Tuesday, March 8, 2011
POSTER SESSION I: THERMAL AND MAGMATIC EVOLUTION OF THE MOON
6:00 p.m. Town Center Exhibit Area

Audet P. Johnson C. L.
Lithospheric Structure of the Moon and Correlation with Deep Moonquake Source Regions **[#1742]**
We investigate relationships between deep moonquake source regions and lithospheric and crustal structure from a wavelet analysis of gravity and topography.

Huang Q. Wieczorek M. A.
Constraints of the Density and Porosity of the Lunar Highlands Crust from Gravity and Topography **[#1879]**
In order to estimate the bulk density of the upper crust, localized spectral analysis has been applied to several highland regions on the Moon. Combined with pore-free density from geochemistry, porosity of the upper crust is implied to be 2–3%.

Fuller M. Weiss B. P.
The Paleomagnetic Record of the Apollo Breccias. **[#1945]**
The paleomagnetism of the breccias is reviewed and the strength of a lunar dynamo prior to the mare formation is assessed.

Schmerr N. C. Matzel E. Ford S. R.
The Effect of Free-Surface Topography on Seismic Waves in the Moon **[#1961]**
We forward model the effects of surface topography on seismic wave propagation in the Moon. Our models constrain the nature of scattering in the lunar crust and will guide future missions deploying seismic instrumentation on the Moon.

Laneuville M. Wieczorek M. A.
The Heat Flow of the Moon: Influence of Long Term Orbital Signals **[#2296]**
In this project, we investigate the influence of the modulation of the annual thermal wave's amplitude by the 18.6 year precession of the lunar nodes on the heat flow estimate.

O'Sullivan K. M. Neal C. R. Simonetti A.
Investigating the Lunar Magma Ocean Hypothesis with Anorthosite 15415 and Troctolite 76535 **[#2570]**
We explore the lunar magma ocean hypothesis using lunar highland samples 15415 and 76535.

Tronche E. J. van Westrenen W.
The Lunar Magma Ocean: An Experimental Solidification Study **[#1415]**
We experimentally solidified the lunar magma ocean, following an equilibrium crystallization in a first 50% step and *in situ* crystallization for the 10 other 5%. The cumulate pile and the residual liquids are different than from previous studies.

Elardo S. M. Shearer C. K. Jr. Burger P. V.
A Petrologic Comparison of Isotopically Distinct Lunar Low-Ti Basaltic Meteorites NWA 032 and LAP 02205 **[#2582]**
Lunar meteorites NWA 032 and LAP 02205 share many compositional and mineralogical similarities, yet are isotopically distinct. We present the preliminary findings of a petrologic comparison of these basalts to investigate a possible relationship.

Wang Y. Hsu W. Guan Y.
Petrology and Geochemistry of the Lunar Basaltic Meteorite Northwest Africa 4734 **[#1593]**
Petrology, mineralogy, and rare earth element geochemistry of the lunar basaltic meteorite Northwest Africa (NWA) 4734 are reported here. NWA 4734 has high affinities to LaPaz Icefield 02205 and had experienced late-stage assimilation processes with KREEP-rich materials.

Neal C. R. Donohue P. Fagan A. Hui H. O'Sullivan K.
Using Quantitative Petrography to Distinguish Between Pristine Basalts and Impact Melts from the Moon **[#2668]**
Crystal size distributions of plagioclase are used to distinguish between pristine basalts and basaltic impact melts.

Fagan A. L. Neal C. R. Simonetti A.
Distinguishing Between Apollo 14 High-Alumina Basalts and Olivine Vitrophyres: Textural and Chemical Analyses of Olivines **[#2149]**
We use chemical and textural analyses of olivines to distinguish between the Apollo 14 impact melt-generated olivine vitrophyres and the pristine, High-Alumina mare basalts.

Hui H. Oshrin J. G. Neal C. R.
Investigation into the Petrogeneses of Apollo 14 High-Alumina Basaltic Melts Through Crystal Stratigraphy **[#1461]**
We investigate the petrogenetic processes of Apollo 14 high-Al basaltic melts using compositions of plagioclase crystals.

Nagaoka H. Karouji Y. Takeda H. Fagan T. J. Ebihara M. Hasebe N.
Co-Existing Pyroxenes in the Northwest Africa 2977 with Reference to the Source Region **[#1864]**
Lunar meteorite Northwest Africa 2977 includes two lithologies. Lithology (1) is similar to a slowly-cooled mare basalt. Lithology (2) is an intrusive rock crystallized more rapidly than Mg-suite rocks.

Snape J. F. Beaumont S. Burgess R. Crawford I. A. Joy K. H.
An Evaluation of Techniques Used in the Age and Petrologic Analysis of Apollo 12 Basalts **[#2011]**
We have analyzed the petrology and age of three well-studied Apollo 12 basaltic samples. Comparison of our data with that of previous studies indicates a broad agreement between our techniques and those of other researchers.

Lindsay F. N. Herzog G. F. Albarède F. Korotev R. L.
Elemental and Isotopic Abundances of Fe, Cu and Zn in Low- Ti Basalts **[#1907]**
Cu and/or Zn isotope abundances in 3 low-Ti lunar basalts are comparable with values reported for high-Ti basalts. δ^{66}Zn and δ^{65}Cu correlate weakly at best, hinting at the presence of distinct components within the basalts.

Donohue P. H. Neal C. R.
Textural Analyses of Apollo 17 High-Titanium Basalts Using Crystal Size Distributions **[#2568]**
This study investigates the petrogenesis of all classified Apollo 17 high-titanium basalts (Types A, B1, B2, C, and D) through the use of crystal size distributions for ilmenite, plagioclase, and armalcolite.

Vander Kaaden K. E. Agee C. B. van Kan Parker M.
The Effect of Titanium on Lunar Magma Compressibility at High Pressure **[#1295]**
The lunar volcanic glasses range in TiO_2 content from 0.26–16.4 wt%, with this study focusing on the Apollo 17 "orange glass," which has 9.1 wt% TiO_2. The goal is to determine the role of TiO_2 on lunar volcanic glass density at elevated P-T.

Nekvasil H. McCubbin F. M. Ustunisik G.
Magmatic Degassing in Planetary Bodies: What Apatite can Tell Us **[#2240]**
Apatite has the potential to retain information on degassing of water, Cl, and F. Lunar apatite records a history of early dehydration followed by loss of a brine during second boiling.

Ustunisik G. Nekvasil H. Lindsley D. H.
Exploring the Effect of Cl, F, H_2O, and S During Experimental Degassing of Lunar Magmas **[#2643]**
Degassing experiments were conducted at <1 bar on synthetic Apollo sample 14053 with Cl, F, H_2O, and S. After six hours, much of the water, S, and halogens were lost, causing significant changes in relative melt and apatite volatile contents.

Ross D. K. Thomas-Keprta K. L. Rahman Z. Wentworth S. J. McKay D. S.
FE-SEM, FIB and TEM Study of Surface Deposits on Apollo 15 Green Glass Volcanic Spherules **[#2203]**
Surface deposits on lunar pyroclastic glass spherules have been characterized using HRTEM. These deposits are dominated by Zn and S, but also include Mg and exhibit a rather complex stratigraphy.

Gaddis L. R. Klem S. Gustafson J. O. III Hawke B. R. Giguere T. A.
Alphonsus Dark-Halo Craters: Identification of Additional Volcanic Vents **[#2691]**
This study presents evidence for at least two previously unrecognized vents in the floor of Alphonsus Crater. Results suggest that many such features and associated pyroclastic deposits are likely to be identified with the wealth of new lunar remote sensing data.

Chauhan P. Kaur P. Srivastava N. Bhattacharya S. Lal D. Ajai Kiran Kumar A. S.
Studies of Lunar Dark Halo Craters in North Western Mare Nectaris Using High Resolution Chandrayaan-1 Data **[#1338]**
In this study, we present the results from remote sensing data of very high resolution (both spatial and spectral) for localized dark mantle deposits (LDMD) around crater Beaumont-L in the northwestern part of Mare Nectaris from Chandrayaan-1.

Gaddis L. van der Bogert C. H. Cheng Y. Huertas A. Skinner J. Hawke B. R. Giguere T.
Small Crater Densities Near Apollo 17: Clues to Properties of Lunar Pyroclastic Deposits **[#2584]**
New crater density data show a deficiency of small craters on pyroclastic mantled soils. New high-resolution remote sensing data and automated crater counting allow us to examine the viability of using small crater populations to identify lunar pyroclastic deposits.

Gustafson J. O. Bell J. F. III Gaddis L. R. Hawke B. R. Giguere T. A. LROC Science Team
A Search for Potential Newly Identified Lunar Pyroclastic Deposits with LROC Data **[#2434]**
New LRO camera (LROC) data are facilitating the search for lunar pyroclastic deposits not previously catalogued. Examples of potential newly identifed pyroclastic deposits are presented.

Weider S. Z. Kellett B. J. Swinyard B. M. Crawford I. A. Joy K. H.
Western Oceanus Procellarum as Seen by C1XS on Chandrayaan-1 **[#1684]**
We present lunar XRF data from C1XS for a ground track through Oceanus Procellarum as MgO/SiO_2 and Al_2O_3/SiO_2 ratios, which are compared to existing remotely sensed data from Lunar Prospector and lunar sample lithology compositions.

Chauhan P. Srivastava N. Kaur P. Bhattacharya S. Ajai Kiran Kumar A. S.
Goswami J. N. Navalgund R. R.
Evidences of Multiphase Modification over the Central Peak of Tycho Crater on Moon from High Resolution Remote Sensing Data **[#1341]**
Results of an integrated analysis of the central peak of Tycho from TMC data onboard Chandrayaan-1, NAC images of LROC, and Multi-band Imager (MI) data from SELENE are presented to understand processes involved in multiphase modifications of the central peak of Tycho.

Arya A. S. Thangjam G. Rajasekhar R. P. Ajai Gopala Krishna B. Amitabh
Kiran Kumar A. S. Navalgund R. R.
Morphometric and Rheological Analysis of an Effusive Dome in Marius Hills Using Chandrayaan-1 TMC Data **[#1470]**
This abstract summarizes the morphometric and rheological analysis of a dome in Marius Hills, Oceanus Procellarum.

Carter L. M. Campbell B. A. Hawke B. R. Bussey D. B. J.
A Radar Survey of Lunar Dome Fields **[#1937]**
Lunar domes have differing radar backscatter characteristics that may provide clues to their formation and evolution. We present initial results from a survey that includes the Marius Hills, Cauchy dome field, and domes near Hortensius and Vitruvius.

Hawke B. R. Giguere T. A. Lawrence S. J. Glotch T. D. Greenhagen B. T. Hagerty J. J.
Braden S. E. Gaddis L. R. Tran T. Joliff B. L. Lucey P. G. Stopar J. D. Peterson C. A. Paige D. A.
Robinson M. S. The LROC Science Team
Hansteen Alpha: A Silicic Volcanic Construct on the Moon **[#1652]**
LROC images, LRO Diviner data, and Clementine UVVIS images were used to investigate Hansteen α, a Th-rich, silicic volcanic construct that was emplaced during the late Imbrian epoch.

Tran T. Robinson M. S. Lawrence S. J. Braden S. E. Plescia J. Hawke B. R. Jolliff B. L.
Stopar J. D. LROC Team
Morphometry of Lunar Volcanic Domes from LROC **[#2228]**
We investigated the morphometry and morphology of Gruithuisen, Mairan, Compton-Belkovich, Hortensius, Rümker Hills, and Marius Hills domes using Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC) derived digital terrain models (DTMs).

Trang D. Gillis-Davis J. J. Hawke B. R. Bussey D. B. J.
The Origin of Lunar Concentric Craters **[#1698]**
Remote sensing data were used to study the origin of lunar concentric craters. Various processes were investigated to find the most probable mechanism. Results indicate igneous intrusion is the likely candidate for the origin of concentric craters.

Staid M. Isaacson P. Petro N. Boardman J. Pieters C. M. Head J. W. Sunshine J.
Donaldson Hanna K. Taylor L. A.
The Spectral Properties of Ina: New Observations from the Moon Mineralogy Mapper **[#2499]**
M^3 observations of Ina are consistent with the presence of freshly exposed high-Ti basalts within the structure's blocky floor materials. These results support previous interpretations that portions of Ina's floor are relatively young.

Lawrence S. J. Denevi B. W. Hawke B. R. Giguere T. A. Robinson M. S. Stopar J. D. Tran T. Jolliff B. L. Bussey D. B. J. Stelling R.
Size Frequency Distributions of Blocks on Lunar Volcanic Landforms: Results from LROC **[#2422]**
We present the results from a comprehensive effort to obtain detailed size-frequency distributions for blocks associated with volcanic landforms by digitizing blocks from LROC NAC images and discuss implications for understanding the geology of the Marius Hills region.

Meyer J. A. Hurtado J. M. Jr.
New Methods for Discovery and Characterization of Lunar Lava Tubes Using Lunar Reconnaissance Orbiter Data **[#1424]**
We describe how Lunar Reconnaissance Orbiter instrumentation can be used to discover and more accurately study lunar lava tubes.