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**Franklin H. J. Kenter\*** ([kenter@usna.edu](mailto:kenter@usna.edu)), Annapolis, MD 21401. *Spectral Approaches to Graph Coloring And Its Variations.*

Hoffman was the first to give a lower bound on the chromatic number of a graph,  $\chi(G)$ , and the eigenvalues of the adjacency matrix. He showed that  $\chi(G) \geq 1 - \frac{\lambda_{\max}}{\lambda_{\min}}$  where  $\lambda_{\max}$  is the maximum eigenvalue and  $\lambda_{\min}$  is the minimum eigenvalue.

In this talk, we investigate several variations or extensions of this equality. We will discuss frugal coloring (graph coloring with additional restrictions), hypergraph coloring, and even finding large bipartite subgraphs. (Received September 19, 2016)