**Target:** Mars and Lunar subsurface.

**Science:**
- Detection and characterization of Mars hydrate minerals (e.g., gypsum, kieserite, epsomite) and ice at local scale down to 5m depth combined with subsurface stratigraphy.
- Detection and characterization of Lunar water-ice/hydroxyl group.
- Selection of sampling sites for biosignatures through detection of Martian evaporitic sulfates, a promising target for exobiology on Mars. Such evaporates would contain permineralized microfossils, if life ever arose on Mars.
- Detection of bulk hydrate minerals and water-ice for future in situ resource utilization.

**Objectives:**
- Development of a prototype RDS. Major development effort will be on an efficient antenna-sensor structure (current TRL2 to TRL4) and miniature electronics for RDS.
- Integration of the RDS with a heritage miniaturized ground penetrating radar (GPR, TRL4).
- Functional integration and interpretation of data between GPR and RDS. Software development for signal processing and integration of RDS/GPR data.

**CoIs:** David Paige/UCLA; Yahya Rahmat-Samii/UCLA

**Key Milestones:**

- **Year 1 (6/30/2017-6/30/2018):**
  - Antenna-Sensor Fabrication/Laboratory Testing (JPL) 6/30/2018

- **Year 2 (7/01/2018-6/30/2019):**
  - Antenna-Sensor Optimization (UCLA), 6/30/2019
  - RDS Electronics/Rover Integration/Field Testing (JPL) 6/30/2019

- **Year 3 (7/01/2019-6/30/2020):**
  - RDS/GPR Functional Integration (JPL), 6/30/2020
  - Field Testing at analog sites/Optimization (JPL), 6/30/2020

**TRL (2) to (4)**