Probability Seminar

Organizer: Tai Melcher & George Kordzakhia

Monday, 3:10–4:00pm, 1011 Evans

Mar 6 **Nathanael Berestycki**, University of British Columbia

Beta-coalescents and continuous random trees

Lambda-coalescents were introduced by Pitman in (1999) and Sagitov (1999). These processes describe the evolution of particles that undergo stochastic coagulation in such a way that several blocks can merge at the same time to form a single block. In the case where the measure Lambda has the Beta(2-a,a) distribution, Birkner et al. recently used the Donnelly-Kurtz lookdown construction to prove that Beta-coalescents can be obtained as the time-changed genealogies of a continuous-state branching process with stable branching mechanism. Here we use this result to prove that Beta-coalescents can be further embedded in continuous stable random trees, for which much is known due to recent progress of Duquesne and Le Gall. This produces a number of results concerning the small-time behavior of Beta-coalescents. Most notably, we get an almost sure limit theorem for the number of blocks at small times, for the rescaled sizes of the blocks, and give the multifractal spectrum corresponding to the emergence of blocks with atypical size. Also, we are able to find asymptotics for several quantities of interest to biologists in the context of population genetics.

This is joint work with Julien Berestycki (Univ. Marseille) and Jason Schweinsberg (UCSD).