

**Friday, March 16, 2007**  
**MARS CRATERING: COUNTS AND CATASTROPHES?**  
**8:30 a.m. Crystal Ballroom A**

**Chairs:** J. M. Boyce  
H. V. Frey

- 8:30 a.m. McEwen A. S. \* Grant J. A. Tornabene L. L. Byrne S. Herkenhoff K. E. Bridges N. T. HiRISE Team  
*HiRISE Observations of Small Impact Craters on Mars* [#2009]  
HiRISE observations of small impact craters on Mars are providing striking new results relevant to hard-hitting debates about chronology.
- 8:45 a.m. Aharonson O. \*  
*The Modern Impact Cratering Flux at the Surface of Mars* [#2288]  
The recent discovery of 20 new impact craters on Mars by Malin et al. allows, for the first time, a direct determination of the modern impact flux on the surface of a solar system body and therefore the dating of younger surfaces than previously possible.
- 9:00 a.m. Hartmann W. K. \*  
*Mars: Toward Resolution of the Controversy About Small Craters* [#1060]  
The Malin et al. (2006) discovery of newly formed craters on Mars matches my production function with implications for the "small crater controversy," aired at recent LPSC meetings.
- 9:15 a.m. Calef F. J. III \* Sharpton V. L. Herrick R.  
*Investigating the Spatial Distribution of Small Rayed Crater on Mars: How Long Do They Retain Their Rays?* [#1483]  
We compared a global sample of rayed craters to current measurements of the <1 km diameter crater flux to generate rayed ejecta retention ages. Possible secondary crater contamination was evaluated. A correlation of retention age to %WEH is suggested.
- 9:30 a.m. Boyce J. M. \* Mougini-Mark P.  
*Single and Multi-layered Ejecta Craters: Characterization of Morphology and Assessment of Possible Mechanisms of Ejecta Emplacement* [#1912]  
New observations based on recently collected THEMIS, and MOC images shows details of ejecta blankets of fluidized ejecta craters types not previously seen. These new details imply processes of emplacement for each type of fluidized ejecta craters.
- 9:45 a.m. Chappelow J. E. \* Herrick R. R.  
*A Double, Oblique Impact on Mars: Asteroid or Moonlet?* [#1419]  
The form of a double impact feature on Mars strongly suggests that it was formed by a moonlet and not by an extra-martian asteroid.
- 10:00 a.m. Herrick R. R. \*  
*Details of the Most Oblique Martian Impact Craters* [#1415]  
MOLA and THEMIS observations are presented of oblique impacts relevant to understanding the cratering process and the crustal properties of Mars.
- 10:15 a.m. Boutin D. B. \* Arkani-Hamed J. A. H.  
*Elliptical Craters on Mars: Evidence for Polar Wander of Mars* [#1249]  
We examine the usefulness of elliptical craters as a tool to estimate paleo equator, and polar motion path, of Mars. The paleo-poles obtained in this study spread roughly over the entire surface of the planet, indicating that the elliptical craters do not reveal the polar motion path.

- 10:30 a.m. Rosenberg M. A. \* Kiefer W. S. Frey H. V.  
*Morphometry of Quasi-Circular Depressions in the Southern Hemisphere of Mars: Implications for QCD Formation and Resurfacing History* [#1460]  
The post-impact fill thickness on the floors of large quasi-circular depressions (QCDs) on Mars is virtually independent of the distance from the Hellas and Argyre impact basins. This implies that ejecta from these basins is not the dominant source of QCD floor fill material.
- 10:45 a.m. Edgar L. A. \* Frey H. V.  
*Buried Impact Basin Distribution on Mars: Contributions from Crustal Thickness Data* [#1344]  
A large population of Circular Thin Areas seen in crustal thickness data may represent additional buried impact basins on Mars. If so, the highlands, lowlands and Tharsis are older than previously thought based on Quasi-Circular Depressions alone.
- 11:00 a.m. Frey H. V. \* Edgar L. A.  
*Implications of a Much Larger Population of Buried Impact Basins on Mars as Revealed by Crustal Thickness Anomalies* [#1353]  
A larger than previously believed population of buried impact craters on Mars suggests the highlands and lowlands are the same age and older than previously thought. Tharsis is older than thought, but may not be built on ancient highland basement.
- 11:15 a.m. Solomon S. C. \* Head J. W. III  
*If the Late Heavy Bombardment of the Moon Was a Terminal Cataclysm, What are Some Implications for Mars?* [#1636]  
The inference that the lunar late heavy bombardment was a terminal cataclysm, if correct, has important implications for Mars, including the timing of the dynamo, the source of Late Noachian water, and the origin of Early Hesperian ridged plains.
- 11:30 a.m. Neukum G. \* Basilevsky A. T. Chapman M. G. Werner S. C. van Gasselt S. Jaumann R. Hauber E. Hoffmann H. Wolf U. Head J. W. Greeley R. McCord T. B. HRSC Co-Investigator Team  
*The Geologic Evolution of Mars: Episodicity of Resurfacing Events and Ages from Cratering Analysis of Image Data and Correlation with Radiometric Ages of Martian Meteorites* [#2271]  
Cratering age analyses show that the martian surface was resurfaced episodically from >4 Ga ago until today. The resurfacing events are coincident in time with age groups found in the martian meteorites.