LadHyX Seminar – September 27, 10:45

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**Sounds and stubbornness of active fluids**

I will first show how to engineer spontaneously flowing liquids from active units. Simply put, our strategy consists in letting self-propelled colloids to collide in microfluidic channels. After a short transient they self-assemble into liquids with emergent long-range orientational order which translates into spontaneous unidirectional flows. I will devote most of my talk to discussing the fluctuations and the dynamical response of these intrinsically non equilibrium materials. (i) I will show that both density and velocity fluctuations almost freely propagate along all directions and exploit these sound modes to infer the analogous of the Navier-Stokes equations for polar active liquids. (ii) I will then discuss the robustness of their spontaneous flows to external pressure gradients. I will evidence that (french) colloids can be collectively very resistant when one tries to waive their privilege to freely choose their direction of motion.

This work is in collaboration with Delphine Geyer and Alexandre Morin.