Combinatorics of the asymmetric simple exclusion process

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The asymmetric simple exclusion process (ASEP) is a Markov chain which describes particles hopping on a one-dimensional lattice. It is of great interest in statistical physics, probability, biology, and (more recently) combinatorics. I'll give a combinatorialist's perspective on the ASEP, explaining how it is connected to the Grassmannian, as well as a host of combinatorial objects including permutations and staircase tableaux. This talk will be an overview of our joint works with Corteel, as well as Sasamoto, Stanley, and Stanton.