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27/04/2016

## **E I N L A D U N G**

zu einem Vortrag im Rahmen des

### **Kolloquiums Thermo- und Fluidodynamik**

**Datum:** Mittwoch, 18. Mai 2016

**Zeit:** 16:15 Uhr

**Ort:** Maschinenlaboratorium ETH Zürich  
Hörsaal ML H 44

**Referent:** Prof. Shankar Subramaniam  
Department of Mechanical Engineering  
Director, CoMFRE: Multiphase Flow Research & Education  
Iowa State University, USA

**Titel:** Particle-Resolved Direct Numerical Simulation for Gas-Solid  
Flow Model Development

The flow of a gas laden with inertial solid particles is commonly encountered in nature and industrial applications. In nature for example, debris and ash from volcanic eruptions is a potential hazard to aviation, and the suspension of sand and dust poses serious consequences for operation of helicopters in brownout conditions. Human endeavors to secure a clean environment and sustainable sources of energy through carbon-neutral or carbon-negative technologies such as biofuel production, chemical looping combustion and CO<sub>2</sub> capture are examples of gas-solid flows in the power generation industry.

Gas-solid flows are characterized by multiscale and nonlinear interactions that manifest as rich flow physics and pose unique modeling challenges. This talk will describe the use of particle-resolved direct numerical simulation (PR-DNS) of the microscale governing equations for understanding gas-solid flow physics and for obtaining quantitative information that leads to the development of statistical models. This talk also summarizes selected recent insights into the physics of momentum, kinetic energy, and heat transfer in gas-solid flows obtained from PR-DNS. Promising future applications of PR-DNS include the study of particle clustering and the effect of number fluctuations on hydrodynamics as well as instabilities in gas-solid flow.

*Hosts: Prof. P. Jenny, PD Dr. D. Meyer-Masseti*

**Gäste sind willkommen!**