Around KPZ universality

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Joint projects with Dan Betea (KU Leuven) and Patrik Ferrari (Uni Bonn)

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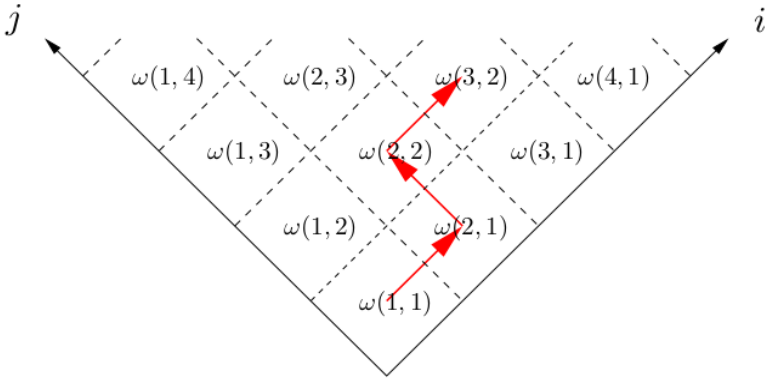
$$\partial_t h = \tfrac{1}{2}\Delta h + \tfrac{1}{2}(\nabla h)^2 + \xi$$

We investigate **scaling limits** of

Random growth models

- **Last Passage Percolation** models in different geometries:
  full-space, half-space, infinite geometry, stationary



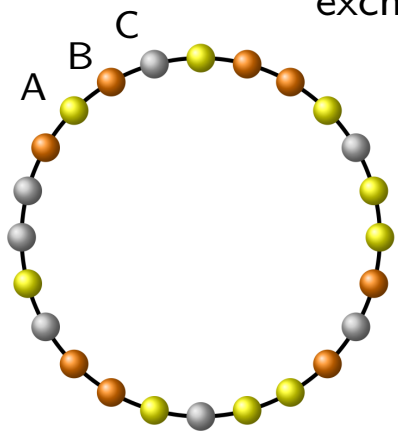
GOAL: uncover universal distributions related to RMT and **KPZ universality class** (e.g. Tracy–Widom) using both probabilistic arguments (polymer localization) and exact formulas from the integrable (determinantal, pfaffian) structure

Interacting particle systems

- Multi-species systems/multi-conserved quantites:
  particle densities (exclusion processes, zero-range, . . .), energy-volume (Hamiltonian systems, harmonic oscillators, . . .)

- Toy model: **ABC MODEL**

nearest neighbor 3-species particle exchanges in the *weakly asymmetric regime*



GOAL: the A and B density fluctuation fields converge to a system of coupled **stochastic Burgers' equations**