Jae Ho Choi

Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213, USA
jaechoi@andrew.cmu.edu • Office: Wean Hall 7128

EMPLOYMENT

Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

- Postdoctoral Research Associate — Sep 2024 – Present

EDUCATION

University of Pennsylvania, Philadelphia, Pennsylvania, USA

- Ph.D. in Mathematics — Sep 2019 – May 2024
  - Advisors: Robert Strain, Yoichiro Mori
- Master of Computer and Information Technology (MCIT) — Sep 2021 – May 2023

University of Maine, Orono, Maine, USA

- M.A. in Mathematics — Sep 2017 – May 2019
  - Thesis: Theory of Lexicographic Differentiation in the Banach Space Setting
  - Adsivor: Peter Stechlinski

Williams College, Williamstown, Massachusetts, USA

- B.A. in Physics, Mathematics, and Economics — Sep 2013 – May 2017
  - Senior Thesis (in Physics): An Unusual Derivation of the Boltzmann Distribution for a Particle in a 1D Box
  - Advisor: William K. Wootters
  - Graduated with Departmental Honors in Physics

CITIZENSHIP

South Korean, with U.S. permanent residency

PERSONAL WEBSITE

choijh93.github.io

RESEARCH INTERESTS

partial differential equations arising in fluid dynamics, primarily analytical study of well-posedness, stability, and long-time dynamics of free boundary problems; numerical simulation of free boundary problems

PREPRINTS

[9] J. Choi and I. Tice, Traveling wave solutions to a two-phase Stokes problem with viscosity contrast driven by surface tension in 2D, *in preparation*.

[8] J. Choi and R. Strain, Stability of a two-phase Taylor-Melcher problem with viscosity contrast driven by surface tension in 2D, *in preparation*.

[7] J. Choi, Stability of a two-phase Brinkman problem with surface tension in 2D, *in preparation*.

[6] L. Bouck, J. Choi, and N. Walkington, A stable boundary integral scheme for a two-phase Brinkman problem in 2D, *in preparation*.

[5] J. Choi and R. Strain, Stability of a two-phase Stokes problem with viscosity contrast driven by surface tension in 2D, *in preparation*.

[4] J. Choi and I. Tice, Traveling wave solutions to a general incompressible Navier-Stokes-Fourier system with free boundary, *submitted*.

[3] J. Choi, Stability of a two-phase Stokes problem with surface tension, *submitted*.

PUBLICATIONS

[2] J. Choi, N. Krishna, N. Magill, and A. Sarria, On the L^p regularity of solutions to the generalized Hunter-Saxton system, *Discrete Contin. Dyn. Syst. Ser. B* 24 (2019), 6349-6365.

[1] S. Alterman, J. Choi, R. Durst, S. Fleming, and W. Wootters, The Boltzmann distribution and the quantum-classical correspondence, *J. Phys. A* 51 (2018), no. 34.

INVITED TALKS

- *A two-phase Stokes problem with viscosity contrast*.
  Graduate Student and Postdoc (GSPS) Seminar
  Department of Mathematical Sciences, Carnegie Mellon University, PA, USA — Oct 2025
- *On the two-phase Stokes flow problem with surface tension*.
  Recent Progress in PDE Models of Incompressible Fluids
  AMS Western Sectional Meeting, University of Denver, CO, USA — Aug 2025

- *Stability and instantaneous analyticity of a 2D Stokes bubble with viscosity contrast.*
  PDE and Applied Analysis Seminar
  Pohang University of Science and Technology, Pohang, Republic of Korea — Jul 2025
- *Well-posedness of a two-phase Stokes flow problem with surface tension.*
  Center for Nonlinear Analysis (CNA) Seminar
  Carnegie Mellon University, PA, USA — Sep 2024
- *On the two-phase Stokes flow problem with surface tension*.
  PDE and Applied Analysis Seminar
  Pohang University of Science and Technology, Pohang, Republic of Korea — Jun 2024
- *The mathematics of fluids*.
  UP GRADe (an NSF-funded talk series co-hosted by Penn's AWM chapter and GeMs in Math)
  Department of Mathematics, University of Pennsylvania, PA, USA — May 2024
- *The boundary integral method for interfacial Stokes flow*.
  Analysis Seminar, Department of Mathematics, University of Pennsylvania, PA, USA — Apr 2024
- *On the two-phase Stokes flow problem with surface tension*.
  Analysis Seminar, Department of Mathematics, University of Pennsylvania, PA, USA — Nov 2023
- *On the two-phase Stokes flow problem with surface tension*.
  Applied and Numerical PDE Seminar, University of California, Berkeley, CA, USA — Nov 2023
- *A friendly introduction to the Taylor-Melcher model*.
  Recent Advances in Mathematical Fluid Dynamics, Duke University, NC, USA — May 2023
- *Infinite-energy solutions of the Euler equations with time-dependent damping*.
  Williams College REU Conference, Williams College, MA, USA — Jul 2016
- *Reduction of error in the discrete truncated Wigner approximation*.
  Williams College Summer Science Research Poster Session, Williams College, MA, USA — Aug 2015

INVITED CONFERENCES

- POSTECH-KIAS Intensive Lecture Series on PDEs I & II, Republic of Korea — Jun 2026
- Mathematics of General Relativity and Fluids (SLMath), Heraklion, Crete, Greece — Jul 2024
- Summer School on Wave Turbulence, Massachusetts Institute of Technology, MA, USA — Jul 2023
- New Trends in Mathematical Fluid Dynamics, Institut Fourier, Gières, France — Jun 2023
- Recent Advances in Mathematical Fluid Dynamics, Duke University, NC, USA — May 2023

SERVICE & STUDENT MENTORSHIP

- Panelist, Graduate School Panel (hosted by the Student Mathematics and Statistics Advisory Board)
  Department of Mathematics, Williams College, MA, USA — Oct 2024
- Mentor, Directed Reading Program (DRP), Department of Mathematics, University of Pennsylvania
  DRP is a program in which undergraduate students are paired with graduate student mentors for independent study based on matching interests.
  - Darren Zheng, harmonic analysis (Spring 2024).
  - Dylan Marchlinski, fluid dynamics and probability theory (Fall 2023).
  - Evan Qiang, probability theory (Spring 2023).
  - David Kogan, probability theory (Spring 2022).

TEACHING EXPERIENCE

CARNEGIE MELLON UNIVERSITY

- Instructor, Integration and Approximation (21-122) — Fall 2024
- Instructor, Integration and Approximation (21-122) — Spring 2025
- Instructor, Integration and Approximation (21-122) — Fall 2025
- Co-Instructor, Integration and Approximation (21-122) — Spring 2026

UNIVERSITY OF PENNSYLVANIA

- Teaching Assistant, Advanced Analysis (MATH 5090) — Spring 2024
- Teaching Assistant, Advanced Analysis (MATH 5080) — Fall 2023
- Grader, Mathematics in the Age of Information (MATH 2100) — Spring 2022
- Teaching Assistant, Ideas in Mathematics (MATH 1700) — Spring 2021
- Teaching Assistant, Advanced Calculus (MATH 3610) — Fall 2020

UNIVERSITY OF MAINE

- Teaching Assistant, Calculus II (MAT 127) — Spring 2019
- Teaching Assistant, Calculus I (MAT 126) — Fall 2018
- Teaching Assistant, Calculus II (MAT 127) — Spring 2018

- Teaching Assistant, Calculus II (MAT 127) — Fall 2017

WILLIAMS COLLEGE

- Teaching Assistant, Real Analysis (MATH 350) — Spring 2016
- Teaching Assistant, Linear Algebra (MATH 250) — Fall 2015

AWARDS & SCHOLARSHIPS

- **Good Teaching Award**
  Department of Mathematics, University of Pennsylvania — Fall 2023, Spring 2024
- **Benjamin Franklin Fellowship**
  Department of Mathematics, University of Pennsylvania — Sep 2019 – May 2024
- **Class of 1960 Scholar in Physics**
  Department of Physics, Williams College — Sep 2016 – May 2017
- **John & Louise Finnerty Class of 1971 Fund for Applied Mathematical Research**
  Department of Mathematics and Statistics, Williams College — Jun 2016– Aug 2016