
LAUREN WILLIAMS, Berkeley

Tableaux combinatorics of hopping particles and Koornwinder polynomials

The asymmetric simple exclusion process (ASEP) is a Markov chain describing particles hopping on a 1-dimensional finite lattice. Particles can enter and exit the lattice at the left and right boundaries, and particles can hop left and right in the lattice, subject to the condition that there is at most one particle per site. The ASEP has been cited as a model for traffic flow, protein synthesis, the nuclear pore complex, etc. In my talk I will discuss joint work with Corteel and with Corteel-Mandelshtam, in which we describe the stationary distribution of the ASEP and the 2-species ASEP using staircase tableaux and rhombic tilings. We also link these models to Askey Wilson polynomials and Macdonald-Koornwinder polynomials, which allows us to give combinatorial formulas for their moments.