

Undergraduate Math Club

Winter 2005

East Hall 1084

January 13, 4:10-5:00pm

(free pizza and pop, as always)

Hyperbolic sports

(and the geometry of 3-dimensional spaces)

Professor Dick Canary

Abstract

We will discuss hyperbolic geometry and some of its applications. Hyperbolic geometry was discovered in the early nineteenth century as the first example of a geometry where Euclid's parallel postulate failed. In modern times, it has been used as a way to understand the shapes of two and three dimensional spaces.

One way to understand a geometry is to think about what it would be like to live in a world with that geometry. We will discuss what it would be like to play various sports in a hyperbolic world.

Most two dimensional spaces can be given a geometry which is hyperbolic. Perelman has recently announced a proof of Thurston's Geometrization Conjecture which involves showing that most 3-dimensional spaces can also be made hyperbolic. If his proof turns out to be successful it will also solve one of the Clay Institute's Million Dollar problems.