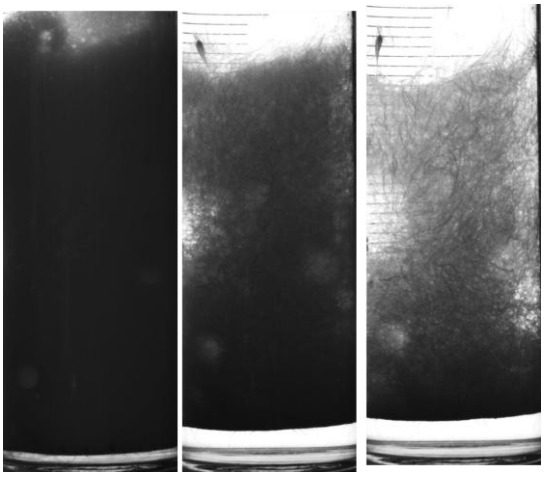
Internship location: Soft Matter Sciences and Engineering Lab (SIMM) – ESPCI – UMR7615
Industrial partnership: Sterimed => funding : yes
Possibility for a Doctoral thesis: **CIFRE**
Internship supervisors Emilie Verneuil - emilie.verneuil@espci.fr, 01 40 79 47 42
Anniina Salonen – anniina.salonen@espci.fr

Anisotropic effects on the rheology of foams containing fibers

Emerging efforts at reducing water consumption in water-based industrial processes have led to an increased use of foams as a carrier in replacement of plain water in which particles or drops are dispersed. Yet, this use of foams, which consists in dispersion of bubbles in a liquid stabilized with surfactants, requires to revisit their behavior under flow when they contain particles or drops. In this framework, the case of fibers being dispersed in foams is of particular interest because strong anisotropic effects are expected under flow. Indeed, viscous shear is likely to orient the fibers in the flow direction, leading to anisotropic effects. In this internship, we aim at measuring the structural and rheological response of foams containing fibers under shear. To do so, several experimental configurations will be studied and compared. (i) Classical rheology measurement between plates or coaxial cylinders. (ii) Flows in millifluidics. In both cases, we will couple the rheological measurement with direct visualization.
Several physical-chemical parameters will be used to gain insights into the behavior of the system: the fiber and gas volume fractions, the amount of surfactant, the viscosity of the continuous phase, the fiber length.



Preliminary experiment : Drainage of a foam containing 1 cm-long fibers with time : the system evolves from a wet foam containing fibers to a network of fibers becoming progressively drier.

Speciality : Soft matter Physics, Physics of liquids
Techniques/methods in use: imaging, rheology or millifluidics
Applicant skills: taste for experimentation an data analysis