



## Postdoc fellowship in experimental fluid mechanics and interfacial phenomena Stability of foam films - flow and instability

The Institut de Physique de Nice (INPHYNI, Université Côte d'Azur, Nice, France) invites applications for one **Postdoc fellowship to begin in October 2021** or as soon as possible after that.

**Keywords** : physics, fluid mechanics, liquid interfaces, instability, experiments, surfactants, soap film

**Postdoctoral Research Description** : DRAINFILM is a project funded by the National Research Agency within a team network of three institutes. The objective is to study the flow patterns and hydrodynamical instabilities that occur inside foam films. Full summary here: <https://anr.fr/Projet-ANR-20-CE30-0019>

Liquid foams are materials whose mechanical and insulating properties are widely used in industry. These properties are closely related to those of the soap films they contain. The rearrangement of the liquid inside these films under the effect of an external stress such as gravity is therefore crucial to understand foam stability. However, understanding the flow properties inside the micron-thick soap films is a complicated task: the flow is rarely homogeneous and laminar but is often turbulent and composed of thin film patches rising inside thicker film portions. In this project, we aim at understanding the instability leading to the formation of the thin patches and the coupling with the properties of the interface covered with surfactants. In this context, the INPHYNI is developing a setup to tune gravity by several orders of magnitude to see the effect of this parameter, among others, on the flow pattern, the thinning rate of the films and the onset of instabilities.

We seek to hire a postdoctoral fellow who will perform experiments and analyses of the influence of gravity and surfactants on the flow pattern inside soap films. The successful candidate will improve the existing setup to characterize the dynamics of the films. He will systematically study the effect of each parameter and develop postprocessing analysis of the data to compare with models. The applicant will spend a few months at the Institut de Physique de Rennes (group of I. Cantat) and at the Laboratoire de Physique du Solide in Orsay (group of E. Rio) to participate in experimental developments.

**Duration**: 24 months.

**Required qualifications**: PhD in Physics, Engineering or related fields. Excellent knowledge of hydrodynamics and competences in optical methods for experimental fluid mechanics.

**Preferred qualifications**: Good knowledge of hydrodynamics instabilities and physico-chemistry at liquid interfaces (surfactants). Good programming skills to post-process and analyze experimental data through image analysis. Ability to write scientific publications in English.

**Gross salary**: between 2675 and 3806 €/month depending on your professional experience.

**Application, deadline date and contact**: Review of applications will begin on September 1st, and continue until the position is filled. Applicants should submit a cover letter including a brief but detailed statement of interest, a CV and the contact of two persons of reference to Christophe Raufaste via email, [christophe.raufaste@univ-cotedazur.fr](mailto:christophe.raufaste@univ-cotedazur.fr) . Please take a first contact for any question you may have.