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Rate of Convergence for Cardy's Formula

We consider 2D critical site percolation on the triangular lattice in a piecewise analytic Jordan domain. In this talk, I will show that crossing probabilities for such domains converge with power law rate in the mesh size to their limit given by the Cardy-Smirnov formula. I will also show how this result can be used to obtain new upper and lower bounds of $e^{O(\sqrt{\log \log R})} R^{-1/3}$ for the probability that the cluster at the origin in the half-plane has diameter R, improving the previously known estimate of $R^{(-1/3+o(1))}$.

This is joint work with Asaf Nachmias and Samuel S. Watson.