

J. Douglas Wright

Department of Mathematics
Drexel University
3141 Chestnut Street
Philadelphia, PA 19104

Office: (215) 895-0981
Fax: (215) 895-1582
jdoug@math.drexel.edu
www.math.drexel.edu/~jdoug/

Education

PhD, Mathematics, Boston University, 2004 (Advisor: C. Eugene Wayne).

BS, Mathematics, Pennsylvania State University, 1997 (with high distinction).

BS, Physics, Pennsylvania State University, 1997 (with high distinction).

Professional Experience

Associate Department Head, Drexel University Department of Mathematics. Fall 2015, 2016–present.

Associate Professor, Drexel University Department of Mathematics. 2012–present.

Visiting Associate Professor, Swarthmore College Department of Mathematics. 2014–2015.

Assistant Professor, Drexel University Department of Mathematics. 2007–2012.

Dunham Jackson Assistant Professor, University of Minnesota School of Mathematics. 2004–2007.

Post-doctoral Fellow, McMaster University Department of Mathematics/Fields Institute. 2003–2004.

Extramural Funding

D. Ambrose, S. Moskow, G. Simpson, X. Song & J. Wright. “Gene Golub summer school on stochastic differential equations and wave propagation.” SIAM. July-August 2016. \$95,000.

J. Wright (PI). “Wave propagation in heterogeneous nonlinear dispersive systems.” NSF DMS-1511488. 2015-2018. \$340,000.

J. Wright (PI). “Degenerate dispersive effects in partial and lattice differential equations.” NSF DMS-1105635. 2011-2014. \$203,000.

R. Hicks (PI) & J. Wright (Co-PI). “Distributions for optical design.” NSF DMS-0908299. 2009-2012. \$329,000.

J. Wright (PI). “Dynamics and interactions of free fluid interfaces.” NSF DMS-0807738. 2008-2012. \$111,000.

Publications

A. Hoffman & J. Wright. “Nanopteron solutions of diatomic Fermi-Pasta-Ulam-Tsingou lattices with small mass-ratio.” Accepted to *Physica D* in 2017.

T. Faver & J. Wright. “Exact diatomic Fermi-Pasta-Ulam-Tsingou solitary waves with optical band ripples at infinity.” Accepted to *SIAM Journal on Mathematical Analysis* in 2016.

G. Medvedev & J. Wright. “Stability of twisted states in the continuum Kuramoto model.” *SIAM Journal of Applied Dynamical Systems*, **1**, 188-203 (2017).

- D. Ambrose & J. Wright. “Nonexistence of small doubly periodic solutions for dispersive equations.” *Analysis & PDE*, **9**, 15-42 (2016).
- B. Akers, D. Ambrose, K. Pond, & J. Wright. “Overturned internal capillary-gravity waves.” *European Journal of Mechanics-B/Fluids*, **57**, 143-151 (2016).
- A. Vainchtein, Y. Starosvetsky, J. Wright & R. Perline. “Solitary waves in diatomic chains.” *Physical Review E*, **93**, 042210 (2016).
- D. Ambrose, W. Strauss & J. Wright. “Global bifurcation theory for periodic traveling interfacial gravity-capillary waves.” *Annales de l’Institut Henri Poincaré. Analyse Non Linéaire*, **33**, 1081-1101 (2016).
- D. Ambrose & J. Wright. “Non-existence of small-amplitude doubly periodic waves for dispersive equations.” *Comptes Rendus Mathématique. Académie des Sciences. Paris*, **352**, 597-602 (2014).
- J. Gaison, S. Moskow, J. Wright and Q. Zhang. “Approximation of polyatomic FPU lattices by KdV equations.” *Multiscale Modeling & Simulation*, **12**, no. 3, 953-995 (2014).
- B. Akers, D. Ambrose & J. Wright. “Gravity perturbed Crapper waves.” *Proceedings of the Royal Society A*, **470**, no. 2161, 20130526 (2014).
- R. Hicks, S. Rody & J. Wright. “Bundle separation, obstructions to perfect imaging and other qualitative aspects of simultaneous multiple surface design.” *Optical Engineering*, **53**, no. 3, 031309 (2013).
- B. Akers, D. Ambrose & J. Wright. “Traveling waves from the arclength parameterization: vortex sheets with surface tension.” *Interfaces and Free Boundaries*, **15**, no. 3, 359-380 (2013).
- D. Ambrose & J. Wright. “Dispersion vs. anti-diffusion: well-posedness in variable coefficient and quasilinear equations of KdV-type.” *Indiana University Mathematics Journal*, **62**, no. 4, 1237-1281 (2013).
- D. Ambrose & J. Wright. “Traveling waves and weak solutions for an equation with degenerate dispersion.” *Proceedings of the American Mathematical Society*, **141**, 3825-3838 (2013).
- R. Chen, J. Marzuola, D. Spirn & J. Wright. “On the regularity of the flow map for the gravity-capillary equations.” *Journal of Functional Analysis*, **264**, 752-782 (2013).
- J. Wright. “On the spectrum of the superposition of separated potentials.” *Discrete and Continuous Dynamical Systems - Series B*, **18**, no. 1, 273-281 (2013).
- D. Ambrose, G. Simpson, J. Wright & D. Yang. “Ill-posedness of degenerate dispersive equations.” *Nonlinearity*, **25**, 2655-2689 (2012).
- D. Spirn & J. Wright. “Linear dispersive decay estimates for the 3+1 dimensional water wave equation with surface tension.” *Canadian Mathematical Bulletin*, **55**, no. 1, 176-187 (2012).
- A. Hoffman & J. Wright. “Exit manifolds for lattice differential equations.” *Proceedings A of The Royal Society of Edinburgh*, **140**, no. 1, 77-92 (2011).
- J. Wright. “Interaction manifolds for reaction-diffusion equations in 2D.” *SIAM Journal of Applied Dynamical Systems*, **9**, 734-768 (2010).

D. Ambrose & J. Wright. “Preservation of support and positivity for solutions of degenerate evolution equations.” *Nonlinearity*, **23**, 607-620 (2010).

D. Spirn & J. Wright. “Linear dispersive decay estimates for vortex sheets with surface tension.” *Communications in Mathematical Sciences*, **7**, no. 3, 521-547 (2009).

J. Wright. “Separating dissipative pulses—the exit manifold.” *Journal of Dynamics and Differential Equations*, **21**, no. 1, 315-328 (2009).

A. Scheel & J. Wright. “Colliding dissipative pulses—the shooting manifold.” *Journal of Differential Equations*, **245**, no. 1, 59-79 (2008).

J. Wright & A. Scheel. “Solitary waves and their linear stability in weakly coupled KdV equations.” *Zeitschrift für angewandte Mathematik und Physik*, **58**, no. 4, 535-570 (2007).

J. Wright. “Corrections to the KdV approximation for water waves.” *SIAM Journal on Mathematical Analysis*, **37**, no. 4, 1161-1206 (2005).

J. Colliander, S. Raynor, C. Sulem & J. Wright. “Ground state mass concentration in the L^2 -critical nonlinear Schrödinger equation below H^1 .” *Mathematical Research Letters*, **12**, no. 2-3, 357-375 (2005).

J. Wright. “Higher order corrections to the KdV approximation for water waves.” Ph.D. Thesis, Boston University, 2004.

C. Wayne & J. Wright. “Higher order modulation equations for a Boussinesq equation.” *SIAM Journal of Applied Dynamical Systems*, **1**, 271-302 (2002).

Invited Talks

Corrections to the KdV approximation for a Boussinesq equation

VIGRE Applied Math and Analysis Workshop at Brown University. May 11, 2002.

AMS Eastern Sectional at Northeastern University. October 5, 2002.

Higher order corrections to the KdV approximation for water waves

SIAM Conference on Applied Dynamical Systems in Snowbird, UT. May 29, 2003.

McMaster University, Department of Mathematics and Statistics PDE Seminar. October 3, 2003.

University of Minnesota, School of Mathematics Dynamical Systems Seminar. March 22, 2004.

Joint Cal Tech and UCLA Analysis Seminar. March 5, 2004.

Fields Institute Workshop on Nonlinear Wave Equations. March 15, 2004.

Fields Institute Workshop on Free Surface Water Waves. June 14, 2004.

University of Washington, Department of Applied Mathematics Seminar. November 9, 2004.

Ground state mass concentration for L^2 -critical NLS below H^1

University of Minnesota, School of Mathematics PDE Seminar. October 13, 2004.

Brown University PDE Seminar. March 18, 2005.

Conference on Nonlinear Dispersive Wave Phenomena in Anogia, Crete. July 11, 2005.

Collective coordinates and collisions of solitary waves

SIAM Conference on Applied Dynamical Systems in Snowbird, UT. May 23, 2005.

The shooting manifold for strong pulse interaction in a FitzHugh-Nagumo equation

SIAM Conference on Applied Dynamical Systems in Snowbird, UT. May 28, 2007.

Clemson University Analysis Seminar. April 12, 2007.

Existence and linear stability of solitary waves in coupled KdV systems

University of Minnesota, School of Mathematics Dynamical Systems Seminar. October 10, 2005.
AMS Spring Central Sectional at the University of Notre Dame. April 9, 2006.
Conference on Mathematical Hydrodynamics at the Steklov Institute, Moscow. June 14, 2006.
SIAM Conference on Nonlinear Waves and Coherent Structures, in Seattle, WA. September 10, 2006.
Dynamics Days Europe in Loughborough, UK. July 9, 2007.

Gravity induced dispersion for nearly flat vortex sheets

University of Delaware, Department of Mathematics Applied Math Seminar. September 18, 2007.
SIAM Conference on Analysis of Partial Differential Equations in Phoenix, AZ. December 10, 2007.
AMS Spring Eastern Sectional at the Courant Institute. March 15, 2008.
NSF/CBMS Regional Conference on Water Waves at Howard University. May 13, 2008.
SIAM Conference on Nonlinear Waves and Coherent Structures in Rome, Italy. July 22, 2008.
Wake Forest University Mathematics Colloquium. April 16, 2009.

Linear dispersive decay estimates for vortex sheets in 2 and 3 dimensions

IMACS Conference on Nonlinear Evolution Equations in Athens, GA. March 25, 2009.

Nonlinear waves: where do they come from? What do they do?

Drexel University CoAS Dean's Seminar. April 9, 2008.
Bryn Mawr Mathematics Biology Colloquium. January 28, 2010.

Shooting and exit manifolds for pulse interactions in one dimensional reaction-diffusion equations

Boston University Dynamical Systems Seminar. April 28, 2008.
University of Kansas Mathematics CAM Seminar. October 1, 2008.

The shooting manifold for reaction-diffusion equations in d -dimensional space

SIAM Conference on Nonlinear Waves and Coherent Structures in Rome, Italy. July 24, 2008.
Workshop on Dynamics of Patterns. MFO, Oberwolfach, Germany. December 16, 2008.
University of Pennsylvania Analysis Seminar. October 6, 2009.
Brown University PDE Seminar. February 19, 2010.

Shooting manifolds in lattice systems

SIAM Conference on Applications of Dynamical Systems, in Snowbird, UT. May 19, 2009.

Interaction manifolds in reaction diffusion systems

NJIT Waves Seminar. March 24, 2010.
AIMS International Conference on Dynamical Systems in Dresden, Germany. May 27, 2010.
DSPDE's 2010-Emerging Topics in Dynamical Systems and PDE in Barcelona, Spain. May 31, 2010.
SIAM Conference on Nonlinear Waves and Coherent Structures in Philadelphia, PA. August 16, 2010.
NC State Differential Equations Seminar. February 23, 2011.

Analytical results for equations with degenerate dispersion

SIAM Conference on Nonlinear Waves and Coherent Structures in Philadelphia, PA. August 18, 2010.

Well-posedness issues for degenerate dispersive equations

SIAM Conference on Nonlinear Waves and Coherent Structures in Philadelphia, PA. August 17, 2010.
Conference on Frontiers in Applied and Computational Mathematics at NJIT. June 11, 2011.
AMS Fall Southeastern Sectional at Wake Forest University. September 10, 2011.
SIAM Conference on Analysis of Partial Differential Equations in San Diego, CA. November 14, 2011.
AMS Spring Eastern Sectional at George Washington University. March 17, 2012.
AMS Spring Central Sectional at the University of Kansas. April 1, 2012.
AMS Fall Eastern Sectional at Rochester Institute of Technology. September 23, 2012.

Disastrous equations

Swarthmore College Mathematics and Statistics Colloquium. November 6, 2012.
Science on Saturday Lecture at the Princeton Plasma Physics Laboratory. January 26, 2013.
Concordia Astronomy and Science Club. August 15, 2013.
Defense Contract Management Agency at Boeing. June 11, 2015.

Approximation of polyatomic FPU lattices by KdV Equations

SIAM Conference on Analysis of Partial Differential Equations in Orlando, FL. December 7, 2013.
University of Delaware Numerical Analysis and PDE Seminar. February 20, 2014.
University of Pennsylvania Analysis Seminar. March 25, 2014.
University of Pittsburgh PDE and Analysis Seminar. April 14, 2014.
Temple University Analysis Seminar. April 28, 2014.
University of Rochester Analysis Seminar. September 26, 2014.
Boston University Dynamics Seminar. November 17, 2014.

Overhanging traveling gravity-capillary waves

Joint Mathematical Meetings, January 8, 2016.

Traveling waves for diatomic FPUT lattices

SIAM Conference on Analysis of Partial Differential Equations in Phoenix, AZ. December 7, 2015.
SIAM Conference on Nonlinear Waves and Coherent Structures in Philadelphia, PA. August 11, 2016.
University of Massachusetts Analysis Seminar. December 7, 2016.
NJIT Mathematics Colloquium. February 3, 2017.
IMACS Conference on Nonlinear Evolution Equations in Athens, GA. March 29, 2017.
Casa Matematica Oaxaca Workshop. June 25, 2017.

Panel Discussions

Motivating the unmotivated

Project NExT Workshop in Pittsburgh, PA. August 4, 2010.

Conference/Summer School Organization

with M. Beck and T. Gallay, Conference on the Analysis of Partial Differential Equations using Dynamical Systems Techniques, a.k.a Gene Wayne's 60 Birthday Conference. Held at Boston University, June 1-3, 2016.

with D. Ambrose, S. Moskow, G. Simpson and X. Song, Gene Golub SIAM Summer School on Stochastic Differential Equations and Wave Propagation. Held at Drexel University, July 25-August 5, 2016.

Seminar Organization

with S. Raynor, The Fields Institute Library Seminar. September, 2003 through May, 2004.

with D. Ambrose, S. Moskow & G. Simpson, Drexel University PDE/Applied Math Seminar. October, 2008 to present.

Minisymposium/Special Session Organization

with A. Scheel, Minisymposium on Collisions of Dissipative and Dispersive Solitons at the SIAM Conference on Nonlinear Waves and Coherent Structures in Seattle, WA. September 9, 2006.

with G. van Baalen, Minisymposium on Long-Time Behaviour in Damped Conservation Laws and Dispersive Equations at the SIAM Conference on Analysis of Partial Differential Equations in Phoenix, AZ. December 10, 2007.

with D. Ambrose, Session on Interfacial Fluid Flows with Applications at the IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena in Athens, GA. March 25, 2009.

with A. Hoffman, Minisymposium on Dynamics and Interaction of Coherent Structures in Lattice Models at the SIAM Conference on Applications of Dynamical Systems in Snowbird, UT. May 19, 2009.

with A. Hicks, Minisymposium on PDE and Optical Design at the SIAM Annual Meeting, in Denver, CO. July 9, 2009.

with D. Ambrose, B. Deconinck and D. Henderson, Special Session on Nonlinear Water Waves at the AMS Eastern Sectional, in State College, PA. October 24-25, 2009.

with D. Ambrose, Minisymposium on Degenerate Dispersive PDE and Compactly Supported Coherent Structures at SIAM Conference on Nonlinear Waves and Coherent Structures in Philadelphia, PA. August 18, 2010.

with D. Ambrose, Minisymposium on Effects of Degeneracy in Dispersive LDE and PDE at SIAM Conference on Nonlinear Waves and Coherent Structures in Seattle, WA. June 16, 2012.

with T. Harkin, Special Session on Nonlinear Partial Differential Equations in the Physical and Biological Sciences at AMS Fall Eastern Sectional in Rochester, NY. September 22-23, 2012.

with D. Ambrose, Session on Quasilinear and Dispersive Partial Differential Equations at IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena in Athens, GA. March 25, 2013.

with N. Mavinga, Special Session on Nonlinear Elliptic and Wave Equations and Applications at the AMS Eastern Section Meeting, in Philadelphia, PA. October 12, 2013.

with D. Pelinovsky, Minisymposium on Lattice Dynamics: Wave Propagation and Continuum Approximation at SIAM Conference on Nonlinear Waves and Coherent Structures in Philadelphia, PA. August 8-9, 2016.

Professional Service

Grant reviewer for the Netherlands Organisation for Scientific Research (2011).

Panel review member for the NSF Division of Mathematical Sciences (2013, 2016).

External reviewer for NSF Division of Mathematical Sciences (2013).

Vice Chair of the SIAM Activity Group on Nonlinear Waves and Coherent Structures (2017-2018).

Other Related Experience

Graduate Assistant, Boston University Differential Equations Project. Summer, 2001.

Research Assistant, Pennsylvania State University Applied Research Laboratory. 1996-1998.

Physics Research Intern, Naval Surface Warfare Center, Dahlgren VA. 1995.

Honors/Awards

Standard Bearer (Top Graduate) for Penn State Physics, 1997.

Boston University Teaching Fellow Award in Mathematics, 2000.

Drexel University Antelo Devereux Award for Young Faculty, 2009. (\$15,000)

Louis and Bessie Stein Family Fellow (jointly with D. Ambrose), 2009-2010. (\$12,000)