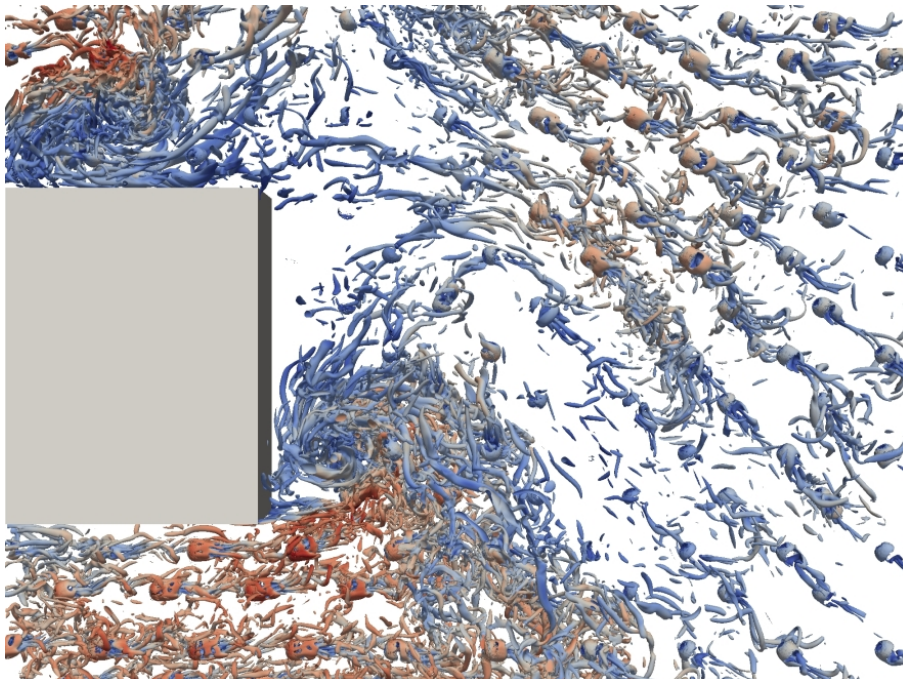# Fluid Dynamics Seminar

Date: Wednesday, September 28th 2016 at 13:00
Location: ZARM, Room 1280

Numerical investigation of the possibility of macroscopic turbulence in porous media

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When a turbulent flow in a porous medium is determined numerically, the crucial question is whether turbulence models should account only for turbulent structures restricted in size to the pore scale or the size of turbulent structures could exceed the pore scale. In order to determine the real size of turbulent structures in a porous medium, we simulated the turbulent flow by DNS calculations, thus avoiding turbulence modelling of any kind. This is accounted for by using and comparing two different DNS approaches, a finite volume method with grid refinement towards the wall and a Lattice-Boltzmann method with equal grid distribution. Two-point correlations, integral length scales and energy spectra were determined in order to answer the question of whether or not macroscopic turbulence can be found in porous media. Based on direct numerical simulations (DNS) in porous media, we conclude that the size of turbulent eddies is restricted by the pore size, leading to the pore scale prevalence hypothesis (PSPH).

https://www.tuhh.de/tt/mitarbeiter/jin/jin.de.html