

Erwin Schrödinger Lecture

Thursday, February 18, 2016 – 5 p.m.

Boltzmann Lecture Hall, ESI, Boltzmanngasse 9, Vienna

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Ramanujan complexes and topological expanders

Expander graphs in general, and Ramanujan graphs, in particular, have played a major role in computer science in the last 4 decades and more recently also in pure mathematics. In recent years a high dimensional theory of expanders is emerging. A notion of topological expanders was defined by Gromov who proved that the complete d -dimensional simplicial complexes are such. He raised the basic question of existence of such bounded degree complexes of dimension $d > 1$. This question was answered recently (by T. Kaufman, D. Kazhdan and A. Lubotzky for $d=2$ and by T. Kaufman and S. Evra for general d) by showing that the d -skeleton of $(d+1)$ -dimensional Ramanujan complexes provide such topological expanders. We will describe these developments and the general area of high dimensional expanders.

Alex Lubotzky holds the Maurice and Clara Weil chair in Mathematics at the Einstein Institute of Mathematics of the Hebrew University Jerusalem.

The Erwin Schrödinger Lectures are directed towards a general audience of mathematicians and physicists. In particular it is an intention of these lectures to inform non-specialists and graduate students about recent developments and results in some area of mathematics or physics.

The lecture will be followed by an informal reception.

Joachim Schwermer
Director