Cardy Embedding of Random Planar Maps

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A random planar map is a canonical model for a discrete random surface which is studied in probability theory, combinatorics, mathematical physics, and geometry. Liouville quantum gravity is a canonical model for a random 2D Riemannian manifold with roots in the physics literature. In a joint work with Xin Sun, we prove a strong relationship between these two natural models for random surfaces. Namely, we prove that the random planar map converges in the scaling limit to Liouville quantum gravity under a discrete conformal embedding which we call the Cardy embedding. We also prove that the percolation interface on the triangulation converges to the Schramm-Loewner evolution (SLE) with parameter 6 in a quenched sense.