Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy Dist., Hyderabad – 500 046

Seminar

Non-equilibrium stationary states of run-and-tumble particles in confining potentials

Grégory Schehr

CNRS-Sorbonne Université, Paris

I will review analytical results that we will obtain for run-and-tumble particles (RTPs) in the presence of external confining potentials. At long times, these systems generally reach a non-equilibrium stationary state (NESS) that differs markedly from the equilibrium Boltzmann-Gibbs distribution. I will begin with the case of noninteracting RTPs in one and higher dimensions, where the NESS will already exhibit rich behaviours, including transitions between passive-like and active-like phases. I will then present recent results on long-range interacting RTPs, focusing on active Riesz gases in which particles interact via pairwise repulsive power-law potentials. These studies reveal interesting phenomena arising from the interplay between activity, interactions, and confinement.

Tuesday, Dec 2nd 2025

14:30 Hrs (Tea / Coffee 14:15 Hrs)

Seminar Hall, TIFRH