

Wednesday, March 14, 2007
MARS TECTONICS AND CRUSTAL DICHOTOMY
8:30 a.m. Crystal Ballroom B

Chairs: R. C. Anderson
R. P. Irwin III

- 8:30 a.m. Anderson R. C. * Dohm J. M. Golombek M. P. Haldemann A. F. C. Pounders E.
Centers of Tectonism Identified for the Western and Eastern Hemisphere of Mars [#1889]
 We have compiled a comprehensive global paleotectonic map of Mars to determine local and regional centers of tectonic activity by tracing the geographic distribution of fault and ridge systems as they formed during successive stages of major geologic activity.
- 8:45 a.m. Andrews-Hanna J. C. * Zuber M. T.
Strike-Slip Faulting and the Tectonic Evolution of Mars [#1897]
 The superposition of contractional and Tharsis-induced stresses on Mars leads to predictions of widespread strike-slip faulting. The locations of previously documented and newly identified faults are used to constrain the contractional history.
- 9:00 a.m. Hauber E. * Charalambakis E. Gwinner K. Grott M. Knapmeyer M.
 Matz K. D. Wählisch M.
Displacement-length Relationships of Normal Faults on Mars: New Observations with MOLA and HRSC [#1670]
 We present displacement-length data for 145 normal faults on Ophir Planum, Mars. The displacement is measured at several locations at a given fault in single MOLA tracks. We also present examples for the displacement distribution along a given fault, and discuss implications for fault linkage.
- 9:15 a.m. Le Deit L. * Mège D. Bourgeois O. Le Mouélic S. Sotin C. Hauber E.
 Mangold N. Bibring J.-P.
Morphology and Tectonics of East Candor Chasma, Valles Marineris (Mars), and Correlation with Mineralogy [#1845]
 MOLA DEM, HRSC, THEMIS and MOC images are used to study the geomorphology and structural patterns in order to constrain the evolution of East Candor Chasma. OMEGA data provide insights as to their mineralogy and help characterize their history.
- 9:30 a.m. Zeng Z. * Birnbaum S. Xie H. Liu L. Zhu M. Yang W.
Three-Dimensional Numerical Modeling of Tharsis Binucleus-type Vortex Structure on Mars [#1210]
 A 3-D finite element modeling suggests that the Tharsis arcuate radial fractures were resulted from the rotation of a magma body beneath the Tharsis montes volcano chain and its associated country rocks around the Pavonis Mons.
- 9:45 a.m. Byrne P. K. * Murray J. B. van Wyk de Vries B. Troll V. R.
Flank Terrace Architecture of Martian Shield Volcanoes [#2380]
 We comprehensively describe terrace structures on the flanks of the Tharsis Montes using MOLA data, and show the complexity of their morphology and distribution. We suggest that edifice and regional stresses can influence terrace architecture.
- 10:00 a.m. Searls M. L. * Phillips R. J.
Tectonics of Utopia Basin, Mars: Results from Finite Element Loading Models [#1965]
 We use a finite element model to show that, in addition to the stresses caused by lithospheric deflection under the weight of the basin infilling material, global compression is needed to describe the tectonic features within Utopia.

- 10:15 a.m. Perron J. T. * Mitrovica J. X. Manga M. Matsuyama I. Richards M. A.
Long-Wavelength Shoreline Deformation on Mars Related to True Polar Wander [#2328]
Long-wavelength trends in the topography of possible paleoshorelines on Mars are consistent with the pattern of deformation expected for a post-Tharsis true polar wander event. The features could indeed be shorelines formed by an ancient ocean.
- 10:30 a.m. Irwin R. P. III* Watters T. R.
The Crustal Dichotomy of Mars: Geological Constraints and Testing of Geophysical Models [#2301]
We use morphological and geophysical data from the crustal dichotomy boundary region to evaluate published models for origin and modification of the crustal dichotomy and to constrain future modeling efforts.
- 10:45 a.m. Zhong S. J. *
Understanding the Early Evolution of Mars and the Formation of Crustal Dichotomy [#2442]
We will discuss physical mechanisms for producing the crustal dichotomy and their implications for recent MGS and MARSIS observations.
- 11:00 a.m. Kiefer W. S. *
Gravity, Topography, and Tectonic Segmentation of the Martian Hemispheric Dichotomy: Evidence for Multiple Formation Mechanisms [#1470]
Gravity, topography, and tectonic observations demonstrate that the martian hemispheric dichotomy can be divided into two distinct segments, Arabia Terra and eastern Mars. This segmentation indicates that at least two processes were involved in dichotomy formation and major modification.
- 11:15 a.m. Hart S. H. * Nimmo F. Korycansky D.
Numerical Modeling of Martian Dichotomy-forming Impacts [#2085]
An investigation into the impact origin of the martian crustal dichotomy. Specifically focusing on a giant single impact origin, using a numerical hydrocode to simulate possible giant impact events.
- 11:30 a.m. Marinova M. M. * Aharonson O. Asphaug E.
Investigating the Martian Dichotomy Mega Impact Formation Hypothesis [#2209]
We investigate whether the Mars crustal dichotomy could form by a mega impact. We simulate the impacts using a smoothed particle hydrodynamics model and examine the disruption of the planet, melt production, and redistribution of excavated material.