

Wednesday, March 12, 2008
MARS INTERIOR DYNAMICS TO EXTERIOR IMPACTS
1:30 p.m. Crystal Ballroom B

Chairs: H. V. Frey
D. L. Buczkowski

- 1:30 p.m. Phillips R. J. * Zuber M. T. Smrekar S. E. Mohit P. S. Putzig N. E. Mellon M. T. Seu R. Biccari D. Campbell B. A. Plaut J. J. Safaeinili A. Carter L. M. Holt J. W. SHARAD Team
The Geodynamical End Game for Mars: Sounding Radar Constraints on the Present Thermal State [#1493]
The Mars sounding radars MARSIS and SHARAD reveal minimal deflection of the lithosphere beneath Planum Boreum and Planum Australe. This implies a minimum elastic thickness of 300 km, which is consistent with the present epoch of a chondritic Mars.
- 1:45 p.m. Roberts J. H. * Lillis R. J. Manga M. Frey H. V.
Impact-related Heating and the Cessation of the Martian Dynamo: Early Results [#1358]
The global magnetic field on Mars vanished sometime during the mid-Noachian, around the same time as the giant impacts. We find that impact heating may reduce the core heat flow by ~2%, potentially hastening the cessation of a dynamo by tens of m.y.
- 2:00 p.m. Jiang W. * Kuang W.
How did the Mars Dynamo Stop: A Dynamic Perspective on the Final Stage of the Mars Dynamo [#2006]
Numerical simulation results show that the time variations of the field strength and the dynamo domain is very strong in the subcritical dynamo state, thus providing further understandings of the termination of the Mars dynamo, and possible observational evidences.
- 2:15 p.m. Frey H. V. *
Mars Crustal Dichotomy: Large Lowland Impact Basins may have Formed in Pre-Thinned Crust [#1342]
Large impact basins in the martian lowlands have thinner crust than do basins of comparable size in the highlands, perhaps because they formed on crust already thinned by some earlier process.
- 2:30 p.m. Zhong S. J. *
Net Rotation of Lithosphere for One-Plate Planets and its Implications for Formation and Evolution of Tharsis Rise [#1528]
A new mechanism of net rotation of lithosphere is proposed to link the formation of Tharsis to crustal dichotomy and explain all the basic features of Tharsis. It challenges the basic tenet that for one-plate planets, lithosphere is stagnant.
- 2:45 p.m. Andrews-Hanna J. C. * Zuber M. T. Banerdt W. B.
Global Structure of the Martian Dichotomy: An Elliptical Impact Basin? [#1980]
We use gravity and topography to constrain the location of the martian crustal dichotomy boundary beneath Tharsis. The globally continuous dichotomy boundary is then found to be accurately matched by an ellipse, suggesting formation by a giant impact.
- 3:00 p.m. Buczkowski D. L. * Murchie S. L. Seelos F. P. Malaret E. Hash C. CRISM Team
CRISM Analyses of Argyre Basin [#1030]
The Argyre basin is a >1500 km, well-preserved impact basin in the southern highlands of Mars. The associated geologic units are mostly Noachian in age so Argyre is an ideal location to characterize the stratigraphy of ancient highland rocks.

- 3:15 p.m. Plesko C. S. * Coker R. F. Wohletz K. H. Asphaug E. Korycansky D. G.
Hydrocode Models of Large Impacts into a Noachian Martian Surface: Initial Results [#2116]
Segura proposed large impacts could broil the surface of Noachian Mars. Later, recondensing volatiles would cause ~1 m/day of precipitation for 1–100 years. We model the smallest impacts capable of causing global effects, and regional effects of smaller impacts.
- 3:30 p.m. Barnhart C. J. * Nimmo F. Travis B. J.
Geophysical Controls on Martian Post-Impact Hydrothermal Systems [#2294]
We present analytic estimates of the effects of two controls on martian post-impact hydrothermal (PIH) systems: permeability and heat sources. These approximations motivate a more sophisticated analysis of PIH systems using MAGHNUM, a numerical model.
- 3:45 p.m. Barlow N. G. * Boyce J. M.
Quasi-MLE Craters: An Unusual Crater Morphology at High Martian Latitudes [#1164]
High-latitude craters on Mars display a double-layer ejecta structure superposed on a more extensive layer. Characteristics of these quasi-MLE craters are similar to smaller pedestal craters. Fine-grained volatile-rich target material is implicated for both.
- 4:00 p.m. Bart G. D. * Melosh H. J.
Identifying Martian Secondary Craters by Their Ejected Boulders [#1461]
Bart and Melosh (2007) demonstrated that distant lunar secondary craters could be distinguished from primary craters by the sizes of the largest ejected boulders. The work presented in this abstract tests the validity of that method for use on Mars.
- 4:15 p.m. Ivanov B. A. Melosh H. J. * McEwen A. S. HiRISE Team
Small Impact Crater Clusters in High Resolution HiRISE Images [#1221]
The HiRISE image scale of 0.25–0.32 meters per pixel allows us for the first time to resolve details of small primary crater fields on Mars. The cluster dispersion is used to estimate strength and density of meteoroids.
- 4:30 p.m. Hartmann W. K. *
Age of Gratteri Crater: Preliminary Test of the Crater-Count Isochron Chronometric System [#1844]
McEwen et al. [2005] suggested a self-consistency test for martian crater count chronology systems. Here we perform this test on the young crater Gratteri and find a satisfactory result.