

EINLADUNG

zum Vortrag
von

Prof. Dr. Björn Hof

Nonlinear Dynamics and Turbulence Group
Institute of Science and Technology Austria (IST Austria)

Transition to turbulence in pipe flow

am

Dienstag, 17. November 2015, um 17:30 Uhr

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,
1090 Wien, Strudlhofgasse 4 / Boltzmannngasse 5, 1. Stock

Barrierefreier Zugang: Boltzmannngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals

Abstract:

How turbulence arises in simple shear flows, such as pipes and channels has been an open question for over a century. In these cases turbulence sets in despite the linear stability of the laminar flow and transition is caused by finite amplitude perturbations. Despite numerous experimental and theoretical studies it has not been possible to measure the critical point for the onset of turbulence and to determine the nature of this transition. It will be shown for the examples of pipe and Couette flow that the onset of sustained turbulence is a nonequilibrium phase transition. The critical point is determined by resolving the extremely long time scales of the underlying growth and decay processes. In detailed experiments and direct numerical simulations close to the transition point we explicitly measure the critical exponents that characterize this transition and show that it falls into the so called directed percolation universality class.

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