Wednesday, October 21, 2015
RESOURCE LONGEVITY AND PROSPECTING
1:30 p.m. USRA Conference Center

Upcoming lunar missions/concepts/instrumentation for resource prospecting are presented along with implication for volatile deposit longevity.

Chairs: **Jerry Sanders**
John Gruener

1:30 p.m. Colaprete A. * Elphic R. C. Andrews D. Sanders G. McGovern A. Vaughn R. Heldmann J. Trimble J.
Resource Prospector: Mission Goals, Relevance, and Site Selection **[#2050]**
The talk will review the Resource Prospector goals, relevance, and current status of site selection.

1:45 p.m. Andrews D. * Colaprete A. Quinn J. Bluethmann B. Chavers G. Trimble J.
Resource Prospector: Mission Overview and Current Activities **[#2053]**
This abstract will provide an overview and current status of the Resource Prospector mission.

2:00 p.m. McGovern J. A. * Colaprete A. Bussey D. B. Stickle A.
Resource Prospector: A Landing Site Survey **[#2079]**
This work describes a process used on RP to search for landing sites near the lunar poles with access to: evidence of surface/subsurface volatiles, reasonable terrain for traverse, direct to Earth communications, and sunlight for power.

2:15 p.m. Quinn J. Smith J. * Captain J. Paz A. Colaprete A. Elphic R. Zacny K.
Resource Prospector: The RESOLVE Payload **[#2046]**
NASA has been developing a lunar volatiles exploration payload named RESOLVE. Now the primary science payload on-board the Resource Prospector (RP) mission, RESOLVE, consists of several instruments that evaluate lunar volatiles.

2:30 p.m. Elphic R. C. * Colaprete A. Heldmann J. L. Deans M. C.
Field Testing Near-IR and Neutron Spectrometer Prospecting: Applications to Resource Prospector on the Moon **[#2045]**
The Resource Prospector payload includes a near-infrared spectrometer and neutron spectrometer for surficial and near-surface volatile prospecting. Here we describe results from a field test in the Mojave Desert using the two instruments.

2:45 p.m. Teodoro L. F. A. * Elphic R. C. Colaprete A. Roush T. Kleinhenz J. E.
Molecular Diffusion of H_2O in Lunar Regolith During Lunar Resources Prospector Mission Sample Acquisition **[#2058]**
In the context of NASA's Resource Prospector (RP) mission to the lunar poles, we study 3-D models of volatile transport in lunar regolith.

3:00 p.m. Zacny K. * Paulsen G. Quinn J. Smith J. Kleinhenz J.
Lunar Resource Prospector Drill **[#2006]**
We report on development and testing of a 1 m class drill for capture and transfer of volatiles-rich sample onboard the Resource Prospector rover.

3:15 p.m. Heldmann J. L. * Colaprete A. C. Elphic R. C. Bussey B. McGovern A. Beyer R. Lees D. Deans M. C. Otten N. Jones H. Wettergreen D.
Rover Traverse Planning to Support a Lunar Polar Volatiles Mission **[#2007]**
We present notional traverse plans for NASA's Resource Prospector mission for a lunar polar rover and utilize this mission architecture and associated constraints to evaluate whether a suitable landing site exists to support an RP flight mission.

3:30 p.m. Carpenter J. D. * Fisackerly R. Aziz S. Houdou B.
Exploring Cold Trapped Volatiles from Stationary Landers and Mobile Rovers: ESA Activities for Resource Prospecting at the Poles **[#2027]**
An overview of ESA activities in the area of measuring cold trapped volatiles in-situ, including the PROSPECT package for the Russian Luna-27 mission and the development of mobile platform capabilities that could be applied to future missions.

3:45 p.m. Visscher P. * Edmundson P. Ghafoor N. Jones H. Kleinhenz J. Picard M.
Lunar Rover Drivetrain Development to TRL-6 **[#2009]**
The LRPDP and SPRP rovers are designed to provide high mobility and robustness in a lunar working environment and are compatible with various lunar surface activities. TRL-6 testing is scheduled for late 2015 on the rover drivetrain components.

4:00 p.m. Jordan A. P. * Wilson J. K. Stubbs T. J. Schwadron N. A. Spence H. E. Izenberg N. R.
Implications of Dielectric Breakdown Weathering for the Lunar Polar Regolith **[#2011]**
Dielectric breakdown weathering may significantly affect lunar regolith in permanently shadowed regions. We estimate how it may evolve the distribution of grain sizes and properties, which could have operational implications for rovers.

4:15 p.m. Chin G. * Sagdeev R. Su J. J. Murray J.
Probing Planetary Bodies for the Structure of Subsurface Volatiles: Geant4 Models of Fast, Epithermal, and Thermal Neutron Emission of Varying Stratigraphy of Water Bearing Regoliths **[#2023]**
Varying ratios of thermal versus epithermal neutron emissions are diagnostics of the depth in which hydrogen/water layers are buried within the top 1-2 meters of the regolith.

4:30 p.m. DISCUSSION