

THE MATHEMATICS DEPARTMENT PRESENTS

# A MATHEMATICS COLLOQUIUM

THURSDAY, January 25, 2007

BOND HALL 106

4:00 pm

**Title: Latent Socio-Spatial Process Model for Social Networks**

**Speaker: Crystal Linkletter**, Simon Fraser University

**Abstract:** With concerns of bioterrorism, the advent of new epidemics that spread with person-to-person contact, such as SARS, and the rapid growth of on-line social networking websites, there is currently great interest in building statistical models that emulate social networks. Stochastic network models can provide insight into social interactions and increase understanding of dynamic processes that evolve through society. A major challenge in developing any stochastic social network model is the fact that social connections tend to exhibit unique inherent dependencies. For example, they tend to show a lot of clustering and transitive behavior, heuristically described as "a friend of a friend is a friend." It might be reasonable to expect that covariate similarities, or "closeness" in social space, should somehow be related to the probability of connection for some social network data. The relationship between covariates and relations is likely to be complex, however, and may in fact be different in different regions of the covariate space. Here, we present a new socio-spatial process model that smoothes the relationship between covariates and connections in a sample network using relatively few parameters, so the probabilities of connection for a population can be inferred and likely social network structures generated. Having a predictive social network model is an important step toward the exploration of disease transmission models that depend on an underlying social network.

Refreshments will precede the talk at 3:30pm in Bond Hall 300  
courtesy of Linda Cave.