

Some themes in first passage percolation and directed polymers

Kenneth Alexander

University of Southern California

Resumo/Abstract:

The talk will have two main themes, not particularly related:

- (1) The discrepancy between the mean passage time $E(a_{0n})$ and its asymptotic approximation $n\mu$ in first passage percolation (FPP), and the relation of this discrepancy to concentration of the passage time about its mean. Here a_{0n} is the passage time from the origin to $(n, 0, \dots, 0)$, and μ is the time constant.
- (2) The directed polymer in a random environment (= positive-temperature last passage percolation) with a defect line in $1+1$ dimensions, and properties of the associated depinning transition. Here the potential is enhanced by a fixed amount u at sites on the axis. When the inverse temperature β is small relative to u , the quenched and annealed free energies are nearly the same, and the polymer is pinned. There has been disagreement in the physics literature, but the main belief is that pinning occurs for all $u > 0$. The analogous question for FPP is open as well.