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Institut für Fluidodynamik: Prof. P. Jenny, Prof. T. Rösgen
Computational Science & Engineering Laboratory: Prof. P. Koumoutsakos*

01/10/2015

EINLADUNG

zu einem Vortrag im Rahmen des

Kolloquiums Thermo- und Fluidodynamik

Datum: >> **Donnerstag, 15. Oktober 2015** <<

Zeit: 16:15 Uhr

Ort: Maschinenlaboratorium ETH Zürich

>> ~~Hörsaal ML-F 36~~ << **→ NEUER HÖRSAAL HG D 7.1 ←**

Referent: Prof. Yannis G. Kevrekidis

Chemical and Biological Engineering & Program in Applied and
Computational Mathematics, Princeton University
This Fall: Fischer Fellow, IAS TU Munich, Germany

Titel: **No Equations, No Variables: Data and the Computational Modeling of Complex Systems**

I will first briefly review how matrix-free, and, in particular, simulator-based matrix-free numerical methods, can functionally link fine-scale simulators (MD, kMC...) with coarse-grained, systems-level numerical modeling tasks (like coarse stability and bifurcation computations). This is the "equation-free" component of the talk for coarse-graining large-scale, complex dynamical system models on the fly.

I will then discuss what we are currently concerned about/working on in my group: the use of data-mining techniques (the "variable-free" component) as part of the overall computational process. Processing the results of brief bursts of multiscale simulations with tools like Diffusion Maps can suggest good macro-scale observables (variables) in terms of which macroscopic equations can in principle be written/solved. Performing scientific computation in terms of these "data-mining-based" variables poses a number of interesting problems that I will outline and discuss.

Host: Dr. C. Frouzakis, Prof. K. Boulouchos

Gäste sind willkommen!