1062-05-185 **David J Galvin*** (dgalvin1@nd.edu), Department of Mathematics, 255 Hurley Hall, Notre Dame, IN 46556. *Unimodality (and otherwise) of some graph theoretic sequences.*

Many natural graph theoretic sequences are unimodal. For example, Heilmann and Lieb showed that if G is any graph and $m_k(G)$ is the number of matchings in G of size k, then the sequence $\{m_k(G)\}_{k\geq 0}$ is unimodal. As another example, Chudnovsky and Seymour recently showed that if G is any claw-free graph and $i_k(G)$ is the number of independent sets in G of size k, then the sequence $\{i_k(G)\}_{k\geq 0}$ is unimodal.

On the other hand, there are examples of graphs for which the sequence $\{i_k(G)\}_{k\geq 0}$ is not unimodal. In fact, Alavi, Erdős, Malde and Schwenk showed that the sequence $\{i_k(G)\}_{k\geq 0}$ can be made to be as far from unimodal as one wishes. They conjectured, however, that if G is a tree then $\{i_k(G)\}_{k\geq 0}$ is unimodal, and more recently Levit and Mandrescu conjectured the unimodality of $\{i_k(G)\}_{k\geq 0}$ for any bipartite G.

Very little progress has been made on either of these conjectures. In this talk I'll discuss what is known. I'll pay particular attention to a special case (regular bipartite graphs) where a "partial unimodality" can be established. I'll also discuss progress in an even more special case (the discrete hypercube), where there really ought to be a combinatorial argument. (Received August 07, 2010)