

Thursday, March 17, 2005
POSTER SESSION II: INSTRUMENTS II: ROVERS, ROBOTICS, IR, AND MORE
7:00 p.m. Fitness Center

Bell M. S. Allen C. C.

Cleanroom Robotics — Appropriate Technology for a Sample Receiving Facility? [#1395]

Robotic processing has been recommended for use in a Receiving Facility supporting a Mars Sample Return Mission. Inorganic, organic and biological contamination can be controlled and minimized using current robot technology in a curation environment.

Mimoun D. Lognonné P. Banerdt W. B. Schibler P. Giardini D. Pont G.

The Mars SEIS Experiment: A Mars Seismic Package [#1685]

For the incoming Mars missions, IGP has developed the SEIS experiment. It includes seismic sensors to measure seismic activity and Martian tides. This paper presents a review of the SEIS design and development, and preliminary breadboard performances.

Sykulska H. Vijendran S. Pike W. T.

Patterned Substrates for the Phoenix Microscopy Station [#2166]

This work aims to develop patterned substrates for the microscopy station on the 2007 Phoenix lander. Experiments show that careful sample preparation will be essential to maximise the scientific return from the optical and atomic force microscopes.

Blake D. F. Sarrazin P. Bish D. L. Chipera S. J. Vaniman D. T. Feldman S. Collins S. A.

CheMin: A Definitive Mineralogy Instrument in the Analytical Laboratory of the Mars Science Laboratory (MSL '09) [#1608]

CheMin is a miniature X-ray diffraction/X-ray fluorescence instrument that has been chosen for the analytical laboratory of MSL. CheMin will unequivocally determine the mineralogy of complex rocks and soils during the two-year duration of the MSL '09 mission.

Dyar M. D. Lane M. D. Bishop J. L. O'Connor V. Cloutis E. A. Hiroi T.

Integrated Spectroscopic Studies of Hydrous Sulfate Minerals [#1622]

Hydrous sulfate minerals are the focus of integrated XRD, compositional, VNIR, IR, emissivity, and Mössbauer studies.

French L. C. Anderson F. S. McMurtry G. Pilger E. Stopar J.

A Rugged Miniature Mass-Spectrometer for Measuring Aqueous Geochemistry on Mars [#2138]

This project is to miniaturize and shock-harden a rotating field mass spectrometer (RFMS) for high precision measurements of aqueous geochemistry on Mars.

Urgiles E. Wilcox J. Z. Toda R. Crisp J. George T.

Atmospheric Electron-induced X-Ray Spectrometer (AEXS) Instrument Development [#1438]

This paper describes the progress in data acquisition and establishing the observational capability of the AEXS instrument. The AEXS enables non-destructive evaluation of sample surfaces in planetary ambient atmospheres.

Wilcox J. Z. Urgiles E. Toda R. George T. Crisp J.

Atmospheric Electron-induced X-Ray Spectrometer (AEXS) Instrument Development [#1059]

The progress in the development of the AEXS instrument for *in situ* excitation of XRF spectra *in situ* using a focused electron beam transmitted through the encapsulation membrane from samples in planetary ambient atmosphere. We describe the development status of the miniature stand-alone instrument.

Jernsletten J. A.

Fast-Turnoff Transient Electromagnetic (TEM) Field Study at the Mars Analog Site of Rio Tinto, Spain [#1014]

This report describes a Fast-Turnoff Transient Electromagnetic (TEM) study at the Peña de Hierro ("Berg of Iron") field area of the Mars Analog Research and Technology Experiment (MARTE), near the towns Rio Tinto and Nerva, Andalusia region, Spain.

Jernsletten J. A.

Time Domain Electromagnetics for Mapping Mineralized and Deep Groundwater in Mars Analog Environments [#1013]

This study evaluates Transient Electromagnetics (TEM) for sounding of groundwater in Mars analog environments. Data from two field studies are shown: 1) TEM data from Pima County, Arizona; and 2) Fast-Turnoff TEM data from Rio Tinto, Spain.

Nelson R. M. Hapke B. W. Smythe W. D. Manatt K. S. Eddy J.

An Improved Instrument for Investigating Planetary Regolith Microstructure [#1521]

We renovated the JPL Long Arm Goniometer permitting measurements at phase angles as small as 0.05 degrees to 20 degrees. We can study the reflectance scattering behavior of regolith materials at phase angles at which important changes occur. We report the first results from the instrument.

Ravine M. A. Bell J. F. III Malin M. C. Miller D.

Semi-Autonomous Rover Operations: A Mars Technology Program Demonstration [#1592]

A 25 kg testbed rover will be used to demonstrate autonomous long range (~10 km) operation at three Mars analog field sites. This capability would enable investigation of localized high value science targets on Mars with Mars Scout-class missions.

Castano R. Estlin T. Gaines D. Castano A. Bornstein B. Anderson R. C. Judd M. Stough T. Wagstaff K.

Science Alert Demonstration with a Rover Traverse Science Data Analysis System [#2260]

The Onboard Autonomous Science Investigation System (OASIS) evaluates geologic data gathered by a planetary rover. We describe results for the system in detecting and reacting to a science alert, as well as the reliability of the rock finder and run time performance.

Wilson G. R. Andringa J. M. Beegle L. W. Jordan J. F. Mungus G. S. Muliere D. A. Vozoff J. Wilson T. J.

Mars Surface Mobility: Comparison of Past, Present, and Future Rover Systems [#2219]

The objective of this study was to explore past, present, and future Mars rover concepts and compare their cost, size, and performance metrics in the context of the goals and objectives of the Mars Exploration Program.

Brown A. J.

Hydrothermal Mars "Through the CRISM": Which Hydroxyl Band and Why [#1091]

The spectral region covered by CRISM contains several OH absorption bands. The subject of this report is: Which of the available OH absorption bands should be targeted during CRISM preliminary mapping?

Mena-Fernandez S. Xie H.

Understanding the Olympus Mons and Valles Marineris Using THEMIS Imagery [#1056]

This study aims at developing methods to assess Mars' mineral composition through THEMIS images. All analyses will be based temperature, radiance, and emissivity. Initial results indicate a difference in temperatures between the Olympus Mons and the Valles Marineris.

Klima R. L. Pieters C. M.

Capabilities and Limitations of Infrared Reflectance Microspectroscopy [#1459]

Spectral analysis of planetary materials in the laboratory is fundamentally limited by the character of samples and system optics. We present experimental results defining general constraints for planetary science applications with microspectroscopy.

Hamilton V. E. Lucey P. G.

One Spectrometer, Two Spectra: Complementary Hemispherical Reflectance and Thermal Emission Spectroscopy Using a Single FTIR Instrument [#1272]

We are introducing a new IR instrument at UH that is capable of both hemispherical reflectance and thermal emission measurements; it enables truly comparable E & R studies of undisturbed particulate samples as well as cross-calibration opportunities.

Roush T. L.

Near-Infrared (0.67–4.7 μm) Optical Constants Estimated for Montmorillonite [#1210]

Procedures to estimate the wavelength dependence of both the real and imaginary indices of refraction from reflectance spectra are described. Resulting absorption coefficients compare favorably with those previously reported for montmorillonite.

Kirkland L. E. Herr K. C. Adams P. M. Prothro L. B. Allen B. M.

MarsLab at the Nevada Test Site: Rover Search for Subsurface Hydrothermal Activity Exposed by Small Craters [#2199]

This is a ground-based (rover analog), thermal-infrared spectral study of mineral exposed by manmade explosion craters in basalt at the Nevada Test Site. One goal is to determine which minerals present exhibit identifiable spectral signatures.

Milam K. A. McSween H. Y. Jr. Moersch J. E. Christensen P. R.

Accuracy of Derived Plagioclase Compositions from Thermal Emissivity Spectra of Multi-Component Mixtures of Pure Plagioclase [#1863]

This study determines the accuracy to which plagioclase compositions can be derived in multi-component mixtures of (pure) plagioclase, the most abundant mineral phase at the martian surface.

Gilmore M. S. Bornstein B. Merrill M. D. Castaño R. Greenwood J. P.

Generation and Performance of Automated Jarosite Mineral Detectors for Vis/NIR Spectrometers at Mars [#1155]

We have developed an algorithm that identifies jarosite in Vis/NIR spectra autonomously.

Greenhagen B. T. Kirkland L. E. Adams P. M. Grabowski T. K.

MarsLab Investigation of the Spectral Signature of Gypsum Bearing Rocks of Differing Composition and Formation Environment [#2117]

In this study, we used field based infrared spectroscopy to compare gypsum bearing rocks of differing composition and formation environment to enhance our knowledge of the role of several mineralogical and textural factors that cloud high fidelity compositional identification.

Heavens N. G. Kirkland L. E. Adams P. M.

Mars Analog Field Infrared Spectroscopy at Alunite, Clark County, NV: Comparison with EDXS [#1936]

In this study, we compare the results of Mini-TES-like field measurements of an outcrop with EDXS, BSE, and XRD analyses of samples of weathered surfaces from the same site.

Mitrofanov I. G. Litvak M. L. Kozyrev A. S. Mokrousov M. I. Sanin A. B. Tretyakov V. I.

Dynamic Albedo of Neutrons (DAN): Active Nuclear Experiment Onboard NASA Mars Science Laboratory [#1635]

In our presentation we describe instrument DAN based on neutron activation technique and selected for NASA/MSL mission. The main task of this experiment is local measurements of water distribution in martian subsurface around MSL rover.