

Students' Annual Seminar

The interplay of segregation and flocking in the dynamics of active polar particles in a crystalline medium

Rahul Kumar Gupta

A mechanically agitated monolayer of elongated, tapered macroscopic particles provides a faithful imitation of motility, transducing the energy of vertical vibration into directed horizontal motion. In these systems the constituent particles individually take up and dissipate energy, thus moving, interacting and aligning collectively. Our current interest is in the motion of such particles through a background of small beads, whose resulting induced motion leads to long-ranged interactions amongst the motile rods. We focus on the case where the bead concentration is high enough that the bead medium has crystalline order, thus entering a regime unexplored in earlier studies. The movement of a rod produces elastic distortions in the ambient crystalline medium which reorients other rods at a considerable distance, leading in turn to a combination of alignment and condensation. My talk will summarize progress in understanding this transition through a theoretical model in terms of the coupled dynamics of rod orientations and the displacement field of the ambient crystalline medium.

Friday, Apr 5th 2019

11:00 AM (Tea/Coffee at 10:00 AM)

Seminar Hall, TIFR-H