

## Postdoctoral position opening

# Mechanical properties of liquid interfaces by cylindrical probe AFM

Location: **Laboratoire de Physique**, CNRS UMR 5672, ENS de Lyon (Lyon, France).

Duration: **18 months**, starting at a flexible date preferably in **Fall 2014**.

Funding: **ANR NANOFUIDYN**, with a **net salary of typically 2050 €/month** (according to CNRS salary grid, depending on experience).

The NANOFUIDYN project aims at investigating the mechanical properties of liquid interfaces and the dynamics of wetting at nanometric scale. To this end, we are developing a combination of new AFM techniques, where a long cylindrical probe is fixed at the end of an AFM cantilever and can be partially immersed in the liquid of interest. The probe radius can be either micrometric (using elongated glass fibers) or nanometric (using carbon nanotubes). At the Laboratoire de Physique, we are able to perform high resolution measurements of the cantilever's deflection thank to an original quadrature phase interferometric sensor. We have already used this technique to probe the thermal vibrations of an AFM cantilever functionalized with a micrometric fiber, evidencing a coupling with the thermal vibrations of the fiber ([arXiv:1311.2217 \[cond-mat.soft\]](https://arxiv.org/abs/1311.2217)).

We now want to implement active measurements on our high resolution AFM setup in order to complement the current thermal noise measurements. These active measurements will allow us in particular to study the stiffness of the liquid meniscus around the cylindrical probe as a function of the exciting frequency and amplitude, and also to develop a non-contact method to probe liquid or soft interfaces.

The postdoctoral researcher is expected to participate in the setting up of the active measurements and in the subsequent cylindrical probe experiments and data analysis. He or she should thus have a strong taste for instrumentation and careful experiments and data analysis. A background in force spectroscopy, wetting or interfacial rheology would be appreciated but is not mandatory. The successful candidate should hold a PhD by the starting date.

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