

Tuesday, September 22, 2015
POSTER SESSION: IMPACTITE FORMATION, SHOCK AND
MELTING IN THE TARGET AND PROJECTILE
6:00 p.m. Geology Department

Winkler R. Poelchau M. H. Michalski C. Kenkmann T.

[Subsurface Deformation of Nonporous Rocks Induced by Hypervelocity Impacts](#) [#1047]

Two hypervelocity impact experiments into quartzite and marble were conducted under similar impact condition. Both experiments show tensile failure; quartzite developed zones of strong grain size reduction, while marble shows intragranular fracturing.

Weimer D. Hergarten S. Kenkmann T.

[Analysis of Fragmentation During Dynamic Loading: Investigations in the Ries Impact Crater, Germany](#) [#1053]

We tested three methods to quantify fragmentation of rocks during dynamic loading and found a trend of decreasing fracture density with increasing distance from crater center. Fragmentation attenuation rates in the near- and far-field are different.

Buchner E. Schmieder M.

[Meteoritic Matter on Fracture Surfaces of Shocked Fossils \(Shattered Belemnites\) from the Nördlinger Ries Impact Structure, Southern Germany](#) [#1025]

We report on the surprising discovery of meteoritic matter on fracture surfaces of shattered belemnites from limestone target rocks of the Nördlinger Ries crater. The crucial element ratios might indicate an iron meteoritic Ries projectile.

Pittarello L. Nestola F. Viti C. Crósta A. P. Koeberl C.

[Shatter Cones in Basalt: A Natural Example from the Vista Alegre Impact Structure, Brazil](#) [#1013]

Shatter cones, formed in fine-grained basalt in the Vista Alegre impact structure (Brazil), exhibit cataclastic layers sub-parallel to the striated surfaces and a continuous melt rock film, investigated with TEM, decorating the striated surface.

Zaag P. T. Hasch M. Reimold W. U. Raschke U. Hipsley C. A. Hess K.-U. Dobson K. J.

[New Laboratory and Field Studies on Shatter Cones](#) [#1077]

Investigations of orientation, distribution, and shock micro-deformation of shatter cones were undertaken with micro-Computed Tomography and polarizing microscopy in the laboratory, and in the field at the Keuruselkä impact structure (Finland).

Wilk J. Kenkmann T.

[Shatter Cones from the MEMIN Impact Experiments](#) [#1066]

We recovered shatter cone fragments from the MEMIN cratering experiments in sandstone, quartzite and limestone blocks. We analyzed the conical to hyperboloid, curved and striated fracture surfaces with SEM, WLI and produced μm -accurate 3D models.

Pittarello L. Burret C. Raes M. Koeberl C. Debaille V. Terryn H. Claeys Ph.

[Impact-Related Deformation of PDFs in Quartz: When Identification of True PDFs Becomes Challenging](#) [#1028]

Electron microscopy on shocked quartz from the El'gytgyn impact structure has revealed syn-impact, crystal deformation that has overprinted PDFs and hampers PDFs correct indexation by means of optical microscope and U-stage.

Pickersgill A. E. Lee M. R.

[Identifying Planar Deformation Features Using EBSD and FIB](#) [#1056]

Planar deformation features in quartz grains from the Gow Lake impact structure have been successfully identified and indexed using electron backscatter diffraction in combination with focused ion beam milling.

Raschke U.

[*Shock Distribution within the Crystalline Ejecta Blanket of the Lockne Impact Structure, Sweden*](#) [#1059]

The Lockne crater (Sweden) provides a well developed crystalline ejecta blanket that was sampled and studied for distribution of shock metamorphic effects. Samples containing the highest shock belong to the down range part of ejected material.

Chanou A. Grieve R. A. F. Osinski G. R.

[*Formation of Ballen in Silica by Thermal Shock*](#) [#1112]

Revisiting ballen silica formation as the result of extreme thermal shock and a hierarchical mode of mechanical failure of silica clasts under extreme thermal conditions.

Naumov M. V.

[*Massive Impact Melt Rock from the Puchezh-Katunki Impact Structure: A Case Study of an Inhomogeneous Impact Melt*](#) [#1010]

In the 42-km sized Puchezh-Katunki impact structure only local small melts differing in body morphology, texture, and geochemical features. Such unusual for large craters pattern is caused by both target properties and dynamics of the impact.

Masaitis V. L. Artemieva N. A.

[*Impact Melts in Ejecta Deposits: Popigai Case Study*](#) [#1084]

Appearance of various impactites depends on many circumstances. Part of them can be reconstructed if observations are combined with models. We discuss possible emplacement mechanisms of melt-bearing impactites from the Popigai crater.

McDermott K. H. Burchell M. J.

[*Impact Melting Experiments in a Hot Basalt Target*](#) [#1007]

An investigation of impact melting within hot basalt targets heated up to a temperature of around 800° C in order to simulate impact melting during the early years of the solar system.

Pilles E. A. Osinski G. R. Grieve R. A. F. Bailey J. Smith D.

[*Exploring the Origin of the Offset Dykes at the Sudbury Impact Structure, Canada*](#) [#1020]

The offset dykes are the best-exposed examples of impact-related dykes on Earth. Due to their rich Ni-Cu-PGE deposits, they have been the subject of exploration for decades, yet many uncertainties remain regarding their origin.

Anders D. Osinski G. R. Grieve R. A. F. Péntek A.

[*Formation and Origin of Metabreccia from the Parkin Offset Dyke at the Sudbury Impact Structure*](#) [#1110]

Metabreccia is an important lithology of the Offset Dykes of the Sudbury impact structure, however, its formation and origin is still topic of discussion. Here we present evidence that Metabreccia is a metamorphosed Footwall Breccia.

Anders D. Osinski G. R. Grieve R. A. F.

[*The Basal Onaping Intrusion — The Missing Roof Rocks of the Sudbury Igneous Complex?*](#) [#1107]

The Basal Onaping Intrusion is currently considered part of the Onaping Formation. This study provides petrographic and geochemical evidence that the Basal Onaping Intrusion are the roof rocks of the Sudbury Igneous Complex.

O'Callaghan J. W. Weirich J. R. Osinski G. R. Lightfoot P. C.

[*Geochemical Variations in Sudbury Breccia of the Sudbury Impact Structure, Canada*](#) [#1011]

Sudbury Breccia samples from around the Sudbury Impact Structure tend to have geochemical signatures that reflect an in-situ mixing of country rock, though some samples appear to have been transported over significant distances.

Čalogović M. Marjanac T. Fazinić S. Strmić-Palinkaš S. Tomša A. M. Marjanac L.
[Chemical Composition of Impact Glass and Suevite-Type Partial Melts of the Rab and Krk Islands and Their Relation with the Proposed Krk Impact Structure in Northern Adriatic, Croatia](#) [#1088]

Chemical composition of Krk impact structure ejecta represented by incomplete melts and glasses indicate affinity with Pleistocene loess as target lithology, and suggests Pleistocene age of the impact.

Marjanac T. Tomša A. M. Marjanac L. Čalogović M. Fazinić S.
[Krk Impact Structure Ejecta Breccia and Melt Rocks on the Islands of Krk and Rab, Croatian Adriatic: A Clue on the Impact Target Lithology](#) [#1086]

Ejecta of the Krk impact structure in Adriatic comprise breccia, incomplete melts and massive crystalline glass. The glass and melts are similar in composition with Pleistocene loess, indicating the target rocks and the age of the event.

Verbaas J. Thorkelson D. J.
[A Possible Impact Origin for the 1.6 Ga Wernecke Breccias in Northern Yukon, Canada](#) [#1038]

The 1.6 Ga Wernecke Breccia is a set of crosscutting breccia zones in northern Yukon Canada. The size (100's of metres) and origin of the clasts within the breccias indicate several km's of transport. They may have formed due to a large impact.

Hamann C. Stöffler D. Reimold W. U.
[Experimental Impacts of Aluminum Projectiles into Quartz Sand: Formation of Khatyrkite \(CuAl₂\) and Reduction of Quartz to Silicon](#) [#1071]

Impacts of aluminum projectiles into quartz sand at ~6 km/s, bearing on our understanding of regolith-forming processes, are studied regarding projectile-target interaction. Moreover, we report experimentally produced khatyrkite for the first time.

Osinski G. R.
[Hypervelocity Impact into Carbonate-Bearing Targets: Processes and Products](#) [#1016]

Here, I review the processes and products of hypervelocity impact into carbonate-bearing targets. Experiments are contradictory. Theory and observations support melting being the dominant response.

Davison T. M. Collins G. S. Bland P. A. Derrick J. G.
[Mesoscale Numerical Modelling of Impact Processing of Primitive Solar System Solids](#) [#1060]

We will present results from a mesoscale modelling study of impacts into bimodal mixtures of chondrules and matrix as analogues for primitive solar system materials.

Reznik B. Kontny A. Fritz J.
[Effect of Shock Waves on Magnetic Susceptibility and Microstructure of Magnetite](#) [#1087]

This study investigates the effect of laboratory shock waves on the magnetic susceptibility and structural behavior of magnetite, and its usage for shock pressure barometry in terrestrial rocks and meteorites.