

On a scaling limit of the stochastic heat equation with exclusion interaction.

Abstract

This talk is about the equation $\partial u(x,t)/\partial t = \Delta u(x,t) + [\xi(x,t) - \rho]u(x,t), x \in \mathbb{Z}^d, t \geq 0$. Here, Δ is the discrete Laplacian and the ξ -field is a stationary and ergodic dynamic random environment with mean ρ that drives the equation. I will focus on the case where ξ is given in terms of a simple symmetric exclusion process, i.e., ξ can be described by a field of simple random walks that move independently from each other subject to the rule that no two random walks are allowed to occupy the same site at the same time. I will discuss the behaviour of the equation when time and space are suitably scaled by some parameter N that tends to infinity. It turns out that in dimension two and three a renormalisation has to be carried out in order to see a non-trivial limit. This is joint work in progress with Martin Hairer.