1105-35-141 **Mauricio Alexander Rivas*** (rivasma@wfu.edu). *Unconstrained Variational Principles for Linear Elliptic Eigenproblems.*

We analyze the set of critical points of a parametrized functional that arises in the study of linear elliptic eigenvalue problems. These critical points are shown to be certain eigenfunctions, and corresponding critical values of the functional are shown to be related to the associated eigenvalues. The functional is twice differentiable, and a Morse index theory is defined and used to characterize which eigenvalue is associated to the critical point. The results are exemplified for unconstrained variational principles for eigenproblems for the Laplacian subject to various boundary conditions. This is joint work with Professor Giles Auchmuty. (Received September 15, 2014)