Thursday, March 22, 2012
LUNAR PETROLOGY AND GEOCHEMISTRY: FROM CORE TO CRUST
1:30 p.m. Waterway Ballroom 4

Chairs: **Willem van Westrenen**
Clive Neal

1:30 p.m. van Westrenen W. * de Meijer R. J. Anisichkin V. F. Voronin D. V.
Forming the Moon from Terrestrial Silicate-Rich Material — 2012 Edition **[#1738]**
Moon formation models have to be consistent with lunar chemistry. Current versions of the giant impact model are not. We provide a (radical) alternative hypothesis in which the Moon is formed from terrestrial material.

1:45 p.m. Rai N. * van Westrenen W.
Constraints on the Formation of a Lunar Core from Metal-Silicate Partitioning of Siderophile Elements **[#1781]**
Using metal-silicate partitioning behaviour of siderophile elements, we model lunar core formation and examine whether a consistent set of P-T-fO_2-X conditions can be obtained to match observed siderophile-element depletions in the silicate Moon.

2:00 p.m. Sprung P. * Kleine T. Scherer E. E.
Lu-Hf Evolution of the Moon — Importance of Neutron Capture Effects **[#2194]**
New Hf-isotope and Lu-Hf data show that neutron capture (NC) has falsified the measured Lu-Hf systematics in 9 out of 13 analyzed lunar rock samples. This frequent occurrence of NC effects calls for a reinvestigation of the lunar Lu-Hf systematics.

2:15 p.m. Rapp J. F. * Draper D. S.
Experimental Fractional Crystallization of the Lunar Magma Ocean **[#2048]**
We have experimentally simulated fractional crystallization of the lunar magma ocean, and present the resultant crystallizing assemblages. These experiments will provide insight into the mechanisms of lunar evolution.

2:30 p.m. Gross J. * Treiman A. H. Mercer C. N. M.
Sinking the Lunar Magma Ocean: New Evidence from Meteorites and the Return of Serial Magmatism **[#2306]**
Current understanding of lunar evolution is built on the lunar magma ocean hypothesis and the assumption that ferroan anorthosites are globally distributed. Anorthosites in lunar meteorites are inconsistent with a global lunar magma ocean.

2:45 p.m. Liang Y. * Yao L. Sun C. Hess P. C.
A REE-in-Two-Pyroxene Thermometer for Mafic and Ultramafic Rocks from the Earth, Moon (FANs and Mg-Suite Rocks), and Other Planetary Bodies: Promises and Challenges **[#1987]**
A REE-in-two-pyroxene thermometer for mafic and ultramafic rocks is developed. Applications to samples from Earth and the Moon (FANs) show both promising and surprising results that may shed new light on the thermal history of the samples.

3:00 p.m. Hui H. * Neal C. R.
Preliminary Study of Olivine Melt Inclusions of Apollo 12 and 14 Basalts **[#2563]**
The goal of this study is to use composition of melt inclusion to infer parental melt composition. The major elements suggest that the magma was saturated with several phases at the time of incorporation into the olivine crystals.

3:15 p.m. Elardo S. M. * McCubbin F. M. Shearer C. K. Jr.
The Origin of Chromite Symplectites in Lunar Troctolite 76535: A New Look at an Old Rock **[#1028]**
The origin of Cr-rich symplectites in 76535 has been debated and bears relevance to the extremely low Cr-content of its cumulus olivine. Here we assess previously proposed formation mechanisms and show that open system addition of Cr may be required.

3:30 p.m. Shearer C. K. Jr. * Borg L. E. Burger P. V. Connelly J. N. Bizarro M.
Timing and Duration of the Mg-Suite Episode of Lunar Crustal Building. Part 1: Petrography and Mineralogy of a Norite Clast in 15445 **[#1421]**
We examine the ambiguity between crystallization ages derived from FANs and Mg-suite lithologies and implications for building the early lunar crust.

3:45 p.m. Treiman A. H. * Gross J.
Lunar Cordierite-Spinel Troctolite: Igneous History, and Volatiles **[#1196]**
Apollo sample 15295,101 contains a cordierite spinel troctolite (Marvin et al., 1989). The cordierite is volatile-free, at least by EMP — more precise analyses are in progress. The troctolite may be a partial melt of a spinel-rich igneous cumulate.

4:00 p.m. Neal C. R. * Davidson J.
A New Look at the Origin and Evolution of Mare Basalts Using REE Profiles **[#1832]**
A method is presented to use the shape and slope of REE profiles to examine source characteristics and post-magma-generation processes.

4:15 p.m. Donohue P. H. * Neal C. R.
Apollo 17 High-Ti Basalt Evolution: Whole Rock vs. Mineral Crystallization Trends **[#2827]**
In-situ trace element geochemical studies are a leading edge in petrologic research, allowing a high level of fidelity in evaluating basalt evolution. We analyzed major phases in a representative suite of samples to unravel A17 basalt crystallization.

4:30 p.m. Zeigler R. A. * Korotev R. L. Jolliff B. L.
Pairing Relationships Among Feldspathic Lunar Meteorites from Miller Range, Antarctica **[#2377]**
The Miller Range ice fields have yielded five feldspathic lunar meteorites. Here we examine the pairing relationships among the Miller Range feldspathic lunar meteorites using petrography in concert with trace- and major-element compositions.