

Speaker: Michael Lauzon, (Swarthmore College)

Time and Place: 2005/10/07, 4:05-5:00pm, Milner 317.

Title: *Harmonic analysis on inhomogeneous spaces (and space-filling curves)*

Abstract: Given a nonnegative function w we may define

$$\|f\|_{L^2(w)}^2 = \int |f(t)|^2 w(t) dt.$$

Similarly given a nonnegative, self-adjoint matrix valued function W we may define $L^2(W)$ for vector-valued f by $\|f\|_{L^2(W)}^2 = \int |(W(t)f(t), f(t))| dt$. The goal is to classify and understand the weights for which the Hilbert transform (or Riesz Projection) is bounded. Motivation for the problem will be drawn from the theory of stationary processes. Following this a brief history of the subject will be given, illustrating the differences and similarities of the scalar and matrix theory. The main focus of the talk will be on understanding the connections between the scalar A_2 and the matrix- A_2 conditions. Space-filling curves will be crucial to one of the examples constructed. If time permits $p \neq 2$ will be considered.