

Seminar im Rahmen des GRK 2078

Referent: Dr.-Ing. Xuan Cai
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Datum: Di., 21.02.2017

Uhrzeit: 14:00 Uhr

Ort: Geb. 10.23, 3. OG (R 308.1 – KM-Seminarraum)

Titel: Modeling and Simulation of Wetting Phenomena in Solid Structures

Abstract

Wetting phenomena are not only ubiquitous in nature and our daily life, but also crucial processes in many industrial applications, for example, microfluidic devices and chemical multiphase reactors with innovative structured packing (e.g., periodic cellular structure and foam structure). In-depth understandings of wetting and multiphase flow potentially lead to technological improvement. To gain these insights, scale-resolving numerical simulation is a very valuable tool.

This talk starts with a brief review on physical and theoretical fundamentals of wetting and moving contact line. For numerical modelling and simulation of these processes, phase-field method is used as underlying approach; the mathematical formulation and numerical implementation in the open-source CFD code OpenFOAM are introduced. After presenting the code verification and validation for fundamental interfacial phenomena, the talk will elaborate on numerical investigations of three application-oriented wetting scenarios: (1) liquid droplet impact and spread on homogenous and chemically-heterogeneous surfaces; (2) air bubble (immersed in liquid phase) rising and interacting with periodic cellular structure and (3) gas-liquid interfacial flows in a representative domain of foam structure.

Alle Interessenten sind herzlich eingeladen.

Prof. Dr.-Ing. Thomas Böhlke