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Beate Schmittmann* (schmittb@iastate.edu), **Jiajia Dong** and **Royce K.P. Zia**. *From asymmetric exclusion processes to protein synthesis.*

Asymmetric exclusion processes, with periodic or open boundaries, have been studied extensively in the mathematics and statistical physics communities, as paradigmatic models for stochastic particle transport far from equilibrium. Though significant progress was made only recently, the original model was actually introduced decades ago to model protein synthesis. In this talk, I will describe recent efforts to develop a comprehensive theory for protein synthesis, building on asymmetric exclusion processes with extended objects, modeling ribosomes covering multiple codons. We discuss the effects of local hopping rates and ribosome size on density profiles and particle currents. The latter translate directly into synthesis rates for the corresponding protein. Some intriguing results for real genes will be presented. (Received March 02, 2013)