1127-62-209 **Sonja Petrovic*** (sonja.petrovic@iit.edu), **Elizabeth Gross** and **Despina Stasi**. *Discrete methods for statistical network analysis.*

Sampling algorithms, hypergraph degree sequences, and polytopes play a crucial role in statistical analysis of network data. This talk will offer a brief overview of open problems in this area of discrete mathematics from the point of view of a particular family of statistical models for networks called exponential random graph models. The problems and underlying constructions are also related to well-known concepts in commutative algebra and graph-theoretic concepts in computer science. We outline a few lines of recent work that highlight the natural connection between these fields and unify them into some open problems. While these problems are often relevant in discrete mathematics in their own right, the emphasis here is on statistical relevance with the hope that these lines of research do not remain disjoint. and that they can be used to advance algebraic statistics theory and applied statistical tools for rigorous statistical analysis of networks. (Received February 03, 2017)