Stanford University
Departments of Mathematics and Statistics

Probability Seminar

4pm, Monday, October 8, 2018
Sequoia Hall Room 200

Refreshments served at 3:30pm in Sequoia Lounge.

Speaker: Alex Dunlap, *Stanford Mathematics*

Title: Constructing (2+1)-dimensional KPZ evolutions

Abstract:

The $(d+1)$-dimensional KPZ equation

$$\partial_t h = \nu \Delta h + \frac{\lambda}{2}|\nabla h|^2 + \sqrt{D}\dot{W},$$

in which $\dot{W}$ is a space-time white noise, is a natural model for the growth of d-dimensional random surfaces. These surfaces are extremely rough due to the white noise forcing, which leads to difficulties in interpreting the nonlinear term in the equation. In particular, it is necessary to renormalize the mollified equations to achieve a limit as the mollification is turned off. The $d = 1$ case has been understood very deeply in recent years, and progress has been made in $d \geq 3$, but little is known in $d = 2$. I will describe recent joint work with Sourav Chatterjee showing the tightness of a family of Cole–Hopf solutions to $(2+1)$-dimensional mollified and renormalized KPZ equations. This implies that subsequential limits exist, which we furthermore can show do not coincide with solutions to the linearized equation, despite the fact that our renormalization scheme involves a logarithmic attenuation of the nonlinearity as the mollification scale is taken to zero.