LISBOA DE LISBOA

UNIVERSIDADE



Faculdade de Ciências da Universidade de Lisboa

## SEMINÁRIO DO GRUPO DE FÍSICA MATEMÁTICA

## Dia 19 de maio (sexta-feira), às 11h00, sala 6.2.33

## Isoperimetric and Universal Inequalities for **Eigenvalues**

## Mark Ashbaugh

(University of Missouri)

Abstract: This talk will survey some of the most prominent inequalities for the eigenvalues of the Laplacian and other differential operators of mathematical physics. These inequalities typically have both analytic and geometric content. In particular, we look at low eigenvalue inequalities for domains of fixed area/volume, especially those where the inequality becomes an equality for a disk/ball. These sharp results are often called isoperimetric inequalities and are usually proved by symmetrization (or rearrangement) techniques, which we will outline. Beyond that there are many interesting general inequalities for eigenvalues, many of which can be proved by elementary means. We look at a few of these inequalities, such as inequalities relating the Dirichlet and Neumann eigenvalues of the Laplacian and also the universal eigenvalue inequalities of Payne, Pólya, and Weinberger (PPW) and their successors, which are inequalities between the eigenvalues of the Dirichlet Laplacian and give control over their rate of growth.



Local: FCUL - Edf. C6 - Piso 2, 6.2.33