RU-YU LAI

School of Mathematics
University of Minnesota
206 Church St. SE
Minneapolis, MN 55455

Email: rylai@umn.edu
Homepage:
http://www.math.umn.edu/∼ rylai

EDUCATION

Ph.D. in Mathematics, Sep. 2010 − Jun. 2015
University of Washington, Seattle (UW), USA
Advisor: Dr. Gunther Uhlmann

MS in Mathematics, Sep. 2007 − Aug. 2009
National Taiwan University (NTU), Taiwan
Advisor: Dr. Jenn-Nan Wang

BS in Mathematics, Sep. 2002 − Jun. 2006
National Taiwan Normal University (NTNU), Taiwan

EMPLOYMENT

Assistant Professor, Aug. 2017 −
School of Mathematics, University of Minnesota, USA

Postdoctoral Researcher, Sep. 2015 − Jun. 2017
School of Mathematics, University of Minnesota, USA

Research/Teaching Assistant, Sep. 2010 − Jun. 2015
Department of Mathematics, UW, USA

Research Assistant, Jul. 2009 − Jun. 2010
Institute of Mathematics, Academia Sinica, Taiwan

Teaching Assistant, Sep. 2007 − Jun. 2008
Department of Mathematics, NTU, Taiwan

Practice Teacher, Jul. 2006 − Jun. 2007
Caotun Junior High School, Taiwan

AWARDS and HONORS

Dean Special Recognition Award, NTU, 2009
Phi Tau Phi Membership, The Phi Tau Phi Scholastic Honor Society, 2006 & 2009
Chow Hung-Ching Scholarship, Institute of Mathematics, Academia Sinica, Taiwan
Scholarship for Excellent Undergraduate Student, NTNU

Grants and Fellowship

NSF grants: DMS-1714490, 2017-2019
AMS Simons Travel Grant, 2015-2017
Tanzi-Egerton Fellowship, UW, 2014

RESEARCH INTERESTS

Inverse problems, partial differential equations.

PUBLICATIONS

Preprints

- (with P. Caro, Y.-H. Lin and T. Zhou) Boundary determination of electromagnetic and Lamé parameters with corrupted data. Preprint available at *arXiv:1903.03524* (2019).
- (with Q. Li and G. Uhlmann) Inverse problems for the stationary transport equation in the diffusion scaling. Preprint available at *arXiv:1808.02071* (2018).

Publications

- (with D. Spirn) Quench detection on a superconducting radio-frequency cavity. *SIAM Applied Mathematics*, 79(1), 341–355 (2019).
- (with Y.-H. Lin) Global uniqueness for the fractional semilinear Schrödinger equation. *Proceedings of the AMS*, 147, 1189-1199 (2019)
- (with T. Zhou) Nonparaxial near-nondiffracting accelerating optical beams. *Communications in Mathematical Physics*, 353(2), 771–790 (2017).
- (with R. Shankar, D. Spirn and G. Uhlmann) An inverse problem from condense matter physics. *Inverse Problems*, 33(11), 115011 (2017).
- (with I. Kocyigit, L. Qiu, Y. Yang and T. Zhou) Applications of CGO solutions on coupled-physics inverse problems. *Inverse problems and imaging*, 11(2), 277–304 (2017).
- (with V. Isakov and J.-N. Wang) Increasing stability for the conductivity and attenuation coefficients. *SIAM J. Math. Anal.*, 48(1), 569-594 (2016).
- (with G. Uhlmann and J.-N. Wang) Inverse boundary value problem for the Stokes and the Navier-Stokes equations in the plane. *Arch. Rational Mech. Anal.*, 215(3), 811–829 (2015).
- Uniqueness and stability of Lamé parameters in elastography. *Journal of Spectral Theory*, 4(4), 841–877 (2014).
- Stability estimates for the inverse boundary value problem by partial Cauchy data. *Math. Meth. Appl. Sci.*, 38(8), 1568-1581 (2015).
- Increasing stability for the diffusion equation, *Inverse Problems*, 30, 075010 (2014).
- Global uniqueness for an inverse problem for the magnetic Schödinger operator, *Inverse Problems and Imaging*, 5, 59–74 (2011).

TEACHING EXPERIENCE

Assistant Professor, University of Minnesota

Spring	2019	MATH 8402: Model and Applied Math
Fall	2018	MATH 8401: Model and Applied Math
Spring	2018	MATH 2374: CSE Multivariable Calculus 4 (1 section: 85)
Fall	2017	MATH 2374: CSE Multivariable Calculus 4 (1 section: 160)

Postdoc, University of Minnesota

Spring	2017	MATH 2374: CSE Multivariable Calculus 4 (1 section: 108)
Fall	2016	MATH 2374: CSE Multivariable Calculus 4 (2 sections: $187 + 206$)
Fall	2015	MATH 1271: Calculus 1 (2 sections: $230 + 144$)

Teaching Assistant, University of Washington

Spring, Winter 2015, Spring 2013, Autumn 2012	MATH 126: Multivariable Calculus
Autumn, Winter 2014, Spring 2011	MATH 125: Calculus 2
Winter 2013	MATH 124: Calculus 1

Grader, University of Washington

Winter	2011	MATH 574: Fundamental Concepts Of Analysis
Autumn	2010	MATH 574: Fundamental Concepts Of Analysis

ACADEMIC ACTIVITIES

Conferences

- Applied Inverse Problems, Jul. 8-12, 2019
  Grenoble, France.
- Inverse Problems, Imaging and Partial Differential Equations, May 20-24, 2019
  IAS, Hong Kong.
- The AWM Research Symposium, Apr. 2019
  Rice University, USA.
- Microlocal Analysis, Inverse Problems and Resonances: A Conference in Honor of Plamen Stefanov, Mar. 2019
  Purdue University, USA
- Special session on "Recent advances in inverse problems and imaging, JMM, Jan. 2019
  Baltimore, USA.
- Inverse Problems in Mathematical Physics, Dec. 2018
  Vancouver, Canada.
- Recent Developments in the Mathematics of Tomography and Scattering, Oct. 20-21 2018
  University of Michigan in Ann Arbor, USA.
- Inverse Problems, Imaging and Partial Differential Equations, Mar. 2018
  IAS, Hong Kong
- Applied Inverse Problems, May 2017
  Hangzhou, China
- SIAM Conference on Mathematical Aspects of Materials Science, May 2016
  Philadelphia, USA
- AMS session of the Joint Mathematics meeting, Jan. 2016
  Seattle, USA
- Hybrid Methods in Imaging, Jun. 2015
  Banff, Canada
- Applied Inverse Problems, May 25-29 2015
  Helsinki, Finland
- Conference on Mathematical and Computational Challenges of Wave Propagation and Inverse Problems, Apr. 2015
  Michigan State University, Michigan, USA
- PDE/Analysis mini-school, Mar., 2015
  University of North Carolina, USA
- International Conference on Inverse Problems and Related Topics, Dec. 2014
  Taipei, Taiwan
- Harmonic Analysis and Partial Differential Equations, Sep. 2014
  The University of Chicago, Chicago, USA
- Inverse Problems and Imaging Conference, Apr. 2014
  Institut Henri Poincaré, Paris, France
- The 23th Jyväskylä Summer School, Jul. 2013
  Department of Mathematics, University of Jyväskylä, Finland
- International Conference on Inverse Problems and PDE Control, Jul.-Aug. 2012
  Chengdu, China
- Thematic Program on Inverse Problems and Imaging, Jul. 2012
  Fields Institute, Toronto, Canada
- A Conference on Inverse Problems in honor of Gunther Uhlmann, Jun. 2012
  UC Irvine, USA
- Inverse Problem and PDE Control, Jan. 2012
  Pontificia Universidad Católica de Chile, Chile

- MSRI Introductory Workshop on Inverse Problems and Applications, Aug. 2010
  Berkeley, USA
- MSRI Connection for Women: Inverse Problems and Applications, Aug. 2010
  Berkeley, USA
- Fourth Trilateral Meeting on Analysis and Applications, Dec. 2009
  Institute of Mathematics, Academia Sinica, Taiwan
- Two-Days Distinguished Lectures of Professor Luigi Ambrosio, Nov. 2009
  Institute of Mathematics, Academia Sinica, Taiwan

Seminar Talks

- PDE Geometric Analysis seminar, Jan. 2019
  University of Wisconsin, Madison, USA
- PDE seminar, Jun. 2018
  NCTS, Taipei, Taiwan
- Analysis and PDE seminar, Apr. 2018
  University of Kentucky, Lexington, USA
- PDE Geometric Analysis seminar, Nov. 2017
  University of Wisconsin, Madison, USA
- Inverse Problem seminar, Apr. 2017
  University of Washington, Seattle, USA
- Inverse Problem and Analysis Seminar, Apr. 2016
  University of Daleware, USA
- Geomechanics seminar, Nov. 2015
  University of Minnesota, USA
- PDE seminar, Sep. 2015
  University of Minnesota, USA
- Reading Seminar, Apr. 30, 2014
  University of Jyväskylä, Finland
- Graduate Student Analysis Seminar, Feb. 20, 2014
  University of Washington, USA

Short term visits

- Department of Mathematics and Statistic, University of Jyväskylä, Finland, Apr. 12 - May 16, 2014.
  Sponsor: Professor Mikko Salo

SERVICES

Organizations

- Mini-symposium: *Inverse problems for linear and nonlinear PDEs*, Applied Inverse Problems, Grenoble, France, Jul. 8-12, 2019.
- *Mathematics in Optical Imaging*, IMA, USA, April 29 - May 3, 2019.
- Special session: *New Developments in Inverse Problems and Imaging*, AMS Sectional Meeting, Northeastern University, Boston, April 21-22, 2018.

Refereed Journal Articles

- Inverse Problems.
- Inverse Problems and Imaging.
- Journal of Differential Equations.
- Research in the Mathematical Sciences.