# XIAO LIU

# ♦ liu328@illinois.edu

#### EMPLOYMENT

University of Illinois Urbana-Champaign, Champaign, IL

- J. L. Doob Research Assistant Professor, 2022-present
  - Mentor: Vera Hur

## **EDUCATION**

Georgia Institute of Technology, Atlanta, GA Ph.D. in Mathematics, 2015-present

• Advisor: Chongchun Zeng

• Dissertation: Capillary gravity water waves linearized at monotone shear flows

Washington University in St. Louis, St. Louis, MO M.A. in Mathematics, 2015

• Mentor: Renato Feres

**University of Science and Technology Beijing**, Beijing, China B.S. in Mathematics and Applied Mathematics, 2012

- Advisor: Chunying Ming
- Thesis: Numerical solutions of unsteady flows of a non-Newtonian fluid nearby a rotating disk

### **RESEARCH INTEREST**

### Partial Differential Equations and Fluid Mechanics

# PUBLICATION AND PREPRINTS

- Capillary gravity water waves linearized at monotone shear flows: eigenvalues and inviscid damping, 94 pages, *Submitted*, http://arxiv.org/abs/2110.12604. (With C. Zeng.)
- Linear instability of two-phase fluids interface problem, Submitted, http://arxiv.org/abs/2208.11159.
- Linearized gravity water waves at monotone shear flows, In preparation. (With C. Zeng.)

### INVITED TALKS

- Analysis of Linearized Capillary Gravity Water Waves near Monotone Shear Flow, Special session on "Geometric methods in spectral stability of waves and patterns" at The Twelfth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, GA (March 29, 2022)
- Capillary Gravity Water Waves Linearized at Monotone Shear Flows: Eigenvalues and Inviscid Damping, AMI Seminar, University of Alberta, Virtual (January 28, 2022)
- 2D Incompressible Euler Equation Linearized at Shear Flows: An Introduction, AMI Seminar, University of Alberta, Virtual (January 21, 2022)
- Linear Instability in Fluid Free Surface Problems, Graduate Student Working Group, Semester program on "Mathematical problems in fluid dynamics", MSRI, Virtual (May 12 2021)

### **RESEARCH EXPERIENCE**

Program Associate, Program on Mathematical Problems in Fluid Dynamic, MSRI (01/19/2021-05/28/2021)

## TEACHING EXPERIENCE

University of Illinois Urbana-Champaign

• Instructor: Math 444: Elementary Real Analysis (Fall 2022)

Georgia Institute of Technology

- Instructor: Math 1553: Introduction to Linear Algebra (Summer 2020), 78 students, 2 TAs Math 2551: Multivariable Calculus (Spring 2021), 105 students, 3 TAs
- Teaching Assistant: Math 2550: Introduction to Multivariable Calculus (Spring 2017) Math 2551: Multivariable Calculus (Fall 2018, Spring 2018, Fall 2017, Fall 2016, Spring, 2016, Fall 2015) Math 1554: Linear Algebra (Fall 2019, Spring 2019)

### PROFESSIONAL SERVICES

Reviewer for: Archive for Rational Mechanics and Analysis.

### HONORS AND AWARDS

Outstanding Online Graduate Student Instructor, Georgia Institute of Technology	04/2021
Thank-a-Teacher Certificate, Georgia Institute of Technology	08/2020
Outstanding Student Evaluations, Georgia Institute of Technology	04/2017
Outstanding Undergraduate Thesis, University of Science and Technology Beijing	06/2012
First class People's Scholarship, University of Science and Technology Beijing	09/2011
Second class People's Scholarship, University of Science and Technology Beijing	09/2010

# ACADEMIC ACTIVITIES (WITH FINANCIAL SUPPORT FROM ORGANIZERS)

- Summer School on Introduction to Water Waves, MSRI, Berkeley, July 2020
- Summer School on Recent Advances in Mathematical Fluid Dynamics, University of Southern California, Los Angeles, May 2019
- Workshop on Nonlinear Differential Equations, Dynamical Systems and Applications, University of Kansas, Lawrence, October 2018
- Workshop Hamiltonian Systems, from Topology to Applications through Analysis I, MSRI, Berkeley, October 2018
- Riviére-Fabes Symposium, University of Minnesota, Minneapolis, April 2018
- Shanks Workshop on Mathematical Aspects of Fluid Dynamics, Vanderbilt University, Nashville, March 2018
- 79/80th Anniversary Midwest PDE Seminar, University of Illinois Chicago, Chicago, September 2017
- Fourth Chicago Summer School in Analysis, University of Chicago, Chicago, June 2017
- UNC PDE Mini-school, The University of North Carolina at Chapel Hill, Chapel Hill, April 2017

#### TECHNICAL SKILLS

MATLAB, C#, SQL Server, LATEX