

APPLIED MATHEMATICS COLLOQUIUM

FRACTAL GEOMETRY OF SIMPLE RANDOM COVERING: LATE AND FAVORITE POINTS

AMIR DEMBO
Stanford University

ABSTRACT:

The multi-scale second moment method was developed for understanding the wavefront of excursions of Brownian motion around different centers. It led also to the solution of several longstanding problems about simple random walk in two dimensions: The first, raised by Erdos and Taylor (1960), involves the number of visits to the most visited lattice site in the first N steps of the walk. The second, raised by Aldous (1989), concerns the number of steps it takes a simple random walk to cover all points of the N by N lattice torus. The most recent, due to Revesz (1990) involves the diameter of the largest disc covered by the planar walk in N steps.

As we shall see, this approach determines the subtle fractal structure of the exceptional sets of p -late points not visited till a fraction p of the cover time of the N by N lattice torus, and it also inspired recent results on the fractal structure of the extrema of the two-dimensional free Gaussian field conditioned to be non-negative in an N by N lattice square.

This talk is based on joint works with Yuval Peres, Jay Rosen and Ofer Zeitouni.

MONDAY, SEPTEMBER 12, 2005
4:30 PM
Building 2, Room 135

Reception at 4:00 PM outside Room 2-135.

Applied Math Colloquium: <http://www-math.mit.edu/amc/fall05>
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Massachusetts Institute of Technology
Department of Mathematics
Cambridge, MA 02139