

# Applied and Computational Mathematics and Statistics Colloquium

**Tyler McCormick**

Department of Statistics  
Columbia University

will give a lecture entitled:

*Latent Space Models for Networks Using Aggregated Relational Data*

Monday, January 17th, 2011

4:00 PM

Location: 129 Hayes-Healy Center

## Abstract:

The latent space model for networks (see Hoff, Raftery and Handcock (2002), for example) assumes that the actors in a network form ties independently given their (latent) position in some unobservable 'social space.' A multidimensional geometric space then parsimoniously represents the complicated dependence structure in the network. In many cases---particularly in the social sciences---collecting complete network data, required for the latent space model, is logistically and financially challenging. In contrast, Aggregated Relational Data (ARD) measure network structure indirectly by asking respondents how many connections they have with members of a certain subpopulation (e.g. How many individuals with HIV/AIDS do you know?). These data require no special sampling procedure and are easily incorporated into existing surveys. This research develops a latent space model for ARD. The key distinction from the complete network case is that instead of conditioning on the (latent) distance between two members of the network, the latent space model for ARD conditions on the expected distance between a survey respondent and the center of a subpopulation in the latent space. A spherical latent space facilitates tractable computation of this expectation. This model estimates relative homogeneity between groups in the population and variation in the propensity for interaction between respondents and group members.