

Fall School 2016: Reactive Transport Modelling Course

From October 10 to October 14 ten RTG PhD students travelled to the Kirchberg convent in Sulz am Neckar, located in Baden-Württemberg, Germany to attend the RTG Fall School 2016 “Reactive Transport Modelling Course”.



Konventgebäude (right): location of classroom, lounge, and dining hall.

Other Geoscience PhD students from the University of Tübingen attended the course as well, in addition to PhD students from universities across Germany, such as Berlin, Bayreuth, and Jena. The course included lectures, modelling exercises, an excursion, and student presentations.



Fall School Participants (above): Lecturers, researchers, and PhD students.

Summary of lectures

Olaf Cirpka (University of Tübingen)

- Bioreactive transport
- Mixing-controlled reactive transport

- Transverse mixing

Martin Thullner (UFZ Leipzig)

- Stable isotopes in biogeochemistry
- Microbial response to environmental perturbations

Chuanhe Lu (University of Tübingen)

- Tools for reactive transport modelling

Li Li (Pennsylvania State University)

- Principles of reactive transport modelling with an introduction to CrunchFlow
- Hydrogeochemical processes at the watershed scale.

Holger Pagel (University of Hohenheim)

- Microbial dynamics and reactions
- Microbial regulation of pesticide degradation coupled to carbon turnover in the detritusphere

Summary of modelling exercises

Matlab modelling exercises:

- 1-D bioreactive transport
- 2-D mixing-controlled reactive transport
- Isotope-fractionation

CrunchFlow exercise:

- 1-D acid mine drainage simulation

Excursion to Haigerloch Atomkeller

On Thursday afternoon the entire class walked approximately 6 km (one-way) from the Kirchberg convent to Haigerloch. In addition to the beauty of the surrounding landscape, Haigerloch is best known for its part in German nuclear research during World War II. In the last months of World War II, German scientists sought out safety from enemy air raids and moved their nuclear research facilities from Berlin to a limestone beer cellar in Haigerloch, earning the name *Atomkeller* (Atomic Cellar). Haigerloch became the location of the Kaiser Wilhelm Institute of Physics and was part of the German Nuclear Program. This site is now a museum with a full-size replica of the experimental nuclear reactor.



Haigerloch Atomkeller (right): Full-size replica of experimental nuclear reactor with long strings of uranium cubes.

Student Presentations

The last day of the course was dedicated to student (and one postdoctoral researcher) presentations. This provided an opportunity for the students to receive feedback on their current research projects and to give their peers insight into the wide variety of reactive transport research in Germany.

Student presentations were given by:

- Evgenii Kortunov (RTG PhD Student, University of Tübingen)
- Matthias Loschko (RTG PhD Student, University of Tübingen)
- Gianna Marschmann (RTG PhD Student, University of Tübingen)
- Yan Liu (RTG PhD Student, University of Tübingen)
- Jana Meierdierks (PhD Student, University of Tübingen)
- Casey Bryce (Postdoc, University of Tübingen)
- Andersson Abel De Souza Machado (PhD Student, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries)
- Thomas Ritschel (PhD Student, Friedrich Schiller University Jena)
- Stefan Durejka (PhD Student, University of Bayreuth)