1069-05-68 **David Galvin*** (dgalvin1@nd.edu), Department of Mathematics, University of Notre Dame, Notre Dame, IN. *Unimodality of the independent set sequence of a graph.*

For a graph G, let $i_t(G)$ denote the number of independent sets (stable sets) of size t, that is, the number of subsets of size t of the vertex set whose elements are pairwise non-adjacent.

Heilmann and Lieb (1972) showed that if G is a line graph, then the independent set sequence $(i_t(G))_{t\geq 1}$ is unimodal. Chudnovsky and Seymour (2007) extended this, showing that the independent set sequence of any claw-free graph is unimodal. In the general case, however, there is no constraint on the locations of the maxima and minima of the independent set sequence; this was shown by Alavi, Erdős, Malde and Schwenk (1987).

Alavi et al. made the conjecture that if G is a tree then the independent set sequence is unimodal, and Levit and Mandrescu (2006) have made the stronger conjecture that being bipartite is sufficient for unimodality. Very little progress has been made on either of these conjectures.

In this talk I'll discuss what is known. Among other things, I'll show that Levit and Mandrescu's conjecture is almost surely true: with high probability, the random equibipartite graph has unimodal independent set sequence. (Received January 12, 2011)