



PhD offer:

Microfluidics and optical interferometry for mass transport in complex fluids

Location: LFCR – Anglet

Duration: 3 years

Start: October 2023

Collaboration: LOF – Pessac

Gross salary: ~2200€/month

Job description

The objective of this thesis is to improve the knowledge of mass transport phenomena within complex fluids, and in particular charged colloidal dispersions. These fluids, although very widely used in many applications, still raise many fundamental questions today. This thesis subject proposes to characterize the mass transport phenomena within these fluids in several complementary model microfluidic configurations using optical visualization by interferometric method. This opto-microfluidic coupling will make it possible to measure the phenomenon of collective diffusion in these media with unprecedented precision and over a wide range of concentrations. Commercial dispersions widely used in research and industry, but also manufactured in our laboratories in a controlled manner, will be used to highlight the respective roles of particles and ions in collective behavior. Advanced mathematical models will also be developed and compared to these measurements. This interdisciplinary thesis, integrating physico-chemistry, soft matter, microfluidics and optics, is part of a larger research project co-financed by the Nouvelle-Aquitaine Region: AMIBES - Additive Migration during drying of Battery Electrode Slurries, bringing together two research laboratories of the region (LFCR and LOF) and the Solvay company on improving the understanding and control of the drying of complex fluids to optimize the manufacture of battery electrodes.

Keywords: Mass transport, Complex fluids, Microfluidics, Optical interferometry, Drying.

Profile and skills

- Engineering/Master student with a major in physics, physico-chemistry, mechanical, instrumentation, optics or microsystems
- Knowledge or experience appreciated in microfluidics and/or signal and image analysis
- Motivated by experimental work
- Attracted by a multidisciplinary environment and technological innovation
- Good communication skills to share information and results within different teams

Contact

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