



INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

SEMINAR

Date:

18.07.2024

19.07.2024

22.07.2024

24.07.2024

Time: 02:00 PM

VENUE:

L- 2

(4th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

TITLE:

Cluster sizes for the vacant sets of random walk on a torus

SPEAKER:

Subhajit Goswami

TIFR, Mumbai

ABSTRACT:

Let us consider a simple random walk on a discrete torus of large side length N in dimensions $d \geq 3$ starting from a uniform point. When the walk runs for a time uN^d for some $u > 0$, the corresponding vacant set, i.e. the set of points not visited by the walk, undergoes a percolation phase transition across a value $u_ \in (0, \infty)$. In these series of lectures we will discuss some recent results on the largest and second largest diameter of a vacant cluster in the subcritical ($u > u_*$) and supercritical ($u < u_*$) regime respectively. Interestingly, in the most precise versions of these results, both these diameters are found to grow at rate $\log N \log \log N$ in dimension 3 whereas in all higher dimensions they grow at a slightly slower, albeit "more familiar", rate $\log N$. Furthermore in dimension 3, one can compute the precise prefactor in front of $\log N \log \log N$ using connections to potential theory which turns out to depend symmetrically on u on either side of u_* and diverges polynomially as $u \rightarrow u_*$. The content is based on several (both published and upcoming) works with Hugo Duminil-Copin, Pierre-Francois Rodriguez, Franco Severo, Yuriy Shulzhenko and Augusto Teixeira.*

ALL ARE CORDIALLY INVITED