

Seminar

Controlling Defect Dynamics in a 2d Active Nematic

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In vitro reconstituted active systems, such as the ATP - driven microtubule bundle suspension developed by the Dogic group (Brandeis University), provide a fertile testing ground for elucidating the phenomenology of active liquid crystalline states. Controlling such novel phases of matter crucially depends on our knowledge of their material and physical properties. In active nematics, defects become dynamical entities and behave like self-propelled particles; driving self-sustained flows and the transition to spatio-temporal chaos. Using the motion of disclinations as intrinsic tracers of the flow field, we show that the rheological properties of the nematic film can be probed by varying its hydrodynamic coupling to a bounding oil layer, providing us an estimate for the as of now unknown shear viscosity of the nematic film. Knowing this now provides us with an additional handle for robust and precision, tunable control of the emergent dynamics of active fluids.

Tuesday, Aug 9th 2016

4:00 PM (Tea/Coffee at 3:45 PM)

Seminar Hall, TCIS