Undergraduate Math Club
November 29, 2007
Undergraduate Colloquium
1360 East Hall, 4:10-5:00pm
(dinner with speaker afterwards)

Spinning around and around

Professor John Boller
(Univ. of Chicago)

Abstract

Does every rotation in space have a fixed line? Does every rotation in 4-dimensional space have a fixed plane? We are all familiar with Euclid's definition of an angle, classically phrased as ``the inclination to one another of two distinct lines in a plane which meet one another'', but how does this correspond to the geometry of higher-dimensional Euclidean space? We will study the structure of the group of all rotations in n-dimensional space for n = 2, 3, and even 4, and hint at a surprising result concerning a 360-degree rotation that does not quite bring you back to where you started.