1145-60-256 **Joe P Chen*** (jpchen@colgate.edu), Department of Mathematics, Colgate University, Hamilton, NY 13346. *Hydrodynamics on resistance spaces: from the asymmetric exclusion process to a nonlinear heat equation.*

I will present an overview of the analysis of the boundary-driven weakly asymmetric exclusion process—a model of multiple random walks subject to the exclusion rule—on the Sierpinski gasket, and discuss its hydrodynamic scaling limit. Our key results are as follows: the empirical density converges to the unique weak solution of a semilinear heat equation with a divergence-form nonlinear term; a large deviation principle for the empirical density in the symmetric exclusion process; and analysis of the said large deviation rate function.

Our proofs use the "entropy method" of Varadhan, and in doing so we discover a number of new technical results, in particular, a "moving particle lemma" which is optimal on any finite weighted graph, from which one can deduce local ergodicity on any strongly recurrent weighted graph, with or without translational invariance. As such we expect our proof methods to be applicable to the exclusion process on a state space equipped with Kigami's resistance form; or the zero-range process on the said state space.

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