

# GIGLIOLA STAFFILANI

## WORK ADDRESS

MIT, room 2-251  
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Cambridge, MA 02139  
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## EDUCATION

University of Chicago  
Ph.D in Mathematics (*Advisor: Carlos Kenig*), June 1995  
University of Chicago  
M.S. in Mathematics, August 1991  
Università di Bologna  
Laurea in Matematica, *summa cum laude*, September 1989

## ACADEMIC APPOINTMENTS

<b>Abby Rockefeller Mauze Professor</b>	MIT	2006-Present
<b>Eisenbud Professor</b>	MSRI	August-December 2015
<b>E. S. and R. M. Cashin Fellow</b>	Radcliffe IAS	2009-2010
<b>Professor</b>	MIT	2006-Present
<b>Associate Professor</b>	MIT	2002-2006
<b>Member of the IAS</b>	IAS	2003-2004
<b>Visiting Associate Professor</b>	Harvard University	January-May 2002
<b>Associate Professor</b>	Brown University	2001-2002
<b>Associate Professor on leave</b>	Stanford University	2001-2002
<b>Assistant Professor</b>	Stanford University	1999-2001
<b>Assistant Professor</b>	Princeton University	1998-1999
<b>Szegő Assistant Professor</b>	Stanford University	1996-1998
<b>Member of the IAS</b> ( <i>Mentor: Jean Bourgain</i> )	IAS	1995-1996

## HONORS and AWARDS

Elected Member of National Academy of Sciences, 2021  
Premio Luigi e Wanda Amerio, Istituto Lombardo, Accademia di Scienze e Lettere, 2021  
MIT Committed to Care Award, 2020  
Guglielmo Marconi Medal, Università di Bologna, 2020  
2019-2023 Simons Collaboration Grant on Wave Turbulence  
2018 Earll M. Murman Award for Excellence in Undergraduate Advising  
2017 Fellow of the Guggenheim Memorial Foundation  
2017 Fellow of the Simons Foundation  
2017 MITx Prize for Teaching and Learning in MOOCs  
Elected Member of the American Academy of Arts and Sciences, 2014  
AMS Fellow, 2013  
Elected Member of the Massachusetts Academy of Sciences, 2013  
Ambasciatore d'Abruzzo nel Mondo, 2012  
Alfred P. Sloan Research Fellowship 2000-2002  
Terman Award, Stanford University, 1998-2001  
NSF Grants 1998-Present  
The Harold M. Bacon Memorial Teaching Award, Stanford University, 1997  
The Lawrence and Josephine Graves Memorial Lectureship Award, University of Chicago, 1994  
The Physical Sciences Teaching Prize, University of Chicago, 1994.

## SPECIAL LECTURES

2022 Myhill Lectures, SUNY, Buffalo  
2021 Inaugural Ingrid Daubechies lecture (virtual)  
2019 Rademacher Lectures, UPenn  
2018 EMS Lecturer  
2018 Earle Raymond Hedrick Lectures, MAA meeting  
2018 van Winter Memorial Lecture in Mathematical Physics, University of Kentucky  
2018 Göran Gustafsson Lectures in Mathematics, KTH, Stockholm  
2018 Guterman Lecture at Tufts University  
2018 Harry S. Kieval Lecture, Humboldt State University  
2018 Clanton Lectures at Furman University

## PROFESSIONAL EXPERIENCES

Co-organizer of the ICERM Program *Hamiltonian Methods in Dispersive and Wave Evolution Equations*, Providence, Autumn 2021.

Chair of the Organizing Committee for the conference *Analysis and Beyond: Celebrating Jean Bourgain's work and its impact*, IAS May 21 – 24, 2016.

Lead organizer of a Jumbo Program at MSRI on *Deterministic and probabilistic challenges in nonlinear dispersive equations*, Berkeley, Autumn 2015.

Co-organizer of the conference *Harmonic Analysis and Partial Differential Equations: Recent Developments and Future Directions*, University of Chicago, September 19 – 21, 2014.

Co-organizer of the *Fifteenth International Conference on Hyperbolic Problems*  
Rio de Janeiro, Brazil, July 28 – August , 2014.

Co-organizer of the Clay Mathematics Institute 2008 Summer School on *Evolution Equations*  
Eidgenössische Technische Hochschule, Zürich, Switzerland, June 23 – July 18, 2008.

Co-organizer of the *MIT Women in Mathematics Conference: A Celebration*  
MIT, Cambridge, April 12 –13, 2008.

Visiting Professor with MIT–France Program  
Université Pierre and Marie Curie I, France, January 29 – February 3, 2007.

Co-organizer of a semester at MSRI, on *Dispersive Equations*  
Berkeley, Autumn 2005.

Visiting Researcher  
Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy, June 9 – July 9, 2004.

Visiting Professor  
Université de Cergy-Pontoise, Cergy-Pontoise, France, May 15 – June 30, 2001.

Visiting Researcher  
University of Chicago, Chicago, January-March, 2001.

Co-organizer of the Workshop on *Nonlinear Dispersive Equations*  
Stanford University, Stanford, February 12 – 13, 2000.

Member of the Mathematical Sciences Research Institute  
Berkeley, September 1 – 30, 1997.

Visiting Professor  
Université de Cergy-Pontoise, Cergy-Pontoise, France, June 1 – 30, 1997.

## INVITED SPEAKER

*AWM Distinguished Colloquium*  
February 17, 2021, University of Maryland, College Park, (virtual).

*INdAM Day 2020*  
December 10, 2020, Rome, (virtual)

*Zurich Colloquium in Mathematics*  
December 17, 2019, ETH, Zurich, Switzerland.

*Opening Colloquium*  
June 20-22, 2019, Münster, Germany.

*Honoring the Life and Work of Jean Bourgain*  
May 30-June 2, 2019, IAS, Princeton.

*Les 60 ans de Jean-Yves Chemin*  
March 25-29, 2019, IHP, Paris, France.

*Conference on “Celebrating Approximate 60s - An International Conference on Nonlinear PDEs and Its Applications”*  
June 19-22, 2018, Shanghai, China.

*Conference on “Nonlinear Wave Equations”*  
May 14-17, 2018, Providence.

*Conference on “Nonlinear Waves: Stability vs Turbulence”*  
May 7-10, 2018, Atlanta.

Plenary Lecturer at the *19th ÖMG Congress*  
September 11-15, 2017, Salzburg, Austria.

AMS Invited Addresses at the *2017 Joint Mathematics Meetings*  
January 4-7, 2017, Atlanta.

*Analysis, PDE's, and Geometry*  
A conference in honor of Sergiu Klainerman,  
January 26-29, 2016, Princeton

Plenary Speaker at the *AMS-EMS-SPM Joint International Meeting*,  
June 10-13, 2015, Porto.

*Geometric non-linear analysis: conference on the occasion of Michael Struwe's 60th Birthday*, June 8-12, 2015, ETH, Zurich.

*NSF-CBMS Regional Research Conference in the Mathematical Sciences*  
June 17–21, 2013, Manhattan KS.

*Conference on “Probability and PDEs”*  
May 20-24, 2013, Pisa.

*32rd Southeastern-Atlantic Regional Conference on Differential Equations*, October 19-20, Wake

Forest.

*International PDE Conference*  
September 10–13, 2012, Oxford.

*XIV International Conference on Hyperbolic Problems: Theory, Numerics, Applications* June 25–29,  
2012, Padova.

*Current Events Bulletin Lectures*  
January 6, 2012, Boston.

*2010 SIAM Annual Meeting*  
July 12–16, 2010, Pittsburgh.

*British Mathematics Colloquium and British Applied Mathematical Colloquium*  
April 6–9, 2010, Edinburgh.

*Conference on “Ondes Non-linéaire et Dispersion”*  
June 22–26, 2009, IHP, France.

*Conference on “Non-linear Phenomena in Mathematical Physics: A dedication to Cathleen Synge Morawetz on her 85th birthday”* September 18–20, 2008, Fields Institute, Toronto, Ontario, Canada.

*Conference on “Nonlinear wave”*  
May 8–11, 2008, Brown University, Rhode Island.

*Fifth IMAC International Conference on Nonlinear Evolution Equations and Wave Phenomena*  
April 16–19, 2007, Athens Georgia.

*Conference in “Nonlinear dispersive equations”*  
March 14–18, 2007, Baltimore, Maryland.

*CMS Meeting*  
December 9–11, 2006, Toronto, Ontario, Canada.

*Satellite Conference on Analysis “Harmonic and Geometrical Analysis with Applications to PDE”*  
August 14–18, 2006, Seville, Spain.

*2 Olga’s Workshop*  
May 18–20 2006, MSRI, Berkeley.

*Schrödinger Evolution Equations*  
April 22–27, 2006, BIRS, Banff, Alberta, Canada.

*Colloque du Groupement de Recherche “Analyse des Equations aux Dérivés Partielles”*  
June 6–10, 2005, Forges-les-Eaux, France

*SIAM Applications of Dynamics Systems Meeting*  
May 22–26, 2005, Snowbird, Utah.

*International Conference on Harmonic Analysis and Partial Differential Equations*  
September 17–19, 2004, University of Chicago, Illinois.

*Harmonic Analysis*  
June 9–July 9, 2004, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy.

*The 2nd Symposium on Analysis and PDEs*

June 7–10, 2004, Purdue University, West Lafayette, Indiana.

*Program for Women in Mathematics*

May 15–28, 2004, Institute for Advanced Study and Princeton University, Princeton.

*The Third Duke Mathematical Journal Conference*

April 23–25, 2004, Duke University, North Carolina.

*Park City Mathematics Institute*

June 13–July 31, 2003, Park City, Utah.

*AMS-UMI meeting, special session on Microlocal Analysis*

June 12–16, 2002, Pisa, Italy.

*Harmonic Analysis and PDE*

May 8–11, 2002, Columbia, Missouri.

*Curvature and Dispersion Effects in Nonlinear Partial Differential Equations*

April 21–27, 2002, Oberwolfach, Germany.

*Arkansas Spring Lecture series*

April 11–13, 2002, University of Arkansas, Fayetteville.

*AMS meeting, Invited Address*

November 10–11, 2001, Irvine, California.

*AMS meeting, special session on PDE*

October 21–22, 2001, San Francisco, California.

*AMS–IMS–SIAM Summer Research Conference in Harmonic Analysis*

June 24–July 5, 2001, Mt. Holyoke College, Massachusetts.

*Nonlinear Waves*

May 20–26, 2001, Oberwolfach, Germany.

*Workshop on PDE*

April 16–21, 2001, Fields Institute, Toronto, Canada.

*Nonlinear Analysis 2000*

May 28–June 2, 2000, Courant Institute, NYU.

*Riviere–Fabes Symposium on Analysis and PDE*

April 28–30, 2000, School of Mathematics, Minneapolis, Minnesota.

*Memphis Lectures on Mathematics year 2000*

March 15–18, 2000, University of Memphis, Memphis.

Conference on *Oscillatory Integrals and their Applications to Partial Differential Equations*

October 23–24, 1997, Mathematical Science Research Institute, Berkeley, California.

Conference on *Nonlinear Waves*

June 30–July 5, 1997, Oberwolfach, Germany.

## EDITORIAL BOARDS

AMS Graduate Studies in Mathematics; Ars Inveniendi Analytica; Communications of the AMS; Duke Math Journal; JAMS, La Matematica; Illinois Journal of Mathematics; Revista Matemática

Iberoamericana; Selecta Mathematica; Stochastics and Partial Differential Equations: Analysis and Computations.

## SEMINARS PRESENTED IN THE LAST FIVE YEARS

SIAM PDE (virtual), 2021; MCQM Seminars (virtual), 2021; Princeton University (virtual), 2021; One World PDE (virtual), 2020; University of Kentucky, 2018; WPI, 2017; USC, 2017;

## PUBLICATIONS AND PREPRINTS

*A rigorous derivation of the Hamiltonian structure for the Vlasov equation.* Preprint, arXiv:2206.07589. (With Joseph K. Miller, Andrea R. Nahmod, Natasa Pavlović and Matthew Rosenzweig)

*The wave maps equation and Brownian paths.* Preprint, arXiv:2111.07381. (With Bjoern Bringmann and Jonas Luhrmann).

*Large deviations principle for the cubic NLS equation.* Preprint, arXiv:2110.15748. To appear in CPAM. (With Miguel Angel Garrido, Ricardo Grande and Kristin M. Kurianski)

*Global solutions of aggregation equations and other flows with random diffusion.* Preprint arXiv:2109.09892. (With Matthew Rosenzweig)

*Energy transfer for solutions to the nonlinear Schrödinger equation on irrational tori.* Preprint, arXiv:2107.01459 (With Alexander Hrabski, Yulin Pan and Bobby Wilson )

*On the wave turbulence theory for a stochastic KdV type equation.* Preprint arXiv:2106.09819. (With Minh-Binh Tran)

*Uniqueness of Solutions to the Spectral Hierarchy in Kinetic Wave Turbulence Theory.* Phys. D 433 (2022), Paper No. 133148. (With M. Rosenzweig)

*Probabilistic small data global well-posedness of the energy-critical Maxwell-Klein-Gordon equation.* Preprint, arXiv:2010.09528. (With J. Krieger and J. Luhrmann)

*Poisson Commuting Energies for a System of Infinitely Many Bosons.* Adv. Math. 406 (2022). (With D. Mendelson, A. R. Nahmod, N. Pavlović and M. Rosenzweig).

*Sharp Strichartz estimates for some variable coefficient Schrödinger operators on  $\mathbb{RT}^2$ .* Math. Eng. 4 (2022), no. 4, Paper No. 033. (With S. Federico)

*On the nonlinear Dysthe equation.* Nonlinear Anal. 207 (2021), 112292, 36 pp. (With R. Grande and K. Kurianski)

*2D-Defocusing Nonlinear Schrödinger Equation with Random Data on Irrational Tori.* Stoch. Partial Differ. Equ. Anal. Comput. 9 (2021), no. 1, 142–206. (With C.Fan, Y. Ou and H. Wang).

*Pointwise Convergence of the Schrödinger Flow.* Int. Math. Res. Not. IMRN (2021), no. 1, 599–650. (With E. Compaan, R. Lucá).

*On the high-low method for NLS on the hyperbolic space.* J. Math. Phys. 61 (2020), no. 8, 081509, 24 pp. (With X. Yu).

*A Rigorous Derivation of the Hamiltonian Structure for the Nonlinear Schrödinger Equation.* Adv. Math. 365 (2020), 107054, 115 pp. (With D. Mendelson, A. R. Nahmod, N. Pavlović and M. Rosenzweig).

*The Surface Quasi-Geostrophic Equation with Random Diffusion.* Int. Math. Res. Not. IMRN (2020), no. 23. (With T. Buckmaster, A. Nahmod and K. Widmayer).

*Stability of the Cubic Nonlinear Schrödinger Equation on Irrational Tori.* SIAM J. Math. Anal. 52 (2020), no. 2, 1318–1342. (With B. Wilson).

*Almost sure boundedness of iterates for derivative nonlinear wave equations.* Comm. Anal. Geom. 28 (2020), no. 4, 943–977. (With S. Chanillo, M. Czubak, D. Mendelson and A. Nahmod).

*Internal waves in sheared flows: Lower bound of the vorticity growth and propagation discontinuities in the parameter space.* Physical Review E (Vol. 97, No. 6), (2018). (With F. Fraternali, L. Domenicale and D. Tordella).

*An infinite sequence of conserved quantities for the cubic Gross-Pitaevskii hierarchy on  $\mathbb{R}$ .* Trans. Amer. Math. Soc. 371 (2019), no. 7, 5179–5202. (With D. Mendelson, A. Nahmod, N. Pavlović).

*Global Flows with Invariant Measures for the Inviscid Modified SQG Equations.* Stoch. Partial Differ. Equ. Anal. Comput. 6 (2018), no. 2, 184–210. (With A. Nahmod, N. Pavlovic and N. Totz)

*On a bilinear Strichartz estimate on irrational tori and some application.* Anal. PDE 11 (2018), no. 4, 919–944. (With C. Fan, H. Wang, B. Wilson).

*A Semi-linear Shifted Wave Equation on the Hyperbolic Spaces with Application on a Quintic Wave Equation on  $\mathbb{R}^2$ .* Trans. Amer. Math. Soc. 368 (2016), no. 4, 2809–2864. (With R. Shen)

*Almost sure well-posedness for the periodic 3D quintic nonlinear Schrödinger equation below the energy space.* J. Eur. Math. Soc. (JEMS) 17 (2015), no. 7, 1687–1759. (With A. Nahmod)

*Randomization and the Gross-Pitaevskii hierarchy.* Arch. Ration. Mech. Anal. 218 (2015), no. 1, 417–485. (With V. Sohinger)

*On the uniqueness of solutions to the periodic 3D Gross-Pitaevskii hierarchy.* J. Funct. Anal. 266 (2014), no. 7, 4705–4764. (With P. Gressman and V. Sohinger)

*Almost sure existence of global weak solutions for super-critical Navier-Stokes equations.* SIAM J. Math. Anal. 45 (2013), no. 6, 3431–3452. (With A. Nahmod and N. Pavlović)

*On the continuum limit for discrete NLS with long-range lattice interactions.* Comm. Math. Phys. 317 (2013), no. 3, 563–591. (With K. Kirkpatrick and E. Lenzmann)

*Absolute continuity of Brownian bridges under certain gauge transformations.* Math. Res. Lett. 18 (2011), no. 5, 875–887. (With A. Nahmod, L. Rey-Bellet, Luc and S. Sheffield)

*On the global well-posedness of energy-critical Schrödinger equations in curved spaces.* Anal. PDE 5 (2012), no. 4, 705–746. (With A. Ionescu and B. Pausader)

*Invariant weighted Wiener measures and almost sure global well-posedness for the periodic derivative NLS.* J. Eur. Math. Soc. (JEMS), 14, no. 4, 1275–1330, (2012). (With A. Nahmod, T. Oh and L. Rey-Bellet)

*Derivation of the two-dimensional nonlinear Schrödinger equation from many body quantum dynamics.* Amer. J. Math. 133, no. 1, 91–130, (2011). (With K. Kirkpatrick and B. Schlein)

*Transfer of energy to high frequencies in the cubic defocusing nonlinear Schrödinger equation.* Invent. Math. 18, no. 1, 39–11, (2010). (With J. Colliander, M. Keel, H. Takaoka and T. Tao)

*The Cauchy problem for Schrödinger flows into Kähler manifolds.* Discrete Contin. Dyn. Syst. 27 (2010), no. 2, 389–439. (With C. Kenig, Carlos, T. Lamm, D. Pollack, and T. Toro)

*Strichartz estimates for the water-wave problem with surface tension.* Comm. Partial Differential Equations 35 (2010), no. 12, 2195–2252. (With H. Christianson and V. Hur)

*Local smoothing effects for the water-wave problem with surface tension.* C. R. Math. Acad. Sci. Paris 347 (2009), no. 3–4, 159–162. (With H. Christianson and V. Hur)

*Semilinear Schrödinger Flows on Hyperbolic Spaces: Scattering in  $H^1$ .* Math. Ann. 345, no. 1, 133–158, (2009). (With A. Ionescu)

*Global well-posedness and polynomial bounds for the defocusing  $L^2$ -critical nonlinear Schrödinger equation in  $\mathbb{R}$ .* Comm. Partial Differential Equations 33 (2008), no. 7–9, 1395–1429. (With D. de Silva, N. Pavlovic and N. Tzirakis)

*On the global well-posedness of the one-dimensional Schrödinger map flow.* Anal. PDE 2, no. 2, 187–209, (2009). (With I. Rodnianski and Y.A. Rubinstein)

*Scattering theory for radial nonlinear Schrödinger equations on hyperbolic space.* Geom. Funct. Anal. 18 (2008), no. 2, 367–399, (2008). (With V. Banica and R. Carles)



*Global well-posedness and scattering in the energy space for the critical nonlinear Schrödinger equation in  $\mathbb{R}^3$ .* Ann. of Math. (2) 167, no. 3, 767–865, (2008). (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Resonant decompositions and the I-method for cubic nonlinear Schrödinger on  $\mathbb{R}^2$ .* DCDS-A, 21 (2008), no. 3, 665–686. (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Weighted low-regularity solutions of the KP-I initial-value problem.* Discrete Contin. Dyn. Syst. 20 (2008), no. 2, 219–258. (With J. Colliander, A. Ionescu, and C. Kenig).

*Regularity of solutions to the Navier-Stokes equations evolving from small data in  $BMO^{-1}$ .* Int. Math. Res. Not. IMRN 2007, no. 21, Art. ID rnm087, 35 pp. 76D03. (With P. Germain and N. Pavlović).

*The energy-critical nonlinear Schrödinger equation in  $\mathbb{R}^3$ .* Recent developments in nonlinear partial differential equations, 69–80, Contemp. Math., 439, Amer. Math. Soc., Providence, RI, 2007. (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Errata to: Low regularity solutions for the Kadomtsev-Petviashvili I equation.* [Geom. Funct. Anal. 13 (2003), no. 4, 737–794;]. Geom. Funct. Anal. 17 (2007), no. 3, 999–1000. (With J. Colliander and C. Kenig).

*Global well-posedness for the  $L^2$  critical nonlinear Schrödinger equation in higher dimensions.* Commun. Pure Appl. Anal. 6 (2007), no. 4, 1023–1041. (With D. De Silva, N. Pavlović and N. Tzirakis).

*Global well-posedness for a periodic nonlinear Schrödinger equation in 1D and 2.* Discrete Contin. Dyn. Syst. 19 (2007), no. 1, 37–65. (With D. De Silva, N. Pavlović and N. Tzirakis).

*Symplectic nonsqueezing of the Korteweg-de Vries flow.* Acta Math. 195 (2005), 197–252. (With J. Colliander, M. Keel, Markus and H. Takaoka).

*Errata: “On solutions for the Kadomtsev–Petviashvili I equation”* [Mosc. Math. J. 1 (2001), no. 4, 491–520, 644; MR1901072]. Mosc. Math. J. 4 (2004), no. 2, 529–530. (With J. Colliander and C.E. Kenig).

*Multilinear estimates for periodic KdV equations, and applications.* J. Funct. Anal. 211 (2004), no. 1, 173–218. (With J. Colliander, M. Keel, H. Takaoka, H. and T. Tao).

*Global existence and scattering for rough solutions of a nonlinear Schrödinger equation on  $\mathbb{R}^3$ .* Comm. Pure Appl. Math. 57 (2004), no. 8, 987–1014. (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Local well-posedness for dispersion-generalized Benjamin–Ono equations.* Differential Integral Equations 16 (2003), no. 12, 1441–1472. (With J. Colliander and C. Kenig).

*Low regularity solutions for the Kadomtsev–Petviashvili I equation.* Geom. Funct. Anal. 13 (2003), no. 4, 737–794. (With J. Colliander and C. Kenig).

*Low regularity stability of solitons for the KdV equation.* Commun. Pure Appl. Anal. 2 (2003), no. 3, 277–296. (With S. Raynor).

*Sharp global well-posedness for KdV and modified KdV on  $\mathbb{R}$  and  $\mathbb{T}$ .* J. Amer. Math. Soc. 16 (2003), no. 3, 705–749 (electronic). (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Polynomial upper bounds for the instability of the nonlinear Schrödinger equation below the energy norm.* Commun. Pure Appl. Anal. 2 (2003), no. 1, 33–50. (With J. Colliander, M. Keel, M., H. Takaoka and T. Tao).

*Polynomial upper bounds for the orbital instability of the 1D cubic NLS below the energy norm.* Discrete Contin. Dyn. Syst. 9 (2003), no. 1, 31–54. (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Existence globale et diffusion pour l'équation de Schrödinger nonlinéaire répulsive cubique sur  $\mathbb{R}^3$  en dessous l'espace d'énergie.* [Global existence and scattering for the cubic repulsive nonlinear Schrödinger equation in  $\mathbb{R}^3$  below the energy space.] Journées “Équations aux Dérivées Partielles” (Forges-les-Eaux, 2002), Exp. No. X, 14 pp., Univ. Nantes, Nantes, 2002. (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*A refined global well-posedness result for Schrödinger equations with derivative.* SIAM J. Math. Anal. 34 (2002), no. 1, 64–86 (electronic). (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Almost conservation laws and global rough solutions to a nonlinear Schrödinger equation.* Math. Res. Lett. 9 (2002), no. 5-6, 659–682. (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Regularity bounds on Zakharov system evolutions.* Electron. J. Differential Equations 2002, No. 75, 11 pp. (electronic). (With J. Colliander).

*Strichartz estimates for a Schrödinger operator with nonsmooth coefficients.* Comm. Partial Differential Equations 27 (2002), no. 7-8, 1337–1372. (With D. Tataru).

*A new approach to study the Vlasov–Maxwell system.* Commun. Pure Appl. Anal. 1 (2002), no. 1, 103–125. (With S. Klainerman).

*On solutions for the Kadomtsev–Petviashvili I equation. Dedicated to the memory of I.G. Petrovskii on the occasion of his 100th anniversary.* Mosc. Math. J. 1 (2001), no. 4, 491–520, 644. (With J. Colliander and C. Kenig).

*Global well-posedness for Schrödinger equations with derivative.* SIAM J. Math. Anal. 33 (2001), no. 3, 649–669 (electronic). (With J. Colliander, M. Keel, H. Takaoka and T. Tao).

*Bilinear estimates and applications to 2D NLS.* Trans. Amer. Math. Soc. 353 (2001), no. 8, 3307–3325 (electronic). (With J.E. Colliander, J.-M. Delort and C.E. Kenig)

*Global well-posedness for KdV in Sobolev spaces of negative index.* Electron. J. Differential Equations 2001, No. 26, 7 pp. (electronic). (With J. Colliander, M. Keel, H. Takaoka and T. Tao)

*Global wellposedness for KdV below  $L^2$ .* Math. Res. Lett. 6 (1999), no. 5-6, 755–778. (With J. Colliander and H. Takaoka)

*On the generalized Korteweg-de Vries-type equations.* Differential Integral Equations 10 (1997), no. 4, 777–796.

*On solutions for periodic generalized KdV equations.* Internat. Math. Res. Notices 1997, no. 18, 899–917.

*Local well-posedness for higher order nonlinear dispersive systems.* J. Fourier Anal. Appl. 3 (1997), no. 4, 417–433. (With C.E. Kenig)

*On the growth of high Sobolev norms of solutions for KdV and Schrödinger equations.* Duke Math. J. 86 (1997), no. 1, 109–142.

*Quadratic forms for a 2-D semilinear Schrödinger equation.* Duke Math. J. 86 (1997), no. 1, 79–107.

## EXPOSITORY PAPERS

*Randomness and nonlinear evolution equations.* Acta Math. Sin. (Engl. Ser.) 35 (2019), no. 6, 903–932. (With A.R. Nahmod).

*Dispersive equations and their role beyond PDE.* Current Events Bulletin, AMS annual meeting, Boston, (2012).

*Periodic Schrödinger equations in Hamiltonian form.* HCDTE Lecture Notes. Part II., AIMS, (2013).

*Evolution Equations.* Clay Mathematics Proceedings 17, (2013). (With Ellwood D. (editor), Rodnianski I. (author and editor) and Wunsch J. (author and editor).)

*Notes on symplectic non-squeezing of the KdV flow.* Journées “Équations aux Dérivées Partielles”, Exp. No. XIV, 15 pp., École Polytech., Palaiseau, (2005). (With J. Colliander, M. Keel, H. Takaoka and T. Tao)

*KdV and almost conservation laws.* In *Harmonic Analysis at Mount Holyoke*, William Beckner, Alexander Nagel, Andreas Seeger, and Hart F. Smith, Editors, American Mathematical Society, 2003, *Contemporary Mathematics*, vol. 320.

Review of the book “Global solutions of nonlinear Schrödinger equations” by J. Bourgain. *Bull. Amer. Math. Soc.* 40 (2003), pp. 99-107.

*Well-posedness for dispersive equations and almost conservation laws. IAS/Park City Mathematics Series*, (2003).

## ADVISING AND MENTORING ACTIVITY

*Graduate Advisor:* Yuri Cacchió (PhD candidate, University of Rome, La Sapienza), Gonzalo Cao (PhD candidate, MIT), Ruoxuan Yang (PhD MIT), Chengyang Shao (PhD, MIT), Michele Dolce (PhD, GSSI), Ricardo Grande-Izquierdo (PhD, MIT), Kristin Kurianski (PhD, MIT), Chenji Fan (PhD, MIT), Loris Domenicale (Master, Politecnico di Torino), Leonardo Pollini (Master, Politecnico di Torino), Federico Fraternali (Master, Politecnico di Torino), Dana Mendelson (PhD, MIT), Ilaria Mondello (Master, Università di Milano-Bicocca) and Vedran Sohinger (PhD, MIT).

*Postdoctoral Mentor:* H. Christianson, University of North Carolina, NC; E. Compaan, DRAPER; K. Kirkpatrick, University of Illinois Urbana-Champaign, IL; V. Hur, University of Illinois Urbana-Champaign, IL; P. Isset, UT Austin; E. Lenzmann, University of Basel, Switzerland; Dominique Maldegue, MIT; Jonathan Luk, Stanford; C. Rodriguez, University of North Carolina, NC; M. Rosenzweig, MIT; R. Shen, McMaster University, Canada; Jia Shi, MIT; Bobby Wilson, University of Washington; Xueying Yu, University of Washington.

## SERVICE

Member of the Board of Trustees of the IAS, 2022  
Elected Member of the AMS Executive Committee, 2019-2023  
Elected Member of the AMS Council, 2018-2021  
Member of Scientific Research Board of AIM, 2016-2022  
Member of Scientific Advisory Panel of the Fields Institute, 2016-2021  
Associate Head, 2013-2015  
Co-chair of MSRI Scientific Advisory Committee (SAC), 2013-2016.  
Member of MSRI Scientific Advisory Committee (SAC), 2010-2013.  
Co-chair of Graduate Studies, 2007-2013.  
Member of the Gender Equity Committee of the School of Science, 2008-2010, Co-chair 2018-present.  
Member of the Faculty Search Oversight Committee at MIT, 2007-present.  
Member of the Search Committee for the Dean of School of Science, Fall 2007 and Spring 2020.  
Member of the Pure Math Committee at MIT, 2004-2012 and 2013-present.