

GEOMETRIC INEQUALITIES AND ELLIPTIC PDE's

Andrea Cianchi,
Dipartimento di Matematica U.Dini, Università di Firenze
Piazza Ghiberti 27, 50122 (Firenze)
e-mail: cianchi@unifi.it

The course will focus on geometric methods, such as isoperimetric and isocapacitary inequalities, symmetrizations, analysis of level sets, in the study of quantitative properties of solutions to boundary-value problems and eigenvalue problems for elliptic equations. Related Sobolev inequalities will also be presented by these methods.

Part 1: Geometric and functional inequalities

- Isoperimetric and isocapacitary inequalities
- Symmetrizations and rearrangements of functions
- Sobolev inequalities

Part 2: Boundary-value problems for linear and quasilinear elliptic equations

- Estimates for solutions
- Gradient bounds
- Inequalities involving eigenvalues and eigenfunctions

Part of the program will be the object of seminars given by the students.

Some basic aspects of the program are covered by the textbook for the course:

S.Kesavan, Symmetrization and applications, World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2006