

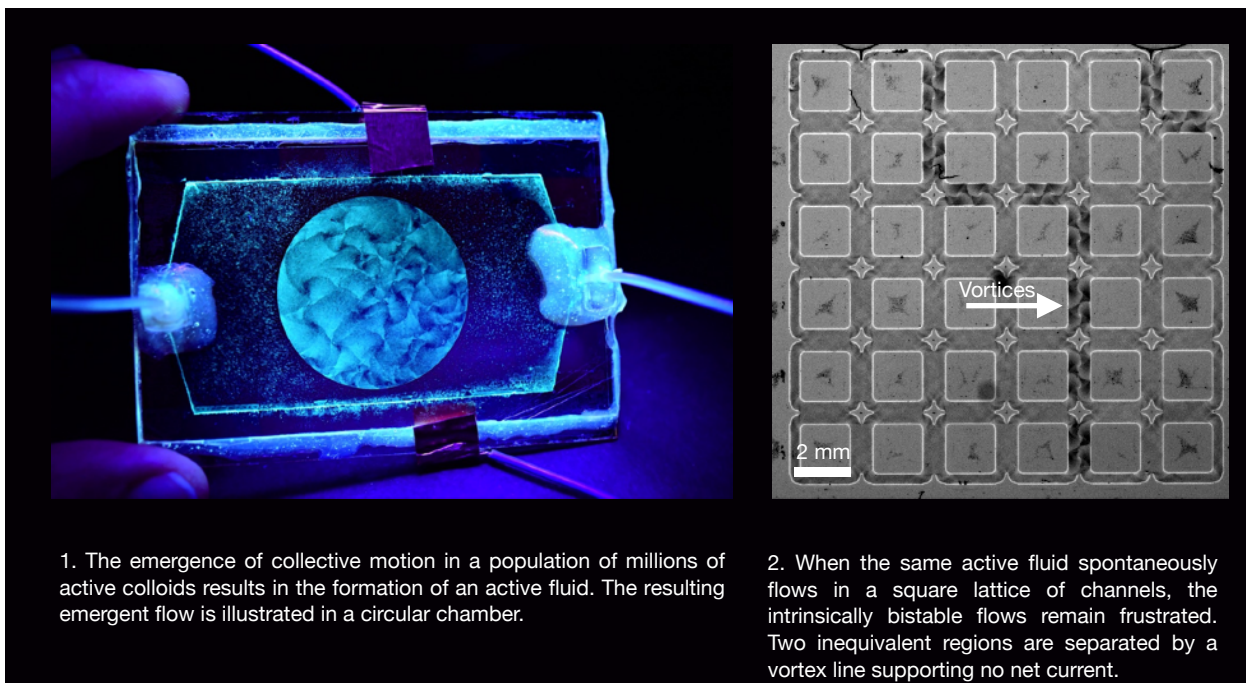
Master 2 & PhD project

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Frustrating Active Flows

Over the past decade, by engineering soft materials from active units, physicists have learned how to drive fluids from within. The generic strategy consists in assembling orientationally ordered liquids from self-propelled particles. Their mesmerizing flows are now understood in simple geometries such as linear channel or circular chambers¹, Fig. 1.



Unlike Newtonian fluids, active flows are not uniquely defined for a given geometry: they are intrinsically multistable. This highly nonlinear feature results in frustrated patterns in most geometries, Fig. 2.

The goal of our research will be to elucidate the degeneracy of the spontaneous flows of active fluids exploring hydrodynamic networks, and to lay out the foundation of active microfluidics.

[1] see e.g. [Morin and Bartolo, PRX \(2018\)](#), [Geyer et al PRX \(2019\)](#), [Chardac et al \(2020\)](#)