

Mechanics Colloquium

Referent: Prof. Dr. Lennaert van Veen
Dept. of Mathematics
Ontario Tech University, Oshawa, Canada

Datum: 27.07.2023
Uhrzeit: 15:45h
Ort: 10.81 Emil Mosonyi-Hörsaal (HS 62)

Titel: **On the nonlinear instability of the Burgers vortex**

Abstract

In various simple geometries, like pipes and channels, the transition from laminar to turbulent flow with increasing Reynolds number is now fairly well-understood, both in terms of dynamical systems theory and in terms of statistical physics. In these cases, the base flow is a parallel shear flow that remains linearly stable, while finite-sized perturbations can evolve into time-periodic solutions, traveling waves and other interesting spatio-temporal structures. A very different kind of base flow is presented by the Burgers vortex, an exact solution posed on an infinite domain. While it has been shown to be linearly stable, we expect finite-sized perturbations to lead to less symmetric, and more realistic, vortical flows. I will present ongoing simulations of such perturbed Burgers flows using OOMPilib and discuss the pitfalls of truncating the computational domain. This is a collaboration with Greg Lewis and Basak Cakmak of Ontario Tech and Andrew Hazel of the University of Manchester.

You are cordially invited to take part in the event!

Prof. Dr.-Ing. Markus Uhlmann