

Professor CHRISTIAN KOEBERL works in the fields of geochemistry and planetology at the University of Vienna in Austria. His main research activities involve all aspects of impact crater studies. Currently he is the chairman of the European Science Foundation "Impact" programme.

FRANCISCA MARTÍNEZ-RUIZ received her Ph.D from the University of Granada, Spain in 1993. She was then a postdoctoral fellow at the ETH-Zurich, Switzerland, and Scripps Institution of Oceanography, USA. Since 1999 she has been employed by the Spanish Council of Scientific Research at the Andalusian Institute for Earth Sciences, Granada, Spain.



Koeberl · Martínez-Ruiz (Eds.)
Impact Markers in the Stratigraphic Record

This volume is the third in a series of impact books resulting from the activities of the scientific programme, Response of the Earth System to Impact Processes (IMPACT), funded by the European Science Foundation. The volume begins with an overview of impact markers in the stratigraphic record, and is followed by three general papers on various aspects of impact cratering, ranging from a suggested nomenclature of impact product to a treatment of the hypothesis that impacts can trigger mantle plumes. Then follow 10 original contributions on various impact deposits in the stratigraphic record, ordered by increasing age, ranging from the Late Eocene Popigai impact crater to the K-T boundary to the J-K boundary and Late Devonian and Ordovician deposits.

ISBN 3-540-00630-3



9 783540 006305

<http://www.springer.de>

Contents

The Stratigraphic Record of Impact Events – A Short Overview <i>Christian Koeberl and Francisca Martinez-Ruiz</i>	1
Application of stratigraphic nomenclature to terrestrial impact-derived and impact-related materials <i>David T. Kring, Jr. and Lucille W. Petruny</i>	41
Main Geochemical Signatures Related to Meteoritic Impacts in Terrestrial Rocks: A Review <i>Maria-Jesus Munoz-Espadas, Jesus Martinez-Frias and Rosario Lunar</i>	65
Impact Decompression Melting: A Possible Trigger for Impact Induced Volcanism and Mantle Hotspots? <i>Adrian P. Jones, David G. Price, Paul S. DeCarli, Neville Price and Richard Clegg</i>	91
Displacement of Target Material During Impact Cratering <i>Valery Shuvalov</i>	121
Obscure-bedded Ejecta Facies from the Popigai Impact Structure, Siberia: Lithological Features and Mode of Origin <i>Victor L. Masaitis</i>	137
Biostratigraphic Indications of the Age of the Boltysh Impact Crater, Ukraine <i>Anton Valter and Ludmila Plotnikova</i>	163
Ejecta of the Boltysh Impact Crater in the Ukrainian Shield <i>Eugene P. Gurov, Simon P. Kelley and Christian Koeberl</i>	179
Stratigraphy and Sedimentology of Coarse Impactoclastic Breccia Units within the Cretaceous-Tertiary Boundary Section, Albion Island, Belize <i>David T. Kring, Jr. and Lucille W. Petruny</i>	203

New Geochemical Insights from Electron-Spin-Resonance Studies of Mn ²⁺ and SO ₃ ⁻ in Calcites: Quantitative Analyses of Chicxulub Crater Ejecta from Belize and Southern México with Comparison to Limestones from Distal Cretaceous-Tertiary-Boundary Sites <i>David L. Griscom, Virgilio Beltrán-López, Kevin O. Pope and Adriana C. Ocampo</i>	229
Petrography and Geochemistry of a Deep Drill Core from the Edge of the Morokweng Impact Structure, South Africa <i>Wolf Uwe Reimold and Christian Koeberl</i>	271
Stratigraphy, Paleomagnetic Results, and Preliminary Palynology across the Permian-Triassic (P-Tr) Boundary at Carlton Heights, Southern Karoo Basin (South Africa) <i>Dylan M. Schwindt, Michael R. Rampino, Maureen B. Steiner and Yoram Eshet</i>	293
Search for an Extraterrestrial Component in the Late Devonian Alamo Impact Breccia (Nevada): Results of Iridium Measurements <i>Christian Koeberl, Heinz Huber, Matthew Morgan and John E. Warmer</i>	315
The Osmussaar Breccia in Northwestern Estonia – Evidence of a ~475 Ma Earthquake or an Impact? <i>Kalle Suuroja, Kalle Krsimäe, Leho Ainsaar, Marko Kõhv, William C. Mahaney and Sten Suuroja</i>	333