Fall Colloquium Series

Poincare Type Inequalities

Prof. Fernando Lopez-Garcia
Cal Poly Pomona

Abstract:

The Poincare inequality which estimates “the size” of a function by “the size” of its derivative, was introduced by Henri Poincare in 1890 and has been widely studied since then for its applications in the study of PDEs, among others.

In this talk, we will start by stating its simplest version for functions on the interval [0,L] and an application to the well-known isoperimetric inequality related to the problem of determining a plane figure with the largest possible area if its boundary has a specified length. Then, we will state a generalized version of the Poincare inequality on convex domains and exhibit the optimal constant shown by L. E. Payne and H. F. Weinberger in 1960. Finally, and if time permits, we will discuss some of the relevant points of a recently developed local-to-global argument to extend the validity of these types of inequalities from convex or “simple” domains to more general ones.

Key Words: Poincar\'e inequality, isoperimetric inequalities, inequalities in spaces of functions, geometric inequalities.

Wednesday, Nov. 15, 1:05 - 1:50pm in 3-1637