Thursday, March 18, 2004
SPECIAL SESSION: MARS CLIMATE CHANGE
8:30 a.m. Salon B

Chairs: R. M. Haberle
J. F. Mustard

8:30 a.m. Head J. W. III* Mustard J. F.
Geological Evidence for Climate Change on Mars **[#1889]**
This paper highlights some of the geological units and features that may be related to climate change to encourage climate modelers to assess their potential significance.

8:45 a.m. Laskar J. * Gastineau M. Joutel F. Levrard B. Robutel P. Correia A.
A New Astronomical Solution for the Long Term Evolution of the Insolation Quantities of Mars **[#1600]**
Using the most recent data, and a new numerical integration of the Solar System, we provide a solution for the evolution of Mars spin over 10 to 20 Myr. We have also performed an extensive statistical analysis of the evolution of Mars over 5 Gyr.

9:00 a.m. Richardson M. I. * Mischna M. A. Basu S. Fenton L. K. Wilson R. J.
Interpreting Martian Paleoclimate with a Mars General Circulation Model **[#2100]**
We review the capabilities and studies undertaken with the Geophysical Fluid Dynamics Laboratory (GFDL) Mars GCM.

9:15 a.m. Haberle R. M. *
History and Progress of GCM Simulations on Recent Mars Climate Change **[#2010]**
General circulation models are now predicting tropical ice accumulations at times of high obliquity.

9:30 a.m. Mitrofanov I. G. * Litvak M. L. Kozyrev A. S. Sanin A. B. Tretyakov V. I. Kuzmin R. O. Boynton W. V. Hamara D. K. Shinihara C, Saunders R. S.
Northern and Southern Permafrost Regions on Mars with High Content of Water Ice: Similarities and Differences **[#1629]**
It is shown that the northern and southern regions of permafrost contain quite similar patterns of subsurface water ice at high latitudes, about 50–55 wt%. However, in South this water-rich layer must be in places covered by a dry layer with thickness about 15–30 g/cm^2.

9:45 a.m. Kreslavsky M. A. * Head J. W. III
Periods of Active Permafrost Layer Formation in the Recent Geological History of Mars **[#1201]**
On the basis of a general estimate of the onset insolation level and on J. Laskar's calculations of spin/orbit parameters of Mars, we predict times and regions of the active (summer thawing) layer formation on Mars for the last 10 Ma.

10:00 a.m. BREAK

10:15 a.m. Marchant D. R. * Head J. W. III
Microclimate Zones in the Dry Valleys of Antarctica: Implications for Landscape Evolution and Climate Change on Mars **[#1405]**
The detailed morphology of polygons and other periglacial-type landforms on Mars can help delineate microclimates. Subtle changes in the morphology of these landforms can shed light on the sign and magnitude of recent climate change on Mars.

10:30 a.m. Kanner L. C. * Allen C. C. Bell M. S.
Geomorphic Evidence for Martian Ground Ice and Climate Change **[#1982]**
This study compares recent data from Mars Orbital Camera and Mars Odyssey to refine the location of subsurface ice deposits at a < km scale. Images of small-scale polygons are mapped with respect to spectroscopy data of subsurface water ice.

10:45 a.m. Mischna M. A. * Richardson M. I. Wilson R. J. Zent A.
Explaining the Mid-Latitude Ice Deposits with a General Circulation Model **[#1861]**
We look at the formation of the mid- and low-latitude subsurface water deposits using the GFDL Mars GCM with an active regolith. Results suggest such deposits are a combination of diffusively placed water and surface ice deposits while at high obliquity.

11:00 a.m. Shean D. E. * Head J. W. III Fastook J. L. Marchant D. R.
Tharsis Montes Cold-based Glaciers: Observations and Constraints for Modeling and Preliminary Results **[#1428]**
Observations of the Tharsis Montes fan-shaped deposits provide constraints for glacial activity and suggest a relationship between their distribution and the local topography. Reconstructed ice sheet profiles are consistent with these inferences.

11:15 a.m. Fastook J. L. * Head J. W. III Marchant D. Shean D.
Ice Sheet Modeling: Terrestrial Background and Application to Arsia Mons Lobate Deposit, Mars **[#1452]**
Input requirements for a dynamic ice sheet model are described with emphasis on availability from Martian data. The model is applied to Arsia Mons deposits to show its potential in determining how the climate may have changed in the past on Mars.

11:30 a.m. Elphic R. C. * Feldman W. C. Prettyman T. H. Tokar R. L. Lanza N. Lawrence D. J. Head J. W. III Mischna M. A. Richardson M. I.
Enhanced Water-Equivalent Hydrogen on the Western Flanks of the Tharsis Montes and Olympus Mons: Remnant Subsurface Ice or Hydrate Minerals? **[#2011]**
Enhanced water-equivalent hydrogen (2–8 wt%) is found in and around the Tharsis Montes and Olympus Mons, especially on the western flanks. This is where glacial landforms are found, and where GCMs hint at past ice accumulations.

11:45 a.m. McEwen A. S. *
New Age Mars **[#1756]**
The youngest terrains on Mars could be older than previously believed because impact craters smaller than ~250 m are largely secondaries and lunar-derived production functions predict far too many small primary craters.