

**Wednesday, July 23, 2003**  
**WATER, CARBON DIOXIDE, AND DUST CYCLES**  
**1:30 p.m. Ramo Auditorium**

**Chairs: D. J. McCleese**  
**J. C. Armstrong**

- 1:30–1:50 p.m. Hinson D. P. \*  
*Radio Occultation Measurements of Pressure Variations on Mars* [#3032]  
 MGS radio occultation experiments provide a unique measure of pressure variations within the lower atmosphere on time scales from diurnal to interannual, yielding an accurate record of seasonal variations spanning several martian years.
- 1:50–2:10 p.m. Clancy R. T. \* Wolff M. J. Whitney B. A. Cantor B. A.  
*Vertical Distributions of Dust Optical Depth During the 2001 Planet Encircling Storm from a Spherical Radiative Transfer Analysis of MOC Limb Images* [#3205]  
 The vertical distribution of dust during the 2001 planet encircling dust storm is derived by spherical RT analysis of MOC and TES limb radiances.
- 2:10–2:30 p.m. Tamppari L. K. \* Smith M. D. Hale A. S. Bass D. S.  
*Water Cycling in the North Polar Region of Mars* [#3121]  
 Water cycling in the north polar region of Mars is addressed through examination of water vapor, water-ice clouds and potentially associated dust and surface temperature changes.
- 2:30–2:50 p.m. Hale A. S. \* Tamppari L. K. Christensen P. R. Smith M. D. Bass D. Pearl J. C.  
*Water Ice Clouds in the Martian Atmosphere: A Comparison of Two Methods and Eras* [#3171]  
 We examine water ice clouds in the martian atmosphere using the MGS TES data set and two different methods. Results are presented, along with a comparison to similar analyses using the Viking IRTM dataset.
- 2:50–3:10 p.m. Benson J. L. \* Bonev B. P. James P. B. Shan K. J. Cantor B. A. Caplinger M. A.  
*The Seasonal Behavior of Water Ice Clouds in the Tharsis and Valles Marineris Regions of Mars: Mars Orbiter Camera Observations* [#3147]  
 Using MOC data, cloud area was measured daily for water ice clouds associated with Olympus, Ascraeus, Pavonis and Arsia Mons, Alba Patera, and Valles Marineris. Altitudes and optical depths of several of these clouds have been determined.
- 3:10–3:20 p.m. Break**
- 3:20–3:40 p.m. Montmessin F. \* Forget F. Haberle R. M. Rannou P. Cabane M.  
*Water-Ice Clouds in the LMDs Martian General Circulation Model* [#3117]  
 In this paper, we discuss the considerable role of clouds as a mobile reservoir for water and thus in the water cycle. We give this effect a quantitative assessment through a comparison of two cloud schemes, which respective results will be compared to observational data.
- 3:40–4:00 p.m. James P. B. \* Benson J. L. Cantor B. A.  
*Seasonal Variation of Martian Polar Caps: 1999 and 2001 MOC Data* [#3093]  
 MOC observations of the martian polar caps encompass one martian year that included a major planet-encircling dust storm and one that did not. Data from the two years will be compared to investigate the effects of dust on the CO<sub>2</sub> cycle.

- 4:00–4:20 p.m. Litvak M. L. \* Mitrofanov I. G. Kozyrev A. S. Sanin A. B. Tretyakov V. Smith D. E. Zuber M. T. Boynton W. V. Hamara D. K. Shinohara C. Saunders R. S. Drake D.  
*4-D Model of CO<sub>2</sub> Deposition at North and South of Mars from HEND/Odyssey and MOLA/MGS* [#3040]  
Seasonal variations of neutrons detected by HEND/Odyssey are corresponded to variations of linear thickness of CO<sub>2</sub> measured by MOLA/MGS. HEND data for February 02 – June 30 are used to build up 4-D model of CO<sub>2</sub> deposition behavior at north and south over a martian year.
- 4:20–4:40 p.m. Karatekin Ö. \* Dehant V. de viron O.  
*Martian Global-scale Seasonal CO<sub>2</sub> Change: Comparison of Geodetic Observations and Numerical Simulations* [#3172]  
The signature of martian global-scale CO<sub>2</sub> annual cycle can be found in the variation of gravitational field. This information is used to estimate the seasonal polar mass and global scale atmospheric pressure variations. The results are compared with GCM simulations.
- 4:00–5:00 p.m. Mischna M. A. \* McCleese D. J. Richardson M. I. Vasavada A. R. Wilson R. J.  
*Volatile Cycling and Layering on Mars: Observations, Theory and Modeling* [#3145]  
Based on theoretical models, spacecraft observations, and new climate modeling of Mars' orbital cycles, we conclude that surface ice deposits form as subaerial ice sheets, the result of atmospheric saturation and direct surface deposition.
- 5:00–5:20 p.m. Armstrong J. C. \* Leovy C. B. Quinn T. R. Haberle R. M. Schaeffer J.  
*A One Billion Year Martian Climate Model — The Importance of Seasonally Resolved Polar Caps and the Role of Wind* [#3064]  
We use a long-term, one-dimensional energy balance model to explore the role seasonally resolved polar caps have on the distribution of CO<sub>2</sub> in the atmosphere-regolith-cap system, and the evolution of the atmospheric pressure in particular.