Graduate School Event

Thesis Defense: Turbulence in Polymeric Flows: A Characterisation of Elasto-Inertial Turbulence and the Maximum Drag Reduction Asymptote

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Hof Group

Host: Robert Seiringer

Flows of ordinary fluids such as water or air transition from laminar to turbulent motion as the velocity increases. This simple dependence of the flow state solely on inertia, does not apply to more complex substances such as polymeric and biofluids which commonly have elastic as well as viscous properties. Here various different instabilities and turbulent states can arise at low and even vanishing inertia, while high inertia turbulence counterintuitively is suppressed and its drag strongly reduced. We here show in experiments of a viscoelastic model fluid that the phenomena observed at low and high inertia have a common origin and that the same dynamical state persists across four orders of magnitude in Reynolds number, ranging from very low inertia, all the way to high inertia Maximum drag reduction (MDR) asymptote. We also explore the transitions from Newtonian turbulence to MDR, and specific cases of flow at high polymer concentrations, exploring the relationship between flow at these wide range of control parameters.

Thursday, May 22, 2025 12:00pm - 01:00pm
Sunstone Bldg / Ground floor / Lab Meeting room (I23.EG.005) and Zoom

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This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.