Dropmann M. Gomringer C. Koch H. Peters S. Herdrich G. Cook M. Schmoke J. Laufer R. Matthews S. Hyde T. W.

[Setup of an Inductively-Heated Plasma Generator and Diagnostics to Build a Hybrid Plasma Simulation Facility for Complex Space Environment Investigations](#) [#2165]

Environmental plasma research using an inductively heated plasma generator and several subsystems for investigation in the fields of dusty plasma, catalysis, atmospheric entry, and even terrestrial applications.

Gillis-Davis J. J. Markley M. M. Lucey P. G. Bradley J. P. Ishii H. A.

[Laser Space Weathering of Quartz](#) [#2664]

Our pulsed laser irradiation experiments are devised to systematically examine how low-iron materials like plagioclase space weather.

Barmatz M. Steinfeld D. Winterhalter D. Rickman D. Gustafson R. Butts D. Weinstein M.

[Microwave Permittivity and Permeability Measurements on Lunar Simulants](#) [#1050]

In this investigation, we have measured the dielectric and magnetic properties of lunar simulants being developed by three companies and compared their resulting behavior to earlier measurements of representative mare and highland lunar soil samples.

Russell P. S. Grant J. A. Williams K. K. Carter L. M. Garry W. B. Morgan G.

Daubar I. Bussey D. B. J.

[Ground Penetrating Radar Field Studies of Lunar-Analog Geologic Settings: Impact Ejecta and Volcanic Materials](#) [#2604]

GPR surveys are analyzed in conjunction with "ground-truth" outcrop observations, with the goal of determining whether and how different geologic materials, processes, and settings can be uniquely distinguished and characterized with GPR.

Gurgurewicz J. Maturilli A. Helbert J. Kostylew J. Zalewska N.

[Emissivity Measurements of Basaltic Analogues for Mercury](#) [#2124]

Emissivity of basaltic rocks from three different terrestrial geological environments has been measured and implications for Mercury's surface composition are discussed.

Bodnarik J. G. Schweitzer J. S. Parsons A. M. Evans L. G. Starr R. D.

[PING Gamma Ray and Neutron Measurements of a Meter-Scale Carbonaceous Asteroid Analog Material](#) [#1544]

We compare PING experimental data from the asteroid simulant, basalt, and granite structures with computer simulations for a homogenous carbonaceous asteroid to show that the asteroid simulant's response closely approximates a carbonaceous asteroid.

Ivliev A. I. Kuynko N. S.

[*The Thermoluminescence in the Experimentally Shock Loaded Minerals*](#) [#1273]

The study of shock loaded matter in such experiments can appear useful for interpreting measurement results of physicochemical transformations of different minerals conditioned by the effects of high pressures and temperatures.

ElShafie A. Heggy E.

[*Dielectric Properties of Volcanic Material and Their Role for Assessing Rock Hardness in the Martian Subsurface*](#) [#2790]

We perform dielectric permittivity and hardness measurements for martian analog rocks in an attempt to correlate between the physical and mechanical properties of volcanic rocks and its implication for optimizing ExoMars drilling and sampling activities.

Choukroun M. Barmatz M. Castillo-Rogez J. C. Mielke R. Mitchell K. Smythe W. Sotin C. Young J. Zhong F.

[*JPL's Capabilities for Ice Physics Experimentation with Planetary Applications*](#) [#2774]

We present experimental facilities developed at JPL to support geophysical models and mission data interpretation on icy bodies of the solar system, and current research that uses these facilities.

Haberle C. W. Cabrol N. A. Grin E. A.

[*Exploring Planetary Analogs: Environmental Monitoring and Lake Bottom Mapping at Planetary Lake Lander 2011*](#) [#2705]

During the deployment of Planetary Lake Lander, external observations and investigations were required. Meteorological information, stream discharge data and bathymetry were critical in determining where to place the Lake Lander.

Núñez J. I. Farmer J. D. Sellar R. G.

[*Exploration at the Hand Lens Scale: Results from the 2010 ILSO-ISRU Field Test Using the Multispectral Microscopic Imager*](#) [#2290]

The MMI provides in situ mineralogy within a microtextural framework. We present results from the first field deployment of the MMI in support of the 2010 International Lunar Surface Operations In-Situ Resource Utilization (ILSO-ISRU) Field Test.