INDIAN STATISTICAL INSTITUTE

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Theoretical Statistics and Mathematics Unit

Monday Colloquium

Date: July 15, 2024 Time: 04:15 P.M.

Venue: L-infinity, Stat-Math Unit (5th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

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TITLE:

Long-range one-dimensional internal diffusion-limited aggregation

ABSTRACT:

We study internal diffusion limited aggregation (IDLA) on $\mathbb{Z}$, where the increment distribution X of the driving random walk has $\mathbb{E}[X] =0$, but may be neither simple nor symmetric, and can have $\mathbb{E}[X^2]= \infty$, for example. In this model, a cluster is grown by successive random walkers dispatched from the origin. Each walker terminates on its first visit to a site outside the current cluster, at which point the walker stops and the terminal site is added to the cluster. For the case where $\mathbb{E} [X^2] < \infty$, we prove that after m sites have been added to the cluster, it contains an approximately symmetric contiguous block of~$m +o(m)$ sites. Moreover, if $\mathbb{E} [X^3]< \infty$, no part of the cluster is farther than $o(m)$ from this block. On the other hand, if~X is in the domain of attraction of a symmetric α-stable law, $1 < \alpha <2$, we prove that the cluster contains a contiguous block of $\delta m +o(m)$ sites, where $0 < \delta < 1$, but, unlike the finite-variance case, one may not take $\delta=1$.

This is ongoing joint work with Conrado DaCosta and Andrew Wade.

ALL ARE CORDIALLY INVITED