Impact and Meteorite Research

Collisions of early dust particles resulted in the accretion of matter and eventually in the formation of planets. Meteorites carry important information about such early processes in the solar system.

- How were the solar system, the planets, asteroids and comets formed?
- Which processes shaped and modified the planetary surfaces?
- How could life evolve?

In the research section Impact and Meteorite Research we try to address these and related questions. Our main focus lies on the exploration of the collision history of the planets in our solar system. Collisions of early dust particles resulted in the accretion of matter and eventually in the formation of planets. Meteorites carry important information about such early processes in the solar system. Since their formation the planets are exposed to a cosmic bombardment that is still ongoing today. This is testified by the cratered landscapes on planetary surfaces.

- How can craters on the permanently changing Earth?s surface be identified?
- What modifications are experienced by rocks due to cosmic impacts and how can we derive the temperature and pressure conditions based on hands-on observations on rock samples?

The collision of a large asteroid with Earth would cause a global hazard, with dramatic consequences for the environment. 65 Ma years ago the impact of a 10 km diameter asteroid resulted in a mass extinction that, among other species, wiped out the dinosaurs.

- Did similar mass extinction events occur during Earth?s history?
- Is it feasible that impact ejected material could carry microorganisms and, thus, transferred life between planets?

We try to answer such questions by the analysis of often mere micro-scale samples, from craters and meteorites, with field studies at terrestrial impact craters, and by reconstruction of the physical and chemical

aspects of the impact process by laboratory experiments and with computer simulations.