LadHyX Seminar - December 7, 10:45

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**Dynamics of motile bacterial suspensions: reaction to oxygen and interaction with passive particles**

The swimming motion of bacteria has recently seen an increasing interest from physicists, utilizing the recent progresses in microscopy and the development of microfluidics to study this interdisciplinary subject. In this seminar, I will present our two main experimental findings on the motile soil bacteria *Burkholderia contaminans*: its reaction to oxygen and its ability to gather micron-sized beads in clusters.

First, we quantitatively studied its aerotaxis, *i.e.* its behavior in an oxygen gradient. We notably characterized the aerotactic coefficient dependency on the oxygen concentration, with both a macroscopic (population scale analysis) and microscopic approaches (bacterial scale analysis), and compared it to the literature. Second, we uncovered a rich clustering phenomena happening when some micron-sized passive beads (2-40 µm) are added to the bacterial suspension. Besides the enhanced bead diffusivity, the swimming bacteria are also responsible for a short-range attractive force between the beads. This results in a dynamical clustering of the beads, with a dynamics similar to Ostwald ripening and a characteristic cluster size slowly growing in $t^{1/3}$ without any apparent saturation.