THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Geometric Functional Analysis and Probability Seminar

Room 290C ,Ziskind Building
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The criticality of a randomly-driven front.

Abstract:

Consider independent continuous-time random walks on the integers to the right of a front R(t). Starting at R(0)=0, whenever a particle attempts to jump into the front, the latter instantaneously advances k steps to the right, absorbing all particles along its path. Sly (2016) resolves the question of Kesten and Sidoravicius (2008), by showing that for k=1 the front R(t) advances linearly once the particle density exceeds 1, but little is known about the large t asymptotic of R(t) at critical density 1. In a joint work with L-C Tsai, for the variant model with k taken as the minimal random integer such that exactly k particles are absorbed by the move of R(t), we obtain both scaling exponent and the random scaling limit for the front at the critical density 1. Our result unveils a rarely seen phenomenon where the macroscopic scaling exponent is sensitive to the initial local fluctuations (with the scaling limit oscillating between instantaneous super and sub-critical phases).