

# CURRICULUM VITAE

January 29, 2020

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**Date of Birth:** March 12, 1979

## ACADEMIC DEGREES:

- Ph.D. in Mathematics, University of Missouri-Columbia, May 2005  
Thesis Advisor: Professor Loukas Grafakos  
Thesis: Distributional Estimates for Multilinear Operators
- Specialist (equivalent of M.Sc.) in Mathematics, degree with honors  
Kharkiv National University, Ukraine, June 2001  
Thesis advisor: Professor Vladimir Kadets  
Master's thesis: The Daugavet Property in the Spaces of Vector Valued Functions

## PAST AND CURRENT AFFILIATIONS:

- Georgia Institute of Technology, Atlanta, GA  
Visiting Assistant Professor, August 2005 - May 2008
- Fields Institute, Toronto, ON, Canada  
Visiting Member, January 2008 - April 2008
- Institute for Advanced Study, Princeton, NJ  
Visiting Researcher, September 2008 - May 2009
- University of South Carolina, Columbia, SC  
Tenure-track Assistant Professor, May 2008 - May 2012
- University of Minnesota, Minneapolis, MN  
Visiting Assistant Professor, August 2011- May 2012
- University of Minnesota, Minneapolis, MN  
Tenured Associate Professor, May 2012 - present

## RESEARCH INTERESTS:

Harmonic and Functional Analysis, Discrepancy Theory, Approximation, Probability

## AWARDS and FUNDING

- NSF grant DMS 1665007 “Uniform Distribution and Harmonic Analysis”, 2017–2020, \$180,000.00
- Simons Foundation Collaboration Grant 429723 “Discrepancy theory and harmonic analysis”, 2016–2021, \$ 35,000.00
- NSF grant DMS 1101519 (DMS 1260516) “Discrepancy Theory and Analysis”, 2011–2015, \$ 105,240.00
- NSF grant DMS 0801036 “The Discrepancy Theory and the Small Ball Conjecture”, 2008–2011, \$102,437.00
- Simons Foundation Fellow at the research program “Approximation, sampling and compression in data science” at the Isaac Newton Institute, Apr–Jun 2019.
- Coauthor of the successful proposal for the Semester Program on “High-dimensional Approximation” at the ICERM, Brown University, Fall 2014.
- 2012 Best Paper Award in the Journal of Complexity (for the paper “Fibonacci sets and symmetrization in discrepancy theory”, with V. Temlyakov and R. Yu).
- National Science Foundation conference grants:
  - (PI) DMS-2000940 “Riviere-Fabes Symposium” 2020, \$29,000.00;
  - (co-PI with G. Livshyts) DMS-2001162 “Harmonic Analysis and Related Topics” 2020, \$49,972.00;
  - (co-PI with S. Mayboroda) DMS-1601863 “The 19th Riviere-Fabes Symposium” 2016, \$25,950.00;
  - (co-PI with M. Keel and S. Mayboroda) DMS-1503700 “The 18th Riviere-Fabes Symposium” 2015, \$24,900.00;
  - (co-PI with N. Krylov and S. Mayboroda) DMS-1362668 “The 17th Riviere-Fabes Symposium” 2014, \$23,850.00;
  - (co-PI with V. Sverak and S. Mayboroda) DMS-1304998 “The 16th Riviere-Fabes Symposium” 2013, \$ 22,950.00;
- Successful proposals for “research in groups” programs at AIM, Palo Alto, CA, (May 2010, May 2011, and Oct 2012), and ICERM, Providence, RI (Aug 2020).

## PAPERS (published, accepted)

Papers and preprints are available on the author's website <http://www-users.math.umn.edu/~dbilyk/> and on the arxiv.

- *General and refined Montgomery Lemmata*, *Mathematische Annalen*, 2019, **373** (5), 3141–3166. (with F. Dai and S. Steinerberger).
- *On the Fejes Tóth problem on the sum of acute angles*, *Proceedings of AMS*, 2018, **147** (1), 51–59 (with R. Matzke)accepted,
- *Geodesic distance Riesz energy on the sphere*, *Trans. of AMS*, 2019, **372** (3–4), 1283–1297 (with F. Dai).
- *Stolarsky principle and energy optimization on the sphere*, *Constructive Approx.*, 2018, **48** (1), 31–60. (with F. Dai and R. Matzke)
- *BMO and exponential Orlicz space estimates of the discrepancy function in arbitrary dimension*, *Journal d'Analyse Math.*, 2018, **135** (1), 249–269. (with L. Markhasin)
- *Tusnády's problem, the transference principle, and non-uniform QMC sampling*, *Monte Carlo and Quasi-Monte Carlo Methods 2016*, *Springer Proceedings in Math. and Stat.*, 2018, 169–180. (with C. Aistleitner and A. Nikolov)
- *One-bit sensing, discrepancy, and Stolarsky's principle*, *Sbornik Math.*, 2017, **208** (6), 744–763. (with M. Lacey)
- *The two-dimensional small ball inequality and binary nets*, *Journal of Fourier Analysis and Appl.*, 2017, **23** (4), 817–833. (with N. Feldheim)
- *Diophantine approximation and directional discrepancy of rotated lattices*, *Transactions of AMS*, **368**, 2016, 3871–3897. (with X. Ma, J. Pipher, C. Spencer)
- Chapter *Roth's Orthogonal Function Method in Discrepancy Theory and Some New Connections* in the book “Panorama of Discrepancy Theory”, *Lecture Notes in Math* **2107** Springer Verlag, 2014. pp. 71–158.
- *Discrepancy theory and harmonic analysis* in the book “Uniform Distribution and Quasi-Monte Carlo Methods”, De Gruyter, 2014. pp 45–62.
- *Dichotomy results for the  $L^1$  norm of the discrepancy function*, *Journal of Math Analysis and Applications* **410**, 2013. (with G. Amirkhanyan and M. Lacey)

- *The  $L^2$  discrepancy of irrational lattices*, Monte Carlo and Quasi-Monte Carlo Methods 2012, Springer Proceedings in Math. and Stat. **65** Springer Verlag, 2013.
- *The supremum norm of the discrepancy function: recent results and connections*, Monte Carlo and Quasi-Monte Carlo Methods 2012, Springer Proceedings in Math. and Stat. **65** Springer Verlag, 2013. (with M. Lacey)
- *On the scientific work of Konstantin Ilyich Oskolkov*, Recent Advances in Harmonic Analysis and Applications: In Honor of Konstantin Oskolkov (Springer Proceedings in Mathematics & Statistics), Springer Verlag, 2013, pp. 3–22. (with L. De Carli, A. Petukhov, A. Stokolos, and B. Wick)
- *The  $L_2$  discrepancy of two-dimensional lattices*, Recent Advances in Harmonic Analysis and Applications: In Honor of Konstantin Oskolkov (Springer Proceedings in Mathematics & Statistics), Springer Verlag, 2013, pp. 63–78. (with V. Temlyakov and R.Yu)
- *Fibonacci sets and symmetrization in discrepancy theory*, (with V. Temlyakov, R.Yu), Journal of Complexity **28** (2012) 18–36.  
**Co-winner of 2012 Best Paper Award in the Journal of Complexity.**
- *Roth's orthogonal function method in discrepancy theory*, Uniform Distribution Theory 6 (2011), no. 1, 143–184.
- *Directional discrepancy in two dimensions*, (with X.Ma, J.Pipher, C.Spencer), The Bulletin of London Math. Soc., (2011) **43** (6), 1151–1166.
- *A three-dimensional signed small ball inequality*, (with M.Lacey, I.Parissis, A.Vagharshakyan), “Dependence in Probability, Analysis and Number Theory”, Walter Philipp memorial volume, 73–87, Kendrick Press, Heber City, UT, 2010.
- *Cyclic shifts of the Van der Corput Set*, Proc. AMS, **137** (2009), 2591–2600.
- *Exponential Squared Integrability of the Discrepancy Function in Two Dimensions*, Mathematika, **55**, (2009), 1–2, 1–27. (with M.Lacey, I.Parissis, A.Vagharshakyan)
- *Composition of Haar Paraproducts: The Random Case*, Analysis Math, **35:1** (2009). (with M.Lacey, X.Li, B.Wick)
- *On the Signed Small Ball Inequality*, Online Journal of Analytic Combinatorics, **3** (2008). (with M. Lacey and A. Vagharshakyan)

- *On the Small Ball Inequality in All Dimensions*, J. Funct. Anal. **254** (2008), no. 9, 2470–2502. (with M.Lacey and A.Vagharshakyan)
- *On the Small Ball Inequality in Three Dimensions*, Duke Math. J. **143** (2008), no. 1, 81–115. (with M.Lacey)
- *The distributional estimates for the bilinear Hilbert transform*, Journal of Geometric Analysis **16** (2006) 563-583. (with L. Grafakos)
- *A new way of looking at distributional estimates; applications for the bilinear Hilbert transform*, Proceedings of the 7th International Conference on Harmonic Analysis and Partial Differential Equations [El Escorial, 2004], Collectanea Mathematica (2006), 141–169. (with L. Grafakos)
- *The interplay between distributional estimates and boundedness in harmonic analysis*, Bulletin of London Math. Soc., **37** (2005) 427-434. (with L. Grafakos)
- *Narrow operators the Daugavet property for ultraproducts*, Positivity, **9** (2005) 45-62. (with V. Kadets, R. Shvidkoy, D. Werner)
- *Narrow operators on vector-valued sup-normed spaces*, Illinois J. Math., **45** (2002) 120-143. (with V. Kadets, R. Shvidkoy, G. Sirotkin, D. Werner)

#### PAPERS IN PROGRESS (submitted, preprints, in preparation)

Papers and preprints are available on the author's website <http://www-users.math.umn.edu/~dbilyk/> and on the arxiv.

- *Random tessellations, restricted isometric embeddings, and one bit sensing*, 2017, submitted. (with M. Lacey)
- *On the  $p$ -frame energy on the sphere*, 2018, in preparation. (with A. Glazyrin, R. Matzke, O. Vlasiuk)
- *Stolarsky principle: interplay between discrepancy and optimal energy*, 2018, in preparation. (with R. Matzke and M. Skriganov)
- *Stolarsky principle on general metric spaces*, 2018, in preparation. (with O. Vlasiuk)
- *Estimates of the discrepancy function in exponential Orlicz spaces*, 2016, submitted. (with G. Amirkhanyan and M. Lacey)
- *On the small ball inequality*, in progress. (with N. Feldheim)

- *Littlewood conjecture and uniform distribution*, in progress. (with J. Pipher, C. Spencer)
- *On some sets with minimal  $L^2$  discrepancy*, in progress.
- *Lacunary sequences: Sidon's theorem and the Peres–Schlag method*, in progress.

## RECENT TALKS:

### 2020

- “Discreteness of minimizing measures”, Joint Mathematics Meeting, Denver, CO, Jan 2020.

### 2019

- “Discrete minimizers of energies on the sphere”, Tenth Discrete Geometry and Algebraic Combinatorics Conference, South Padre Island, TX, Sep 2019.
- “Discrepancy bounds and related questions”, Program “Equidistribution: Arithmetic, Computational and Probabilistic Aspects”, IMS, Singapore, May 2019.
- “Distributing points on a sphere”, Conference “Optimal Point Configurations and Potential Theory”, CIEM, Castro Urdiales, Spain, April 2019.
- “Energy minimization on the sphere”, Analysis seminar, Georgia Tech, Atlanta, GA, March 2019.
- “Energy optimization on the sphere”, AMS meeting, Auburn, AL, Mar 2019.

### 2018

- Tutorial talk “Discrepancy theory”, RICAM, Linz, Austria, Nov 2018.
- “Points on the sphere”, colloquium, Innsbruck University, Austria, Nov 2018.
- “Point distributions and harmonic analysis”, 4-lecture series, TU Graz, Austria, October 2018.
- “Discrepancy and energy optimization on the sphere”, 6th International Conference on Uniform Distribution Theory (UDT2018), CIRM, Luminy, France, Sep 2018.

- “Energy minimization on the sphere”, ICM 2018 Satellite Conference Harmonic Analysis, Federal University of Rio Grande do Sul, Porto Alegre, Brazil, July 24–29, 2018.
- Analysis seminar, Yale University, New Haven, CT, March 2018.
- Plenary talk “Point distributions on the sphere: energy minimization, discrepancy, and more”, 34th Southeastern Analysis Meeting (SEAM) conference, Georgia Tech, Atlanta, GA, March 2018.
- Analysis seminar, Brown University, Providence, RI, March 2018.
- invited talk “Point distributions on the sphere: energy minimization, discrepancy, and more”, workshop “Optimal and Random Point Configurations”, ICERM, Providence, RI, Feb 2018.
- “Discrepancy and energy minimization on the sphere”, ICERM graduate student/postdoc seminar, Feb 2018.

## 2017

- “On some problems of uniform distribution and energy minimization on the sphere”, invited talk, workshop “Discrepancy theory and quasi-Monte Carlo methods”, ESI, Vienna, Sep 2017.
- “Distributing points on the sphere”, probability seminar, UMN, Minneapolis, MN, Sep 2017.
- “Uniform distribution problems on the sphere”, invited talk, Vilnius Conference in Combinatorics and Number Theory, July 2017.
- “Various uniform distribution problems on the sphere”, invited talk, “Approximation Theory and Function Spaces”, CRM, Barcelona, Spain, June 2017.
- “Discrepancy and energy optimization on the sphere”, conference “Optimal point configurations and orthogonal polynomials 2017”, CIEM, Castro Urdiales, Spain, April 2017.
- “Discrepancy theory”, joint ANT & HA seminar, MSRI, Berkeley, CA, March 2017.
- “Geometric discrepancy theory”, colloquium talk, Indiana University, Bloomington, IN, Mar 2017.

- “Discrepancy and energy optimization (on the sphere)”, colloquium talk, Vanderbilt University, Nashville, TN, Feb 2017.

## 2016

- “Uniform tessellations of spheres by hyperplanes, almost isometric embeddings, one-bit sensing, and discrepancy”, Analysis/Probability seminar, University of Michigan, Ann Arbor, MI, Nov 2016.
- “Discrepancy and energy optimization on the sphere”, Analysis/Probability learning seminar, University of Michigan, Ann Arbor, MI, Nov 2016.
- “Lacunary Fourier series: from Weierstrass to our days”, Halloween talk for graduate students, University of Minnesota, Minneapolis, MN, Oct 2016.
- “Point Distributions on the Sphere, Almost Isometric Embeddings, One-Bit Sensing, and Energy Optimization”, 12th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, MCQMC 2016, Stanford University, Palo Alto, CA, Aug 2016.
- “Stolarsky-type identities, energy optimization, uniform tessellations, and one-bit sensing”, workshop “Optimal and Random Point Configurations: From Statistical Physics to Approximation Theory”, Institut Henri Poincaré, Paris, France, Jun-Jul 2016.
- “Points on a sphere: Stolarsky-type identities, energy optimization, uniform tessellations, and one-bit sensing”, workshop on Function Spaces and High-dimensional Approximation, CRM, Barcelona, Catalunya, May 2016.
- “Tessellations of the sphere, one-bit sensing, restricted isometries, and discrepancy”, AMS sectional meeting, Athens, GA, March 2016.
- “Geometric discrepancy”, AIM workshop “Hereditary discrepancy and factorization norms”, San Jose, CA, Feb 2016.
- “Introduction to research” seminar, University of Minnesota, Feb 2016.

## 2015

- “Methods of harmonic analysis in discrepancy theory” (four 1.5-hr lectures), Winter School on Complexity and Discrepancy, Traunkirchen, Austria, Nov-Dec 2015.



- “Small ball inequality and low discrepancy constructions”, ”Diophantine approximation and related topics” conference, Aarhus, Denmark, July 2015.
- “Small ball inequality and low discrepancy constructions”, Johannes-Kepler Universität, Linz, Austria, June 2015.
- “Sphere tessellations and discrepancy”, Information-based Complexity program, Banach Center, Bedlewo, Poland, April 2015.
- “Discrepancy theory and analysis”, Duke University, Durham, NC, February 2015.

## 2014

- “Discrepancy function estimates in various function spaces”, Analysis Seminar, Brown University, Providence, RI, November 2014.
- “The  $L^2$  discrepancy of Fibonacci (and other) lattices”, Program in “Minimal energy point sets, lattices, and designs”, Erwin Schrödinger Institute, Vienna, Austria, October 2014.
- Tutorial talk “Relationship of Discrepancy with harmonic analysis, approximation theory and probability”, ICERM, Brown University, Providence RI, October 2014.
- “Uniform distribution, lacunary Fourier series, and Riesz products”, Hausdorff Institute, Bonn, Germany, May 2014.
- “The  $L^1$  dichotomy for the discrepancy function estimates”, 11th International Conference on Monte-Carlo and Quasi-Monte Carlo Methods in Scientific Computing, MCQMC 2014, Leuven, Belgium, April 2014.
- “Simultaneous Diophantine approximation and lacunary Fourier series”, AMS Sectional Meeting, Albuquerque, NM, April 2014.

## 2013

- “On some distributions with low  $L^2$  discrepancy”, International conference “Nonlinear approximations and applications” dedicated to 60th birthday of V. Temlyakov, Steklov Institute, Moscow, Russia, October 29 - November 1, 2013.
- *Invited talk*, “Discrepancy theory and harmonic analysis”, workshop “Uniform distribution and quasi-Monte Carlo methods”, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, October 14-18, 2013.

- *Invited talk*, “Small ball inequalities and discrepancy”, Oberwolfach workshop “Uniform Distribution Theory and Applications”, Oberwolfach, Germany, September 29 - October 5, 2013
- *Invited talk*, “Discrepancy estimates, small ball inequalities, and hyperbolic cross approximations”, workshop “Discrepancy, Numerical Integration and Hyperbolic Cross Approximation”, Hausdorff Center for Mathematics, University of Bonn, September 23-27, 2013
- *Invited talk* “Discrepancy theory and harmonic analysis”, Palanga Conference in Combinatorics and Number Theory, Palanga, Lithuania September 1-7, 2013
- *Plenary lecture*, “Discrepancy theory and analysis”, Second International Conference “Mathematics in Armenia. Advances and Perspectives”, Tsaghkadzor, Armenia, August 24-31, 2013.
- *Simultaneous Diophantine approximation and rotated lattices*, Georgia Analysis Symposium, University of Georgia, Athens, GA, March 1-2, 2013.

## 2012

- *Discrepancy theory and the small ball inequality*, Analysis seminar, Charles University, Prague, Czech Republic, December 2012.
- *Discrepancy theory, harmonic analysis, and the small ball inequality*, Analysis seminar, Toulouse, France, November 2012.
- *Discrepancy theory and the small ball inequality*, Analysis seminar, Université Paris-Sud XI, Orsay, France, November 2012.
- *Geometric Discrepancy Theory and Analysis*, Analysis seminar, North Dakota State University, Fargo, ND, October 30, 2012.
- *Discrepancies with respect to various set systems*, AMS Fall Central Sectional Meeting, University of Akron, Akron, OH, October 20-21, 2012.
- *Harmonic analysis and irregularities of distribution*, Function spaces seminar, Beijing Normal University, Beijing, China, July 2012.
- *Small deviation probabilities and entropy estimates in mixed smoothness spaces*, Function spaces seminar, Beijing Normal University, Beijing, China, July 2012.
- *Recent results in discrepancy theory and the small ball inequality*, Function spaces seminar, Beijing Normal University, Beijing, China, July 2012.

- *Uniform distribution theory*, Graduate student seminar, Beijing Normal University, Beijing, China, July 2012.
- *Directional discrepancy*, 3rd International Conference on Uniform Distribution Theory (UDT2012), Congress Center of the Slovak Academy of Sciences, Smolenice, Slovakia June 25 - June 29, 2012.
- *Discrepancy theory and the small ball inequality*, Analysis seminar, Friedrich-Schiller-Universität, Jena, Germany, June 20, 2012.
- *The analysis of the van der Corput set*, Analysis seminar, University of Missouri, Columbia, MO, April 3, 2012.
- *Fourier analysis and uniform distribution*, Special Session in Harmonic Analysis and Applications, AMS Spring Central Section Meeting, Lawrence, KS, March 30–April 1, 2012.
- *Discrepancy theory*, joint Number Theory and Analysis seminar, Kansas State University, Manhattan, KS, March 29, 2012.
- *$L^2$  discrepancy and symmetrization*, 10th International Conference on Monte-Carlo and Quasi-Monte Carlo Methods in Scientific Computing, MCQMC 2012, Sydney, Australia, February 2012.
- *Small ball probabilities for the Brownian sheet, uniform distributions, and related problems*, Probability seminar, University of Minnesota, Minneapolis, MN, February 3, 2012.
- *Uniformly distributed sequences*, MathClub seminar, University of Minnesota, Minneapolis, MN, January 26, 2012.

## 2011

- *$L^2$  discrepancy and symmetrization*, ICREA Conference on Approximation Theory and Fourier Analysis, Centre de Recerca Matemàtica (CRM), Bellaterra, Barcelona, Spain, December 12-16, 2011
- *Harmonic Analysis Methods In Discrepancy Theory And Related Problems*, Analysis seminar, University of Wisconsin, Madison, WI, November 1, 2011.
- Colloquium talk *The small ball inequality in analysis, discrepancy, probability, and approximation theory*, University of Minnesota, Minneapolis, MN, September 22, 2011.

- *Low-discrepancy sets and harmonic analysis*, International Conference “Harmonic Analysis and Approximations V”, Tsaghkadzor, Armenia, September 10-17, 2011.
- *Discrepancy and Fourier analysis*, 8th International ISAAC Congress 2011, Moscow, Russia, August 22-27, 2011.
- *Low-discrepancy sets and harmonic analysis*, conference “Complex analysis and its applications” devoted to the 70th anniversary of A.F.Grishin, Kharkiv, Ukraine, August 15-18, 2011.
- *Cubature formulas, low-discrepancy sets, and harmonic analysis*, Approximation Theory and Harmonic Analysis Workshop, Kennesaw State University, Kennesaw, GA, May 14-15, 2011.
- Colloquium talk *Irregularities of distribution and small ball probabilities*, Purdue University, West Lafayette, IN, March 23, 2011.
- *On the small ball inequality in harmonic analysis, probability, approximation theory, and irregularities of distribution*, Measure Theory seminar, Kent State University, Kent, OH, February 15, 2011.
- Colloquium talk *Geometric Discrepancy Theory and Analysis*, Kent State University, Kent, OH, February 15, 2011.
- Colloquium talk *Analysis and Irregularities of Distribution*, Georgia State University, Atlanta, GA, February 2, 2011.
- Colloquium talk *Geometric Discrepancy Theory and Analysis*, University of Rochester, Rochester, NY, January 27, 2011.

# TEACHING

## TEACHING EXPERIENCE AND ACTIVITIES:

- University of Minnesota: Differential Equations and Applications, Calculus 2, Honors Analysis I & II, Numerical Methods II (evaluations: **5.38** out of 6), Graduate Real Analysis (evaluations: **5.83** out of 6), Honors Calculus II (evaluations: **5.13** out of 6), Graduate Harmonic Analysis (evaluations: **5.9** out of 6), Honors Calculus II (evaluations: **5.35** out of 6).
- Advising undergraduate mathematics majors (starting Fall 2013), participating in advisers meetings, committee on undergraduate mathematics scholarships.
- Advising a PhD student, several senior projects and honors theses.
- Teaching a reading course on harmonic analysis for PhD students, Spring 2017.
- Help running the Graduate Student PDE seminar.
- Preparing and grading the Real Analysis Preliminary examination for PhD students (2013-2017).
- Serving on the Graduate Studies Committee, reviewing graduate school applications (2014-present).
- Serving on the curriculum committee (University of Minnesota, 2012-2013), meeting with graduate directors of schools of Economics, Statistics, Biostatistics to discuss the service courses of the mathematical curriculum.
- Giving talks aimed at undergraduate and graduate students:
  - ◊ Lecture course at the Santaló summer school, Santander, Spain, Jul 2020.
  - ◊ “Discrepancy theory”, introductory workshop tutorial (3 hrs), Johann Radon Institute for Computational and Applied Mathematics, Linz, Austria, Nov 2018.
  - ◊ Mini-series “Harmonic analysis and discrete geometry”, 4 two-hour lectures for graduate students and postdocs, Technische Universität Graz, Austria, Oct 2018.
  - ◊ “Discrepancy and energy minimization on the sphere”, ICERM graduate student/postdoc seminar, Feb 2018.
  - ◊ “Lacunary Fourier series: from Weierstrass to our days”, Halloween talk for graduate students, University of Minnesota, Oct 2016.
  - ◊ “Introduction to research” seminar, University of Minnesota, Feb 2016.
  - ◊ “Methods of harmonic analysis in discrepancy theory” (four 1.5-hr lectures), Winter School on Complexity and Discrepancy, Traunkirchen, Austria, Nov-Dec 2015.
  - ◊ Tutorial talk “Relationship of Discrepancy with harmonic analysis, approximation

theory and probability”, ICERM, Brown University, Providence RI, October 2014.

◇ “Uniform distribution theory”, Graduate student seminar, Beijing Normal University, Beijing, China, July 2012

◇ “Uniformly distributed sequences”, *Math Club undergraduate seminar*, University of Minnesota, Minneapolis, MN, January 26, 2012

◇ “Discrepancy and Numerical Integration”, *addendum to the graduate class on Numerical Integration*, University of South Carolina, April 2010

◇ “The Discrepancy Theory: Classical and New results” *Research Horizons graduate student seminar*, Georgia Tech, April 2007

- University of South Carolina: Graduate Complex Analysis (evaluations: **4.71** out of 5), Calculus 1 (evaluations: **4.76** & **4.78**), Calculus 2 (evaluations: **4.28** & **4.53** out of 5), Vector Analysis (evaluations: **4.64** out of 5), Undergraduate Fourier Analysis and Wavelets (evaluations: **4.45** out of 5), Differential Equations and Applications (evaluations: **4.6** out of 5).
- Advising undergraduate mathematics majors, serving as the faculty advisor of Pi Mu Epsilon and Gamecock Math Club: in charge of organizing the meetings, Sudoku contest night, public lectures, Graduate school information night etc.
- Organization and preparation of the High School Math Contest, University of South Carolina, 2010-2011:
  - ◇ Chaired the committee in charge of preparing the written test.
  - ◇ Judging and proctoring.
  - ◇ Presenting solutions to high school teachers.
- Georgia Institute of Technology: Calculus 2, Calculus 3, Analysis 1, Analysis 2
  - ◇ Average evaluations: **4.67** out of 5
  - ◇ “*Thank a Teacher*” Award, Spring 2006.
- University of Missouri-Columbia: College Algebra, Elements of Calculus, Calculus for Business Students, Finite Mathematics, Advanced Calculus
  - ◇ “*Green Chalk*” Teaching Award, Spring 2004.
- Teaching mathematical clubs for middle school and high school students. Organizing, mentoring, and judging various mathematical competitions for high school students. (Kharkiv, Ukraine, 1996-2001)

# MENTORING ACTIVITY

## Advised:

- Advising a PhD student, Ryan Matzke (started Fall 2015, PhD expected 2020).  
– 2 joint papers, 2 in preparation.
- Senior thesis: Xiaoyang Ji (2012); Yaoling Wang, Anton Okhrimchuk (honors) (2014); Da Teng (2015); Mohamed Boujnah (2018).
- Ranil Wanigasiri (University of South Carolina, MA in Mathematics, 2010)  
– Master’s thesis “Interpolation of entire functions by integer points”
- Serving as a faculty academic advisor for undergraduate mathematics majors (UMN 2013-present; USC 2009-2011)

## Mentored the work and collaborated with the following graduate students:

- Oleksandr Vlasiuk (Vanderbilt, PhD expected in August 2018)  
– collaborated during the ICERM program, 2 joint papers submitted.
- Graduate reading course (Spring '17: G. Dorpalen-Barry, R. Matzke, E. Stucky)
- Gagik Amirkhanyan (Georgia Tech, PhD 2014)  
– 2 joint papers; served on Amirkhanyan’s PhD committee.
- Lev Markhasin (Friedrich-Schiller-Universität, Jena, Germany, PhD 2013)  
– 1 joint paper, served on Markhasin’s PhD committee.
- Rui Yu (University of South Carolina, PhD 2012)  
– 2 joint papers; serving on Yu’s PhD committee
- Xiaomin Ma (Brown University, PhD 2011)  
– 2 joint papers.
- Armen Vagharshakyan (Georgia Tech, PhD 2010; subsequently a postdoc at Brown and Kent State)  
– 4 joint papers; served on Vagharshakyan’s PhD committee
- Served on other PhD defense and oral exam committees:  
Florian Puchhammer (JKU Linz, PhD 2017), Dallas Albritton (UMN, 2017),  
Sam Stewart (UMN, 2018), Bruno Poggi (UMN, 2018)

## Postdoctoral mentoring:

- Naomi Feldheim (IMA postdoc, 2014-15; PhD Tel-Aviv University, 2014; 2015-17 NSF postdoc at Stanford)
  - 1 joint paper, 1 in preparation.

# SERVICE

## CONFERENCES ORGANIZED:

- Co-organizer of the workshop “Harmonic Analysis and related topics” in honor of Michael Lacey’s birthday, CRM Barcelona, May 2020.
- Co-organizer of the conference “Analysis in Missouri: a Midwestern Symposium”, Columbia, MO, Sep 2019
- Co-organizer of the Dagstuhl Seminar on “Algorithms and Complexity for Continuous Problems”, Dagstuhl, Germany, August 2019.
- Co-organizer of the workshop “Approximation, sampling, and compression in high dimensional problems” in the framework of the “Approximation, sampling and compression in data science” at the Isaac Newton Institute, Cambridge, UK, Spring 2019.
- Co-organizer of the workshop in discrepancy theory in the framework of a semester program at the Johannes-Kepler-Universität Linz, Austria, Fall 2018.
- Member of the scientific committee of the 12th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing (MC-QMC 2016), Stanford, Aug 2016.
- Co-organizer of the Workshop in Discrepancy Theory in memory of Klaus Roth and Jiří Matoušek, Villa Cipresi, Varenna, Italy, June 2016.
- Co-organizer of the CRM Research Program “Classical and Modern Aspects of Constructive Approximation and Harmonic Analysis”, CRM, Barcelona, Spain, Spring-Summer 2016.
- ICERM Semester Program on “High-dimensional Approximation”, ICERM, Brown University, Providence, RI, September 8 - December 5, 2014
  - ◊ Member of the organizing committee of the Semester Program
  - ◊ Organizer of the workshop “Discrepancy Theory”



- Special MAA Invited Paper Session on “Uniform Distribution, Discrepancy, and Related Field” at the Joint AMS-MAA Meeting, Baltimore, MD, 2014.
- Member of the organizing committee of the 16th-19th, Rivière–Fabes Symposia on Analysis and PDE, University of Minnesota, 2013-present.
- SQuaREs Research in Groups Program, American Institute of Mathematics, Palo Alto, CA, May 2010, May 2011, October 2012. (with J. Pipher, X. Ma, W. Chen, C. Spencer, A. Vagharshakyan)
- Special Session on *Harmonic Analysis and Applications* at the 2011 Southeastern Sectional Meeting #1068, Georgia Southern University, Statesboro, GA, March 12-13, 2011. (with A. Stokolos, L. DeCarli, B. Wick)
  - ◊ Co-edited the proceedings volume “Recent Advances in Harmonic Analysis and Applications: In Honor of Konstantin Oskolkov” (Springer Proceedings in Mathematics & Statistics), Springer Verlag, 2013 (editors: D. Bilyk, L. De Carli, A. Petukhov, A. Stokolos, and B. Wick)
- Mini-conference “Analysis: connections and applications”, University of South Carolina, Columbia, SC, April 26-27, 2011
  - talks accessible to graduate students from various areas of mathematics
  - attracted 5 prominent outside speakers
- Special Session on *Harmonic Analysis* at the 2010 Fall Eastern Sectional Meeting #1062, Syracuse University, Syracuse, NY, October 2–3, 2010. (with S. Mayboroda)
- 26th Southeastern Analysis Meeting, Georgia Institute of Technology, Atlanta, GA, March 25-28, 2010 (with B. Wick, M. Lacey)
- Mini-conference on Harmonic Analysis, University of South Carolina, Columbia, SC, February 12, 2010

## COMMITTEES:

### University of Minnesota:

- *Hiring committee* (2016-2017, 2019-2020)
- *Graduate Studies committee* (2013-2017)
- *Graduate Preliminary Exam committee* (2015-2017)
- *Curriculum committee*: working on mathematical curriculum, consulting with the DGAs of other departments (2012-13)

- *Dunham–Jackson (postdoctoral) committee* (2015–2017)
- *Rivière–Fabes Symposium committee* (2012–present)
- *Academic advising: meetings of undergraduate advisers and staff, committee on undergraduate mathematics scholarships* (2013–present)

University of South Carolina:

- *Events committee:* organizing and coordinating departmental events (2009–11)
- *Pi Mu Epsilon/Gamecock math club committee:* faculty advisor, working with undergraduates, organizing mathematical events for students (2009–11)
- *High School Math Contest committee:* chaired the committee in charge of preparing the problems for the written test; actively participated in judging, proctoring; presented solutions to high school teachers (2010–11)
- *Qualifying exam committee:* chaired the committee in charge of grading the qualifying exam (Jan 2011)

**OTHER SERVICE ACTIVITIES:**

- Serving as a moderator for math.CA (classical analysis) on *arxiv.org* since 2014.
- Editor: Proceedings of AMS (since 2020), Journal of Complexity (since 2019).
- Refereeing: Israel Journal of mathematics, Proceedings of AMS, Transactions of AMS, Constructive Approximation, Acta Arithmetica, Mathematika, Journal of Mathematical Analysis and Applications, Journal of Complexity, Uniform Distribution Theory, Springer Proceedings in Mathematics, SIAM Journal on Discrete Mathematics, Monatshefte für Mathematik, Austrian Science Fund etc.
- Chaired the PDE Seminar (Fall 2012, University of Minnesota)
- Took an active part in running Analysis/PDE seminars: attended, gave talks, brought outside speakers (University of Missouri, Georgia Tech, University of South Carolina, University of Minnesota)
- Academic advising of undergraduate mathematics majors on the mathematical curriculum (University of Minnesota, Fall 2013–present; University of South Carolina, 2009–2011)
- Served as a Faculty Judge for graduate student presentations in the Graduate Student Day (University of South Carolina, April 2, 2010)
- Organized and sponsored trips of graduate students to various conferences.