Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Institut für Energietechnik: Prof. R.S. Abhari (LEC), Prof. K. Boulouchos (LAV)
Prof. Ch. Müller (ESE), Prof. H.G. Park (NETS), Prof. D. Poulikakos (LTNT)
Prof. H.-M. Prasser (LKE), Prof. A. Steinfeld (PRE)
Institut für Fluiddynamik: Prof. P. Jenny, Prof. T. Rösgen
Computational Science & Engineering Laboratory: Prof. P. Koumoutsakos

22/04/2016

E I N L A D U N G

zu einem Vortrag im Rahmen des

Kolloquiums Thermo- und Fluiddynamik

Datum: ***>> Freitag, 1. Juli 2016 <<***

Zeit: ***>> 11:15 Uhr <<***

Ort: Maschinenlaboratorium ETH Zürich
Hörsaal ML H 44

Referent: **Prof. Bernhard Müller *)**
Department of Energy and Process Engineering
Norwegian University of Science and Technology
Trondheim, Norway

Titel: **A Multiscale Coarse-Grained Molecular and Continuum Model for the Flow of Droplets in Oil with Asphaltenes**

In complex fluids like crude oil, asphaltenes migrate to the interface of a water droplet and give rise to phenomena not seen in surfactant-contaminated systems. An example is the “crumpling drop” experiment, where the interface of a drop being deflated becomes non-smooth at some point. In this seminar, we report on the development of a multiscale method for simulating such complex liquid-liquid systems. We consider simulations where water droplets covered with asphaltenes are deflated, and reproduce the crumpling observed in experiments. The method on the nanoscale is based on using coarse-grained molecular dynamics simulations of the interface with a model for the asphaltene molecules. This enables the calculation of interfacial properties, namely interfacial tension and elasticity of the interface. These properties are then used in the macroscale simulation, which is performed with a two-phase incompressible flow solver using a novel hybrid level-set/ghost-fluid/immersed-boundary method for taking the complex interface behaviour into account. The numerical results show qualitative agreement with a crumpled water drop attached to a micropipette in crude oil.

*) Joint work with Åsmund Ervik (NTNU)

Host: Prof. P. Jenny

Gäste sind willkommen!
