Geometry Seminar
November 5, 2002, Tuesday, 6:00 p.m.
Room 613, Courant Institute
251 Mercer Street, New York

A Helly-type theorem for line transversals to disjoint unit balls

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Abstract

Let $\mathcal{F}$ be a family of disjoint unit balls in $\mathbf{R}^3$. We prove that there is a Helly-number n_0 such that if every n_0 members of $\mathcal{F}$ ($|\mathcal{F}| \geq n_0$) have a line transversal then $\mathcal{F}$ has a line transversal. In order to prove this we show that if the members of $\mathcal{F}$ can be ordered in a way such that every 12 members of $\mathcal{F}$ are met by a line consistent with the ordering then $\mathcal{F}$ has a line transversal. The proof also uses the recent result on geometric permutations for disjoint unit balls by Katchalski, Suri and Zhou.

Joint work with M. Katchalski and T. Lewis.

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