

Wednesday, March 21, 2012

SPECIAL SESSION: MESSENGER'S FIRST YEAR IN ORBIT ABOUT MERCURY

8:30 a.m. Waterway Ballroom 1

**Chairs: Sean Solomon
David Paige**

- 8:30 a.m. Johnson C. L. * Purucker M. E. Anderson B. J. Winslow R. M. Al Asad M. Korth H. Slavin J. A. Alexeev I. I. Ritzer J. A. Phillips R. J. Zuber M. T. Solomon S. C.
[MESSENGER Observations of Mercury's Magnetic Field Structure](#) [#1355]
We use orbital magnetic field data from MESSENGER to constrain Mercury's internal dipolar field and large-scale, time-averaged magnetopause and magnetotail fields. We investigate mechanisms that may account for structure in the residual fields.
- 8:45 a.m. Purucker M. E. * Johnson C. L. Winslow R. M. Nicholas J. B. Anderson B. J. Korth H. Head J. W. III Zuber M. T. Solomon S. C. Slavin J. A. Alexeev I. I. Phillips R. J. Paige D. A.
[Evidence for a Crustal Magnetic Signature on Mercury from MESSENGER Magnetometer Observations](#) [#1297]
Magnetic fields from low-altitude MESSENGER observations over the northern pole reveal an anomaly that can be reproduced with a crustal layer magnetized in a direction opposite to that of the present main field. We present possible interpretations.
- 9:00 a.m. Mazarico E. * Lemoine F. G. Goossens S. J. Smith D. E. Zuber M. T. Neumann G. A. Torrence M. H. Rowlands D. D. Solomon S. C.
[The Gravity Field of Mercury from MESSENGER](#) [#2189]
A gravity field of Mercury is developed from MESSENGER orbital observations. In addition to the radiometric tracking data, altimetric crossovers base on the MLA data are used.
- 9:15 a.m. Hauck S. A. II * Solomon S. C. Margot J.-L. Lemoine F. G. Mazarico E. Peale S. J. Perry M. E. Phillips R. J. Smith D. E. Zuber M. T.
[Mercury's Internal Structure as Constrained by MESSENGER Observations](#) [#1170]
We discuss the implications of Mercury's gravity field as revealed by MESSENGER and Earth-based measurements of its spin-state for the planet's internal structure. Results indicate that Mercury has a large core with a potentially unique structure.
- 9:30 a.m. Michel N. C. * Hauck S. A. II Solomon S. C. Phillips R. J. Roberts J. H. Zuber M. T.
[Implications of MESSENGER Observations for Mantle Convection on Mercury](#) [#1671]
We investigate the implications of MESSENGER observations for the evolution of Mercury's interior by modeling convection in a mantle constrained to be relatively thin.
- 9:45 a.m. James P. B. * Zuber M. T. Phillips R. J.
[Viscosity Structure of Mercury and Implications for Support of the Northern Rise](#) [#2425]
Models for support of the Northern Rise are tested against viscosity profiles of Mercury's mantle. Additionally, we address the role of lithospheric stresses in the support of topography and we compare our results to crater tilts measured by MLA.
- 10:00 a.m. Solomon S. C. * Klimczak C. Byrne P. K. Hauck S. A. II Balcerski J. A. Dombard A. J. Zuber M. T. Smith D. E. Phillips R. J. Head J. W. III Watters T. R.
[Long-Wavelength Topographic Change on Mercury: Evidence and Mechanisms](#) [#1578]
Orbital observations by the MESSENGER spacecraft show that Mercury experienced marked changes in long-wavelength topography more recently than the end of late heavy bombardment and the volcanic emplacement of the largest expanses of smooth plains.

- 10:15 a.m. Byrne P. K. * Şengör A. M. C. Klimczak C. Solomon S. C. Watters T. R.
[Large-Scale Crustal Deformation on Mercury](#) [#2118]
We map laterally extensive sets of contractional landforms on Mercury as fold-and-thrust belts. In places these belts correlate to regions of high topography, and may play a role in the distribution of thicker crustal blocks on the innermost planet.
- 10:30 a.m. Chabot N. L. * Ernst C. M. Harmon J. K. Murchie S. L. Solomon S. C.
Blewett D. T. Denevi B. W.
[Craters Hosting Radar-Bright Deposits in Mercury's North Polar Region](#) [#1476]
All radar-bright features near Mercury's north pole are confined to shadowed areas in MESSENGER images to date, consistent with the water-ice hypothesis, although low-latitude and small craters provide challenging thermal environments.
- 10:45 a.m. Talpe M. J. * Zuber M. T. Neumann G. A. Mazarico E. Solomon S. C. Vilas F.
[Characterization of the Morphometry of Impact Craters Hosting Polar Deposits in Mercury's North Polar Region](#) [#1600]
We characterize the shape of 274 craters between 6.08 and 207 km in diameter and located in Mercury's north polar region from MLA observations. Thirty-five craters host radar-bright deposits and are statistically deeper than craters that don't host deposits.
- 11:00 a.m. Neumann G. A. * Cavanaugh J. F. Sun X. Mazarico E. Smith D. E. Zuber M. T.
Solomon S. C. Paige D. A.
[Dark Material at the Surface of Polar Crater Deposits on Mercury](#) [#2651]
All Mercury radar-bright deposits correspond to poleward-facing slopes in permanently shadowed regions north of 68°N. The Mercury Laser Altimeter on the MESSENGER spacecraft sees these regions as darker than their surroundings at 1064 nm wavelength.
- 11:15 a.m. Paige D. A. * Harmon J. K. Smith D. E. Zuber M. T. Neumann G. A. Solomon S. C.
[Thermal Stability of Frozen Volatiles in the North Polar Region of Mercury](#) [#2875]
We examine the thermal stability of water ice and other frozen volatiles in the north polar region of Mercury using topographic profiles obtained by the MESSENGER MLA instrument in conjunction with a three-dimensional ray-tracing thermal model.
- 11:30 a.m. Lawrence D. J. * Feldman W. C. Evans L. G. Goldsten J. O. McNutt R. L. Jr. Nittler L. R.
Peplowski P. N. Prettyman T. H. Solomon S. C.
[Hydrogen at Mercury's North Pole? Update on MESSENGER Neutron Measurements](#) [#1802]
The MESSENGER Neutron Spectrometer (NS) is being used to identify and measure putative hydrogen deposits of Mercury's north pole. The NS data analysis is in progress and an update will be provided.