

Department of Mathematics  
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# Jared Wunsch

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## Education

- 1998 **Ph.D., Mathematics**, *Harvard University*, Cambridge, MA.  
Advisor: Richard Melrose (MIT)
- 1993 **A.B., summa cum laude**, *Princeton University*, Princeton, NJ.

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## Appointments

- 2009–present **Professor**, *Northwestern University*, Evanston, IL.  
Department Chair, 2012–2015.
- 2005–2009 **Associate Professor**, *Northwestern University*, Evanston, IL.
- 2002–2005 **Assistant Professor**, *Northwestern University*, Evanston, IL.
- 2000–2002 **Assistant Professor**, *SUNY at Stony Brook*, Stony Brook, NY.
- 1999–2000 **VIGRE Assistant Professor**, *Columbia University*, New York, NY.
- 1998–1999 **NSF Postdoctoral Fellow**, *Columbia University*, New York, NY.
- Spring 1995 **Teaching Fellow**, *Harvard University*, Cambridge, MA.
- Summer 1993 **Visiting Research Fellow**, *Center for Communications Research*, La Jolla, CA.
- Summer 1992 **Visiting Research Fellow**, *Center for Communications Research*, Princeton, NJ.

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## Visiting Appointments

- Fall 2019 **Member**, *Mathematical Sciences Research Institute*, Berkeley, CA.
- February 2016 **“Research in Paris,” joint with D. Baskin**, *Institut Henri Poincaré*, Paris, France.
- January 2016 **Professeur Invité**, *Université de Paris 11*, Orsay, France.
- October 2015 **Professeur Invité**, *Université de Paris 6*, Paris, France.
- Fall 2015 **Member**, *Institut Henri Poincaré*, Paris, France.
- July 2013 **Professeur Invité**, *Université de Nantes*, Nantes, France.
- July 2009 **Visitor**, *Institut Henri Poincaré*, Paris, France.
- 2008–9 **Research Professor**, *Mathematical Sciences Research Institute*, Berkeley, CA.
- May–June, 2007 **Professeur Invité**, *Université de Paris Nord*, Paris, France.

- Feb.–March 2005 **Visiting Fellow**, *Mathematical Sciences Institute*, Australian National University, Australia.
- May 2004 **Maître de Conférence Invité**, *Université de Paris 11*, Orsay, France.

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### Awards and Honors

- 2021 **Simons Fellow in Mathematics**.
- 2013 **Fellow**, *American Mathematical Society*.
- 2011 **Distinguished Teaching Award**, WCAS, Northwestern University.
- 2008 **ASG Honor Roll**, *Northwestern University*.
- 1993 **Phi Beta Kappa**, *Princeton University*.
- 1993 **Sigma Xi**, *Princeton University*.
- 1993 **George B. Covington Prize**, *Senior Prize in Mathematics*, Princeton University.
- 1992 **Andrew H. Brown Prize**, *Junior Prize in Mathematics*, Princeton University.
- 1990–1992 **Goldwater Scholarship**, *Princeton University*.

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### Grant Support

- 1993–98 **Fannie and John Hertz Fellowship**, *Harvard University*.
- 1993 **NSF Graduate Fellowship**, (*declined*).
- 1993 **DoD Graduate Fellowship**, (*declined*).
- 1998–99 **NSF Postdoctoral Fellowship**, *Columbia University*.
- 2001–03 **NSF grant DMS-0100501**, *Linear Partial Differential Equations on Singular Spaces*.
- 2002–05 **NSF grant DMS-0323021**, *Linear Partial Differential Equations on Singular Spaces*.
- 2004–07 **NSF grant DMS-0401323**, *Linear Partial Differential Equations on Singular Spaces*.
- 2007–11 **NSF grant DMS-0700318**, *Linear Partial Differential Equations on Singular Spaces*.
- 2009 **Co-PI, NSF grant DMS-0935967**, *Conferences/Workshops on Partial Differential Equations and Related Analysis and Applications*.
- 2010–13 **NSF grant DMS-1001463**, *Linear Partial Differential Equations on Singular Spaces*.
- 2013–17 **NSF grant DMS-1265568**, *Linear Partial Differential Equations on Singular Spaces*.
- 2014 **NSF grant DMS-1420160**, *73rd Midwest PDE Seminar*.
- 2015– **Co-PI, NSF grant DMS-1502632**, *RTG: Analysis on Manifolds*.
- 2016 **NSF grant DMS-1600014**, *Conference: Evolution Equations on Singular Spaces*.

- 2016– NSF grant **DMS-1600023**, *Linear Partial Differential Equations on Singular Spaces*.
- 2019–20 NSF grant **DMS-1830112**, *Conference on Microlocal Analysis and Applications*.
- 2019–24 **Simons Foundation Collaboration Grant 631302**, *Linear Partial Differential Equations on Singular Spaces*.

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## Publications

- [1] *The Shields-Harary number for wheel and broken wheel graphs*, Discrete Applied Mathematics **59** (1995), 193–199.
- [2] *Propagation of singularities and growth for Schrödinger operators*, Duke Math. J., **98** (1999), 137–186.
- [3] *The trace of the generalized harmonic oscillator*, Ann. Inst. Fourier, **49** (1999), 351–373.
- [4] *Distribution of resonances for asymptotically euclidean manifolds* (with Maciej Zworski), J. Diff. Geom., **55** (2000), 43–82.
- [5] *The FBI transform on compact  $C^\infty$  manifolds* (with Maciej Zworski), Trans. AMS, **353** (2001), 1151–1167.
- [6] *Singularities and the wave equation on conic spaces* (with Richard Melrose), Proceedings of the Centre for Mathematics and its Applications, Australian National University, **39** (2001).
- [7] *Propagation of singularities for the wave equation on conic manifolds* (with Richard Melrose), Inventiones Mathematicae, **156** (2004), 235–299.
- [8] *A Poisson relation for conic manifolds*, Math. Res. Lett., **9** (2002), 813–828.
- [9] *The Schrödinger propagator for scattering metrics* (with Andrew Hassell), Annals of Mathematics, **162** (2005), 487–523.
- [10] *On the structure of the Schrödinger propagator* (with Andrew Hassell), *Partial Differential Equations and Inverse Problems*, Contemp. Math. 362, Amer. Math. Soc., Providence RI, 2004.
- [11] *The radiation field is a Fourier integral operator* (with Antônio Sá Barreto), Ann. Inst. Fourier, **55** (2005) 213–227.
- [12] *A Strichartz inequality for the Schrödinger equation on non-trapping asymptotically conic manifolds* (with Andrew Hassell and Terence Tao), Comm. PDE., **30** (2005), 157–205.
- [13] *Sharp Strichartz estimates on non-trapping asymptotically conic manifolds* (with Andrew Hassell and Terence Tao), Amer. J. Math. **128** (2006), 963–1024.
- [14] *Absence of super-exponentially decaying eigenfunctions on Riemannian manifolds with pinched negative curvature* (with András Vasy), Math. Res. Lett. **12** (2005), 673–684.

- [15] *Spreading of quasimodes in the Bunimovich stadium* (with Nicolas Burq and Andrew Hassell), Proc. AMS **135** (2007), 1029–1037.
- [16] *Spreading of Lagrangian regularity on rational invariant tori*, Comm. Math. Phys. **279** (2008), 487–496.
- [17] *The semiclassical resolvent and the propagator for nontrapping scattering metrics* (with Andrew Hassell), Adv. Math. **217** (2008), 586–682.
- [18] *Propagation of singularities for the wave equation on edge manifolds* (with Richard Melrose and András Vasy), Duke Math. J. **144** (2008), 109–193.
- [19] *Semiclassical second microlocal propagation of regularity and integrable systems* (with András Vasy), J. Anal. Math. **108** (2009), 119–157.
- [20] *Microlocal analysis and evolution equations*, in “Evolution Equations,” Ellwood, David, et al., eds. Vol. 17. American Mathematical Soc., 2013.
- [21] *Evolution Equations (Clay Mathematics Proceedings Vol. 17)*, edited volume with D. Ellwood, I Rodnianski, G. Staffilani, American Mathematical Soc., 2013.
- [22] *Diffraction of singularities for the wave equation on manifolds with corners* (with Richard Melrose and András Vasy), Astérisque No. 351 (2013).
- [23] *Positive commutators at the bottom of the spectrum* (with András Vasy), J. Func. Anal. **259** 2, (2010), 503–523.
- [24] *Resolvent estimates for normally hyperbolic trapped sets* (with Maciej Zworski), Ann. Henri Poincaré, **12** (2011), 1349–1385.
- [25] *Non-concentration of quasimodes for integrable systems*, Comm. PDE, 37 (2012), no. 8, 1430–1444.
- [26] *Morawetz estimates for the wave equation at low frequency* (with András Vasy), Math. Ann., 355 (2013), 1221–1254.
- [27] *Local smoothing for the Schrödinger equation with a prescribed loss* (with Hans Christianson), Amer. J. Math., **135** (2013), 1601–1632.
- [28] *Erratum to Semiclassical second microlocal propagation of regularity and integrable systems* (with András Vasy), J. Anal. Math. **115** (2011), 389–391.
- [29] *From resolvent estimates to damped waves*, (with Hans Christianson, Emmanuel Schenck, and András Vasy), J. Anal. Math. **122** (2014), 143–162.
- [30] *Resolvent estimates with mild trapping*, Journées “Équations aux Dérivées Partielles,” 2012.
- [31] *Resolvent estimates and local decay of waves on conic manifolds* (with Dean Baskin), J. Diff. Geom. **95** (2013), 183–214.

- [32] *Strichartz estimates on exterior polygonal domains* (with Dean Baskin and Jeremy Marzuola), *Contemp. Math.*, 630, Amer. Math. Soc., Providence, RI, 2014.
- [33] *Asymptotics of radiation fields in asymptotically Minkowski space* (with Dean Baskin and András Vasy), *Amer. J. Math.* **137** (2015) 1293–1364.
- [34] *The diffractive wave trace on manifolds with conic singularities* (with G. Austin Ford), *Adv. Math.* **304** (2017) 1330–1385.
- [35] *Sharp high-frequency estimates for the Helmholtz equation and applications to boundary integral equations* (with Dean Baskin and Euan Spence), *SIAM J. Math. Anal.* **48** (2016) 229–267.
- [36] *Periodic damping gives polynomial energy decay*, *Math. Res. Lett.* **24** (2017) 519–528.
- [37] *Asymptotics of scalar waves on long-range asymptotically Minkowski spaces* (with Dean Baskin and András Vasy), *Adv. Math.* **328** (2018) 160–216.
- [38] *Diffractive propagation on conic manifolds*, Séminaire Laurent Schwartz, 2016.
- [39] *On resonances generated by conic diffraction* (with Luc Hillairet), *Ann. Inst. Fourier*, to appear.
- [40] *Refined Weyl law for homogeneous perturbations of the harmonic oscillator* (with Moritz Doll and Oran Gannot), *Commun. Math. Phys.* **362** (2018), 269–294.
- [41] *Semiclassical diffraction by conormal potential singularities* (with Oran Gannot), preprint (2018).
- [42] *On non-diffractive cones* (with Jeffrey Galkowski), *J. Diff. Geom.*, to appear.
- [43] *Resonance-free regions for diffractive trapping by conormal potentials* (with Oran Gannot), *Amer. J. Math.*, to appear.
- [44] *Optimal constants in non-trapping resolvent estimates and applications in numerical analysis* (with Jeffrey Galkowski and Euan Spence), *Pure Appl. Anal.* **2** (2020), no. 1, 157–202.
- [45] *For most frequencies, strong trapping has a weak effect in frequency-domain scattering* (with David Lafontaine and Euan Spence), *Comm. Pure Appl. Math.*, to appear.
- [46] *A sharp relative-error bound for the Helmholtz  $h$ -FEM at high frequency* (with David Lafontaine and Euan Spence), preprint (2019).
- [47] *Caustics of weakly Lagrangian distributions* (with Sean Gomes), preprint (2020).
- [48] *Wavenumber-explicit convergence of the  $hp$ -FEM for the full-space heterogeneous Helmholtz equation with smooth coefficients* (with David Lafontaine and Euan Spence), preprint (2020).

- [49] *Diffraction for the Dirac–Coulomb propagator* (with Dean Baskin), preprint (2020).
- [50] *Decompositions of high-frequency Helmholtz solutions via functional calculus, and application to the finite element method* (with David Lafontaine and Euan Spence), preprint (2021).

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## Book Reviews

- [1] Review of *Stalking the Riemann Hypothesis* by Daniel Rockmore, *Booklist*, Feb. 15, 2005, p.1045.
- [2] *Magic square and circles* (rev. of “Benjamin Franklin’s Numbers” by Paul Pasles) *Nature*, vol 450, 20/27 Dec. 2007, p.1162.

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## Professional Service

- 2019–22 **AMS Prize Oversight Committee, Chair, 2019–2024.**
- 2009–10 **Representative to MSRI Sponsors Committee.**
- 2011–12 **AMS Central Section Program Committee.**
- 2010, 2012, 2017 **Service on National Science Foundation Panels, Washington, D.C..**
- 2012 **Proposal Reviewing, Institut Universitaire de France, France.**
- 2013 **Proposal Reviewing, EPSRC, UK.**
- 2015, 2018, 2020 **Proposal Reviewing, NSERC, Canada.**
- 2017 **Promotion Committee, University of Cyprus, Cyprus.**
- 1998–present **Reviewer for mathematics journals and book series.**  
 Including Trans. AMS, J. Func. Anal., Duke Math J., Comm. PDE, Comm. Math Phys., Adv. Geom. JAMS, Proc. Edinburgh Math. Soc., Amer. J. Math., Indiana Math. J., J. Math. Anal. Applic., Math. Res. Lett., Ann. Sci. ENS, Ann. Math., GAFA, Anal. PDE, SIAM J. Math. Anal., Journal d’An. Math., IMRN, Adv. Math., Ann. Inst. Fourier., AMS Grad. Studies., Ann. Henri Poincaré, Ann. Henri Lebesgue

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## Conference Organization

- October 2004 **Geometric Partial Differential Equations, AMS Sectional Meeting, Evanston, IL.**
- May 2005 **Scattering Theory and Singular Spaces, Northwestern University, Evanston, IL.**
- April 2006 **Schrödinger Evolution Equations, Banff International Research Station, Banff, Canada.**
- June–July 2008 **Clay Mathematics Institute Summer School on Evolution Equations, ETH Zürich, Zürich, Switzerland.**  
 Organizer and lecturer in 150 student summer school.
- Fall 2008 **Analysis on Singular Spaces, MSRI, Berkeley, CA.**  
 Co-lead organizer of semester-long program with \$350,000 budget, 65 participants.

- October 2009 **Complex geometry: a conference in honor of Simon Donaldson**, *Northwestern University*, Evanston, IL.
- March 2010 **International Conference on Nonlinear PDE and Related Analysis/Applications**, *Northwestern University*, Evanston, IL.
- June 2010 **Local and Global Properties of Eigenfunctions**, *Northwestern University*, Evanston, IL.
- 2009–10 **Emphasis Year in PDE**, *Northwestern University*, Evanston, IL.
- October 2011 **Workshop on Microlocal Methods in Spectral and Scattering Theory**, *Northwestern University*, Evanston, IL.
- October 2011 **Workshop on Mathematics in the Geosciences**, *Northwestern University*, Evanston, IL.
- May 2012 **Workshop on Evolution Equations (in honor of Terence Tao)**, *Northwestern University*, Evanston, IL.
- 2011–12 **Emphasis Year in Microlocal Analysis**, *Northwestern University*, Evanston, IL.
- May 2014 **73rd Midwest PDE Seminar**, *Northwestern University*, Evanston, IL.
- May 2015 **May Midwestern Microlocal Meeting**, *Northwestern University*, Evanston, IL.
- April 2016 **Evolution Equations on Singular Spaces**, *CIRM Luminy*, France.
- May 2017 **May Midwestern Microlocal Meeting**, *Purdue University*, West Lafayette, IN.
- July–Aug. 2017 **Summer Northwestern Analysis Program**, *Northwestern University*, Evanston, IL.
- March 2019 **March Midwestern Microlocal Meeting (in honor of Plamen Stefanov)**, *Purdue University*, West Lafayette, IN.
- May 2019 **Microlocal Methods in Analysis and Geometry**, *CIRM Luminy*, France.
- June 2019 **Fudan Conference on Microlocal Analysis**, *Fudan University*, Shanghai, China.
- Aug. 2019 **Summer Northwestern Analysis Program**, *Northwestern University*, Evanston, IL.  
3 weeks, 119 participants
- June 2021 **Semiclassical Analysis Meets Numerical Analysis**, *University of Bath*, Bath, UK.
- Sept. 2022 **At the Interface between Semiclassical Analysis and Numerical Analysis of Wave Scattering Problems**, *MFO Oberwolfach*, Germany.

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## Curriculum Development

- 2004–5 **Development of new undergraduate courses in analysis**, *Northwestern University*.  
Now Math 321-1,2,3.

- 2010 **Development of new undergraduate course *Mechanics for Mathematicians*, Northwestern University.**  
Now Math 327.

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### Undergraduate Theses Supervised

- 2006 **David Miller**, Northwestern University.  
2007 **Sam Blinsein**, Northwestern University.  
2007 **Matthew Gill**, Northwestern University.  
2010 **Amy Danks**, Northwestern University.  
2010 **Tae Eun Kim**, Northwestern University.  
2015 **Erik Johnson**, Northwestern University.

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### Graduate Students

- 2006 **Drew Youngren**, *Ph.D.*, Northwestern University.  
2009 **Randy Qian**, *Ph.D.*, Northwestern University.  
2012 **Austin Ford**, *Ph.D.*, Northwestern University.  
2015 **Rohan Kadakia**, *Ph.D.*, Northwestern University.  
2020 **Peter Kleinhenz**, *Ph.D.*, Northwestern University.  
current **Mengxuan Yang**, Northwestern University.  
current **Ruoyu Wang**, Northwestern University.

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### Postdoctoral Fellows

- 2010–11 **Emmanuel Schenck**, *Boas Assistant Professor*, Northwestern University.  
2010–14 **Dean Baskin**, *NSF Postdoctoral Fellow, Boas Assistant Professor*, Northwestern University.  
2016–2019 **Oran Gannot**, *RTG Postdoctoral Fellow*, Northwestern University.  
2017–2020 **Sean Gomes**, *Boas Assistant Professor*, Northwestern University.  
2020–present **Katrina Morgan**, *NSF Postdoctoral Fellow*, Northwestern University.

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### Departmental and University Service

- 2000–2002 **Organizer of Partial Differential Equations Seminar**, *SUNY at Stony Brook*.  
2002–present **Co-organizer of Analysis Seminar**, *Northwestern University*.  
2004–present **Advisor for Mathematics Graduate School Applicants**, *Northwestern University*.  
2004–7 **Gates Cambridge Committee**, *Northwestern University*.  
2005 **Provost's Domain Dinner Presentation**, *Northwestern University*.  
2006–8 **Rhodes/Marshall Committee**, *Northwestern University*.  
2005–12 **Phi Beta Kappa Board of Advisors**, *Northwestern University*.



- 2007, 2008, **Mathematics Department Budget Committee**, *Northwestern University*.  
 2010, 2011, Also served Ex Officio 2013–15.  
 2017, 2018
- 2007–8 **Chair, Boas Hiring Committee**, *Northwestern University*.
- 2009–12 **President, Phi Beta Kappa Alpha Chapter of Illinois**, *Northwestern University*.  
 Chapter Chartered in 1890
- 2007–8 **Integrated Science Program Honors Committee**, *Northwestern University*.
- 2008 **WCAS Lecturer Promotion Committee**, *Northwestern University*.
- 2009–12 **Chair, Mathematics Department Personnel Committee**, *Northwestern University*.
- 2009–10, **Chair, Yamabe Lectures Committee**, *Northwestern University*.  
 2016–17
- 2009–10, **Chair, Pinsky Lectures Committee**, *Northwestern University*.  
 2016–17
- 2010–2014 **Hertz Fellowships Committee**, *Northwestern University*.
- 2009–11 **Chair, Mathematics Department Space Committee**, *Northwestern University*.
- 2011–12 **Co-Chair, Mathematics Department Emphasis Year Committee**, *Northwestern University*.
- 2011 **Completed Kellogg School of Management minicourse *Management Skills for Innovative University Leaders***, *Northwestern University*.
- 2012–15 **Chair, Northwestern University Department of Mathematics**, *Northwestern University*, Evanston, IL.
- 2012–13 **Committee for the Reform of the Ad Hoc Committee Process**, *WCAS, Northwestern University*.
- 2013–14 **WCAS Strategic Plan Committee**, *Northwestern University*.
- 2016–17 **Chair, Bellow Lectures Committee**, *Northwestern University*.
- 2018 **Nemmers Prize Committee**, *Northwestern University*.
- 2017–19 **Faculty Appeals Panel**, *Northwestern University*.
- 2018–20 **Executive Committee of Faculty Appeals Panel**, *Northwestern University*, Committee Chair, 2019–20.
- 2018–19 **Mathematics Department Program Review Liaison**, *Northwestern University*.

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## Panel Appearances

- 2008 **Postdoctoral Jobs for Math. Graduate Students**, *Northwestern University*.
- 2009 **Panel for Graduate Students on Job Applications**, *Northwestern University*.

- 2014 **Panel for Undergraduates on Math. Graduate Study**, *NUMS*, Northwestern University.
- 2014 **Third Annual Introduction to Graduate Study at Northwestern University**, *TGS*, Northwestern University.
- 2017 **Panel for Graduate Students on Job Applications**, *Northwestern University*.
- 2018 **Academic Job Forum/Panel Discussion**, *Northwestern University*.
- 2020 **Panel for Graduate Students on Job Applications**, *Northwestern University*.

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### Distinguished Addresses

- September 22, 2008 **MSRI Evans Lecture**, *MSRI/Berkeley*, Berkeley, CA.
- November 5, 2010 **AMS 2010 Fall Central Section Meeting**, *Notre Dame*, South Bend, IN.
- June 7, 2012 **Journées EDP 2012**, Biarritz, France.
- January 26, 2016 **Séminaire Laurent Schwartz**, *IHES*, Bures sur Yvette, France.

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### Minicourses

- June–July 2008 **Clay Mathematics Institute Summer School on Evolution Equations**, *ETH Zürich*, Zürich, Switzerland.  
10 lectures.
- June–July 2014 **Chicago Summer School in Analysis**, *University of Chicago*, Chicago, IL.  
5 lectures.
- May 2016 **Oxford University Center for Doctoral Training in PDE**, *Oxford*, UK.  
3 lectures (4.5 hours).
- June 2017 **Microlocal Analysis and Applications**, *Cardiff*, UK.  
2 lectures.
- August 2017 **Summer Northwestern Analysis Program**, *Northwestern University*, Evanston, IL.  
4 lectures (6 hours).
- March 2018 **Graduate minicourse in Microlocal Analysis**, *Australian National University*, Canberra, Australia.  
2 hours
- December 2018 **PDE/Analysis Mini-School *Trapping, diffraction, and decay of waves***, *UNC*, Chapel Hill, North Carolina.  
4 lectures (principal lecturer)
- June 2019 **Fudan Conference on Microlocal Analysis**, *Fudan University*, Shanghai, China.  
2 lectures

August 2019 **Summer Northwestern Analysis Program**, *Northwestern University*,  
Evanston, IL.  
4 lectures.

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### Invited Talks

London Analysis Seminar (virtual), 5/21/20  
MSRI Microlocal Analysis Seminar, 11/12/19  
Berkeley Analysis and PDE Seminar, 11/4/19  
Bay Area Microlocal Analysis Seminar, Berkeley, 4/12/19  
Stanford University Geometry Seminar, 4/10/19  
Ninth Ohio River Analysis Meeting, University of Cincinnati, 3/30/19  
Conference “Analysis of PDEs: unique continuation, stabilization, control and dispersive properties,” IHP Paris, 11/8/18  
Banff International Research Station Workshop “Around Quantum Chaos,” 7/20/18  
MIT PDE/Analysis Seminar, 5/1/18  
UNC Analysis and PDE Seminar, 4/25/18  
AMSI-ANU Workshop on Microlocal Analysis and its Applications, Murrumarang Australia, 3/23/18  
“Spectral Geometry, Graphs and Semiclassical Analysis,” Aussois France, 12/14/17  
79/80th Midwest PDE Seminar, UIC, 9/14/17  
Third Symposium on Scattering and Spectral Theory, Florianópolis Brazil, 7/26/17  
Calderón-Zygmund Analysis Seminar, Univ. of Chicago, 5/22/17  
Operator Semigroups in Analysis: Modern Developments, Bedlewo Poland, 4/25/17  
Bay Area Microlocal Analysis Seminar, Stanford, 3/20/17  
University of Michigan Mathematics Colloquium, 2/7/17  
CMO Oaxaca “Geometric and Spectral Methods in Partial Differential Equations”, 12/15/16  
University of Cyprus, 11/16/16  
Purdue University Mathematics Colloquium, 10/18/16  
Oxford University Partial Differential Equations Seminar, 5/23/16  
Analysis and Differential Equations Seminar, University of Bath (UK), 4/14/16  
Séminaire Géométrie, EDP et Physique Mathématique, Université de Cergy-Pontoise, 4/4/16  
Séminaire Équipe MIP, Institut des Mathématiques de Toulouse, 3/8/16  
Séminaire de Physique Mathématique, Institut Fourier, Grenoble, 1/18/16  
PDE and Fluid Mechanics Seminar, ICMAT Madrid, 1/13/16  
Séminaire du MAPMO, Université d’Orléans, 12/10/15  
Groupe de Travail Problèmes Spectraux et Physique Mathématique, Université Paris-Sud, 12/7/15  
Oberseminar Analysis/Numerik, Carl von Ossietzky Universität, Oldenburg Germany, 12/3/15  
Relativity Seminar, Institut Henri Poincaré, Paris, 11/4/15  
London Analysis and Probability Seminar, University College London, 10/22/15  
Séminaire “Problèmes Spectraux en Physique Mathématique”, IHP Paris, 10/19/15  
Workshop on Analysis and PDE, Leibniz Universität Hannover, 9/29/15  
Berkeley/Bonn/Paris Nord/Zürich PDE Video Seminar, 9/24/15  
Erwin Schrödinger Institute for Mathematical Physics workshop “Semi-classical Analysis: Spectral Theory and Resonances,” 8/28/15  
University of Toronto Analysis and Applied Mathematics Seminar, 4/10/15  
Texas A&M Mathematical Physics and Harmonic Analysis Seminar, 3/27/15

UNC Analysis/PDE Seminar, 3/18/15  
Duke/UNC Student Colloquium, 3/17/15  
Temple University Analysis Seminar, 2/23/15  
Stanford University Analysis and PDE Seminar, 11/17/14  
Thematic Program on Nonlinear PDEs in Geometry and Physics, Notre Dame, 6/17/14  
Montreal Analysis Seminar, McGill University, 5/23/14  
Stanford University Analysis and PDE Seminar, 12/16/13  
CIRM “HANDDY” (Hamiltonian and Dispersive Equations) conference Luminy France, 6/28/13  
University of Illinois at Chicago Mathematics Colloquium, 2/15/13  
Stanford University Analysis and PDE Seminar, 11/15/12  
University of Michigan Differential Equations Seminar, 11/8/12  
Conference on Spectral Invariants on Non-compact and Singular Spaces, CRM, Montreal, 7/25/12  
A Conference on Partial Differential Equations Analytic and Geometric Aspects in honor of Michael Taylor’s 65th Birthday, 6/17/12  
University of Illinois at Urbana-Champaign Colloquium, 11/17/11  
Johns Hopkins Analysis Seminar, 11/7/11  
Banff International Research Station Workshop “Self Adjoint Extensions and Singularity Resolution in String Theory and Quantum Gravity,” 8/24/11  
University of Kentucky NSF-CBMS conference on “Global Harmonic Analysis,” 6/20/2011, 6/23/2011  
CIRM Meeting “Analyse Géométrique,” Luminy France, 1/21/2011  
UNC Analysis/PDE Seminar, 12/1/10  
MIT PDE/Analysis Seminar, 9/14/10  
Banff International Research Station Workshop “Geometric Scattering Theory and Applications,” 3/16/10  
Calderón-Zygmund Analysis Seminar, Univ. of Chicago, 3/1/10  
June Workshop, Institut Henri Poincaré Trimester: Nonlinear Waves and Dispersion, 6/23/09  
Institut Henri Poincaré Séminaire: Problèmes Spectraux en Physique Mathématique, 6/15/09  
MIT “Mini Micro Conference,” 4/3/09  
Southern California Analysis and PDE Meeting, UCLA, 2/7/09  
U.C. Davis Mathematics Colloquium, 11/17/08  
From Wave Propagation to K-theory: a Conference in Honour of the 60th Birthday of Richard Melrose, Stanford University, 10/25/08  
MIT Casual Geometric Analysis Seminar, 4/30/08  
University of Pennsylvania Analysis Seminar, 3/25/08  
University of Rochester Analysis Seminar, 3/21/08  
University of Kentucky PDE and Analysis Seminar, 3/10/08  
U.C. Berkeley PDE/Analysis Seminar, 1/28/08  
UCSD Real Analysis Seminar, 12/4/07  
AMS special session on Wave Propagation from Mathematical and Numerical Viewpoints, Chicago, 10/6/07  
MFO Oberwolfach Workshop “Analysis and Geometric Singularities,” 8/23/07  
Université de Paris Nord Seminar “Equations non linéaires,” 6/1/07, 6/15/07  
Princeton University Analysis Seminar, 4/9/07  
University of Southern California Mathematics Colloquium, 3/21/07  
AMS Special Session on Microlocal Analysis and Singular Spaces, New Orleans, 1/6/07  
Purdue University Spectral and Scattering Theory Seminar, 10/26/06

Stanford University Mathematics Colloquium, 4/6/06  
Johns Hopkins Analysis Seminar, 3/13/06  
Osaka University PDE Seminar, 1/20/06  
“Spectral and scattering theory and related topics” workshop, RIMS, Kyoto, 1/18/06  
“Analysis of singularities of solutions to Schrödinger equation” workshop, University of Tokyo, 1/13/06, 1/14/06  
Colloque d’Equations aux Dérivées Partielles, Hamammet, Tunisia, 9/9/05  
University of Bordeaux Applied Mathematics Seminar, 6/23/05  
AMS/DMV/ÖMG Special Session on Nonlinear Waves, Mainz, Germany, 6/16/05  
Calderón-Zygmund Analysis Seminar, Univ. of Chicago, 5/23/05  
The Australian National University Mathematics Colloquium, 3/3/05  
The Australian National University PDE/Analysis Seminar, 2/28/05  
Mathematics Colloquium, McMaster University, 10/8/04  
Conference on Phase Space Analysis and Related Topics, Grado Italy, 9/16/04  
Séminaire Equations aux Dérivées Partielles, University of Paris XI (Orsay), 5/25/04  
Purdue Scattering and Spectral Theory Seminar, 4/7/04  
Michigan State University PDE Seminar, 4/6/04  
Fields Institute Workshop on Nonlinear Wave Equations, 3/17/04  
MIT PDE/Analysis Seminar, 2/11/04  
Short programme on analysis and resolution of singularities, CRM, Montreal, 9/4/03  
Symposium on Scattering and Spectral Theory, Serrambi Brazil, 8/21/03  
Calderón-Zygmund Analysis Seminar, Univ. of Chicago, 4/28/03  
51st Midwest PDE Seminar, UIC, 4/13/03  
UCLA Analysis Seminar, 3/14/03  
The Australian National University PDE/Analysis Seminar, 3/3/03  
PASI on PDE, Inverse Problems, and Non-Linear Analysis, Santiago de Chile, 1/14/03  
CMS Special Session on Partial Differential Equations, Ottawa, 12/9/02  
Recent Advances in Calculus of Variations and PDE’s, Pisa, 11/7/02  
MIT PDE/Analysis Seminar, 9/11/02  
Northwestern University Colloquium, 3/4/02  
CUNY Graduate Center Differential Geometry and Analysis Seminar, 2/27/02  
McGill University Analysis Seminar, 1/11/02  
Temple University Colloquium, 9/17/01  
University of Potsdam workshop “Ellipticity and Parabolicity in Analysis and Geometry,” 8/24/01  
Erwin Schrödinger Institute for Mathematical Physics, Workshop in Scattering Theory, 5/21/01  
MSRI Spectral Invariants Workshop, 5/7/01  
AMS Special Session on Nonlinear Partial Differential Equations, New York, 11/4/00  
Hyperbolic Equations and Scattering: A Conference in Honor of Gerard Friedlander, MIT, 9/30/00  
University of New South Wales Pure Mathematics Colloquium, 7/14/00  
The Australian National University PDE/Analysis Seminar, 7/10/00  
The Australian National University, National Research Symposium on Geometric Analysis and Applications, 6/29/00  
University of Bologna, 6/12/00, 6/13/00, 6/14/00  
Princeton University Analysis Seminar, 2/28/00  
University of Toronto Analysis and Applied Mathematics Seminar, 12/6/99  
Columbia University Analysis and Geometry Seminar, 11/11/99

U.C. Berkeley Analysis and PDE Seminar, 9/3/99  
CIRM Meeting “Théorie des résonances,” Luminy France, 6/17/99  
University of Bologna, 6/8/99  
SUNY Stonybrook Colloquium, 2/25/99, 9/14/00  
University of Pennsylvania Analysis Seminar, 10/20/98  
U.C. Berkeley Analysis and PDE Seminar, 9/29/98  
University of Bologna, 6/29/98  
Erwin Schrödinger Institute for Mathematical Physics, Workshop in Spectral Geometry and its Applications, 6/18/98  
The Ohio State University Analysis and Geometry Seminar, 3/13/98  
University of British Columbia, 2/26/98  
University of Washington Differential Geometry/PDE Seminar, 2/23/98  
Columbia University Analysis and Geometry Seminar, 2/12/98  
The Johns Hopkins University Partial Differential Equations/Geometric Analysis Seminar, 11/20/97  
Fields Institute Workshop on Microlocal Methods in Geometric Analysis and Mathematical Physics, 11/1/97  
Harvard University Differential Geometry Seminar, 10/7/97  
AMS Special Session on Geometric Analysis and Spectral Theory, Montreal, 9/27/97  
MIT PDE/Analysis seminar, 3/19/97, 9/11/02  
Universität Potsdam Arbeitsgruppe “Partielle Differentialgleichungen und Komplexe Analysis” Spring School, 2/26/97  
Brown University PDE seminar, 11/15/96