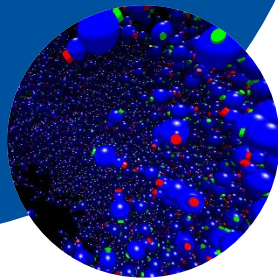




"Fundamentals of turbulent flows: Physics and Data Analysis"

Graduate Academy
SimTech

GS Seminar by
Dr.-Ing. Xu Chu
and Prof. Heng Xiao



Description:

Having completed this course, students will be able to:

Statistical description of turbulence including the probability theory, correlations, spectra, turbulent kinetic energy transport and others.

Isotropic turbulence: Kolmogorov hypothesis, spectra ranges: energy-containing, inertial, dissipation

Wall-bounded turbulence: law of the wall, Townsend's wall-attached eddy model, coherent structures, effect of wall roughness

Data-driven data analysis methods, POD, DMD, Autoencoder

Direct numerical simulation (DNS): history resolution requirement,

Large-eddy-simulation (LES): explicit, implicit models, wall-resolved/wall-modeled LES

Hands-on programming and practice with POD, DMD data-driven analysis (Matlab), LES simulations with OpenFOAM

Student seminar with publication presentation: one group with 2 students, presentation of notable journal papers from a given pool, take Q&A from the audience and docents.

Fundamentals of turbulent flows: Physics and Data Analysis

lectures (3.0 SWS)

tutorials (1.0 SWS)

Participants have to complete

- Presentation at end of course (15 min) (40%)

- One-on-one interview at end of course (15 min) (60%)

Language: English

Date: To be discussed

Time: To be discussed

SWS: 4

ECTS: 6

Proof of attendance: Regular presence, presentation and interview

Please register via Campus [Module number: 107350].