

Jason C. Murphy

CONTACT INFORMATION

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RESEARCH INTERESTS

Harmonic Analysis and Nonlinear Dispersive Partial Differential Equations

EDUCATION

University of California Los Angeles, Los Angeles, California USA

Ph.D. Mathematics, August 2009–June 2014

- Advisors: Rowan Killip and Monica Viřan
- Thesis topic: Nonlinear Schrödinger equations at non-conserved critical regularity

M.A. Mathematics, June 2010

University of Texas at Austin, Austin, Texas USA

B.S. (highest honors), Mathematics, August 2005–May 2009

ACADEMIC POSITIONS

- NSF Postdoctoral Fellow, UC Berkeley, Fall 2014–Spring 2017

EXTENDED SCIENTIFIC VISITS

- Hausdorff Research Institute for Mathematics, Bonn, Germany, July 2014
- Institute for Applied Physics and Computational Mathematics, Beijing, China, July 2015
- Research Member at MSRI, Berkeley, CA, August–December 2015
- Institute for Applied Physics and Computational Mathematics, Beijing, China, April 2016

HONORS AND AWARDS

- 2014 NSF Mathematical Sciences Postdoctoral Fellowship (DMS-1400706)
- 2013 Robert Sorgenfrey Distinguished Teaching Award (UCLA)
- 2009 Dean's Honored Graduate (UT-Austin)
- 2009 Mathematics Departmental Honors (UT-Austin)
- 2009 College of Natural Sciences Book Award (UT-Austin)
- 2008 Carmelina Cutro Albino Memorial Endowed Presidential Scholarship (UT-Austin)

PUBLICATIONS AND PREPRINTS

1. *Intercritical NLS: critical \dot{H}^s -bounds imply scattering.* SIAM J. Math. Anal. **46** (2014), 939–997. MR3166962
2. *The defocusing $\dot{H}^{1/2}$ -critical NLS in high dimensions.* Discrete Contin. Dyn. Syst. Series-A. **34** (2014), 733–748. MR3094603
3. *The defocusing energy-supercritical NLS in four space dimensions*, with C. Miao and J. Zheng. J. Funct. Anal. **267** (2014), 1662–1724. MR3237770
4. *The radial defocusing nonlinear Schrödinger equation in three space dimensions.* Comm. Partial Differential Equations **40** (2015), 265–308. MR3277927
5. *The final-state problem for the cubic-quintic NLS with non-vanishing boundary conditions*, with R. Killip and M. Visan. Anal. PDE **9** (2016), no. 7, 1523–1574. MR3570231
6. *The defocusing quintic NLS in four space dimensions*, with B. Dodson, C. Miao, and J. Zheng. To appear in Annales IHP (C). Preprint [arXiv:1508.07298](https://arxiv.org/abs/1508.07298), doi:10.1016/j.anihpc.2016.05.004
7. *The focusing cubic NLS with inverse square potential in three space dimensions*, with R. Killip, M. Visan, and J. Zheng. To appear in Differential and Integral Equations. Preprint [arXiv:1603.08912](https://arxiv.org/abs/1603.08912).
8. *Almost global existence for cubic nonlinear Schrödinger equations in one space dimension*, with F. Pusateri. Discrete Contin. Dyn. Syst. Series-A **37** (2017), 2077–2102.
9. *Large data mass-subcritical NLS: critical weighted bounds imply scattering*, with R. Killip, S. Masaki, and M. Visan. Submitted. Preprint [arXiv:1606.01512](https://arxiv.org/abs/1606.01512)

10. *A new proof of scattering below the ground state for the 3d radial focusing cubic NLS*, with B. Dodson. To appear in Proceedings of the AMS. Preprint [arXiv:1611.04195](https://arxiv.org/abs/1611.04195)
11. *Scattering in H^1 for the intercritical NLS with an inverse-square potential*, with J. Lu and C. Miao. Submitted. Preprint [arXiv:1702.04064](https://arxiv.org/abs/1702.04064)
12. *The initial-value problem for the cubic-quintic NLS with non-vanishing boundary conditions*, with R. Killip and M. Visan. Submitted. Preprint [arXiv:1702.04413](https://arxiv.org/abs/1702.04413)
13. *Random data final-state problem for the mass-subcritical NLS in L^2* . Submitted. Preprint [arXiv:1703.09849](https://arxiv.org/abs/1703.09849)

EXPOSITORY
PAPERS

1. *Subcritical scattering for defocusing NLS*. Available online at www.math.berkeley.edu/~murphy/expository.pdf

TEACHING
EXPERIENCE

University of California Los Angeles (August 2009–June 2014)

Department of Mathematics: Teaching Assistant (Fall 2009–Spring 2014)

Center for Excellence in Engineering and Diversity: Academic Excellence Workshop Facilitator (Fall 2010–Winter 2011)

Courses taught:

- Lower Division - Differential and Integral Calculus, Integration and Infinite Series, Calculus of Several Variables, Differential Equations
- Upper Division - Linear Algebra, Analysis, Honors Analysis, Topics in Analysis
- Graduate - Applied Differential Equations

University of California Berkeley (July 2014–present)

Department of Mathematics: Instructor

- Fall 2014 - M126 Introduction to Partial Differential Equations (Upper Division)
- Spring 2015 - M185 Complex Analysis (Upper Division)
- Fall 2016 - M204 Ordinary Differential Equations (Graduate)
- Spring 2017 - M121B Mathematical Tools for the Physical Sciences (Upper Division)

Undergraduate Reading Courses:

- Spring 2015 - Mathematics of Signal Processing
- Fall 2015 - Mathematics of Machine Learning

INVITED TALKS

- Joint International Meeting of the AMS and the Romanian Mathematical Society, Special Session on Nonlinear Evolution Equations, Summer 2013
- Berkeley Analysis/PDE Seminar, Fall 2013
- UCLA Analysis Seminar, Fall 2013
- University of Minnesota PDE Seminar, Fall 2013
- University of Chicago Calderón–Zygmund Seminar, Winter 2014
- Hausdorff Trimester Program in Harmonic Analysis and PDE, Closing Workshop, Summer 2014
- Berkeley Analysis/PDE Seminar, Fall 2014
- AMS Sectional Meeting, San Francisco State University, Special Session on Hamiltonian PDE, Fall 2014
- Institute for Applied Physics and Computational Mathematics, Beijing, China, Summer 2015
- UC Davis PDE and Applied Math Seminar, Fall 2015
- MSRI Postdoc Symposium, MSRI, Fall 2015
- Institute for Applied Physics and Computational Mathematics, Beijing, China, Spring 2016
- University of Iowa PDE Seminar, Spring 2016
- AMS Sectional Meeting, North Carolina State University, Special Session on Harmonic Analysis and Dispersive PDE, Fall 2016

- Berkeley Analysis/PDE Seminar, Fall 2016
- Joint Mathematics Meeting, Atlanta, Georgia, AMS Special Session on Recent Progress on Nonlinear Dispersive and Wave Equations, Winter 2017
- Joint Mathematics Meeting, Atlanta, Georgia, AMS Special Session on Spectral Calculus and Quasilinear Partial Differential Equations, Winter 2017
- Missouri University of Science and Technology, Colloquium, Winter 2017
- San Jose State University, Colloquium, Winter 2017

ACADEMIC SERVICE

- Co-organizer, Analysis & PDE Seminar, UC Berkeley, Fall 2014–Spring 2015
- Referee: *Archive for Rational Mechanics and Analysis*; *Communications in Partial Differential Equations*; *Journal of the Australian Mathematical Society*; *Journal of Differential Equations*; *Journal of Functional Analysis*; *Nonlinearity*; *Nonlinear Analysis: Real World Applications*; *Proceedings of the Royal Society of Edinburgh, Section A*.
- Reviewer for AMS MathSciNet (MR AuthorID 1034475)

CONFERENCES ATTENDED

- Southern California Analysis & PDE (SCAPDE) meeting, UCLA, Fall 2010
- Rivière–Fabes Symposium on Analysis & PDE, University of Minnesota, Spring 2012
- Evolution Equations: a Workshop in Honor of Terence Tao, Northwestern University, Spring 2012
- Evolution equations of physics, fluids, and geometry: asymptotics and singularities, 5-day workshop, Banff International Research Station, Summer 2012
- Seminar on Dispersive Equations, Oberwolfach, Germany, Fall 2012
- Southern California Analysis & PDE (SCAPDE) meeting, UCLA, Winter 2013
- Rivière–Fabes Symposium on Analysis & PDE, University of Minnesota, Spring 2013
- NSF-CBMS Regional Research Conference in the Mathematical Sciences, Kansas State University, Summer 2013
- Joint International Meeting of the AMS and the Romanian Mathematical Society, Alba Iulia, Romania, Summer 2013
- Meeting: Nonlinear Waves and Dispersive Equations, Oberwolfach, Germany, Summer 2013
- Introductory Workshop: Mathematical General Relativity, MSRI, Fall 2013
- Rivière–Fabes Symposium on Analysis & PDE, University of Minnesota, Spring 2014
- Dynamics in Geometric Dispersive Equations, 5-day workshop, Banff International Research Station, Spring 2014
- Hausdorff Trimester Program in Harmonic Analysis and Partial Differential Equations, Summer 2014
- AMS Sectional Meeting, San Francisco State University, Fall 2014
- Introductory Workshop: Randomness and long time dynamics in nonlinear evolution differential Equations, MSRI, Fall 2015
- New challenges in PDE: deterministic dynamics and randomness in high and infinite dimensional systems, MSRI, Fall 2015
- Analysis, PDEs, and Geometry: a conference in honor of Sergiu Klainerman, Princeton University, Spring 2016
- Mathematical and Physical Models of Nonlinear Optics, Institute for Mathematics and its Applications, University of Minnesota, Fall 2016
- AMS Sectional Meeting, North Carolina State University, Fall 2016
- Joint Mathematics Meeting, Atlanta, Georgia, Winter 2017

REFERENCES

Available upon request.