

Dissertations of the WG Modelling and PDEs

Our dissertations are centered around problems from

- Functional Analysis
- Partial Differential Equations
- Modelling of complex phenomena in material sciences (Theory AND applications)

Finished dissertations

- Adrian Muntean, “A moving-boundary problem: modeling, analysis and simulation of concrete carbonation” (2006), currently at TU Eindhoven
- Malte Peter, “Coupled reaction-diffusion systems and evolving microstructure: mathematical modelling and homogenisation” (2006), currently Professor at the University of Augsburg
- Sebastian Meier, “Two-scale models for reactive transport and evolving microstructure” (2008)
- Yakub Tijani, “Modeling and Simulation of Thermochemical Heat Treatment Processes: A Phase Field Calculation of Nitriding in Steel” (2008)
- Sören Dobberschütz, “Homogenization Techniques for Lower Dimensional Structures” (2012), currently at the Nano-Science Center, University of Copenhagen
- Sören Boettcher, “Modelling, Analysis and Simulation of Thermo-Elasto-Plasticity with Phase Transitions in Steel” (2012), currently at the “bime“, University of Bremen
- Niels Hendrik Kröger, “Multi-Mechanism Models, Theory and Applications” (2013)
- Hari S. Mahato, “Homogenization of a System of Nonlinear Multi-Species Diffusion-Reaction Equations in an $H^{1,p}$ Setting” (2013), currently at the TU Dortmund
- Simone Bökenheide, “Modelling and simulation of inelastic phenomena in the material behaviour of steel during heat treatment processes ” (2015)
- Martin Höpker, “Extension Operators for Sobolev Spaces on Periodic Domains, Their Applications, and Homogenization of a Phase Field Model for Phase Transitions in Porous Media” (2016)

Currently working on their Ph.D

- Michael Eden, “Homogenization of Phase Transformation Problems with Sharp Interfaces”
- Simon Grützner, “Parameter Identification in Damaged Continua”

Free topics

- Inverse Problems in Mechanics
- Time-dependent-obstacle variational inequalities and their applications to plasticity
- Theory of Homogenization
- others