

THE MATHEMATICS DEPARTMENT PRESENTS

# A MATHEMATICS COLLOQUIUM

THURSDAY, January 24, 2008

BOND HALL 227

4:00 pm

**Title: The Unreasonable Effectiveness of Homotopy Theory in Algebra and Representation Theory**

**Speaker: Sunil Chebolu**, University of Western Ontario

**Abstract:** Homotopy theory is a branch of topology which studies topological spaces and deformations of continuous maps. For a long time this remained as an independent field with applications limited only to geometry. Not until the 1970s did people realise that the notion of homotopy can also be mimicked with many algebraic objects including chain complexes and group representations. A systematic mimicking of homotopy theory in algebraic subjects began only after Quillen's seminal work on abstract homotopy theory – an axiomatic approach to homotopy theory. This allowed us to ask many interesting questions about various algebraic objects and prove new results about them which would have been impossible otherwise. I will explain how this reflected in my thesis work and also in my more recent joint work on the generating hypothesis in modular representation theory. The goal of the talk is therefore to illustrate the power of analogy in mathematics.

Refreshments will precede the talk at 3:30pm in Bond Hall 300  
courtesy of Edoh Amiran.