TITLE: Fluctuation Exponents for Some Directed Polymer Models

SPEAKER: Professor Timo Seppalainen
Department of Mathematics
UW-Madison

TIME & PLACE: Wednesday, October 19, 2011
Room 140 Bardeen
4pm

Cookies & Coffee @ 3:30p in Rm 1210 MSC

ABSTRACT:
Directed polymer in a random environment is a model from statistical physics that has been around for 25 years. It is a type of random walk that evolves in a random potential. This means that the walk lives in a random landscape, some parts of which are favorable and other parts unfavorable to the walk. The objective is to understand the behavior of the walk on large space and time scales.

I will begin the talk with simple random walk straight from undergraduate probability and explain what diffusive behavior of random walk means and how Brownian motion figures into the picture. A recent result described in the talk concerns a particular 1+1 dimensional polymer model: the order of magnitude of the fluctuations of the polymer path is described by the exponent 2/3, in contrast with the exponent 1/2 of diffusive paths. Finding a rigorous proof of this exponent has been an open problem since the introduction of the model.