

# Asymptotics of discrete random surfaces

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Thursday, December 4, 2003

102 Bradley Hall, 4:00 pm  
(Tea 3:30 pm Math Lounge)

## Abstract

We discuss joint work with Andrei Okounkov. We study a model of random interfaces arising in the dimer model (domino tiling model). These can be viewed as a natural generalization of the simple random walk, where the domain is (part of)  $\mathbf{Z}^2$  instead of  $\mathbf{Z}$ . Because we are in two dimensions the boundary conditions on the domain can be much more varied, leading to interesting behavior in the scaling limit (limit when the mesh tends to zero). Specifically, there is a “law of large numbers” which says that at small mesh size a typical surface lies very close to its mean value. The mean value surface is obtained by solving a Dirichlet problem for a certain nonlinear PDE. Remarkably, solutions to this PDE can be parametrized by analytic functions and one can see facets appearing in the limit shapes.