TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

Institute for Analysis and Scientific Computing, and
Doctoral Program "Dissipation and Dispersion in Nonlinear PDEs"

Course Announcement:

Homogenization theory
Multiscale modelling and analysis of physical and biological processes

by

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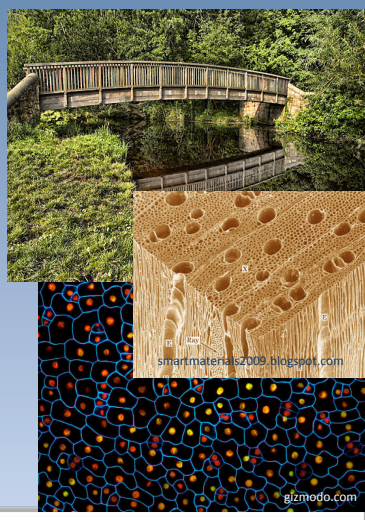

For further details, please visit http://npde.tuwien.ac.at

Contents:

- methods of periodic homogenization: formal asymptotic expansion, two-scale convergence, unfolding operator
- multiscale modelling and analysis of transport and reaction processes in perforated and partially perforated domains (e. g. flow in porous media, signalling processes in biological tissues)
- dual-porosity: transport and reaction processes in fractured media
- locally-periodic homogenization: derivation of macroscopic properties of plywood-like microstructures (characteristic for heart muscles and exoskeletons)
- multiscale analysis of equations of linear elasticity and viscoelasticity
- main ideas of Γ (Gamma) and G convergences

Aim of Homogenization: to derive macroscopic properties of composite materials by taking microscopic processes and complex microstructure into account