Abstract:

In this work, we consider a 2D lattice gas model of two species of particles, called the active (A) and the passive (P), in which their interactions are performed by a mutual exclusion principle. This two-species model arises in a variety of applications, for instance, the evacuation of pedestrian populations. Unlike the species (P), the active (A) is subject to a drift that encodes the awareness of the location of the exit door on the lattice. By enjoying the Monte Carlo simulations, we investigate the characteristic time scales of evacuation of both species through the exit door and discuss the onset of a peculiar "drafting" effect in our lattice dynamics. More precisely, in spite of the excluded volume interaction, the evacuation of the species (A) can be found and this way we are able to enhance the rate of evacuation of the passive species (P), even in presence of obstacles inside the domain. This is a joint work with Dr. Matteo Colangeli (University of L'Aquila, Italy).