

Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

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Lipschitz-Saal (LWK 1.016)

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Phase transition for the late points of random walk

Let X be a simple random walk in \mathbb{Z}_n^d with $d \geq 3$ and let t_{cov} be the expected time it takes for X to visit all vertices of the torus. In joint work with Prévost and Rodriguez we study the set \mathcal{L}_α of points that have not been visited by time αt_{cov} and prove that it exhibits a phase transition: there exists α_* so that for all $\alpha > \alpha_*$ and all $\epsilon > 0$ there exists a coupling between \mathcal{L}_α and two i.i.d. Bernoulli sets \mathcal{B}^\pm on the torus with parameters $n^{-(a \pm \epsilon)d}$ with the property that $\mathcal{B}^- \subseteq \mathcal{L}_\alpha \subseteq \mathcal{B}^+$ with probability tending to 1 as $n \rightarrow \infty$. When $\alpha \leq \alpha_*$, we prove that there is no such coupling.