



# Hamilton Institute

Juggler's Exclusion Process

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**Abstract:**

Juggler's exclusion process describes a system of particles on the positive integers where particles drift down to zero at unit speed. After a particle hits zero, it jumps into a randomly chosen unoccupied site. I will model the system as a set-valued Markov process and show that the process is ergodic if the family of jump height distributions is uniformly integrable. In a special case where the particles perform jumps according to an entropy-maximizing fashion, the process reaches its equilibrium in finite nonrandom time, and the equilibrium distribution can be represented as a Gibbs measure conforming to a linear gravitational potential. Time permitting, I will also discuss a recent result which sharply characterizes uniform integrability using the theory of stochastic orders, and allows to interpret the dominating function in Lebesgue's dominated convergence theorem in a natural probabilistic way.

This talk is based on joint work with Harri Varpanen (Aalto University, Finland) and Matti Vihola (University of Jyväskylä, Finland).

References:

- L. Leskelä, H. Varpanen. Juggler's exclusion process. *Journal of Applied Probability* 49(1), 2012. arXiv:1104.3397.
- L. Leskelä, M. Vihola. Stochastic order characterization of uniform integrability and tightness. arXiv:1106.0607.

**Venue:** Seminar Room, Hamilton Institute, Rye Hall, NUI Maynooth

**Time:** 2.00pm - 3.00pm

Travel directions are available at [www.hamilton.ie](http://www.hamilton.ie)