Colloquium Series
Department of Mathematics and Statistics

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Species sampling problems and the Dirichlet process

Abstract: Consider a population of animals consisting of many different species, possibly infinite, and suppose the proportion of each species in the population is unknown. How many different species will we discover in a random sample of size n? How many species will be represented r times in the sample? If we observe k different species in the sample, how many new species will we discover if we take an additional sample of size m?

In this talk we give a brief history of species sampling problems, introduce the Bayesian nonparametric framework and the Dirichlet process, and survey some past and recent results. Along the way, we discover that these questions lead to connections with beautiful mathematics: exchangeable sequences, random partitions, combinatorial stochastic processes, discrete random measures, asymptotic theory.

Monday, Feb. 10, 1:05 – 1:50 pm in 1-109