



Expanders in Pure and Applied Mathematics

February 11 – 15, 2008

ORGANIZING COMMITTEE: ALEXANDER GAMBURD (UCSC), ALEXANDER LUBOTZKY (HEBREW UNIVERSITY), AUDREY TERRAS (UCSD), AVI WIGDERSON (IAS)

Scientific Overview

Expanders are highly-connected sparse graphs widely used in Computer Science, in areas ranging from parallel computation to complexity theory and cryptography. 2008 marks two important anniversaries in the development of the theory of expander graphs: the field was born 35 years ago, in 1973, when, following Pinsker's observation that random regular graphs are expanders, Margulis gave the first explicit construction using Kazhdan's Property T; fifteen years later, in 1988, Margulis, Lubotzky, Phillips and Sarnak constructed Ramanujan graphs (optimal expanders from spectral point of view) using deep results from the theory of automorphic forms. After a period of steady development, the theory of expander graphs has undergone explosive growth over the past several years: on the one hand, a number of long-standing problems have been resolved; on the other hand, several completely new and unexpected lines of development have emerged. Currently expanders are at the center of a great deal of research involving mutually beneficial interactions between computer science, number theory, combinatorics, group theory, and geometry. The workshop will bring together researchers from these fields to survey the progress made, outline the challenges ahead, and generate further collaborations.

Confirmed Speakers:

Noga Alon (Tel Aviv University), **Christina Ballantine** (College of the Holy Cross), **Mikhail Ershov** (University of Chicago), **Joel Friedman** (University of British Columbia), **Uzy Hadad** (Hebrew University), **Harald Helfgott** (University of Bristol), **Motoko Kotani** (Tohoku University), **Kristin Lauter** (Microsoft), **Winnie Li** (Penn State University), **Nati Linial** (Hebrew University), **Roy Meshulam** (Technion), **Anup Rao** (University of Texas at Austin), **Alan Reid** (University of Texas, Austin), **Omer Reingold** (Weizmann Institute), **Peter Sarnak** (Princeton), **Yehuda Shalom** (Tel Aviv University), **Terry Tao** (UCLA), **Luca Trevisan** (UC Berkeley), **Uzi Vishne**, (Bar Ilan University), **Van Vu** (Rutgers University)

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

www.ipam.ucla.edu/programs/eg2008

