NYU-ECNU
Institute of Mathematical Sciences
at NYU Shanghai

PROBABILITY SEMINAR

TOPIC: **Absorbing-state Phase Transitions: Challenges for Mathematicians**

SPEAKER: **Leonardo T. Rolla**
NYU Shanghai and University of Buenos Aires

TIME: 15:00-16:00, 18 September 2014

VENUE: Room 264, Geography Building, 3663 Zhongshan Road North, Shanghai (中山北路校区，地理楼 264 室)

ABSTRACT OF THE TALK

Modern statistical mechanics offers a large class of driven-dissipative systems that naturally evolve to a critical state. Here we consider two infinite-volume systems: the activated random walks and the stochastic sandpile.

The main goal in this field is to describe the critical behavior, the scaling relations and critical exponents of these systems, and whether their critical density is the same as the long-time limit attained in their driven-dissipative finite-volume version. These questions are however far beyond the reach of current techniques. Due to strong non-locality of correlations and dynamic long-range effects, classical analytic and probabilistic tools fail in most cases of interest, making the rigorous analysis of such systems a major mathematical challenge.

In this talk we will report on the progress obtained in recent years. We will show some novel ideas and techniques which allowed some steps forward in understanding the phase transition in these systems, and discuss some of the open problems.

BIOGRAPHY

Leonardo T. Rolla is a Visiting Assistant Professor at NYU Shanghai. He is also a tenured Researcher of the Argentinian National Research Council. He obtained the PhD in 2008 from IMPA, Rio de Janeiro, Brazil.

Professor Rolla's research interests are Percolation, Particle Systems and Spatial Processes. His work has appeared in journals such as Inventiones Mathematicae, Communications on Pure and Applied Mathematics, The Annals of Probability, SIAM Multiscale Modeling and Simulation, Stochastic Processes and their Applications, and Journal of Statistical Physics.

Professor Rolla has obtained fellowships from the Foundation Sciences Mathématiques de Paris in 2008 and the Excellence Postdoctorate from IMPA in 2010.