Speaker: Sourav Sarkar, UC Berkeley

Title: Formation of large-scale random structure by competitive erosion

Abstract:

Competitive erosion models a random interface sustained in equilibrium by equal and opposite pressures on each side of the interface. Here we study the following one dimensional version. Begin with all sites of $\mathbb{Z}$ uncolored. A blue particle performs simple random walk from 0 until it reaches a nonzero red or uncolored site, and turns that site blue; then, a red particle performs simple random walk from 0 until it reaches a nonzero blue or uncolored site, and turns that site red. We prove that after $n$ blue and $n$ red particles alternately perform such walks, the total number of colored sites is of order $n^{1/4}$. The resulting random color configuration has a certain fractal nature which after scaling by $n^{1/4}$ and taking a limit, has an explicit description in terms of alternating extrema of Brownian motions.

This is joint work with Shirshendu Ganguly and Lionel Levine.