

RECENT DEVELOPMENTS IN THE ANALYSIS OF NON-LOCAL OPERATORS

Organizers:

Donatella Danielli (contact person) Purdue University, West Lafayette, Indiana, USA **e-mail:** danielli@math.purdue.edu

Nicola Garofalo University of Padova, Italy **e-mail:** nicola.garofalo@unipd.it

Aims: Over the last decade there has been a resurgence in the study of non-local operators. The distinctive feature of such operators, and of the associated equations, is that (unlike in the case of classical partial differential equations) the behavior of the solution at a point depends not only from the behavior of the function nearby, but also from the values of the function far away. To a great extent, the study of nonlocal equations is motivated by applications. For instance, fully non-linear integro-differential equations naturally arise in the study of certain problems in stochastic control. A prime example of a non-local operator of elliptic type is the fractional Laplacian, which is the generator of α -stable Lévy processes. In turn, the study of non-local operators has led to the development of a wide range of new mathematical tools and methods, and much progress has been made by researchers working in different areas.

Our session's aim is to bring together both junior and senior mathematicians to present the state of the art on the subject. We also hope to stimulate interaction on the latest developments of analytic, geometric, and probabilistic properties of problems involving nonlocal operators. Such problems include elliptic and parabolic equations, free-boundary and obstacle-type problems, extension operators, and systems of interacting particles, among others.