

**Department of Mathematics and Statistics  
Honours Seminar**

**December 7, 2009  
Mathematics & Statistics Lounge  
CW307.20**

**2:30 p.m.**

**Gina Hochban**

**Manifolds in Music**

**Abstract:** Math and music have more in common than just the letter "m"! This talk will introduce differentiable manifolds and demonstrate how the Implicit Function Theorem ensures the existence of charts to a manifold. We will then illustrate how we can use manifolds to describe and understand music. Princeton University's Dmitri Tymoczko has given literal shape to music by relating musical chords of  $n$  notes to points in an  $n$ -dimensional geometric space - with an attempt at quantifying "good sounding music." Focusing on the 2-dimensional case for visual ease, we will construct a familiar orbifold on which every possible 2-note chord resides.