ICTS Seminar

Title : Dynamics Of Propagating Modes and Characterisation Of Ordering In Coupled NonEquilibrium Systems

Speaker : Shauri Chakraborty, Department of Theoretical Sciences, Kolkata

Date : Wednesday, August 21, 2019

Time : 11:00 AM

Venue : Chern Lecture Hall, ICTS Campus, Bangalore

Abstract : We study a coupled non-equilibrium system consisting of two species of particles, one lighter (L) and the other heavier (H), that move stochastically on an energy landscape, which also fluctuates in time. The particles tend to minimize their energy by moving along the local potential gradient and also by modifying the landscape around their position in such a way that the energy is further lowered. By tuning the coupling parameters that govern the action of the H and L particles on the landscape, we obtain a phase diagram that shows two new kinds of ordered phases in both particle species and also the landscape, along with two earlier found phases, and a disordered phase. The newly found ordered phases show algebraically fast coarsening to steady state and rich dynamics. The phase diagram remains qualitatively valid for all densities in one and two dimensions. The disordered phase is characterised using a recently developed formalism of non-linear fluctuating hydrodynamics (NLFH) along with mode-coupling theory that predicts diffusive, KPZ, 3/2-Lévy, 5/3-Lévy, and gold-Lévy universality classes for our system. However, we argue that in verifying the predictions through numerical simulations, the conclusions can be masked by finite size effects.