

# Notional Mercury Exosphere - Magnetosphere Coupling Workshop Sessions

MESSENGER – BepiColombo Workshop, Nov. 2-5, 2010

## Day 1 – Tuesday, November 2

8:15-8:30 a.m. Welcome

### Session 1. Magnetospheric Observations

#### 1.1. Planetary Magnetic Field Observations & Theory

8:30-9:10 a.m. Haje Korth (Invited), *Magnetospheric Magnetic Field Observations and Modeling at Mercury*

9:10-9:30 a.m. Haje Korth (Contributed), *Mercury's Magnetospheric Response to the Dynamics of the Space Environment*

#### 1.2. Plasma & Energetic Particles Observations

9:30-10:10 a.m. Dan Baker (Invited), *Substorms at Mercury: Old Questions and New Insights*

10:10-10:30 a.m. Break

10:30-11:10 a.m. Dominique Delcourt (Invited), *Magnetospheric Charged Particle Observations and Modeling at Mercury*

11:10-11:30 a.m. Jim Raines (Contributed), *MESSENGER Observations of the Composition of Mercury's Ionized Exosphere and Plasma Environment*

11:30-12:30 p.m. Menelaos Sarantos (Invited), *Planetary Pickup Ions at Mercury*

12:30-1:20 p.m. Lunch

1:20-1:40 p.m. George Ho (Contributed), *Observations of Suprathermal Electrons in Mercury's Magnetosphere During the Three MESSENGER Flybys*

1:40-2:00 p.m. Jim Raines (Contributed), *MESSENGER Observations of the Plasma Environment Near Mercury*

### Session 2. Exospheric Observations

#### 2.1. Ground Measurements

2:00-2:40 p.m. Rosemary Killen (Invited), *Overview of Ground Based Observations of the Exosphere*

2:40-3:00 p.m. François Leblanc (Contributed), *Energetic Characterization of Mercury's Exospheric Sodium Component*

3:00-3:20 p.m. Break

3:20-3:40 p.m. Valeria Mangano (Contributed), *A Statistical Study of Sodium Intensity and Dynamics in The Exosphere of Mercury*

3:40-4:00 p.m. Rosemary Killen (Contributed), *Long-Term Supply of Volatiles and Refractories to the Exosphere of Mercury*

#### 2.2. Space-Based Measurements

4:00-4:40 p.m. Ron Vervack (Invited), *MESSENGER's Flybys of Mercury: Three Glimpses into the Workings of a Complex Exospheric System*

4:40-5:00 p.m. Carl Schmidt (Contributed), *Observations of Tail Structures at Mercury with the STEREO Spacecraft*

5:00 p.m. **Welcoming Reception – LASP Mission Operations Lobby**

## Day 2 – Wednesday, November 3

### Session 3. Surface Interactions

#### 3.1. Photon Stimulated Desorption

**8:00-8:40 a.m.**     **Boris Yakshinskiy (Invited)**, *Electron and Photon Stimulated Desorption of Alkali atoms from Mineral Surfaces*

#### 3.2. Sputtering and Backscattering

**8:40-9:20 a.m.**     **Peter Wurz (Invited)**, *The Combined Effect of Physical and Chemical Processes on the Release of Particles into the Exosphere*

**9:20-10:00 a.m.**     **Thomas Orlando (Invited)**, *Stimulated Desorption of Silicates: A Potential Source for Ions in Mercury's Space Environment*

**10:00-10:20 a.m.**     **Todd Smith (Contributed)**, *Facilitating Mercury Surface Process and Exosphere Generation Research*

**10:20-10:40 a.m.**     *Break*

#### 3.3. Micrometeoroid Bombardment

**10:40-11:00 a.m.**     **Matt Burger (Contributed)**, *Impact Vaporization at Mercury: Limits from the MASCS Data*

#### 3.4. Chemistry and Space Weathering

**11:00-11:40 p.m.**     **Karl Hibbitts (Invited)**, *Solar Powered Water and Hydroxyl on Mercury*

**11:40-12:00 p.m.**     **Ann Sprague (Contributed)**, *Exploring New Views of Mercury's Exosphere and Surface*

**12:00-1:00 p.m.**     *Lunch*

**1:00-1:20 p.m.**     **Deborah Domingue (Contributed)**, *Space Weathering on Mercury*

#### 3.5. Dust and Surface Charging

**1:20-2:00 p.m.**     **Tim Stubbs (Invited)**, *A Comparison Between Surface Charging and Dust Transport Processes at the Moon and Mercury*

**2:00-2:20 p.m.**     **Sho Sasaki (Contributed)**, *Measurement of Dust Environment around Mercury by MDM (Mercury Dust Monitor) on Board MMO Bepi Colombo*

### Session 4. Exospheric Models and Processes

#### 4.1. Atmospheric Models

**2:20-3:00 p.m.**     **Alex Mura (Invited)**, *Particle and Chemical Sputtering as a Source for the Exosphere of Mercury: Modeling and Data Comparison*

**3:00-3:20 p.m.**     *Break*

**3:20-4:00 p.m.**     **François Leblanc (Invited)**, *Mercury Exosphere, Global Circulation Model of its Sodium Component*

**4:00-4:40 p.m.**     **Shingo Kameda (Invited)**, *Loss of Mercury's Exospheric Sodium*

**4:40-5:00 p.m.**     **Menelaos Sarantos (Contributed)**, *Implications of MESSENGER Observations for Models of Exospheric Magnesium*

**5:00-5:20 p.m.**     **Matt Burger (Contributed)**, *Calcium in Mercury's Exosphere: Modeling MESSENGER Data*

## Day 3 – Thursday, November 4

### Session 5. Plasma Processes

#### 5.1. K-H Boundary Waves

**8:30-9:10 a.m.** Masaki Fujimoto (Invited), *Ion Kinetic Effects on the Mercury-like Ion Kinetic-Scale Velocity Shear Layer with/without Heavy Ions*

#### 5.2. Magnetic Reconnection

**9:10-9:30 a.m.** Jim Slavin (Contributed), *MESSENGER Observations of Reconnection and Its Effects on Mercury's Magnetosphere*

#### 5.3. Electrodynamic Interactions

**9:30-10:10 a.m.** Lars Blomberg (Invited), *Magnetospheric Electric Fields at Mercury*

**10:10-10:30 a.m.** Wladislaw Lyatsky (Contributed), *Alfen Wave Reflectance Model for Field-aligned Currents at Mercury*

**10:30-10:50 a.m.** *Break*

#### 5.4. Wave Particle Interactions & ULF Waves

**10:50-11:30 a.m.** Toshi Nishimura (Invited), *Direct Measurements of the Poynting Flux Associated with Convection Electric Fields*

**11:30-11:50 a.m.** Scott Boardsen (Contributed), *Quasi-Periodic ~20–30-s Oscillations in Mercury's Inner Magnetosphere During Steady Southward IMF*

**11:50-12:10 p.m.** Vadim Uritsky (Contributed), *Understanding Multiscale Transients in Mercury's Plasma Environment under Northward IMF Condition: Data Analysis Tools and First Results*

**12:10-12:30 p.m.** Scott Boardsen (Contributed), *Bursts of Narrow-Band Magnetospheric Waves near the  $He^+$  to  $H^+$  Cyclotron Frequencies Observed During MESSENGER's Mercury Flybys*

**12:30-1:30 p.m.** *Lunch*

### Session 6. Mercury Global Simulations

#### 6.1. MHD Simulations

**1:30-2:10 p.m.** Robert Winglee (Invited), *Global Modeling of Mercury's Magnetosphere*

**2:10-2:30 p.m.** Mehdi Benna (Contributed), *Modeling of Mercury's Pick-up Ion Dynamics and its Response to Changes in IMF Conditions*

**2:30-2:50 p.m.** Alex Gloer (Contributed), *Three Dimensional MHD Modeling of Mercury's Magnetosphere During ICMEs*

**2:50-3:10 p.m.** *Break*

#### 6.2. Hybrid Simulations

**3:10-3:50 p.m.** Y-C Wang (Invited), *Exospheric and Magnetospheric Responses to Large Solar Wind Disturbances*

**3:50-4:10 p.m.** Pavel Travnicek (Contributed), *Ion Foreshock and Magnetosheath Properties in Global Hybrid Simulations of Mercury's Magnetosphere*

#### 6.3. Surface Precipitation & Sputtering Maps

**4:10-4:30 p.m.** David Schriver (Contributed), *Electron Transport and Precipitation at Mercury During the MESSENGER Flybys*

### Science Dinner – Red Lion Restaurant (<http://www.redlionrestaurant.com/>)

**5:45 p.m.** Transportation to the Red Lion (leaving from the Millennium Hotel)

**6:00 p.m.** Reception – Gazebo Room

**6:45 p.m.** Dinner

## Day 4 – Friday, November 5

### 7. Summary

Atmospheric Reporter  
Magnetospheric Reporter  
MESSENGER & BepiColombo Leadership Panel

### Posters:

**Emmanuel Grotheer**, *HEMO – The Hermean Exosphere Model of Oxygen: A Comprehensive Model for Interpreting Data from the MESSENGER and BepiColombo Missions to Mercury*

**Ariah Kidder**, *Reconnection Events and Sodium Morphology at Mercury*

**Susan McKenna-Lawlor**, *Mercury's Magnetosphere in Response to Elevated, Prolonged, Solar Activity in December, 2006: Hybrid Modeling Results*

**Helen Middleton**, *BepiColombo - Hermean Environment Instrument Science Operation Planning*

**Andrew Potter**, *Sodium Velocity Maps on Mercury*

**Mea Simon Wedlund**, *Monte Carlo Modelling of Neutral Hydrogen in the Exosphere of Mercury*