DAVID DUNCAN (McMaster University)

Title: A short tour from manifolds to gauge theory (and back?)

Abstract: I will describe some equations from gauge theory and discuss ways in which they are currently used to study manifolds in dimensions 2 and 3 (and 4, time permitting).

MARGARET THOMAS (McMaster University)

Title: Counting Rational Points on Definable Sets

Abstract: Given a set in Euclidean space, what is the `density' of its subset of points with rational coordinates? This is a question with a long number-theoretic history, in particular where the initial sets are `algebraic'. In the analogous `transcendental' setting, significant progress has been made only relatively recently, largely influenced by the involvement of model theory -- in particular, a framework for `tame geometry' known as `o-minimality'. The goal of this talk is to survey the central ingredients in this interaction, illustrate what this density tells us about the algebraic nature of certain sets, and highlight potential improvements that are the subject of ongoing research.

DARIO VALDEBENITO (McMaster University)

Title: Birkhoff normal form and the quasilinear wave equation

Abstract: The Birkhoff normal form algorithm is an important tool in the study of Hamiltonian systems, allowing one to transform a Hamiltonian to eliminate inessential nonlinearities. I will discuss some challenges in the use of this algorithm to study Hamiltonian PDE, with emphasis on the quasilinear wave equation.

Refreshments will be served in HH/216 at 3:00 pm