UNIVERSITÄT HEIDELBERG
Zukunft. Seit 1386.

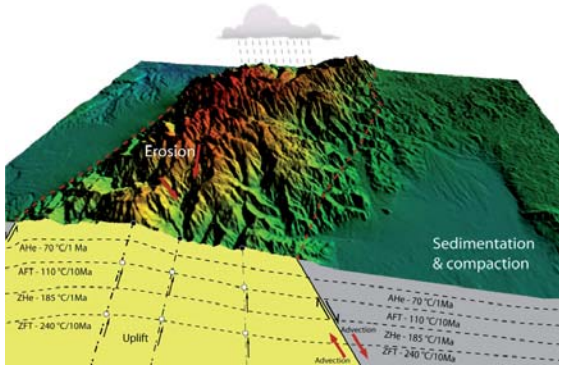
ThermoArchaeo

Competence in geoscience

We offer competence in science, research, and project management with special emphasis to geo-sciences projects in Africa and South America.

Long-term landscape evolution Thermochronology

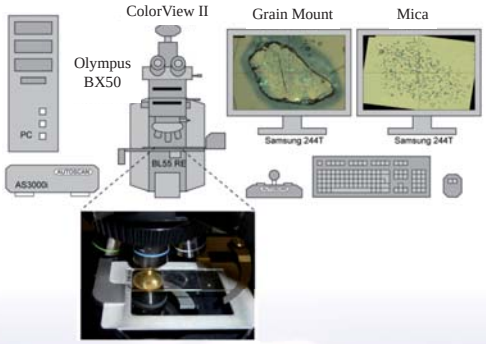
Low-temperature thermochronology allows determining the long-term landscape evolution in a variety of tectonic settings: active orogens, rift zones, active and passive continental margins, and sedimentary basins.



Dynamic feedback between erosion and tectonics
(Bauer et al. 2010, Geology Today)

Methods

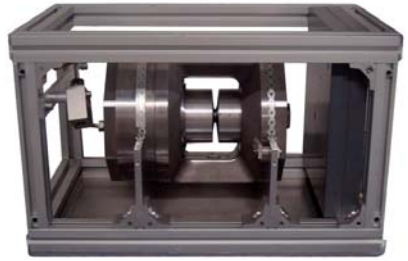
- Heavy mineral separation
- Fission-track dating
- (U-Th-Sm)/He dating
- 2D time-temperature modelling
- 3D thermokinematic modelling



Data acquisition on the Heidelberg FT-1 system
(Grobe 2010, Thesis)

Material science

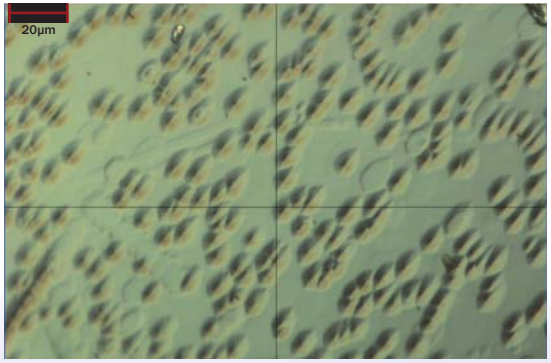
Physical properties of condensed matter under extreme high pressure and temperature are changed by irradiation with accelerated heavy ions at the nanoscale. Simulation of radioactive decay by heavy ions open the use of new minerals (e.g. carbonate minerals) as an thermochronological archive, and allow to understand the radioactive decay process at mantle conditions.



Paris-Edinburgh Press

Methods

- Accelerated heavy ions (GSI Darmstadt)
- DAC (diamond anvil cell), Paris-Edinburgh press
- Spectroscopy (Raman, UV, FT-IR, Luminescence)
- SEM, AFM, HRTEM
- Etching techniques



Edge pits on calcite

Geo-Bio Interaction

Climate change and globalization endangers undisturbed ecosystems (e.g. Rainforest, Savanna). Research on Geo-Bio Interaction allows understanding natural (e.g. K, Ca, Sr, P) and anthropenic (e.g. Pb, Zn, Cd, Mo) element transport and coupling systems, and might help to preserve endangered ecosystems.

Schematic illustration of the element cycles from rock to soil to roots to leaves

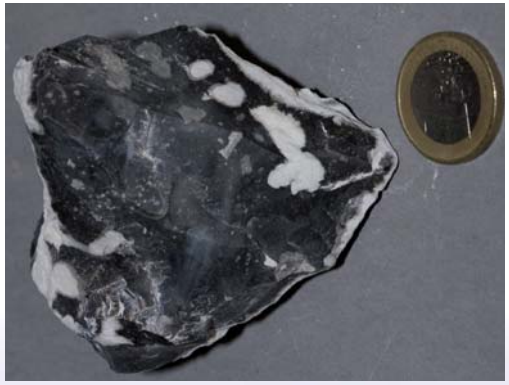
Archaeometry

Petrology and geochemistry of artefacts (flintstones), pottery, and human remains (e.g. *Homo heidelbergensis*) are used to learn about the human past and the cultural evolution of mankind.

Ancient ceramic pottery

Methods

- Petrology
- Inorganic geochemistry
- Raman spectroscopy



Flint stone sample

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