NEAL MADRAS, York University

Must random walk move rapidly on either a graph or its complement?

One way to measure how rapidly a random walk moves around a graph G is by the Kemeny constant of the graph. Roughly speaking, if G has n vertices and its Kemeny constant is $O(n)$, then a random walk is not slow to visit a randomly chosen target vertex.

I shall outline a proof that for every $\epsilon > 0$, there is a constant Ψ with the following property: If G has n vertices, and every vertex has degree between ϵn and $(1-\epsilon)n$, then either G or its complement has its Kemeny constant less than Ψn. The methods are mainly probabilistic, with the spectral gap playing a key role. Some stronger results and open questions will also be described.

This is based on joint work with Sooyeong Kim, Ada Chan, Mark Kempton, Steve Kirkland, and Adam Knudson.