Seminar/Talk

Interacting particle systems, stochastic self-duality and homogenization: hydrodynamics in random environment

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Host: M. Beiglboeck, N. Berestycki, L. Erdoes, J. Maas

In this talk we present a class of interacting particle systems (IPS) - so-called exclusion and independent particle systems are examples among them - with a certain degree of exact solvability. We refer to this property as stochastic self-duality. From a probabilistic point of view, stochastic self-duality refers to the possibility of studying a class of observables of the original system in terms of quantities of a - possibly simpler - dual system. In this particular context of particle systems, this typically consists in reducing the study of an observable of many particles to one of just one or two particles. From a stochastic calculus perspective, stochastic self-duality simply refers to linearity in the drift for the associated system of SDEs. After extending this property to the inhomogeneous context, as an application, we show how to derive the hydrodynamic limit in random environment for such IPS by means of a homogenization problem - or, in other words, an invariance principle - for a suitable random walk in random environment. Joint work with Simone Floreani (TU Delft) and Frank Redig (TU Delft).

Tuesday, November 26, 2019 05:30pm - 06:30pm

IST Austria, Heinzel SR / Ground floor, Office Bldg West (I21.EG.101)

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