

CURRICULUM VITAE

Elisabeth M. Werner

Department of Mathematics

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Education

Diploma in Mathematics, University of Tübingen, Germany, 1985

Ph.D. in Mathematics at Université P. et M. Curie, Paris VI, 1989

Employment

- permanent positions

Professor, Case Western Reserve University, Cleveland, OH, 2002-present

Associate Professor, Case Western Reserve University, 1995-2002

Maitre de Conférences, Université de Lille 1, France, 1991-present

Assistant Professor, Case Western Reserve University, 1989-1995

- Visiting positions, Fellowships

Visiting Researcher at the Institute for Mathematics and its Applications,
University of Minnesota, Minneapolis, fall semester 2011

Visiting Researcher at the Renyi Institute, Budapest, Summer 2008

Visiting Professor at University of Paris VI, Paris, France, February 07 - July 07

Visiting Researcher at Institut Henri Poincaré, Paris, France, Summer 2006

Visiting Researcher at Schrödinger Institute, Vienna, Austria, Summer 2005

Visiting Researcher at Pacific Institute of Mathematical Sciences, Vancouver,
Canada, July 2002

Visiting Researcher at Schrödinger Institute, Vienna, Austria, March 99

Lecturer, Oklahoma State University, Stillwater, OK, August 87 - December 88

Lecturer, University of Missouri, Columbia, MO, January 86 - May 86

Graduate assistant, University of Tübingen, Germany, April 83 - October 84

Research Interests

- convex geometry
- analysis
- probability
- applications of the above to approximation theory, mathematical physics, quantum information theory

Grants, Honors

Invited Address at the AMS Spring Eastern Section meeting 2007

FRG Collaborative Research Grant from National Science Foundation
(Co-PI at the lead institution), 2007-2011

Bi-national Science Foundation Grant (Israel/US), 2007-2011

National Science Foundation Grants, Summer 89 - Summer 93, Summer 94 - Summer 97
and Summer 00 - present,

NSF travel award (to support travel of US participants to “Workshop on Asymptotic Analysis and Applications” at Institut Henri Poincaré, Paris, France, Summer 2006

NSF Advance Opportunity Grant, Fall 04 - Summer 05

NATO Collaborative Linkage Grants, March 00 - 01 and April 03 - 05

Travel grants from the AWM, May 94 and July 99

Grant U.S.-Poland Research on Convexity and Operators, Spring 93 - Summer 96

Invited Member at the Mathematical Sciences Research Institute, Berkeley, Ca.
January 96 - May 96

Research Grant from the French Government, October 85 - June 89

Professional Activities

- Co-Organizer of a workshop “Invariants in convex geometry and Banach space theory” at AIM, Palo Alto (August 2012)
- Co-Organizer of a workshop “Geometry of Entanglement” at Centre International de Rencontres Mathématiques (CIRM), Marseille, France (January 2012)
- Gave 4 hour tutorial “Local Banach space theory and Quantum Channels” at the “Advanced Topics of Analysis Applied to Quantum Information Problems” meeting, CIEM International Center for Mathematical Meetings, Bilbao, Spain (September 2010)
- Co-Organizer of a conference “Perspectives in High Dimensions”, Cleveland, OH (August 2010)
- Co-Organizer of a workshop “Geometry of Quantum Entanglement” at MFO, Oberwolfach, Germany (December 2009)
- Organizer of the workshop “Affine Convex Geometric Analysis” at the Banff International Research Station, Banff, Canada (January 2009)
- Co-organizer of the Summer School on “Fourier analytic and probabilistic methods in functional analysis and convexity”, Kent State (August 2008)
- Organizer of a session on convex geometry at the AMS meeting in Hoboken (April 2007)
- Organizer of the workshop *Asymptotic Analysis and Applications* during the “Phenomena in High Dimensions” event at Institut Henri Poincaré, Paris (Summer 2006)
- Organizer of the workshop “Convex Geometric Analysis” at the Banff International Research Station, Banff, Canada (July 2004)
- Organizer of a session “Analytic Convex Geometry” at the AMS meeting in Lawrenceville (April 2004)
- Organizer of a session on convex geometry at the AMS meeting in Boston (October 2002)
- Organizer of a session “Invariance in Convex Geometry” at the AMS meeting in Lowell (April 2000)

- Organizer of a session “Harmonic Analysis and Convexity” at the AMS meeting in Memphis (March 1997)

Theses Direction

Mark Meckes, PhD (Spring 2003), currently Assistant Professor at Case Western Reserve University

Deping Ye, PhD (Summer 2009), currently Assistant Professor at Memorial University, Canada

Justin Jenkinson, current

Umut Caglar, current

Postdoctoral supervision

Fall 2008-Spring 2010: Pawel Wolff

2008/2009: Marisa Zymonopoulou

Research Publications

- Thèse de doctorat de l’Université Paris VI, May 1989
- Le corps flottant convexe, Sminaire d’Initiation l’Analyse, Exp. No. 11, 3 pp., Publ. Math. Univ. Pierre et Marie Curie, 94, Univ. Paris VI, Paris, 1989.
- Some results about the floating body, Sminaire d’Initiation l’Analyse, Exp. No. 15, 4 pp., Publ. Math. Univ. Pierre et Marie Curie, 107, Univ. Paris VI, Paris, 1990
- Quasi-Banach spaces which are unique predual, Mathem. Annalen 280, (1988),559-563.
- Moduli of non-dentability and the Radon-Nikodym property in Banach spaces (with W. Schachermayer, A. Sersouri), Israel Journal of Math. 65, (1989), 225-257.
- Non-dentable solid subsets in Banach lattices failing Radon Nikodym Property. Applications to renormings. Proc. AMS 107, (1989), 611-620.
- The convex floating body (with C. Schütt), Math. Scand. 66 (1990),275-290.
- The convex floating body of almost polygonal bodies (with C. Schütt), Geom. Dedic., 44, (1992), 169-188.
- Homothetic floating bodies, (with C. Schütt), Geom. Dedic. 49 (1994),335-348.
- Illumination bodies and the affine surface area, Studia Math. 110 (1994), 257-269.
- Some remarks on norm-attaining n-linear forms (with R. Aron, C. Finet), Lecture Notes in Pure and Applied Mathematics 172 Proceedings of the Second Conference on Function Spaces, Marcel Dekker (1995), 19-28.
- The illumination bodies of a simplex, Journal of Discrete and Computational Geometry 15, (1996) 297-306.
- The illumination body of almost polygonal bodies, Geom. Ded. 64 No. 3 (1997), 343-354

- The Santalo-regions of a convex body (with M. Meyer), Transactions of the AMS 350, no.11 (1998), 4569-4591
- A nonsymmetric correlation inequality for Gaussian measure (with S. Szarek), Journal of Multivariate Analysis 68 (1999), 193-211
- A general geometric construction of affine surface area, Studia Math.132 (3) (1999), 227-238
- On the p -affine surface area (with M. Meyer), Advances in Math. 152 (2000), 288-313
- One Dimensional Regularizations of the Coulomb Potential with Application to Atoms in Strong Magnetic Fields, (with M. B. Ruskai and R. Brummelhuis), Differential Equations and Mathematical Physics, ed. by G.Weinstein and R. Weikard, 43-51, International Press, (2000)
- Study of a class of regularizations of $1/|x|$ using Gaussian integrals, (with M. B. Ruskai), SIAM J. of Math. Analysis vol.32, no. 2 (2000), 435-463
- Random polytopes with vertices on the boundary of a convex body (with C. Schütt), Comptes Rendus de l'Académie des Sciences Paris 331 (2000), 697-201
- Dropping a vertex or a facet from a convex polytope (with S. Reisner and C. Schütt), Forum Math. 13 (2001), 359-378
- An Analysis of Completely positive Trace preserving maps on \mathcal{M}_2 (with M. B. Ruskai and S. Szarek), Linear Algebra and its Applications 347 (2002), 159-187
- Random polytopes of points chosen from the boundary of a convex body (with C. Schütt), GAFA Seminar Notes (2002), Lecture Notes in Mathematics 1807, Springer-Verlag, 241-422
- The p - affine surface area and geometric interpretations, Rendiconti Circ. Mat. Palermo Serie II, 70 (2002), 367-382.
- Orlicz norms of sums of random variables (with Y. Gordon, A. Litvak and C. Schütt), Annals of Probability 30 (2002), 1833-1853.
- Geometry of spaces between polytopes and related zonotops (with Y. Gordon, A. Litvak and C. Schütt), Bulletin des sciences mathématiques, 126 (2002), 733-762.
- Surface bodies and p - affine surface area (with C. Schütt), Advances in Math. 187 (2004), 98-145
- Minima of sequences of Gaussian random variables (with Y. Gordon, A. Litvak and C. Schütt), C.R.Acad.Sci.Paris, Ser.I 340 (2005), 445-448.
- Approximation of the Euclidean ball by a polytope (with M. Ludwig, C. Schütt), Studia Math. 173 (2006), 1-18.
- Floating bodies and Illumination bodies, Integral Geometry and Convexity, Proc. Conf. Wuhan, E. Grinberg, S. Li, G. Zhang, J. Zhou editors, World Scientific Pub. (2006).
- On the minimum of several random variables (with Y. Gordon, A. Litvak and C. Schütt), Proc. Amer. Math. Soc. 134 (2006), no. 12, 3665-3675

- On L_p -affine surface areas, *Indiana Univ. Math. J.* 56, No. 5 (2007), 2305-2324
- Geometry of sets of quantum maps: a generic positive map acting on a high-dimensional system is not completely positive (with S. Szarek and K. Życzkowski), *J. Math. Phys.* 49 (2008), no. 3, 032113
- New L_p affine isoperimetric inequalities (with Deping Ye), *Advances in Math.* 218 (2008), no. 3, 762-780
- Bipartite states of low rank are almost surely entangled (with M. B. Ruskai), *J. Phys. A* 42 (2009), no. 9, 095303, 15 pp
- New Higher-Order Equiaffine Invariants (with Alina Stancu), *Israel J. of Math.* 171 (2009), 221-235
- Inequalities for mixed p -affine surface area (with Deping Ye), *Math. Annalen* 347 (2010), 703-737
- Nonadditivity of Rényi entropy and Dvoretzky's theorem (with G. Aubrun and S. Szarek), *J. Math. Phys.* 51 (2010), no. 2, 022102 and *Virtual Journal of Quantum Information* 10 (2010)
- How often is a random quantum state k -entangled? (with S. Szarek and K. Życzkowski), *J. Phys. A* 44 (2011), no. 4, 045303
- Uniform estimates for order statistics and Orlicz functions (with Y. Gordon, A. Litvak and C. Schütt), *Positivity*, DOI 10.1007/s11117-010-0107-3 (2011)
- Mahler's conjecture and curvature (with S. Reisner and C. Schütt), *International Mathematics Research Notices*, DOI 10.1093/imrn/rnr003 (2011)
- Hastings's additivity counterexample via Dvoretzky's theorem (with G. Aubrun and S. Szarek), *Comm. Math. Phys.* 305 (2011), no. 1, 8597
- Relative entropy of cone measures and L_p centroid bodies (with G. Paouris), *Proc. London Math. Soc.* DOI 10.1112/plms/pdr030 (2011)
- New affine measures of symmetry for convex bodies (with M. Meyer and C. Schütt), *Advances in Mathematics* 228, 29202942 (2011)
- On the Homothety Conjecture (with Deping Ye), to appear in *Indiana J. of Math.*

Invited Talks, Conferences, Workshops

- December 2011 Nankai University, Tianjin, China "Functional affine-isoperimetry and an inverse logarithmic Sobolev inequality"
- November 2011 University of Michigan, Ann Arbor "Functional affine-isoperimetry and an inverse logarithmic Sobolev inequality"
- November 2011 Wayne State University, Detroit "Entropies of cone measures of convex bodies"
- October 2011 University of Minnesota, Minneapolis "Functional affine-isoperimetry and an inverse logarithmic Sobolev inequality"
- June 2011, Fifth International Workshop on Convex Geometry Analytic Aspects, Cortona, Italy "How often is a random quantum state k -entangled?"

- May 2011 Workshop Harmonic analysis in convex geometry” at the Banff International Research Station, Banff, Canada, “How often is a random quantum state k -entangled?”
- September 2010 “Advanced Topics of Analysis Applied to Quantum Information Problems” meeting, CIEM International Center for Mathematical Meetings, Bilbao, Spain, 4 hour tutorial: “Local Banach space theory and Quantum Channels”
- September 2010 Workshop on ” Asymptotic Geometric Analysis and Convexity” Fields Institute, Toronto, Canada
- August 2010 Workshop on “Mahler’s conjecture and duality in convex geometry” American Institute of Mathematics, Palo Alto “Affine isoperimetric, Santalo and inverse Santalo Inequalities”
- August 2010 co-organizer of Conference “Perspectives in High Dimensions”, Cleveland, OH
- July 2010 Conference “Asymptotic Geometric Analysis”, Euler Institute, St. Petersburg, Russia “Entropy and Dvoretzky’s theorem”
- April 2010 Workshop “Algebraic and Random Topology”, University of Chicago, “Relative entropy of cone measures”
- March 2010 Workshop “Volume inequalities” at the Banff International Research Station, Banff, Canada, “Relative entropy of cone measures and L_p centroid bodies”
- December 09 co-organizer of Mini-Workshop “Geometry of Quantum Entanglement” MF Oberwolfach, Germany
- December 09 Conference ”Convex Geometry and its Applications” MF Oberwolfach, Germany, “Relative entropy of cone measures and L_p centroid bodies”
- August 09 Workshop on “Topological Complexity of Random Sets” American Institute of Mathematics, Palo Alto
- June 09 Conference in honor of V. Milman, Tel Aviv University, Israel “Homothetic floating bodies”
- February 09 Conference in honor of Y. Gordon, Technion, Haifa, Israel “Mixed p -affine isoperimetric inequalities”
- December 08 AMS-SMS joint meeting, Shanghai University, Shanghai China “Geometry of quantum maps”
- October 08 AMS meeting, University of Vancouver, Vancouver, Ca “Geometry of quantum maps”
- August 08 Texas A&M University, Sumirfas conference, “Orlicz norms and order statistics”
- June 08 Conference on “Phenomena in High Dimensions”, Sevilla, Spain “New L_p -affine isoperimetric inequalities”
- May 08 Conference in honor of L. Tzarfiri, Hebrew University, Jerusalem, Israel “ L_p -affine isoperimetric inequalities”
- November 07 Workshop on “Algorithmic Convex Geometry” American Institute of Mathematics, Palo Alto
- September 07 Conference on “Geometrization of probability” Fields Institute, Ottawa, Canada “Maxima and minima of sequences or random variables”
- August 07 Workshop on “Fourier analytic methods in convex geometry” American Institute of Mathematics, Palo Alto “ L_p -affine isoperimetric inequalities”
- July 07 Conference on “Phenomena in High Dimensions”, Samos, Greece “Geometry of states and superoperators”
- July 07 Conference on Convexity, Cortona, Italy “On the L_p affine surface area”

- April 07 AMS meeting, Stevens College, Hoboken, NJ co-organizer of a special session on Convexity
- December 06 Conference on “Convex Geometry” Oberwolfach, Germany
- September 06 Colloquium talk, Columbia, Missouri “Approximation of convex bodies by polytopes”
- June/July 06 “Phenomena in High Dimensions”, Institut Henri Poincaré, Paris, France co-organizer of the workshop “Asymptotic Analysis and Applications”
- April 06 AMS meeting, University of New Hampshire, Durham, NH “Spaces between zonotopes and polytopes”
- April 06 AMS meeting, Florida International University, Miami, FL ”Minima of sequences of Gaussian random variables”
- March 06 Colloquium talk, Brooklyn Polytechnical University “Approximation of convex bodies by polytopes”
- March 06 Conference on “Convex and Discrete Geometry” Banff International Research Station, Banff, Canada “Spaces between zonotopes and polytopes”
- January 06 AMS meeting, San Antonio, Texas “Approximation of the Euclidean ball by polytopes”
- December 05 Colloquium talk, University of Massachusetts, Lowell, Ma “Approximation of convex bodies by polytopes”
- September 05 Colloquium talk, Kent State University, Kent “Approximation of the Euclidean ball by polytopes”
- July/August 05 Workshop “Asymptotic Theory of Geometry of Finite-Dimensional Spaces” Erwin Schrödinger Institute, Vienna, Austria
- July 05 Conference on “Convex Geometry and High Dimensional Phenomena” Technical University, Vienna, Austria
- June 05 2 Conferences on Banach Space Theory and Convex Geometry Jerusalem and Dead Sea, Israel
- May 05 Conference on Convex Geometry, Florence, Italy
- October 04 Conference on Integral Geometry, Wuhan, China “Floating bodies, Illumination bodies, Surface bodies”
- July 04 co-organizer of “Convex Geometric Analysis” at the Banff International Research Station, Banff, Canada
- April 04 AMS meeting, Rider University, Lawrenceville co-organizer of a special session on Convexity
- April 04 Colloquium talk, University of Montreal, Canada
- June 03 Conference on Convexity, Cortona, Italy “Aspects of Approximation of convex bodies by polytopes”
- April 03 Conference on Geometry of Banach spaces, Mathematisches Forschungsinstitut Oberwolfach, Germany
- April 03 Conference on local Banach space theory, University of Kiel, Germany “Random polytopes and surface bodies”
- November 02 Conference on Quantum information theory and cryptography, Mathematical Science Research Institute, Berkeley, Ca
- October 02 AMS meeting, Northeastern, Boston co-organizer of a special session on Convexity

- September 02 Conference on Banach Space theory, Bedlewo, Poland
- July 02 3 Workshops at PIMS Vancouver, Canada:
Convexity and Asymptotic Theory of normed spaces (“Approximation of convex bodies by polytopes and and surface bodies”),
Measure Transportation and Geometric inequalities,
Phenomena of large dimensions
- June 02 AMS-UMI Meeting, Pisa, Italy “ L_p -affine surface areas and surface bodies”
- June 02 Hebrew University, Jerusalem, Israel “Approximation of convex bodies by polytopes and and surface bodies”
- May 02 2 Conferences at Technion and Haifa University, Haifa, Israel
- April 02 Conference on Geometry and Topology, Bedlewo, Poland “Random and best approximation of convex bodies by polytopes”
- March 02 Oakland University, MI “Random and best approximation of convex bodies by polytopes”
- March 02 University of Alberta, Edmonton, Canada
- January 02 Workshop on Quantum Information Processing, IBM Watson Research Center, Yorktown, NY
- August 01 Workshop on Convexity theory, Crete, Greece
- June 01 University of Tübingen, Germany “Random and best approximation of convex bodies by polytopes”
- April 01 Convexity theory conference, Oberwolfach, Germany “Aspects of random variables in convexity theory”
- March 01 AMS Meeting, Columbia, SC “Extreme points of completely positive trace preserving maps”
- March 01 Technion, Haifa, Israel “Extreme points of completely positive trace preserving maps”
- March 01 Tel Aviv University, Tel Aviv, Israel “Extreme points of completely positive trace preserving maps”
- October 00 Schrödinger Institute, Vienna, Austria “A characterization of completely positive trace preserving maps”
- September 00 University of Missouri, Columbia Missouri, “Regularizations of the Coulomb potential using Gaussian integrals”
- July 00 University of Karlsruhe, Germany “Dropping a vertex from a convex polytope”
- May 00 Franking, Austria “Dropping a vertex from a convex polytope”
- April 00 AMS Meeting, Lowell, Ma., “Extreme points of completely positive trace preserving maps” and co-organizer of a special session on Convexity
- March 00 Conference and Workshop on Local Theory of Banach spaces, “Santaló regions” Technion and University of Haifa, Haifa, Israel Tel Aviv University, Tel Aviv, Israel
- June/July 99 Conference and Workshop on Local Theory of Banach spaces, PIMS Vancouver, Canada
- May 99 Conference on Convexity, Cortona, Italy “Random polytopes”
- April 99 University of Massachusetts, Lowell “A correlation inequality for the Gaussian measure”
- March 99 University of Vienna, Vienna, Austria “A class of regularizations of $1/|x|$ using Gaussian integrals”

- March 99 University of Linz, Austria “A class of regularizations of $1/|x|$ using Gaussian integrals”
- October 98 Brooklyn Polytechnical University, New York “On the Gaussian measure”
- September 98 Miami University, Oxford, Ohio “Affine invariants in convexity theory”
- May 98 Academy of Sciences, Warsaw, Poland “The p-affine surface area”
- April 98 Academy of Sciences, Budapest, Hungary
- April 98 University of Vienna, Vienna, Austria “Affine invariants in convexity theory”
- March/April 98 Technion and Haifa University, Haifa, Israel “On the Gaussian measure”
Invited member at the Landau Institute at the Hebrew University, Jerusalem, Israel “The p-affine surface area”
- November 97 Convexity theory conference, Oberwolfach, Germany “The p-affine surface area”
- October 97 AMS Meeting, Atlanta, GA, “On the p-affine surface area”
- October 97 Georgia Tech. University, Atlanta, GA, “Correlation inequalities for the Gaussian measure”
- August 97 Conference on Analysis and Logic, Mons, Belgium
- May 97 University of Denver “Convex bodies and Differential Geometry”
- March 97 AMS Meeting, Memphis, TN, co-organizer of Special Session on Harmonic Analysis and Convexity “A general construction of Affine surface area”
- October 96 AMS Meeting, Lawrenceville, NJ, “On the Santalo-regins of a convex body”
- September 96 Conference on Banach space Theory, Oberwolfach, Germany
- March 96 Conference Women in Analysis, Berkeley, California “Convexity and Affine Differential Geometry”
- November 95 AMS SMM Meeting, Guanajuato, Mexico “Illumination bodies of almost polygonal bodies”
- November 95 AMS Meeting, Kent, Ohio “Norm attainig n-linear forms”
- June 95 Conference on Convex and Discrete Geometry, Cortona, Italy “On a Gaussian correlation inequality”
- June 95 Université de Mons, Belgium “Sur l’aire de la surface affine”
- May 95 AMS Meeting, Jerusalem, Israel “On a Gaussian correlation inequality”
- September 94 International Conference on Convexity, Paris, France “On the problem of positive Gaussian correlation for convex sets”
- August 94 Regional Conference Texas A & M University “On the affine surface area”
- June 94 Convex and Discrete Geometry, Bydgoszcz, Poland “Affine surface area and polytopes”
- May 94 Conference on Functional Analysis, Harmonic Analysis and Probability, Columbia, MO
- April 94 AMS meeting, New York “On the affine surface area”
- June 93 Polish Academy of Sciences, Warsaw, Poland “On the affine surface area”
- April 93 University of South Carolina, Columbia, SC “Floating bodies”
- January 93 Meeting of the AMS, San Antonio, Texas, “Homothetic floating bodies”
- November 92 University of Alberta, Edmonton, Canada, “Floating bodies”
- May 92 North European Analysis Conference, St. Amand les Eaux, France

- November 91 Polish Academy of Sciences, Warsaw, Poland “The convex floating body”
- September 91 Geometrie der Banachräume, Oberwolfach, Germany, “The convex floating body of almost polygonal bodies”
- June 91 Banach space conference, Jerusalem, Israel
- January 91 Journée d’Analyse Fonctionnelle Lille-Paris, “Le corps flottant des corps de type presque polytope”
- April 90 Kent State University, Kent, Ohio “Banach lattices without RNP”
- June 89 Conference on Geometry of Banach spaces, Strobl, Austria “The convex floating body”
- July 88 Microprogram on Banach spaces, Berkeley, California
- September 87 University of Missouri, Columbia, MO “Banach spaces failing RNP”
- April 87 Ohio State University, Columbus, OH “The RNP in Banach spaces”
- October 86 Conference on Banach space Theory, Oberwolfach, Germany
- June 86 Conference on Banach Space Theory, Sandbjerg, Denmark

Teaching Experience

I have taught a variety of graduate and undergraduate courses including Calculus, Advanced Calculus, Complex Analysis, Real Analysis, Probability Theory, Measure Theory, Functional Analysis, Linear Algebra.

I have developed a new course at Case Western Reserve University on “Convexity and Applications”.

It has been very gratifying for me to have been nominated on several occasions for the Case Undergraduate and Graduate Teaching awards.