A one year post-doc position is available at iLM in the group Liquid at Interfaces entitled **"Transport in model soft nanofluidics channels".**

The transport of liquids at the nanoscale is encountered in many situations among which biological systems, filtration membranes and soils. On the contrary to microfluidics, liquid transport in confined systems at nanoscales, comparable to the electrostatic ones, is particular due to the strong coupling between ionic and mass transport, namely electrokinetics. These couplings allow the design of new specific properties, useful for energy harvesting[1], lab on chip application[2], desalination and filtration. Nowadays, one key question concerns the interactions between the interfacial material (electronic) properties and the ionic transport in the liquid. Indeed, conductive and insulating materials demonstrate very different unexpected behaviors, yet not fully understood.
On this topic, one big challenge is to build dedicated experiments to investigate nanofluidic flows. This difficulty can be overcome by considering model spontaneously formed nanofluidic systems. Among them, soap films are tools of choice as they are easily formed and spontaneously nanometric in thickness. Moreover, the surfactants required to stabilize the soap films form a single monolayer of charges at the interface[3,4], a situation encountered only in the most promising solid state systems for energy recovery.
In this project, we will experimentally investigate nanofluidic transport properties in such *soft* systems varying the electronic and chemical properties of the surfactant layers. Electric transport measurements will be coupled to optical characterization of the films[5] (interferometry and beyond, depending on the abilities of the candidate). Alternative *soft* nanofluidics systems will also be considered.
The position implies interactions with different researchers from the team Liquid at Interface at iLM, but also with chemists who will provide specific surfactants and/or solid state physicists for alternative routes. We also expect involvements of the post-doc in the supervision of undergraduates.

The candidate should be an experimentalist, with a PhD in soft matter, fluid mechanics or solid state physics obtained in 2016 or after. Specific competencies in electrochemistry, optics or physico-chemistry of surfactants will be considered favorably but are not required.

This project will take place in iLM, campus de la Doua, Villeurbanne (very close to the city center of Lyon, France). This is a one year CNRS contract open on February 1st 2019. Charged salary is 2948€ per month (2370€ net).

Applications should include a CV, a motivation letter and some references. For information and applications, please contact A.L. Biance by email: anne-laure.biance@univ-lyon1.fr.

References: [1] Siria, A., Poncharal, P., Biance, A. L., Fulcrand, R., Blase, X., Purcell, S. T., & Bocquet, L. (2013). *Nature*, *494*(7438), 455. [2] Lee, C., Cottin-Bizonne, C., Biance, A. L., Joseph, P., Bocquet, L., & Ybert, C. (2014). *Physical review letters*, *112*(24), 244501. [3] Joly, L., Detcheverry, F., & Biance, A. L. (2014). Anomalous ζ potential in foam films. *Physical review letters*, *113*(8), 088301. [4] Blanc, B., Bonhomme, O., Brevet, P. F., Benichou, E., Ybert, C., & Biance, A. L. (2018). Electroosmosis near surfactant laden liquid–air interfaces. *Soft matter*, *14*(14), 2604-2609. [5] Bonhomme, O., Liot, O., Biance, A. L., & Bocquet, L. (2013). Soft nanofluidic transport in a soap film. *Physical review letters*, *110*(5), 054502.