Séminaire de Probabilités et Statistique

Mardi 15 Décembre à 14h00

Laboratoire Dieudonné

Salle de conférence - LJAD

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A new Universality Class in (1+1)-dimensions: the Brownian Castle

This is joint work with M. Hairer.

In the context of randomly fluctuating interfaces in (1+1)-dimensions two Universality Classes have generally been considered, the Kardar-Parisi-Zhang and the Edwards-Wilkinson. Models within these classes exhibit universal fluctuations under 1:2:3 and 1:2:4 scaling respectively.
We introduce a (1+1)-dimensional temperature-dependent model such that the classical ballistic deposition model is recovered as its zero-temperature limit. Surprisingly enough, its infinite-temperature version, the 0-Ballistic Deposition (0-BD) model, does not belong to either the universality classes mentioned above. We show that 0-BD has a scaling limit, a new stochastic process that we call Brownian Castle (BC) which, although it is "free", is distinct from EW and, like any other renormalisation fixed point, is scale-invariant, in this case under the 1:1:2 scaling. The aim of the present talk is to provide a "global" construction of BC, determine some of its path-wise and distributional properties and prove its universality by showing that 0-BD converges to it.