

Tuesday, March 19, 2013

[T612]

POSTER SESSION: PLANETARY DYNAMICS AND TECTONICS**6:00 p.m. Town Center Exhibit Area**Walsh L. S. Watters T. R. Banks M. E. Solomon S. C. **POSTER LOCATION #135**[*Wrinkle Ridges on Mercury and the Moon: A Morphometric Comparison of Length-Relief Relationships with Implications for Tectonic Evolution*](#) [#2937]

Morphometric comparison of 300 mercurian and lunar wrinkle ridges indicate greater amounts of global contraction on Mercury than the Moon.

Williams N. R. Bell J. F. III Watters T. R. Banks M. E. Robinson M. S. **POSTER LOCATION #136**[*Recent Tectonic Deformation in Mare Frigoris*](#) [#2949]

Tectonic deformation within Mare Frigoris has continued to within the last tens of millions of years.

Weller M. B. Lenardic A. **POSTER LOCATION #137**[*Hysteresis of Tectonics Regimes on Terrestrial Worlds, One is Not Enough: Plate Tectonics and Internal Heating Through Time*](#) [#1822]

Time passes, worlds age / Where once only stagnant reigns / Active may remain.

Matsuyama T. **POSTER LOCATION #138**[*Large Effect of Small Planet on Plate Tectonics and Thermal Evolution: Application to Mars*](#) [#2783]

This study applies a recently developed thermal evolution model of Earth to other planets, especially Mars, which supports the early martian plate tectonics.

Sekhar P. King S. D. **POSTER LOCATION #139**[*Analysis of Martian Geoid and Topography based on Temperature Dependent Layered Viscosity Mantle Convection Models*](#) [#2719]

Correlate spherical harmonic degree structure of martian mantle with geoid and topography for varying viscosity-layered models and compare it with observed data.

Arkani-Hamed J. Roberts J. H. **POSTER LOCATION #140**[*Impact Heating and Coupled Core Cooling and Mantle Dynamics on Mars*](#) [#2395]

Impact shock heats Mars / Core can't convect, dynamo dies / Back in a billion?

Lillis R. J. Robbins S. J. Manga M. Halekas J. S. Frey H. V. **POSTER LOCATION #141**[*A New, Statistically Robust Timeline for the Martian Dynamo*](#) [#1435]

Using a probabilistic technique for estimating crater magnetization from magnetic fields, we determined that the martian dynamo very likely ceased 4.1 Gyr ago.

Espley J. R. Connerney J. E. P. **POSTER LOCATION #142**[*Crustal Magnetic Fields at Mars: Improved Interpretation Through Higher Resolution*](#) [#2891]

Downward continuation of martian magnetic crustal fields creates higher-spatial-resolution maps that allow for improved interpretations of geophysical features.

Amara S. Cole T. E. Morales N. Schuman S. **POSTER LOCATION #143**[*Comparing and Contrasting Magnetic Properties of Terra Cimmeria and Tharsis Montes*](#) [#1308]

Our team studied this question: What mineralogical and thermal characteristics make the magnetism of Terra Cimmeria different from that of Tharsis Montes?

Banerdt W. B. Smrekar S. Lognonné P. Spohn T. Asmar S. W. et al. **POSTER LOCATION #144**[*InSight: A Discovery Mission to Explore the Interior of Mars*](#) [#1915]

The InSight mission will illuminate the processes of terrestrial planet formation and evolution through a surface-based geophysical investigation of Mars.

Taylor J. Teanby N. A. Wookey J. **POSTER LOCATION #145**
[Seismic Activity Estimates for the Cerberus Fossae Region of Mars and Implications for the 2016 InSight Mission](#) [#1264]

Using of crater density and measured fault motion in the Cerberus Fossae region of Mars to determine the annual rate of seismicity and number of detectable events.

Teanby N. A. Taylor J. Wookey J. Pike W. T. **POSTER LOCATION #146**
[Seismic Wind Noise Coupling Through Mars' Regolith: Implications for the InSight NASA Discovery Mission](#) [#1035]

We present seismic attenuation properties of martian regolith analogues and discuss implications for a surface-deployed planetary seismometer.

Lorenz R. D. Nakamura Y. **POSTER LOCATION #147**
[Viking Seismometer Record: Data Restoration and Dust Devil Search](#) [#1178]

Whispers from the past / Viking mostly felt the wind / Let's all look closer.

Castillo-Rogez J. C. Banerdt W. B. **POSTER LOCATION #148**
[Impact of Anelasticity on Mars' Dissipative Properties — Application to the InSight Mission](#) [#2679]

Attenuation models accounting for material anelasticity suggest that Mars' average mantle viscosity is orders of magnitude greater than previously inferred.

Nimmo F. Faul U. H. **POSTER LOCATION #149**
[Dissipation Inside Mars at Tidal and Seismic Frequencies](#) [#2174]

Measured martian dissipation is consistent with a convective interior having a temperature ~1450 K. A low-velocity zone exists at the base of the lithosphere.

Tielke J. Li Y. Zimmerman M. Kohlstedt D. **POSTER LOCATION #150**
[Water Incorporation Mechanisms and Mechanical Properties of Hydrous Olivine Single Crystals: Insight into the Rheological Properties of Mantle Rocks of Terrestrial Planets](#) [#2738]

We investigated the influence of silica activity on water incorporation and evaluated the climb-controlled dislocation creep model in olivine.

Haines A. J. Dimitrova L. L. **POSTER LOCATION #151**
[Fully-3D Models for Lithospheric Deformation: A Comparison with the Thinsheet and Flexure Approximations](#) [#2441]

Compared to 3-D Mars models, thin sheet models match only the style but not magnitude of horizontal displacement while flexure fits only the radial displacement.

Dimitrova L. L. Haines A. J. **POSTER LOCATION #152**
[Constraining the Long Term Poisson's Ratio of the Martian Lithosphere From 2D and 3D Dynamic Modeling of Lithospheric Stress and the Surface Faulting Record](#) [#1730]

We constrain the long term Poisson's ratio of the martian crust from dynamic models and surface faults, and discuss implications on elastic thickness estimates.

McMillin A. M. Kattenhorn S. A. **POSTER LOCATION #153**
[Geometry and Evolution of Segmented Normal Fault Systems on Mars](#) [#1099]

Relay zones between segmented normal faults on Mars were analyzed to determine how relay zone geometry relates to segment linkage and evolution.

Watkins J. Yin A. **POSTER LOCATION #154**
[Progressive Evolution of Valles Marineris Fault Zone and its Role in Controlling Interior Layered Deposits and Outflow Channels](#) [#3071]

The role of the progressive opening of Valles Marineris in the evolution of ILDs and the outflow channels is investigated through systematic geologic mapping.

Oosthoek J. H. P. Rossi A. P. Carranza E. J. Unnithan V. **POSTER LOCATION #155**
[Developing Strategies for Predicting Locations of Past Hydrothermal Activity on Mars](#) [#2565]

We investigate the spatial pattern of known past martian hydrothermal activity signals and their possible association with geology to predict unknown locations.

Dehant V. Van Hoolst T. Breuer D. Claeys P. Debaille V. et al. **POSTER LOCATION #156**
[Planet TOPERS: Planets, Tracing the Transfer, Origin, Preservation, and Evolution of Their Reservoirs](#) [#2052]

An overview is given of the Planet TOPERS project addressing habitability in our solar system.

Liu Z. Y. C. Radebaugh J. Harris R. Christiansen E. H. **POSTER LOCATION #157**
[Liquid Hydrocarbons and Fluid Overpressures Explain Contractional Structures on Titan](#) [#1851]

Liquid hydrocarbons and fluid overpressures reduce shear strength of Titan's icy crust and enable contractional structures to form without the large stresses.

Martin E. S. Kattenhorn S. A. **POSTER LOCATION #158**
[Probing Regolith Depths on Enceladus by Exploring a Pit Chain Proxy](#) [#2047]

We explore results from two independent proxies for regolith depth using pit chains to further our understanding of Enceladus' surface modification processes.

Beddingfield C. B. Burr D. M. Dunne W. M. **POSTER LOCATION #159**
[Evidence for Contraction Within the Leading Hemisphere Section of the South Polar Terrain Boundary, Enceladus](#) [#1254]

We test for both extensional and contractional origins of Enceladus' south polar terrain boundary. Our results support the hypothesis of contraction.

Beddingfield C. B. Emery J. P. Burr D. M. **POSTER LOCATION #160**
[Testing for a Contractional Origin of Janiculum Dorsa on the Northern, Leading Hemisphere of Saturn's Moon Dione](#) [#1301]

We test for both extensional and contractional origins of Janiculum Dorsa on Dione. Our results better support the hypothesis of contraction over extension.

Czechowski L. Leliwa-Kopystynski J. **POSTER LOCATION #161**
[Isostasy and the Shape of Iapetus](#) [#1766]

Investigation of shape of Iapetus indicates that its equatorial bulge could be an isostatic structure instead of fossil bulge resulting from fast rotation.

Matsuyama I. Nimmo F. **POSTER LOCATION #162**
[Pluto's Tectonic Pattern Predictions](#) [#1399]

We make predictions for Pluto's global tectonic pattern due to despinning, orbital migration, contraction, and expansion.