ICTS Seminar

Title : Run-and-tumble particles on a 1D lattice

Speaker : Rahul Dandekar, Institute of Mathematical Sciences, Chennai

Date : Thursday, August 8, 2019

Time : 11:00 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : We study run-and-tumble particles (RTPs) on a 1D lattice, where each lattice site cannot hold more than one particle. Each RTP carries a spin which points in the positive or negative direction, and hops on the lattice at unit rate in the direction of the spin. The spin itself flips at a rate D_r.

I will show that the steady-state of the model determined using the independent interval approximation shows excellent agreement with simulations for D_r>1. I will also also derive the hydrodynamics in this picture, and show that there are strong non-equilibrium effects, like the violation of the Einstein relation. I will also briefly describe a coalescence picture for D_r << 1, and time permitting, describe the hydrodynamics in this limit.