

**Speaker: John Stembridge**  
University of Michigan

Wednesday, February 27, 2008  
4:00 pm  
117 Hayes-Healy Hall

**Title:** Coxeter cones and their  $h$ -vectors

**Abstract:**

Understanding the  $h$ -vectors of various classes of simplicial complexes has been a topic of long-standing interest in topological combinatorics. A particular focus of attention has been the identification of natural conditions that force unimodality of the  $h$ -vector. In this talk, we will discuss results of this type for “Coxeter cones”. These are simplicial fans formed by intersecting the nonnegative sides of a subset of root hyperplanes in some root system. They are (shellable) subcomplexes of the Coxeter complex, and their  $h$ -vectors record the distribution of descents among their chambers. We identify a natural class of “graded” Coxeter cones with the property that their  $h$ -vectors are symmetric and unimodal, thereby generalizing recent theorems of Reiner-Welker and Brändén about the Eulerian polynomials of graded partially ordered sets.