Eigenvalues of random matrices: convergence of spectral measures and eigenvalue rigidity

Abstract:
The behavior of the eigenvalues of large random matrices is generally very predictable, on multiple scales. Macroscopically, results like the semi-circle law describe the overall shape of the eigenvalue distributions. Indeed, for many natural ensembles of random matrices, we can describe in great detail the way the distribution of the eigenvalues converges to some limiting deterministic probability measure. On a microscopic scale, we often see the phenomenon of eigenvalue rigidity, in which individual eigenvalues concentrate strongly at predicted locations. I will describe some general approaches to these phenomena, with many examples: Wigner matrices, Wishart matrices, random unitary matrices, truncations of random unitary matrices, Brownian motion on the unitary group, and others.

Host: Todd Kemp
Thursday, April 4, 2019
1:00 PM
AP&M 6402