

**Wednesday, July 11, 2007**  
**THE MARTIAN CLIMATE AND**  
**ATMOSPHERE: VARIATIONS IN TIME AND SPACE**  
**8:30 a.m. Beckman Auditorium**

**Chairs: S. Bougher**  
**F. Forget**

- 8:30 a.m. INTRODUCTORY THEMSES – FRAMING THE SESSION
- 8:35 a.m. Mischna M. A. \* Johnson S. S.  
*On Sulfur Induced Warming in the Early Martian Atmosphere* [#3058]  
 We examine the role of the sulfur-containing volatile species SO<sub>2</sub> and H<sub>2</sub>S as putative greenhouse gases during the early, formative years of Tharsis, when volcanic outgassing was a significant contributor to the martian atmosphere.
- 8:50 a.m. Manning C. V. \* Zahnle K. J. McKay C. P.  
*The Evolution of Carbon Dioxide and Nitrogen on Early Mars* [#3182]  
 We describe our general model of evolving volatiles for Mars and present results. CO<sub>2</sub> evolution, and new work on nitrogen is described, including nitrate formation by impacts. We describe opportunities for validating and refining the model.
- 9:05 a.m. Wood S. E. \* Griffiths S. D.  
*Mars Subsurface Warming at Low Obliquity* [#3387]  
 We present a modeling study of a mechanism that has not previously been considered but is likely to have generated significant subsurface warming during the periodic intervals when Mars' obliquity was lower than 25°.
- 9:20 a.m. Piqueux S. \* Christensen P. R.  
*Recent Deposition of CO<sub>2</sub> and Erosion of the South Polar Cap: Implications for Climate Change* [#3068]  
 We have documented the changes of the areal CO<sub>2</sub> ice distribution in the South Polar Region and we discuss them in terms of possible volume or mass changes of the cap with possible implications for present climate change.
- 9:35 a.m. Golombek M. P. \* Grant J. A. Crumpler L. S. Greeley R. Arvidson R. E. Bell J. F. III  
 Weitz C. M. Sullivan R. Christensen P. R. Soderblom L. A. Squyres S. W.  
*Climate Change on Mars from Erosion Rates at the Mars Exploration Rover Landing Sites* [#3034]  
 The gradation history of the Gusev and Meridiani plains argues for a dry and desiccating environment since the Late Hesperian, in contrast to the sedimentary evaporites in Meridiani Planum that document a warmer and wetter environment in the Noachian.
- 9:50 a.m. Paige D. A. \* Golombek M. P. Maki J. N. Parker T. J. Crumpler L. S.  
 Grant J. A. Williams J. P.  
*MER Small Crater Statistics: Evidence Against Recent Quasi-Periodic Climate Variations* [#3392]  
 The observed absence of cm-sized impact craters at the MER sites is not consistent with the notion that Mars has experienced extended periods of low atmospheric pressure.
- 10:05 a.m. Fillingim M. O. \* Peticolas L. M. Lillis R. J. Brain D. A. Halekas J. S.  
 Lummerzheim D. Bougher S. W.  
*Ionization Patches on the Night Side of Mars and Their Seasonal and Solar Cycle Variations* [#3336]  
 We model the effect of precipitation of accelerated auroral-like electrons on the night side of Mars and determine the seasonal and solar cycle variations of the resulting ionosphere.

- 10:20 a.m. Forget F. \* Lebonnois S. Angelats i Coll M. Quemerais E. Bertaux J.-L. Montmessin F. Dimarellis E. Reberac A. Lopez Valverde M. Gonzalez Galindo F.  
*Mars Atmosphere Density and Temperature Between 50 and 130 km Observed by Mars Express SPICAM Stellar Occultation* [#3029]  
Profiles of densities and temperatures of the martian atmosphere between 50 and 130 km have been obtained for more than 1 year by the SPICAM UV spectrometer. They are presented and analysed with the help of the LMD general circulation model.
- 10:35 a.m. Bougher S. W. \* Bell J. M. Steers B. Murphy J. R. Keating G. M.  
*Winter Polar Warming in the Mars Thermosphere* [#3027]  
Mars winter polar warming is a phenomenon of the lower thermosphere temperatures and densities that is well documented by in situ accelerometer data taken during three previous spacecraft aerobraking campaigns (MGS, Odyssey, MRO).
- 10:50 a.m. González-Galindo F. \* Forget F. López-Valverde M. A. Angelats i Coll M. Bougher S. W.  
*LMD-MGCM: The First Ground-to-Exosphere General Circulation Model of the Martian Atmosphere* [#3099]  
LMD-MGCM has been extended to the thermosphere, becoming the first ground-to-exosphere GCM of Mars. It has been validated against other models and against data. This model will be used to analyze some data concerning the upper atmosphere.
- 11:05 a.m. MODERATED DISCUSSION