

TEMPLE UNIVERSITY MATHEMATICS COLLOQUIUM

Juan J. Manfredi

University of Pittsburgh

will speak on

Quasilinear elliptic equations in the Heisenberg group

ABSTRACT: We consider minimizers of p -Dirichlet integrals of the type

$$\int_{\Omega} (\Lambda^2 + |\mathfrak{X}u|^2)^{p/2} dx$$

where $\Lambda \geq 0$, $\Omega \subset \mathbb{R}^N$ is a given domain, and $\mathfrak{X}u = (X_1u, X_2u, \dots, X_ku)$ is the gradient of u relative to a frame of linearly independent vector fields $\mathfrak{X} = \{X_1, X_2, \dots, X_k\}$ in \mathbb{R}^N .

An important class of examples is given by Carnot groups, the simplest of which is the Heisenberg group \mathcal{H}^n . In this case \mathfrak{X} is the horizontal frame consisting of $2n$ linearly independent left-invariant horizontal vector fields and $N = 2n + 1$. Estimating the missing derivative is a serious obstacle when trying to extend the classical regularity results to this setting.

We will present an overview of analysis in the Heisenberg group followed by a discussion of what is known – and mostly unknown – about regularity for these type of degenerate quasilinear equations.

MONDAY, APRIL 3, 2006

LECTURE AT 4:00 PM (#)

COFFEE, TEA, AND REFRESHMENTS FROM 3-5 PM

ROOM 617, WACHMAN BUILDING
DEPARTMENT OF MATHEMATICS