Directed random polymers and Macdonald processes

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The goal of the talk is to survey recent progress in understanding statistics of certain exactly solvable growth models, particle systems, directed polymers in one space dimension, and stochastic PDEs. A remarkable connection to representation theory and integrable systems is at the heart of Macdonald processes, which provide an overarching theory for this solvability. This is based off of joint work with Alexei Borodin.