

**Thursday, March 26, 2009**  
**MARTIAN GULLIES: MORPHOLOGY AND ORIGINS**  
**3:15 p.m. Waterway Ballroom 6**

**Chairs: Timothy Titus**  
**Nina Lanza**

- 3:15 p.m. Schon S. C. \* Head J. W. Fassett C. I.  
[\*Unique Chronostratigraphic Marker in Depositional Fan Stratigraphy on Mars: Evidence for ~1.25 Ma Old Gully Activity and Surficial Meltwater Origin\*](#) [#1677]  
 Gully fan morphology indicates multiple periods of depositional activity with date-able secondary craters from a nearby rayed-crater emplaced during an intermediate period in deposition, which provides a maximum age for recent activity of this gully.
- 3:30 p.m. Parsons R. A. \* Nimmo F.  
[\*Fluvial Discharge Rates of Martian Gullies: Slope Measurements from Stereo HiRISE Images and Numerical Modeling of Sediment Transport\*](#) [#1947]  
 Based on fluvial discharge and sediment transport theory from Kleinhans [2005], groundwater is a plausible mechanism for forming gullies on Mars if the supplying aquifer is permeable and ~10s of meters thick. Our model suggests gullies form rapidly (~h).
- 3:45 p.m. Coleman K. A. \* Dixon J. C.  
[\*Martian Gully Morphologies\*](#) [#1230]  
 Numerous morphologically distinct forms on Mars are referred to using the term “gullies”. We analyzed HiRISE and MOC images and began to build a database of morphologies seen in gullies on Mars. To date seven distinct morphologies have been identified.
- 4:00 p.m. Xu D. \* Zeng Z. Yue Z. Wang J. Zhang Z. Birnbaum S. J. Xie H. Yan D.  
[\*A Case Study of an Application of Fractal Theory to Gully’s Alcove on Mars\*](#) [#2481]  
 Poleward facing gullies have higher fractal values than those of equator-ward facing ones in crater of Mars and provides evidence for the hypothesis, formation of gullies is related to snow and ice accumulation and melting due to climatic processes.
- 4:15 p.m. Morgan G. A. \* Head J. W. III Marchant D. R. Dickson J. Levy J.  
[\*The Effect of Varying Annual Snow Accumulation on Gully Formation in Antarctica: Comparisons Between ‘Wet’ and ‘Dry’ Seasons and Implications for Gully Formation on Mars\*](#) [#2331]  
 The sensitivity of gully activity to snow volume in Antarctica demonstrates the importance of snow accumulation, in addition to temperatures permitting melt generation, in determining the location of gully activity.
- 4:30 p.m. Lanza N. L. \* Meyer G. A. Okubo C. Newsom H. E. Wiens R. C.  
[\*Preliminary Evidence for a Debris Flow Gully Slope-Area Relationship on Mars and Implications for a Source Liquid\*](#) [#2225]  
 We compare morphometric characteristics of terrestrial gullies associated with debris flows with a subset of martian gullies to test the hypothesis that these martian gullies are formed by saturation and failure of the regolith.