

Marchetti, Cristina: *"Dynamics and topology of an active liquids crystals"*

A variety of active systems, such as mixtures of cytoskeletal filaments and motor proteins, monolayers of living cells and bacterial suspensions, form active fluids with liquid crystalline order and self-sustained flows characterized by evolving topological defects. While in passive liquid crystals opposite-strength defects attract and ultimately annihilate, in active liquid crystals defects are continuously generated by activity. The system then reaches a defective steady state, with self-sustained, turbulent-like flows. I will show how these complex flows can be described in terms of the dynamics of individual active defects, which in turn behave like self-propelled particles. When active nematics are confined to the surface of lipid vesicles the defects required by topological constraints acquire tunable oscillatory dynamics, producing a new kind of topological active matter.