Friday, March 16, 2007
LUNAR INTERIOR AND DIFFERENTIATION
8:30 a.m. Amphitheater

Chairs: **L. L. Hood**
Y. Liang

8:30 a.m. Khan A. Connolly J. A. D. * Olsen N. Mosegaard K.
Constraining the Composition and Thermal State of the Moon from an Inversion of Electromagnetic Lunar Day-Side Transfer Functions **[#1086]**
We present a general method to constrain planetary composition and thermal state from an inversion of long-period electromagnetic sounding data. As an example of our approach, we reexamine the problem of inverting lunar day-side transfer functions to constrain the internal structure of the Moon.

8:45 a.m. Saito Y. * Tanaka S. Takita J. Horai K. Hagermann A.
Lost Apollo Heat Flow Data Suggest a Different Lunar Bulk Composition **[#2197]**
Lunar surface heat flow values were measured on the Apollo missions between 1971 and 1977. However the late-term data have been lost. We succeeded in archiving the data after March 1, 1976. We will introduce the new set of archived data.

9:00 a.m. Hood L. L. * Artemieva N. A. Purucker M. E. Sabaka T. J.
Antipodal Seismic Effects of Lunar Basin-forming Impacts: Enhanced Magnetic and Geochemical Anomalies Peripheral to the South Pole-Aitken Basin **[#1381]**
In addition to being concentrated antipodal to young large basins, lunar magnetic anomalies are also concentrated along the northwestern periphery of the SPA basin. The origin of these anomalies and related geochemical anomalies is discussed.

9:15 a.m. Frohlich C. * Nakamura Y.
Geographic Variations in the Tidal Control of Deep Moonquake Nests and Speculation About Their Mechanical Origin **[#1749]**
We group nests of deep moonquakes into categories depending on how their occurrence depends on the anomalistic or draconic month. For well-located nests having 20 or more individual events, we show that epicenters of some categories are geographically separated from one another on the Moon.

9:30 a.m. Richmond N. C. * Hood L. L. Blewett D. T.
A New Analysis of the Lunar Prospector Magnetometer Data: Application to the Study of Reiner Gamma-type Swirls **[#1410]**
We present new mapping results using the low altitude Lunar Prospector magnetometer measurements obtained in 1999. Maps of the improved coverage will be presented and the results applied to the study of high albedo swirls of the Reiner Gamma-type.

9:45 a.m. Garrick-Bethell I. * Weiss B. P.
Early Lunar Magnetism **[#2405]**
We present new paleomagnetism results for some of the oldest rocks in the Apollo collection. We find evidence for strong magnetic fields before 4.1 Ga, making this the oldest paleointensity determination for a large, differentiated body.

10:00 a.m. Krawczynski M. J. * Grove T. L.
A Common Depth of Origin for Lunar High-Ti Glasses **[#1235]**
Recent experiments have revealed a similar depth of origin for the Apollo 14 black glass, Apollo 15 red glass, and Apollo 17 orange glass. Implications for similar multiple saturation points of lunar high-Ti glasses on magma ocean processes is discussed.

10:15 a.m. Barr J. A. Grove T. L. *
Experimental Petrology of Apollo 15 Group A Ultramafic Green Glasses: In Search of a Primordial Lunar Interior **[#1194]**
The Apollo 15 Group A glasses may represent melts of primordial lunar mantle. These glasses are close to multiple saturation with olivine, orthopyroxene and garnet at 1520°C and 2.5 GPa.

10:30 a.m. Saal A. E. * Hauri E. H. Rutherford M. J. Cooper R. F.
The Volatile Contents (CO_2, H_2O, F, S, Cl) of the Lunar Picritic Glasses **[#2148]**
We present the first report of magmatic water in lunar basalts using the primitive lunar volcanic glasses from Apollo 15 and 17 landing sites. We complement the data with new data on Cl, F, S. Our new technique improve the detection limit for volatiles by almost an order of magnitude.

10:45 a.m. Liang Y. * Lo Cascio M. Hess P. C.
Preferential Assimilation of Armalcolite and Ilmenite During Melt Migration and Melt-Rock Reaction in the Lunar Mantle: An Experimental Study **[#1075]**
Armalcolite and ilmenite can be preferentially dissolved during melt transport and melt-rock reaction in the lunar harzburgitic mantle, selectively assimilating TiO_2, FeO, and SiO_2 to the reacting low TiO_2 magma.

11:00 a.m. Touboul M. * Kleine T. Bourdon B. Palme H.
The Duration of Magma Ocean Crystallization on the Moon — Evidence from New W Isotope Data for Metals from High-Ti and Low-Ti Mare Basalts **[#2385]**
We obtained new W isotope data for metals from low- and high-Ti mare basalt. These data are used here to assess the duration of LMO crystallization and to address the issue why the Hf-W ages of the LMO (30–50 Myr) is inconsistent with its ^{146}Sm-^{142}Nd age (~215 Myr).

11:15 a.m. Taylor D. J. * McKeegan K. D. Harrison T. M. McCulloch M.
^{176}Lu-^{176}Hf in Lunar Zircons: Identification of an Early Enriched Reservoir on the Moon **[#2130]**
We analyzed ~80 Apollo 14 zircons for Lu-Hf isotopes, U-Pb ages and Ti/REE concentrations. Ages range from 3.9 Ga to 4.4 Ga, with ε_{Hf} values as low as –7, indicating that the zircons crystallized from an early enriched reservoir.

11:30 a.m. Edmunson J. * Nyquist L. E. Borg L. E.
Sm-Nd Isotopic Systematics of Troctolite 76335 **[#1962]**
Samarium-neodymium isotopic systematics of mineral fractions from lunar Mg-suite troctolite 76335 yield a crystallization age of 4278 ± 60 Ma and an initial ε_{Nd} of 0.06 ± 0.39.