Wednesday, March 21, 2012
MERCURY COMPOSITION AND EVOLUTION FROM THE INSIDE OUT
1:30 p.m. Waterway Ballroom 1

Chairs: **Patrick Peplowski**
Miriam Riner

1:30 p.m. Peplowski P. N. * Evans L. G. Hamara D. K. Lawrence D. J. Rhodes E. A. Sprague A. L. Solomon S. C.
Compositional Variability on the Surface of Mercury: Results from the MESSENGER Gamma-Ray Spectrometer **[#1541]**
MESSENGER's Gamma-Ray Spectrometer has been used to examine variations in the surface composition of Mercury for the elements Si, K, O, Ca, and S.

1:45 p.m. Weider S. Z. * Nittler L. R. Starr R. D. Byrne P. K. Hamara D. K. McCoy T. J. Solomon S. C.
Compositional Heterogeneity on Mercury's Surface Revealed by MESSENGER's X-Ray Spectrometer **[#1472]**
MESSENGER X-ray spectrometer data reveal that Mercury's northern volcanic plains are different in composition (especially in terms of Mg/Si) to the surrounding terrain.

2:00 p.m. McCubbin F. M. * Riner M. A. Vander Kaaden K. E. Elardo S. M. Shearer C. K. Jr.
Is Mercury Volatile Enriched or Volatile Depleted? New Insights from Combining MESSENGER X-Ray, Neutron, and Gamma-Ray Spectrometer Data **[#1270]**
Is Mercury volatile enriched or volatile depleted? The data from the MESSENGER mission may not be sufficient for answering this question when data from all the instruments is considered together. Experimental work is needed to determine the answer.

2:15 p.m. Izenberg N. R. * Holsclaw G. M. Domingue D. L. McClintock W. E. Klima R. L. Blewett D. T. Kochte M. C. Helbert J. D'Amore M. Sprague A. L. Vilas F. Solomon S. C.
Ultraviolet Through Near-Infrared Reflectance Variation on Mercury and the Search for Mineralogical Telltales **[#2365]**
We examine ultraviolet through near-infrared reflectance spectra of Mercury from the MASCS VIRS instrument, and find variations possibly indicative of differing iron contents in different units.

2:30 p.m. Riner M. A. * Lucey P. G.
Intense Space Weathering on Mercury: Are There Any Surface Exposures of Immature Material? **[#2866]**
Application of a new space weathering model to multi-spectral images of Mercury suggest accumulation space weathering derived iron is substantially higher than on the Moon and large deposits of immature material may not occur at the surface.

2:45 p.m. Helbert J. * Maturilli A. D'Amore M. Vaughan W. M. Head J. W. III Klima R. L. Blewett D. T. McCoy T. J.
Spectral Reflectance Measurements of Sulfides at the Planetary Emissivity Laboratory — Analogs for Hollow-Forming Material on Mercury? **[#1381]**
We present spectral reflectance measurements at visible and near-infrared wavelengths of fresh and heated samples of MnS, CaS, and MgS, as well as elemental sulfur. We infer that sulfides display a diagnostic feature at or near 0.6 μm.

3:00 p.m. Malavergne V. * Brunet F. Righter K. Zanda B. Avril C. Borensztajn S. Berthet S.
Experimental Behavior of Sulfur Under Primitive Planetary Differentiation Processes, the Sulfide Formations in Enstatite Meteorites and Implications for Mercury **[#1860]**
We have simulated different models of CaS-FeS-MgS sulfide formation and determine the solubility of sulfur in silicate melts at high pressure and high temperatures. We will present their implications for planetary differentiation and Mercury.

3:15 p.m. Charlier B. * Grove T. L. Zuber M. T.
Composition and Differentiation of 'Basalts' at the Surface of Mercury **[#1400]**
New experiments on surface compositions of Mercury obtained by MESSENGER and relevant phase equilibria constrain the composition and crystallization paths of "basaltic" rocks that cover most of the planet.

3:30 p.m. Vaughan W. M. * Helbert J. Blewett D. T. Head J. W. III Murchie S. L. Gwinner K. McCoy T. J. Solomon S. C.
Hollow-Forming Layers in Impact Craters on Mercury: Massive Sulfide or Chloride Deposits Formed by Impact Melt Differentiation? **[#1187]**
We map the geology of the heavily hollowed crater Kertesz and show that hollows in this crater develop in a 30-meter-thick hollow-forming layer derived from impact melt. This layer may be a massive sulfide or chloride impact melt differentiate.

3:45 p.m. Grott M. * Breuer D. Spohn T.
The Thermo-Chemical Evolution of Mercury Revisited **[#1376]**
The thermo-chemical evolution of Mercury is revisited. New constraints on the abundance of heat-producing elements and core size are taken into account. The evolution of Mercury is found to be compatible with a komatiitic composition.

4:00 p.m. Brown S. M. * Elkins-Tanton L. T.
The Early Dynamics and Density Structure of Mercury's Mantle **[#2062]**
We numerically model Mercury's mantle to investigate the fate of high-density minerals that fractionally crystallize from a magma ocean. We produce different density profiles based on initial composition of a given formation mechanism.

4:15 p.m. Head J. W. III * Solomon S. C. Fassett C. I. Murchie S. L. Prockter L. M. Robinson M. S. Blewett D. T. Denevi B. W. Watters T. R. Whitten J. L. Goudge T. A. Baker D. M. H. Hurwitz D. M. Byrne P. K. Klimczak C.
Effusive Volcanism on Mercury from MESSENGER Mission Data: Nature and Significance for Lithospheric Stress State and Mantle Convection **[#1451]**
MESSENGER data are interpreted to mean that the small vertical extent of Mercury's mantle may inhibit convection and favor sublithospheric magma buildup and extensional lithospheric stresses on regional scales in the planet's early history.

4:30 p.m. Chapman C. R. * Merline W. J. Marchi S. Prockter L. M. Fassett C. I. Head J. W. Solomon S. C. Xiao Z.
The Young Inner Plains of Mercury's Rachmaninoff Basin Reconsidered **[#1607]**
Smooth plains within Rachmaninoff Basin's peak ring were interpreted from MESSENGER flyby images as very young (~1 Ga). Orbital images now show many secondaries D = 0.8–2 km, so the plains are not so young, but still younger than the basin itself.