

Welcomes

2024 Taft Lecturer

Dr. Juan Manfredi

Professor

Department of Mathematics

University of Pittsburgh

Thursday November 21

Rec Center Room 3250

4:00-5:00pm



**Asymptotic Mean Value Expansions For Solutions to
Nonlinear Equations**

Harmonic functions in Euclidean space are characterized by the mean value property and by expectations of stopped Brownian motion processes. This equivalence has a long history with fundamental contributions by Doob, Hunt, Ito, Kakutani, Kolmogorov, Levy, and many others. In this lecture, I will propose ways to extend this characterization to solutions of non-linear elliptic and parabolic equations. The non-linearity of the equation requires that the rigid mean value property be replaced by asymptotic mean value expansions and Brownian motion by stochastic games, but the main equivalence remains when formulated with the help of the theory of viscosity solutions. Moreover, this local equivalence also holds on more general ambient spaces like Riemannian manifolds and the Heisenberg group.

I will present the details of this equivalence for the p -Laplace equation in Euclidean space and in the Heisenberg group.

Refreshments will be served 3:15-3:45pm in the Math Faculty
& Graduate Student Lounge Room 4118 French Hall West