

Albert Ai

CONTACT INFORMATION

UW-Department of Mathematics
Van Vleck Hall
480 Lincoln Drive
Madison, WI 53706 USA

Email: aai@math.wisc.edu
Homepage:
<https://www.math.wisc.edu/~aai/>

RESEARCH INTERESTS

Nonlinear dispersive partial differential equations, fluid dynamics, harmonic analysis

EMPLOYMENT

Department of Mathematics, University of Wisconsin-Madison, Madison, WI, USA

- Henry Luce Postdoctoral Fellow, August 2019 - August 2020
- Van Vleck Visiting Assistant Professor, August 2020 - Present
- Host: Mihaela Ifrim

Mathematical Sciences Research Institute, Berkeley, CA, USA

Uhlenbeck Postdoctoral Fellow, Spring 2021

- Program: Mathematical problems in fluid dynamics

Department of Mathematics, University of California Berkeley, Berkeley, CA, USA

Postdoctoral Scholar, June 2019 – July 2019

EDUCATION

Department of Mathematics, University of California Berkeley, Berkeley, CA, USA

Ph.D. in Mathematics, August 2013 – May 2019

- Advisor: Daniel Tataru
- Thesis: Low regularity solutions for gravity water waves

Princeton University, Princeton, NJ, USA

A.B. in Mathematics, August 2009 – May 2013

- summa cum laude, with 3.9/4.0 GPA

HONORS AND AWARDS

- MSRI Emissary: Featured Uhlenbeck Postdoc (Spring 2021) link
- Herb Alexander Prize (for an outstanding dissertation in pure mathematics) (2019)
- Outstanding Graduate Student Instructor Award (2019)
- National Defense Science and Engineering Graduate Fellowship (2014 – 2017)
- Phi Beta Kappa (2013)

PUBLICATIONS AND PREPRINTS

- A. Ai, M. Ifrim, and D. Tataru, *The time-like minimal surface equation in Minkowski space: low regularity solutions*, arXiv preprint arXiv:2110.15296 (2021).
- A. Ai and O. Avadanei, *Well-posedness for the dispersive Hunter-Saxton equation*, arXiv preprint arXiv:2105.01221 (2021).

- A. Ai, M. Ifrim, and D. Tataru, *Two dimensional gravity waves at low regularity II: Global solutions*, arXiv preprint arXiv:2009.11513, to appear in Annales de l'Institut Henri Poincaré C, Analyses Non Linéaire (2021).
- A. Ai, M. Ifrim, and D. Tataru, *Two dimensional gravity waves at low regularity I: Energy estimates*, arXiv preprint arXiv:1910.05323 (2019).
- A. Ai, *Low regularity solutions for gravity water waves II: The 2D case*, Ann. PDE, 6, 4 (2020).
- A. Ai, *Low regularity solutions for gravity water waves*, Water Waves, 1(1):145-215 (2019).
- A. Ai, Z. Dvir, S. Saraf, and A. Wigderson, *Sylvester-Gallai type theorems for approximate collinearity*, Forum Math. Sigma, Vol. 2 (2014).
- A. Ai, A. Lapanowski, Y. Plan, and R. Vershynin, *One-bit compressed sensing with non-gaussian measurements*, Linear Algebra and its Applications, Vol. 441 (2014), p. 222-239.

CONFERENCE AND
SEMINAR TALKS

- *Oberwolfach Seminar Mini-series Lectures*. May 28 – June 3, 2023. MFO, Oberwolfach-Walke, Germany (upcoming).
- *PDE Seminar*. October 22, 2021. Brown University, Providence, RI, USA (virtual).
- *Analysis and PDE Seminar*. April 16, 2021. University of Southern California, Los Angeles, CA, USA (virtual).
- *Recent Developments in Fluid Dynamics*. April 15, 2021. Mathematical Sciences Research Institute, Berkeley, CA, USA (virtual).
- *Differential Equations Seminar*. April 1, 2021. University of Michigan, Ann Arbor, MI, USA (virtual).
- *Water Waves and Other Interface Problems Seminar*. March 30, 2021. Mathematical Sciences Research Institute, Berkeley, CA, USA (virtual).
- *AMS Special Session on Nonlinear Wave Equations, General Relativity, and Connections to Fluid Dynamics*. March 20, 2021 (virtual).
- *Analysis and PDE Seminar*. May 11, 2020. UC Berkeley, Berkeley, CA, USA (virtual).
- *PDE and Applied Math Seminar*. April 30, 2020. UC Davis, Davis, CA, USA (virtual).
- *BIRS Workshop: Dynamics in Geometric Dispersive Equations and the Effects of Trapping, Scattering and Weak Turbulence, Revisited*. February 2 – 7, 2020. Banff International Research Station, Banff, Alberta, Canada.
- *PDE-Geometric Analysis Seminar*. October 28, 2019. University of Wisconsin-Madison, Madison, WI, USA.
- *AMS Special Session on Nonlinear Dispersive Equations and Water Waves*. September 14, 2019. Madison, WI, USA.
- *Oberwolfach Workshop: Mathematical Theory of Water Waves*. July 14 – 20, 2019. MFO, Oberwolfach-Walke, Germany.
- *Analysis and PDE Seminar*. February 13, 2019. Michigan State University, East Lansing, MI, USA.
- *Rainwater Seminar*. February 5, 2019. University of Washington, Seattle, WA, USA.

- *AMS Special Session on Analysis and Geometry of Nonlinear Evolution Equations*. January 17, 2019. Baltimore, MD, USA.
- *PDE-Geometric Analysis Seminar*. November 5, 2018. University of Wisconsin-Madison, Madison, WI, USA.
- *Harmonic Analysis and PDE Student Seminar*. October 17, 2017. UC Berkeley, Berkeley, CA, USA.

CONFERENCES
ATTENDED AS
PARTICIPANT

- *Southern California Analysis and PDE Conference*. November 2 – 3, 2019. UC San Diego, San Diego, CA, USA.
- *Winter School on Fluid Dynamics, Dispersive Equations, and Quantum Fluids*. December 17 – 21, 2018. Università Degli Studi Di Padova, Bressanone, Italy.
- *Nonlinear Dirac Equations and Related Problems*. May 28 – 30, 2018. Bielefeld University, Bielefeld, Germany.
- *Rivière-Fabes Symposium on Analysis and PDE*. April 27 – 29, 2018. University of Minnesota, Minneapolis, MN, USA.
- *Shanks Workshop on Mathematical Aspects of Fluid Dynamics*. March 24 – 25, 2018. Vanderbilt University, Nashville, TN, USA.
- *Oberwolfach Workshop: Nonlinear Waves and Dispersive Equations*. June 11 – 14, 2017. MFO, Oberwolfach-Walke, Germany.
- *Mathematical Analysis of Water Waves and Related Models*. June 5 – 9, 2017. Bodega Marine Laboratory, Bodega Bay, CA, USA.
- *Rivière-Fabes Symposium on Analysis and PDE*. April 28 – 30, 2017. University of Minnesota, Minneapolis, MN, USA.

ACADEMIC
SERVICES

- Co-organizer (with J. Wang) of the *Harmonic Analysis and PDE Student Seminar*. Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Fall 2018 – Spring 2019.
- Co-organizer (with H. Mandel) of the *Preliminary Examination Workshop*. Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Summer 2018 – Winter 2018.
- Co-organizer (with K. O’Neill) of the *Harmonic Analysis and PDE Student Seminar*. Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Spring 2018.
- Co-organizer (with J. Chen) of the *Preliminary Examination Workshop*. Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Fall 2016 – Winter 2017.

TEACHING AND
MENTORING
EXPERIENCE

- Instructor for *Math 431: Introduction to Probability*. Department of Mathematics, UW Madison, Madison, WI, USA. Fall 2021.
- Instructor for *Math 431: Introduction to Probability*. Department of Mathematics, UW Madison, Madison, WI, USA. Fall 2020 (virtual).
- Teaching assistant for the *MSRI Virtual Summer Graduate School: Introduction to water waves*. Mathematical Sciences Research Institute, Berkeley, CA, USA. July 27, 2020 – August 7, 2020.
- Mentor for the *Directed Reading Program*. Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Fall 2014 – Spring 2017.

- *Instructor.* Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Summer 2014 – Summer 2016.
- *Graduate Student Instructor.* Department of Mathematics, UC Berkeley, Berkeley, CA, USA. Fall 2013 – Spring 2019.