**IZABELLA ŁABA**
Department of Mathematics
University of British Columbia
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May 2016

## Education:

M.Sc. in Mathematics, Wrocław University, 1986 (advisor: P. Biler)

Ph.D. in Mathematics, University of Toronto, 1994 (advisor: I. M. Sigal)

## Employment:

Wrocław University, Instructor of Mathematics, 1986–89

University of California at Los Angeles, E. R. Hedrick Assistant Professor of Mathematics, 1994–97

Princeton University, Assistant Professor of Mathematics, 1997–2000

University of British Columbia, Associate Professor of Mathematics (tenured since 2002), 2000-05

University of British Columbia, Professor of Mathematics, since 2005

## Visiting positions:

University of Missouri at Columbia, May 2006
Pennsylvania State University, April 2007
Fields Institute, Toronto, January–May 2008

## Research Areas:

Mathematical Physics and Partial Differential Equations, 1990–2000
Harmonic Analysis, Additive Combinatorics, Combinatorial Number Theory and Geometric Measure Theory, 1998– present

## Awards and Honours:

NSERC Postdoctoral Scholarship (declined), 1994
NSERC University Faculty Award, 2000-05
UBC Faculty of Science Achievement Award for Research, 2002
Coxeter-James Prize, Canadian Mathematical Society, 2004
Krieger-Nelson Prize, Canadian Mathematical Society, 2008
Fields Institute Fellow, 2009
Fellow of the American Mathematical Society, 2012
Invited Speaker, International Congress of Mathematicians, Seoul, 2014
Etta Z. Falconer Lecturer, Association for Women in Mathematics and Mathematical Association of America, 2016

## Research grants:

NSF Grant DMS-9501033, 1995-98
NSERC Discovery Grants: 2000-present
Senior personnel, NSF Focused Research Group "New Trends in Harmonic Analysis", 2005-08
NSERC Discovery Accelerator Supplement, 2007-10

## Graduate students:

### M.Sc. level

Mariah Hamel, 2002-04, thesis: *Fourier Analytic Applications in Number Theory.*

Roger Woodford, 2004-05 (co-supervisor: Denis Sjerve), thesis: *Prime Symmetric Divisor Functions.*

Kelan Zhai, 2004-06, essay: *Maximal operators along direction sets.*

Karsten Chipeniuk, 2005-07 (co-supervisor: Ozgur Yilmaz, 2005-06), essay: *Exposing Roth's theorem in the primes.*

Christopher Coulter, 2006-07, essay: *Restriction theory in harmonic analysis.*

Rhoda Sollazzo, 2010-2011 (co-supervisor: Mahta Khosravi), thesis: *The Finite Field Restriction Problem.*

Marc Carnovale, 2010-2013 (co-supervisor: Malabika Pramanik), essay: *Gowers Norms for Measures*

## Ph.D. level

Mariah Hamel, 2004-08, thesis: *Arithmetic Structures in Random Sets.*

Roger Woodford, 2005-08, thesis: *Partitions into Prime Powers and Related Divisor Functions.*

Karsten Chipeniuk, 2007-11, thesis: *Structure and Arithmetic in Sets.*

Vincent Chan, 2010-2014 (co-supervisor: Malabika Pramanik), thesis: *Finite Patterns in Sparse Sets.*

Kyle Hambrook, 2011-2015, thesis: *Restriction Theorems and Salem Sets*

Alessandro Marinelli, 2014-present (co-supervisor: Malabika Pramanik)

## Postdoctoral fellows:

Ben Green, 2003-04

Hadi Jorati, 2005-07 (co-supervisor: Malabika Pramanik, 2006-07)

John Paul Steinberger, 2007-09

John Griesmer, 2009-11 (co-supervisor: Malabika Pramanik)

Matthew Smith, 2009-11 (co-supervisor: Akos Magyar)

Matthew Bond (NSF Postdoctoral Fellow), 2011-13

Kevin Henriot, 2014-16 (co-supervisor: Malabika Pramanik)

Ben Krause (PIMS Distinguished Postdoctoral Fellow and NSF Postdoctoral Fellow), 2015-19

## Conferences and programs organized:

Symposium on Partial Differential Equations, CMS Winter 2000 meeting, Vancouver; co-organized with Richard Froese and Nassif Ghoussoub

Thematic Program "Combinatorial and Number-Theoretic Methods in Harmonic Analysis" at the Erwin Schrödinger Institute, Vienna, February 15 – April 15, 2003; co-organized with Alex Iosevich and Detlef Müller

Symposium on Harmonic Analysis, CMS Winter 2003 meeting, Vancouver; co-organized with Alex Iosevich

Session on Harmonic Analysis, CMS Winter 2006 meeting, Toronto; co-organized with Malabika Pramanik

Program chair, "New Trends in Harmonic Analysis", Fields Institute thematic program, Toronto, January 1 - June 30, 2008. Co-organizers: Alex Iosevich, Michael Lacey, Eric Sawyer.

Program chair, Clay-Fields Conference on Additive Combinatorics, Number Theory, and Harmonic Analysis, Toronto, April 5-13, 2008. Co-organizers: David Ellwood, Andrew Granville, Bryna Kra, Trevor Wooley.

Harmonic Analysis Retrospective Meeting, Fields Institute, Toronto, May 31-June 4, 2010. Co-organizer: Michael Lacey.

Session on Harmonic Analysis and Additive Combinatorics, CMS Winter Meeting, Vancouver, December 4-6, 2010. Co-organizers: Akos Magyar, Malabika Pramanik.

Summer School on Harmonic Analysis, Geometric Measure Theory and Additive Combinatorics, Catalina Canyon Resort, Catalina Island, California, June 24-29, 2012. Co-organizers: Malabika Pramanik, Christoph Thiele.

Workshop chair, Workshop on the Kakeya Problem, Restriction Problem, and Sum-Product Theory, IPAM, Los Angeles, May 5 - 9, 2014. Co-organizers: Larry Guth, Alex Iosevich, Nets Katz.

Program organizer, Dimension and Dynamics, ICERM, Providence, February 1 - May 6, 2016. Co-organizers: D. Dolgopyat, M. Hochman, S. Luzzato, Y. Pesin, M. Pollicott, J. Schmeling, B. Solomyak, W. Tucker.

Workshop on Ergodic, Algebraic and Combinatorial Methods in Dimension Theory, ICERM, Providence, February 15-19, 2016. Co-organizers: M. Hochman, P. Shmerkin, B. Weiss.

## Journal editorships:

*Online Journal of Analytic Combinatorics* (`http://www.ojac.org`), founding and managing editor (jointly with Alex Iosevich and Sinai Robins), 2005–12; editor, 2012– present
Editor, *Analysis and PDE*, Mathematical Sciences Publishers, 2007–present
Editor, *SIAM Journal on Discrete Mathematics (SIDMA)*, 2011–2016
Associate Editor, *Canadian Journal of Mathematics* and *Canadian Mathematical Journal*, 2011–2015
Editor, *Discrete Analysis*, 2015–present

## Selected committees:

Doctoral Prize Selection Committee, Canadian Mathematical Society, 01/2006–12/2007

Research Committee, Canadian Mathematical Society, 01/2007–12/2009

Current Events Bulletin Committee, American Mathematical Society, since 2007

William Lowell Putnam Committee, Mathematical Association of America (for the selection of problems for the Putnam competition), committee member 01/2009 – 12/2011 and chair 01/2011-12/2011.

AWM-Sadosky Research Prize Selection Committee, Association for Women in Mathematics, 01/2015–07/2018

## PUBLICATIONS:

### Books authored

C. Gérard and I. Łaba: *Multiparticle Scattering in Constant Magnetic Fields* (250 pages), American Mathematical Society, *Mathematical Surveys and Monographs*, vol. 90, 2002.

### Books edited

T. Wolff: *Lectures in harmonic analysis*, edited by I. Łaba and C. Shubin (140 pages), American Mathematical Society, *University Lecture Series*, vol. 29, 2003.

### Research articles

1. I. Łaba: *Unique continuation for Schrödinger operators and for higher powers of the Laplacian*, Math. Methods in the Applied Sciences 10 (1988), 531–542.

2. I. Łaba: *Long-range one particle scattering in a homogeneous magnetic field*, Duke Math. J. 70 (1993), 283–303.

3. I. Łaba: *Scattering for hydrogen-like systems in a constant magnetic field*, Commun. Part. Diff. Eq. 20 (1995), 741–762.

4. C. Gérard, I. Łaba: *Scattering theory for N-particle systems in constant magnetic fields*, Duke Math. J. 76 (1994), 433–466.

5. C. Gérard, I. Łaba: *Scattering theory for N-particle systems in constant magnetic fields, II: Long-range interactions*, Commun. Part. Diff. Eq. 20 (1995), 1791–1830.

6. C. Gérard, I. Łaba: *Scattering theory for 3-particle systems in constant magnetic fields: dispersive case*, Ann. Inst. Fourier (Grenoble), 46 (1996), 801–876.

7. I. Łaba, A. Soffer: *Global existence and scattering for the nonlinear Schrödinger equation on Schwarzschild manifolds*, Helv. Phys. Acta 72 (1999), 274–294.

8. N.H. Katz, I. Łaba, T. Tao: *An improved bound on the Minkowski dimension of Besicovitch sets in* $\mathbf{R}^3$, Annals of Math. 152 (2000), 383–446.

9. I. Łaba, T. Tao: *An x-ray transform estimate in* $\mathbf{R}^n$, Revista Mat. Iberoamericana 17 (2001), 375–407.

10. I. Łaba: *Fuglede's conjecture for a union of two intervals*, Proc. Amer. Math. Soc. 129 (2001), 2965–2972.

11. I. Łaba, T. Tao: *An improved bound for the Minkowski dimension of Besicovitch sets in medium dimension*, Geom. Funct. Anal. 11 (2001), 773–806.

12. I. Łaba: *The spectral set conjecture and multiplicative properties of roots of polynomials*, J. London Math. Soc. 65 (2002), 661–671.

13. A. Granville, I. Łaba, Y. Wang: *A characterization of finite sets that tile the integers*, preprint, 2001.

14. I. Łaba, Y. Wang: *On spectral Cantor measures*, J. Funct. Anal. 193 (2002), 409–420.

15. I. Łaba, T. Wolff: *A local smoothing estimate in higher dimensions*, J. d'Analyse Math. 88 (2002), 149–171.

16. S. Konyagin, I. Łaba: *Spectra of certain types of polynomials and tiling the integers with translates of finite sets*, J. Number Theory 103 (2003), 267–280.

17. M. Kolountzakis, I. Łaba: *Tiling and spectral properties of near-cubic domains*, Studia Math. 160 (2004), 287–299.

18. A. Iosevich, I. Łaba: *Distance sets of well-distributed planar point sets*, Discr. Comp. Geom. 31 (2004), 243–250.

19. A. Iosevich, I. Łaba: *K-distance sets, Falconer conjecture, and discrete analogs*, Integers: Electronic Journal of Combinatorial Number Theory, 5(2) (2005), #A08 (hardcopy edition: *Topics in Combinatorial Number Theory: Proceedings of the Integers Conference 2003 in Honor of Tom Brown*, DIMATIA, ITI Series, vol. 261, dimatia@kam.mff.cuni.cz).

20. S. Konyagin, I. Łaba: *Separated sets and the Falconer conjecture*, Proceedings of the Harmonic Analysis and its Applications at Sapporo, A. Miyachi and K. Tachizawa, eds., Hokkaido University, Sapporo, 2005, pp. 43-55.

21. S. Konyagin, I. Łaba: *Distance sets of well-distributed planar sets for polygonal norms*, Israel J. Math. 152 (2006), 157–179.

22. I. Łaba, M. Pramanik: *Wolff's inequality for hypersurfaces*, Proceedings of the 7th International Conference on Harmonic Analysis and Partial Differential Equations, El Escorial, Madrid, 2004 (published by Collectanea Mathematica, Vol. Extra (2006), 293-326.

23. I. Łaba, Y. Wang: *Some properties of spectral measures*, Appl. Comp. Harmonic Analysis 20 (2006), 149–157.

24. I. Łaba, J. Solymosi: *Incidence theorems for pseudoflats*, Discr. Comput. Geom. 37 (2007), 163–174.

25. M. Hamel, I. Łaba: *Arithmetic structures in random sets*, Integers: Electronic Journal of Combinatorial Number Theory 8 (2008), #A4.

26. A. Iosevich, H. Jorati, I. Łaba: *Geometric incidence theorems via Fourier analysis*, Trans. Amer. Math. Soc. 361 (2009), 6595–6611.

27. I. Łaba, M. Pramanik: *Arithmetic progressions in sets of fractional dimension*, Geom. Funct. Anal. 19 (2009), 429–456.

28. I. Łaba, K. Zhai: *The Favard length of self-similar sets*, Bull. London Math. Soc. 42 (2010), 997–1009.

29. I. Łaba, M. Pramanik: *Maximal theorems and differentiation theorems for sparse sets*, Duke Math. J. 158 (2011), 347–411.

30. E. Croot, I. Łaba and O. Sisask: *Arithmetic progressions in sumsets and $L^p$-almost-periodicity*, Combinatorics, Probability and Computing 22 (2013), 351-365.

31. K. Hambrook and I. Łaba: *On the sharpness of Mockenhaupt's restriction theorem*, Geom. Funct. Anal. 23 (2013), 1262–1277.

32. M. Bond, I. Łaba and A. Volberg: *Buffon's needle estimates for rational product Cantor sets*, Amer. J. Math. 136 (2014), 377–391.

33. V. Chan, I. Łaba, M. Pramanik: *Finite configurations in sparse sets*, J. Anal. Math., 128 (2016), 289–335.

34. M. Bond, I. Łaba, J. Zahl: *Quantitative visibility estimates for unrectifiable sets in the plane*, Trans. Amer. Math. Soc. 368 (2016), 5475-5513.

35. K. Hambrook and I. Łaba: *Sharpness of the Mockenhaupt-Mitsis-Bak-Seeger restriction theorem in higher dimensions*, accepted for publication in Bull. London Math. Soc., 16 pages.

36. K. Henriot, I. Łaba, M. Pramanik: *On polynomial configurations in fractal sets*, accepted for publication in Analysis & PDE, 38 pages.

37. L. Cladek, K. Henriot, B. Krause, I. Łaba, M. Pramanik, *A discrete Carleson theorem along the primes with a restricted supremum*, preprint, May 2016

### Expository articles

1. I. Łaba: *Multiparticle quantum systems in constant magnetic fields*, in: *Multiparticle Quantum Scattering With Applications to Nuclear, Atomic and Molecular Physics*, D. Truhlar and B. Simon, Eds., IMA Volumes in Mathematics and its Applications, Volume 89, Springer-Verlag 1997, 147–215.

2. I. Łaba: *From harmonic analysis to arithmetic combinatorics: a brief survey*, July 2006, Proceedings of the MSRI workshop "Women in Mathematics: the legacy of Ladyzhenskaya and Oleinik".

3. I. Łaba: *From harmonic analysis to arithmetic combinatorics*, AMS Current Events Bulletin session booklet, New Orleans, January 2007 (an informal version of the AMS Bulletin article of the same title)

4. I. Łaba: *From harmonic analysis to arithmetic combinatorics*, Bull. Amer. Math. Soc. 45 (2008), 77–115.

5. I. Łaba: *Buffon's needle estimates and vanishing sums of roots of unity*, CMS Notes 44 (2012), no. 6, 16-17

6. I. Łaba: *Recent progress on Favard length estimates for planar Cantor sets*, in: Operator-Related Function Theory and Time-Frequency Analysis, Proceedings of the 2012 Abel Symposium, Gröchenig, K., Lyubarski, Y., Seip, K., eds., Springer 2015, pp. 117-145.

7. I. Łaba: *Harmonic analysis and the geometry of fractals*, Proceedings of the International Congress of Mathematicians, Seoul, 2014.

### General interest articles

1. I. Łaba: *Photography*, in *Art in the Life of Mathematicians*, Anna Kepes Szemerédu, ed., American Mathematical Society, 2015, pp. 139–163.

## Invited conference presentations:

- Summer School in Mathematical Quantum Theory, University of British Columbia, Vancouver, August 1993

- UAB - Georgia Tech International Conference on Differential Equations and Mathematical Physics, University of Alabama, Birmingham, March 1994

- AMS Eastern Section Meeting, University of Kentucky, Lexington, March 1994 (special session)

- IMA Workshop on Quantum Scattering with Applications to Nuclear, Atomic and Molecular Physics, Minneapolis, June 1995

- Gathering of Women Analysts, University of California at Berkeley, March 1996

- AMS Western Section Meeting, San Francisco State University, October 2000 (special session)

- Plenary lecture, CMS Winter Meeting, Vancouver, December 2000

- Second Pacific Rim Conference on Mathematics, Taipei, January 2001

- Workshop on Partial Differential Equations, Fields Institute, Toronto, April 2001

- Pacific Northwest PDE Workshop, University of Washington, Seattle, May 2001

- AMS-IMS-SIAM Joint Summer Research Conference on Harmonic Analysis, Mount Holyoke College, South Hadley, Mass., July 2001

- The Second Canada-China Mathematics Congress, Vancouver, August 2001

- Conference on Harmonic Analysis and Partial Differential Equations, University of Missouri, Columbia, May 2002

- Thematic Programme on Asymptotic Geometric Analysis, PIMS, Vancouver, July 2002 (3 expository lectures)

- BIRS Workshop on Analysis and Geometric Measure Theory, Banff, July 2003

- Workshop on Combinatorial and Additive Number Theory, CUNY, May 2004

- NSF/CMBS Instructional Conference, Georgia Institute of Technology, May 2004

- International Conference on Harmonic Analysis and PDE, El Escorial, June 2004

- Centro di Ricerca Matematica Ennio de Giorgi, Harmonic Analysis program, Pisa, July 2004

- ARCC Workshop on Recent Trends in Additive Combinatorics, AIM, Palo Alto, September 2004

- Coxeter-James prize lecture, CMS Winter Meeting, Montreal, December 2004

- CMS Winter Meeting, Montreal, December 2004 (Harmonic Analysis symposium)

- AMS Western Section meeting, Santa Barbara, April 2005 (Combinatorial Number Theory session)

- Workshop on Combinatorial and Additive Number Theory, CUNY, May 2005

- Harmonic Analysis and its Applications, Sapporo, August 2005 (2 lectures)

- CMS Winter Meeting, University of Victoria, December 2005 (Discrete Geometry session)

- Women in Mathematics: the legacy of Ladyzhenskaya and Oleinik, MSRI, Berkeley, May 2006

- SIAM Conference on Discrete Mathematics, Victoria, June 2006

- Plenary lecture, AMS Western Section Meeting, Salt Lake City, October 2006

- Current Events Bulletin, AMS-MAA Joint Mathematics Meetings, New Orleans, January 2007

- NSF FRG Conference on New Developments in Harmonic Analysis,, University of Georgia, October 2007

- Workshop on Arithmetic Combinatorics, IAS, Princeton, December 2007

- Workshop on Harmonic Analysis, Fields Institute, February 2008

- Krieger-Nelson prize lecture, The Second Canada-France Congress, Montreal, June 2008

- Summer School on Dynamical Systems: Geometric Structures and Rigidity, Banach Center, Bedlewo, Poland, July 2008 (8-hour minicourse)

- Workshop on Broader Connections: Ergodic Theory and Additive Combinatorics, MSRI, August 2008 (2-hour minicourse)

- Workshop on Introduction to Ergodic Theory and Additive Combinatorics, MSRI, August 2008

- Conference on Non-linear Phenomena in Mathematical Physics: Dedication to Cathleen Synge Morawetz on her 85th birthday, Fields Institute, Toronto, September 2008

- AMS Western Section Meeting, Vancouver, October 2008 (Harmonic Analysis session)

- University of Arkansas Spring Lecture Series in Harmonic Analysis, Fayetteville, April 2009

- AMS Western Section Meeting, Riverside, November 2009 (Additive Combinatorics session)

- Harmonic Analysis: A Retrospective Workshop, Fields Institute, Toronto, June 2010

- AMS Western Section Meeting, Los Angeles, October 2010 (Harmonic Analysis session)

- Workshop on Oscillatory integrals in Harmonic Analysis, ICMS, Edinburgh, June 2011

- Workshop for Women in Analysis and PDE, Institute for Mathematics and its Applications, Minneapolis, May-June 2012

- Summer Informal Regional Functional Analysis Seminar, Texas A& M University, College Station, August 2012

- The Abel Symposium 2012: Operator-Related Function Theory and Time-Frequency Analysis, The Norwegian Academy of Science and Letters, Oslo, Norway, August 2012

- AMS Central Section Meeting, Akron, October 2012 (Session on Additive and Combinatorial Number Theory)

- CMS Winter Meeting, Montreal, December 2012 (Analytic Number Theory session)

- Workshop on Quasiconformal Geometry and Elliptic PDEs, IPAM, Los Angeles, May 2013

- Harmonic Analysis Workshop to celebrate Michael Cowling's 65th birthday, Segovia, July 2014

- Invited section speaker, International Congress of Mathematicians, Seoul, August 2014

- Joint Mathematics Meetings, Seattle, January 2016 (Special Session on Pseudorandomness and Its Applications)

- Workshop on Ergodic, Algebraic and Combinatorial Methods in Dimension Theory, ICERM, Brown University, Providence, February 2016. (As a co-organizer of the workshop, I was invited to speak by the ICERM director.)

## Other invited presentations (seminars, colloquia, lectures):

- Princeton University, November 1992

- Erwin Schrödinger Institute, Vienna, November 1994

- California Institute of Technology, Pasadena, January 1996

- Johns Hopkins University, Baltimore, February 1997

- University of Southern California, Los Angeles, February 1997

- Rutgers University, New Brunswick, November 1997

- Erwin Schrödinger Institute, Vienna, June 1998

- University of British Columbia, Vancouver, September 1999 (departmental colloquium)

- Georgetown University, Washington, November 1999

- Northeastern University, Boston, March 2000

- Washington University, St. Louis, December 2000 (departmental colloquium)

- Georgia Institute of Technology, Atlanta, February 2001 (departmental colloquium)

- CRM Mathematics Colloquium, Montreal, January 2002

- University of Wisconsin, Madison, March 2004

- Reed College (departmental colloquium), Portland, April 2005

- University of Victoria, Victoria, February 2006

- NSF Harmonic Analysis Focused Research Group lecture series, University of Missouri, Columbia, May 2006

- Brown University, Providence, November 2006 (departmental colloquium)

- University of Toronto, Toronto, December 2006

- Georgia Institute of Technology, Atlanta. February 2007

- Pennsylvania State University, State College, April 2007 (departmental colloquium and 8-hour minicourse)

- Rice University, Houston, December 2008 (departmental colloquium and seminar)

- Michigan State University, April 2009

- Centre de Recerca Matématica, Barcelona, Spain, June 2009

- Universidad Autónoma de Madrid, Madrid, Spain, June 2009

- University of Rochester, Rochester, October 2012 (departmental colloquium)

- Hebrew University of Jerusalem, May 2013 (departmental colloquium)

- Minicourses in Mathematical Analysis, Padova, June 2014 (5-hour minicourse)

- Georgia Institute of Technology, Atlanta, February 2015 (departmental colloquium)

- Polish Academy of Sciences, Warsaw, May 2015 (4 lectures)

- University of Illinois at Urbana-Champaign, August 2015 (departmental colloquium)

- Brown University, Providence, April 2016