Curriculum Vitae
Elizabeth S. Meckes

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D.O.B.: 6/23/1980
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Appointments

Professor of Mathematics, Case Western Reserve University, July 2018 – present.

Associate Professor of Mathematics, Case Western Reserve University, July 2013 – June 2018.

Associate Researcher, Institut de Mathématiques de Toulouse, Université Paul Sabatier, Toulouse, France, August 2013 – July 2014.

Assistant Professor of Mathematics, Case Western Reserve University, July 2007 – June 2013.

American Institute of Mathematics Five-year Fellow, July 2006 – June 2011.

Visiting Scholar of Mathematics, Cornell University, August 2006 – June 2007.

Education

Ph.D. in Mathematics, Stanford University, September 2002 – June 2006.
   Thesis: An Infinitesimal Version of Stein's Method
   Advisor: Persi Diaconis

M.S. in Mathematics, Case Western Reserve University, August 2001 – May 2002.
   Thesis: Harmonic Maps Between Graphs
   Advisor: E. Jerome Benveniste

B.S. in Mathematics, summa cum laude, with a minor in German, Case Western Reserve University, August 1998 – May 2001.

Grants, honors, memberships

NSF individual grant DMS-1612589, 2016 – 2019.
NSF individual grant DMS-1308725, 2013 – 2016.

Simons Fellowship, 2013 – 2014.

NSF individual grant DMS-0852898, 2009 – 2013.

Clay Institute of Mathematics Liftoff Fellowship – 2007.

American Institute of Mathematics Five-Year Fellowship 2006 – 2011.

ARCS Fellowship, 2005-06.

Mary Sunseri Fellowship, 2004-05.

Barry M. Goldwater Fellowship, 2001.

Max Morris Prize for the outstanding undergraduate in mathematics, Case, 2001.

Memberships: American Mathematical Society, Phi Beta Kappa.

Papers

Meckes, Elizabeth; Stewart, Kathryn. "On the eigenvalues of truncations of random unitary matrices." arXiv:1811.08340 (2018).

Meckes, Elizabeth; Meckes Mark. "Random matrices with prescribed eigenvalues and expectation values for random quantum states." arXiv:1711.02710 (2017).

Meckes, Elizabeth; Melcher, Tai. "Convergence rates of the empirical spectral measure of unitary Brownian motion." To appear in *Annales Henri Lebesgue.* arXiv:1705.03057 (2017).

Meckes, Elizabeth; Meckes, Mark. "A sharp rate of convergence for the empirical spectral measure of a random unitary matrix". *Zapiski Nauchnyh Seminarov POMI*, vol. 457, 2017. (Also printed in *The Journal of Mathematical Sciences*, Springer.)

Meckes, Elizabeth; Meckes, Mark. "Rates of convergence for empirical spectral measures: a soft approach". In *Convexity and Concentration*, in the series *The IMA Volumes in Mathematics and its Applications*, Springer, 2017.

Meckes, Elizabeth; Meckes Mark. "Self-similarity in the circular unitary ensemble." *Discrete Analysis*, 2016:9.

Buzinski, David; Meckes, Elizabeth. "Almost sure convergence in quantum spin glasses." *J. Math. Phys.* 56 (2015).

Meckes, Elizabeth; Meckes Mark. "A rate of convergence for the circular law for the complex Ginibre ensemble." *Annales de la Faculté des Sciences de Toulouse (6)* 24, no. 1 (2015).

Meckes, Elizabeth; Meckes, Mark. "On the equivalence of modes of convergence for log-concave measures." In *Geometric Aspects of Functional Analysis:* Papers from the Israel Seminar (GAFA) (Springer Lecture Notes Vol. 2116, 2014).

Meckes, Elizabeth; Meckes, Mark. "Spectral measures of powers of random matrices." *Electron. Comm. Probab.* 18, no. 78 (2013).

Kirkpatrick, Kay; Meckes, Elizabeth. "Asymptotics of the mean-field Heisenberg model." *J. Stat. Phys* 152, no. 1 (2013).

Meckes, Elizabeth; Meckes, Mark. "Concentration and convergence rates for spectral measures of random matrices." *Probab. Theory Related Fields* 156, no. 1-2 (2013).

Meckes, Elizabeth. "Projections of probability distributions: A measure-theoretic Dvoretzky theorem." In *Geometric Aspects of Functional Analysis:* Papers from the Israel Seminar (GAFA) (Springer Lecture Notes Vol. 2050, 2012).

Kahle, Matthew; Meckes, Elizabeth. "Limit theorems for Betti numbers of random simplicial complexes." *Homology, Homotopy and Applications* 15, no. 1 (2013).

Meckes, Elizabeth. "Approximation of projections of random vectors." *J. Theoret. Probab.* 25, no. 2 (2012).

Meckes, Elizabeth; Meckes, Mark. "Another observation on operator compressions." *Proc. Amer. Math. Soc.* 139 (2011).

Meckes, Elizabeth. "On Stein's method for multivariate normal approximation". In *High Dimensional Probability V: The Luminy Volume* (2009).

Meckes, Elizabeth. "Quantitative asymptotics of graphical projection pursuit". *Elec. Comm. Probab.* 14 (2009).

Meckes, Elizabeth. "On the approximate normality of eigenfunctions of the Laplacian". *Trans. Amer. Math Soc.* 361, no. 10 (2009).

Chatterjee, Sourav; Meckes, Elizabeth. "Multivariate central limit theorems via the method of exchangeable pairs". *ALEA* 4 (2008).

Meckes, Elizabeth. "Linear functions on the classical matrix groups". *Trans. Amer. Math. Soc.* 360, no. 10 (2008).

Meckes, Elizabeth; Meckes, Mark. "The central limit problem for random vectors with symmetries". *J. Theoret. Probab.* 20, no.4 (2007).

Chatterjee, Sourav; Diaconis, Persi; Meckes, Elizabeth. "Exchangeable pairs and Poisson approximation". *Probab. Surv.* 2, 64–106, 2005.

Books

Meckes, Elizabeth; Meckes, Mark. *Linear Algebra*, Cambridge Mathematical Textbooks, Cambridge University Press, 2018.

Meckes, Elizabeth. *The Random Matrix Theory of the Classical Compact Groups*, Cambridge Tracts in Mathematics, Cambridge University Press. To appear 2019.

Plenary lectures

20th Conference of the International Linear Algebra Society, Leuven, Belgium, July 2016.

Southeast Probability Colloquium, Duke University, May 2015.

Northeast Probability Seminar, Columbia University, November 2014.

Midwest Probability Colloquium, Northwestern University, October 2012.

Short courses

Concentration of Measure and the Compact Classical Matrix Groups, Program for Women and Mathematics, Institute for Advanced Study (Princeton), May 2014.

Geometry and Randomness, SAMSI Summer School on Low-dimensional Structure in High-dimensional Systems, August 2013.

Other talks and workshops

Invited speaker, Workshop on Functional Inequalities in Probability, University of Conneticut, October 2018.

Special Invited Colloquium as part of the Semester on Probability, University of Conneticut, September 2018.

Invited speaker, IPAM workshop "Random Matrices and Free Probability Theory", May 2018.

Invited speaker, Finger Lakes Probability Seminar, April 2018.

Invited speaker, ICERM workshop Optimal and Random Point Configurations", February 2018.

Invited speaker, Connections for Women: geometry and probability in high dimensions, MSRI, Berkeley, CA, August 2017.

Invited speaker, 61st World Statistics Congress (Special Session on Stein's Method), Marrakech, Morrocco, July 2017.

Invited speaker, Foundations of Computational Mathematics (Workshop on Random Matrices), Barcelona, Spain, July 2017.

Invited speaker, ICERM workshop Stochastic Topology and Thermodynamic Limits, October 2016.

Invited speaker, Concentration week in geometric functional analysis, Texas A & M, July 2016.

Invited speaker, UK Easter probability meeting, Lancaster, England, April 2016.

Colloquium, University of Cincinnati, March 2016.

Probability Seminar, University of Wisconsin, December 2015.

Invited speaker, IMA workshop on Information Theory and Concentration, April 2015.

Colloquium, Georgia Institute of Technology, February 2015.

AMS Special Session on High-dimensional Convexity and Applications, San Francisco, October 2014.

Mathematical Physics Seminar, University of Bristol, May 2014.

Number Theory Seminar, University of York, May 2014.

Probability Seminar, Universite de Versailles Saint-Quentin-en-Yvelines, March 2014.

Analysis/Geometry seminar, IMT, Toulouse, France, October 2013.

Learning Seminar, University of Michigan, April 2013.

Probability Seminar, Duke University, April 2013.

Workshop on Inteplay of convex geometry and Banach space theory, Banff International Research Station, Banff, Canada, March 2013.

Harvard University Probability Seminar, November 2012.

AMS Special Session on Convex Geometry and Fourier Analysis, University of Akron, October, 2012.

Additional speaker, 2012 Clifford Lectures at Tulane University, March 2012 (Main Speaker: Shmuel Weinberger).

Seminar, University of Illinois at Urbana-Champaign, November 2011.

Analysis Seminar, University of Michigan, October 2011.

High Dimensional Probability, Banff International Research Station, October 2011.

Session on Current Trends in Probability, Association of Women in Mathematics 40th Anniversary Conference, Brown University, September 2011.

University of Delaware Probability Seminar, December 2010.

Thematic Program on Asymptotic Geometric Analysis, Fields Institute, September 2010.

AMS Special Session on Random Matrices and Applications, Albuquerque, April 2010.

Colloquium, Cleveland State University, November, 2009.

Workshop on Topological Complexity of Random Sets, American Institute of Mathematics, August, 2009.

Workshop on Advances in Stochastic Inequalities and their Applications, Banff International Research Station, June, 2009.

Cincinnati Symposium on Probability Theory and Applications, University of Cincinnati, March, 2009.

Workshop for Women in Probability, Cornell University, October 2008.

High Dimensional Probability V, Luminy, France, May 2008.

Workshop on Stein's Method, Institute for Mathematical Sciences, National University of Singapore, April 2008.

UC Berkeley Probability Seminar, March 2008.

Carnegie Mellon Analysis Seminar, February 2008.

Carnegie Mellon Probability Seminar, February 2008.

Workshop on Probability Inequalities with Applications to High Dimensional Phenomena, Texas A&M University, August, 2007.

Third Cornell Probability Summer School, June 2007.

Courant Probability Seminar, NYU, April 2007.

Upstate New York Probability Seminar, University of Rochester, April 2007.

Workshop on Number Theory and Random Phenomena, University of Bristol, March 2007.

AMS Special Session on Random Matrices and Non-commutative Probability, Miami University, March 2007.

AMS Special Session on Limit Theorems of Probability Theory, University of Cincinnati, October 2006.

Conference on Number Theory and Random Matrix Theory, University of Rochester, June 2006.

UCSD Probability Seminar, May 2006.

Case Western Reserve University Colloquium, February 2006.

University of Illinois at Chicago Probability Seminar, February 2006.

Northwestern University Probability Seminar, February 2006.

Conference on Convex Geometry and High Dimensional Phenomena, TU Vienna, July 2005.

Courses taught

Service courses: Calculus for Engineering II; Calculus for Life Sciences I and II; Introduction to Differential Equations; Linear Algebra for Applications.

Probability: Introduction to Probability (undergraduate); Topics in Probability; Probability I and II (graduate).

Other upper level math: Introduction to Advanced Mathematics (transition to proof-based courses); Linear Algebra (for math majors), Analysis I and II (graduate).

Mentoring

Ph.D. students advised

- Kathryn Lockwood (2015-). "On truncations of random matrices from the classical compact groups".

M.S. students advised

- David Judkovich (2018-). "Variations on the classical problems of combinatorial probability".

Senior projects advised

- David Judkovich (2018). "Approximate matchings and the Poisson distribution".
- David Buzinski (2014-2015). "Almost sure convergence in quantum spin glasses" (appeared in *J. Math. Phys.*).
- Sang Du and Mark Syvuk (joint project, 2011-2012). "Comparison of f-vectors of Random Polytopes to the Gaussian Distribution".
- Charles Pairan (2009-2010). "Toward the twin primes conjecture: The work of Goldston, Pintz and Yildirim".

Ph.D. student committees

- Eli Rose
- Ben Li
- Justin Jenkinson
- Brad Seadler

M.S. student committees

- Edward Agarwala

Deparment and College service

Department committees served on: undergraduate committee, graduate committee, curriculum committee, scheduling committee, colloquium committee, appointments committee, planning and budget committee.

College committees served on: graduate committee (chair in 2010–2011), faculty development committee, executive committee.

University committees served on: Faculty Senate Committee on Undergraduate Education (FSCUE), 2012–2013

Professional service

Member, 2017–18, Committee on Nominations, Institute of Mathematical Statistics (IMS).

NSA-AMS proposal reviewer, NSA Mathematical Sciences Grant Program.

NSF proposal-review panelist, Probability Program, Division of Mathematical Sciences.

Associate Editor for:

> *Journal of Statistical Planning and Inference* (2012–2014)

Referee for:

> AMS Book Program
> *Annales de l'Institut Henri Poincaré*
> *Annals of Probability*
> *Combinatorics, Probability and Computing*
> *Communications in Mathematical Physics*
> *Electronic Communications in Probability*
> *Electronic Journal of Probability*
> *Journal of Functional Analysis*
> *Journal of Mathematical Analysis and Applications*
> *Journal of Theoretical Probability*
> *Rocky Mountain Journal of Mathematics*
> *SIAM Journal on Matrix Analysis and Applications*

Conference organizer for:

> AMS Special Session *Random Matrix Theory Beyond Wigner and Wishart*, University of Michigan, October 2018.
>
> AMS Special Session *Probability in Convexity and Convexity in Probability*, Ohio State University, March 2018.
>
> *Asymptotic Geometric Analysis Mini-Symposium*, Case Western Reserve University, August 15 – 16, 2015.
>
> *Stochastic processes and high dimensional probability distributions*, Euler International Mathematical Institute, Saint-Petersburg, Russia, June 16 – 20, 2014.
>
> *Perspectives in High Dimensions*, Case Western Reserve University, August 2 – 6, 2010.

Outreach

Contributor to "Math Buffet" feature in *The Bulletin of Girls' Angle*, a girls' math club based in Cambridge, MA, 2017.

Volunteer at Cleveland Math Corps (a free summer math camp for middle school students in Cleveland), 2012-2013 and 2017.

Two-part expository piece "The Laws of Probability" for *The Bulletin of Girls' Angle*, 2015.

Interview on mathematics and being a mathematician with *The Bulletin of Girls' Angle*, 2010.