1057-62-460 **Alessandro Rinaldo*** (arinaldo@stat.cmu.edu), **Stephen E. Feinberg** and **Yi Zhou**. *On the Geometry of Discrete Exponential Families with Application to Exponential Random Graph Models.*

There has been an explosion of interest in statistical models for analyzing network data, and considerable interest in the class of exponential random graph (ERG) models. In this talk I will relate the properties of ERG models to the properties of the broader class of discrete exponential families. I will describe a general geometric result about discrete exponential families with polyhedral support. Specifically, I will show how the statistical properties of these families can be well captured by the normal fan of the convex support. I will discuss the relevance of such results to maximum likelihood estimation and apply them to the analysis of ERG models. By means of a detailed example, I will provide some characterization and a partial explanation of certain pathological features of ERG models known as degeneracy. (Received January 27, 2010)