Monday, March 7, 2011
FORMATION AND EVOLUTION OF THE MOON I:
FROM GIANT IMPACT TO DIFFERENTIATION
2:30 p.m. Waterway Ballroom 6

Chairs: **Renee Weber**
Willem van Westrenen

2:30 p.m. Reufer A. * Meier M. M. M. Benz W. Wieler R.
Obtaining Higher Target Material Proportions in the Giant Impact by Changing Impact Parameters and Impactor Composition **[#1136]**
In the current giant impact scenario, the Moon is composed mainly from impactor material. This contradicts heavily the isotopic signature of the Moon. We show alternate models with considerably higher amounts of target material in the Moon.

2:45 p.m. Williams J. G. Boggs D. H. Ratcliff J. T. *
Lunar Moment of Inertia and Love Number **[#2610]**
New data improves lunar science results. A fluid core and tidal dissipation are inferred from dissipation effects on orientation. Detection of core-mantle boundary flattening is also fluid core evidence. A new Love number and solid moment are given.

3:00 p.m. Ward Wm. R. *
Vertical Structure of a Two-Phase Pre-Lunar Disk **[#1319]**
The post-impact evolution of a two-phase pre-lunar disk is examined assuming that the vertical temperature profile is regulated by the vapor-melt phase transition and that the spreading rate of the disk is radiation limited.

3:15 p.m. Zhang J. * Dauphas N. Davis A. M.
Titanium Isotope Homogeneity in the Earth-Moon System: Evidence for Complete Isotope Mixing Between the Impactor and the Protoearth **[#1515]**
High-precision Ti-isotope studies show that the Moon has the same ε^{50}Ti as the Earth within ~0.1 ε-units. These results provide solid evidence showing that the isotopic compositions of Earth and the Moon were well mixed, irrespective of elemental volatility.

3:30 p.m. Desch S. J. * Taylor G. J.
A Model of the Moon's Volatile Depletion **[#2005]**
We present a preliminary model of the protolunar disk and quantify the depletion of volatiles due to hydrodynamic escape of the disk's atmosphere. Depletion of water from a terrestrial value ~500 ppm, to a value <10 ppm, is predicted.

3:45 p.m. Weber R. C. * Lin P. Garnero E. J. Williams Q. Lognonne P.
Seismic Evidence for the Lunar Core **[#1903]**
In this work, we present a re-analysis of the Apollo lunar seismic data to search for evidence of layering in the deepest Moon, and find evidence of a solid inner and fluid outer core, overlain by a partial melt boundary layer.

4:00 p.m. Dwyer C. A. * Nimmo F. Stevenson D. J.
Driving an Early Lunar Dynamo via Mechanical Stirring **[#2044]**
We find, using an energetics approach, that differential motion across the lunar core-mantle boundary could have stirred a liquid (outer) core sufficiently to generate a dynamo at ancient times.

4:15 p.m. Le Bars M. * Cébron D. Wieczorek M. Karatekin O. Laneuville M.
An Impact Driven Dynamo for the Early Moon **[#2291]**
We propose an alternative mechanism for generating a dynamo in the early Moon, supplied by tidal instability in its core once unlocked from synchronization by large impacts. Surface field of several microT are obtained for several 10000 years.

4:30 p.m. Day J. M. D. * Walker R. J.
The Highly Siderophile Element Composition of the Lunar Mantle **[#1288]**
Available HSE data indicates the lunar mantle has <20× lower abundances of these elements than the terrestrial mantle. We review the distribution of these elements in mantle source regions and constraints placed on lunar evolution.