

“I don’t wanna have to learn to count. I don’t wanna have the biggest amount. I don’t wanna grow up.” — Tom Waits, “I Don’t Wanna Grow Up”

The Trivial Notions Seminar Proudly Announces

Growth in groups - abelian and otherwise

A talk by
Harald Helfgott
IAS/Bristol

Abstract

Take a set A . Consider $A + A = \{x + y : x, y \in A\}$. How large is $A + A$, compared to A ? It could be large, or it could be small; what does the answer tell us about A ?

People were poking around abelian groups asking this sort of questions: that is called “additive combinatorics”. What if the group is not abelian? It turns out that some of the techniques and results developed for the abelian case carry over. However, non-abelian groups have a face all their own.

As it turns out, subsets A of *really* non-abelian groups - such as most matrix groups - seem to grow rapidly, essentially without exceptions.

We shall glance at a proof for SL_2 , and look at how things are shaping up for other matrix groups; their structure as groups of Lie type (that is, the way in which they are non-abelian) is central to the matter.

Applications to diameters, expander graphs and the like keep popping up. It happens that “growth” leads to “growth”, after all.

Thursday, November 29th, 2007 at 5:00 pm
Science Center 507