

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

07/05/2015

## **EINLADUNG**

zu einem Vortrag im Rahmen des

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

und des

### **ERCOfTAC Visitors Programme**

**Datum:** Mittwoch, 8. Juli 2015

**Zeit:** 16:15 Uhr

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

**Referent:** Prof. Andrey V. Kuznetsov  
Department of Mechanical & Aerospace Engineering  
North Carolina State University, USA

**Titel:** **Microfluidics of Left-Right Symmetry Breaking in Mammal Embryos**

We developed an approximate method for modelling the flow of embryonic fluid in a ventral node. We simplified the problem as flow in a 2D cavity; the effect of rotating cilia was modeled by specifying a constant vorticity at the edge of the ciliated layer. We also developed an approximate solution for morphogen transport in the nodal pit. The solutions were obtained utilizing the proper generalized decomposition (PGD) method. We compared our approximate solutions with the results of numerical simulation of flow caused by the rotation of 81 cilia, and obtained reasonable agreement in most of the flow domain. We discuss locations where agreement is less accurate. The obtained semi-analytical solutions simplify the analysis of flow and morphogen distribution in a nodal pit.

*Host: Prof. P. Jenny*

**Gäste sind willkommen!**