

**Undergraduate Math Club  
Winter 2005  
2<sup>nd</sup> floor Nesbitt Common Room  
March 31, 4:10-5:00pm  
(free pizza and pop, as always)**

## **Regular Polytopes and Tessellations**

**Professor Nathan Reading**

### **Abstract**

Polytopes (known in dimensions zero through three as "points," "line segments," "polygons" and "polyhedra") have been objects of interest to mathematicians throughout the recorded history of mathematics. Regular polytopes have extreme symmetry in a sense that I will make precise in the talk. Regular tessellations are tilings of space which are symmetric in an analogous sense.

I will discuss the proof that the symmetry groups of regular polytopes and tessellations are generated by reflections and discuss how that leads to a complete classification of regular polytopes and tessellations (via the theory of reflection groups). This will explain why there are so few regular polytopes and tessellations in high dimensions.