Characteristics of Basaltic Particles Transported by Different Geologic Processes

We present preliminary analyses of basaltic lithic fragments found in volcanic tephra, eolian dunes, fluvial deposits, and glacial moraines found in Hawaii.

Analyses of Basaltic Sediments Subjected to Wave Erosion and Their Implications for Past Martian Coastal Processes

We analyzed basaltic beach sand to determine physical characteristics of the sediments that may be useful for identifying ancient shorelines on Mars.

Grain-Surface Textural Indicators of Volatiles in Terrestrial Mars-Regolith Analogs: Implications for Interpreting Sand and Silt Imaged by the Phoenix Optical Microscope at the Phoenix Mars Lander Landing Site

Several widely used Mars regolith (soil) simulants exhibit textural indications of volatiles in their environments of formation and alteration.

Grain Size Analysis with Simulation of Digital Images from Mars Science Laboratory Testbed Imagers

The limitations of grain resolution with the ChemCam remote micro imager can be understood by using high-resolution images of terrestrial sedimentary rocks.

The Accuracy of 2D Rover Imagery for Representing 3D Sedimentary Textures of Basaltic Mars Analog Sediment

A comparative study of 2- and 3-D textural analyses has found that 2-D representation of 3-D textures depends on image resolution and igneous rock texture.

Sorting of a Different Sort: Experimental Observations of Sublimation-Driven Grain Size Sorting in Mars-Analog Excess Ice Simulants

We report experimental results showing the evolution of grain size sorting in response to sublimation-driven ice loss from a Mars-analog sediment substrate.

Variation of Dielectric Constant and Brightness Temperature with Respect to Percentage of Water Ice Content

Laboratory measurement of TALS is carried out to calculate the dielectric constant.

Discrete Dipole Approximation of Scattering from Granular Targets

This abstract explores the effectiveness of discrete dipole approximation in the limit of close-packing between a periodically recurring lattice of spheres.

Mathematical Theory of Thermal Inertia Revisited: Improving our Understanding of Martian Thermophysical Properties Through Analogous Examples of “Periodic Diffusive Inertia”

We provide a set of analogous equations that relate thermal inertia to other scenarios described by a diffusion equation undergoing a periodic boundary condition.
Mellon M. T. McKay C. P. Grant J. A. POSTER LOCATION #335
*The Thermal Conductivity of Soils with Bimodal Grain-Sizes at Mars Pressures* [#2837]
We report new measurements of the thermal conductivity of bimodal size mixtures of natural soils and soil analogs at a range of Mars pressures.

Morlok A. Klemme S. Dittmar I. Stojic A. Weber I. et al. POSTER LOCATION #336
*Synthetic Glasses as Analogs for Infrared Studies of Planetary Surfaces* [#2175]
Synthetic glasses with compositions of planetary surfaces are used to produce infrared spectra.

Cloutis E. A. POSTER LOCATION #337
*Fe-Bearing Glassy Materials: Spectral Reflectance Properties* [#1234]
Reflectance spectra of glassy Fe-bearing materials are sensitive to both ferrous and ferric iron content and can have predictable spectral properties.

Cannon K. M. Mustard J. F. POSTER LOCATION #338
*Identifying Basaltic Glass in Complex Samples with Blind Endmember Non-Linear Unmixing* [#1968]
We use laboratory experiments with physical mixtures of rock samples and basaltic glass to explore the feasibility of glass detection with spectral unmixing.

Farrand W. H. Wright S. P. Glotch T. D. POSTER LOCATION #339
Altered and fresh basaltic glass from hydro- and glaciovolcanic eruptions and from Lonar Crater were examined with VNIR, TIR, XRD, and Raman spectroscopy.

Burgess K. D. Stroud R. M. De Gregorio B. T. Dyar M. D. McCanta M. C. POSTER LOCATION #340
EELS in the aberration-corrected STEM with quality reference spectra is improving the spatial and energy resolution of analyses of space-weathered materials.

Malespin C. A. McAdam A. C. Stern J. C. Webster C. Flesch G. et al. POSTER LOCATION #341
*Select MSL Sample Analysis at Mars (SAM) Testbed Analog Studies* [#2558]
The SAM testbed instrument is used as a high fidelity replica of the version currently on MSL. Analog samples run on the testbed can be used for FM reference.

Thompson D. R. Flannery D. T. Allwood A. C. Bue B. D. Elam W. T. et al. POSTER LOCATION #342
*Nonlinear Projections of X-Ray Fluorescence Spectra, with Application to PIXL on Mars 2020* [#2406]
We apply statistically-motivated dimensionality reduction to data from the breadboard version of the PIXL instrument, slated for the proposed Mars 2020 rover.

De Angelis S. De Sanctis M. C. Manzari P. Ammannito E. Di Iorio T. et al. POSTER LOCATION #343
*Analysis of Rocks Slabs by VNIR Spectroscopy and Linear Mixing with Ma Miss Instrument Breadboard* [#1324]
Ma Miss, integrated inside the ExoMars-2018 Rover Drill, is a miniaturized VIS-NIR spectrometer for the investigation of the martian shallow subsurface.

Maturilli A. Helbert J. D’amore M. Ferrari S. POSTER LOCATION #344
*Experimental Verification of Validity for Kirchhoff’s Law (ε=1-R) in Vacuum and Purged Air* [#1722]
R and ε @ 200°C to 400°C measured at PEL in vacuum and purging, to study Kirchhoff’s law ε = 1–R, for fine and large separates. Found dependence on particle size.
Applin D. M.  Izawa M. R. M.  Cloutis E. A.  POSTER LOCATION #345
An Ultraviolet Reflectance Survey of Some Materials Relevant to Planetary Exploration [#2358]
Here we show the UV reflectance of a number of planetary-relevant materials that have, to date, not been spectrally characterized in the UV.

Carli C.  De Angelis S.  Tosi F.  Beck P.  Schmitt B.  et al.  POSTER LOCATION #346
VNIR Spectral Change of Hydrated Sulfate Minerals at Different Low Temperatures [#1800]
Reflectance VNIR laboratory spectra of hydrated sulfates measured at different low temperatures and variable particle sizes as a tool for planetary mineralogy.

Leask E. K.  Ehlmann B. L.  POSTER LOCATION #347
Identification and Quantification of Mineral Abundance from VSWIR Reflectance Spectra in Carbonate/Serpentine Systems [#1689]
Ophiolite mineralogy is mapped and identified at the submillimeter scale in cut rock samples, using VSWIR reflectance spectra from UCIS rover instrument prototype.

Fox V. K.  Arvidson R. E.  Jolliff B. L.  Carpenter P. K.  Catalano J. G.  et al.  POSTER LOCATION #348
Characterization of Synthetic and Natural Manganese Oxides as Martian Analogues [#2132]
Concentrated manganese oxides discovered in Gale and Endeavour Craters motivate in-depth characterization of this mineral class.

Trang D.  Gillis-Davis J. J.  Hammer J. E.  Cahill J. T. S.  POSTER LOCATION #349
The Optical Constants of Manganese-Bearing Olivine: The Synthesis [#2643]
We attempted to synthesize Fo50 olivines through two different methods, a hydrothermal and a 1 atm experiment.

Brand H. E. A.  Scarlett N. V. Y.  Grey I. E.  POSTER LOCATION #350
Formation of Jarosite Minerals in the Presence of Seed Material [#1825]
We report the results of in situ SXRD experiments to investigate the formation of jarosite minerals in the presence of mineral seed material.

Ling Z. C.  Cao F. K.  Ni Y. H.  Wu Z. C.  Zhang J.  et al.  POSTER LOCATION #351
Raman Spectroscopic Study of the K-Na Jarosite Solid Solutions [#2731]
We report the method of K content estimation in K-Na jarosite solid solutions by Raman spectroscopy, which is applicable to future Raman payloads for Mars.

Weber I.  Böttger U.  Pavlov S. G.  Hübers H.-W.  POSTER LOCATION #352
Raman Investigations of Iron Sulfides Under Various Environmental Conditions [#1759]
We investigate iron sulfides with Raman spectroscopy to determine their behavior in different environmental conditions.

Sklute E. C.  Dyar M. D.  Friedlander L.  Glotch T. D.  Sharp T. G.  et al.  POSTER LOCATION #353
Mössbauer Analysis of Shocked Clays — What Do We Really Know About Mars? [#2048]
Shock changes phyllosilicate structure, expanding the range of Mössbauer parameters for these phases. Therefore, MER Mössbauer spectra should be reexamined.

Rucks M. J.  Arnold J. A.  Glotch T. D.  POSTER LOCATION #354
MID IR Optical Constants of Triclinic Minerals: A Case Study with Labradorite [#2902]
We derived optical constants for the triclinic mineral, labradorite.

Arnold J. A.  Rucks M. J.  Glotch T. D.  POSTER LOCATION #355
Mid-IR Optical Constants of Triclinic Minerals [#2707]
A method outlined/And tested; labradorite/Data to follow.
A calibration for analysis of Ni using laser-induced breakdown spectroscopy is presented.

A 3500-sample calibration suite for Mars-analog LIBS spectroscopy has been prepared.

Development of standards for analysis of Cr, Ni, Mn, Co, Zn, and S for use in LIBS applications is described.

We have successfully synthesized large (>100 µm) pigeonite crystals as standards for remote sensing measurements, e.g., infrared spectrometry.