# Hamilton Institute

## Random-access Networks: Slow Transitions, Slow Mixing & Long Delays

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*Abstract*

We consider a stylised stochastic model for a wireless random-access network, which yields a product-form stationary distribution of the activity process for the various users and provides useful estimates for the user throughputs. The network users try to become active after an exponential back-off time, and stay active for an exponential transmission time. Due to wireless interference, active users prevent other nearby users from simultaneous activity, which we describe as hard-core interaction on a conflict graph. We focus on partite network topologies, for which we investigate the strong interplay in a high-load regime between long transition times among different components, poor delay characteristics and starvation issues, and long mixing times of the Markov process. In particular, we establish the asymptotic order of magnitude and the scaled asymptotic distribution of the transition time when the activation rates grow large. Moreover we exploit these results to obtain lower bounds for delays and mixing times.

**Venue**: Seminar Room, Hamilton Institute,  Science Building, NUI Maynooth

**Time**:   2.00 - 3.00pm

Travel directions are available at www.hamilton.ie

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