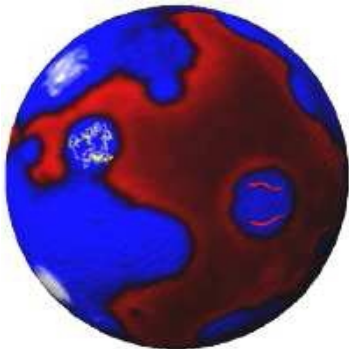

Sächsische Forschergruppe
FOR 877
From Local Constraints to Macroscopic Transport

April 25, 2012, 13:00

Seminar Room, 3rd Floor
BIOTEC, TU Dresden

Dr. M. Paul Lettinga

Soft Condensed Matter, Institute of Complex Systems, Forschungszentrum Jülich

Dynamics of colloidal rods at rest and in external fields

Abstract

Colloidal rods form the most basic system to study the origin of self-assembled structures. Depending on concentration it can form phases with only orientational ordering and 1-, 2- and 3-D positional ordering. In this talk I will first show what can be learned from the dynamical behavior of individual rods about the nature of the equilibrium self-assembly. This is experimentally achieved by tracking rod-like viruses with video fluorescence microscopy. The viruses are ideal model systems since they are very slender, monodisperse and can be made with variable stiffness. Dynamic signatures for the different phase transitions are obtained, leading to a reconsideration of the nature of the transitions.

Another interesting aspect of colloidal rods is that they are very susceptible to external fields. In shear flow the torque on the rod will cause alignment, while in confinement rods tend to align with the wall. Both effects can drive or frustrate structure formation. In the second part of the talk, I will give several examples of this interplay of rod dispersions with external fields and show pathways to a microscopic understanding of the observed phenomena.