

GEOMETRIES & REGULARITY PROPERTIES OF SOLUTIONS TO ELLIPTIC AND PARABOLIC PDES

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Aims: In the study of partial differential equations, the quest for a precise description of the qualitative and quantitative features of their solutions have attracted much attention from the early beginnings. In recent years, once the classical question of well-posedness has been quite understood, research on topological and/or geometric properties of solutions to parabolic and elliptic PDEs have become more intense. The study of these aspects is tightly connected to that of Regularity Theory. Indeed, in many situations, one has to deal with solutions obtained by variational or viscosity methods - possibly in degenerate or singular regimes - which have to be intended in a suitable weak sense. Thus, a thorough analysis of the regularity of their solutions has to be undertaken in order to handle their geometric properties.

A list of topics currently and actively investigated in this field includes, to name a few: positivity; a priori estimates and sharp constants; critical points of solutions; symmetry and non-symmetry of ground states; rigidity results for overdetermined boundary value problems and entire solutions; stability of symmetric configurations; geometric properties of level sets of solutions; interplay between the curvature of the domain and the geometry of the relevant solutions.

The session is intended to put together young and expert researchers in these topics.