Joint colloquium with the Department of Statistics

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Probabilistic Perspective Toward Last Passage Percolation and KPZ

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ABSTRACT

A striking phenomenon in probability theory is universality, where different probabilistic models produce the same large-scale or long-time limit. One example is the Kardar-Parisi-Zhang (KPZ) universality class, encompassing a wide range of natural models such as growth processes modeling bacterial colonies, eigenvalues of random matrices and random graphs, and traffic flow models originating from mRNA translation. Historically, these KPZ class models have mostly been studied via algebraic methods. In this talk, I will introduce a strategy of synergizing algebraic inputs with probabilistic analysis, which has allowed us to successfully resolve many open problems. I will focus on Exponential Last Passage Percolation, a pivotal model in the KPZ class, and present a selection of results including correlation structures, local statistics, and behavior under perturbations. No prior knowledge of this topic will be assumed.