Candidate Colloquium

Tyler Helmuth

University of Bristol

Friday, December 6th 2019
Room 608, 2925 Campus Green Drive
4:00-5:00 pm

Recurrence of the vertex-reinforced jump process in two dimensions

Linearly-reinforced random walks have a preference to revisit previously visited locations. These models were introduced by Persi Diaconis to model how he walked around the streets of Paris in the 1980s. This playful invention turned out to be quite inspired — the highly non-Markovian way in which the history of the walk affects the future trajectory leads to interesting probabilistic challenges. Moreover, research over the past decade has revealed deep connections between linearly reinforced random walks and the mathematics of disordered electron systems (i.e., Anderson localization). I'll introduce these topics and describe some of the connections. In particular, I will focus on the vertex-reinforced jump process, and I will highlight how these connections can be used to prove this process is recurrent on Z^2 for all values of the reinforcement strength.

Based on joint work with Roland Bauerschmidt and Andrew Swan.

Refreshments will be served 3:30-4 pm in Room 608, 2925 Campus Green Drive

UNIVERSITY OF
Cincinnati