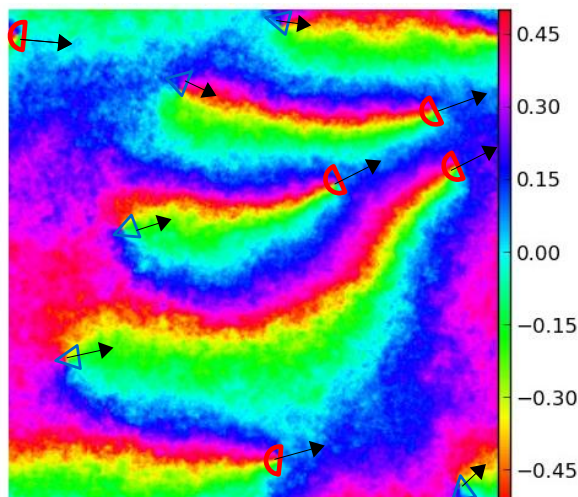


INTERNSHIP/PHD POSITION

OUTSTANDING PROBLEMS IN THE STATISTICAL PHYSICS OF ACTIVE MATTER

The past ten years have seen the emergence of Active Matter – composed of particles that convert energy from an ambient source into systematic movement -- as a distinct topic in nonequilibrium statistical physics, motivated mainly by the need to understand and imitate individual and collective motility.

It is time to bring the focus back to unresolved fundamental questions, perhaps ignored amidst the excitement from new experiments and novel, complex theories: Is the active nematic phase stable to the proliferation of topological defects? Are self-propelled rods distinct from active nematics? Is polar active smectic order stable? Does the physics of polar order dominate the nature of density fluctuations in the apolar active nematic? We seek progress on these key issues through theory and simulations on minimal models and hydrodynamic descriptions.



Snapshot of orientation field revealing topological defects in an active nematic : contrary to equilibrium systems, here $-1/2$ defects (blue triangle) move at constant speed, and have non-trivial interactions

Depending on the candidate's taste and capabilities, the work will be more or less analytical. In all cases, though numerical skills will be welcome.

CONTACTS: Hugues Chaté, 06 66 03 46 79, hugues.chate@cea.fr