

# Nonlinear Problems with Nonstandard Growth Conditions and Analysis on Metric Spaces Special Session A18

*Antonella Nastasi*

University of Palermo, ITALY

*Nageswari Shanmugalingam*

University of Cincinnati, USA

The session focuses on the study of nonlinear partial differential equations under nonstandard growth conditions which constitute an important sub-field of the calculus of variations. Variational methods are powerful tools not only in investigating existence of solutions, but also in obtaining information on the behaviour and regularity properties of minimizers and, more generally, quasiminimizers that minimize the energy functional up to a multiplicative constant.

The topics include regularity theory for a wide class of singular and degenerate elliptic and parabolic equations as well as stability properties essential in applications of PDE. As certain natural physical settings are non-smooth, by necessity the research is conducted in the general setting of (potentially) nonsmooth metric measure spaces. One of the advantages of this kind of approach is that it embraces many different spaces, as a consequence the results can be applied in manifolds, graphs, vector fields and groups, just to mention a few. We are interested both in theoretical aspects of nonlinear partial differential equations and also in their applications to the regularity theory. In particular, we present regularity questions including boundedness and Hölder continuity of solutions and higher integrability properties of the gradients of solutions.

The nonlinear partial differential equations under study are connected to many different applications, for example diffusion in highly nonhomogeneous media and the motions of multiphased fluids in porous media.

The aim of the session is bringing together leading minds in the field and early career mathematicians in a relaxed, informal atmosphere conducive of creating new scientific collaborations. We intend to make the environment more inclusive and the participants reflect the diversity of mathematicians in the field.

The Nonlinear Problems with Nonstandard Growth Conditions and Analysis on Metric Spaces Session is scheduled on July 23-24. We look forward to seeing you in Palermo!