

PHD PROPOSAL

Laboratory name: Laboratoire de Physique des Solides

CNRS identification code: UMR 8502

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PhD location: LPS, Bâtiment 510, Université Paris Saclay, 91400 Orsay

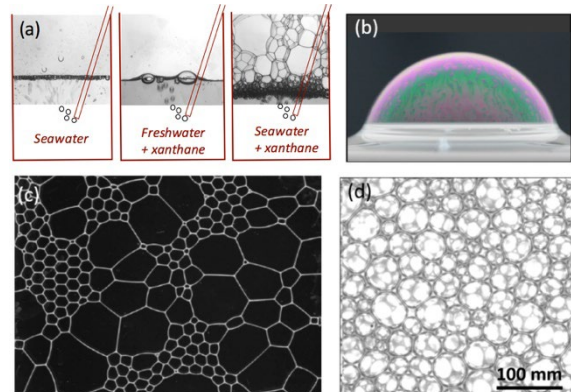
Funding already obtained for a PhD: YES

If YES, which type of funding: ANR

Depollution at sea : foaming at high salinity

Foams are used to clean up and depollute water. They work as pollution sticks onto the surface of the gas bubbles. Although very efficient as a method, it is still complicated in seawater due to the high salinity, which changes interactions between the bubbles and pollutant. We are part of an ANR which aims to better understand the role of ions on foaming to identify surface active components capable of stabilising bubbles in conditions of high ionic strength, and ultimately to foam sea water. This with a broader aim of creating improved depollution methods at sea.

In the last years we have developed an expertise on the main physical mechanisms involved in foam ageing, which makes it possible today to identify model experiments to test the impact of salinity on each of the mechanism and compare to existing models. The PhD is experimental and consists of setting up model experiments to identify the effect of ions on each foam destabilisation mechanism. The specific experiments can be of single bubbles for surface properties, individual films for coalescence or 2D foams to follow coarsening (as illustrated in the Figure on the left). The experiments are designed to allow a physical modeling of the mechanisms, which will be developed during the PhD. Collaborations with theoreticians are in place to create more elaborate models when needed. We will work on model systems to explore the role of ions more generally, but will collaborate with colleagues working on foaming algae.



We are looking for an enthusiastic student to work on a collaborative project aimed to clean up sea water. The internship will be based at LPS, Orsay. However being part of a wider project the student will work in close collaboration with Florence Elias from PMMH, ESPCI. This can entail field trips to collect sea foam used to identify the components active in sea foam stability.