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Invitation to Talks on  
“Fluids, Dynamics and Differential Equations”

**Particle accumulation in periodic vortex flows**

Professor Hendrik Kuhlmann  
Institute of Fluids Mechanics and Heat Transfer, Vienna University of Technology

*Friday 31. October 2014, 14:30*

*Location: Freihaus Hörsaal 3, Turm B, gelber Bereich, 2nd floor, A-1040 Wien, Technische Universität Wien, Wiedner Hauptstraße 8-10*

Abstract: Experiments in millimetric thermocapillary liquid bridges show a rapid accumulation of micrometer-sized spherical particles for certain laminar flows. An explanation of this phenomenon is offered in terms of a finite particle size which restricts the particle motion near the boundaries. A simplified particle-motion model yields limit cycles, quasi-periodic and chaotic attractors for the particle motion. The effect of particle inertia as well as numerical issues will be addressed.

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**The onset of turbulence in shear flows**

Professor Björn Hof  
Institute of Science and Technology Austria

*Friday 31. October 2014, 15:30, directly after the talk by Prof. Kuhlmann, same location.*

Abstract: How turbulence arises in simple shear flows has been an open question for over a century. In pipe and channel flows turbulence is commonly observed even though the laminar flow is linearly stable. Despite numerous experimental and theoretical studies it has not been possible to determine a well defined critical point nor to clarify the nature of the transition. I here show for the examples of pipe and Couette flow that the critical point for the onset of sustained turbulence can be determined by resolving the extremely long time scales of the underlying growth and decay processes. The onset of turbulence is characterized as a non-equilibrium phase transition and the critical exponents show that it falls into the directed percolation universality class

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Organizer:

Christian Kuehn (Institut E101)

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