



# Colloquium

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**Coxeter's Approach to  
Discrete Groups Generated  
by Reflections**

**Friday, December 4, 2009**  
**3:30 – 4:30 p.m.**  
**CW307.20**

**Abstract:** Donald Coxeter (1907-2003) began his investigation of regular polytopes as a teenager. By the time he received his Ph.D in 1931, he had a thorough knowledge of the reflection groups associated with regular figures, and he had developed the notation that he modified the following year into what is now called "Coxeter-Dynkin diagrams." For him, reflection groups acted on physical models that he was able to picture in his mind; the diagram allows a person to describe what the intuitive model tells us, while it facilitates the enumeration of the groups and the polytopes derived from them. I will show how an understanding of the way reflection groups work in two dimensions enables one to picture how they work in higher dimensions. The classification of these groups turns out to be easily intuited -- it's all done with mirrors, no smoke required.