Asymptotic behavior of random walks and growth of groups

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Abstract:
The question about existence of groups of intermediate growth (super-polynomial but sub-exponential) was raised by Milnor in the 60s. First examples of such groups were constructed by Grigorchuk in the early 1980s. These groups have extraordinary algebraic and geometric properties, providing examples and counterexamples to many questions in group theory. In this talk we will survey some recent progresses in probabilistic methods in studying such groups, and explain a near optimal volume growth lower estimates of Grigorchuk groups coming from random walks with nontrivial Poisson-Furstenberg boundary on these groups.