



Thursday, January 15, 2009
3:00–3:50 p.m.
Harrelson 330

Regular Polytopes and Tessellations

**Why life is more interesting
in low dimension**

Nathan Reading

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. Most notably, the five **Platonic solids** were probably known at least a thousand years before Plato. Regular polytopes are “as symmetric as possible” in a sense that I’ll 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.**

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