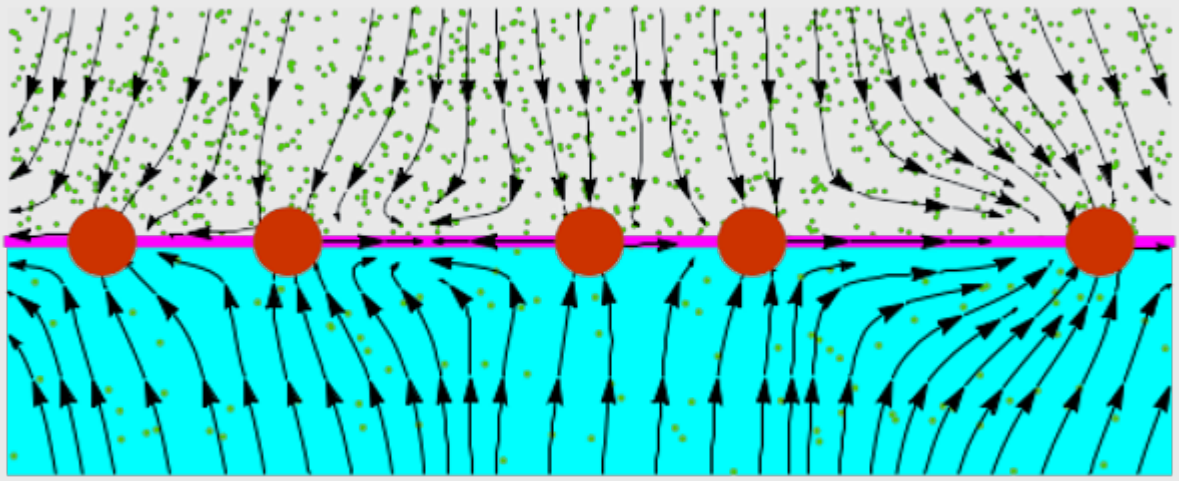
Active Colloid at a Fluid Interface



Title: Active Colloid at a Fluid Interface.
When: Tuesday, June 05, (2018), 12:00.
Place: Department of Theoretical Condensed Matter Physics, Faculty of Sciences, Module 5, Seminar Room (5th Floor).
Speaker: Álvaro Domínguez, Atomic, Molecular and Nuclear Physics Department, Universidad de Sevilla, Spain.

The last years have witnessed the growing interest on active colloids, i.e., of colloids made of particles that exhibit chemical activity: this activity induces gradients in the ambient fluid and thus drives a self-induced colloidal dynamics. This kind of systems have attracted attention both as a paradigm of nonequilibrium physics and for its potential applications.

In this talk, I will present recent theoretical work focused on a monolayer of active colloid formed at a fluid interface. A new phenomenology arises which is exclusive to the combination “activity + interface”, because the interface is also responsive to chemical gradients: the spatial variations of the surface tension induce Marangoni flows in the ambient fluids that manifest themselves as an effective interaction between the colloidal particles and between these and the interface. At the mean-field level, this interaction is analogous to two-dimensional Newtonian gravity. A particularly interesting result is the existence of “pseudoequilibrium” particle distributions in the monolayer describing the Marangoni-induced coexistence of thermodynamic phases. I will finally discuss the experimental evidence and the feasibility of observing the theoretical predictions.

References

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