

JIAN ZHAI

Institute for Advanced Study, HKUST

IAS 4009, Lo Ka Chung Building, HKUST, Clear Water Bay, Kowloon, Hong Kong

iasjzhai@ust.hk <http://jianzhai.github.io>

EMPLOYMENT

Postdoctoral Fellow, Institute for Advanced Study, **The Hong Kong University of Science and Technology**, Mar. 2019 - Now

Visiting Lecturer, Department of Mathematics, **University of Washington**, Sep. 2018 - Mar. 2019

Postdoctoral Fellow, Department of Computational and Applied Mathematics, **Rice University**, July 2018 - Aug. 2018

EDUCATION

Rice University May 2018

Ph.D. in Computational and Applied Mathematics

Advisor: Prof. Maarten V. de Hoop

Purdue University Aug. 2013 - Aug. 2015

Ph.D. Student in Mathematics

Advisor: Prof. Maarten V. de Hoop

Fudan University Jun. 2013

M. S. in Mathematics

Advisors: Prof. Jin Cheng, Prof. Shuai Lu

Sichuan University Jun. 2010

B. S. in Mathematics

RESEARCH INTERESTS

- Inverse Problems, Ill-posed Problems
- Partial Differential Equations
- Microlocal Analysis
- Spectral theory
- Scientific Computing

PUBLICATIONS

- (with G. Bao and X. Xu) An inverse spectral problem for a damped wave operator, *preprint*, arXiv:2008.04523.
- (with P. Li and Y. Zhao) Lipschitz stability for an inverse source scattering problem at a fixed frequency, *preprint*, *preprint*, arXiv:2007.09900.
- (with P. Hintz and G. Uhlmann) An inverse boundary value problem for a semilinear wave equation on Lorentzian manifolds, *preprint*, arXiv:2005.10447.

- (with G. Uhlmann) Inverse problems for nonlinear hyperbolic equations, *Discrete Contin. Dyn. Syst.*, to appear.
- (with P. Li and Y. Zhao) Stability for the acoustic inverse source problem in inhomogeneous media, *SIAM J. Appl. Math.*, to appear.
- (with G. Uhlmann) On an inverse boundary value problem for a nonlinear elastic wave equation, *preprint*, arXiv:1912.11756.
- (with M. V. de Hoop, T. Saksala and G. Uhlmann) Generic uniqueness and stability for the mixed ray transform, *preprint*, arXiv:1909.11172.
- (with M. V. de Hoop, A. Iantchenko and R. D. van der Hilst) Semiclassical inverse spectral problem for seismic surface waves in isotropic media II: Rayleigh waves, *Inverse Problems*, **36** (2020) 075016.
- (with M. V. de Hoop, A. Iantchenko and R. D. van der Hilst) Semiclassical inverse spectral problem for seismic surface waves in isotropic media I: Love waves, *Inverse Problems*, **36** (2020) 075015.
- (with X. Xu) Inversion of trace formulas for a Sturm-Liouville operator, *preprint*, arXiv:1906.12108.
- (with M. V. de Hoop and G. Nakamura) Unique recovery of piecewise analytic density and stiffness tensor from the elastic-wave Dirichlet-to-Neumann map, *SIAM J. Appl. Math.*, **79** (2019) 2359-2384.
- (with M. V. de Hoop and G. Uhlmann) Inverting the local geodesic ray transform of higher rank tensors, *Inverse Problems*, **35** (2019) 115009.
- (with Y. Yang) Unique determination of a transversely isotropic perturbation in a linearized inverse boundary value problem for elasticity, *Inverse Probl. Imaging*, **13** (2019) 1309-1325.
- (with M. V. de Hoop and T. Saksala) Mixed ray transform on simple 2-dimensional Riemannian manifolds, *Proc. Amer. Math. Soc.*, **147** (2019) 4901-4913.
- (with M. V. de Hoop, A. Iantchenko, G. Nakamura) Semiclassical analysis of elastic surface waves, *preprint*, arXiv:1709.06521.
- (with M. V. de Hoop and G. Nakamura) Reconstruction of Lamé moduli and density at the boundary enabling directional elastic wavefield decomposition, *SIAM J. Appl. Math.*, **77** (2017) 520-536.
- (with E. Beretta, M. V. de Hoop, E. Francini and S. Vessella) Uniqueness and Lipschitz stability of an inverse boundary value problem for time-harmonic elastic waves, *Inverse Problems*, **33** (2017) 035013.

AWARDS

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| • Alan Weiser Memorial Travel Awards , Rice University, CAAM | May 2017 |
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PRESENTATIONS

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| • Seminar, Southern University of Science and Technology, online ZOOM seminar | Jun. 2020 |
| • Minisymposium on Recent Advances in Geometric Inverse Problems, Applied Inverse Problems Conference, Grenoble, France | July 2019 |
| • Minisymposium on Inverse Problems in Elastic Medium, Applied Inverse Problems Conference, Grenoble, France | July 2019 |
| • Seminar, Zhejiang University, Hangzhou, China | Jun. 2019 |

- The 11th Conference on Inverse Problems, Imaging and Applications, Lanzhou, China Jun. 2019
- The 5th East Asia Section of IPIA Young Scholars Symposium, Beijing, China Jun. 2019
- Seminar, Hong Kong University of Science and Technology, Hong Kong, China May. 2019
- Canadian Mathematical Society Winter Meeting, Vancouver, Canada Dec. 2018
- Differential Geometry and PDE Seminar, University of Washington, Seattle, WA, USA Oct. 2018
- International Workshop on Inverse Problems for PDEs, Nanjing, China Sep. 2018
- SIAM Annual Meeting, Portland, OR, USA July 2018
- Seminar, Zhejiang University, Hangzhou, China Jun. 2017
- Applied Inverse Problem Conference, Hangzhou, China Jun. 2017
- Graduate Seminar, Rice University, Houston, TX, USA Feb. 2017
- IAS Workshop on Inverse Problems, Imaging and PDEs, HKUST, Hong Kong, China Dec. 2016
- Seminar, Fudan University, Shanghai, China May 2016
- Graduate Seminar, Rice University, Houston, TX, USA Nov. 2015

TEACHING

- Calculus II (MATH 1014), Instructor, HKUST, Spring 2020.
- Introduction to Differential Equations (MATH 307), Instructor, University of Washington, Winter 2019.
- Numerical analysis I (CAAM 453), Teaching Assistant, Rice University, Fall 2017.

PROGRAMMING SKILLS

C/C++, Matlab