

CURRICULUM VITAE

Mark Rudelson

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University of Michigan,
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Education:

1997 Ph.D., Hebrew University of Jerusalem, Jerusalem, Israel
Thesis: Problems in the Local Theory of Banach Spaces
Advisor: Professor Joram Lindenstrauss
1988 M.Sc., Polytechnical Institute, Sankt–Petersburg, Russia

Appointments:

Current Professor,
University of Michigan, Ann Arbor, Michigan
Fall 2005 – Luther Marion Defoe Distinguished Professor
Spring 2010 of Mathematics, University of Missouri – Columbia
Columbia, Missouri
Fall 2003– Associate Professor, University of Missouri – Columbia
Spring 2005 Columbia, Missouri
Fall 2000– Assistant Professor, University of Missouri – Columbia
Spring 2003 Columbia, Missouri
Fall 1998– Post Doctoral Fellow, University of Missouri – Columbia
Spring 2000 Columbia, Missouri
Fall 1996 – Visiting Assistant Professor, Texas A & M University,
Spring 1998 College Station, Texas
Spring 1996 Post Doctoral Fellow, Mathematical Sciences
Research Institute, Berkeley, California
1994-1995 Instructor, The Hebrew University of Jerusalem
1991-1993 Assistant, The Hebrew University of Jerusalem
1988-1990 Programmer, Institute “Lengidrostal”,
Sankt–Petersburg, Russia

Research interests:

asymptotic geometric analysis, high-dimensional probability, convex geometry.

Grants and awards:

Fall 2017 – Winter 2018	Simons Fellowship
2015-2018	NSF grant DMS-1161372, Non-asymptotic random matrix theory and geometric functional analysis
2014-2016	AFOSR grant FA9550-14-1-0009, Probabilistic signal recovery and random matrices
2012-2015	NSF grant DMS-1161372, Random matrices and geometric functional analysis
2008-2011	NSF grant DMS-1111318, Non-asymptotic random matrix theory
2007-2011	NSF FRG grant DMS-0652684, Collaborative Research: Fourier analytic and probabilistic methods in geometric functional analysis and convexity.
2006-2009	NSF grant DMS-0556151, Probabilistic Approach in Geometric Functional Analysis.
2004 August 1–21	Oberwolfach "Research in Pairs" grant, joint with S. Mendelson and R. Vershynin.
2003-2006	NSF grant DMS-024380, Probabilistic Approach in Geometric Functional Analysis.
2000-2003	NSF grant DMS-0070458, Probabilistic Approach in Geometric Functional Analysis.
1997-2000	NSF grant DMS-9706835, Probabilistic Approach in the Local Theory of Banach Spaces and Convex Geometry.
1997	Nessiyahu Prize (Israeli prize for the best Ph. D. of the year in Mathematics)

Some talks and lecture series:

- 2013 November, Annual Meeting of the Dutch Probability and Statistics Society (2 talks),
- 2010 August International Congress of Mathematicians, Hyderabad, India sectional talk.
- 2008 December Polish Institute of Mathematics, Warsaw, Poland (4 talks).
- 2008 May Annual French Mathematical Society conference “Etats de la Recherche” (4 talks).
- 2006 August NSF-CBMS Conference: Probabilistic and Combinatorial methods in Analysis Kent State University, Ohio (main speaker, 10 talks).

Editorial board:

Journal of theoretical probability

Conferences organized and co-organized:

- August 2017 – Geometric functional analysis
December 2017 Special Semester program at MSRI;
- July 2016 Geometric functional analysis
Texas A&M University;
- November 2015 Analytic and probabilistic techniques
in Modern Convex Geometry, University of Missouri.
- October 2013 Informal Analysis and Probability Seminar,
University of Michigan.
- June 2013 Section on random matrices,
Joint Meeting of the AMS and Israeli Math. Union,
Tel Aviv, Israel.
- May 2011 Workshop on random matrices, geometric functional analysis,
and algorithms, Oberwolfach, Germany.
- March 2008 Conference on classical convex geometry,
University of Missouri.
- March 2008 Conference on asymptotic convex geometry,
University of Missouri.
- August 2008 Workshop on probabilistic methods in convex geometry,
Kent State University.

Teaching experience:

University of Michigan

Undgraduate courses: Probability theory,
Advanced Calculus,
Multivariable Advanced Calculus.

Graduate courses: Real Analysis I,
Functional Analysis,
Probability and random processes,
Discrete time random processes,
Fourier analysis,
Brownian Motion,
Measure concentration.

University of Missouri

Undgraduate courses Finite Mathematics
Calculus for Natural Sciences,
Calculus II for Engineering Sciences,
Advanced Calculus.

Graduate courses Real Analysis I and II,
Functional Analysis I and II,
Complex Analysis I and II,
Volume of Convex Bodies,
Probabilistic Methods in Convex Geometry,
Probabilistic and Combinatorial methods in Analysis,

Texas A & M University
Calculus III for engineers,
Finite Mathematics,
Brief Calculus

Publications

1. A. Basak, M. Rudelson, *The circular law for sparse non-Hermitian matrices*, submitted.
2. M. Rudelson, *Delocalization of eigenvectors of random matrices. Lecture notes*, submitted.
3. S. P. Kasiviswanathan, M. Rudelson, *Compressed sparse linear regression*, submitted.
4. A. Basak, M. Rudelson, *Invertibility of sparse non-hermitian matrices*, Adv. Math. 310 (2017), 426–483.
5. M. Rudelson, R. Vershynin, *No-gaps delocalization for general random matrices*, Geom. Funct. Anal. 26 (2016), no. 6, 1716–1776.
6. M. Rudelson, A. Samorodnitsky, O. Zeitouni, *Hafnians, perfect matchings and Gaussian matrices*, Ann. Probab. 44 (2016), no. 4, 2858–2888.
7. M. Rudelson, *On the complexity of the set of unconditional convex bodies*, Discrete Comput. Geom. 55 (2016), no. 1, 185–202.
8. M. Rudelson, O. Zeitouni, *Singular values of gaussian matrices and permanent estimators*, Random Structures Algorithms 48 (2016), no. 1, 183–212.
9. M. Rudelson, R. Vershynin, *Small ball probabilities for linear images of high dimensional distributions*, IMRN 2015, no. 19, 9594–9617.
10. S. P. Kasiviswanathan, M. Rudelson, *Spectral norm of random kernel matrices with applications to privacy*, Approximation, randomization, and combinatorial optimization. Algorithms and techniques, 898–914, LIPIcs. Leibniz International Proceedings in Informatics , 2015.
11. M. Rudelson, R. Vershynin, *Delocalization of eigenvectors of random matrices with independent entries*, Duke Math. J. 164 (2015), no. 13, 2507–2538.

12. M. Rudelson, R. Vershynin, *Hanson–Wright inequality and sub-gaussian concentration*, Electron. Commun. Probab. 18 (2013), no. 82, 9 pp.
13. M. Rudelson, *Recent developments in non-asymptotic theory of random matrices*, Modern Aspects of Random Matrix Theory – AMS Proceedings of Symposia in Applied Mathematics - AMS, 2014, p. 83–121.
14. A. Litvak, M. Rudelson, N. Tomczak-Jaegermann, *Approximation by projections of polytopes with few facets*, Israel J. Math. 203 (2014), no. 1, 141–160.
15. M. Rudelson, R. Vershynin, *Invertibility of random matrices: unitary and orthogonal perturbations*, J. Amer. Math. Soc. 27 (2014), no. 2, 293–338.
16. S. Kasiviswanathan, M. Rudelson, A. Smith, *The power of linear reconstruction attacks*, Proceedings of the ACM-SIAM symposium on discrete algorithms (SODA 2013).
17. M. Rudelson, S. Zhou, *Reconstruction from anisotropic random measurements*, IEEE Trans. Inform. Theory 59 (2013), no. 6, 3434–3447.
18. M. Rudelson, *Row products of random matrices*, Adv. Math. 231 (2012), no. 6, 3199–3231.
19. M. Rudelson, R. Vershynin, *Non-asymptotic theory of random matrices: extreme singular values*, Proceedings of the International Congress of Mathematicians, Hyderabad, India, 2010,
20. S. Kasiviswanathan, M. Rudelson, A. Smith, J. Ullmann, *The price of privately releasing contingency tables and the spectra of random matrices with correlated rows*, STOC 2010 (42nd ACM Symposium on Theory of Computing).
21. M. Rudelson, R. Vershynin, *The smallest singular value of a random rectangular matrix*, Comm. Pure Appl. Math. 62 (2009), no. 12, 1707–1739.
22. M. Rudelson, R. Vershynin, *The least singular value of a random square matrix is $O(n^{-1/2})$* , Comptes Rendus de l’Académie des sciences - Mathématique, C. R. Math. Acad. Sci. Paris 346 (2008), no. 15-16, 893–896.

23. M. Rudelson, R. Vershynin, *The Littlewood-Offord Problem and invertibility of random matrices*, Adv. Math. 218 (2008), no. 2, 600–633.
24. M. Rudelson, R. Vershynin, *On sparse reconstruction from Fourier and Gaussian measurements*, Comm. Pure Appl. Math. 61 (2008), no. 8, 1025–1045.
25. M. Rudelson, *Invertibility of random matrices: norm of the inverse*, Annals of Mathematics 168 (2008), 575–600.
26. O. Guedon, M. Rudelson, *L_p moments of random vectors via majorizing measures*, Adv. Math. 208 (2007), no. 2, 798–823.
27. M. Rudelson, R. Vershynin, *Sampling from large matrices: an approach through geometric functional analysis*, J. ACM 54 (2007), no. 4, Art. 21, 19 pp.
28. M. Rudelson, *Norm of the inverse of a random matrix*, FOCS 2006 (47th Annual Symposium on Foundations of Computer Science).
29. M. Rudelson, R. Vershynin, *Sparse reconstruction by convex relaxation: Fourier and Gaussian measurements*, CISS 2006 (40th Annual Conference on Information Sciences and Systems), invited paper.
30. M. Rudelson, *Lower estimates for the singular values of random matrices*, Compt. Rendus Math. de L'Academie des Sciences 342 (2006), no. 4, 247–252.
31. M. Rudelson, R. Vershynin, *Geometric approach to error correcting codes and signal recovery*, Int. Math. Res. Not. 2005, no. 64, 4019–4041.
32. E. Candes, M. Rudelson, T. Tao, R. Vershynin, *Error correction via linear programming*, FOCS 2005 (46th Annual Symposium on Foundations of Computer Science).
33. M. Rudelson, R. Vershynin, *Combinatorics of random processes and sections of convex bodies*, Annals of Mathematics 164 (2006), 603–648.
34. M. Rudelson, R. Vershynin, *Isoperimetry of waists and local versus global convex geometries*, appendix to a paper of R. Vershynin, Duke Math. J. 131 (2006), no. 1, 14–16.

35. S. Mendelson, A. Pajor, M. Rudelson, *On the geometry of $\{+1, -1\}$ polytopes*, Discrete Comput. Geom. 34 (2005), no. 3, 365–379.
36. A. Litvak, A. Pajor, M. Rudelson, N. Tomczak-Jaegermann, *Smallest singular value of random matrices and geometry of random polytopes*, Adv. Math. 195 (2005), no. 2, 491–523.
37. A. Litvak, A. Pajor, M. Rudelson, N. Tomczak-Jaegermann, R. Vershynin, *Random Euclidean embeddings in spaces of bounded volume ratio*, C. R. Math. Acad. Sci. Paris 339 (2004), no. 1, 33–38.
38. A. Litvak, A. Pajor, M. Rudelson, N. Tomczak-Jaegermann, R. Vershynin, *Euclidean embeddings in spaces of finite volume ratio via random matrices*, J. Reine Angew. Math. 589 (2005), 1–19.
39. M. Rudelson, *Extremal distances between sections of convex bodies*, Geom. Funct. Anal. 14 (2004), no. 5, 1063–1088.
40. M. Rudelson, R. Vershynin, *Embeddings of Levy families into Banach spaces*, Geom. Funct. Anal. 12 (2002), no. 1, 183–198.
41. A. A. Giannopoulos, V. D. Milman and M. Rudelson, *Convex bodies with minimal mean width*, Geometric aspects of functional analysis, 81–93, Lecture Notes in Math., 1745, Springer, Berlin, 2001.
42. M. Rudelson, *Sections of the difference body*, Discrete and Computational Geometry, 23 (2000), 137–146.
43. M. Rudelson, *Distances between non-symmetric convex bodies and the MM^* estimate*, Positivity 4 (2000), no. 2, 161–178.
44. M. Rudelson, *Almost orthogonal submatrices of an orthogonal matrix*, Israel J. Math. 111 (1999), 143–155
45. M. Rudelson, *Random vectors in the isotropic position*, J. of Functional Analysis 164 (1999), no. 1, 60–72.
46. M. Rudelson, *Contact points of convex bodies*, Israel J. of Math. 101 (1997), 93–124.

47. M. Avellaneda, A. V. Cherkaev, L. V. Gibiansky, G. W. Milton, M. Rudelson, *A complete characterization of the possible bulk and shear moduli of planar polycrystals*, J. Mech. Phys. Solids. **44**(1996) 1179–1218.
48. M. Rudelson *Approximate John's decompositions*, Operator Theory: Advances and Applications **77** (1995), 245–249.
49. M. Rudelson *Estimates of the weak distance between finite-dimensional Banach spaces*, Israel J. of Math. **89** (1995), 189–204.
50. M. Rudelson *A characterization of 2-trivial Banach spaces with an unconditional basis*, Zap. Nauchn. Sem. LOMI **157** (1987), 76–87, Russian; (English translation in: Journal of Soviet Math., **44**, N 6, 800-808.)