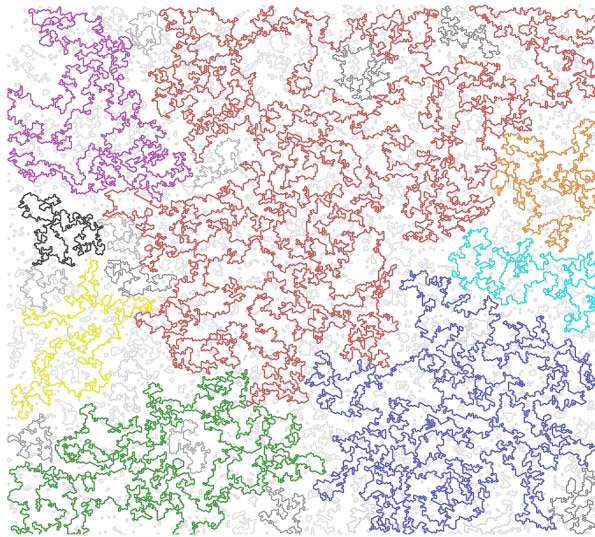


# Percolation, The Loop $O(1)$ Model, And Beyond

Morgan Shuman

April 3rd, 2026



The last century of statistical physics has profoundly influenced our understanding of random geometry and stochastic analysis. We will take a tour of the most studied models and seminal works with a focus on Stanislav Smirnov's proof of the conformal invariance of site percolation on the triangular lattice. A miraculous proof that won him the Fields medal, establishing the universal scaling limit for percolation: Schramm-Loewner Evolution.

This is a first of a series of three talks. We will conceptually cover the most seminal results of the field and begin Smirnov's proof of conformal invariance.