Universal and Isoperimetric Inequalities for Eigenvalues of Elliptic Operators

Abstract: In this series of lectures, I will survey techniques for estimating eigenvalues of elliptic operators modeled after the Laplacian with Dirichlet or Neumann eigenvalues. I will focus on low lying eigenvalues and present key results such as the Faber-Krahn, Szego-Weinberger, and Payne-Polya-Weinberger, and Berezin-Li-Yau inequalities. I will also discuss the related functional and geometric inequalities, and what tools go into proving such classical results.