

## WORKING AND LITERATURE SEMINAR

**Topic:** Diffusion in a Random Lattice Lorentz Gas

**Speaker:** Raphael Lefevre, Paris Diderot University

**Time:** 16:15 - 17:15, 24 March 2014

**Venue:** Room 379, Geography Building, 3663 Zhongshan Road North, Shanghai  
(华东师范大学中山北路校区, 地理楼 379 室)

### ABSTRACT OF THE TALK

Ever since the works of the founding fathers of statistical mechanics, the derivation of the laws of macroscopic transport as the result of the motion of the microscopic components has been a major challenge which remains largely unsolved to this day.

I will present a new model that can be seen as a random lattice Lorentz gas and for which a macroscopic diffusion equation can be rigorously derived from the microscopic dynamics. The proof is based on the fact that in high dimension, random walks have a small probability of making loops or intersecting each other when starting sufficiently far apart.

### BIOGRAPHY

Raphael Lefevre is an associate professor at Paris Diderot University (Paris 7). He received his Ph.D. in Mathematical Physics from the University of Louvain (Belgium) in 1999. He went on to conduct postdoctoral research at the University of Helsinki (Finland) and in Kyoto University (Japan) before joining the Probability and Stochastic Models Laboratory in Paris Diderot University (France) in 2004. His main research focus is on Statistical Mechanics.