



Lunedì 21 marzo 2016

Aula Seminari – Dipartimento di Matematica

ore 15:00

Italo Capuzzo Dolcetta (Università di Roma)

"The principal eigenvalue and the maximum principle for degenerate elliptic operators"

Abstract:

I will report on research in collaboration with Berestycki, Porretta and Rossi [1] and with Birindelli and Camilli [2]. An extended notion of principal eigenvalue is introduced in [1] in the general framework of fully nonlinear degenerate elliptic operators; the positivity of this number is shown to be equivalent to the validity of the maximum principle (or sign propagation property). Under stronger ellipticity conditions we proposed in [2] some finite differences schemes to compute this number by means of Collatz-Wielandt type formula. It is worth to point out that numerical approaches to the computation of eigenvalues are usually based on finite elements approximations of the classical Rayleigh-Ritz formula, therefore requiring divergence structure of the operator which is not assumed in our approach.

[1] H. Berestycki, A. Porretta, L. Rossi, ICD, Maximum Principle and generalized principal eigenvalue for degenerate elliptic operators, JMPA 2014

[2] I. Birindelli, F. Camilli, ICD, On the approximation of the principal eigenvalue for a class of nonlinear elliptic operators, submitted

Referente: **Luciano Tubaro**

ore 16:30

Martino Bardi (Università di Padova)

"On some nonlinear degenerate elliptic equations arising in stochastic control"

Abstract:

The talk is on a joint work with Annalisa Cesaroni and Luca Rossi. We consider a class of Bellman equations in bounded domains where the ellipticity of the operator degenerates at the boundary. We prove that sub- and supersolutions whose growth at the boundary is suitably controlled must be constant. We apply this result to two problems of optimal control for the diffusion process associated to the Bellman operator. In the first problem the cost is a function of the exit point of the process from the domain. The second problem is a small discount limit related with ergodic control with state constraints.

Referente: **Fabio Bagagiolo**