

ICTS Skype Seminar

Title : Studies of fluctuations in systems of self-propelled particles

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Date : Thursday, January 10, 2019

Time : 10:45 AM

Venue : Nambu Discussion Room (Left), ICTS Campus, Bangalore

Abstract : In this talk, I shall discuss the problem of characterizing fluctuations in systems of interacting self-propelled particles (SPPs), which propel themselves by converting chemical energy to mechanical one. Using an additivity property and a consequent fluctuation-response relation, we formulate a thermodynamic theory for SPPs. Here we consider two classes of SPPs: Active Brownian particles and Vicsek-like models with alignment interactions. We substantiate our claims by analytically calculating subsystem particle number distributions (or, analogously the density large deviation functions) in the disordered phase of the models. We find good agreement between theory of additivity and simulations, where our theory captures remarkably well the non-Gaussian features observed in the density large-deviation functions obtained using additivity.