



Kolloquium

Thursday,

22th November
2012

at: 5.00 pm

Hörsaal für
Theoretische
Physik
Linnéstr. 5
04103 Leipzig

*Coffee will be
served from
4.30 pm!*

Prof. Dr. Hans-Jürgen Butt

Max Planck Institute for Polymer Research,
Ackermannweg 10,
D-55128 Mainz

Dynamics at solid-liquid interfaces

The interface between a liquid and a solid determines many natural phenomena and technical processes. Still, its dynamics is poorly understood. Even the simple question about the correct hydrodynamic boundary condition is not settled. Is there slip or is the no slip? Two aspects of dynamics of liquids at solid surface will be discussed: Flow and wetting. A new optical method is described to study flow of liquids near solid surfaces: Total internal reflection fluorescence cross-correlation spectroscopy (TIR-FCCS).

Wetting not only involves the flow of the liquid but also the movement of a three-phase contact line. Wetting of simple liquids on smooth and homogeneous surface is relatively well understood. We focus on the wetting of more complex liquids such as surfactant solutions, or polymer melts. Structured surface offer new opportunities. The Lotus effect on superhydrophobic surfaces is one prominent example. Recently we were able to make even superamphiphobic surfaces. Superamphiphobic surfaces not only repel water but also non-polar liquids and surfactant or protein solutions. Superamphiphobic layers hold great promise for many applications, including self-cleaning, antifouling and for drag reduction in microfluidics. The physical principles of superamphiphobicity and possible applications will be discussed.



Drop of water/ethanol mixture (50%) 23 ms after impacting on a superamphiphobic layer.