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Institute of Science and Technology

Mathematics and CS Seminar

On the two-dimensional KPZ and Stochastic Heat Equation

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Host: M. Beiglböck, N. Berestycki, L. Erdös, J. Maas, F. Toninelli

We consider the Kardar-Parisi-Zhang equation (KPZ) and the multiplicative Stochastic Heat Equation (SHE) in two space dimensions, driven by with space-time white noise. These PDEs are very singular and lack a solution theory, so it is standard to introduce a regularization - e.g. by convolving the noise with a smooth mollifier - and to investigate the behavior of the solutions when the regularization is removed. Interestingly, these regularized solutions are closely linked to a much studied model in statistical mechanics, the so-called directed polymer in random environment. Building on this link, we show that a phase transition emerges, as the noise strength is varied on a logarithmic scale. In the sub-critical regime, the solutions of the regularized KPZ and SHE (suitably centered and rescaled) converge to an explicit Gaussian field, the solution of an *additive* Stochastic Heat Equation. We finally discuss the critical regime, where many questions are open. Based on joint works with Rongfeng Sun and Nikos Zygouras

Tuesday, December 15, 2020 04:30pm - 05:15pm

IST Austria Campus Online via Zoom

This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage: https://ist.ac.at/en/campus/how-to-get-here/ The IST Shuttle bus is marked IST Shuttle (#142) and has the Institute Logo printed on the side.