1106-62-950 **Anna V. Little*** (alittle2@ju.edu), Department of Mathematics, Jacksonville University, 2800 University Blvd. N, Jacksonville, FL 32211, and **Alicia Byrd**. *A Multiscale Spectral Algorithm for Estimating the Number of Clusters in a Data Set.*

This talk introduces a new multiscale, spectral algorithm for estimating the number of clusters in a data set. Spectral clustering techniques are based on viewing the data as a weighted graph: each data point is a vertex and the weights of the edges are determined by a similarity function. This reduces the clustering problem to a graph cut problem, and an approximate solution can be found by computing the eigenvalues and eigenvectors of the normalized graph Laplacian. Spectral clustering algorithms generally require the user to specify two parameters: the number of clusters k and a scale parameter σ, and the clustering results are very sensitive to these parameter choices. This algorithm computes the eigenvalues of the Laplacian iteratively for a whole range of σ values, and analyzes how these quantities change as a function of the scale σ. Thus variation of the scale parameter, which usually confuses the clustering problem, will actually be used to infer the number of clusters in a robust and automated way. The algorithm is applied to benchmark data sets (both artificial and real-world) for method validation. (Received September 09, 2014)