Monday, August 5, 2013
LARGE IMPACT BASINS:
THEIR FORMATION, STRUCTURE, AND ENVIRONMENTAL EFFECTS I
8:30 a.m. Fraser Auditorium

New data, models, and mapping are used to study the formation, structure, and environmental effects of large impact basins on the Moon, Earth and Mercury.

Chairs: **David Kring**
Kai Wünnemann

8:30 a.m. Zuber M. T. * GRAIL Science Team
Gravity Recovery and Interior Laboratory (GRAIL): Analysis Status and Implications for Understanding the Role of Impacts in Lunar and Planetary Evolution **[#3048]**
High-resolution models of the lunar gravity field from GRAIL are enabling geophysical analyses that elucidate the role of large impacts on the evolution of the Moon, and by extension, other terrestrial planets.

9:00 a.m. Collins G. S. * Wieczorek M. A. Miljković K.
Large Impact Crater Formation on the Moon: Comparing Numerical Models with GRAIL-Derived Crustal Thickness Profiles **[#3072]**
We use gravity and crustal thickness anomalies measured by GRAIL, which provide new constraints on crustal deformation beneath large lunar craters, as a test of models of crater formation.

9:20 a.m. Potter R. W. K. * Kring D. A. Collins G. S. Kiefer W. S. McGovern P. J.
Orientale Basin: Formation Processes and Structure Inferred from Hydrocode Modeling **[#3026]**
By constraining hydrocode models to, primarily, gravity-inferred crustal structure, we present best-fit formation scenarios for the Orientale impact basin.

9:40 a.m. Blair D. M. * Johnson B. C. Freed A. M. Melosh H. J.
Gravity Anomalies of the Lunar Orientale Basin and the Mercurian Caloris Basin **[#3041]**
We model the formation and evolution of the lunar Orientale and mercurian Caloris basin gravity anomalies using a combination of hydrocode and finite-element methods, constrained by free-air and Bouguer gravity anomalies and basin topography.

10:00 a.m. *Coffee Break*

10:15 a.m. Miljkovic K. * Wieczorek M. A.
Tracing Lower Crust and Upper Mantle on the Surface on the Moon **[#3018]**
GRAIL-derived crustal thickness map shows that the lunar crust is thinner than previously thought. We investigate whether these crustal thicknesses could have caused the excavation of the lower crust and upper mantle during impact basin formation.

10:35 a.m. Baker D. M. H. * Head J. W. Phillips R. J. Neumann G. A. Smith D. E. Zuber M. T.
Grail Gravity Observations of the Transition from Complex Craters to Peak-Ring Basins on the Moon: Implications for Crustal Structure and Impact Basin Formation **[#3077]**
GRAIL gravity observations are combined with morphometric measurements to investigate the evolution of crust/mantle structure in the transition from complex craters to peak-ring basins on the Moon.

10:55 a.m. Kiefer W. S. * Potter R. W. K. McGovern P. J. Collins G. S. Kring D. A.
Thermal Evolution of Lunar Impact Basins and Implications for Mascon Formation **[#3009]**
In a basin-forming impact, the impact melt pool and surrounding mantle may deform as a rising gravity current, modifying the distribution of melt and its cooling time, and affecting the possible creation of super-isostatic mantle uplift.

11:15 a.m. Kring D. A. * Kramer G. Y. Potter R. W. K.
Interpreting the Depth of Origin of the Schrodinger Peak Ring and Implications for Other Impact Basins **[#3069]**
We propose a model for the formation of the Schrodinger peak ring that uplifts material from beneath the transient crater, but only exposes material from a fraction of the transient crater depth.

11:35 a.m. Schultz P. H. * Crawford D. A. Donaldson K. L.
New Contraints on Multi-Ring Basin Formation **[#3109]**
New near-infrared studies of the Moon reveal that the inner rings of large basins are composed of pure anorthosite derived from the crust (not the mantle) while retaining signatures of the impactor trajectory and size.