

ICTS Skype Seminar

Title : Exactly solvable driven interacting particle systems

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Date : Thursday, July 26, 2018

Time : 10:00 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : Non-equilibrium steady states have no unique measure in contrast to systems in equilibrium which are characterized by Gibbs-Boltzmann distribution. To address this question, we introduce a class of interacting particle systems and solve the corresponding steady states exactly using several techniques like matrix product ansatz, h -balance condition, pairwise balance condition etc. These stochastic processes include finite range processes (e.g. zero range process, misanthrope process, multi species assisted exchange models) and their generalizations (e.g. invoking asymmetric rate functions). Using transfer matrix methods in these models, we can calculate analytically several observables of interest like spatial correlation functions, particle current etc. Particle current, for special choice of the rates, exhibit interesting features like density dependent current reversal and negative differential mobility. Phenomena like formation of condensates and phase coexistence have also been observed in some of these non-equilibrium processes with specific dynamics.