

Friday, March 19, 2004
IMPACTS ON MARS AND EARTH
8:30 a.m. Salon A

Chairs: E. Pierazzo
J. M. Boyce

- 8:30 a.m. Frey H. V. *
A Timescale for Major Events in Early Mars Crustal Evolution [#1382]
 Visible and buried impact basins provide a basis for a chronology of major events in early martian history. Both a relative N(200) crater retention and a Hartmann-Neukum "absolute" chronology are presented.
- 8:45 a.m. Barlow N. G. * Dohm J. M.
Impact Craters in Arabia Terra, Mars [#1122]
 Large concentrations of multiple layer ejecta morphology and central pit craters occur in Arabia Terra, Mars. These features suggest that a long-lived volatile-rich reservoir underlies this region.
- 9:00 a.m. Dohm J. M. * Barlow N. G. Williams J.-P. Baker V. R. Anderson R. C. Boynton W. V. Fairen A. G. Hare T. M.
Ancient Giant Basin/Aquifer System in the Arabia Region, Mars [#1209]
 Unique traits in the Arabia region indicate a possible ancient giant impact basin that later became an important aquifer as it provided yet another source of water for the formation of putative water bodies in the northern plains and addresses water-related characteristics of the region.
- 9:15 a.m. Hurst M. * Golombek M. P. Kirk R.
Small Crater Morphology Within Gusev Crater and Isidis Planitia: Evidence for Widespread Secondaries on Mars [#2068]
 Through the use of digital elevation models created from stereogrammetry, we determined the diameter, rim height, and crater depth of small (<1 km) craters on the martian surface. The morphology of these craters suggests that they are secondaries.
- 9:30 a.m. Valiant G. J. * Stewart S. T.
Martian Surface Properties: Inferences from Resolved Differences in Crater Geometries [#1293]
 We find large differences in geometry between fresh crater populations in Utopia and Lunae Pl. Crater cavities and ejecta volumes in Utopia are significantly larger, probably due to different composition or subsurface structure in the two terrains.
- 9:45 a.m. Mitchell K. L. *
Asymmetric Ramparts of Secondary Craters in Cerberus, Mars: Interpretation and Implications for Local Stratigraphy [#1547]
 I have identified several small craters with unusual, thick, highly-fluidised ejecta, apparently unique to Cerberus, consistent with secondary impacts into wet sediment or shallow water, from a young (~1 Ma) fresh rayed crater.
- 10:00 a.m. BREAK
- 10:15 a.m. Boyce J. M. * Mougini-Mark P. Garbeil H.
Depth to Diameter Relationships of Craters in the High Latitudes (70°-80°) of Mars: Implications for Geologic History of Those Areas [#1129]
 Depth to diameter relationships of impact crater populations have been measured in the high latitude regions of Mars as a continuation of our work on the degradation history of Mars. These data indicate that the regions show signs that a different surface process has dominated in each region.

- 10:30 a.m. Werner S. C. * Ivanov B. A. Neukum G.
Impact Cratering on Mars: Search for Target Influence on Morphology [#1953]
Based on morphometric parameters of Martian impact craters the influence of the target properties were investigated. As a first step the numerical modeling of impact crater processes indicates a dependence of the central peak shape on the projectile and target properties.
- 10:45 a.m. Pierazzo E. * Artemieva N. A. Ivanov B. A.
Starting Conditions for Hydrothermal Systems Underneath Martian Craters: Hydrocode Modeling [#1352]
We present preliminary results of hydrocode simulations of asteroid and comet impacts on Mars, aimed at constraining the initial conditions for modeling the onset and evolution of impact-generated hydrothermal systems on the red planet.
- 11:00 a.m. Abramov O. * Kring D. A.
Impact-induced Hydrothermal System at the Sudbury Crater: Duration, Temperatures, Mechanics, and Biological Implications [#1697]
A finite-difference computer code was used for the modeling of an impact-induced hydrothermal system at the Sudbury crater. Estimates of system duration and temperatures and insights into system dynamics were obtained. Implications for the evolution of life on early Earth are addressed.
- 11:15 a.m. Newsom H. E. * Nelson M. J. Shearer C. K. Rietmeijer F. J. M. Gakin R. Lee K.
Major and Trace Element Variations in Impact Crater Clay from Chicxulub, Lonar, and Mistastin, Implications for the Martian Soil [#1087]
Li, Be, B, and Ba fractionation and clay compositions suggest low temperature incipient alteration in Yaxcopoil and Lonar samples. Clay protolith in YAX matrix could represent heterogeneous dust or mixtures of condensed metastable eutectic dehydroxylates.
- 11:30 a.m. Zurcher L. * Kring D. A. Dettman D. Rollog M.
Stable Isotopes and Hydrothermal Fluid Source in the Yaxcopoil-1 Borehole, Chicxulub Impact Structure, Mexico [#1261]
We present a detailed C, O, and H isotope survey on carbonate and silicate fractions from the hydrothermally altered impactites at Yaxcopoil-1. In combination with mineralogical and geochemical data, results allowed us to place constraints on fluid parameters, and the likely source.
- 11:45 a.m. Kring D. A. * Zurcher L. Hörz F. Mertzmann S. A.
Chicxulub Impact Melts: Geochemical Signatures of Target Lithology Mixing and Post-Impact Hydrothermal Fluid Processes [#1701]
Major, minor, and trace element analyses of melt samples from the Yaxcopoil-1 borehole into the Chicxulub impact crater indicate the melts have been altered by complex hydrothermal processes and do not represent primary impact melt compositions.