

Geometry Seminar
Tuesday, January 11, 2010
Room 201 WWH at 6:00 P.M.

A counter-example to the Hirsch conjecture

Francisco Santos Leal
University of Cantabria, Spain.

The Hirsch conjecture, stated in 1957, said that if a polyhedron is defined by n linear inequalities in d variables then its combinatorial diameter should be at most $n - d$. That is, it should be possible to travel from any vertex to any other vertex in at most $n - d$ steps (traversing an edge at each step). The unbounded case was disproved by Klee and Walkup in 1967. In this talk I will describe the construction of the first counter-example to the bounded case (a polytope). The counter-example has dimension 38 and 76 facets, and is obtained by a lifting and perturbation argument from a 5-dimensional polytope with 48 facets. The conjecture was posed and is relevant in the context of the simplex method in linear programming.

For more information please visit the seminar website at:
http://www.math.nyu.edu/seminars/geometry_seminar.html.