1096-15-2245 **Jason J Molitierno*** (`molitiernoj@sacredheart.edu`), Department of Mathematics, Sacred Heart University, 5151 Park Avenue, Fairfield, CT 06825-1000. *Ordering maximal planar graphs by algebraic connectivity.*

Given an unweighted graph on n vertices with vertices labelled $1, \ldots, n$, the Laplacian matrix for the graph is the $n \times n$ matrix whose i^{th} diagonal entry is the degree of vertex i and the (i, j) entry is -1 if vertices i and j are adjacent and 0 if vertices i and j are not adjacent. The Laplacian matrix for a graph is positive semidefinite, hence its eigenvalues can be ordered $0 = \lambda_1 \leq \lambda_2 \ldots \leq \lambda_n$. The eigenvalue λ_2 is known as the algebraic connectivity of a graph as it gives a measure of how connected the graph is. We will first show that for all planar graphs $\mathcal{G}$ that $\lambda_2(\mathcal{G}) \leq 4$. We then find a smaller upper bound on planar graphs whose minimum degree is five and show which class of graphs achieves this upper bound. We then determine all maximal planar graphs with minimum degree three or four that have a larger algebraic connectivity than all maximal planar graphs with minimum degree five. (Received September 17, 2013)