

Fall School 2017: Uncertainty and Heterogeneity in Environmental Geoscience

Spatial variability and parameter uncertainty pose major challenges in modelling environmental systems. This affects the predictability of models especially on larger scales. Therefore, the RTG 1829 “Integrated Hydrosystem Modelling” hosted a fall school on uncertainty assessment, geostatistics and data assimilation together with the newly established Collaborative Research Center (CRC) 1253 CAMPOS – Catchments as Reactors. The fall school took place from the 9th to the 13th of October and was located in the Haus Schwarzwaldsonne in Freudenstadt, which facilitated a highly productive and focused learning environment. Lecturers were Olaf Cirpka (University of Tübingen), Wolfgang Nowak (University of Stuttgart) and Graham Fogg (University of California, Davis). The daily routines contained alternating sequences of lectures together with modelling and programming exercises which were supplemented by key-note lectures and a hike in the Black Forest revealing also the regional geology and its provoked landscape.



Lecturers and attendees of the fall school 2017 during a break on the hike in the Black Forest around Freudenstadt.

Attendees were from the Universities of Tübingen, Stuttgart and Hohenheim including three postdoctoral researchers of the CRC, ten doctoral candidates of the RTG and five current and

prospective doctoral candidates of the CRC. Furthermore, the fall school was attended by five associated current and prospective doctoral candidates and students as well as a guest doctoral candidate from EAWAG (Zürich).

Program

Monday, October 9: Conditional Statistics (Prof. Nowak)

How to infer knowledge about something, if you know something related

Tuesday, October 10: Geostatistics (Prof. Cirpka)

How to quantify variability and spatial correlation and how it affects flow and transport

Evening lecture by Prof. Fogg on some paradoxes of flow and transport conceptualizations, and a way out of the ‘forest’

Wednesday, October 11: The importance of real geologic heterogeneity (Prof. Fogg)

The geologic origins of aquifers and non-aquifers, their modelling with transition probability, and the connected network paradigm

In the afternoon: hike in the Black Forest

Thursday, October 12: Data Assimilation (Prof. Nowak)

How to use incoming data to update models

Evening lecture by Olaf Cirpka on geostatistical inverse modelling in hydrogeology

Friday, October 13: Presentations of attendees on their research

Postdoctoral and doctoral researchers who presented:

- Stefan Klingler & Simon Martin (University of Tübingen, CRC)
- Ruth Maier (University of Tübingen)
- Jeremy Bennett (University of Tübingen, RTG)
- Tobias Weber (University of Hohenheim, postdoc CRC)
- Bo Xiao (University of Tübingen)

- Max Ramgraber (EAWAG, Zürich)
- Matthias Loschko (University of Tübingen, RTG)
- Reynold Chow (University of Stuttgart, RTG)
- Marvin Höge (University of Stuttgart, RTG)
- Aline Schäfer (University of Stuttgart, CRC)
- Ana Gonzalez (University of Stuttgart, postdoc CRC)