

Automorphic Forms, Group Theory and Graph Expansion

Monday February 9, 2004

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:50 **Avi Wigderson** (Institute for Advanced Studies, Princeton)
Expander graphs - where Combinatorics and Algebra compete and cooperate.
- 9:50–10:20 *Break*
- 10:20–10:50 **Roy Meshulam** (Technion, Haifa, Israel)
Laplacians, Homology and Hypergraph Matching
- 10:50–11:20 *Break*
- 11:20–11:50 **Igor Pak** (Massachusetts Institute of Technology)
The Product Replacement Algorithm: an Update
- 11:50–12:20 **Joel Friedman** (University of British Columbia, Vancouver)
A Proof of the Alon Second Eigenvalue Conjecture
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:50 **Jon Rogawski** (UCLA)
Background on Automorphic Representations and the Ramanujan Conjecture
- 3:00–3:50 **Wen-Ching Li** (Pennsylvania State University)
Automorphic forms and Ramanujan hypergraphs
- 3:50–4:10 *Break*
- 4:10–4:40 **Cristina Ballantine** (Holy Cross)
Ramanujan Type Graphs and Bigraphs
- 4:40–6:00 *Wine/Cheese Reception (Hosted by IPAM)*

Tuesday February 10, 2004

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:50 **Donald Cartwright** (University of Sydney)
 n groups and their applications
- 9:50–10:20 *Break*

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- 10:20–10:50 **Beth Samuels** (Yale University)
Ramanujan Complexes of Type \tilde{A}_{d-1}
- 10:50–11:20 *Break*
- 11:20–11:50 **Uzi Vishne** (Bar-Ilan University)
Ramanujan complexes of type \tilde{A}_d and isospectrality
- 11:50–12:20 **Yair Glasner** (University of Illinois)
On Ramanujan graphs and their girth
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:50 **Alexander Lubotzky** (Hebrew University, Jerusalem, Israel)
Property 'tau' I : Applications to Discrete Mathematics
- 3:00–3:50 **Audrey Terras** (University of California at San Diego)
Fun with Zeta and L-Functions of Graphs
- 3:50–4:10 *Break*
- 4:10–4:40 **Nathan (Nati) Linial** (Hebrew University, Jerusalem, Israel)
Lifts, discrepancy and nearly optimal spectral gaps

Wednesday February 11, 2004

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:50 **Alexander Lubotzky** (Hebrew University, Jerusalem, Israel)
Property 'tau' II : Applications to Hyperbolic Geometry
- 9:50–10:20 *Break*
- 10:20–11:10 **Ron Livne** (Hebrew University, Jerusalem, Israel)
Mumford's 2-dimensional complex and generalizations
- 11:10–11:30 *Break*
- 11:30–12:00 **Tim Steger** (UNISS, Italy)
Tempered Irreducible Unitary Representations of the Free group
- 12:00–2:00 *Lunch (on your own)*
- 2:00–2:50 **David Zuckerman** (University of Texas, Austin)
Some Successes and Failures of Algebra in Constructing Extractors
- 3:00–3:50 **Salil Vadhan** (Harvard University)
The Zig-Zag Product and Expansion Close to the Degree
- 3:50–4:10 *Break*

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- 4:10–5:00 **Avi Wigderson** (Institute for Advanced Studies, Princeton)
Some explicit constructions we don't yet have
- 5:00–7:00 *Dinner (Hosted by IPAM)*

Thursday February 12, 2004

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:50 **Anton Deitmar** (Exeter University)
A discrete Lefschetz Formula
- 9:50–10:20 *Break*
- 10:20–10:50 **Eyal Rozenman** (Hebrew University, Jerusalem, Israel)
A New Explicit Construction of Constant-Degree Expander Cayley Graphs (?)
- 10:50–11:20 *Break*
- 11:20–11:50 **Andrzej Zuk** (University of Chicago)
Spectra of buildings
- 11:50–12:20 **Tatiana Smirnova-Nagnibeda** (University of Geneva)
Random walks on trees and Ramanujan graphs
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:50 **Shahar Mozes** (Hebrew University, Jerusalem, Israel)
Irreducible lattices in products of trees
- 3:00–3:30 **Alexander Gamburd** (Stanford University)
Uniform expansion and diameter bounds for some families of Cayley graphs
- 3:30–3:50 *Break*
- 3:50–4:40 **Peter Sarnak** (Princeton University)
The generalized Ramanujan Conjectures I

Friday February 13, 2004

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:30 **Bruce Jordan** (Baruch College, New York)
Ramanujan graphs and the Weil Conjectures
- 9:30–10:00 *Break*

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10:00–10:30

TBA

10:30–11:00

Break

11:00–11:50

Peter Sarnak (Princeton University)
The generalized Ramanujan Conjectures II

11:50–12:20

TBA

12:30–2:00

Lunch (on your own)

2:00–3:30

Avi Wigderson (Institute for Advanced Studies, Princeton)
Future Directions and Open Problems

