

Silvia Cingolani, Università degli Studi di Bari Aldo Moro

Titolo: *Morse theory beyond Hilbert spaces*

Abstract: Morse theory provides a powerful connection between the topology of a space and the critical points of a smooth functional. Many nonlinear elliptic problems can be formulated variationally on Sobolev spaces $W_0^{1,p}(\Omega)$, which are Banach rather than Hilbert spaces whenever $p \neq 2$. In this setting, several fundamental tools of classical Morse theory are no longer available, making the construction of a Morse-theoretic framework significantly more delicate. In this talk, I will review some local Morse-theoretic results for quasilinear elliptic functionals, including the role of the Morse index and critical groups. Finally I will present recent results of Asselle, Cingolani and Starostka on the construction of Morse homology for p-area functionals.