Master internship

Probing foam structure in fresh plasterboards formulations

Context— Plasterboards are widely used building materials largely made from foamed liquid plaster (fig.1a). Saint-Gobain aims at optimizing the energy used to produce them. This requires to incorporate additives in the fresh plaster formulation, which has an impact of the structure of the final solid material (pore size distribution). However, the underlying key mechanism has not been identified among initial shear, coarsening and coalescence.

Objectives and work program— The goal of the internship will be to **characterize the evolution of the bubble size distribution in a fresh (liquid) plaster foam** to shed light on the **mechanisms governing the structure of plaster foams**. Images of the foam surface will be recorded in the first minutes after foam generation and analysed to detect the bubbles and determine the bubble size distributions (fig.1b). Based on the results obtained, complementary experiments at the bubble/film scale (interfacial rheology and/or single soap film generation) will be performed on different formulations.

(a) (b)

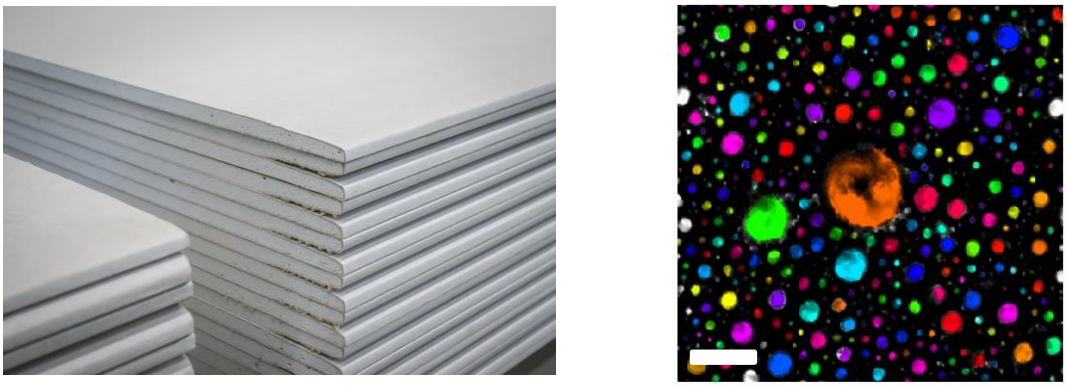

Figure 1 : (a) Plasterboards used as building materials (credit: Shutterstock). (b) Bubble detection on a plaster foam image (E. Huguet 2024, scale bar 1 mm).

Key words: foams, plaster, bubbles, image analysis

Profile: M1/M2/engineering school – Soft matter physics, physical chemistry, material science

Duration: 5 to 6 months

Location
The internship will be based in Institut Lumière Matière (ILM) in the Liquids and interfaces team, in close collaboration with Saint-Gobain Recherche (SGR). A visit to SGR Paris will be planned.

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