Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Seminar

Tuning Self Organization of Confined Active Particles by Steepness of the Trap

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We consider self-propelling particles in two dimensions. They can align themselves according to the direction of propulsion of their neighbours, together with a random perturbation (i.e. rotational fluctuation). They are also interacting with each other by a soft, isotropic, excluded- volume interaction. Particles are confined within a trap. The steepness of the trap is tuneable. Their average packing fraction and strength of rotational fluctuation are low. When the trap is steep, particles flock along its boundary. They form polar cluster that spreads over the boundary. The cluster has no spatial or structural order. We show, when the steepness is decreased beyond a threshold value, the clusters become round, compact and eventually spatial order (hexagonal) emerges in addition to the pre-established polar order within them. We investigate kinetics of such ordering. We also discuss the stability of the order when the trap is suddenly switched off.

Thursday, Apr 4th 2019

4:00 PM (Tea/Coffee at 3:30 PM)

Auditorium, TIFR-H