2 PhD projects in soft matter physics on passive and active self-assembly of patchy virus rods: experiment and theory

We welcome applications from PhD candidates interested in self-assembly of colloidal systems, active matter, liquid crystals and other topics in Soft Matter Physics. We have funded positions for both an experimental candidate (PhD1) and a theoretical one (PhD2).

Project description –

The main objective of the project is to deepen our knowledge of hierarchical assembly and responsive properties of passive and self-propelled anisotropic nanoparticles. These rod-shaped objects possess “patchy” interactions that facilitate self-assembly with a higher level of complexity. We aim at designing new anisotropic responsive colloidal particles and explore their self-assembly at the single particle level resolution. This strongly interdisciplinary project covers a variety of topics including biological engineering (fabrication of functionalized virus particles), experimental soft matter physics (self-organization at the many-particle level) and theoretical modeling (predicting and tuning structure-property relations) using numerical simulation, variational theory and density functional methods.

Location –

PhD1: Centre de Recherche Paul-Pascal, CNRS & University of Bordeaux (Bordeaux, France).
PhD2: Laboratoire de Physique des Solides, University Paris-Sud (Orsay, Greater Paris area, France).

Requirements –

Both candidates are required to have a MSc degree in Physics, Physical Chemistry, Chemical Engineering or a related discipline. Our project combines experiment, theory and simulations and involves a close collaboration between the two PhDs. The candidates should have a strong affinity with Soft Matter and Statistical Physics and be motivated to work in an interdisciplinary and highly collaborative environment. Good communication skills in written and spoken English are indispensable.

Work environment –

PhD1 will be part of the CRPP in the group of Eric Grelet at Bordeaux. Self-assembly and dynamics at the single particle level using various microscopy techniques will be performed, as well as physical analysis using home-made numerical codes.

PhD2 will work on theoretical and modelling aspects under the supervision of Dr. Rik Wensink at the LPS. A good knowledge of statistical physics and experience with computer programming and numerical simulations are essential.

Financial supports –

Financial supports have been obtained from the French National Agency for Research (ANR) with a salary of 1730 € / month after taxes.
Specific budget available for travel expenses (international conferences and scientific collaborations).

Starting date –

1 October 2019 or as soon as possible afterwards.

Applications will be reviewed continuously, with the positions remaining open until filled. Suitable candidates are strongly encouraged to apply as soon as possible.

Informal inquiries can be sent to:

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