Geometry Seminar
March 20, 2007, Tuesday, 6:00 p.m.
Room 613, Courant Institute
251 Mercer Street, New York

The complete fewnomial conjecture

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Abstract

A fundamental result still missing from real algebraic geometry is an optimal estimate for the maximal number of isolated real roots in a family of sparse polynomial systems. Loose upper bounds were discovered during the late 1970s and have already helped spur advances within Hilbert's 16th Problem and arithmetic geometry. More recently, analogous results were discovered over the p-adic rationals. However, optimal bounds are still elusive.

We survey progress on this problem from the point of view of a onjectural answer. In particular, we will show how A-discriminants and polyhedral combinatorics help advance new deterministic and probabilistic estimates. As a consequence, we also obtain much tighter bounds on the number of diffeotopy types in certain families of real algebraic sets.

We assume no background in combinatorics or real algebraic geometry.

For further information contact {pach,pollack}@cims.nyu.edu, or visit our website: http://www.math.nyu.edu/seminars/geometry_seminar.html