Andrew W. Lawrie

CONTACT INFORMATION

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APPOINTMENTS

Massachusetts Institute of Technology.
Assistant Professor. Fall 2016 –.
The University of California, Berkeley.
NSF Postdoctoral Fellow. 2013-2016. Sponsoring Scientist: Professor Daniel Tataru.
Mathematical Sciences Research Institute (MSRI).
Research Member. Fall 2015.

EDUCATION

The University of Chicago Ph.D., Mathematics, 2013.
Advisor: Professor Wilhelm Schlag
Columbia University, B.A., Mathematics, 2007

RESEARCH

Publications

17. The Cauchy problem for wave maps on hyperbolic space in dimensions $d \geq 4$. with S.-J Oh and S. Shahshahani. arXiv preprint 2015.

16. Equivariant wave maps on the hyperbolic plane with large energy. with S.-J Oh and S. Shahshahani. *Math. Res. Lett., to appear.* preprint 2015.

15. A refined threshold theorem for (1+2)-dimensional wave maps into surfaces. with S.-J. Oh. *Comm. Math. Phys.* 342 (2016) no. 3, 989–999.

14. Gap eigenvalues and asymptotic dynamics of geometric wave equations on hyperbolic space. with S.-J. Oh and S. Shahshahani. arXiv preprint 2015.

13. Profile decompositions for wave equations on hyperbolic space with applications. with S.-J. Oh and S. Shahshahani. *Math. Ann., to appear.* preprint 2014.

12. Stable soliton resolution for exterior wave maps in all equivariance classes. with C. Kenig, B. Liu, and W. Schlag. *Advances in Math.* 285 (2015), 235–300.

11. Channels of energy for the linear radial wave equation. with C. Kenig, B. Liu, and W. Schlag. *Advances in Math.* 285 (2015), 877–936.

10. Scattering for radial, semi-linear, super-critical wave equations with bounded critical norm. with B. Dodson. *Arch. Ration. Mech. Anal.* 218 (2015) no. 3, 1459–1529.

9. Scattering for the radial $3d$ cubic wave equation. with B. Dodson. *Analysis and PDE.* 8 (2015) no. 2, 467–497.

8. Stability of stationary equivariant wave maps from the hyperbolic plane with S.-J. Oh and S. Shahshahani. *Amer. J. Math., to appear.* preprint 2014.

7. Profiles for the radial focusing 4d energy-critical wave equation. with R. Côte, C. Kenig, and W. Schlag. *Comm. Math. Phys., to appear.* preprint 2014.

6. Conditional global existence and scattering for a semi-linear Skyrme equation with large data. *Comm. Math. Phys.* 334 (2015) no. 2, 1025–1081.

5. Relaxation of wave maps exterior to a ball to harmonic maps for all data.
with C. Kenig, and W. Schlag. *Geom. Funct. Anal. (GAFA).* 24 (2014), no. 2, 610–647.

4. Characterization of large energy solutions of the equivariant wave map problem: I.
with R. Côte, C. Kenig, and W. Schlag. *Amer. J. Math.* 137 (2015) no. 1, 139–207.

3. Characterization of large energy solutions of the equivariant wave map problem: II.
with R. Côte, C. Kenig, and W. Schlag. *Amer. J. Math.* 137 (2015) no. 1, 209–250.

2. Scattering for wave maps exterior to a ball.
with W. Schlag. *Advances in Math.*. 232 (2013) no. 1, 57–97.

1. The Cauchy problem for wave maps on a curved background. *Calc. Var. Partial Differential Equations.* 45 (2012), no. 3–4, 505–548.

Thesis

- On the global behavior of wave maps. *Ph.D. Thesis.* The University of Chicago. 2013.

Proceedings and Reports

- Stable soliton resolution for equivariant wave maps exterior to a ball. *Seminairé Laurent Schwartz–EDP et applications.* (2014-2015) Exp. No. 3, 11 p.
- Soliton resolution for exterior wave maps. *Oberwolfach Reports* Volume 10, Issue 3, (2013), 2321–2374.
- Scattering for equivariant wave maps. *Oberwolfach Reports* Volume 9, Issue 2, (2012), 1563–1637.

Selected Lectures

Colloquia

- Séminaire Laurent Schwartz, EDP et applications. IHES, Bures-sur-Yvette, France. Oct. 2014
- Stony Brook Math Colloquium, Oct. 2015

Invited Conference Lectures

- Nonlinear Dispersive Equations in Valdivia. Valdivia, Chile. Dec. 2016 (*planned*)
- IHES Trimester on Nonlinear Waves; International conference. IHES, Bures-sur-Yvette, France. June 2016 (*planned*)
- Nonlinear Evolution Problems. Mathematisches Forschungsinstitut Oberwolfach, Germany. May 2016 (*planned*)
- Singularity formation and long-time behavior in dispersive PDEs. The Mathematical Institute of the University of Bonn, Germany. Mar. 2016
- Focus Program on 100 years of General Relativity: Nonlinear waves equations and their numerical study. The Fields Institute, Toronto, Canada. June 2015
- Asymptotics for Nonlinear Geometric PDEs. Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy. Nov. 2014
- Dynamics in Geometric Dispersive Equations and the Effects of Trapping, Scattering and Weak Turbulence. Banff International Research Station, Alberta Canada. May 2014
- SIAM Conference on Analysis of PDEs. Florida. Dec. 2013
- Nonlinear Waves and Dispersive Equations. Mathematisches Forschungsinstitut Oberwolfach, Germany. Aug. 2013
- Nonlinear Evolution Problems. Mathematisches Forschungsinstitut Oberwolfach, Germany. May 2012

Research Seminars

- UC Berkeley – Analysis and PDE Seminar, Feb. 2015
- Université Paris 13, Paris – Séminaire Équations aux Dérivées Partielles non-linéaires, Oct. 2014
- University of North Carolina, Chapel Hill – Analysis/PDE Seminar, Oct. 2013
- Northwestern University – Analysis Seminar, June 2013
- Rutgers University – Nonlinear Analysis Seminar, Apr. 2013
- The University of Chicago – Calderón-Zygmund Analysis Seminar, Feb. 2013
- NYU – Courant Institute Analysis Seminar, Nov. 2012
- MIT – Analysis and PDE Seminar, Nov. 2012
- The University of Chicago – Calderón-Zygmund Analysis Seminar, Nov. 2012
- UC Berkeley – Analysis and PDE Seminar, Oct. 2012
- Johns Hopkins University – Analysis and PDE Seminar, Sept. 2012
- UIUC– Harmonic Analysis and PDE Seminar, Feb. 2012
- The University of Chicago – Calderón-Zygmund Analysis Seminar, Jan. 2012
- The University of Chicago – Calderón-Zygmund Analysis Seminar, May 2011

Service

Seminar Organizer

- The Analysis and PDE seminar, UC Berkeley, 2013-2014

Referee

- Advances in Differential Equations, The American Journal of Mathematics, Analysis and PDE, Annales de l'Institut Henri Poincaré/Analyse non lineaire, Bulletin de la Société Mathématique de France, Communications in Mathematical Physics, Communications in PDE, Communications on Pure and Applied Analysis, International Mathematical Research Notices, Journal of Differential Equations, Journal of the European Mathematical Society, Journal of Functional Analysis, Memoirs of the AMS, Nonlinearity, Proceedings of the AMS, and Transactions of the AMS.

Awards

Wirszup Research Prize UChicago, 2013
NSF Postdoctoral Fellowship, DMS-1302782. 2013-2016

Teaching

The University of California, Berkeley
Instructor

- Math 104: Introduction to Analysis. Spring 2014
- Math 185: Complex Analysis. Fall 2013 and Fall 2015
- Math 204: Ordinary Differential Equations. Spring 2016

The University of Chicago
University Instructor 2009 - 2013

- Math 131, 132, 133: Calculus 1, 2, 3, Fall 2009, Winter 2010, Spring 2011.
- Math 152, 153: Calculus 2, 3, Fall 2010, Winter 2011 .
- Math 195: Multivariable Calculus, Fall 2011, Spring 2012, Fall 2012, Spring 2013
- Math 196: Linear Algebra, Winter 2012, Winter 2013

College Fellow Course Assistant 2008 - 2009

- Math 270: Basic Complex Variables.
- Math 272: Basic Functional Analysis.
- Math 275: Basic Theory of Partial Differential Equations.