



The Nördlingen-Ries Geopark and nearby museums as a natural teaching laboratory for Geoscience students

Michael Kaminski (1), SanLinn Kaka (1), and Matthew Kaminski (2)

(1) KFUPM, College of Petroleum & Geosciences, Geosciences, Dhahran, Saudi Arabia (kaminski@kfupm.edu.sa), (2) Department of Earth and Environmental Sciences, University of St Andrews, St Andrews KY16 9AL, UK

The hypervelocity impact of an asteroid in southern Germany around 15 million years ago not only caused an environmental catastrophe, but it also created a scenario that provides us with a world-class natural laboratory for teaching the basic Principles of Geology. The combination of museum visits and observation of rock outcrops enables the student to reinforce or rediscover the basic principles of physical and historical Geology that are presented in first- or second-year Geoscience courses.

At KFUPM, our visit to the Ries Geopark begins at the Ries Crater Museum in Nördlingen, where students review knowledge learned in their Physical Geology course: the Nebular Theory, origin of the solar system, and the classification of meteorites based on real examples. Students then learn the stages of impact crater formation, shock metamorphism, and the products of impact crater formation such as tectites, impact breccia and suevite. Students also become familiar with the Mesozoic stratigraphy of Southern Germany, reviewing basic principals of stratigraphy. Visits to local outcrops reinforce the knowledge gained at the Museum.

A visit to the nearby Solnhofen Museum and quarries provides insight into the nature of the late Jurassic animals that lived at the edge of the Tethys Sea, reinforcing many topics learned during their second-year Paleontology course, such as taphonomy, and the idea of a death assemblage. At the Museum of the Geosciences Department of the University of Tübingen, the students become familiar with Mesozoic ammonoids as part of their second-year Paleontology course. A visit to the Urwelt Museum and quarry in Holzmaden explores animal life during the Early Jurassic, stratigraphic principles as presented on the museum's "geological staircase", and the origin of petroleum source rocks. The museum houses spectacular examples of Early Jurassic marine reptiles. All knowledge gained in the Jurassic of southern Germany enriches the students' understanding of the Jurassic subsurface petroleum system in Saudi Arabia, which is one of the world's largest petroleum reservoirs.

The combination of museum visits followed by field studies centered around the Ries Geopark in southern Germany not only creates a world-class attraction for Geotourists, but also an ideal teaching laboratory for students interested in Physical and Planetary Geology, Historical Geology, and Paleontology at various levels within the respective subjects.