

教員名 : David Croydon

教員の大分野名 : Mathematical Sciences

教員の小分野名 : Probability Theory

分野のキーワード : random walk, random graphs, fractals

研究分野紹介 :

My main research interest is in diffusions on random fractals and how such processes can be constructed as scaling limits of related random walks on random graphs. The mathematical models in this area are often simple to define, but can nonetheless lead to a rich array of behavior, and their study helps shed light on how disordered media can give rise to anomalous properties of stochastic processes. Underlying motivation for undertaking research in this area comes from physics, in particular understanding various models naturally arising in statistical mechanics, and computer science, where a random graph can represent a complex network, for example.

Currently, this is a most exciting research field, with lots of international activity, and there are various possibilities of interesting problems to work on. Many of the canonical models exhibit large-scale fractal behavior, which mean it is often a challenge to describe their geometric properties – the latter point explaining why two recent Fields medals (Werner, Smirnov) have been awarded in this area. Nonetheless, the remarkable progress made over the previous decade has opened the door for much further exploration!

志願者に期待すること :

I expect that applicants will have a good background in mathematical analysis, and in particular have taken a course in probability based on measure theory.