# Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

**Hyperbolic equations - structure preserving methods & other topics**

## *Alina Chertock*

North Carolina State University, USA

# Hybrid Multifluid Algorithms Based on the Path-Conservative Central-Upwind Scheme

*Abstract:*

We develop new hybrid numerical algorithms for compressible multicomponent fluids. The fluid components are assumed to be immiscible and are separated by material interface. We track the location of the interface using the level set approach and replace the energy equation in the original model with the corresponding pressure equation in its neighborhoods. In these neighboring areas we solve the resulting nonconservative system using a path-conservative central-upwind scheme, while in the rest of the computational domain, a central-upwind scheme is used to numerically solve the original conservative system. We first develop a finite-volume method of the second order and then extend it to the fifth order via the finite-difference alternative WENO (A-WENO) framework. In order to reduce oscillations, we switch from A-WENO back to second-order central-upwind scheme in certain nonsmooth parts of the computational solution. We illustrate the performance of the new hybrid methods on a number of one- and two-dimensional examples including the shock-bubble interaction tests.

via Zoom video conference (request the Zoom link from klingen@mathematik.uni-wuerzburg.de)

Friday, Feb. 25 at 3 pm CET

Zu diesem Vortrag sind Sie herzlich eingeladen.

*gez. Christian Klingenberg*