Math Postdoc Seminar

Phase Transition in a Generalised Parallel TASEP on the Ring

Time: Tuesday, April 2, 2019 - 12:30 to 1:30 pm
Venue: Room 264, Geography Building, Zhongbei Campus, East China Normal University
Speaker: Jérôme Casse, NYU Shanghai

Abstract:
In this talk, I present a generalization of the parallel TASEP (Totally ASymetric Exclusion Process) where the probability for a particle to move depends on the number of free-space in front of it. In some cases (in particular, the gravitational case on torus), we prove that there exists a phase transition in the mean speed of a particle: there exists a critical density such that if the density is upper this critical value, the mean speed increases when the density decreases, and under this critical value, the mean speed is the same for any density.
To prove that, we relate the TASEP with some Probabilistic Cellular Automata (PCA) that permits to find the invariant measures of this TASEP. Then, we study these invariant measures to show the phase transition phenomenon.

Biography:

Casse obtained his Ph.D. in Mathematics in 2015 from University of Bordeaux, France and he is currently a postdoc at NYU Shanghai.
Casse did his Ph.D. at LaBRI (computer science research department of Bordeaux) from 2012 to 2015. Then, from Sept. 2015 to August 2016, he was Research and Teaching Assistant at Mines Nancy and IECL (mathematics department of Nancy).
Casse's research interests are at the frontier of Probability, Discrete Mathematics and Statistical Physics. He is particularly interested in probabilistic cellular automata and iterated brownian motion.