

# Svitlana Mayboroda

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ETH Zürich  
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URL: <http://www.math.umn.edu/~svitlana>

Born: June 2, 1981 – Kharkiv, Ukraine

## Academic Degrees:

- 2005 **PhD** degree in Mathematics, University of Missouri at Columbia, USA, May 2005. Thesis advisor Professor Marius Mitrea. Thesis title “The Poisson Problem in Lipschitz Domains”.
- 2001 Full Higher Education in the specialty Applied Mathematics (equivalent to **MS**), Kharkiv National University, Ukraine, June 2001.
- 2001 Full Higher Education in the specialty Finance (equivalent to **MBA**), KISP, Ukraine, September 2001.

## Academic Positions:

- 2023– Professor of Mathematics, ETH Zurich, Switzerland
- 2020– McKnight Presidential Professor, University of Minnesota, USA
- 2016–2020 Northrop Professor, University of Minnesota, USA
- 2015– Full Professor, University of Minnesota, USA
- 2011–2015 Associate Professor, University of Minnesota, USA
- 2008–2011 Assistant Professor (promoted to Associate Professor from August 2011), Purdue University, USA
- 2007 Visiting Assistant Professor, Brown University, USA
- 2006–2008 Zassenhaus Visiting Assistant Professor, The Ohio State University, USA
- 2005 Visiting Assistant Professor, Australian National University, Australia

## Research Interests:

### PARTIAL DIFFERENTIAL EQUATIONS:

second and higher order elliptic differential equations and systems in non-smooth media, boundary value problems, regularity, potential theory, spectral theory, wave propagation and localization of the eigenmodes in rough domains, free boundary problems, harmonic/elliptic measure.

### ANALYSIS:

harmonic analysis, singular integral operators, maximal functions, function spaces, wavelet and atomic decompositions, interpolation, functional calculus of differential operators, operator theory.

#### GEOMETRIC MEASURE THEORY:

geometry of rough domains, non-linear capacity, rectifiability, Analysis and PDEs on uniformly rectifiable sets, harmonic measure, regularity of free boundaries.

#### PHYSICS:

influence of rough geometry and/or material on properties of a physical system, localization of waves in acoustics, plate vibration, Anderson localization, quantum physics, systems of cold atoms.

#### ENGINEERING:

analysis and design of GaN light emitting devices, the impact of disorder in nitride alloy materials on localization of carriers in quantum wells, radiative efficiency, Auger recombination, quantum droop, on performance of LEDs and lasers.

### Current membership in professional organizations:

Society for Industrial and Applied Mathematics  
American Mathematical Society  
Association for Women in Mathematics

### Grants, awards, and honors:

2023 Stein Prize for New Perspectives in Analysis, 2023  
2023 US Blavatnik National Award, 2023  
2023 Distinguished Alumni Award, University of Missouri, 2023  
2022 Simons Collaborations in MPS, Director of Collaboration, 2018–2022, renewed for 2022–2025, \$14,000,000  
2021 Von Neumann Fellowship, IAS, 2021  
2020 McKnight Presidential Professor, University of Minnesota  
2020 Main lecturer of the CBMS lecture series, Florida State University, NSF DMS 1933361  
2019 Kirk Distinguished Fellowship at the Isaac Newton Institute for Mathematical Sciences, Cambridge, UK  
2018 NSF RAISE-TAQS: The Hidden Structure of the Disorder in Quantum Systems, lead PI, \$1,000,000  
2018 speaker at the ICM 2018  
2018 NSF DMS 1764430, Research Term on Real Harmonic Analysis and Its Applications to Partial Differential Equations and Geometric Measure Theory, PI, \$26,410  
2017 Von Neumann Fellowship, IAS, 2018  
2017 Simons Foundation, Simons Fellowship in Mathematical Sciences, PI, 2017–2018, \$110,000  
2016 Northrop Professor, University of Minnesota  
2016 Ecole Polytechnique, 2016, chercheur invité, 3 months  
2016 NSF, The Nineteenth Rivière-Fabes Symposium, PI, 2016  
2015 Fellow of the American Mathematical Society  
2015 NSF, The Eighteenth Rivière-Fabes Symposium, co-PI, 2015  
2015 Fondation Jacques Hadamard Fellowship, 2015  
2014 AWM-Sadosky Prize in Analysis, 2014  
2014 Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) Award, 2014–2019, \$800,000.00, “INSPIRE Track 1:” *Localization: analysis, control, and design of waves in inhomogeneous media.*  
2014 NSF, The Seventeenth Rivière-Fabes Symposium, co-PI, 2014.  
2013 Ecole Polytechnique, 2013, chercheur invité, 2 months

- 2011 NSF Faculty Early Career Development (CAREER) Award, 2011–2016, \$410,000.00, *CAREER: Analysis of Partial Differential Equations in non-smooth media*,
- 2013 CNRS, Projets Exploratoires Pluridisciplinaires (PEPS 2013), Physique Théorique et ses Interfaces, “*Théorie géométrico-analytique de la localisation*”, collaborator, 2013.
- 2013 NSF DMS 1304998, The Sixteenth Rivière-Fabes Symposium, co-PI, 2013.
- 2012 CNRS, 2012, chercheur invité, 3 mois
- 2012 CNRS, Projets Exploratoires Pluridisciplinaires (PEPS 2012), Physique Théorique et ses Interfaces, “*Théorie géométrique de la localisation*”, collaborator, 2012.
- 2012 NSF MRSEC (Materials Research Science and Engineering Center) Seed, MRSEC III Award DMR 0819885, 2011-2014. The project was chosen for NSF MRSEC Seed highlights in 2012.
- 2010 Alfred P. Sloan Research Fellowship, 2010–2015, \$50,000.00.
- 2010 Farman Project, ENS Cachan, France, collaborator, January-December 2010.
- 2008 NSF Grant DMS 0758500 (individual disciplinary grant, Analysis program), 2008–2011, *Elliptic Boundary Value Problems, Harmonic Analysis and Spectral Theory*,
- 2007 The Association for Women in Mathematics, Travel Grant, Summer 2007.
- 2001 Degree with Honors, Kharkiv National University, Ukraine, June 2001.
- 1997 Honors Fellowship, Kharkiv National University, Ukraine, September 1997- June 1999.

### Currently active funding:

- 2018–2025 Simons Collaborations in MPS, Director of Collaboration, 2018–2022, renewed for 2022–2025, \$14,000,000
- 2018–2022 NSF RAISE-TAQS: The Hidden Structure of the Disorder in Quantum Systems, lead PI, \$1,000,000

### Publications

#### 10 MOST IMPORTANT PUBLICATIONS:

- 2020 *Square functions, non-tangential limits and harmonic measure in co-dimensions larger than one* (with Guy David and Max Engelstein), *Duke Mathematical Journal*, 170, 455-501, (2021), DOI:10.1215/00127094-2020-0048, <https://arxiv.org/pdf/1808.08882.pdf>.
- 2019 *The effect of disorder and irregularities on solutions to boundary value problems and spectra of differential operators*, *Proceedings of the International Congress of Mathematicians–Rio de Janeiro 2018*, 3, 1691–1712 (2018), DOI:10.1142/9789813272880-0113
- 2018 *Polyharmonic capacity and Wiener test of higher order* (with Vladimir Maz’ya), *Inventiones Mathematicae*, 211, 779, DOI: 10.1007/s00222-017-0756-y.
- 2016 *The effective confining potential of quantum states in disordered media* (with Doug Arnold, Guy David, Marcel Filoche, and David Jerison), *Physical Review Letters*, 116 (2016), 056602, DOI: 10.1103/PhysRevLett.116.056602.
- 2016 *Rectifiability of harmonic measure* (with Jonas Azzam, Steve Hofmann, José María Martell, Mihalis Mourgoglou, Xavier Tolsa, and Alexander Volberg), *Geometric and Functional Analysis (GAFA)*, 26, 703-728, DOI: 10.1007/s00039-016-0371-x.
- 2016 *Uniform Rectifiability, Carleson measure estimates, and approximation of harmonic functions*, (with Steve Hofmann and Jose Maria Martell), *Duke Math. J.*, 165, 12, 2331-2389, DOI: 10.1215/00127094-3477128.
- 2015 *Square function/non-tangential maximal function estimates and the Dirichlet problem for non-symmetric elliptic operators* (with Steve Hofmann, Carlos Kenig, and Jill Pipher), *Journal of the American Mathematical Society*, 28, 2, 483–529.

- 2014 *Regularity of solutions to the polyharmonic equation in general domains* (with Vladimir Maz'ya), *Inventiones Mathematicae*, 196, 1, 1–68.  
<http://dx.doi.org/10.1007/s00222-013-0464-1>.
- 2012 *Universal mechanism for Anderson and weak localization* (with Marcel Filoche), *Proceedings of the National Academy of Sciences*, 2012 109 (37) 14761–14766; published ahead of print August 27, 2012, doi:10.1073/pnas.1120432109
- 2009 *Boundedness of the gradient of a solution and Wiener test of order one for the biharmonic equation* (with Vladimir Maz'ya), *Inventiones Mathematicae*, 175, 2, 287–334.

PUBLISHED AND IN PRESS:

- 2024 *Non-local distance functions and geometric regularity* (with Max Engelstein and Cole Jeznach), *Advances in Mathematics*, accepted, arXiv:2208.07342
- 2024 *Critical Perturbations for Second Order Elliptic Operators. Part II: Non-tangential maximal function estimates* (with Simon Bortz, Steve Hofmann, José Luis Luna Garcia, Bruno Poggi), *Archive for Rational Mechanics and Analysis*, accepted, <https://arxiv.org/abs/2302.02746>
- 2024 *The Anderson mobility edge as a percolation transition*, (Marcel Filoche, Pierre Pelletier, Dominique Delande, Svitlana Mayboroda), *Physical Review B*, accepted, <http://arxiv.org/abs/2309.03813>
- 2024 *The landscape function on  $\mathbf{R}^d$*  (with G. David and A. Gloria), *Les Annales de la Faculté des Sciences de Toulouse*, accepted, <https://arxiv.org/abs/2307.11182>
- 2023 *Green functions and smooth distances* (with Joseph Feneuil and Linhan Li), *Math. Ann.*, published, DOI: 10.1007/s00208-023-02715-6, arXiv:2211.05318.
- 2023 *Transference of scale-invariant estimates from Lipschitz to Non-tangentially accessible to Uniformly rectifiable domains* (with Steve Hofmann, José María Martell), *Analysis & PDE*, published, DOI: 10.1090/tran/9004, <https://arxiv.org/abs/1904.13116>.
- 2023 *Small  $A_\infty$  results for Dahlberg-Kenig-Pipher operators in sets with uniformly rectifiable boundaries* (with Guy David, Linhan Li), *Transactions of the AMS*, accepted, arXiv:2207.13602.
- 2023 *On an Effective Equation of the Reduced Hartree-Fock Theory* (with Ilias Chenn, Wei Wang, Shiwen Zhang), *Advanced Nonlinear Studies*, Special Issue in honor of David Jerison, 23, 1, DOI 10.1515/ans-2022-0070, <https://arxiv.org/abs/2106.13887>.
- 2023 *The Regularity problem in domains with lower dimensional boundaries* (with Zhanbing Dai and Joseph Feneuil), *Journal of Functional Analysis*, 284, 11, DOI:10.1016/j.jfa.2023.109903, arXiv:2208.00628.
- 2022 *Elliptic theory in domains with boundaries of mixed dimension*, (with Guy David and Joseph Feneuil), *Astérisque*, published, 442, DOI:10.24033/ast.1202, <https://arxiv.org/abs/2003.09037>.
- 2022 *Carleson Perturbations for the Regularity Problem* (with Zhanbing Dai, Joseph Feneuil), *Revista Matemática Iberoamericana*, DOI 10.4171/RMI/1401, arXiv:2203.07992.
- 2022 *Approximation of Green functions and domains with uniformly rectifiable boundaries of all dimensions* (with Guy David), *Adv. Math.*, 410 (A), 108717. DOI:10.1016/j.aim.2022.108717, <https://arxiv.org/pdf/2010.09793.pdf>.
- 2022 *The landscape law for tight binding Hamiltonians*, (with Douglas N. Arnold, Marcel Filoche, Wei Wang, Shiwen Zhang), *Communications in Mathematical Physics*, 396, 1339-1391, DOI:10.1007/s00220-022-04494-8, <https://arxiv.org/pdf/2101.03282.pdf>.
- 2022 *Carleson estimates for the Green function on domains with lower dimensional boundaries* (with Guy David and Linhan Li), *Journal of functional analysis*, 283, 5, 109553, DOI:10.1016/j.jfa.2022.109553, <http://arxiv.org/abs/2107.08101>.
- 2022 *Harmonic measure is absolutely continuous with respect to the Hausdorff measure on all low-dimensional uniformly rectifiable sets*, (with Guy David), *International Mathematics Research Notices*, 2023, 11, 9319-9426, DOI:10.1093/imrn/rnac109.
- 2022 *Wigner-Weyl description of light absorption in disordered semiconductor alloys using the localization landscape theory*, (with Jean-Philippe Banon, Pierre Pelletier, Claude Weisbuch, Marcel Filoche), *Phys. Rev. B*, 105, 125422, DOI: 10.1103/PhysRevB.105.125422.

- 2022 *Green function estimates on complements of low-dimensional uniformly rectifiable sets*, (with Guy David and Joseph Feneuil), *Math. Ann.*, 385, 1797–1821, DOI: 10.1007/s00208-022-02379-8.
- 2022 *Spectral functions and localization landscape theory in speckle potentials* (with P. Pelletier, D. Deland, V. Josse, A. Aspect, D. Arnold, M. Filoche), *Phys Rev A*, 105, 023314, DOI:10.1103/PhysRevA.105.023314, arXiv:2111.13155.
- 2021  *$L^p$  theory for the square roots and square functions of elliptic operators having a BMO anti-symmetric part* (with Steve Hofmann, Linhan Li, Jill Pipher), *Math. Z.* 301, 935–976, DOI:10.1007/s00209-021-02938-w, <https://arxiv.org/pdf/1908.01030.pdf>.
- 2021 *Elliptic Theory for Sets with Higher Co-Dimensional Boundaries* (with G. David and J. Feneuil), *Memoirs of the American Mathematical Society* 274, 1346. DOI: 10.1090/memo/1346.
- 2021 *Carleson measure estimates for the Green function* (with Guy David and Linhan Li), *Archive for Rational Mechanics and Analysis*, 243, 1525–1563, DOI: 10.1007/s00205-021-01746-0, <https://arxiv.org/pdf/2102.09592.pdf>, <https://link.springer.com/article/10.1007/s00205-021-01746-0>.
- 2021 *The landscape law for the integrated density of states* (with Guy David and Marcel Filoche), *Advances in Mathematics*, 390, 2021, 107946, DOI: 10.1016/j.aim.2021.107946, arXiv:1909.10558.
- 2021 *Sharp estimates for the integrated density of states in Anderson tight-binding models*, (with P. Desforges, S. Zhang, G. David, D. Arnold, W. Wang, M. Filoche), *Phys. Rev. A*, 104, 012207, DOI: 10.1103/PhysRevA.104.012207.
- 2021 *The Dirichlet problem for elliptic operators having a BMO anti-symmetric part*, (with Steve Hofmann, Linhan Li, Svitlana Mayboroda, Jill Pipher), *Math. Ann.*, 382, 103–168, DOI: 10.1007/s00208-021-02219-1, <https://arxiv.org/abs/1908.08587>.
- 2021 *Uniform rectifiability and elliptic operators satisfying a Carleson measure condition* (with Steve Hofmann, José María Martell, Svitlana Mayboroda, Tatiana Toro, Zihui Zhao), *Geom. Funct. Anal.* 31, 325–401, DOI: 10.1007/s00039-021-00566-4, <https://arxiv.org/pdf/2008.04834.pdf>.
- 2021 *Good elliptic operators on Cantor sets*, (with Guy David), *Advances in Mathematics*, 383, 2021, 107687, DOI: 10.1016/j.aim.2021.107687.
- 2021 *The effective potential of an  $M$ -matrix*, (with Marcel Filoche and Terence Tao), *Journal of Mathematical Physics*, 62, 041902 DOI: 10.1063/5.0042629.
- 2021 *Carleson perturbations of elliptic operators on domains with low dimensional boundaries* (with Bruno Poggi), *Journal of Functional Analysis*, 280, 8, 2021, 108930, DOI: 10.1016/j.jfa.2021.108930.
- 2021 *Dirichlet problem in domains with lower dimensional boundaries* (with Joseph Feneuil and Zihui Zhao), *Revista Matemática Iberoamericana*, 37, 3, 2021, 821–910. DOI: 10.4171/rmi/1208, <https://arxiv.org/pdf/1810.06805.pdf>.
- 2021 *Critical Perturbations for Second Order Elliptic Operators. Part I: Square function bounds for layer potentials* (with S. Bortz, S. Hofmann, J. L. Luna Garcia, and B. Poggi), *Analysis & PDE*, 15, 5, 1215–1286, DOI: 10.2140/apde.2022.15.1215, <https://arxiv.org/abs/2003.02703>.
- 2021 *Square functions, non-tangential limits and harmonic measure in co-dimensions larger than one* (with Guy David and Max Engelstein), *Duke Math. J.* 170 3, 455–501, DOI: 10.1215/00127094-2020-0048, <https://arxiv.org/pdf/1808.08882.pdf>.
- 2021 *Elliptic theory for sets with higher co-dimensional boundaries* (with Guy David and Joseph Feneuil), *Memoirs of the AMS*, 274, 1346. DOI: 10.1090/memo/1346.
- 2020 *Reply to comment by Comtet and Texier*, (with Douglas Arnold, Guy David, Marcel Filoche, David Jerison), *Physical Review Letters*, 124, 219702, Published 28 May 2020.
- 2020 *Nontangential estimates on layer potentials and the Neumann problem for higher order elliptic equations* (with Ariel Barton and Steve Hofmann), *International Mathematics Research Notices*, 2021, 23, 18300–18366, DOI: 10.1093/imrn/rnaa051, <https://arxiv.org/pdf/1808.07137.pdf>.
- 2019 *The effect of disorder and irregularities on solutions to boundary value problems and spectra of differential operators*, *Proceedings of the International Congress of Mathematicians–Rio de Janeiro 2018*. Vol. III. Invited lectures, 1691–1712, World Sci. Publ., Hackensack, NJ, 2018.
- 2019 *Universality of fold-encoded localized vibrations in enzymes* (with Yann Chalopin, Francesco Piazza, Claude Weisbuch, and Marcel Filoche), *Scientific Reports*, 9, 12835 (2019).

<https://doi.org/10.1038/s41598-019-48905-8>

- 2019 *Bounds on layer potentials with rough inputs for higher order elliptic equations* (with Ariel Barton and Steve Hofmann), *Proc. Lond. Math. Soc.* (3) 119 (2019), no. 3, 613–653.
- 2019 *Dahlberg’s theorem in higher co-dimension* (with Guy David and Joseph Feneuil), *J. Funct. Anal.* 276 (2019), no. 9, 2731–2820.
- 2019 *Dirichlet and Neumann boundary values of solutions to higher order elliptic equations* (with Ariel Barton and Steve Hofmann), *Annales de l’Institut Fourier*, 69 (2019), no. 4, 1627–1678.
- 2019 *Square function estimates, BMO Dirichlet problem, and absolute continuity of harmonic measure on lower-dimensional sets* (with Zihui Zhao), *Analysis & PDE*, 12 (2019), no. 7, 1843–1890.
- 2019 *Exponential decay estimates for fundamental solutions of Schrödinger-type operators* (with Bruno Poggi), *Transactions of the AMS*, 372 (2019), no. 6, 4313–4357.
- 2019 *Localization of eigenfunctions via an effective potential* (with Douglas Arnold, Guy David, Marcel Filoche, David Jerison), *Communications in Partial Differential Equations* 44 (2019), no. 11, 1186–1216.
- 2019 *A new elliptic measure on lower dimensional sets* (with Guy David and Joseph Feneuil), *Acta Math. Sin. (Engl. Ser.)*, the special issue in honor of the 65th birthday of Professor Carlos Kenig, 35 (2019), no. 6, 876–902.
- 2019 *Computing spectra without solving eigenvalue problems* (with Douglas Arnold, Guy David, Marcel Filoche, David Jerison), *SIAM J. Sci. Comput.* 41 (2019), no. 1, B69–B92.
- 2018 *Polyharmonic capacity and Wiener test of higher order* (with Vladimir Maz’ya), *Inventiones Mathematicae*, (2018) 211: 779. <https://doi.org/10.1007/s00222-017-0756-y>
- 2018 *Fundamental Matrices and Green Matrices for non-homogeneous elliptic systems* (with Blair Davey and Jonathan Hill), *Publicacions Matemàtiques*, Volume 62, Number 2 (2018), 537–614.
- 2018 *The Neumann problem for higher order elliptic equations with symmetric coefficients* (with Ariel Barton and Steve Hofmann), *Math. Ann.*, (2018) 371: 297. <https://doi.org/10.1007/s00208-017-1606-3>
- 2017 *Localization landscape theory of disorder in semiconductors III: Application to carrier transport and recombination in light emitting diodes*, (with Chi-Kang Li, Marco Piccardo, Li-Shuo Lu, Lucio Martinelli, Jacques Peretti, James S. Speck, Claude Weisbuch, Marcel Filoche, Yuh-Renn Wu), *Phys. Rev. B*, 95, 144206 (2017)
- 2017 *Localization landscape theory of disorder in semiconductors I: Theory and modeling* (with Marcel Filoche, Marco Piccardo, Yuh-Renn Wu, Chi-Kang Li, Claude Weisbuch), *Phys. Rev. B*, 95, 144204 (2017).
- 2017 *A free boundary problem for the localization of eigenfunctions* (with Guy David, Marcel Filoche, David Jerison), a monograph, *Astérisque*, 392 (2017), 203 pages
- 2017 *Square function estimates on layer potentials for higher-order elliptic equations* (with Ariel Barton and Steve Hofmann), *Mathematische Nachrichten*, 290: 2459–2511. doi:10.1002/mana.201600116
- 2017 *Local Hardy spaces associated with inhomogeneous higher order elliptic operators* (with Dachun Yang and Jun Cao), *Anal. Appl. (Singap.)* 15 (2017), no. 2, 137–224.
- 2016 *Localization of eigenfunctions*, *Notices of the AMS*, April 2017, 341–342.
- 2016 *One single static measurement predicts wave localization in complex structures* (with Gautier Lefebvre, Alexane Gondel, Marc Dubois, Michael Atlan, Florian Feppon, Aimé Labbé, Camille Gillot, Alix Garelli, Maxence Ernoult, Marcel Filoche, Patrick Sebbah), *Physical Review Letters*, 117, 074301 (2016).
- 2016 *Higher-order elliptic equations in non-smooth domains: some old and new results* (with Ariel Barton), *Harmonic Analysis, Partial Differential Equations, Complex Analysis, Banach Spaces, and Operator Theory. Celebrating Cora Sadosky’s life. Volume 1.*
- 2016 *Rectifiability of harmonic measure* (with Jonas Azzam, Steve Hofmann, José María Martell, Mihalis Mourgoglou, Xavier Tolsa, and Alexander Volberg), *Geom. Funct. Anal.* 26 (2016), no. 3, 703–728. DOI: 10.1007/s00039-016-0371-x
- 2016 *Harmonic measure is rectifiable if it is absolutely continuous with respect to the co-dimension one Hausdorff measure* (with Jonas Azzam, Steve Hofmann, José María Martell, Mihalis Mourgoglou,

- Xavier Tolsa, and Alexander Volberg), C. R. Math. Acad. Sci. Paris 354 (2016), no. 4, 351–355.
- 2016 *The effective confining potential of quantum states in disordered media* (with Doug Arnold, Guy David, Marcel Filoche, and David Jerison), Physical Review Letters, 116 (2016), 056602.
- 2016 *Layer potentials and boundary-value problems for second order elliptic operators with data in Besov spaces* (with Ariel Barton), Mem. Amer. Math. Soc. 243 (2016), no. 1149, v+110 pp.
- 2016 *Uniform Rectifiability, Carleson measure estimates, and approximation of harmonic functions*, (with Steve Hofmann and Jose Maria Martell), Duke Math. J. 165 (2016), no. 12, 2331–2389.
- 2016 *Maximal function characterizations of Hardy spaces associated to homogeneous higher order elliptic operators* (with Dachun Yang and Jun Cao), Forum Math. 28 (2016), no. 5, 823–856.
- 2015 *Dual hidden landscapes in Anderson localization on discrete lattices* (with Marcel Filoche, Marcelo Lyra), Europhys. Lett. EPL, Volume 109, Number 4, *Editor's choice*.
- 2015  *$L^p$  and endpoint solvability results for divergence form elliptic equations with complex  $L^\infty$  coefficients* (with Steve Hofmann and Mihalis Mourgoglou), Advances in Mathematics, 270 (2015), 480–564.
- 2015 *The Regularity problem for second order elliptic operators with real non-symmetric coefficients* (with Steve Hofmann, Carlos Kenig, and Jill Pipher), Mathematische Annalen, 361 (2015), no. 3-4, 863–907.
- 2015 *Square function/non-tangential maximal function estimates and the Dirichlet problem for non-symmetric elliptic operators* (with Steve Hofmann, Carlos Kenig, and Jill Pipher), Journal of the American Mathematical Society, 28 (2015), no. 2, 483–529.  
<http://www.ams.org/journals/jams/0000-000-00/S0894-0347-2014-00805-5/S0894-0347-2014-00805-5.pdf>
- 2014 *Regularity of solutions to the polyharmonic equation in general domains* (with Vladimir Maz'ya), Inventiones Mathematicae, 196 (2014), no. 1, 1–68.  
<http://dx.doi.org/10.1007/s00222-013-0464-1>.
- 2014 *Uniform Rectifiability and Harmonic Measure III: Riesz transform bounds imply uniform rectifiability of boundaries of 1-sided NTA domains* (with Steve Hofmann and Jose Maria Martell), International Mathematics Research Notices, 2014, no. 10, 2702–2729. <http://dx.doi.org/10.1093/imrn/rnt002>.
- 2014 *Boundary-value problems for higher-order elliptic equations in non-smooth domains* (with Ariel Barton), Concrete operators, spectral theory, operators in harmonic analysis and approximation, 53–93, Oper. Theory Adv. Appl., 236, Birkhäuser Springer, Basel, 2014.
- 2013 *The Dirichlet problem for higher order equations in composition form* (with Ariel Barton), Journal of Functional Analysis, Volume 265, Issue 1, (2013), 49–107,  
<http://dx.doi.org/10.1016/j.jfa.2013.03.013>.
- 2013 *The landscape of Anderson localization in a disordered medium* (with Marcel Filoche), Contemporary Mathematics, 601 (2013), 113–121,  
<http://dx.doi.org/10.1090/conm/601/11916>.
- 2012 *Universal mechanism for Anderson and weak localization* (with Marcel Filoche), Proceedings of the National Academy of Sciences, 2012 109 (37) 14761–14766; published ahead of print August 27, 2012, doi:10.1073/pnas.1120432109
- 2012 *Localization of eigenfunctions of a one-dimensional elliptic operator* (with Marcel Filoche and Brandon Patterson), “Recent Advances in Harmonic Analysis and Partial Differential Equations”, Contemporary Mathematics, 581 (2012), 99–116,  
<http://dx.doi.org/10.1090/conm/581>
- 2011 *Second order elliptic operators with complex bounded measurable coefficients in  $L^p$ , Sobolev and Hardy spaces* (with Alan McIntosh and Steve Hofmann), Les Annales Scientifiques de l'École Normale Supérieure, Volume 44, fascicule 5 (2011), 723–800.
- 2010 *The connections between Dirichlet, Regularity and Neumann problems for second order elliptic operators with complex bounded measurable coefficients*, Advances in Mathematics 225 (2010), 1786–1819.
- 2009 *Boundedness of the gradient of a solution and Wiener test of order one for the biharmonic equation* (with Vladimir Maz'ya), Inventiones Mathematicae, 175 (2009), no. 2, 287–334.

- 2009 *Strong localization induced by one clamped point in thin plate vibrations* (with Marcel Filoche), *Physical Review Letters*, Volume: 103, Issue: 25, Article Number: 254301, (2009).
- 2009 *Finite square function implies integer dimension* (with Alexander Volberg), *Comptes Rendus - Mathématique* 347 (2009), pp. 1271–1276.
- 2009 *Hardy and BMO spaces associated to divergence form elliptic operators* (with Steve Hofmann), *Mathematische Annalen*, 344 (2009), no. 1, 37–116.
- 2009 *Boundedness of the square function and rectifiability* (with Alexander Volberg), *Comptes Rendus - Mathématique* 347 (2009), pp. 1051–1056.
- 2009 *Pointwise estimates for the polyharmonic Green function in general domains* (with Vladimir Maz'ya), Cialdea, Alberto (ed.) et al., *Analysis, partial differential equations and applications. The Vladimir Maz'ya anniversary volume. Selected papers of the international workshop, Rome, Italy, June 30–July 3, 2008*. Basel: Birkhäuser. *Operator Theory: Advances and Applications* 193, 143–158 (2009).
- 2008 *Boundedness of the Hessian of a biharmonic function in a convex domain* (with Vladimir Maz'ya), *Comm. Partial Differential Equations* 33 (2008), no. 7–9, 1439–1454.
- 2007 *Interpolation of Hardy-Sobolev-Besov-Triebel-Lizorkin spaces and applications to problems in partial differential equations* (with Nigel Kalton and Marius Mitrea), *Interpolation Theory and Applications, Contemporary Mathematics*, 445 (2007), 121–177.
- 2007 *The solution of the Chang-Krantz-Stein conjecture* (with Marius Mitrea), to appear in *Proceedings of the Workshop in Harmonic Analysis, Tokyo, Japan*.
- 2006 *The Poisson problem for the Lamé system on low-dimensional Lipschitz domains* (with Marius Mitrea), *Integral methods in science and engineering*, 137–160, Birkhauser Boston, Boston, MA, 2006.
- 2006 *Layer potentials and boundary value problems for Laplacian in Lipschitz domains with data in quasi-Banach Besov spaces* (with Marius Mitrea), *Annali di Matematica Pura ed Applicata* (4) 185 (2006), no. 2, 155–187.
- 2004 *Sharp estimates for Green potentials on non-smooth domains* (with Marius Mitrea), *Mathematical Research Letters*, 11 (2004), 481–492.
- 2004 *Square-function estimates for singular integrals and applications to partial differential equations* (with Marius Mitrea), *Differential Integral Equations*, 17 (2004), no. 7–8, 873–892.
- 2001 *On one approach to the solution of problems of numerical analysis of the electrostatic field*, *Collection of the scientific works of KISP, V. 6* (2001), 223–227.

## Students and postdoctoral researchers

### GRADUATE:

- 2024– Aaron Moser, ETHZ
- 2020– Cole Jeznach, University of Minnesota, ETHZ
- 2017–2023 Zanbing Dai, University of Minnesota
- 2015–2021 Bruno Poggi, University of Minnesota
- 2013–2017 Jonathan Hill, University of Minnesota
- 2015–2016 Eli Johnson, University of Minnesota
- 2009–2014 Koushik Ramachandran, Purdue University



#### POSTDOCTORAL:

2023– Vikram Giri, ETHZ  
2023– Jaume de Dios, ETHZ  
2022– Laura Shou, University of Minnesota  
2022– Stefano Decio, University of Minnesota, ETHZ  
2020–2022 Tomas Merchán Rodríguez, University of Minnesota  
2019–2022 Shiwen Zhang, University of Minnesota  
2019–2022 Linhan Li, University of Minnesota  
2018–2019 Guillermo Rey, University of Minnesota  
2016–2018 Simon Bortz, University of Minnesota  
2016–2017 Robert Viator, University of Minnesota and IMA  
2015–2018 Joseph Feneuil, University of Minnesota.  
2014–2015 Stephen Lewis, University of Minnesota.  
2013–2015 Blair Davey, University of Minnesota  
2010–2013 Ariel Barton, Purdue University and University of Minnesota.

#### UNDERGRADUATE RESEARCH:

2016–2017 Joseph Pate, University of Minnesota  
2016 Levi Walls, University of Minnesota  
2013 Ye Wang, University of Minnesota  
2012 Yaowen Gu, University of Minnesota  
2010–2011 Brandon Patterson, Purdue University  
2011 Landon Lehman, Purdue University

### Service and other synergistic activities:

#### CONFERENCES AND WORKSHOPS ORGANIZED:

2024 Annual meeting of Simons Collaboration on Wave Localization (with Marcel Filoche), February 2024  
2023 Annual meeting of Simons Collaboration on Wave Localization (with Marcel Filoche), February 2023  
2022 Wave Localization and Many-Body Localization in Quantum Information (with Marcel Filoche and Richard Friend), October 2022  
2022 Harmonic Analysis and PDE in Seoul (with Steve Hofmann, Nam-Gyu Kang, Seick Kim), May 2022  
2022 Annual meeting of Simons Collaboration on Wave Localization (with Marcel Filoche), February 2022  
2021 Research in Groups, Localization landscape for higher-energy modes and its relationship to Wigner-Weyl formalism, May 2021  
2020 Wave Localization Midscale Collaboration Meeting (with Doug Arnold and Marcel Filoche), May 2020  
2020 Annual meeting of Simons Collaboration on Wave Localization (with Marcel Filoche), February 2020  
2018 Start-up meeting of Simons Collaboration on Wave Localization (with Doug Arnold), September 2018  
2018 PCMI Summer School on Harmonic Analysis (with Carlos Kenig, Fanghua Lin, Tatiana Toro), July 2018  
2018 Trimester on Harmonic Analysis (with Simon Bortz and Jose-Maria Martell), ICMAT, Madrid, May 2018  
2017 MSRI program on Harmonic Analysis (with Michael Christ, Allan Greenleaf, Steven Hofmann,

- Michael Lacey, Betsy Stovall, Brian Street), January 17–May 26, 2017
- 2016 The Nineteenth Rivière-Fabes Symposium (lead organizer), University of Minnesota, April 15–17, 2016
- 2015 AIM SQuaRE program (with A. Barton, S. Hofmann, C. Kenig, and J. Pipher), American Institute of Mathematics, Palo Alto, CA, August 31–Sept 4, 2015.
- 2015 Institut Henri Poincaré, Research in Paris (with S. Hofmann, J.-M. Martell, X. Tolsa, A. Volberg), 15 June –15 July, 2015
- 2012–2016 Workshop for Women in Analysis and PDE, yearly in the Spring/Summer of 2012–2016  
*2012 edition:* May 30–June 2, 2012, at the Institute for Mathematics and its Applications, Minneapolis, MN, 47 participants,  
<http://www.ima.umn.edu/2011-2012/SW5.30-6.2.12/>  
*2015 edition:* May 22–25, 2015, at the Institute for Mathematics and its Applications, Minneapolis, MN  
<http://www.ima.umn.edu/2014-2015/SW5.28-31.15/>  
*2016 edition:* October 28–30, 2016, as a Special Session in the AMS Fall Central Sectional Meeting # 1123  
[http://www.ams.org/meetings/sectional/2239\\_program\\_ss24.html](http://www.ams.org/meetings/sectional/2239_program_ss24.html)
- 2015 Banff Research Station, Research in Teams, Localization of eigenfunctions of elliptic operators (with D. Arnold, G. David, M. Filoche, D. Jerison), April 2015
- 2015 The Eighteenth Rivière-Fabes Symposium & Spring 2015 Midwest PDE Conference, University of Minnesota, April 17–19, 2015
- 2014 The Seventeenth Rivière-Fabes Symposium, University of Minnesota, April 25–27, 2014
- 2014 AIM SQuaRE program (with A. Barton, S. Hofmann, and J. Pipher), American Institute of Mathematics, Palo Alto, CA, April 21–25, 2014.
- 2013 The Sixteenth Rivière-Fabes Symposium, University of Minnesota, April 19–21, 2013
- 2012 AIM SQuaRE program (with S. Hofmann, C. Kenig and J. Pipher), American Institute of Mathematics, Palo Alto, CA, August 27–31, 2012.
- 2011 Workshop “Weighted singular integral operators and Non-Homogeneous Harmonic Analysis” (with A. Volberg and M. Reguera), American Institute of Mathematics, Palo Alto, CA, tentatively October 10–14, 2011.
- 2011 Special Session on Harmonic Analysis and Partial Differential Equations at Joint Mathematics Meetings #1067 (with T. Toro), New Orleans, LA, January 6–9, 2011.
- 2010 Special Session on Harmonic Analysis at the 2010 Fall Eastern Sectional Meeting #1062 (with D. Bilyk), October 2–3, 2010, Syracuse University, Syracuse, NY.
- 2010 Research in Teams, Banff International Research Station, “Boundary problems for the second order elliptic equations with rough coefficients” (with S. Hofmann, C. Kenig and J. Pipher), April 18–25, 2010.

#### EDITORIAL WORK:

- 2020–2023 Editor for AMS Proceedings of Symposia in Applied Mathematics
- 2020– Associate Editor for Reviews for the Bulletin of the AMS Editorial Committee
- 2018–2023 Editor for the Transactions of the American Mathematical Society
- 2018–2023 Editor for the Memoirs of the American Mathematical Society
- 2018– Editor for *Mathematika*
- 2015–2019 Editor for the Proceedings of the American Mathematical Society
- 2017–2019 Editor for the Potential Analysis

#### SCIENTIFIC FUNDING

- 2023 Simons Foundation Simons Investigator Award Program reviewer
- 2012–2022 Served on an NSF panel (2012, 2013, 2014, 2016, 2017, 2018, 2019, 2021, 2022)

2021 ANR grant reviewer  
 2019 ERC grant reviewer  
 2017 Simons foundation Collaboration Grants Program reviewer

#### SCIENTIFIC ADVISORY BOARDS

2023– Scientific Advisory Board of the Max Planck Institute for Mathematics in the Sciences in Leipzig, Germany  
 2023– Advisory Board of the Institute for Theoretical Studies at the ETH Zurich  
 2023– Science Advisory Board of the Institute of Pure and Applied Mathematics (IPAM)

#### SERVICE TO THE UNIVERSITY AND THE DEPARTMENT:

2021–2022 Executive Committee; Ordway Professor Search Committee; PhD Admissions Committee  
 2020–2021 Endowed Chairs and Professors Committee; Rivière-Fabes Symposium organizing committee; Awards Committee  
 2019–2020 Ordway Search Committee; Rivière-Fabes Symposium organizing committee  
 2018–2019 Faculty Search Committee; Dunham Jackson Postdoc Search Committee; Rivière-Fabes Symposium organizing committee  
 2016–2017 College of Science & Engineering Consultative Committee; Awards Committee  
 2015–2016 College of Science & Engineering Dean Search Committee; College of Science & Engineering Consultative Committee, Faculty Search Committee; Rivière-Fabes Symposium organizing committee; Visitor Program Committee  
 2014–2015 Dunham Jackson Postdoc Search Committee; Rivière-Fabes Symposium organizing committee; Ordway Visitor Committee  
 2013–2014 Faculty Search Committee; Rivière-Fabes Symposium organizing committee; Visitor Program Committee  
 2012–2013 Graduate Studies Committee; Rivière-Fabes Symposium organizing committee; Ordway Visitor Committee

## Teaching Experience

2013 *Elliptic PDEs*, graduate, Fall 2024, ETHZ.  
 2019 *Elementary Partial Differential Equations*, undergraduate, Fall 2019, University of Minnesota.  
 2015 *Elementary Partial Differential Equations*, undergraduate, Fall 2015, University of Minnesota.  
 2014 *Real Analysis*, graduate, Fall 2014, University of Minnesota.  
 2014 *Theory of Partial Differential Equations – II*, graduate, Spring 2014, University of Minnesota.  
 2013 *Linear Algebra and Differential Equations*, undergraduate, Spring 2013, University of Minnesota.  
 2011 *Elementary Partial Differential Equations*, undergraduate, Fall 2011, University of Minnesota.  
 2011 *Introduction to Distributions*, graduate, reading course, Summer 2011, Purdue University.  
 2011 *Partial Differential Equations*, graduate, Spring 2011, Purdue University.  
 2010 *Localization of vibrations*, graduate, reading course, Spring and Fall 2010, Purdue University.  
 2009 *Ordinary Differential Equations*, undergraduate, Fall 2009, Fall 2010, Purdue University (2 sections each).  
 2008 *Differential Equations and Partial Differential Equations for Engineering and the Sciences*, undergraduate, Fall 2008, Purdue University.  
 2008 *Accelerated Calculus with Analytic Geometry II*, undergraduate, Winter 2008, the Ohio State University.  
 2007 *Multivariable Calculus*, undergraduate, Fall 2007, Brown University.  
 2006–2008 *Introduction to Real Analysis* (various levels, undergraduate/graduate), Fall 2006, Winter 2007, Spring 2007, Spring 2008, the Ohio State University.

- 2004, 2006 *Analytic Geometry and Calculus I*, undergraduate, Fall 2004, University of Missouri-Columbia, Winter 2006, The Ohio State University.
- 2003 *Calculus II*, undergraduate, Fall 2003, University of Missouri-Columbia
- 2003–2005 *Elements of Calculus*, undergraduate, Winter 2003, Winter 2004, Winter 2005, University of Missouri-Columbia
- 2002 *College Algebra for Calculus Bound Students*, undergraduate, Fall 2002, University of Missouri-Columbia

## Invited Talks

- 2024 Series of Lectures on Waves and Imaging V, Zürich, Switzerland, July 2024
- 2024 9th European Congress of Mathematics, invited speaker, Seville, Spain, July 2024
- 2024 Harmonic Analysis and PDE conference: in honour of Jill Pipher, Sydney, Australia, June 2024
- 2024 Perimeter Institute, Waterloo, Canada, May 2024
- 2024 Arkansas Spring Lecture Series, Main Lecturer, Fayetteville, AR, USA, May 2024
- 2024 Recent Advances in Nonlinear Partial Differential Equations: Vladimir Sverak's 65th Birthday, Minneapolis, MN, USA, May 2024
- 2024 Annual meeting of Simons Collaboration on Wave Localization, Simons Foundation, February 2024
- 2023 SIAM PDE Webinar, December 2023
- 2023 Applied Mathematics Colloquium, Zürich, Switzerland, November 2023
- 2023 Ladyzhenskaya Lecture, Max Planck Institute and University of Leipzig, Leipzig, Germany, October 2023
- 2023 Blavatnik ceremony Award Reception, New York, NY, USA, September 2023
- 2023 Analysis & Beyond: a conference in honour of Luigi Ambrosio's 60th birthday, Zürich, Switzerland, September 2023
- 2023 Geometric Spectral Theory, Oberwolfach, Germany, August 2023
- 2023 Lviv Summer Data Science School, one of the main lecturers, Lviv, Ukraine, August 2023
- 2023 Kharkiv-Vienna International Science School, Kharkiv, Ukraine, August 2023
- 2023 Université Sorbonne, April 2023
- 2023 Annual meeting of Simons Collaboration on Wave Localization, Simons Foundation, February 2023
- 2022 Presentations for the donors, University of Minnesota, November 2022
- 2022 Wave Localization & Many-Body Localization in Quantum Information, Cargese, October 2022
- 2022 Chern-Weil symposium on the Laplace eigenfunctions, University of Chicago, October 2022
- 2022 Geometric applications of microlocal analysis 2022, celebrating Rafe Mazzeo's 60th birthday, Stanford, Palo Alto, September 2022
- 2022 Lecture series at the 12th School on Analysis and Geometry in Metric Spaces, Levico Terme, Italy, June 2022
- 2022 Board of the Simons Foundation, New York, June 2022
- 2022 Harmonic Analysis and related topics. Celebrating Michael Lacey's birthday, Barcelona, Spain, June 2022
- 2022 Harmonic Analysis and PDE in Seoul, South Korea, May 2022
- 2022 CBMS lectures, Tallahassee, FL, May 2022
- 2022 Workshop on Geometric measure theory and Harmonic analysis, Hausdorff Institute, Bonn, Germany, April 2022
- 2022 Annual meeting of Simons Collaboration on Wave Localization, Simons Foundation, February 2022
- 2022 Members' colloquium, IAS, February 2022
- 2022 Math Conversations, IAS, January 2022
- 2021 Analysis seminar, IAS, December 2021
- 2021 Localization seminar series, Japan, December 2021
- 2021 Conference on Ultracold atoms, Localization, and Beyond, October 2021

2021 Great Lakes Mathematical Physics Meeting, plenary talk, June 2021  
 2021 EDGE Colloquium, June 2021  
 2021 Geometric and Functional Inequalities and Applications, June 2021  
 2021 Spectral geometry in the clouds, April 2021  
 2021 Virginia L. Chatelain Memorial Lecture, The Kansas State University, March 2021  
 2021 Director's Overview, Simons Collaboration on Localization of Waves, February 2021  
 2021 University of Chicago, Colloquium, February 2021  
 2020 FIM Lecture, ETH, November 2020  
 2020 Princeton University, October 2020  
 2020 International Association of Mathematical Physics, One World mathematical physics seminar, October 2020  
 2020 Open PDE & Analysis Seminar, France–delocalized, June 2020  
 2020 Annual meeting of the Simons Collaboration on Localization of Waves, February 2020  
 2020 Simons Foundation Lunch Seminar, February 2020  
 2020 Brown University, Colloquium, January 2020  
 2019 Analysis in Missouri: a Midwestern Symposium Columbia, MO, September 2019  
 2019 Plenary Speaker at Equadiff 2019, Leiden, Netherlands, July 2019  
 2019 The Isaac Newton Institute for Mathematical Sciences, Kirk Distinguished Fellow public lecture, Cambridge, UK, June 2019  
 2019 Harmonic Analysis and PDEs, University of Helsinki, Helsinki, Finland, June 2019  
 2019 Quantum Mechanics and Semiconductors, University of California, Santa Barbara, CA, April 2019  
 2019 AMS meeting, Honolulu, March 2019  
 2019 University of St. Thomas, Minneapolis, MN, February 2019  
 2019 Workshop on Spectral Properties of Disordered Systems, Paris, France, January 2019  
 2018 PDEs and Geometric Measure Theory, ETH, Zürich, Switzerland, November 2018  
 2018 ICM 2018 satellite conference in Harmonic Analysis, Porto Alegre, Brazil, August 2018  
 2018 International Congress of Mathematicians, Rio de Janeiro, Brazil, August 2018  
 2018 Courant Institute, April 2018  
 2018 Harvard University, Widely Applied Mathematics Seminar, School of Engineering and Applied Sciences, March 2018  
 2018 Princeton University, March 2018  
 2018 Institute for Advanced Study, Members' seminar, March 2018  
 2018 Brown University, March 2018  
 2018 University of Chicago, February 2018  
 2017 Ecole Polytechnique, November 2017  
 2017 Université Paris-Sud, November 2017  
 2017 Plenary Speaker at the 2017 Northeast Analysis Network Conference, Syracuse, NY, 2017  
 2017 Harmonic measure and rectifiability, Principal Lecturer, Prairie Analysis Seminar, Kansas State University, Manhattan, Kansas, September 2017  
 2017 V International Conference "Analysis and Mathematical physics" dedicated to Vladimir A. Marchenko's 95th birthday, Ukraine, June 2017  
 2017 Localization of eigenfunctions, Recent Developments In Harmonic Analysis, MSRI, Berkeley, CA, May 2017  
 2017 Localization of eigenfunctions, Geometry, Analysis and Probability, in honor of Peter Jones, KIAS, Seoul, Korea, May 2017  
 2017 Harmonic measure in higher co-dimension, Colloquium, University of California, Irvine, April 2017  
 2017 The hidden landscape of localization of eigenfunctions, Math Physics seminar, University of California, Irvine, April 2017  
 2017 The hidden landscape of localization of eigenfunctions, plenary talk at the AWM Research Symposium 2017, April 2017

2017 Harmonic measure in higher co-dimension, Analysis seminar, UCLA, April 2017  
 2017 Localization of eigenfunctions, Indiana University, Bloomington, February 2017  
 2017 Scale-invariant estimates in Analysis, PDEs, and geometry, lecture series, Introductory Workshop, MSRI, January 2017  
 2016 Barcelona Analysis Conference 2016, Barcelona, Spain, September 2016  
 2016 Harmonic Analysis at its Boundaries, Nantes, France, June 2016  
 2016 10th International Conference on Harmonic Analysis and Partial Differential Equations, El Escorial, Madrid (Spain), June 2016  
 2016 Conference in Harmonic Analysis in Honor of Michael Christ, Madison, Wisconsin, May 2016  
 2016 Workshop on function spaces and high-dimensional approximation, CRM, Barcelona, May 2016  
 2016 Analysis Seminar, Institute for Advanced Study, February 2016  
 2016 Analysis Seminar, MIT, February 2016  
 2016 Analysis Seminar, Institute for Advanced Study, February 2016  
 2015 Analysis Seminar, Princeton University, November 2015  
 2015 Brandeis-Harvard-MIT-Northeastern Joint Mathematics Colloquium, October 2015  
 2015 Institut Henri Poincaré, Problèmes Spectraux en Physique Mathématique, June 2015  
 2015 Complex Analysis & Dynamical Systems VII, Naharia, Israel, May 2015  
 2015 Colloquium, Stanford University, April 2015  
 2015 Columbia University, April 2015  
 2015 Banff International Research Station, Workshop “Laplacians and Heat Kernels: Theory and Applications”, March 2015  
 2015 Workshop on Harmonic Analysis, Partial Differential Equations and Geometric Measure Theory, ICMAT, Campus de Cantoblanco, Madrid, January 12–16, 2015.  
 2014 Colloquium, Duke University, December 2014  
 2014 Institute for Computational and Experimental Research in Mathematics, Providence, RI, October 2014  
 2014 Colloquium, UC Berkeley, September 2014  
 2014 Invited address at the AMS meeting at the University of Wisconsin, Eau Claire, September 2014  
 2014 “Harmonic Analysis and Partial Differential Equations - Recent Developments and Future directions”, a conference in honor of Carlos Kenig, The University of Chicago, September 2014.  
 2014 Conference “Perspectives of Modern Complex Analysis”, the Banach Center conference place in Bedlewo, Poland, June 2014  
 2014 Conference “Recent advances in non-local and non-linear analysis: theory and applications”, Zurich, Switzerland, June 2014  
 2014 Trimester Program on Harmonic Analysis and Partial Differential Equations, “Introductory Workshop: Topics in Harmonic Analysis and PDEs”, the Hausdorff Research Institute, Bonn, Germany, June-July 2014  
 2014 73rd Midwest PDE Seminar, Northwestern University, May 10-11, 2014  
 2014 University of California – Santa Barbara, Colloquium, April 2014  
 2014 University of California – Santa Barbara, Applied Mathematics and PDE Seminar, April 2014  
 2014 Purdue University, Special Seminar, April 2014  
 2014 13th New Mexico Analysis Seminar, An afternoon in Honor of Cora Sadosky, Albuquerque, NM, April 2014  
 2014 Western Spring Sectional Meeting, Special Session on Harmonic Analysis and Operator Theory, Albuquerque, NM, April 2014  
 2014 University of Chicago, Calderón-Zygmund Analysis Seminar, January 2014  
 2014 2014 Joint Mathematics Meetings, Baltimore, AMS Special Session “Fractal Geometry: Mathematics of Fractals and Related Topics”, January 2014  
 2013 Mathematics and Mechanics in the Physical Sciences: A Tribute to James Serrin, November 2013.  
 2013 University of California – Santa Barbara, Materials Department Seminar, August 2013  
 2013 University of Minnesota, PDE Seminar, September 2013

- 2013 Fluid Mechanics and Singular Integrals, Seville, Spain, June 2013
- 2013 Research Term on Real Harmonic Analysis and Applications to PDE Madrid, June 2013
- 2013 University of Minnesota, Introduction to Research seminar, April 2013.
- 2013 Stanford University, Colloquium, March 2013.
- 2013 Stanford University, Analysis & PDE seminar, March 2013.
- 2013 Career Options for Women in Mathematical Sciences, The Institute for Mathematics and its Applications, March 2013.
- 2013 University of Wisconsin, Colloquium, February 2013.
- 2013 Stanford University, Analysis seminar, February 2013.
- 2012 Charles University, Prague, December 2012, *Hardy spaces and elliptic operators with non-smooth coefficients*
- 2012 Institut de mathematiques de Toulouse, Toulouse, France, November 2012, *Elliptic PDEs in rough media*
- 2012 Université Paris-Sud 11, Orsay, France, November 2012, *Analysis of higher order elliptic operators*
- 2012 International Workshop on Operator Theory and Applications, University of New South Wales, Sydney, Australia, July 2012, *Elliptic PDEs in rough media*
- 2012 School of Mathematical Sciences, Beijing Normal University, Beijing, China, June 2012, *Generalized Hardy, BMO, and Hölder spaces*
- 2012 School of Mathematical Sciences, Beijing Normal University, Beijing, China, June 2012, *Boundary value problems for second order elliptic operators with rough coefficients*
- 2012 School of Mathematical Sciences, Beijing Normal University, Beijing, China, June 2012, *Higher order elliptic boundary problems*
- 2012 School of Mathematical Sciences, Beijing Normal University, Beijing, China, June 2012, *Elliptic PDEs in rough media*
- 2012 The Arkansas Spring Lecture Series, Plenary Talk, Fayetteville, AR, March 2012, *Singular integrals, perturbation problems, boundary regularity, and harmonic measure for elliptic PDEs in rough media*
- 2012 Université Paris-Sud 11, Paris, March 2012, *Well-posedness in  $L^p$  for elliptic boundary value problems*
- 2012 The 28th annual Southeastern Analysis Meeting, Plenary Talk, University of Alabama in Tuscaloosa, Alabama, March 2012, *Elliptic PDEs, analysis, and potential theory in irregular media*
- 2012 University of Minnesota, Colloquium, March 2012, *Elliptic PDEs, analysis, and potential theory in irregular media*
- 2011 Universitat Autònoma de Barcelona, Barcelona, Spain, December 2011, *Analysis and potential theory for higher order PDEs in the domains of rough geometry.*
- 2011 ICREA Conference on Approximation Theory and Fourier Analysis, Barcelona, Spain, December 2011, *Elliptic PDEs with rough coefficients.*
- 2011 AIM Workshop “Weighted singular integral operators and non-homogenous harmonic analysis”, Palo Alto, CA, USA, October 2011, *Riesz transforms and rectifiability.*
- 2011 International conference “Harmonic Analysis and Approximations, V” dedicated to 75th anniversary of academician Norair Arakelian, Armenia, September 2011, *Harmonic analysis and potential theory for higher order elliptic boundary problems.*
- 2011 “Complex analysis and its applications” International Conference dedicated to the 70th anniversary of A.F.Grishin, Kharkiv, Ukraine, August 2011, *Potential theory, analysis and elliptic boundary problems in rough domains.*
- 2011 International Workshop on Operator Theory and its Applications, Seville, Spain, July 2011, *Elliptic boundary problems with rough coefficients.*
- 2011 Ecole Normale Supérieure de Cachan, Paris, France, June 2011, *The hidden landscape of localization.*
- 2011 Ecole Polytechnique, Paris, France, June 2011, *The hidden landscape of localization.*
- 2011 University of Minnesota, Minneapolis, MN, April 2011, *Analysis of partial differential equations in non-smooth media.*
- 2011 University of South Carolina, Columbia, SC, February 2011, *Analysis of partial differential equa-*

- tions in non-smooth media.
- 2011 The Georgia Institute of Technology, Atlanta, GA, February 2011, *Analysis of partial differential equations in non-smooth media.*
- 2011 Northeastern University, Boston, MA, January 2011, *Analysis of partial differential equations in non-smooth media.*
- 2010 The Georgia Institute of Technology, Atlanta, GA, December 2010, *Square function, Riesz transform and rectifiability.*
- 2010 2010 Fall Western Section Meeting, Los Angeles, CA, October 2010, *Square function, Riesz transform and rectifiability.*
- 2010 University of Helsinki, June 2010, *Elliptic PDEs, analysis and potential theory in non-smooth domains.*
- 2010 Université Paris-Sud, May 2010, *Analysis and potential theory for higher order PDEs in the domains of rough geometry.*
- 2010 Université Bordeaux 1, May 2010, *Analysis and potential theory for higher order elliptic equations.*
- 2010 Wabash Seminar, March 2010, *Weighted integral estimates, analysis and potential theory for higher order boundary problems.*
- 2010 University of Kentucky, March 2010, *Analysis and potential theory for higher order elliptic equations.*
- 2010 2010 Spring Southeastern Sectional Meeting, Special Session on Complex Analysis and Potential Theory, Lexington, KY, March 2010, *Boundedness of the square function and rectifiability.*
- 2010 2010 Spring Southeastern Sectional Meeting, Special Session on Function Theory, Harmonic Analysis, and Partial Differential Equations, Lexington, KY, March 2010, *The connections between Dirichlet, Regularity and Neumann problems for second order elliptic operators with complex bounded measurable coefficients.*
- 2010 Purdue University, March 2010, *Hadamard's Conjecture, Green Function Estimates and Potential Theory for Higher Order PDEs.*
- 2010 University of South Carolina, March 2010, *Analysis and potential theory for higher order elliptic equations.*
- 2010 Calderón-Zygmund Analysis Seminar, University of Chicago, February 2010, *Fine regularity properties of the solutions to the higher order elliptic equations.*
- 2010 Colloquium at Georgetown University, January 2010, *Harmonic analysis and elliptic equations in non-smooth domains.*
- 2009 Fall Southeastern Meeting of the AMS, Boca Raton, FL, October 2009, *Square function, Riesz transform and rectifiability.*
- 2009 Conference on "Microlocal Analysis and Spectral Theory on Singular Spaces" Pennsylvania State University, State College, PA, October 2009, *Properties of the biharmonic functions: Hadamard's conjecture, regularity of the Green function and Wiener criterion.*
- 2009 Georgia Institute of Technology, April 2009, *Hadamard's conjecture, Green's function estimates and potential theory for higher order partial differential equations*
- 2009 Michigan State University, April 2009, *Hadamard's conjecture, Green's function estimates and potential theory for higher order partial differential equations*
- 2009 Brown University, February 2009, *Hadamard's conjecture, Green's function estimates and potential theory for higher order partial differential equations.*
- 2009 Colloquium at Washington University, St. Louis, MO, February 2009, *Harmonic analysis and elliptic equations in non-smooth domains.*
- 2009 University of Missouri, Columbia, MO, February 2009, *Hadamard's conjecture, Green's function estimates and potential theory for higher order partial differential equations.*
- 2009 The conference "Potential Theory and Analysis of Growth Processes", Laboratoire MAPMO, Université d'Orléans, France, January 2009, *Higher order elliptic problems in non-smooth domains.*
- 2009 Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie (Paris VI), January 2009, *Properties of solutions to the polyharmonic equation in arbitrary domains.*
- 2008 Institute for Advanced Study, Princeton, NJ, October 2008, *Higher order elliptic boundary value*



- problems.*
- 2008 Purdue University, October 2008, *Higher order capacity and regularity properties of polyharmonic functions in non-smooth domains.*
- 2008 The conference on the occasion of the 70th birthday of Vladimir Maz'ya "Analysis, PDEs and Applications", Rome, Italy, July 2008, *Regularity properties of solutions to higher order elliptic equations in non-smooth domains.*
- 2008 The conference "Recent Advances in Geometric Function Theory", Syracuse University, May 2008, *Regularity properties of polyharmonic functions in non-smooth domains.*
- 2008 The Second Workshop on Harmonic Analysis and Partial Differential Equations, Merida, Yucatan, Mexico, February 2008, *Higher order elliptic boundary value problems in non-smooth domains.*
- 2008 University of Oregon, January 2008, *Elliptic partial differential equations in non-smooth domains.*
- 2008 Lehigh University, January 2008, *Elliptic partial differential equations in non-smooth domains.*
- 2008 Michigan State University, January 2008, *Elliptic partial differential equations in non-smooth domains.*
- 2008 Syracuse University, January 2008, *Elliptic partial differential equations in non-smooth domains.*
- 2008 Purdue University, January 2008, *Elliptic partial differential equations in non-smooth domains.*
- 2007 University of Minnesota, December 2007, *Elliptic partial differential equations in non-smooth domains.*
- 2007 University of Kentucky, December 2007, *Elliptic partial differential equations in non-smooth domains.*
- 2007 SIAM Conference on Analysis of PDE, Mesa, AZ, December 2007, *Regularity of the solutions to higher order elliptic equations on non-smooth domains.*
- 2007 Colloquium at Brown University, November 2007, *Elliptic partial differential equations in non-smooth domains.*
- 2007 Michigan State University, October 2007, *Regularity of solutions to the higher order elliptic equations.*
- 2007 2007 Fall Western Section Meeting, University of New Mexico, Albuquerque, NM, October 2007, *Properties of solutions to the biharmonic equation on non-smooth domains.*
- 2007 2007 Fall Central Section Meeting, DePaul University, Chicago, IL, October 2007, *Green function estimates and Wiener's test for the biharmonic equation.*
- 2007 Brown University, September 2007, *The solution of the Chang-Krantz-Stein conjecture.*
- 2007 Brown University, September 2007, *Higher order elliptic boundary value problems in non-smooth domains.*
- 2007 Instituto de Matemáticas, Cuernavaca, Mexico, Colloquium talk, May 2007, *Regularity of a biharmonic function on a non-smooth domain.*
- 2007 The VII Joint AMS-SMM Meeting, Zacatecas, Mexico, May 2007, *Boundedness and continuity of the gradient of a biharmonic function.*
- 2007 The Ohio State University, May 2007, *Regularity of a biharmonic function on a non-smooth domain.*
- 2006 University of Missouri – Columbia, November 2006, *Boundedness of the gradient and the Hessian of a biharmonic function.*
- 2006 Syracuse University, November 2006, *The Dirichlet problem for the bilaplacian.*
- 2006 Brown University, October 2006, *Boundedness of the gradient and the Hessian of a biharmonic function.*
- 2006 Satellite Conference to the ICM-2006 "Harmonic and Geometrical Analysis with Applications to Partial Differential Equations", Seville, Spain, August 2006, *Estimates for the solution to the biharmonic equation on an arbitrary domain.*
- 2006 The Ohio State University, May 2006, *Boundedness of the gradient and the Hessian of a biharmonic function.*
- 2006 2006 Spring Central Sectional Meeting, University of Notre Dame, Notre Dame, IN, April 2006, *Hardy and BMO spaces associated to divergence form elliptic operators.*

- 2006 University of Missouri – Columbia, March 2006, *Hardy and BMO spaces associated to divergence form elliptic operators.*
- 2005 Flinders University, Adelaide, Australia, November 2005, *Poisson problem on Lipschitz domains and solution of the Chang-Krantz-Stein conjecture.*
- 2005 Macquarie University, Sydney, Australia, October 2005, *Regularity of Green potentials on non-smooth domains and solution of the Chang-Krantz-Stein conjecture.*
- 2005 Australian National University, Canberra, Australia, August 2005, *Boundary value problems for Laplacian in Lipschitz domains and solution of the Chang-Krantz-Stein conjecture.*
- 2005 Ohio State University, February 2005, *The regularity of Green potentials and the solution of the Chang-Krantz-Stein conjecture.*
- 2004 The 7th International Conference on Harmonic Analysis and PDEs, El Escorial, Madrid (Spain), June 2004, *Elliptic boundary value problems on non-smooth domains with data in Besov and Triebel-Lizorkin spaces.*
- 2004 The 2nd Symposium on Analysis and PDEs, Purdue University, June 2004, *Sharp estimates for Green potentials on non-smooth domains.*
- 2004 Show Me Analysis Meeting, University of Missouri-Columbia, June 2004, *On the regularity of Green potentials on non-smooth domains.*
- 2004 The 29th Spring Lecture Series in the Mathematical Sciences, Recent Developments in Applied Harmonic Analysis: Multiscale Geometric Analysis, Fayetteville, Arkansas, April 2004, *Envelopes of Besov and Triebel-Lizorkin spaces.*
- 2004 2004 AMS Spring Southeastern Section Meeting, Tallahassee, Florida, March 2004, *The Poisson problem with optimal Besov and Triebel-Lizorkin estimates on non-smooth domains.*
- 2004 University of Missouri – Columbia, February 2004, *On the regularity of Green potentials on non-smooth domains.*
- 2004 University of Tuebingen, Germany, January 2004, *The Poisson problem for Laplacian in Lipschitz domains.*
- 2004 University of Ulm, Germany, January 2004, *Estimates for Green potential in irregular domains.*
- 2003 University of Missouri – Columbia, October 2003, *The Poisson Problem in Lipschitz Domains with Sobolev-Besov Data.*
- 2003 The 6-th TULKA Internet Seminar “Operator matrices and delay semigroups,” Heinrich-Fabri Institut, Blaubeuren, June 2003, *Operators with Wentzell-Robin Boundary Conditions.*
- 2003 The 6-th New Mexico Analysis Seminar, Albuquerque, New Mexico, March 2003, *Layer Potentials and Boundary Value Problems for the Laplace’s Equation in Quasi-Banach Sobolev-Besov Spaces on Lipschitz Domains.*
- 2003 University of Missouri – Columbia, February 2003, *Elliptic Boundary Value Problems in Lipschitz Domains with Data in Quasi-Banach Spaces.*

*Updated: June 19, 2024*