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- 4 **Research Interest 1:** Convergence of polymers and particle systems to SPDEs:
 - Convergence of WASEP to KPZ in a half-space and a bounded interval in the full Neumann boundary regime. (arXiv 1711.05297)
 - Convergence of partition function of directed polymers in an octant to half-space Dirichlet KPZ. (arXiv 1901.09449)
 - Proving joint convergence of WASEP to KPZ with multiple initial data and coupling of the dynamics. (arXiv 2106.07727)
 - Obtaining identities for half space KPZ using these convergence results.

- Research Interest 2:** Solving combinatorial problems with large deviations and variational techniques, without exact formulas.
 - Find a limit shape for the partition of n that maximizes the number of subpartitions as well as k -chains of subpartitions, as $n \rightarrow \infty$. (arXiv 1907.09628)
- Research interest 3:** Self-similarity properties of singular SPDE.
 - Consider the KPZ equation

$$\partial_t h^\epsilon = \partial_x^2 h^\epsilon + C_\epsilon (\partial_x h^\epsilon)^2 + \zeta$$

and show for a certain choice of $C_\epsilon \uparrow \infty$ that for a fixed realization of ζ one obtains a nonlinear version of the law of the iterated logarithm for $\epsilon^{-1/2} h^\epsilon(\epsilon^2 t, \epsilon x)$ divided by $(2 \log \log(1/\epsilon))^{1/2}$ as $\epsilon \rightarrow 0$. (in progress)