

Space Science Seminar
Tuesday, 2018 October 23
10:30 a.m.
NSSTC/2096

**Seismic Properties of Soils on Earth and
Possible Applications to Moon and Mars**

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Host: Dr. Renee Weber

Thanks to LaSPACE seed funds we intend to evaluate piezo-sensor and source technology in order to confirm its potential to characterize shallow (0-1 m) soils and ground ice on Mars and other planetary bodies when installed on landers and rovers. We are looking for other scientists who share common interests. Piezo-technology tests and measurements have wide uses in the defense, aerospace and structural engineering fields.

On Earth the study of soils using geophysics is relatively new and challenging because materials are highly non-elastic, heterogeneous and anisotropic at small scales (< 1 m). Seismic lessons on these topics come from addressing engineering problems and through laboratory-scale (~ 10 cm) investigations into unexpected physical behaviors.

Based on our current knowledge of Mars soils we will create theoretical predictions regarding the seismic response of soils that contain ice at shallow depths. In small sand-tanks at -30°C , we will compare the theoretical predictions against physical cases. Six scenarios will test from the most simple (single-soil, cold and dry) to the most complex case (two-soils, laterally variable and ice-saturated). Comparisons of theory against data will help confirm the technology and support its long-term development into a higher technological level for deployment in future space missions.

<https://solarscience.msfc.nasa.gov/colloquia/>

