

ALEXANDER KOLDOBSKY: CURRICULUM VITAE

Department of Mathematics
University of Missouri-Columbia
Columbia MO 65211, U.S.A
e-mail: koldobsk@math.missouri.edu
tel. (573)424-5835

ACADEMIC TRAINING

Ph.D., Mathematics, June 1982, St. Petersburg State University, Russia.
M.S., Mathematics, June 1977, St. Petersburg State Pedagogical Institute, Russia.

ACADEMIC POSITIONS

Professor, University of Missouri-Columbia, 1999–present
Leonard M. Blumenthal Distinguished Professor, University of Missouri, 2002–2007
Professor, University of Texas at San Antonio, 1998–1999
Associate Professor, University of Texas at San Antonio, 1995–1998
Assistant Professor, University of Texas at San Antonio, 1993–1995
Visiting Associate Professor, University of Missouri-Columbia, 1992–1993.
Visiting Member, Courant Institute, New York University, Feb. 1992–Aug. 1992
Associate Professor (half-time), Leningrad State University, 1990–1991.
Associate Professor, Leningrad University of Economics and Finance, 1987–1991.
Assistant Professor, Leningrad University of Economics and Finance, 1984–1987.
Researcher, Leningrad Research Institute of Chemical Fibers, 1979–1984.

GRANTS

Current:

NSF Grant DMS-0652571: FRG: Collaborative Research: Fourier Analytic and Probabilistic Methods in Geometric Functional Analysis and Convexity , 7/1/07– 6/30/10, \$469,998 (Co-PI with M.Rudelson)

NSF Grant DMS-0455696: Applications of Fourier Analysis to Convex Geometry, 7/1/05– 6/30/08, \$142,075

Expired:

University of Missouri Research Board Grant, 01/01/05–12/31/05, \$14,100

NSF Research Grant DMS-0136022, 7/1/02– 6/30/05, \$77,994

NSF Research Grant DMS-9996431, 7/1/99– 6/30/02, \$72,000

NSF Research Grant DMS-9531594, 7/1/96– 6/30/99, \$64,577

AWARDS

NSF-CBMS conference, principal lecturer, Kansas State University, July 2006

Advisor of V.Yaskin, recipient of the 2006 University of Missouri Distinguished Dissertation Award

University of Missouri Provost's Research Leave, 09/01/07–05/31/08

University of Missouri Provost's Research Leave, 09/01/03–05/31/04

UTSA Faculty Development Leave for Spring 1998

UTSA President's Award in Recognition of Research Excellence, 1998

GRADUATE STUDENTS

Geoff Diestel, M.S., graduated May 2003

Jared Schlieper, M.S., graduated May 2005

Vladyslav Yaskin, PhD, graduated May 2006, currently postdoc at Univ of Oklahoma

Marina Yaskina, PhD, graduated May 2006, currently postdoc at Univ of Oklahoma

Jared Schlieper, PhD candidate, expected graduation May 2008

Marisa Zymonopoulou, PhD candidate, expected graduation May 2008

Chris Shane, PhD candidate

POSTDOCS

Dmitri Ryabogin, 2000–2003, currently at Kansas State University

Artem Zvavitch, 2001–2004, currently at Kent State University

Leonid Slavin, 2007–

Witold Bednorz, 2007–

PUBLICATIONS

Books:

Fourier Analysis in Convex Geometry, Mathematical Surveys and Monographs, American Mathematical Society, Providence RI, 2005, 170 p.

Lectures on the Interface between Convex Geometry and Harmonic Analysis, CBMS Regional Conference Series, American Mathematical Society, Providence RI, in press, 103 p. (with V.Yaskin)

Papers in convex geometric analysis:

The complex Busemann-Petty problem on sections of convex bodies, submitted (with H.König and M.Zymonopoulou)

Inequalities of the Kahane-Khinchin type and sections of L_p -balls, submitted (with A.Pajor and V.Yaskin)

The geometry of L_0 , Canadian J. Math., to appear (with N.Kalton, V.Yaskin and M.Yaskina)

- Determination of convex bodies by derivatives of section functions*, Archiv Math. 88 (2007), 279–288 (with C.Shane)
- Modified Busemann-Petty problem on sections of convex bodies*, Israel J. Math. 154 (2006), 191–208 (with V.Yaskin and M.Yaskina)
- Intersection bodies and L_p -spaces*, Advances in Math. 196 (2005), 257–275 (with N.Kalton)
- Comparison of volumes by means of areas of central sections*, Advances in Applied Math. 33 (2004), 728–732.
- Extremal sections of complex l_p -balls, $0 < p \leq 2$* , Studia Mathematica 159 (2003), 185–194 (with M.Zymonopoulou)
- Fourier methods in the study of sections and projections of convex bodies*, In: Fourier analysis and convexity, L.Brandolini et al, eds, Birkhauser, 2004, p. 119–130 (with D.Ryabogin and A.Zvavitch)
- Projections of convex bodies and the Fourier transform*, Israel J. Math. 139 (2004), 361–380 (with D.Ryabogin and A.Zvavitch)
- The Busemann-Petty problem via spherical harmonics*, Advances in Math. 177 (2003), 105–114
- Extremal slabs in the cube and the Laplace transform*, Advances in Math. 174 (2003), 89–114 (with F.Barthe)
- Sections of star bodies and the Fourier transform*, in Harmonic Analysis at Mount Holyoke, Proceedings of AMS-IMS-SIAM Joint Summer Research Conference on Harmonic Analysis, Contemp. Math. 320 (2003), 225–248
- On the central limit property of convex bodies*, GAFA Seminar volume, Lecture Notes in Math. 1807 (2003), 44–52. (with S.Bobkov)
- On the derivatives of X -ray functions*, Archiv Math. 79 (2002), 216–222.
- Average volume of sections of star bodies*, Geometric Aspects of Functional Analysis, V.Milman and G.Schechtman, eds., Lecture Notes in Mathematics 1745 (2000), 119–146 (jointly with M.Lifshits).
- A functional analytic approach to intersection bodies*, Geometric and Functional Analysis (GAFA) 10 (2000), 1507–1526
- A generalization of the Busemann-Petty problem on sections of convex bodies*, Israel J. Math. 110 (1999), 75–91
- An analytic solution to the Busemann-Petty problem on sections of convex bodies*, Annals of Math. 149 (1999), 691–703 (with R.J. Gardner and Th. Schlumprecht)
- An analytic solution to the Busemann-Petty problem*, C. R. Acad. Sci Paris 328 (1999), 29–34 (with R.J.Gardner and Th.Schlumprecht)
- Intersection bodies, positive definite distributions and the Busemann-Petty problem*, Amer. J. Math. 120 (1998), 827–840
- Intersection bodies in R^4* , Advances in Math. 136 (1998), 1–14
- Second derivative test for intersection bodies*, Advances in Math. 136 (1998), 15–25

An application of the Fourier transform to sections of star bodies, Israel J. Math. 106 (1998), 157–164

Intersection bodies and the Busemann-Petty problem, C. R. Acad. Sci Paris 325 (1997), 1181–1186

Papers in harmonic analysis and probability:

Schoenberg's problem on positive definite functions, Algebra i Analiz 3 (1991), 78-85; English translation in St. Petersburg Math. J. 3 (1992), 563–570.

A short proof of Schoenberg's conjecture on positive definite functions, Bull. London Math. Soc. 31 (1999), 693–699 (with Y. Lonke).

A correlation inequality for stable random vectors, In: Advances in Stochastic Inequalities, AMS Special Session on Stochastic Inequalities and their applications, Atlanta, 1997, Contemporary Mathematics 234 (1999), 121–124.

Positive definite distributions and subspaces of L_p with applications to stable processes, Canad. Math. Bull. 42 (1999), 344-353.

A remark on positive isotropic random vectors, In: Functional Analysis and Economic Theory, Y. Abramovich, E. Avgerinos, N.C. Yannelis (Eds.), Springer-Verlag, 1998, 9–15 (with A. Arias)

Inequalities of correlation type for symmetric stable random vectors, Stat. Probab. Letters 28 (1996), 91–97 (with S. Montgomery-Smith)

Inverse formula for the Blaschke-Levy representation, Houston J. Math. 23 (1997), 95–107

Positive definite functions, stable measures, and isometries on Banach spaces, Lect. Notes in Pure and Appl. Math. 175 (1996), 275–290.

The Fourier transform of order statistics with applications to Lorentz spaces, Israel J. Math. 92 (1995), 411–425 (with S. Dilworth)

Characterization of measures by potentials, J. Theor. Prob. 7 (1994), 135-145.

Generalized Levy representation of norms and isometric embeddings into L_p -spaces, Ann. Inst. H. Poincaré, Prob. et Stat., ser.B 28 (1992), 335-353.

The Fourier transform and convolution in the space l_1 , Proceedings of the Leningrad Branch of the Steklov Institute: Problems of Theory of Probabilistic Distributions 194 (1992), 98-105

Convolution equations in certain Banach spaces, Proc. Amer. Math. Soc. 111 (1991), 755-765

The Fourier transform technique for convolution equations in infinite dimensional l_q -spaces, Math. Ann. 291 (1991), 403-407.

Inverse problem for potentials of measures in Hilbert spaces, Proc. of the Leningrad Branch of the Steklov Institute 177 (1989), 73-77.

Inverse problems for potentials of measures in Banach spaces, Probability Theory and Mathematical Statistics, Proc. 5th Vilnius Conference 1989, Vol.1, Mokslas-VSP, Utrecht, 627-637.

Measures on spaces of operators and isometries, J. Soviet Math. 42 (1988), 1628-1636.
On potentials of measures in Banach spaces, Siberian Math. J. 28 (1987), 65-80 (with E.A. Gorin)
On potentials identifying measures on Banach spaces, Soviet Math. Dokl. 32 (1985), 659-663. (with E.A. Gorin)
Uniqueness theorem for measures in $C(K)$ and its applications to stochastic processes, J. Soviet Math. 27 (1984), 3095-3102.

Papers in functional analysis:

Sobolev spaces with only trivial isometries, Positivity 10 (2006), 135–144 (with G. Diestel)
Banach spaces embedding isometrically into L_p when $0 < p < 1$, Proc. Amer. Math. Soc. 132 (2004), 67–76 (with N.Kalton)
Aspects of the isometric theory of Banach spaces, Handbook of the Geometry of Banach Spaces, W.B.Johnson and J.Lindenstrauss, eds, Elsevier, 2001, p. 899–939 (with H. König)
A Banach subspace of $L_{1/2}$ which does not embed in L_1 (isometric version), Proc. Amer. Math. Soc. 124 (1996), 155–160
Isometric stability properties of certain Banach spaces, Canad. Math. Bull. 38 (1995), 93–97.
Isometries of L_p -spaces of solutions of homogeneous partial differential equations, Lect. Notes in Pure and Appl. Math. 172 (1995), 251–263.
Common subspaces of L_p -spaces, Proc. Amer. Math. Soc. 122 (1994), 207–212
Operators preserving orthogonality are isometries, Proc. Royal Soc. of Edinburgh 123 A (1993), 835-837.
Isometries of $L_p(X; L_q)$ and equimeasurability, Indiana Univ. Math. J. 40 (1991), 677-705.
On minimal projections generated by isometries of Banach spaces, Commentationes Math. 27 (1988), 265-274 (with V. Odinec)
Convolution metrics on spaces of measures and almost isometric operators in L_p , J. Soviet Math. 44 (1989), 852-855
Isometries of the spaces $L_p(X; L_q)$ and equimeasurability, Izv. Vuzov. Matematika, 1989, No.3, 25-34
On isometric operators in vector valued L_p -spaces, Proceedings of Leningrad Branch of the Steklov Institute 107 (1982), 198-203
Isometric classification of L_p -spaces of solutions of homogeneous elliptic equations, Contemporary Problems of Function Theory and Functional Analysis, Karaganda State Univ., 1980, 90-100
On isometric operators in $L_p(X; R^n)$, Functional Analysis (A. V. Strauss, editor) 12 (1979), 90-99

Papers in engineering:

Morphological regularization neural networks, Pattern Recognition 33 (2000), 935–944
(with P.Gader and M.Khabou)

Optimization of the multistage washing of complex fibers, Chemical Fibers, 1985, #5
(four coauthors)

Kinetic approach to evaluating the influence of active admixtures in the reactions of polycondensation, Journal of Applied Chemistry, 1984, #4 (four coauthors)

Stochastic nature of fiber strength, Chemical Fibers, 1984, #6 (with E.Ya. Sorokin)

Influence of the polymer matrix on the properties of fibers produced by the method of baking of mixtures of polymers, Chemical Fibers, 1983, #6 (four coauthors)

Influence of the termal extraction on the linear density of polyphen fibers, Chemical Fibers, 1983, #2 (three coauthors)

Connection between the linear density and strength of polyphen fibers, Chemical Fibers, 1982, #5 (four coauthors)

Investigation of the distribution of fiber strength, Izvestiya Vuzov. Textile Industry, 1982, #3 (five coauthors)

Papers in mathematical economics:

One-parameter systems of economical stimulating, Structure of Production Management, Leningrad Institute of Economics and Finance, 1987

Economical stimulating of fuel saving, Fireproofs, 1987, #10 (three coauthors)

Course notes for business students:

Linear algebra for business students, Leningrad University of Economics and Finance, 1987

Statistical data managing, Leningrad University of Economics and Finance, 1987

Mathematical models of economical stimulating, Leningrad University of Economics and Finance, 1987

VISITING POSITIONS

Visiting Professor, University of Toulouse, France, June-July 2006

Visiting Professor, EU Marie Curie Transfer of Knowledge Program, Institute of Mathematics, Polish Academy of Sciences, March-June 2006

Visiting Professor, University of Kiel, Germany, November 2003

Visiting Professor, Université de Marne-La-Vallee, France, May-June 1999, October 2001, June 2003

Visiting Associate Professor, Weizmann Institute of Science, Israel, Spring 98

PRESENTATIONS

Colloquium Talks: University of Kiel, Germany, 2007; Tufts University, 2007; University of Texas at San Antonio, 2006; University of Denver, 2005; De Paul University, Chicago, IL, 2004; Kent State University, 2004; Polytechnic University, Brooklyn, NY, 2004; College of William and Mary, Williamsburg, Virginia, 2004; University of Kiel, Germany, 2003; University of New Hampshire, 2003; University of South Carolina, 2002; Georgia Institute of Technology, 2001; University of California at Riverside, 2001; University of Connecticut at Storrs, 2000; Case Western Reserve University, 1999; Kent State University, 1999, 2001; University of Freiburg, Germany, 1998; University of Karlsruhe, Germany, 1998; University of Missouri-Columbia, 1997; Texas A&M University, 1997; Massachusetts Institute of Technology, 1997; Free University Berlin, 1997; University of Memphis, 1995, 1997; University of Missouri-Columbia, 1995; University of California at Riverside, 1993; Indiana University–Purdue University at Indianapolis, 1993; The Citadel, Military College of South Carolina, 1993; Oklahoma State University, 1993; Southern Illinois University at Edwardsville, 1993; University of Texas at San Antonio, 1993; University of Missouri-Columbia, 1993; University of Kiel, Germany, 1991.

Invited 1-hour Seminar Talks: Analysis Seminar, Concordia - McGill Universities, Canada, 2007; Analysis Seminar, University of Orleans, France, 2006; Probability Seminar, University of Toulouse, France, 2006; Probability Seminar, Technical University of Wrocław, Poland, 2006; Probability Seminar, University of Warsaw, Poland, 2006; Functional Analysis Seminar, University of Alberta at Edmonton, 2006; Functional Analysis Seminar, Institute of Mathematics, Polish Academy of Sciences, 2006; Free University Berlin, 2005; University of Kiel, Germany, 2005; John Hopkins University, 2004; Kansas State University, 2003; University of Southern Denmark, 2003; University of Kiel, Germany, 2003; University of Milan-Bicocca, 2002; Université Paris 6, 1998, 1999, 2001, 2003; Université de Marne-La-Vallee, France, 1998, 1999; Hebrew University, Jerusalem, Israel, 1998; Technion-Israel Institute of Technology, 1998; Weizmann Institute of Science, 1998; University of Kiel, Germany, 1997; Institute of Mathematics, Polish Academy of Sciences, 1997; University of Jena, Germany, 1997; University of Paderborn, Germany, 1997; Adam Mickiewicz University, Poznan, Poland, 1997; Wrocław Technical University, Poland, 1997; University of Tennessee at Knoxville, 1997; Georgia Institute of Technology, 1997; Texas A&M University, 1995, 1996; University of Texas at Austin, 1993, 1995, 1997; University of Illinois at Urbana-Champaign, 1993; University of California at Los-Angeles, 1993; Bowling Green State University, 1993; University of Wisconsin-Madison, 1993; Washington University at St Louis, 1993; University of Missouri-Columbia, 1992; Bell Laboratories, 1992; Memphis State University, 1992; Mathematical Institute of the Ukrainian Academy of Sciences, 1991; University of Paderborn, Germany, 1990; Free University Berlin, 1990, 1991; Wrocław Technical University, Poland, 1989, 1991; University of Jena, Germany, 1987; Leningrad State University, 1982-1991, yearly; Steklov Institute, Leningrad Branch, 1982-1991, yearly; Moscow State University, 1982, 1984, 1987, 1990.

Conference Talks: Workshop on Fourier Methods in Convex Geometry, American Institute of Mathematics, Palo Alto, CA, 2007 (one-hour talk); Conference on Phenomena in High Dimensions, Samos, Greece, 2007; Conference on Convex and Fractal Geometry, Bedlewo, Poland, 2007 (plenary lecture); AMS Special Session on Radon Transforms, New

Orleans, 2007; Konvexgeometrie, Oberwolfach, Germany, 2006; NSF-CBMS Regional Conference on the Interplay between Convex Geometry and Harmonic Analysis, Manhattan, KS, 2006 (principal speaker - ten lectures); Workshop on Convex Sets and their Applications, Banff, Canada, 2006; Seminar on Analysis, University of Missouri, 2005 (one-hour talk); Conference on Convex Geometry and High Dimensional Phenomena, Vienna, Austria, 2005; Workshop on Geometric aspects of analysis and probability, Schroedinger Institute, Vienna, Austria, 2005 (one-hour talk); Contemporary Ramifications of the Banach Space Theory, Jerusalem, Israel, 2005; Workshop on Geometric Inequalities, Florence, Italy, 2005; Southeast Geometry Conference, Columbia, SC, 2005 (plenary lecture); Informal Regional Functional Analysis Seminar, Texas A&M Univ., 2004 (plenary lecture); Joint AMS-SIAM-IMS Summer Research Meeting - Gaussian Measures and Convex Geometry, Snowbird, Utah, 2004 (one-hour talk); AMS Special Session on Analytic Convex Geometry, Lawrenceville, NJ 2004; Workshop on Convex Geometry - Analytic Methods, Cortona, Italy, 2003 (one-hour plenary talk); Conference on Banach Spaces, Oberwolfach, Germany, 2003 (one-hour talk); Conference on Banach Spaces and Convex Geometric Analysis, Kiel, Germany 2003 (one-hour talk); Workshop on Combinatorial and Number-Theoretic Methods in Harmonic Analysis, Erwin Schroedinger Institute, Vienna, 2003 (one-hour talk); AMS Special Session on Banach Spaces and Convex Geometry, Baltimore, MD 2003 (one-hour expository talk); AMS Special Session on Convex Geometry, Boston, MA 2002; Workshop on Asymptotic Geometric Analysis, Vancouver, Canada, 2002 (one-hour talk); Conference on High Dimensional Probability, Sandbjerg, Denmark, 2002; AMS-IMU Special Session on Analytic Methods in Convex Geometry, Pisa, Italy, 2002; 4th Conference on Function Spaces, Edwardsville, IL 2002 (plenary lecture); AMS Special Session on Harmonic Analysis, Atlanta, GA 2002; The Lindenstrauss Festival, Kent State University, 2001 (1-hour plenary talk); Workshop on Geometric Convex Analysis, Crete, Greece, 2001 (keynote speaker); AMS-IMS-SIAM Summer Research Conference on Harmonic Analysis, Mt Holyoke, MA, 2001 (one-hour lecture); Workshop on Fourier Analysis and Convexity, Milan, Italy, 2001 (series of 3 one-hour lectures); Konvexgeometrie, Conference in Oberwolfach, Germany, 2001; AMS Special Session on Banach Spaces, Columbia, SC, 2001; Workshop on Linear Analysis and Probability, College Station, TX 2000; AMS Special Session on Invariants in Convex Geometry, Lowell, MA 2000; Wabash Analysis Conference, Indianapolis, 1999 (1-hour plenary talk); AMS Special Session on Banach and Operator Spaces, Austin, TX 1999; Workshop on Geometric Functional Analysis, Vancouver, Canada, 1999; Conference on Geometric Aspects of Fourier and Functional Analysis (Satellite meeting for ICM98), Kiel, Germany (plenary lecture), 1998; Konvexgeometrie, Conference in Oberwolfach, Germany, 1997 (main talk); Summer Meeting of the Canadian Mathematical Society, Special Session on Convex Geometry, St. John, 1998; Informal Regional Functional Analysis Seminar, College Station, TX, 1997 (one-hour talk); AMS Special Session on Modern Banach Space Theory, Atlanta, GA, 1997; AMS Special Session on Stochastic Inequalities, Atlanta, GA, 1997; AMS Special Session on Harmonic Analysis and Convexity, Memphis, TN, 1997; AMS Special Session on Banach Spaces and Applications, Columbia, MO, 1996; AMS Special Session on Geometric Functional Analysis, Lawrenceville, NJ, 1996; Conference on Banach Space Theory, Kent State University, 1996; Joint Annual Meeting of the American Statistical Association and Institute of Mathematical Statistics, Chicago,

IL, 1996; Informal Regional Functional Analysis Seminar, College Station, 1993, 1996; Conference on Infinite Dimensional Geometry, Mathematical Sciences Research Institute, Berkeley, CA, 1996; Wabash Modern Analysis Mini-Conference, Indianapolis, 1995; International Conference on Interactions between Probability, Harmonic Analysis, and Banach Spaces, Columbia, MO, 1994; Second Conference on Function Spaces, Edwardsville, IL, 1994; AMS Special Session on Banach Spaces, College Station, 1993; Workshop on Linear Analysis and Probability, College Station, 1993; International Conference on Approximation and Probability, Santa Barbara, 1993; 9th Southeastern Analysis Meeting, Memphis, 1993; AMS Special Session on Banach Spaces, San Antonio, 1993; Mini-Conference on Banach Spaces, Columbia, Missouri, 1992; Workshop on Banach Spaces, Jerusalem, Israel, 1991; 20th Conference on Stochastic Processes and Applications, Nahariya, Israel, 1991; 19th Conference on Stochastic Processes and Applications, Eisenach, Germany, 1990; International Conference on Probability and Mathematical Statistics, Vilnius, 1989.

TEACHING EXPERIENCE

I have taught a variety of graduate and undergraduate courses including Calculus, Advanced Calculus, Complex Analysis, Real Analysis, Engineering Analysis, Probability Theory and Mathematical Statistics, Linear Algebra, Linear Programming, Mathematics for Business Students, Analysis Seminar.

I have given numerous lectures on popular and olympiad mathematics for high school and college students. Also I have experience in training students for mathematical competitions, and was a member of the organizing committee for Leningrad mathematical olympiads.