Seminar

Antipolar ordering of topological charges and universality in active liquid crystals

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Recent experiments in the laboratory of Zvonimir Dogic (Brandeis University) demonstrated that ATP-driven microtubule-kinesin bundles can self-assemble into two-dimensional active liquid crystals that exhibit a rich creation and annihilation dynamics of topological defects. This remarkable discovery has sparked considerable theoretical and experimental interest. I will present and validate a minimal continuum theory for this new class of active matter systems by merging universality ideas with the classical Landau-de Gennes theory. The resulting model agrees quantitatively with recently published data and, in particular, predicts a previously unexplained regime of antipolar order of topological defects. Our results suggest that complex nonequilibrium pattern-formation phenomena might be predictable from a few fundamental symmetry-breaking and scale-selection principles.

Friday, Dec 4th 2015

2:30 PM (Tea/Coffee at 2:15 PM)

Seminar Hall, TCIS