

Wednesday, June 13, 2012
SCIENCE AND MISSION CONCEPTS:
COMPOSITIONAL INVESTIGATIONS
8:00 a.m. Berkner Room

Bridges N. T. Murchie S. L. *

[*A High Resolution Compositional Imager for Mars Science and Future Exploration*](#) [#4203]

Coverage of CRISM's wavelength range at HiRISE color resolution would provide fundamental data to further unravel the geology of Mars and to select the best sites for future robotic and human exploration. Here we propose such an investigation.

Lucey P. G. * Glotch T. D. Rogers A. D. Greenhagen B. T.

[*Ten Meter-Scale Thermal Infrared Spectroscopy and Thermophysical Properties from Mars Orbit*](#) [#4289]

A thermal infrared spectrometer that collects spectral and thermophysical properties at 10-meter resolution is proposed. Data from this instrument would enhance rover safety, and provide compositional data at unprecedented spatial resolution.

Hand K. P. Wray J. * Calvin W. Carlson R. W.

[*Active and Passive Mid-Infrared Spectroscopy on Mars for In Situ Analyses and Connection to Remote Sensing Observation*](#) [#4375]

Active and Passive Mid-Infrared Spectroscopy on Mars for *in situ* analyses and connection to remote sensing observation.

Getty S. A. * Brinckerhoff W. B. Arevalo R. D. Jr. Floyd M. M. Li X.

Cornish T. Ecelberger S. A.

[*A Miniature Laser Desorption/Ionization Time-of-Flight Mass Spectrometer for In Situ Analysis of Mars Surface Composition and Identification of Hazards in Advance of Future Manned Exploration*](#) [#4302]

The adaptable, compact, and highly capable technique of laser desorption/ionization time-of-flight mass spectrometry has significant potential to contribute substantially to the dual objectives of scientific and human exploration of Mars.

Blacksberg J. * Maruyama Y. Choukroun M. Charbon E. Rossman G. R.

[*Maximizing Science Return from a Single On-Surface Mineralogy Tool: Combined Raman, LIBS, and Fluorescence Spectroscopy*](#) [#4309]

We present a single mineralogy tool with the potential for in-depth surface analyses that typically require the use of multiple techniques and instruments. We combine three techniques: Raman spectroscopy, LIBS, and fluorescence spectroscopy.

Aubrey A. D. Hecht M. H. Grunthner F. J. Kounaves S. P. Lee M. C. *

O'Neil G. D. DeFlores L.

[*MECA Wet Chemistry — The Next Generation*](#) [#4329]

The NERNST project (NASA ASTID funded) is focused on developing the next generation wet chemistry laboratory based on techniques employed during the Phoenix MECA-WCL *in situ* experiments.

Quinn R. C. * Ricco A. J. Ehrenfreund P. Grunthner F. Santos O. Zent A. Hines J. Agasid E.

[*Reactivity Analyzer for Soil, Ices, and Regolith \(RASIR\)*](#) [#4177]

The Reactivity Analyzer for Soil, Ices, and Regolith (RASIR) is an integrated microanalytical system designed to simultaneously measure the organic content and chemical reactivity/toxicity levels of martian surface samples.

Willis P. A. * Stockton A. M. Mora M. F. Cable M. L. Jensen E. C. Jiao H. Mathies R. A.

[Mars End-to-End Microfluidic Analyzer \(MEEMA\) for Solids, Liquids, and Gases](#) [#4291]

We propose to develop MEEMA, a 3kg, 2W, flight-capable microfluidic lab-on-a-chip analyzer that is capable of injecting solid, liquid, or gas samples and performing a suite of chemical analyses with parts per trillion sensitivity.

Sellar R. G. * Farmer J. D. Nunez J. I. Smith-Dryden S.

[Multispectral Microscopic Imager: Petrography on Mars with a Compact, Contact Instrument](#) [#4275]

The Multispectral Microscopic Imager provides crucial petrologic and astrobiological information for exploring Mars, with only MER-class resource requirements in mass, cost, and complexity.

Hu Z. W. *

[X-Ray Imaging with Phase Contrast: An Approach to In Situ Mapping of Textures and Biosignatures of Martian Materials](#) [#4260]

A nondestructive approach to *in situ* identification and selection of high-priority martian materials is explored, based on X-ray imaging with phase contrast.

Bonetti J. A. * Manohara H. M. Holmes W. A.

[Stray Field Magnetic Resonance Imaging: A Non-Destructive Means for Internal Imaging of Planetary Rock Samples](#) [#4157]

The ability to quickly scan and image rocks internally would be a huge advantage for Mars and other planetary, lunar and primitive body missions. A technique known as Stray Field Magnetic Resonance Imaging is described that would make this a reality.

Lawrence D. J. * Peplowski P. N. Elphic R. C. Goldsten J. O. Tyagi K. T.

[Miniature Nuclear Spectrometers For Measuring the Surface Composition and Near-Surface Composition Stratigraphy on Mars and its Moons](#) [#4340]

We describe mature nuclear spectroscopy instruments for *in situ* compositional stratigraphy measurements, which can be accommodated within resource constrained missions as they are low-mass, low-power, low-data rate and are operationally simple.

Parsons A. M. *

[Complete Subsurface Elemental Composition Measurements with PING](#) [#4279]

The probing *in situ* with neutrons and gamma rays (PING) instrument will measure the complete bulk elemental composition of the subsurface of Mars down to ~1 m depth without the need for contacting the surface or extracting samples.

PANEL DISCUSSION