Analysis and Applications:
A Conference in Honor of Elias M. Stein

Princeton University, Princeton, New Jersey
May 16-20, 2011

Speaker: Joseph Kohn (Princeton University)

Date/Time: Friday, May 20, 2011 / 1:30-2:30 pm

Talk Title: "Existence and hypoellipticity with loss of derivatives."

Abstract:

If L denotes the Lewy operator then there exists a function f such that the equation Lu=f does not have any local distribution solutions. Hence the equation LL*u=f does not have any distribution solutions. The operators LL*+L*|z|^{2k}L have the property that their limit as k goes to infinity is LL* and they do have local solutions. These operators "lose" derivatives in the sense that for each s there is an f in H^s such that there is a u in H^{s+1-k} with LL*u+L*|z|^{2k}Lu=f and u is not in H^{s'} when s'>s-(k-1)/m. Furthermore, these operator are hypoelliptic. In this lecture I will discuss various generalizations of these phenomena.