

Curriculum Vitae

Assaf Naor

Courant Institute of Mathematical Sciences
Warren Weaver Hall 1113
251 Mercer Street
New York NY, 10012
USA

Telephone Number: +1 212 998-3382

Fax number: +1 212 995-4121

Electronic Mail: naor@cims.nyu.edu

Employment:

- **2002–2004:** Post-doctoral Researcher, Theory Group, Microsoft Research.
- **2004–2007:** Permanent Member, Theory Group, Microsoft Research.
- **2005–2008:** Affiliate Assistant Professor of Mathematics, University of Washington.
- **2006–2009:** Associate Professor of Mathematics, Courant Institute of Mathematical Sciences, New York University.
- **2008–present:** Associated faculty member in computer science, Courant Institute of Mathematical Sciences, New York University.
- **2009–present:** Professor of Mathematics, Courant Institute of Mathematical Sciences, New York University.

Education:

1993-1996: Studies for a B.Sc. degree in Mathematics at the Hebrew University in Jerusalem. Graduated *Summa Cum Laude* in 1996.

1996-1998: Studies for an M.Sc. degree in Mathematics at the Hebrew University in Jerusalem. M.Sc. thesis: “Geometric Problems in Non-Linear Functional Analysis”, prepared under the supervision of Professor Joram Lindenstrauss. Graduated *Summa Cum Laude* in 1998.

1998-2002: Studies for a Ph.D. degree at the Hebrew University in Jerusalem, under the supervision of Professor Joram Lindenstrauss. Thesis title: “Linear and Non-Linear Geometric Problems in Banach Spaces”.

Research Interests:

- Analysis,
- Probability,
- Quantitative geometry,
- Linear and non-linear geometric Banach space theory,
- Structure theory of discrete metric spaces,
- Applications of the above to theoretical computer science, combinatorics and mathematical physics.

Professional Activities:

- Member of the nominating committee for the IPAM scientific advisory board (2011-present).
- Member of the scientific advisory board of the Institute for Pure and Applied Mathematics (IPAM) (2008–present).
- Member of the 2010 Bolyai Medal committee (Hungarian Academy of Sciences).
- Delegate (Israel) to the General Assembly of the International Mathematical Union, Bangalore, India, 2010.
- Organizer of the Courant Institute Theory of Computing Seminar. Seminar web-site: http://cs.nyu.edu/web/Calendar/colloquium/cs_theory_seminar/.
- Served on the following committees at the Courant Institute: Planning and Development Committee (2007–2008), Colloquium Committee (2008–2009), Fellowships Committee (2008–2009, 2011–2012).
- Editor of the journal “Probability Theory and Related Fields” (2012–present). Journal web-site: <http://www.springer.com/mathematics/probability/journal/440>.
- Editor of the journal “Mathematika” (2011–present). Journal web-site: <http://www.ucl.ac.uk/mathematics/Mathematika/>.
- Editor of the journal “International Mathematics Research Notices” (2008–present). Journal web-site: <http://imrn.oxfordjournals.org/>.
- Editor of the journal “Theory of Computing” (2005–present). Journal web-site: <http://theoryofcomputing.org/>.
- Editor of the journal “Journal of Topology and Analysis” (2007–present). Journal web-site: <http://www.worldscinet.com/jta/jta.shtml>.
- Associate editor of Journal of the American Mathematical Society (2007–present). Journal web-site: <http://www.ams.org/jams/>.

- Member of the program committee of STOC 2006. Conference web site:
<http://www.cs.washington.edu/stoc06/>.
- Member of the program committee of SODA 2007. Conference web site:
<http://www.siam.org/meetings/da07/>.
- Organizer of the workshop on Metric Geometry and Geometric Embeddings of Discrete Metric Spaces at Texas A&M University, July 17-22, 2006.
- Organizer of the session “Applications of the Arora-Rao-Vazirani Algorithm” at INFORMS 2006.
- Organizer of the workshop “Geometry and Algorithms” at the International Centre for Mathematical Sciences in Edinburgh, April 16-21, 2007.
- Organizer of the workshop “Algorithmic Convex Geometry” at the American Institute of Mathematics, November 2007.
- Organizer of the workshop “Quantitative and Computational Aspects of Metric Geometry” at IPAM, January 2009.
- Organizer of the workshop “Probability in Asymptotic Geometry”, Texas A&M University, July 20–24, 2009.
- Member of the program committee of STOC 2010.
- Organizer of the program “Quantitative Geometry” at MSRI, fall semester of 2011.
- Organizer of the program “Discrete Analysis” at the Newton Institute, winter 2011.
- Organizer of the workshop “Embeddings” at the Newton Institute, January 2011.
- Member of the American Mathematical Society.
- Member of the Association of Computing Machinery Special Interest Group on Algorithms and Computation Theory.
- Referee of research articles in the journals: Israel Journal of Mathematics, Geometric and Functional Analysis, Proceedings of the American Mathematical Society, Journal of Functional Analysis, Mathematiche Annalen, Random Structures and Algorithms, Annals of Probability, Journal of the Association of Computing Machinery, Advances in Mathematics, Arkiv der Matematik, Journal of the American Mathematical Society, Combinatorica, ACM Transactions on Algorithms, International Mathematics Research Notices, SIAM Journal on Computing, Duke Mathematical Journal, London Mathematical Society, American Mathematics Monthly, Inventiones Mathematicae, Communications in Pure and Applied Mathematics, Discrete and Computational Geometry, Commentarii Mathematici Helvetici, Experimental Mathematics, Acta Mathematica, Communications in Pure and Applied Mathematics, American Journal of Mathematics, Groups, Geometry and Dynamics, Annals of Mathematics Studies, Mathematische Zeitschrift, Comptes Rendus Mathematique, Revista Matemática Iberoamericana, Selecta Mathematica.

- Referee of research articles in the conferences (multiple years): STOC, FOCS, RANDOM, SODA, CCC, SOCG, STACS, APPROX, ICALP.
- Reviewer of grant proposals for the NSF, ERC, ISF, NSA.
- Served on several NSF grant panels.
- Served on thesis defenses of graduate students in Princeton University, EPFL Lausanne, NYU.

Honors:

- **Awards:**

- Pazy Memorial Research Award, 2011.
- Bôcher Memorial Prize, 2011.
- Salem Prize, 2008.
- Packard Fellowship, 2008.
- European Mathematical Society Prize, 2008.
- Bergmann Memorial Award, 2007.
- The Clore Scholarship, 2000.
- The Klein prize for excellence in teaching (Hebrew University), 1998.
- Israeli parliament (Knesset) award for academic studies, 1998.
- The Intel prize for B.Sc. students for the academic year, 1996.
- Hebrew University Rector Prize (1995 and 1997), and the Hebrew University Dean of Natural Sciences Faculty Award (1998).

- **Special lectures:**

- Invited address, National AMS Meeting, 2012.
- Zygmund-Calderón Lectures, University of Chicago, 2011.
- Seymour Sherman Memorial Lecture, University of Indiana, 2011.
- Séminaire Bourbaki, Paris, 2011.
- Invited Speaker, International Congress of Mathematicians, Hyderabad, 2010.
- Plenary talk, annual meeting of the Israel Mathematics Union, May 2008.
- Plenary talk, Clay Research Conference, Cambridge MA, May 2008.
- Plenary address, Joint meeting of the American Mathematical Society and the New Zealand Mathematical Society, Wellington New Zealand, December 2007.
- Norbert Wiener Lectures, MIT, October 2007.
- Kuwait Foundation Lecture, Cambridge University, February 2007.

- Plenary address, Southeast Section Meeting of the American Mathematical Society, 2005.

- **Funding:**

- Simons Fellowship, 2012–2013.
- BSF grant 2010021.
- NSF “Expeditions in Computing Grant” (CCF-0832795), 2008.
- BSF grant 2006009.
- NSF grant CCF-0635078.
- European Union Marie Curie fellowship, 2001.

- **Special visiting positions:**

- Simons Visiting Professor, MSRI, 2011.
- Weston Visiting Professorship, Weizmann Institute, 2009.
- Distinguished visitor, University of California at San Diego, April 2008.

Teaching Experience:

Courses taught at the Courant Institute of Mathematical Sciences:

- “Embeddings of discrete spaces” (spring 2012).
- “Analysis 1” (spring 2011). Course website:
[http://www.cims.nyu.edu/~naor/analysis\[1\]2011](http://www.cims.nyu.edu/~naor/analysis[1]2011).
- “Topics in geometric nonlinear functional analysis” (fall 2010).
- “Algebra 1” (fall 2008, fall 2009, spring 2012). Course website:
[http://www.cims.nyu.edu/~naor/algebra\[1\]2009.html](http://www.cims.nyu.edu/~naor/algebra[1]2009.html).
- “Concentration of measure” (fall 2008).
- “The local theory of metric spaces and its algorithmic applications” (spring 2008).
- “The local theory of Banach spaces” (fall 2007).

Worked as a teaching assistant at the Hebrew University in Jerusalem in the academic years 1996-1997, 1997-1998, 1998-1999, 1999-2000, 2001-2002. This work involved teaching frontal recitation classes, and grading homework and exams. The courses taught were:

- First year linear algebra (linear algebra 1 and linear algebra 2).
- Differential and integral calculus for economics students.
- Complex function theory (for third year students).

- Probability 2 (advanced probability theory for second/third year students).
- Basic concepts in analysis (an advanced analysis course for M.Sc. students. This is a two-semester course that was taught for two years in a row).
- First year infinitesimal calculus (infinitesimal calculus 1 and infinitesimal calculus 2).
- Advanced calculus 1 (for second year students).

Advising:

- **Ph.D. students:**

- Ohad Giladi (Courant Institute of Mathematical Sciences),
- Sean Li (Courant Institute of Mathematical Sciences),
- Steven Heilman (Courant Institute of Mathematical Sciences).

- **M.Sc. students:**

- Hassane Kone (Courant Institute of Mathematical Sciences).

- **Undergraduate research advisees:**

- Aukosh Jagannath (Courant Institute of Mathematical Sciences).

- **Post-doctoral advisees:**

- Grigoris Paouris (Courant Institute of Mathematical Sciences, 2008–2009),
- Alexandr Andoni (Center for Computational Intractability, affiliated with Courant, 2009–2010),
- Per Austrin (Courant Institute of Mathematical Sciences, 2009–2010),
- Ofer Neiman (Courant Institute of Mathematical Sciences and Center for Computational Intractability, 2009–2011).
- Arie Israel (NSF postdoctoral fellowship at the Courant Institute of Mathematical Sciences, 2011-2014).

- **Interns:**

- James R. Lee (Microsoft Research intern, 2003 and 2004),
- Lior Silberman (Microsoft Research intern, 2004),
- Nir Avni ((Microsoft Research intern, 2005),
- Konstantin Makarychev (Microsoft Research intern, 2005),
- Yury Makarychev (Microsoft Research intern, 2005 and 2006).

Invited tutorial: Workshop on Linear Analysis and probability, Texas A&M University, July 2003. The tutorial on metric space theory was directed toward graduate students in Mathematics and Theoretical Computer Science.

Invited tutorial: IPAM workshop on Multiscale Geometry and Analysis in High Dimensions, UCLA, September 2004.

Invited tutorial: Doc-Course on Harmonic Analysis in Computer Science and Combinatorics. Charles University, Prague, September 2006.

Invited mini-course: Spring school États de la recherche Géométrie et Probabilités en interaction, Toulouse France, May 2008.

Invited min-course: LMS/EPSRC Short Instructional Course, Cambridge University, July 2009.

Publications and preprints:

Journal papers:

- **On the Banach space valued Azuma inequality and small set isoperimetry of Alon-Roichman graphs.** To appear in Combinatorics, Probability and Computing.
- **Absolutely minimal Lipschitz extension of tree-valued mappings** (with S. Sheffield). To appear in Mathematische Annalen.
- **Markov convexity and local rigidity of distorted metrics** (with M. Mendel). To appear in Journal of the European Mathematical Society.
- **Grothendieck-type inequalities in combinatorial optimization** (with S. Khot). To appear in Communications in Pure and Applied Mathematics.
- **Approximate kernel clustering** (with S. Khot). To appear in Random Structures and Algorithms.
- **Scale-oblivious metric fragmentation and the nonlinear Dvoretzky theorem** (with T. Tao). To appear in Israel Journal of Mathematics.
- **Sparse quadratic forms and their geometric applications (after Batson, Spielman and Srivastava)**, séminaire Bourbaki, exposé no. 1033, 2011.
- **Overlap properties of geometric expanders** (with J. Fox, M. Gromov, V. Lafforgue and J. Pach). To appear in Journal für die reine und angewandte Mathematik.
- **Compression bounds for Lipschitz maps from the Heisenberg group to L_1** (with J. Cheeger, B. Kleiner). To appear in Acta Mathematica.
- **Poincaré inequalities, embeddings, and wild groups** (with L. Silberman). To appear in Compositio Mathematica.

- **Improved bounds in the metric cotype inequality for Banach spaces** (with O. Giladi and M. Mendel). *Journal of Functional Analysis* 260 (2011) 164–194.
- **L_p compression, traveling salesmen, and stable walks**, (with Y. Peres). To appear in *Duke Mathematical Journal*.
- **L_1 embeddings of the Heisenberg group and fast estimation of graph isoperimetry**. Proceedings of the International Congress of Mathematicians Hyderabad, India, 2010.
- **Random martingales and localization of maximal inequalities** (with T. Tao). *Journal of Functional Analysis* 259 (2010) 731–779.
- **Approximate kernel clustering** (with S. Khot). *Mathematika* 55 (2009), no. 1-2, 129–165.
- **The Johnson-Lindenstrauss lemma almost characterizes Hilbert space, but not quite** (with W. B. Johnson). *Discrete and Computational Geometry* volume 43, issue 3 (2010), pages 542–553.
- **Maximum gradient embeddings and monotone clustering** (with M. Mendel). *Combinatorica* 30 number 5 (2010), 581–615.
- **The Euclidean distortion of the lamplighter group** (with T. Austin and A. Valette). *Discrete and Computational Geometry*, volume 44, issue 1 (2010), pages 55–74.
- **The UGC hardness threshold of the L_p Grothendieck problem** (with G. Kindler and G. Schechtman). *Mathematics of Operations Research*, volume 35, number 2 (2010), 267–283.
- **Linear equations modulo 2 and the L_1 diameter of convex bodies** (with S. Khot). *SIAM Journal on Computing* 38 (2008), no. 4, 1448–1463.
- **Embeddings of discrete groups and the speed of random walks** (with Y. Peres). *International Mathematics Research Notices* 2008, Art. ID rnn 076, 34 pp.
- **The wreath product of \mathbb{Z} with \mathbb{Z} has Hilbert compression exponent $\frac{2}{3}$** (with T. Austin and Y. Peres). *Proceedings of the American Mathematical Society* 137 (2009), no. 1, 85–90.
- **Ramsey partitions and proximity data structures** (with M. Mendel). *Journal of the European Mathematical Society* 9 (2007), no. 2, 253–275.
- **Frechet embeddings of negative type metrics** (with S. Arora and J. R. Lee). *Discrete and Computational Geometry* 38 (2007), no. 4, 726–739.
- **Parity check matrices and product representations of squares** (with J. Verstraete). *Combinatorica* 28 (2008), no. 2, 163–185.
- **Planar Earthmover is not in L_1** (with G. Schechtman). *SIAM Journal on Computing* 37 (2007), no. 3, 804–826.

- **Trees and Markov convexity** (with J. R. Lee and Y. Peres). Geometric and Functional Analysis (GAFA) 18-5 (2008), 1609-1659.
- **Euclidean distortion and the Sparsest Cut** (with S. Arora and J. R. Lee). Journal of the American Mathematical Society 21 (2008), no. 1, 1–21.
- **Markov chains in smooth Banach spaces and Gromov hyperbolic metric spaces** (with Y. Peres, O. Schramm and S. Sheffield). Duke Mathematical Journal 134(1), 165-197 (2006).
- **Metric cotype** (with M. Mendel). Annals of Mathematics 168 (2008), no. 1, 247-298.
- **Nonembeddability theorems via Fourier analysis** (with S. Khot). Mathematische Annalen 334, number 4, 821-852 (2006).
- **Scaled Enflo type is equivalent to Rademacher type** (with M. Mendel). Bulletin of the London Mathematical Society 39 (2007), no. 3, 493–498.
- **Nearest neighbor preserving embeddings** (with P. Indyk). ACM Transactions on Algorithms 3 (2007), no. 3, Art. 31, 12 pp.
- **On the Turán Number of the Hexagon** (with Z. Füredi and J. Verstraete), Advances in Mathematics 203(2), 476-496 (2006).
- **Some applications of Ball’s extension theorem** (with M. Mendel), Proceedings of the American Mathematical Society 134 (2006), 2577-2584.
- **Quadratic forms on graphs** (with N. Alon, K. Makarychev and Y. Makarychev), Inventiones Mathematicae 163, number 3, 499-522.
- **Quasisymmetric embeddings, the observable diameter, and expansion properties of graphs** (with Y. Rabani and A. Sinclair), Journal of Functional Analysis 227(2), 273-303 (2005).
- **Rigorous location of phase transitions in hard optimization problems** (with D. Achlioptas and Y. Peres), Nature 435, 759-764 (2005).
- **Measured descent: A new embedding method for finite metrics** (with R. Krauthgamer, J. R. Lee and M. Mendel), Geometric and Functional Analysis (GAFA) 15(4), 839-858 (2005).
- **Extending Lipschitz functions via random metric partitions** (with J. R. Lee), Inventiones Mathematicae 160 (2005), no. 1, 59-95.
- **On Metric Ramsey-type Dichotomies** (with Y. Bartal, N. Linial and M. Mendel), Journal of the London Mathematical Society 71, no. 2, 289-303 (2005).
- **A Note on Bipartite Graphs without a $2k$ -Cycle** (with J. Verstraete). Probability, Combinatorics and Computing 14 (5-6), 845-849 (2005).
- **Limitations to Frechet’s Metric Embedding Method** (with Y. Bartal, N. Linial and M. Mendel), Israel Journal of Mathematics 151 (2006) 111-124.

- **Metric structures in L_1 : Dimension, snowflakes, and average distortion** (with J. R. Lee and M. Mendel). *European Journal of Combinatorics* 26(8), 1180-1190.
- **Solution of Shannon's Problem on the Monotonicity of Entropy** (with K. Ball, F. Barthe and S. Artstein), *Journal of the American Mathematical Society* 17, 975-982 (2004).
- **The Two Possible Values of the Chromatic Number of a Random Graph** (with D. Achlioptas). *Annals of Mathematics* 162(3), 1333-1349 (2005).
- **Approximating the Cut-Norm via Grothendieck's Inequality** (with N. Alon). *SIAM Journal on Computing* 35, issue 4 (STOC 2004 special issue), 787-803 (2006).
- **On Metric Ramsey Type Phenomena** (with Y. Bartal, N. Linial and M. Mendel), *Annals of Mathematics* 162(2), 643-709 (2005).
- **Embedding the Diamond Graph in L_p and Dimension Reduction in L_1** (with J. R. Lee), *Geometric and Functional Analysis (GAFA)* 14(4), 745-747 (2004).
- **Euclidean Quotients of Finite Metric Spaces** (with M. Mendel), *Advances in Mathematics* 189(2), 451-494 (2004).
- **A Probabilistic Approach to the Geometry of the ℓ_p^n Ball** (with F. Barthe, O. Guedon and S. Mendelson), *Annals of Probability* 33 (2005), no. 2, 480-513.
- **Entropy Jumps in the Presence of a Spectral Gap** (with K. Ball and F. Barthe), *Duke Mathematical Journal* 119, No. 1, 41-63 (2003).
- **On the Rate of Convergence in the Entropic Central Limit Theorem** (with K. Ball, F. Barthe and S. Artstein), *Probability Theory and Related Fields* 129, 381-390 (2004).
- **Absolute Lipschitz extendability** (with J. R. Lee), to appear in *Comptes Rendus de l'Académie des Sciences - Series I - Mathematics* 338(11): 859-862, 2004.
- **On the maximum satisfiability of random formulas** (with D. Achlioptas and Y. Peres). *Journal of ACM* 54 (2007), no. 2, Art. 10, 21 pp.
- **Low Dimensional Embeddings of Ultrametrics** (with Y. Bartal, N. Linial and M. Mendel), *European Journal of Combinatorics*, 25 (2004), no. 1, 87-92.
- **Projecting the Surface Measure of the Sphere of ℓ_p^n** (with D. Romik), *Annales de l'Institut Henri Poincaré (B), Probability and Statistics* 39 (2003), 241-261.
- **Lipschitz Sums of Convex Functions** (with M. Csörnyei), *Studia Mathematica* 158 (2003), 269-286.
- **On Some Low Distortion Metric Ramsey Problems** (with Y. Bartal, N. Linial and M. Mendel), *Discrete and Computational Geometry* 33(1), 27-45 (2005).
- **Girth and Euclidean Distortion** (with N. Linial and A. Magen), *Geometric and Functional Analysis (GAFA)* 12 (2002), no. 2, 380-394.

- **Remarks on Non Linear type and Pisier's Inequality** (with G. Schechtman), Journal fur die reine und angewandte mathematik (Crelle's Journal) 552 (2002) 213-236.
- **Hyperplane Projections of the Unit Ball of ℓ_p^n** (with F. Barthe), Discrete and Computational Geometry 27 (2002), no. 2, 215- 226.
- **Boolean Functions whose Fourier Transform is Concentrated on the First Two Levels** (with E. Friedgut and G. Kalai), Advances in Applied Mathematics 29, no. 3, (2002) 427-437.
- **A Note on Simultaneous Polar and Cartesian Decomposition** (with F. Barthe and M. Csörnyei), Geometric Aspects of Functional Analysis, Springer Lecture Notes in Mathematics 1807, 1-19.
- **The Surface Measure and Cone Measure on the Sphere of ℓ_p^n** , Transactions of the AMS 359 (2007), no. 3, 1045–1079.
- **A Phase Transition Phenomenon Between the Isometric and Isomorphic Extension Problems for Holder Functions Between L_p Spaces**, Mathematika 48 (2001), 253-271.
- **Isomorphic Embedding of ℓ_p^n , $1 < p < 2$, into $\ell_1^{(1+\epsilon)n}$** (with A. Zvavitch), Israel Journal of Mathematics 122 (2001), 371-380.

Conference proceedings:

- **Girth and Euclidean Distortion** (with N. Linial and A. Magen). STOC 2002.
- **On metric Ramsey-type phenomena** (with Y. Bartal, N. Linial and M. Mendel). STOC 2003.
- **On the maximum satisfiability of random formulas** (D. Achlioptas and Y. Peres). FOCS 2003.
- **Metric structures in L_1 : Dimension, snowflakes, and average distortion** (with J. R. Lee and M. Mendel). LATIN 2004.
- **Approximating the Cut-Norm via Grothendieck's Inequality** (with N. Alon). STOC 2004.
- **The Two Possible Values of the Chromatic Number of a Random Graph** (with D. Achlioptas). STOC 2004.
- **Measured descent: A new embedding method for finite metrics** (with R. Krauthgamer, J. R. Lee and M. Mendel). FOCS 2004.
- **Quadratic forms on graphs** (with N. Alon, K. Makarychev and Y. Makarychev). STOC 2005.
- **Euclidean distortion and the Sparsest Cut** (with S. Arora and J. R. Lee). STOC 2005.

- **Improved bounds on the size of sparse parity check matrices** (with J. Verstraete). ISIT 2005.
- **Nonembeddability theorems via Fourier analysis** (with S. Khot). FOCS 2005.
- **Metric cotype** (with M. Mendel). SODA 2006.
- **Trees and Markov convexity** (with J. R. Lee and Y. Peres). SODA 2006.
- **Lower bounds on Locality Sensitive Hashing** (with R. Motwani and R. Panigrahi). SoCG 2006.
- **Ramsey partitions and proximity data structures** (with M. Mendel). FOCS 2006.
- **L_p metrics on the Heisenberg group and the Goemans-Linial conjecture** (with J. R. Lee). FOCS 2006.
- **Planar Earthmover is not in L_1** (with G. Schechtman). FOCS 2006.
- **Maximum gradient embeddings and monotone clustering** (with M. Mendel). APPROX 2007.
- **Linear equations modulo 2 and the L_1 diameter of convex bodies** (with S. Khot). FOCS 2007.
- **The UGC hardness threshold of the L_p Grothendieck problem** (with G. Kindler and G. Schechtman). SODA 2008.
- **Markov convexity and local rigidity of distorted metrics** (with M. Mendel). SOCG 2008.
- **Approximate kernel clustering** (with S. Khot). FOCS 2008.
- **The Johnson-Lindenstrauss lemma almost characterizes Hilbert space, but not quite** (with W. B. Johnson). SODA 2009.
- **A $(\log n)^{\Omega(1)}$ integrality gap for the Sparsest Cut SDP** (with J. Cheeger and B. Kleiner). FOCS 2009.
- **Sharp kernel clustering algorithms and their associated Grothendieck inequalities** (with S. Khot). SODA 2010.
- **Towards a calculus of non-linear spectral gaps** (with M. Mendel). SODA 2010.
- **Overlap properties of geometric expanders** (with J. Fox, M. Gromov, V. Lafforgue and J. Pach). SODA 2011.
- **The Grothendieck constant is strictly smaller than Krivine's bound** (with M. Braverman, K. Makarychev and Y. Makarychev). FOCS 2011.

Preprints:

- **Metric decomposition, smooth measures, and clustering** (with J. R. Lee).
- **Spectral inequalities on curved spaces** (with Y. Rabani).
- **On the bi-Lipschitz structure of Wasserstein spaces** (with T. Austin).
- **Snowflake universality of Wasserstein spaces** (with A. Andoni and O. Neiman).
- **On the role of random walks in quantitative nonembeddability.**
- **Sharp quantitative nonembeddability of the Heisenberg group into superreflexive Banach spaces** (with T. Austin and R. Tessera).
- **Assouad's theorem with dimension independent of the snowflaking** (with O. Neiman).
- **An approximation scheme for quadratic form maximization on convex bodies** (with G. Schechtman).
- **On isomorphic dimension reduction in ℓ_1** (with A. Andoni and Ofer Neiman).
- **Ultrametric subsets with large Hausdorff dimension** (with M. Mendel).
- **Bourgain's discretization theorem** (with O. Giladi and G. Schechtman).
- **Solution of the propeller conjecture in \mathbb{R}^3** (with S. Heilman and A. Jagannath).
- **Ultrametric skeletons** (with M. Mendel).

Invited Talks and Visiting Positions:

- Invited talk, International Workshop on Geometric Convex Analysis, Technion, Israel. March 2000.
- Invited talk, International Functional Analysis Meeting, Valencia, Spain. July 2000.
- Invited talk, Functional analysis session of the Israeli Mathematical Union meeting, Weizmann Institute, Israel. June 2001.
- Three invited talks, Workshop on Linear Analysis and Probability and SUMMIRFAS conference, College Station, Texas. July-August 2001.
- Invited Talk, Conference on Convex Geometric Analysis, Crete, Greece. August 2001.
- Invited talk, GAFA seminar, Tel-Aviv, Israel. November 2001.
- Invited talk, analysis seminar, Technion, Israel. December 2001.
- Invited talk, analysis seminar, University of Paris 6, Paris France. January 2002.
- Invited talk, analysis seminar, University of Marne-la-Valee, France. January 2002.
- Visiting researcher, Australian National University, Canberra, Australia. February 2002.
- Invited talk, Workshop on Discrete Metric Spaces and their Algorithmic Applications, Haifa University, March 2002.
- Invited talk, Conference on Geometric and Topological Aspects of Functional Analysis, Haifa University, May, 2002.

- Invited talk, analysis seminar, University of Marne-la-Valee, France. May 2002.
- Two invited talks, thematic program on asymptotic geometric analysis, Pacific Institute of Mathematics, Vancouver BC, Canada. July-August 2002.
- Invited talk, Combinatorics/Geometry seminar, University of Washington, Seattle WA, USA. October 2002.
- Short term visitor (November 1-15 2002), Institute for Advanced Study, Princeton NJ, USA. Invited talk at the Theoretical Computer Science and Discrete Mathematics seminar.
- Invited talk, Probability Seminar, University of Washington, Seattle WA, USA. November 2002.
- Invited talk, national meeting of the American Mathematical Society, special session on Banach spaces and convex geometry, Baltimore MD, USA, January 2003.
- Visiting fellow, Research School of Information Sciences and Engineering, The Australian National University, Canberra, Australia, February 2003.
- Mathematics colloquium talk, The Australian National University, Canberra, Australia, February 2003.
- Invited talk, Conference on Banach Spaces and Convex Geometric Analysis, Kiel, Germany, April 2003.
- Invited tutorial, Workshop on linear analysis and probability, College Station Texas, July 2003.
- Two invited talks, Workshop on discrete metric spaces and their algorithmic application, Princeton, August 2003.
- Invited talk, session on analysis on singular spaces, sectional AMS meeting, Boulder CO, October 2003.
- Invited talk, probability seminar, U. C. Berkeley, October 2003.
- Invited talk, complex analysis seminar, University of Washington, October 2003.
- Invited talk, theory of computing seminar, MIT, October 2003.
- Invited talk, theory of computing seminar, University of Washington, November 2003.
- Visiting fellow, Research School of Information Sciences and Engineering, The Australian National University, Canberra, Australia, November 2003.
- Invited talk, Geometry seminar, New York University, March 2004.
- Invited talk at the Pacific Northwest Theory of Computing Day, Microsoft, May 2004.
- Invited talk, Columbia Applied Probability Day, Columbia University, May 2004.
- Invited talk, GAFA seminar, Tel-Aviv University, May 2004.
- Invited talk, Workshop on Mathematical Foundations of Computer Science, ETH Zürich, May 2004.
- Invited talk, Workshop on Recent Developments in Finite Metric Spaces: Theory and Algorithmic Applications, Haifa University, June 2004.
- Invited talk, conference on Mathematical Foundations of Learning Theory, Barcelona, June 2004.
- Invited talk, Banff workshop on Convex Geometric Analysis, July 2004.
- Invited tutorial, IPAM workshop on Multiscale Geometry and Analysis in High Dimensions, UCLA, September 2004.
- Invited talk, mathematics colloquium, Georgia Institute of Technology, October 2004.
- Invited talk, combinatorics and optimization seminar, University of Waterloo, October 2004.
- Invited talk, IPAM workshop Multiscale structures in the analysis of High-DimensionalData, UCLA, October 2004.
- Invited talk, analysis seminar, Caltech, October 2004.
- Invited talk, probability seminar, U. C. Berkeley, November 2004.
- Invited talk, theory of computing seminar, University of Washington, November 2004.
- Invited talk, Applied and Computational Mathematics Colloquium, CALTECH, November 2004.
- Invited talk, IPAM workshop on Math Analysis and Multiscale Geometric Analysis., UCLA, November 2004.
- Invited talk, theory of computing seminar, U. C. Berkeley, December 2004.

- Invited talk, mathematics colloquium, U. C. Berkeley, December 2004.
- Invited talk, Conference on Harmonic Analysis, Ergodic Theory and Probability (a conference in honor of I. Katznelson's 70th Birthday), Stanford, December 2004.
- Invited talk, probability seminar, University of Washington, February 2005.
- Invited talk, algorithms seminar, Stanford University, February 2005.
- Invited talk, mathematics colloquium, Courant Institute, New York University, March 2005.
- Invited talk, analysis seminar, Weizmann Institute, March 2005.
- Invited talk, mathematics colloquium, Hebrew University, Jerusalem, March 2005.
- Invited talk, GAFA seminar, Tel-Aviv University, April 2005.
- Invited talk, analysis seminar, Stanford University, April 2005.
- Invited talk, applied mathematics colloquium, MIT, April 2005.
- Invited talk, analysis seminar, MIT, April 2005.
- Invited talk, applied mathematics colloquium, Harvard University, April 2005.
- Invited talk, analysis seminar, UCLA, May 2005.
- Invited talk, Contemporary Ramifications of Banach Space Theory (conference in honor of Joram Lindenstrauss and Lior Tzafriri), Hebrew University, Jerusalem, June 2005.
- Invited talk, Asymptotic Geometric Analysis (conference in honor of Nicole Tomczak-Jaegermann), Dead Sea, June 2005.
- Invited talk, conference in honor of Haskell Rosenthal, Texas A&M University, August 2005.
- Invited talk, mathematics colloquium, University of Minnesota, September 2005.
- Invited talk, Industrial Problems Seminar, University of Minnesota, September 2005.
- Plenary address, Southeast Section Meeting of the American Mathematical Society, October 2005.
- Short-term member, Institute for Advanced Study, October 2005.
- Invited talk, computer science/discrete mathematics seminar, Institute for Advanced Study, October 2005.
- Invited talk, mathematics colloquium, Princeton University, October 2005.
- Invited talk, analysis seminar, Weizmann Institute, December 2005.
- Invited talk, mathematics colloquium, Hebrew University, December 2005.
- Invited talk, national AMS meeting, special session on extensions of functions, San Antonio, January 2006.
- Invited tutorial, Doc-Course on Harmonic Analysis in Computer Science and Combinatorics, Charles University, Prague, September 2006.
- Invited talk, probability seminar, NYU, March 2006.
- Plenary talk, Banach Spaces and their Applications in Analysis (conference in honor of Nigel Kalton), Miami University, Ohio, May 2006.
- Plenary talk, annual meeting of the European network on Phenomena of High Dimensions, Institut Henri Poincaré, Paris France, June 2006.
- Invited talk, conference on Random Graphs and Large-Scale Real-World Networks, Institute for Mathematical Sciences, Singapore, June 2006.
- Invited educational talk, conference on Asymptotic Geometry and its applications, Institut Henri Poincaré, Paris France, July 2006.
- Plenary talk, conference on Asymptotic Geometry and its applications, Institut Henri Poincaré, Paris France, July 2006.
- Two educational talks, workshop on Metric Geometry and Geometric Embeddings of Discrete Metric Spaces, Texas A&M University, July 2006.
- Invited talk, workshop on Metric Geometry and Geometric Embeddings of Discrete Metric Spaces, Texas A&M University, July 2006.

- Plenary talk at the conference “Banach space theory: classical topics and new directions”, Caceres Spain, September 2006.
- Invited talk, analysis seminar, UCLA, October 2006.
- Invited talk, Oberwolfach workshop “Probability, combinatorics, and computing”, November 2006.
- Invited talk, EXCILL: Extremal Combinatorics at Illinois, University of Illinois at Urbana-Champaign, November 2006.
- Invited talk, Oberwolfach workshop “Konvexgeometrie”, December 2006.
- Kuwait Foundation Lecture, University of Cambridge, Cambridge UK, February 2007.
- Invited talk, combinatorics seminar, University of Cambridge, Cambridge UK, February 2007.
- Invited mini-course, research semester on limits of graphs in group theory and computer science, Bernoulli Center, EPFL Lausanne, March 2007.
- Invited talk, Colloquium on Combinatorial Computing, CUNY Graduate Center, New York, April 2007.
- Invited talk, discrete mathematics seminar, Princeton University, April 2007.
- Invited talk, Theory of Computation Colloquium, MIT, May 2007.
- Invited talk, theory seminar, Princeton University, May 2007.
- Invited speaker, C&O@40 conference, University of Waterloo, June 2007.
- Consulting researcher at Microsoft Research, June-July 2007.
- Invited speaker, Conference on Real Analysis, Geometric Measure Theory, PDE and Banach Spaces, Warwick University, August 2007.
- Invited talk, Mathematics Colloquium, Brooklyn Polytechnic University, September 2007.
- Invited talk, Discrete Mathematics Seminar, Columbia University, October 2007.
- Norbert Wiener Lecture Series, MIT, October 2007.
- Invited talk, Mathematics Colloquium, Stanford University, November 2007.
- Plenary address, Joint meeting of the American Mathematical Society and the New Zealand Mathematical Society, Wellington New Zealand, December 2007.
- Invited talk, Open University of Israel Theory Day, Israel, March 2008.
- Invited talk, IAS discrete mathematics and theoretical computer science seminar, Princeton, April 2008.
- Invited talk, mathematics colloquium, UCSD, San Diego, April 2008.
- Plenary talk, Clay Research Conference, Cambridge MA, May 2008.
- Invited mini-course at the spring school États de la recherche Géométrie et Probabilités en interaction, Université Paul-Sabatier, Toulouse France, May 2008.
- Plenary talk, annual meeting of the Israel Mathematics Union, May 2008.
- Invited talk, Symposium on geometry of Banach spaces in memory of Lior Tzafriri, Hebrew University, Jerusalem Israel, May 2008.
- Invited talk, Geometric Functional Analysis and Probability Seminar, Weizmann Institute, Rehovot Israel, June 2008.
- Invited address, 5th European Congress of Mathematics, Amsterdam, July 2008.
- Invited talk, Oberwolfach meeting on Discrete Geometry, September 2008.
- Invited talk, Mathematics Colloquium, Brooklyn Polytechnic University, October 2008.
- Invited talk, IBM T.J. Watson Research Center, October 2008.
- Plenary talk, New York Area Theory Day, December 2008.
- Invited talk, Mathematics Colloquium, Rutgers University, December 2008.
- Invited talk, IPAM workshop “Quantitative and Computational Aspects of Metric Geometry”, January 2009.
- Invited talk, Mathematics Colloquium, Columbia University, January 2009.

- Invited talk, Computer Science and Discrete Mathematics Seminar, Institute for Advanced Study, February 2009.
- Invited talk, Geometric Functional Analysis and Probability Seminar, Weizmann Institute, March 2009.
- Invited talk, Discrete Analysis Seminar, Cambridge University, March 2009.
- Invited talk, Lior Tzafriri Memorial Meeting, Hebrew University, March 2009.
- Invited talk, Probability Seminar, MIT, April 2009.
- Invited talk, Combinatorics and Probability Seminar, University of Pennsylvania, April 2009.
- Invited talk, International Conference on Metric and Differential Geometry, Chern Institute of Mathematics, Tianjin, and the Capital Normal University, Beijing, May 2009.
- Visiting researcher, Microsoft Research, Redmond WA, June 2009.
- Invited talk, Microsoft Research Theory Group, Redmond WA, June 2009.
- Invited talk, conference on Affine Isometric Actions of Discrete Groups, Ascona Switzerland, June 2009.
- Visiting researcher, “Methods for Discrete Structures” program, Technische Universität Berlin, July-August 2009.
- Invited talk, Mathematics Colloquium, Technische Universität Berlin, July 2009.
- Invited min-course, LMS/EPSRC Short Instructional Course, Cambridge University, July 2009.
- Invited talk, Annual Packard Fellows Meeting, Monterey CA, September 2009.
- Invited talk, Mathematics Colloquium, Brooklyn Polytechnic University, September 2009.
- Invited talk, Mathematics Colloquium, Courant Institute, New York University, October 2009.
- Invited talk, workshop on Analytical Methods in Combinatorics, Additive Number Theory and Computer Science, IPAM, UCLA, December 2009.
- Invited talk, Probability Seminar, IMPA, Rio de Janeiro, January 2010.
- Invited talk, Mathematics Colloquium, Princeton University, March 2010.
- Invited talk, Discrete Mathematics Seminar, Princeton University, April 2010.
- Invited talk, Mathematics Colloquium, Harvard University, April 2010.
- Invited talk, Probability Seminar, Cornell University, April 2010.
- Professeur invité, Université Paris 6, May-June 2010.
- Invited talk, conference on “Probability and Geometry in High Dimensions”, Paris, May 2010.
- Invited talk, functional analysis seminar, Université Paris 6, May 2010.
- Invited talk, operator algebras seminar, Université Paris 7, May 2010.
- Invited talk, topology and dynamics seminar, Université Paris-Sud 11, June 2010.
- Invited talk, conference on “Groups and Large Scale Geometry”, Clermont-Ferrand, June 2010.
- Plenary speaker, SUMIRFAS 2010, Texas A&M University, July 2010.
- Plenary speaker, conference on “Perspectives in High Dimensions”, Case Western Reserve University, August 2010.
- Invited talk, International Congress of Mathematicians, Hyderabad India, August 2010.
- Invited talk, mathematics colloquium, Brooklyn Polytechnic University, October 2010.
- Invited talk, mathematics colloquium, Yale University, October 2010.
- Invited talk, computer science and discrete mathematics seminar, Institute for Advanced Study, December 2010.
- Invited talk, workshop on embeddings, Newton Institute for Mathematical Sciences, January 2011.
- Invited talk, workshop on metric embeddings, algorithms and hardness of approximation, Institut Henri Poincaré, January 2011.
- Invited talk, Séminaire Bourbaki, January 2011.

- Invited talk, geometry seminar, Indiana University Bloomington, February 2011.
- Invited talk, Seymour Sherman Memorial Lecture Series, Indiana University Bloomington, February 2011.
- Invited talk, discrete geometry and combinatorics seminar, University College London, March 2011.
- Invited talk, monthly meeting of the Center for Computational Intractability, Princeton NJ, April 2011.
- Zygmund-Calderón lecture series (3 lectures), University of Chicago, April 2011.
- Plenary address, conference for the 75th anniversary of the Courant Institute, May 2011.
- Invited talk, annual meeting of the Isaac Newton Institute Correspondents, June 2011.
- Professeur invité, Ecole Normale Supérieure, June-July 2011.
- Invited talk, séminaire d'analyse fonctionnelle, Université Paris 6, June 2011.
- Invited talk, Rényi Institute of Mathematics, Budapest, July 2011.
- Invited talk, analysis seminar, Princeton University, September 2011.
- Invited talk, mathematics colloquium, Princeton University, September 2011.
- Invited talk, workshop on Probabilistic Reasoning in Quantitative Geometry, September 2011.
- Invited talk, Bay Area Discrete Mathematics Day, U. C. Davis, October 2011.
- Invited talk, mathematics colloquium, UCLA, November 2011.
- Invited talk, Bay Area Differential Geometry Seminar, November 2011.
- Invited talk, probability seminar, U. C. Berkeley, November 2011.
- Invited talk, Southern California Analysis and PDE Conference, U. C. Irvine, December 2011.
- Invited talk, mathematics colloquium, Hebrew University in Jerusalem, December 2011.