GIGLIOLA STAFFILANI

WORK ADDRESS
MIT, room 2-251
77 Massachusetts Avenue
Cambridge, MA 02139
(617) 253-4981

EDUCATION

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

ACADEMIC APPOINTMENTS

Abby Rockefeller Mauze Professor	MIT	2006-Present
Minerva Fellow	Princeton University	February-May 2025
Senior Fellow	ITS, ETH Zurich	August-December 2024
Eisenbud Professor	MSRI	August-December 2015
E. S. and R. M. Cashin Fellow	Radcliffe IAS	2009-2010
Professor	MIT	2006-Present
Associate Professor	MIT	2002-2006
Member of the IAS	IAS	2003-2004
Visiting Associate Professor	Harvard University	January-May 2002
Associate Professor	Brown University	2001-2002
Associate Professor on leave	Stanford University	2001-2002
Assistant Professor	Stanford University	1999-2001
Assistant Professor	Princeton University	1998-1999
Szegö Assistant Professor	Stanford University	1996-1998
Member of the IAS (*Mentor: Jean Bourgain*)	IAS	1995-1996

HONORS and AWARDS

Premio Luigi e Wanda Amerio, Istituto Lombardo, Accademia di Scienze e Lettere, 2022
Elected Member of National Academy of Sciences, 2021
Medaglia Guglielmo Marconi – Engigneering and Technology, Universitá di Bologna, 2020
MIT Committed to Care Award, 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

2025 Trjitzinsky Memorial Lectures, University of Illinois Urbana-Champaign
2025 Distinguished Yormark Lecture, Stanford University
2024 Baylor Lecture Series, Baylor University
2023 Floer Lectures, University of Bochum, Germany
2023 Hilldale Lectures, University of Wisconsin Madison
2023 The Foias Lectures, TAMU
2023 Inagural Noether Lecture Series, IAS, Princeton
2023 Alice Roth Lecture, ETH, Zurich
2022 Myhill Lectures, SUNY, Buffalo
2021 Simons Foundation Public Lecture, NYC
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 conference *Nonlinear dispersive and wave equations – Recent developments and future directions*, Monash University, Melbourne, Fall 2023.

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, Oberfolfach, 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

Corrent: Communications of the AMS; Duke Math Journal; JAMS, La Matematica Revista Matemática Iberoamericana; Selecta Mathematica; Stochastics and Partial Differential Equations: Analysis and Computations.

Past: AMS Graduate Studies in Mathematics; Ars Inveniendi Analytica; Communications in Pure and Applied Analysis, Illinois Journal of Mathematics.

SEMINARS PRESENTED IN THE LAST FIVE YEARS

Rutgers University (virtual), 2024, La Sapienza 2024; Politecnico di Milano, 2023; SIAM PDE (virtual), 2021; MCQM Seminars (virtual), 2021; Princeton University (virtual), 2021; One World PDE (virtual), 2020.

PUBLICATIONS AND PREPRINTS

Non-radial implosion for the defocusing nonlinear Schrödinger equation in $\mathbb{T}^3$ *and* $\mathbb{R}^3$. Preprint, arXiv:2410.04532. (With Gonzalo Cao-Labora, Javier Gómez-Serrano and Jia Shi)

Condensation and non-condensation times for 4-wave kinetic equations. Preprint, arXiv:2407.18533. (With Minh-Binh Tran)

On the energy transfer towards large values of wavenumbers for solutions of 4-wave kinetic equations. Preprint, arXiv:2407.18508. (With Minh-Binh Tran)

Modified scattering for the cubic Schrödinger equation on Diophantine waveguides Preprint, arXiv:2404.16817. (With Nicolas Camps)

Non-radial implosion for compressible Euler and Navier-Stokes in $\mathbb{T}^3$ *and* $\mathbb{R}^3$. Preprint, arXiv:2310.05325. (With Gonzalo Cao-Labora, Javier Gómez-Serrano and Jia Shi)

Trend to equilibrium for flows with random diffusion. Preprint, arXiv:2307.03147. To appear in IMRN (With Shrey Aryan and Matthew Rosenzweig)

On the effect of the Coriolis force on the enstrophy cascade. Preprint, arXiv:2305.03209. (With Yuri Cacchió and Amirali Hannani).

On decaying properties of nonlinear Schrödinger equations. Preprint, arXiv:2211.03124. To appear in SIAM Journal on Mathematical Analysis. (With Chenjie Fan and Zehua Zhao).

On the wave turbulence theory for a stochastic KdV type equation – Generalization for the inhomogeneous kinetic limit. Preprint arXiv:2210.17445. (With Amirali Hannani, Matthew Rosenzweig and Minh-Binh Tran).

A rigorous derivation of the Hamiltonian structure for the Vlasov equation. Forum Math. Sigma 11 (2023), Paper No. e77, 64 pp. (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. Comm. Pure Appl. Math. 76 (2023), no. 12, 4087–4136. (With Miguel Angel Garrido, Ricardo Grande and Kristin M. Kurianski)

Global solutions of aggregation equations and other flows with random diffusion. Probab. Theory Related Fields 185 (2023), no. 3-4, 1219–1262. (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. Arch. Ration. Mech. Anal. 247 (2023), no. 4, Paper No. 68, 109 pp. (With J. Krieger and J. Lührmann)

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 Schrdinger 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 Schrdinger 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 Schrdinger 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. Fraternale, 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 Schrdinger 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 Schrdinger equation. Invent. Math. **18**, no. 1, 39-11, (2010). (With J. Colliander, M. Keel, H. Takaoka and T. Tao)

The Cauchy problem for Schrdinger 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 Schrodinger 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. Journés "Èquations aux Dèrivès Partielles", Exp. No. XIV, 15 pp., Ècole 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, Univerity 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 Fraternale (Master, Politecnico di Torino), Dana Mendelson (PhD, MIT), Ilaria Mondello (Master, Universitá di Milano-Bicocca) and Vedran Sohinger (PhD, MIT).

Postdoctoral Mentor: H. Christianson, University of North Carolina, NC; E. Compaan, DRAPER; V. Hur, University of Illinois Urbana-Champaign, IL; Felipe Hernandez, MIT; K. Kirkpatrick, 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

US-based director of Friends of the IMU (FIMU) 2025-2029
Member of the Local Organizing Committee for ICM 2026
Chair of the Satellite Events Committee for ICM 2026
Co-chair of the Scientific Program & Short Communications and Posters Committee for ICM 2026
Clay Mathematics Institute Scientific Advisor Board, 2023-present
Member of the Board of Trustees of the IAS, 2022-present
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.