UNIVERSITÀ DI PARMA

DIPARTIMENTO DI SCIENZE MATEMATICHE, FISICHE E INFORMATICHE

http://smfi.unipr.it

Notizie **SEMINARIO di Analisi Matematica**

Data: **martedì 12 dicembre**, ore **14**

Luogo: **Aula B**, Plesso di Matematica

Relatore: Prof.ssa **Iwona Skrzypczak**
MIMUW (Faculty of Mathematics, Informatics, and Mechanics, University of Warsaw)
IMPAN (Institute of Mathematics, Polish Academy of Sciences)

Titolo: **Absense of Lavrentiev's phenomenon meets renormalized solutions. The Musielak-Orlicz case**

Tutti gli interessati sono invitati a partecipare,

Proff. Alessandra Lunardi e Giampiero Palatucci

Abstract: We investigate a general nonlinear elliptic and parabolic equation with L^1-data in the anisotropic Musielak-Orlicz space avoiding growth restrictions. The growth of the monotone vector field is controlled by a generalized nonhomogeneous and anisotropic N-function. We do not assume any particular type of growth condition of M or its conjugate M^* and therefore the spaces we deal with are not reflexive.

The main results are existence and uniqueness of renormalized solutions to the above general elliptic and parabolic equations. As a main tool we provide density of smooth functions in modular topology. The condition we impose is certain type of regularity of $M(x,\xi)$ capturing interplay between behavior of M for big $|\xi|$ and small changes of and space variables. Retrieving the known optimal results we exclude the Lavrentiev phenomenon in the variable exponent spaces under asymptotical log-H\"older continuity assumption and in the double-phase space within the sharp range of parameters.

In order to get existence, the regularity assumption can be simply skipped not only in the Orlicz case ($M(x,\xi)=M(\xi)$), but also in reflexive spaces (e.g. if $M,M^*\in\Delta_2$), that is among others in the variable exponent, weighted Sobolev and the double phase space, no matter how irregular the exponent or the weights are.