Tuesday, March 18, 2003
MARS GEOPHYSICS AND TECTONICS
1:30 p.m. Salon C

Chairs: H. V. Frey
S. A. Hauck II

Arkani-Hamed J. *
Thermo-Remanent Magnetization of Martian Lithosphere **[#1948]**
The TRM of the martian lithosphere is determined assuming that the upper part of the lithosphere was magnetized by the core field and the lower part by the magnetic field of the upper part. The lower part can have appreciable contributions to the observed magnetic anomalies.

Frey H. V. *
Large-Diameter Visible and Buried Impact Basins on Mars: Implications for Age of the Highlands and (Buried) Lowlands and Turn-Off of the Global Magnetic Field **[#1838]**
Large diameter buried basins greatly outnumber visible impact basins of the same size., The buried lowland crust may be slightly younger than the highlands. Two out 10 very large basins may pre-date the disappearance of the global magnetic field.

Hood L. L. * Richmond N. C. Pierazzo E. Rochette P.
Distribution of Crustal Magnetic Fields on Mars: Shock Effects of Basin-Forming Impacts **[#1704]**
Radially extended shock demagnetization caused primarily by the Hellas and Argyre impacts can potentially explain a majority of the distribution of crustal magnetic fields in the southern highlands of Mars.

Solomon S. C. * Aharonson O. Banerdt W. B. Dombard A. J. Frey H. V. Golombek M. P. Hauck S. A. II Head J. W. III Johnson C. L. McGovern P. J. Phillips R. J. Smith D. E. Zuber M. T.
Why are There So Few Magnetic Anomalies in Martian Lowlands and Basins? **[#1382]**
We suggest that hydrothermal alteration of magnetic carriers within the crust beneath Martian lowlands and basins may have contributed to the pattern of crustal magnetization observed today.

Scott E. R. D. * Fuller M. D.
A Source for the Martian Crustal Magnetic Field **[#1892]**
We propose that the crustal magnetic fields on Mars may be due to single-domain magnetite formed by thermal decomposition of iron-rich carbonate that precipitated in basalt during alteration by a CO_2-rich fluid.

Kiefer W. S. *
Gravity Evidence for Extinct Magma Chambers on Mars: Tyrrhena Patera and Hadriaca Patera **[#1234]**
MGS gravity data requires the presence of dense, cumulate minerals in extinct magma chambers beneath Tyrrhena Patera and Hadriaca Patera. These observations provide our first look at the magmatic plumbing system on Mars.

Hauck S. A. II* Solomon S. C. Phillips R. J.
Potential Sources of Hesperian Contractional Tectonics on Mars **[#1667]**
We review the potential contribution to contractional strain of a variety of global, regional, and local mechanisms in order to isolate those that might have influenced the deformation that formed wrinkle ridges on Hesperian plains materials on Mars.

Goudy C. L. * Schultz R. A.
Wrinkle Ridges in Hesperia Planum and the Stress State in the Eastern Hemisphere of Mars **[#1475]**
We interpret Late Noachian reactivation of preexisting faults in Hesperia Planum based on Coulomb failure stress changes. This implies a regional stress state rotation of 90° between the Noachian and Late Noachian/ Hesperian.

Johnson C. L. * Phillips R. J.
Constraints on the Evolution of the Tharsis Region of Mars **[#1360]**
We suggest a mechanism for the formation and evolution of the Tharsis province that satisfies gravity, topography and magnetic data and the regional tectonic history.

Lowry A. R. * Zhong S.
Surface Versus Internal Loading of the Tharsis Rise, Mars **[#1798]**
We introduce a method to invert load structure from geoid and topography of a viscoelastic planetary body. We use the method to assess relative contributions of (1) volcanic construction and (2) an upwelling mantle plume in the Tharsis province, Mars.

Anderson R. C. * Dohm J. M. Hare T. Haldemann A. F. C. Baker V.
Strain Histories Among Alba and Syria Planum, Mars **[#1839]**
This investigation highlights two prominent centers in the Tharsis region, Syria Planum and Alba Patera focusing on their similarities and distinctions, topographic and morphologic signatures, deformational extent, and intensities and durations of activity.

Okubo C. H. * Schultz R. A.
Two-Dimensional Wrinkle Ridge Strain & Energy Release Based on Numerical Modeling of MOLA Topography **[#1283]**
Numerical models of MOLA-based wrinkle ridge topography provide depth-dependent fault- and fold-related strain, and more significantly reveal along-strike variability in the magnitude of work done, or energy released, through wrinkle ridge formation.

Buczkowski D. L. * Cooke M. L. McGill G. E.
Double-ringed Circular Grabens and Thickness of Cover Material in Utopia Planitia, Mars **[#1042]**
Analytical and numerical models of compaction, drape folding and horizontal extension (1) explain the doubling of circular grabens and (2) explain an observed dependency of graben spacing on cover thickness in Utopia Planitia.