1135-VP-638 **Jason J Molitierno*** (molitiernoj@sacredheart.edu), Department of Mathematics, Sacred Heart University, 5151 Park Avenue, Fairfield, CT 06825. *Entries of the group inverse of the Lapalcian matrix for generalized Johnson graphs.*

Given a graph on n vertices, the Laplacian matrix L is the matrix $D - A$ where D is the diagonal matrix of the vertex degrees and A is the traditional adjacency matrix. The Laplacian matrix is singular since the vector of all ones is an eigenvector corresponding to the eigenvalue of zero. However, the group inverse $L^{\#}$ is known to exist. In this talk, we use graph theoretic and combinatorial properties of generalized Johnson graphs to compute the entries of the group inverse of the Laplacian matrix for such graphs. Concepts such a spanning trees and spanning forests for both directed and undirected graphs will be essential in these computations. (Received September 11, 2017)