1067-15-559 **Jason J Molitierno*** (molitiernoj@sacredheart.edu), Department of Mathematics, 5151 Park Avenue, Fairfield, CT 06825. *A Matrix Theory Approach to Planar Graphs.*

In graph theory, a graph can be represented in terms of a Laplacian matrix. In the Laplacian matrix, the diagonal entries are the degree of each vertex and the off-diagonal entries are -1 if the vertices are adjacent and zero otherwise. Laplacian matrices are positive semidefinite, hence zero is always the smallest eigenvalue. The second smallest eigenvalue of the Laplacian matrix is termed the algebraic connectivity of a graph. The algebraic connectivity is zero if and only if the graph is disconnected. Adding edges to an existing graph can never cause the algebraic connectivity to decrease. Hence connected graphs with a greater number of edges tend to have larger algebraic connectivites. Since planar graphs have relatively few edges, it follows that the algebraic connectivity of such graphs should be low. In this talk, I prove that the algebraic connectivity of planar graphs is bounded above by 4 and show for which graphs that this upper bound is achieved. (Received September 09, 2010)