MSRI Five Minute Talk

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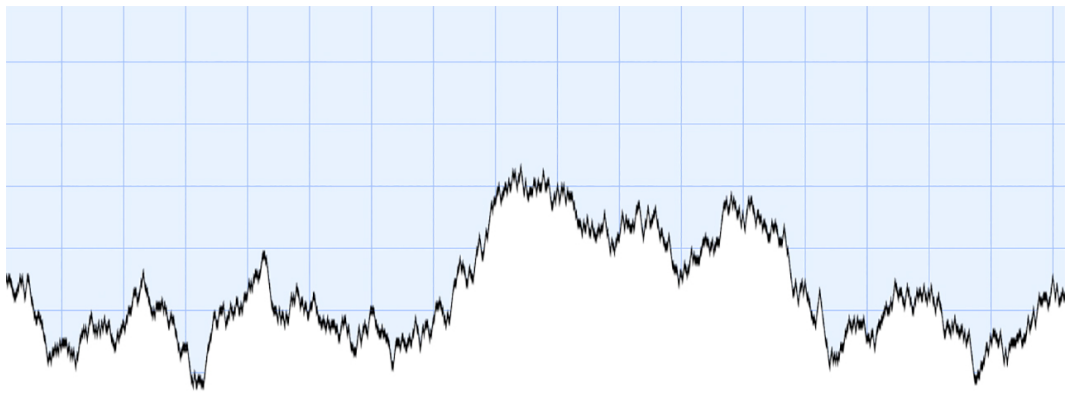
Research Interests

Random Growth Models and Interacting Particle Systems

1. Kardar-Parisi-Zhang SPDE: $\partial_t \mathbf{h} = \frac{1}{2}\partial_x^2 \mathbf{h} - \frac{1}{2}|\partial_x \mathbf{h}|^2 + \xi$



2. In general: hydrodynamic/fluctuations/scaling limits/large-scale behavior for interacting particle systems, SPDEs, homogenization

1. Kardar-Parisi-Zhang SPDE: $\partial_t \mathbf{h} = \frac{1}{2}\partial_x^2 \mathbf{h} - \frac{1}{2}|\partial_x \mathbf{h}|^2 + \xi$
   - Canonical model for rough interface growth (Kardar-Parisi-Zhang '86)
   - *Universality*, e.g. for height functions of interacting particle systems
   - Heuristic – take a general growth model and perform a "Taylor expansion procedure" to match it to KPZ
     - Details in Wikipedia page for "Kardar-Parisi-Zhang equation"
   - Bertini-Giacomin '97 – ASEP (integrable)
   - *Non-integrable* models? In general, Taylor series answer is wrong!
   - "Correct/Rigorous Taylor expansion": *Boltzmann-Gibbs principle*
     - Applications to *integrable* models
     - Applications to fluctuations of hydrodynamic limits

Happy to talk to anybody about anything! Thank you!