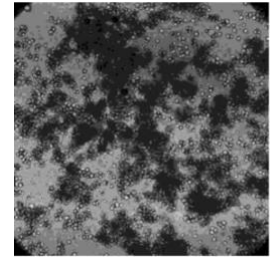


Post-Doctoral Position « Rheology of Attractive Microcapsules »

Project summary

Microcapsules are droplets protected by an elastic membrane and used to control the delivery of active ingredients in an increasing number of applications. Whereas microcapsules were originally designed with petroleum resources (polymers and solvents), the challenge for the microencapsulation industry is to use biobased materials. One generic solution is to assemble at water-oil interfaces oppositely charged biomaterials. The assembly of these materials is relatively well-mastered but the resulting physical properties are poorly controlled. Very recently, it has been shown that suspensions of different bio-based microcapsules can form **gels** for volume fraction as low as 10%, which is reminiscent of **suspensions of attractive colloidal particles**. This behavior is puzzling as it requires the emergence of attraction between athermal particles on length scales of several tens or hundreds of micrometers. Microscopically, microcapsules formed spontaneously aggregates under quiescent conditions, whereas in rheometric experiments, suspensions of these capsules behave as a yield stress fluid, see image.



Understanding long-range interactions in suspensions of capsules requires to couple rheology with physico-chemical phenomena at micro/nano-scale. The post-doc will characterize the time-dependent rheological properties of suspensions of capsules with LRP team. He/She will also develop an experimental set-up to characterize the interactions between two capsules. In parallel, he/she will collaborate with researchers to design well-controlled membranes and to characterize the short- and long-range interactions between membranes with Dynamic Surface Forces Apparatus (DSFA).

Location and practical aspects

The successful applicant will be affiliated to Laboratoire Rhéologie et Procédés (LRP) in Grenoble, France and the research will be conducted in collaboration with LIPhy and CERMAV laboratories on the same campus under the supervision of C. de Loubens (LRP), B. Cross (LIPhy) and L. Heux (CERMAV).

The gross salary will be 2656 euros/months, equivalent to a net salary of 2134 euros/month.

Qualifications of the applicant

The applicant is expected to have a PhD with a strong experience in experimental rheology and soft matter physics. The applicant will have to work in a multidisciplinary team and to supervise research work of a Master student. Excellent written and oral communications skills are required.

Applications

Interested candidates should send their CV, cover letter and references to clement.de-loubens@univ-grenoble-alpes.fr and benjamin.cross@univ-grenoble-alpes.fr

Deadline for the application: the 15th of July 2022 / Starting date: between September and December 2022