

RIES CRATER CONFERENCE



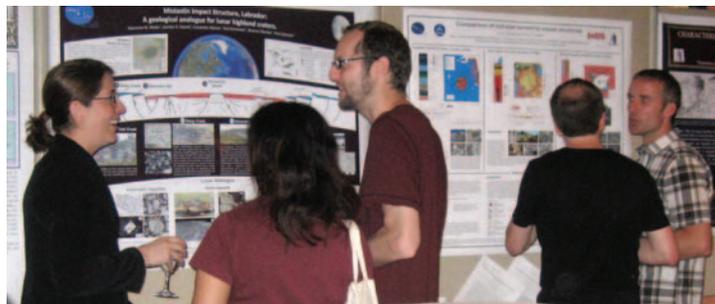
Space travel to nearby celestial bodies will need careful planning. It will be essential to select a safe and scientifically valuable landing site for manned and unmanned landings. An energy-efficient location will be required if return of the spacecraft is planned. Before landing on the

Moon, scientists at NASA had already considered the mechanics and dynamics of the Ries Crater (in the center of southern Germany) in their computations. Four astronauts from the Apollo 14 and 17 missions visited the Ries area for field training before their space flights to the Moon. This is one of the reasons why the Lunar and Planetary Institute (LPI) in Houston, USA, and other organizations hold frequent meetings in Noerdlingen, the largest town within the Ries Crater. In 2003 an impact conference of similar scope was held in Noerdlingen (www.dmg-home.de/Altes_DMG-Forum/Jan2004/30Ries.html; click on "English version" below the title).

THE 2010 CONFERENCE

A goal of the conference was to allow scientists from many countries to discuss new scientific knowledge about impact geology. Another focal point was to evaluate possible landing sites on celestial bodies close to Earth (Mars, Moon, planetoids). More details, including abstracts of the presentations and information about the presenters, can be obtained at www.lpi.usra.edu/meetings/nordlingen2010/.

On Friday, astronauts Dr. Stanley Love (NASA, STS-122) and Dr. Gerhard Thiele (ESA, STS-099) described present and future space travel. Dr. Love reported about the current reorientation of space-travel activities in the USA. Instead of returning to the Moon, the goal is to land on Mars, via an intermediate step of landing on celestial bodies close to Earth. In Dr. Thiele's opinion, it is not a question of whether man will conquer Mars—it will certainly happen. It is human nature to explore things beyond our horizons, and the first astronaut to set foot on Mars may already be living. After these presentations and all day Saturday, participants were able to peruse the many posters, mainly on geological topics.



On Saturday ten papers were presented in three sessions. The first session was about crater formation, shock metamorphism, and the classification of impacts. The second showed the influence of Ries Crater research on theories of crater formation on Mars and the Moon. The third session dealt with future landing sites on Mars and the Moon.

Apart from the already known impact minerals coesite and stishovite, new impact minerals have been identified in and around the Ries Crater.

Numerical simulation of the Ries event is becoming increasingly important. The theory about the creation of suevite, named after Swabia (Latin: *Suevia*), the part of Bavaria containing the Ries Crater, must be reevaluated. Up to now the role of water during an impact has been neglected. Because the presence of water (ice) on Mars has been proven, the mechanical and dynamic effects of crater creation on Mars are more closely related to those on Earth than on the Moon. When choosing possible landing sites on Mars or the Moon, it will be important to select the ideal distance from the crater rim to find the most interesting materials, especially those from the lowest part of the surface before the impact. Landing in the crater center is not a good idea: you will find only minerals that fell last, probably from the original top soil. As gravity on Mars and the Moon is 1/3 and 1/6, respectively, of Earth's gravity, there is less air to slow down the descent of the impacting body, and this results in much deeper (several kilometers) craters on Mars and the Moon than on Earth.

Conference attendees spent all day Sunday on a geological excursion: "On the Track of the Apollo 14 and 17 Astronauts of August 1970." Seven localities, such as quarries, gravel pits, and other impact-relevant places in and around the Ries, were visited. Among them was the historical site, now a derelict quarry, where coesite was sampled by American NASA planetologist Dr. Eugene Shoemaker in 1960. Within a few days of receiving samples from Dr. Shoemaker, Dr. Edward Chao, a scientist from the U.S. Geological Survey, proved that the Ries Crater was indeed a meteorite impact crater. This was the start of continual impact research in the Ries area. The Ries Crater is now the best-researched impact crater worldwide, and a large amount of knowledge on impact dynamics has been acquired in and around the crater.

On Saturday night conference attendees and VIPs celebrated three anniversaries in the Klosterle convention center:

- 50 years (July 27, 1960): scientific proof that the Ries Crater is an impact crater
- 40 years (Aug 10, 1970): training of NASA Apollo 14 and 17 astronauts in the Ries area
- 20 years (May 06, 1990): opening of the Ries Crater museum, a worldwide leader in the transfer of scientific and public knowledge

Prof. Ernst Messerschmid (ESA, STS-061A), the second German astronaut (1985, Spacelab D1), delivered a keynote address about the highlights of several decades of manned space travel and about future plans. Prof. Dieter Stoeffler, one of the most active impact-research scientists, presented a keynote talk entitled "What Is the Importance of the Ries for Moon Research and for Plans to Send Astronauts to Nearby Celestial Bodies?"



Prof. Dr. Dieter Stoeffler
studying impact breccias.
PHOTO: HERMANN STRASS

The city of Noerdlingen is almost perfectly circular, with a completely preserved, roofed, medieval city wall. Its diameter, about 1 km, is similar to the diameter of the meteorite that formed the Ries Crater. Both scientists and interested laymen can pick up research material (mineral samples) from the ground and take it home or to a laboratory for further analysis. The Ries is the only "National Geopark" in Bavaria (www.geopark-ries.de).

The Ries Crater is not the largest impact crater in the world, but it is the largest permanently inhabited one and is the most accessible large one. The crater structure is clearly visible: it features an inner crater

Cont'd on page 335

rim and a circular, 25 km diameter outer rim. After the impact 15 million years ago, the crater became an undrained lake for two million years and filled up with washed-down silt. Thus, the crater was protected from weathering and vegetation. Earthquakes, volcanism, and faulting have not affected it. During the Pleistocene, the crater sediments were washed out. Human settlement started slowly during the Paleolithic era (Old Stone Age). Archeological finds can be seen in the museums in the Ries. Ipf, a table mountain at the western edge of the Ries Crater, is currently the largest Celtic excavation site in Western Europe.

Further information can be obtained on the Internet by entering the names of locations, minerals, concepts, and STS numbers of space flights.

Hermann Strass, Noerdlingen, Germany
techcon.hstrass@t-online.de

DMG PETROLOGY AND PETROPHYSICS SECTION MEETING



Participants at this year's Petrology and Petrophysics Section meeting in front of the Institute of Geosciences, Goethe University, Frankfurt/Main. PHOTO: ALAN WOODLAND

On 26 June 2010, the traditional Petrology and Petrophysics Section meeting of the German Mineralogical Society was held once more. At the invitation of Prof. Alan Woodland and Dr. Kevin Klimm, 44 scientists and young researchers from all over Germany convened at the Institute of Geosciences of Goethe University in Frankfurt/Main to present their latest scientific results and discuss them with colleagues. Many participants had met the evening before to exchange news and get early information about the meeting program.

After a short introduction by Allan Woodland, the program started with a presentation by Prof. Katsura (Bavarian Geoinstitute, Bayreuth, Germany), who explained in detail multi-anvil experiments, including X-ray diffractometry measurements under high pressure and temperature conditions. Other contributors presented experimental studies on the formation of reaction rims on mineral surfaces, water-rock interactions in submarine hydrothermal systems, laboratory-scale CO₂ sequestration, and the composition of the Archean and Proterozoic atmosphere and seawater. Field-related studies, such as fluid processes in subduction channels, metasomatic processes in eclogites, research on the eastern Antarctic Annandagstoppane granite, and Ta-Nb mineralization processes in Colombia, were also detailed. Other workers described new methods in X-ray microcomputer tomography and electron backscatter diffractometry, as well as the atomistic simulation of silicate melts. One talk dealt with a new Internet platform on which petrologists can discuss problems or ask questions. Find further information about this at www.expet-network.com. With a total of 16 presentations, the diverse program allowed participants to look outside their own scientific interests and get insights into different subjects.

During lunch break and after the scientific program was completed, participants had the opportunity to visit the new Institute and laboratories. The evening ended with sporting events and a delicious BBQ with cold drinks (with the kind support of Springer). The 2011 meeting will be organized by colleagues of the Ruhr University in Bochum.

Katja Beier, Kiel



Sociedad Española de Mineralogía

www.ehu.es/sem

BIOMINERALS AND BIOMINERALIZATION PROCESSES: NEW VOLUME OF THE SEM SEMINAR SERIES

Understanding the complex interplay between the organic and inorganic factors controlling the formation of biominerals represents one of the most challenging goals of modern mineralogy. *Biominerals and Biomineralization Processes*, the seventh volume in the Seminar Series of the Mineralogical Society of Spain, is aimed at providing young and senior researchers with an updated and comprehensive view of recent advances in the field of biomineralization. The volume collects the invited lectures delivered at a workshop held in Madrid on 13 September 2010. The first chapter introduces the hierarchical architecture of most biomaterials, from which their mechanical properties derive. The second chapter provides a detailed review of the state of knowledge about bacteria-mediated magnetite crystallization. The third contribution focuses on the microstructural and crystallographic features characteristic of shells. The fourth and fifth chapters discuss the so-called "vital effects"—how they influence the geochemical signature of biominerals and the applicability of such signatures as proxies for paleoclimate reconstructions. The final chapter reviews the impact of contaminants on biomineralization and the suitability of biominerals as contamination pathfinders.

Lurdes Fernández-Díaz and José Manuel Astilleros, researchers in the Department of Mineralogy of the Complutense University of Madrid, are the special editors of this volume.



This book, like the others in the series (with the exception of volumes 1 and 2, which are in the process of being digitalized) can be downloaded at no cost from the SEM website (www.ehu.es/sem/revista/seminarios.htm).

This seventh volume of the SEM Seminar Series inaugurates a new format, typography, and image. These changes, while improving many visual aspects, seek the harmonization of the editorial products of the SEM (the Seminar series and the journal *MACLA*) with the new corporate image of the society.