

Tuesday, August 5, 2003
POSTER SESSION
5:30 p.m. Gewölbe, Rathaus (Town Hall)

Terrestrial Craters

Rondot J.

Mass-Movement in Geological Strata of Some Astroblemes [#4007]

Mass-movement of parautochthonous rocks, which have preserved their internal coherence, but are separated by faults, provides indications on their displacement. Collapsed rocks surround a central uplift, which represent less than a quarter of their surface.

L'Heureux E. Ugalde H. Milkereit B. Eyles N. Boyce J. Morris W.

Magnetic, Gravity and Seismic Constraints on the Nature of the Wanapitei Lake Impact Crater [#4016]

Vertical dikes were used as markers in the identification of a medium sized impact crater located in Wanapitei Lake, Canada. Results of a magnetic and seismic survey indicate that the crater is much smaller than originally proposed (3 to 4 km).

Wieland F. Reimold W. U. Gibson R. L.

New Evidence Related to the Formation of Shatter Cones; with Special Emphasis on Structural Observations in the Collar of the Vredefort Dome, South Africa [#4008]

New field observations on shatter cones from the Vredefort Dome give new insight into the formation of this impact deformation phenomenon. The orientations of shatter cone apices are not uniform with regard to the center of the structure and show a variety of prominent directions.

Newsom H. E. Hagerty J. J.

Evidence for Impact-induced Hydrothermal Alteration at the Lonar Crater, India, and Mistastin Lake, Canada [#4116]

Impact crater hydrothermal alteration at the Lonar crater, India and Mistastin Lake, Canada consists of Fe-rich clays. These clays could be similar to alteration material present on Mars.

Morrow J. R. Sandberg C. A.

Late Devonian Alamo Event, Nevada, USA; Multiple Evidence of an Off-Platform Marine Impact [#4055]

Multiple lines of evidence document that the Alamo Event resulted from a cometary impact into an off-platform marine setting, 150 km north of present-day Las Vegas, Nevada, USA, during early Late Devonian (early Frasnian punctata Zone) time.

Mungall J. Milkereit B. Grieve R. Leshner M.

Probing the Sudbury Structure at Depth — An ICDP Proposal [#4108]

The Sudbury structure is the largest and best-exposed remnant of a large meteorite impact structure on earth. It hosts one of the world's largest concentrations of magmatic Ni-Cu-Pt-Pd-Au mineralizations and has produced more than \$100 billion worth of metal in over a century in production.

Koeberl C. Milkereit B. Overpeck J. Scholz C.

Proposed Scientific Drilling at the Bosumtwi Impact Structure, Ghana, West Africa [#4107]

The 10.5 km diameter Bosumtwi impact crater has an age of 1.07 Ma and was excavated in lower greenschist facies metasediments of the 2.1–2.2 Ga Birimian Supergroup. A deep drilling project has been approved by the International Continental Scientific Drilling Program (ICDP).

Koeberl C. Rampino M. R. Jalufka D. A. Winiarski D. H.

A 2003 Expedition into the Libyan Desert Glass Strewn Field, Great Sand Sea, Western Egypt [#4079]

Libyan Desert Glass is an enigmatic impact glass found in the western desert of Egypt. We undertook an expedition to collect a number of specimens that might contain a meteoritic component.

Howard K. T. Haines P. W.

Distribution and Abundance of Darwin Impact Glass [#4057]

We have constrained the dimensions of the Darwin glass strewn field and estimated the abundance of glass. Results show that relative to the size of the suspected source crater more glass has been ejected and to greater distances than in any other known impact.

Krull A. E. Lowe D. R. Byerly G. R.

Inferred Primary Compositions of Archean Spherules Formed by the Condensation of an Impact-produced Rock Vapor Cloud, Barberton Greenstone Belt, South Africa [#4056]

In this study we estimate the original mineralogy of Archean spherules in the S3 layer of the Barberton Greenstone Belt, South Africa, through an analysis of preserved textures, compositions, and alteration products.

Seydoux-Guillaume A.-M. Deutsch A.

Al-rich Orthopyroxenes in Impact Melt Coatings of Gneiss Bombs from Popigai, Russia — New ATEM Data [#4085]

This ATEM study provide chemical and structural data for highly exotic orthopyroxenes in impact melt glass, having Al_2O_3 contents of up to 13 wt.%.

Masaitis V. L. Mashchak M. S. Naumov M. V.

Original Diameter and Depth of Erosion of the Popigai Impact Crater, Russia [#4039]

Based on topographic, structural, and geophysical data, the diameter of the Popigai impact structure is confirmed to be 100 km. The depth of erosion of the crater varies sharply from 100–200 to 300–500 m.

Osinski G. R. Grieve R. A. F. Spray J. G.

The Nature of the Groundmass of Surficial Suevites from the Ries Impact Structure, Germany [#4022]

We present the results of a detailed field, optical, and analytical SEM study of the groundmass or surficial suevites from the Ries impact structure. The results of this study reveal that the groundmass comprises a series of impact-generated melts.

Artemieva N. A.

Distal Ejecta from the Ries Crater — Moldavites and Projectile [#4050]

Numerical modeling of tektites ejection, atmospheric flight and deposition at the surface is considered.

The calculated size of the strewn field is an order of magnitude larger than the real one with average density of $0.01\text{--}0.1 \text{ kg/m}^2$.

Tsikalas F. Faleide J. I.

Mjølnir Marine Crater Resulting from Oblique Impact: Compelling Evidence [#4005]

Diagnostic structural and geophysical signatures clearly demonstrate that the 40-km-diameter Mjølnir marine crater resulted from an oblique impact from south/southwest at a 45–50 degrees angle from the horizontal.

Gersonde R. Kyte F. T. Frederichs T. Bleil U. Kuhn G.

Reports of Discovery of the “Eltanin Crater” are Contradicted by Data [#4095]

Recent abstracts have reported the discovery of a 132 km crater on the ocean floor possibly related to the Eltanin impact. We state categorically that this is contradicted by our extensive exploration and analysis of this impact event.

Ivanov B. A. Shuvalov V. V. Lindstrom M.

The Lockne Crater: Shock Compression of Basement Rocks and Ejected Material [#4066]

We present results of the numerical modeling with estimates of shock level and melt fraction in ejecta of the submarine Lockne crater.

Modeling

Shuvalov V. V.

Cratering Process After Oblique Impacts [#4130]

The purpose of this paper is to study the cratering process after an oblique impact using direct numerical simulations. I consider impacts of 0.5-km- and 8-km-radius asteroids, which result in formation of complex craters with central peak (0.5 km) and peak ring (8 km).

Ugalde H. A. Artemieva N. Milkereit B.

Numerical Modeling and Petrophysical Constraints on the Magnetic Signature of Impact Structures [#4017]

The magnetic anomalies over impact structures are analyzed, and constrained by paleomagnetic data and numerical modelling. The processes that lead to magnetic anomalies on impact structures are addressed and constrained.

Ivanov B. A. Melosh H. J.

Large Scale Impacts and Triggered Volcanism [#4062]

The aim of this publication is to critically examine some frequently cited mechanisms of impact energy transformation into a trigger for terrestrial volcanism and magmatism.

de Niem D.

A Model of Early Condensate Composition in Impacts [#4069]

The evolution of composition and temperature of early condensates in a terrestrial impact is investigated numerically.

Lorenz R. D.

On the Decoupling of Microtektites from the Ejecta Plume [#4114]

I aim to connect the distribution of launch parameters of microtektites (velocity, angle, altitude) with the particle size, consistent with ejecta thickness relationships and the shapes of venusian parabolae: this link should shed light on the plume expansion and particle launch process.

Chicxulub

Schmitt R. T. Wittmann A. Stöffler D.

The ICDP Drill Core Yaxcopoil-1, Chicxulub Impact Crater, Mexico: Shock Metamorphism of the Impactite Units (794–894 m) [#4061]

In this study we focus on the shock metamorphism of the impactites (794–894 m) of the ICDP drilling Yax-1. The full range of the progressive stages of shock metamorphism is observed in silicate grains. Yax-1_884.92 m, which may contain carbonate melt, is described in detail.

Wittmann A. Kenkmann T. Schmitt R. T. Hecht L. Stöffler D.

Impact Melt Rocks in the “Cretaceous Megablock Sequence” of Drill Core Yaxcopoil-1, Chicxulub Crater, Yucatan, Mexico [#4125]

We present geochemical and petrographic data on impact melt rocks in YAX-1.

Schönian F. Salge T. Stöffler D. Urrutia Fucugauchi J.

Additional Observations on the Impact Breccias of the Chicxulub Ejecta Blanket from the UNAM-7 Drill Core, Yucatán, Mexico [#4132]

Abundance of melt in both units of impact breccias of the UNAM-7 drill core (Chicxulub) and the absence of a sharp contact implies that they can't directly be compared with the Bunte Breccia/Suevite of the Ries ejecta blanket (Germany).

Kenkmann T. Wittmann A. Scherler D. Stöffler D.

The Cretaceous Sequence of the Chicxulub YAX-1 Drillcore: What is Impact-derived? [#4075]

The question is addressed whether the Cretaceous rocks of YAX-1 represent a continuous undisturbed sequence or an impact-disrupted megablock unit. New data indicate impact-induced fragmentation, dike formation, and localized shock metamorphism.

Lounejeva E. Elias-Herrera M. Ortega-Gutiérrez F. Cedillo-Pardo E.

Origin of Epidote from the Impact Melt of the Chicxulub Crater, Mexico [#4054]

Magmatic epidote in the Chicxulub melt rocks was identified and considered on textural-chemical grounds to be of low pressure origin.

Schulte P. Kontny A. Stinnesbeck W.

"Fingerprinting" Target Lithologies of the Chicxulub Crater in Ejecta from NE Mexico and Texas: Yucatán Subsurface Revisited [#4090]

Mineralogical and compositional data of Chicxulub ejecta deposits in NE Mexico and Texas imply a suite of mafic to intermediate precursor lithologies, including a specific potassium rich rock type. This suggests a complex basement of the Chicxulub crater in Yucatán.

Aadte T. Keller G. Stinnesbeck W. Harting M. Stüben D. Kramar U.

Multiple Impacts Across the Cretaceous-Tertiary Boundary [#4048]

Multiple impacts (comet shower?) across the K/T Boundary are most consistent with current evidence of spherules, Ir anomalies and climate change during the late Maastrichtian to early Danian and support three impact events.

King D. T. Jr. Petruny L. W. Pope K. O. Ocampo A. C.

Possible Modes of Emplacement of Coarse Impactoclastic Ejecta (Breccia) from a Large Body Impact on Earth: Chicxulub Ejecta in Belize, Central America [#4052]

The Albion impactoclastic breccia (Albion Island, Belize) is a very coarse, carbonate clast-rich unit that was formed by ballistic sedimentation and ejecta debris-flow processes associated with the Chicxulub impact event approximately 325 km away on the Yucatán Peninsula of México.

Gulick S. P. S. Christeson G. L. Morgan J. V. Warner M. R. Barton P.

Urrutia-Fucugauchi J. Melosh H. J.

Active Seismic and Drilling Studies of the Chicxulub Impact Crater: A Status Report [#4019]

A status report on the results of recent studies and plans for upcoming international efforts at imaging the Chicxulub crater with seismic methods and direct sampling using continental and oceanic drilling platforms.

Shock Metamorphism

Skála R. Hörz F. Langenhorst F.

Diaplectic Glass Content in Experimentally Shock-loaded Quartz Determined by X-Ray Powder Diffraction [#4033]

Diaplectic glass content in quartz experimentally shock-loaded in the range between 8 and 33 GPa is determined using integral intensity measurements for the (101) diffraction line of quartz in X-ray powder diffraction patterns.

Dubrovinsky L. Dubrovinskaia N.

Phase Relations in TiO₂ at Elevated Pressures and Temperatures [#4060]

Combined theoretical and experimental investigations have led to the discovery of new polymorphs of titanium dioxide and revealed phase relations in TiO₂ system.

Fel'dman V. I. Sazonova L. V. Kozlov E. A. Zhugin Ju. N.

Transformation of Some Minerals in Shock Wave — Comparison of Natural and Experimental Data [#4014]

There are some differences in natural and experimental shock-thermal aggregates (STA) in minerals of target rocks.

Hertzsch J.-M.

Shock Effects at Inclined Material Interfaces — Numerical Simulations [#4031]

Computer simulations of shock waves passing inclined material interfaces have been performed and the effect of the angle between shock wave plane and interface on shock-induced temperature changes has been examined.

Elwood Madden M. E. Hörz F. Bodnar R. J.

Experimental Simulation of Shock Reequilibration of Fluid Inclusions During Meteorite Impact [#4013]

The effects of shock events on fluid inclusions in quartz were investigated experimentally. Results show that inclusion textures undergo a systematic evolution with increasing shock pressures leading to complete destruction of inclusions above 10 GPa.

New Craters

Zegers T. E. Ocampo A.

Vaalbara and Tectonic Effects of a Mega Impact in the Early Archean 3470 Ma [#4038]

Recently, impact layers have been recognized in the Early Archean (3.47 and 3.2 Ga) sequences of the Pilbara and Kaapvaal Cratons. We will present results on the paleogeography of the two cratons in the Archean, and discuss potential impact structures and impact melt.

Ormö J. Rossi A. P. Komatsu G.

The Sirente Crater Field: Outline, Age, and Evidence for Heating of the Target [#4070]

We present a more complete outline of the Sirente crater field, new age datings, and evidence for heating of the target.

Pesonen L. J. Donadini F. Salminen J. Lehtinen M.

The Suvasvesi South Structure, Central Finland: Further Evidences to the Discovery of Impact [#4074]

The summer 2002 field research in the Suvasvesi S area led to the discovery of new impact evidence. Bathymetric, geophysical data and thin section studies of the discovered melt boulders confirm that Suvasvesi S is a new impact structure in Finland.

Hamill B. J.

The Loch Leven Crater: Anatomy of a Low-Angle Oblique Impact Structure [#4041]

Rocks of the Loch Leven crater show properties which, though similar to those in conventional circular craters, display some subtle differences and are asymmetrically distributed in the structure.

Evans K. R. Rovey C. W. II Mickus K. L. Miller J. F. Plymate T. G. Thomson K. C.

Weaubleau-Osceola Structure, Missouri: Deformation, Event Stratification, and Shock Metamorphism of a Mid-Carboniferous Impact Site [#4111]

The Weaubleau-Osceola structure is a newly recognized 19-km diameter impact site in southwestern Missouri. Shocked quartz, deformational striae, intense folding, and event stratification provide evidence of its impact origin.

Brookfield M. E.

The Eastern Hudson Bay Arc, Canada: Part of a Multi-Ringed Basin [#4010]

The best available explanation of the eastern arc of Hudson Bay is as part of an early Proterozoic multi-ringed impact basin, particularly when closing the James Bay rift aligns the Sutton ridges to form an arc of over 240°, or two thirds of a circle, with a radius of 230 km.

Rocca M. C. L.

Bajo Hondo, a Very Puzzling Crater in Chubut, Patagonia, Argentina

Bajo Hondo is a very puzzling 4.8 km crater in Chubut, Argentina. The author believes it is in fact a gigantic simple impact crater on a basaltic plateau like the Lonar Lake impact crater in India.

(This poster combines three abstracts: [#4001] and [#4002] and [#4003])

Burba G. A.

Effect of the Supposed Giant Impact Crater on the Geologic Evolution of the Ural Mountain Range [#4117]

Middle-Ural Ring Structure (MURS) is located in Russia, between 54° and 59° N, 52° and 62° E. Its diameter is 400 km. MURS curves the rectilinear Ural Range eastward. It looks like MURS may have been a stable obstacle during the formation of the Ural Mountains.

Miura Y. Koga N. Nakamura A.

Impact Drilled Samples of Buried Crater Structure from Takamatsu-Kagawa District in Japan

The Takamatsu-Kagawa structure is confirmed by surface and drilled samples as impact crater in Japan that was deformed by later volcanic depression.

(This poster combines two abstracts: [#4122] and [#4127])

Shukla A. D. Bhandari N. Shukla P. N.

Shocked Quartz at the Permian-Triassic Boundary (P/T) in Spiti Valley, Himalaya, India [#4059]

Shocked quartz grains with planar deformation features from the P/T boundary sediments of Spiti Valley, Himalaya, have been found which support an impact event at the end-Permian.

Planetary Craters/Early Earth

Neal J. Barlow N. G.

Comparison Study of Layered Ejecta Morphologies Surrounding Impact Craters on Ganymede and Mars [#4021]

We are studying the similarities and differences between the layered ejecta morphologies on Ganymede and Mars to investigate how impact into increasing amounts of target ice affect these ejecta morphologies.

Takata T. Hori S.

Locations and Compositions of Mare Ponds in South Pole-Aitken Basin on the Moon and Its Implication to the Impact Tectonics [#4058]

Locations and compositions of mare in South Pole-Aitken (SPA) basin are correlated to the structure of the SPA crater. The coverage of mare indicates mare extrusions exist inside and along the rings. The lack of Hi-Ti basalt in SPA could result from the subsurface structure.

Lahtela H. Kostama V.-P. Aittola M. Öhman T. Raitala J.

The Lacustrine Reservoirs in Hellas Impact Basin Region [#4073]

The Hellas Basin in the southern hemisphere of Mars is rich in details of past fluvial and lacustrine activity. Studies of these reservoirs will reveal additional details of Martian erosion, deformation and sedimentation.

Whitehead J. Grieve R. A. F. Garvin J. B. Spray J. G.

The Dependence of Target Properties Upon Fresh Crater Morphologies on Mars [#4086]

The Viking images of ~900 martian craters were analyzed in order to test any correlations between their morphologies and the interpreted target geologic units.

Korteniemi J.

Collapses and Depressions Post-Dating Crater Formation in Martian Impact Structures — Distribution and Consequences [#4091]

Craters with distinctive depressions on their floors can be found in clusters around the highlands of Mars. The collapses always form inside the crater, some following the circular shape. These craters outline areas of local distinctive geology.

Pechernikova G. V. Davidenko I. W.

Estimations of Axial Moment of the Growing Earth [#4015]

Results of calculations of mass increase of the planet and corresponding planetary spin K in the new model are presented. Model combines analytical and statistical approaches in the framework standard scenario of the solar system formation.

Vityazev A. V. Pechernikova G. V. Bashkirov A. G.

Early Accretion and Differentiation of Protoplanetary Bodies and Hf-W Chronometry [#4035]

Hf-W data can be interpreted as evidence for early differentiation and forming of primitive cores and mantles in large planetesimals tens of Ma before their integration into four terrestrial planets. Nb-Zr data are not in conflict with this scenario.