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Wayne Barrett, Steve Butler, Shaun M. Fallat, H. Tracy Hall, Leslie Hogben, Jephian C.-H. Lin* (chinhunglin@uvic.ca), **Bryan L. Shader** and **Michael Young**. *The inverse eigenvalue problem of a graph: Multiplicities and minors.*

Given a simple graph G , the family $\mathcal{S}(G)$ collects all real symmetric matrices whose off-diagonal i, j -entry is nonzero whenever $\{i, j\}$ is an edge in G and zero otherwise. The diagonal entries can be any real number. The inverse eigenvalue problem of a graph is asking to characterise the possible spectra among matrices in $\mathcal{S}(G)$. Recently, many new tools for this problem are developed through the Implicit Function Theorem, including the Strong Spectral Property, the Strong Multiplicity Property, and the matrix liberation lemma. In this talk, we will show how to use these techniques to construct matrices of a given graph and with the desired spectrum. (Received September 20, 2017)