Thursday, March 10, 2011
LUNAR SURFACE AND VOLATILES:
INTERACTION WITH THE SPACE ENVIRONMENT
1:30 p.m. Waterway Ballroom 6

Chairs: **Arlin Crotts**
Georgiana Kramer

1:30 p.m. McCord T. B. * Combe J.-Ph.
Relationships of Widespread OH Presence in the Lunar Surface Materials with Lunar Physical Properties **[#1483]**
Correlations of OH-related spectral absorptions with lunar physical properties suggest solar wind proton-induced hydroxylation as the source of OH. This process may be a source for other OH-related findings and may operate on other airless bodies.

1:45 p.m. Haruyama J. * Morota T. Shirao M. Hiesinger H. van der Bggert C. H. Pieters C. M. Lucey P. G. Ohtake M. Nishino M. Matsunaga T. Yokota Y. Miyamoto H. Iwasaki A.
Water in Lunar Holes? **[#1134]**
Recently, three deep holes of larger than tens of meters in diameter were discovered on the Moon. In these holes, we can expect existence of an amount of hydrogen and/or water molecules that would be a clue to the origin of water on the Moon.

2:00 p.m. Combe J.-Ph. * Hayne P. O. Paige D. McCord T. B.
Spectral Thermal Emission of the Lunar Surface: Implications for Mapping of the Surficial Volatiles and Monitoring Variations with Time of Day **[#2573]**
Removal of thermal contribution in lunar surface reflectance spectra is critical for characterizing the composition. We use Diviner temperature measurements to correct M^3 spectra and to monitor time of day variations of the 3-µm absorption band.

2:15 p.m. Ichimura A. S. * Zent A. P. Quinn R. C. Taylor L. A.
Formation and Detection of OH/OD in Lunar Soils After 1H2+/D2+ Bombardment **[#2724]**
Evidence for newly formed OH/OD signals in Apollo 17 mare soil after exposure to 2.3 keV H^{2+}/D^{2+} ion beams, respectively, is presented. Our study supports the solar wind hypothesis that accounts for the formation of OH/H_2O on the lunar surface.

2:30 p.m. Jensen E. A. * Vilas F.
Lunar Hydration and the Plasma Environment: What Can We Learn from Lunar Transits Through the Earth's Magnetotail? **[#2699]**
Solar wind chemical alteration is considered a source of lunar hydration. For six days out of each orbit, the Moon is immersed within the Earth's magnetosphere; this plasma population is significantly different from the solar wind allowing comparison.

2:45 p.m. Keller J. W. * Killen R. M. Stubbs T. J. Farrell W. M. Halekas J. S.
Lunar Ion Transport Near Magnetic Anomalies: Possible Implications for Swirl Formation **[#1817]**
We present a new hypothesis, based on low energy ion transport, explaining the bright swirling features on the lunar surface in areas around the Moon that are associated with crustal magnetic anomalies.

3:00 p.m. Farrell W. M. * Killen R. M. Vondrak R. R. Hurley D. M. Stubbs T. J. Delory G. T. Halekas J. S.
Could Lunar Polar Ice be a 'Fountain' Source for the Dayside Water Veneer? **[#1770]**
We examine the possibility that impact vaporization of the polar icy regolith provides energy to transport water molecules to mid-latitude surfaces, creating the dynamic water/OH veneer.

3:15 p.m. Mitrofanov I. G. * Litvak M. L. Sanin A. B. Golovin D. V. Boynton W. V. Chin G. Garvin J. B. Evans L. G. Harshman K. Kozyrev A. S. McClanahan T. Sagdeev R. Shevchenko V. Shvetsov V. Starr R. Trombka J.
Neutron Suppression Regions at Lunar Poles, as Local Areas of Water-Rich Permafrost **[#1787]**
Recent results of LRO/LEND neutron mapping are presented, which allows us/one to identify local Neutron Suppression n Regions (NSR) at lunar poles with high content of hydrogen. The physics of their origin and necessary conditions of water preservation in NSR are discussed.

3:30 p.m. Thomson B. J. * Bussey D. B. J. Cahill J. T. S. Neish C. Patterson G. W. Spudis P. D.
The Interior of Shackleton Crater as Revealed by Mini-RF Orbital Radar **[#1626]**
Mini-RF on LRO has obtained complete radar coverage of the interior of Shackleton Crater near the lunar south pole. The data reveal patchy and non-uniform occurrences of material with anomalous polarization properties.

3:45 p.m. Hurley D. M. * Gladstone G. R. Stern S. A. Retherford K. D. Versteeg M. Slater D. Davis M. Miles P. Horvath D. Greathouse T. K. Egan A. F. Steffl A. Parker J. Wm. Kaufmann D. Feldman P. D. Pryor W. Hendrix A.
Comparing LAMP Data to Models of the LCROSS Vapor Plume **[#1894]**
We model Hg/Ca/Mg/H_2/CO gas plume evolution from LCROSS. We find a blast velocity of 3–4 km/s consistent with LAMP observations. Fewer particles achieve great distance at angles close to the horizontal than expected from an isotropic distribution.

4:00 p.m. Elphic R. C. * Teodoro L. F. A. Eke V. R. Paige D. A. Siegler M. A. Colaprete A.
The Average Water Concentration Within Cabeus Crater: Inferences from LRO/Diviner, LCROSS and Lunar Prospector **[#2751]**
The relatively high volatile abundances inferred from LCROSS measurements cannot be representative of a homogeneous distribution within the Cabeus permanently shadowed region, but lateral and/or depth variations can account for the discrepancy.

4:15 p.m. Zhang S. * Keller L. P.
Space Weathering Effects in Lunar Soils: The Roles of Surface Exposure Time and Bulk Chemical Composition **[#1947]**
Transmission electron microscopy was used to study the roles of surface exposure time (estimated by solar flare particle tracks) and bulk chemical composition on space weathering effects. Samples involved in this study are 10084, 71061, and 72051.

4:30 p.m. Frasl B. * Honda M. Ireland T. R.
Isotopic Compositions of Solar He and Ne in Single Lunar Olivine Grains **[#1605]**
Total fusion experiments have been conducted on 24 single lunar olivine grains, from soil 10084, to extract solar noble gases. This pilot study was undertaken to test the analytical setup and to confirm the level of data quality of the analysis.