Eigenvalues of graphs

Suil O

Assistant Professor

AMS, SUNY Korea

5 pm, Friday, May 11, 2018

A (Laplacian) eigenvalue of a graph G is an eigenvalue of its (Laplacian) adjacency matrix. Many relations between (Laplacian) eigenvalues and graph parameters were investigated for a long time. In 1972, Fiedler proved $\mu_2(G) \leq \kappa(G)$ for a non-complete simple graph G, where $\mu_2(G)$ and $\kappa(G)$ are the second smallest Laplacian eigenvalue and vertex-connectivity of a graph G, respectively. A lot of research was stimulated by his research, and now we call $\mu_2(G)$ the algebraic connectivity.

For a d-regular graph G, we have $\lambda_2(G) = d - \mu_2(G)$, where $\lambda_2(G)$ is the second largest eigenvalue of G. For a given positive integer $d \geq 3$ and $t = 1$ or 2, Cioabá gave the sharp upper bounds for $\lambda_2(G)$ in a d-regular graph G to guarantee that $\kappa'(G) \geq t+1$. In this talk, for any positive integer t, we extend Cioabá's result.