

# Curriculum Vitae

## Eyal Lubetzky

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### **RESEARCH AREA:**

Combinatorics and Probability Theory.

### **APPOINTMENTS:**

Mar 2008 – Present: Researcher, Theory Group of Microsoft Research.  
Sep 2008 – Present: Affiliate Assistant Professor of Mathematics, University of Washington.

### **EDUCATION:**

Jul 2007 – Mar 2008: Post-doctoral Researcher, Theory Group of Microsoft Research.  
2002 – 2007: Ph.D. in Mathematics (with distinction)  
Tel-Aviv University  
Performed under the supervision of Prof. Noga Alon.  
Thesis title: Graph powers and related extremal problems.  
1999 – 2002: B.Sc. in Mathematics and Computer Science (Summa Cum Laude)  
Tel-Aviv University

### **AWARDS AND HONORS:**

2007 Rothschild Postdoctoral Fellowship (not used).  
2006 The Charles Clore Foundation Fellowship for Ph.D. students.  
2006 The Celia and Marcos Maus Annual Prize for Ph.D. students.  
1999-2001 Three annual Chairman of the Israeli Parliament (Knesset) and Chairman of the Israeli Education Committee awards.  
1999-2001 Three annual Rector's list awards, Faculty of Exact Sciences, Tel Aviv University  
1999-2001 Three annual Dean's list awards, Faculty of Exact Sciences, Tel Aviv University.  
2000, 2001 Two Wolf Scholarship awards for B.Sc. students.  
2001 Excellence award, School of Computer Science, Tel Aviv University.  
1999 Award of excellence for first year B.Sc. students, Schools of Computer Science and Mathematics, Tel Aviv University.

## **SERVICES**

- Associate Editor: Probability Theory and Related Fields, Sep 2010 – Present.
- Associate Editor: Annals of Applied Probability, Jan 2009 – Present.
- Program Committee, SODA 2010 (ACM-SIAM Symposium on Discrete Algorithms).
- Workshop organization: “Percolation and Interacting Systems”, MSRI, Berkeley, Feb 2012.

## **SELECTED WORKS**

- E. Lubetzky, B. Sudakov and V. Vu,  
Spectra of lifted Ramanujan graphs,  
*Advances in Mathematics* 227 (2011), no. 4, 1612-1645.
- J. Ding, J.H. Kim, E. Lubetzky and Y. Peres,  
Anatomy of a young giant component in the random graph,  
*Random Structures and Algorithms* 39 (2011), no. 2, 139-178.
- E. Lubetzky and A. Sly,  
Cutoff phenomena for random walks on random regular graphs,  
*Duke Mathematical Journal* 153 (2010), no. 3, 475-510.
- N. Alon and E. Lubetzky,  
Uniformly cross intersecting families,  
*Combinatorica* 29 (2009), no. 4, 389-431.
- E. Lubetzky and A. Sly,  
Cutoff for the Ising model on the lattice,  
*Inventiones Mathematicae*, to appear.
- E. Lubetzky and A. Sly,  
Critical Ising on the square lattice mixes in polynomial time,  
*Communications in Mathematical Physics*, to appear.

## **SELECTED INVITED TALKS IN CONFERENCES / WORKSHOPS**

- Paul Erdős Lecture Series 2012, Memphis, May 2012.
- The 10<sup>th</sup> North-East Probability Seminar, Courant Institute (NYU), Nov 2011.
- EuroComb 2011, Budapest, Aug 2011 (*plenary address*).
- La-Pietra 2011 conference on Probability, Florence, Jun 2011 (*5-lecture mini-course*).
- The 16<sup>th</sup> International Congress on Mathematical Physics, Prague, Aug 2009.

## **SELECTED INVITED TALKS IN SEMINARS / COLLOQUIA**

- Tel Aviv University Colloquium, Mathematics department, Jun 2011.
- UCLA Colloquium, Mathematics department, Oct 2010.
- IAS (Princeton) Mathematics Seminar, April 2010.
- MIT Probability Seminar, Mar 2010.
- Harvard Probability Seminar, Mar 2010.
- MIT Combinatorics Seminar, Mar 2010.
- University of Rome Tre Mathematical Physics Seminar, Feb 2010.

## **TEACHING:**

- Probabilistic Combinatorics (CSE 599Z), University of Washington, Spring 2010.
- Advanced topics in Probability (Math 523), University of Washington, Spring 2009.

## **LIST OF PUBLICATIONS**

- E. Lubetzky and A. Sly,  
Cutoff for the Ising model on the lattice,  
*Inventiones Mathematicae*, to appear.
- E. Lubetzky and A. Sly,  
Critical Ising on the square lattice mixes in polynomial time,  
*Communications in Mathematical Physics*, to appear.
- P.-S. Loh and E. Lubetzky,  
Stochastic coalescence in logarithmic time,  
*Annals of Applied Probability*, to appear.  
Preliminary version appeared in the *Proc. of the 23rd ACM-SIAM SODA* (2012), 541-551.
- E. Lubetzky, F. Martinelli, A. Sly and F.L. Toninelli,  
Quasi-polynomial mixing of 2D stochastic Ising model with "plus" boundary up to criticality,  
*Journal of the European Mathematical Society*, to appear.
- J. Ding, E. Lubetzky and Y. Peres,  
Mixing time of near-critical random graphs,  
*Annals of Probability*, to appear.
- M. Krivelevich, E. Lubetzky and B. Sudakov,  
Longest cycles in sparse random digraphs,  
*Random Structures and Algorithms*, to appear.
- N. Alon, O. Angel, I. Benjamini and E. Lubetzky,  
Sums and products along sparse graphs,  
*Israel Journal of Mathematics* 188 (2012), no. 1, 353-384.
- E. Lubetzky, B. Sudakov and V. Vu,  
Spectra of lifted Ramanujan graphs,  
*Advances in Mathematics* 227 (2011), no. 4, 1612-1645.
- J. Ding, J.H. Kim, E. Lubetzky and Y. Peres,  
Anatomy of a young giant component in the random graph,  
*Random Structures and Algorithms* 39 (2011), no. 2, 139-178.
- A. Blasiak, R. Kleinberg and E. Lubetzky,  
Lexicographic products and the power of non-linear network coding,  
*Proc. of the 52nd IEEE FOCS* (2011), 609-619.
- A. Azar, O. Gurel-Gurevich, E. Lubetzky and T. Moscibroda,  
Optimal whitespace synchronization strategies,  
*European Symposium on Algorithms (ESA)* (2011), 713-722.
- E. Lubetzky and A. Sly,  
Explicit expanders with cutoff phenomena,  
*Electronic Journal of Probability* 16 (2011), 419-435.
- E. Lubetzky and A. Sly,  
Cutoff phenomena for random walks on random regular graphs,  
*Duke Mathematical Journal* 153 (2010), no. 3, 475-510.

- J. Ding, E. Lubetzky and Y. Peres,  
Mixing time of critical Ising model on trees is polynomial in the height,  
*Communications in Mathematical Physics* 295 (2010), no. 1, 161-207.
- M. Krivelevich, E. Lubetzky and B. Sudakov,  
Hamiltonicity thresholds in Achlioptas processes,  
*Random Structures and Algorithms* 37 (2010), no. 1, 1-24.
- J. Ding, J.H. Kim, E. Lubetzky and Y. Peres,  
Diameters in supercritical random graphs via first passage percolation,  
*Combinatorics, Probability and Computing* 19 (2010), no. 5-6, 729-751.
- J. Ding, E. Lubetzky and Y. Peres,  
Total variation cutoff in birth-and-death chains,  
*Probability Theory and Related Fields* 146 (2010), no. 1, 61-85.
- N. Alon, O. Gurel-Gurevich and E. Lubetzky,  
Choice-memory tradeoff in allocations,  
*Annals of Applied Probability* 20 (2010), no. 4, 1470-1511.  
Preliminary version appeared in the *Proc. of the 50th IEEE FOCS* (2009), 230-238.
- T. Bohman, A. Frieze and E. Lubetzky,  
Random greedy triangle-packing beyond the  $7/4$  barrier,  
*Journal of Combinatorics* 1 (2010), no. 3-4, 477-488.
- G. Amir, O. Gurel-Gurevich, E. Lubetzky, A. Singer,  
Giant components in biased graph processes,  
*Indiana University Mathematics Journal*, 59 (2010), no. 6, 1893-1930.
- J. Ding, E. Lubetzky and Y. Peres,  
The mixing time evolution of Glauber dynamics for the mean-field Ising model,  
*Communications in Mathematical Physics* 289 (2009), 725-764.
- N. Alon and E. Lubetzky,  
Poisson approximation for non-backtracking random walks,  
*Israel Journal of Mathematics* 174 (2009), 227-252.
- J. Ding, E. Lubetzky and Y. Peres,  
Censored Glauber Dynamics for the mean field Ising Model,  
*Journal of Statistical Physics* 137 (2009), no. 3, 407-458.
- N. Alon and E. Lubetzky,  
Uniformly cross intersecting families,  
*Combinatorica* 29 (2009), no. 4, 389-431.
- E. Lubetzky and U. Stav,  
Non-linear index coding outperforming the linear optimum,  
*IEEE Transactions on Information Theory* 55 (2009), 3544-3551.  
Preliminary version appeared in *Proc. of the 48th IEEE FOCS* (2007), 161-167.
- N. Alon, A. Hasidim, E. Lubetzky, U. Stav and A. Weinstein,  
Broadcasting with side-information,  
*Proc. of the 49th IEEE FOCS* (2008), 823-832.
- I. Benjamini, S. Haber, M. Krivelevich and E. Lubetzky,  
The isoperimetric constant of the random graph process,  
*Random Structures and Algorithms* 32 (2008), 101-114.

- N. Alon, I. Benjamini, E. Lubetzky and S. Sodin,  
Non-backtracking random walks mix faster,  
*Communications in Contemporary Mathematics* 9 (2007), 585-603.
- N. Alon and E. Lubetzky,  
Privileged users in zero-error transmission over a noisy channel,  
*Combinatorica* 27 (2007), 737-743.
- N. Alon and E. Lubetzky,  
Graph powers, Delsarte, Hoffman, Ramsey and Shannon,  
*SIAM J. Discrete Math* 21 (2007), 329-348.
- N. Alon and E. Lubetzky,  
Codes and Xor graph products,  
*Combinatorica* 27 (2007), 13-33
- N. Alon and E. Lubetzky,  
Independent sets in tensor graph powers,  
*Journal of Graph Theory* 54 (2007), 73-87.
- T. Amiaz, N. Kiryati, E. Lubetzky,  
Coarse to Over-Fine Optical Flow Estimation,  
*Pattern Recognition* 40 (2007), 2496-2503.
- N. Alon and E. Lubetzky,  
The Shannon capacity of a graph and the independence numbers of its powers,  
*IEEE Transactions on Information Theory* 52 (2006), 2172-2176.
- Y. Azar, M. Feder, E. Lubetzky, D. Rajwan, N. Shulman,  
The Multicast Bandwidth Advantage in Serving a Web Site,  
*Proc. of 3rd NGC* (2001), 88-99.
- A. Blasiak, R. Kleinberg and E. Lubetzky,  
Index coding via linear programming, submitted.
- J. Ding, E. Lubetzky and Y. Peres,  
Anatomy of the giant component: The strictly supercritical regime, submitted.
- G. Amir and E. Lubetzky,  
On two biased graph processes, preprint.
- P. Cuff, J. Ding, O. Loidor, E. Lubetzky, Y. Peres and A. Sly,  
Glauber Dynamics for the Curie-Weiss Potts Model, preprint.
- E. Lubetzky and A. Sly,  
Cutoff for general spin systems with arbitrary boundary conditions, preprint.
- T. Bohman, A. Frieze and E. Lubetzky,  
Random triangle removal, preprint.

### **TALKS IN CONFERENCES / WORKSHOPS:**

- Paul Erdős Lecture Series 2012, Memphis, May 2012.
- The 10<sup>th</sup> North-East Probability Seminar, Courant Institute (NYU), Nov 2011.
- EuroComb 2011, Budapest, Aug 2011 (*plenary address*).
- La-Pietra 2011 conference on Probability, Florence, Jun 2011 (*5-lecture mini-course*).
- AMS Meeting, Combinatorics Section, Los Angeles, Oct 2010.
- SIAM Conference on Discrete Math, Austin, Jun 2010.
- IPAM workshop on Probabilistic Techniques and Applications, Los Angeles, Oct 2009.

- The 50<sup>th</sup> IEEE Symposium on Foundations of Computer Science (FOCS), Atlanta, Oct 2009.
- The International Congress on Mathematical Physics, Prague, Aug 2009.
- BIRS workshop on Extremal and Probabilistic Combinatorics, Banff, Aug 2009.
- Oberwolfach Workshop on Combinatorics & Probability, Apr 2009.
- Annual Northwest Probability Seminar, Seattle, Nov 2008.
- European Conference on Complex Systems, Jerusalem, Sep 2008.
- BIRS workshop on Phase Transitions, Banff, Jun 2008.
- Newton Institute CSM Workshop on MCMC Methods, Cambridge (UK), Mar 2008.
- National AMS Meeting, Probability Theory section, San Diego, Jan 2008.
- The 48<sup>th</sup> IEEE Symposium on Foundations of Computer Science (FOCS), Oct 2007.
- AMS Meeting, Combinatorics & Probability section, Rutgers University, Oct 2007.
- Random Structures and Algorithms Conference, Tel Aviv, May 2007.
- Oberwolfach Workshop on Combinatorics, Probability & Computing, Oct 2006.
- Israel Mathematical Union Annual Meeting, Neve Ilan, May 2006.
- Random Structures and Algorithms Conference, Poznan, Aug 2005.

### **TALKS IN SEMINARS:**

- UC Berkeley Probability Seminar, Nov 2011.
- Tel Aviv University Colloquium, Mathematics department, Jun 2011.
- Weizmann Institute of Science GAFA & Probability Seminar, May 2011.
- Tel Aviv University Combinatorics Seminar, May 2011.
- University of Washington Colloquium, Mathematics department, May 2011.
- University of Washington Combinatorics Seminar, April 2011.
- MSR Theory day, Redmond, Mar 2011.
- UCLA Colloquium, Mathematics department, Oct 2010.
- UCLA Combinatorics Seminar, May 2010.
- Institute for Advanced Study (Princeton) Math. Seminar, April 2010.
- MIT Probability Seminar, Mar 2010.
- Harvard Probability Seminar, Mar 2010.
- MIT Combinatorics Seminar, Mar 2010.
- Courant Institute (NYU) Probability Seminar, Mar 2010.
- University of Rome Tre Mathematical Physics Seminar, Feb 2010.
- UC San Diego Colloquium, Mathematics department, Feb 2010.
- Weizmann Institute of Science GAFA & Probability Seminar, Dec 2009.
- Tel Aviv University Combinatorics Seminar, Dec 2009.
- Cornell Probability Seminar, Nov 2009.
- Cornell Computer Science Theory Seminar, Nov 2009.
- Georgia Tech Combinatorics Seminar, Oct 2009.
- CMU Combinatorics Seminar, Sep 2009.
- Weizmann Institute of Science GAFA & Probability Seminar, Dec 2008.
- Institute for Advanced Study (Princeton) Math. Seminar, Dec 2008.
- CMU Combinatorics Seminar, Nov 2008.
- UCLA Combinatorics Seminar, Nov 2008.
- UCLA Probability Seminar, Nov 2008.

- University of Washington Computer-Science Seminar, Oct 2008.
- University of Washington Probability Seminar, May 2008.
- UCLA Combinatorics Seminar, May 2008.
- UCLA Probability Seminar, Apr 2008.
- University of Washington Combinatorics Seminar, Oct 2007.
- University of Washington Probability Seminar, Oct 2007.
- Tel Aviv University Combinatorics Seminar, May 2007.
- Weizmann Institute of Science GAFA & Probability Seminar, Apr 2007.
- Technion & Haifa Univeristy Combinatorics Seminar, Apr 2007.
- Hebrew University Combinatorics Seminar, Dec 2006.
- Tel Aviv University GAFA Seminar, Nov 2006.
- Tel-Aviv University Combinatorics Seminar, Oct 2006.
- Weizmann Institute of Science GAFA & Probability Seminar, May 2006.
- Tel-Aviv University Combinatorics Seminar, May 2006.
- Princeton University Discrete Math. Seminar, March 2006.
- Tel-Aviv University Combinatorics Seminar, Nov 2005.
- Hebrew University Combinatorics Seminar, Nov 2005.
- Institute for Advanced Study (Princeton) Math. Seminar, May 2005.
- Combinatorics Seminar, Tel-Aviv University, May 2004.

### **EMPLOYMENT:**

- 8/00-6/04      Bandwiz Inc., Senior Software Engineer, Algorithms Team Leader (development of algorithms for distributed caching, routing and scheduling P2P applications, codes for streaming media over multi-cast transmissions).
- 8/95-8/00      IDF, Mathematical research and algorithms development.

### **PATENTS SUBMITTED**

1. Data streaming (w. Y. Azar, D. Rajwan)
2. Data streaming (w. D. Rajwan)
3. Content Delivery System (w. T. Amiaz, H. Neerman, J. Weihs)
4. Interactive Scenario Exploration  
For Tournament-Style Gaming (w. Y. Azar, Y. Peres, G.R. Smith, D. Tan)
5. Cache And Index Refreshing Strategies  
For Variably Dynamic Items And Accesses (w. Y. Azar, E. Horvitz, D. Shahaf)
6. Channel Selection Protocol (w. Y. Azar, O. Gurel-Gurevich, T. Moscibroda)
7. Distributed Stochastic Clustering For Automated  
Formation of Connected Networks of Agents (w. P.-S. Loh, D. Malkhi, Y. Peres)