Geometry Seminar
April 23, 2002, Tuesday, 6:00 p.m.
Room 1013, Courant Institute
251 Mercer Street, New York

On the betti numbers of semi-algebraic sets

Richard Pollack
Courant Institute, NYU

Abstract

A classic result in real algebraic geometry due to Oleinik-Petrovsky, Thom, and Milnor, bounds the topological complexity (the sum of the Betti numbers) of basic semi-algebraic sets. These bounds are used in many applications – for instance, for proving tight lower bounds on the complexity of several problems in computer science. Over the past few years there have been several improvements and generalizations of this bound due to Basu, Basu-Pollack-Roy, and Pollack-Roy. In particular, it is now possible to prove better bounds on the individual Betti numbers of semi-algebraic sets rather than their sum. The talk will be a survey of these results and their geometric applications to configurations of finite point sets in R^d, geometric transversal theory, and generalizations of arrangements of segments and their higher dimensional analogues.

For further information contact Janos Pach at pachcims.nyu.edu, or visit our website: http://www.math.nyu.edu/seminars/geometry_seminar.html