

Wednesday, June 13, 2012
SCIENCE AND MISSION CONCEPTS:
GEOPHYSICAL INVESTIGATIONS
1:00 p.m. Berkner Room

Stillman D. E. Grimm R. E. *

[*Prospecting for Near-Surface H₂O on Mars with Dielectric Spectroscopy*](#) [#4204]

We describe how dielectric spectroscopy, which measures the frequency-dependence (1 mHz–10 kHz) of the electrical properties of the subsurface, can quantify the volume percentage of ice and adsorbed water in the top 3 m of the martian regolith.

Ciarletti V. * Clifford S. M. Plettemeier D. Mangold N. Petinelli E. Herique A. Kofman W. Heggy E.

[*Analyzing the Shallow Martian Subsurface with the WISDOM GPR*](#) [#4201]

The WISDOM GPR has been designed and selected for the ExoMars rover mission to do near subsurface imaging, understand the geological context of the landing site and help identify the location to retrieve samples.

Grant J. A. * Leuschen C. J. Russell P. S.

[*The Strata Ground Penetrating Radar: Constraining the Near Surface Properties of Mars*](#) [#4074]

The Strata ground penetrating radar is a low mass, power, and volume instrument. Testing in analog environments demonstrates its utility in defining hazards/resources and geologic settings that may be related to habitable environments on Mars.

Kedar S. Tanaka H. Naudet C. * Plaut J. Jones C. E. Webb F. H.

[*Low Cost, Low Power, Passive Muon Telescope for Interrogating Martian Subsurface*](#) [#4150]

The muon telescope represents an entirely new class of instruments for planetary exploration, providing a wholly new type of measurement for the detection of potentially habitable subsurface environments, and for exploration of martian geology.

Ciarletti V. * Clifford S. M. Plettemeier D. LeGall A. Biancheri-Astier M.

[*The NetStation GPR: A Tool for Conducting Lander-Based 3-D Investigations of Martian Subsurface Structure, Stratigraphy, and Volatile Distribution*](#) [#4346]

The NetStation GPR is a stationary, impulse, multiband polarimetric HF GPR, designed to conduct geologic and volatile-related investigations of the martian near- and deep-subsurface (~10 m–1 km).

Townsend J. P. French R. A. *

[*Seismicity of Mars*](#) [#4349]

The scientific objectives of a seismic survey of Mars are outlined.

Hurst K. * Banerdt W. Hecht M.

[*Combining Inertial and Strain Seismometer Data on Mars*](#) [#4372]

Combining inertial and strain seismic data at a single site would aid interpretation of the data. A system consisting of a Phoenix-type lander and a thermal drill could install such an instrument in a borehole in the north polar icecap on Mars.

Campbell B. A. * Grant J. A. Plaut J. J. Freeman A. Eagle Discovery Proposal Team

[*Near-Surface Ice, Transient Water Releases, and the Geologic Context of Hydrated Mineral Exposures: Sample Return and Human Exploration Benefits of an Orbital Imaging Radar for Mars*](#) [#4156]

We present the science and resource-mapping capabilities of a synthetic aperture radar (SAR) sensor that can be accommodated on a Discovery class bus or as part of the instrument suite of a MRO/MAVEN scale spacecraft.

Carter L. M. * Rincon R. Berkoski L.

[Mapping the Upper Subsurface of Mars Using Radar Polarimetry](#) [#4285]

A polarimetric Synthetic Aperture Radar would provide a detailed mapping of the upper meters of the martian surface, address multiple Decadal Survey science goals, and enhance the science return from sample caching and human exploration missions.

Clifford S. M. * Delamere W. A. Gogineni S. Kofman W. Herique A. Spudis P. Sharpton B. Orosei R. Stofan E. Ciarletti V. Heggy E. Plettemeier D. Smith D. Zuber M.

[The Mars Advanced Radar and LIDAR Orbiter \(MARLO\) for High-Resolution Investigations of Global Topography, Surface Roughness, Subsurface Volatiles, Stratigraphy and Structure Within the Shallow- and Deep-Subsurface](#) [#4312]

We describe a Mars Advanced Radar and LIDAR Orbiter (MARLO) — which includes a low-frequency sounder, P- and X-band imaging SAR, and 9-beam laser altimeter array — to conduct high-resolution investigations of the martian surface and deep-subsurface.

Renno N. O. Ruf C. Gaier T. (Presenter: H. Elliott *)

[A Passive Instrument to Search for Brines in the Shallow Martian Subsurface](#) [#4121]

The Phoenix Mars Mission discovered physical and thermodynamical evidence for liquid brines at its landing site. The passive instrument proposed here is capable of testing the hypothesis that brines are common in the martian shallow subsurface.

Mitrofanov I. G. * Sanin A. B. Malakhov A. V. Bobrovniksky Yu. I.

Tomilina T. M. Fedosov F. S.

[Fine Resolution Epithermal Neutron Detector \(FRIEND\) for Mapping Martian Water from ESA's TGO](#) [#4209]

The Fine Resolution Epithermal Neutron Detector (FRIEND) for ESA's TGO is described. The main goal of FRIEND is mapping of epithermal neutrons from the surface of Mars with high spatial resolution ~40 km. These data will allow to map the martian water.

PANEL DISCUSSION