Dynamics of interfaces stabilized with ellipsoidal particles

We have a vacancy for a highly qualified PhD student at the Polymer Physics group of Prof. Hans Christian Öttinger at the material science department of ETH Zurich, in a collaboration with Wageningen University (Dr. Leonard Sagis) and the University of Reading (Dr. Patrick Ilg).

We recently developed a method to simulate structure formation in interfaces stabilized by ellipsoidal colloidal particles which are interacting through capillary forces (see Fig. 1). The method can explore structure formation for large sets of particles using VMMC simulations, for which we developed an empirical pair potential which captures the multibody interactions between the particles very accurately.

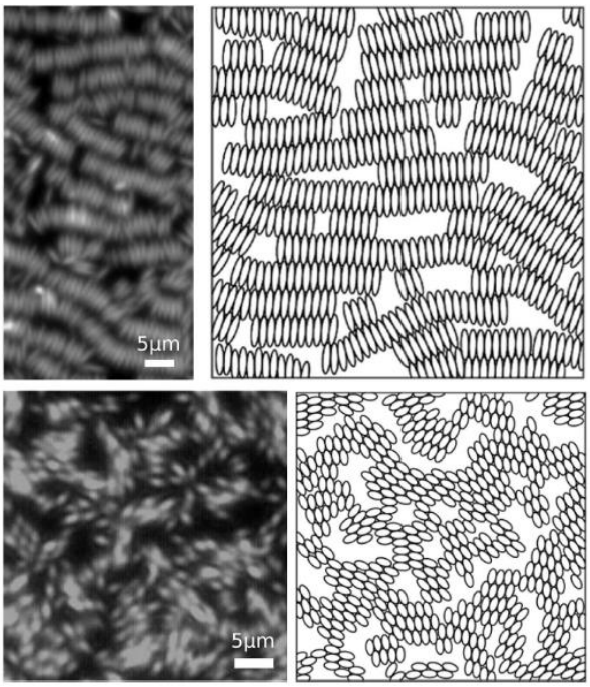

Figure 1. VMMC simulation of ellipsoidal particles at an interface at high (top) and low (bottom) surface coverage. Left side are atomic force microscopy images of an air-water interface at the same surface coverage as the simulation (right side).

The new project is a continuation of this work, and we wish to extend this work in two ways: 1) explore the effects of other forces (such as electrostatic repulsion) on the static structure of ellipsoid stabilized interfaces; 2) explore the effects of shear and dilatational deformations on the structure using NEMD, with the aim to construct constitutive models for the surface stress tensor.

We are looking for an excellent candidate, who recently graduated with an MSc in Physics, Chemical, or Mechanical Engineering, and has **prior experience** in computational methods. If you are interested, please send a copy of your CV, a motivation letter, and translations of your BSc and MSc grade transcripts to: Leonard Sagis (leonard.sagis@wur.nl). The research will be performed primarily in the Polymer Physics group at ETH Zurich, and the candidate will be employed as a PhD student at ETH Zurich.

Dr. Leonard Sagis
Wageningen University

Dr. Patrick Ilg
University of Reading

Hans Christian Öttinger
ETH Zurich