

Research Interests

Pure and applied analysis of PDE: microlocal analysis, spectral and scattering theory, mathematical physics, control theory and dynamical systems.

Education

- 2023 **Ph.D. Mathematics**, Northwestern University, US.
Advisor: Jared Wunsch.
- 2017 **M.A.St. Mathematics**, University of Cambridge, UK.
- 2016 **B.Sc. Mathematics**, University College London, UK.

Appointments

- From 2024 **Gibbs Assistant Professor**, Yale University, US.
- 2023–2024 **Research Fellow**, University College London, UK.

Visiting Appointments

- From 2024 **Honorary Research Fellow**, University College London, UK.
- 2026/01 **Visitor**, Issac Newton Institute, UK.
- 2024/05 **Chercheur Invité**, I.H.É.S., Université Paris-Saclay, France.

Awards and Honours

- 2023 **Graduate Thesis Award**, International Congress of Chinese Mathematicians.
- 2022 **Outstanding Student Teacher Award**, Northwestern University.
- 2020 **Graduate Teaching Assistant Award**, Northwestern University.
- 2016 **Wynne–Roberts Prize**, University College London.
- 2016 **IMA Graduate Prize**, University College London.
- 2016 **MAPS Dean’s List**, University College London.
- 2015 **Summer Student Scholarship in Mathematics**, University College London.
- 2015 **Bosanquet Prize**, University College London.
- 2014 **Undergraduate Prize in Mathematics**, University College London.

Grant Support

- 2024 **LMS Early Career Researcher Travel Grant** (ECR-2324-25)
- 2024 **LMS Scheme 4 Research Grant** (42303)

Publications

- [8] Hölder damping for fractional wave equations
Preprint (2025/10), with Jian Wang.
- [7] Weakly elliptic damping gives sharp decay
C. R. Math. **363** (2025), 1263–1275, with Lassi Paunonen and Nicolas Vanspranghe.
- [6] Optimal backward uniqueness and polynomial stability of second order equations with unbounded damping
Preprint (2023/10), with Perry Kleinhenz.
- [5] Control estimates for 0th order pseudodifferential operators
Int. Math. Res. Not. IMRN **2024** (2024), 6656–6679, with Hans Christianson and Jian Wang.
- [4] Sharp polynomial decay for polynomially singular damping on the torus
Submitted (from 2023/05), with Perry Kleinhenz.
- [3] Stabilisation of waves on product manifolds by boundary strips
Proc. Amer. Math. Soc. **152** (2024), 2423–2437.
- [2] Sharp polynomial decay for waves damped from the boundary in cylindrical waveguides
Math. Res. Lett. **30** (2023), 1253–1298.
- [1] Exponential decay for damped Klein–Gordon equations on asymptotically cylindrical and conic manifolds
Ann. Inst. Fourier (Grenoble) **74** (2024), 2623–2666.

Reviews and Expositions

- [R1] Quantitative unique continuation on conic manifolds
In press (2024/02).

Research Talks

- [41] 2026/04 *AMS Special Session on “Recent developments in dynamics of nonlinear dispersive equations”*, Spring Central Sectional Meeting, North Dakota State.
- [40] 2026/03 *AMS Special Session on “Microlocal Analysis and Mathematical Physics”*, Spring Eastern Sectional Meeting, Boston.
- [39] 2026/01 Inverse Problems, Spectral and Scattering Theory Seminar, Purdue.
- [38] 2026/01 *High energy spectral theory: geometry and dynamics*, Issac Newton Institute, UK.
- [37] 2025/09 Geometric Analysis Seminar, Yale.
- [36] 2025/05 *Geometric and functional inequalities and applications* Seminar (virtual).
- [35] 2025/04 AMS Special Session on *“Spectral Theory and Quantum Systems”*, Spring Eastern Sectional Meeting, Hartford.
- [34] 2024/12 London Analysis and Probability Seminar.
- [33] 2024/12 Analysis Seminar, Yale.
- [32] 2024/11 PDE Seminar, Brown.
- [31] 2024/09 Brown–Yale PDE Seminar, Brown.
- [30] 2024/08 *Spectral Analysis of Schrödinger Operators* (poster), ICERM, Brown.
- [29] 2024/06 *Microlocal Analysis and Quantum Dynamics* (poster), Northwestern.
- [28] 2024/02 Analysis Seminar, Loughborough University.
- [27] 2024/02 Informal Spectral and Scattering Theory Seminar, University College London.
- [26] 2024/01 Applied Mathematics Seminar, University College London.

- [25] 2024/01 AMS Special Session on “*Dynamics and Regularity of PDEs*”;
- [24] 2024/01 AMS Special Session on “*Advances in Analysis, PDE’s and Related Applications*”, Joint Mathematics Meetings, San Francisco.
- [23] 2024/01 International Congress of Chinese Mathematicians, Shanghai.
- [22] 2023/11 London Analysis and Probability Seminar.
- [21] 2023/11 *Problèmes Spectraux en Physique Mathématique*, Inst. Henri Poincaré.
- [20] 2023/10 M. E. Taylor Analysis & PDE Seminar, UNC Chapel Hill.
- [19] 2023/10 Calderón–Zygmund Analysis Seminar, University of Chicago.
- [18] 2023/10 Analysis Seminar, Northwestern.
- [17] 2023/07 Analysis & PDE Seminar, Tsinghua.
- [16] 2023/07 *Microlocal and Probabilistic Methods in Geometry and Dynamics* (poster), Inst. Math. Jussieu.
- [15] 2023/06 Differential Geometry Seminar (virtual), UC Santa Barbara.
- [14] 2023/05 Analysis Seminar, Yale.
- [13] 2023/05 Midwest PDE Seminar, Notre Dame.
- [12] 2023/04 Mathematical Physics and Harmonic Analysis Seminar, Texas A&M.
- [11] 2023/04 Analysis Seminar, Northwestern.
- [10] 2022/10 *Trends in Soliton Dynamics and Singularity Formation for Nonlinear Dispersive PDEs*, Texas A&M.
- [9] 2022/06 Analysis and PDE Seminar (virtual), University of Kentucky.
- [8] 2022/05 Midwest Dynamical Systems Early Career Conference (poster), Notre Dame.
- [7] 2022/04 AMS Special Session on “*Asymptotic Behavior of Evolution Equations*” (virtual), Joint Mathematics Meetings, Seattle.
- [6] 2021/11 Analysis & PDE Seminar (virtual), Tsinghua.
- [5] 2021/10 Informal Geometric Analysis Seminar, Northwestern.
- [4] 2021/10 Spectral and Scattering Theory Seminar, Purdue.
- [3] 2021/09 Analysis and PDE Seminar (virtual), Michigan State University.
- [2] 2021/06 Analysis Summer School (virtual), Imperial College London.
- [1] 2020/10 Harmonic Analysis and Differential Equations Seminar (virtual), UC Berkeley.

Research Visits

- 2026/03 IHÉS, Laboratoire Math. Orsay.
- 2025/05 University College London.
- 2024/12 University College London.
- 2024/05–06 IHÉS, Laboratoire Math. Orsay.
- 2024/04 Inst. Henri Poincaré, Université Paris-Est Créteil.
- 2024/01 Tampere University.
- 2023/11 Inst. Henri Poincaré, Laboratoire Math. Orsay.
- 2023/10 Northwestern University, UNC Chapel Hill.

Instructorships

Yale University

- 2026/01 Senior Seminar
- 2026/01 Introduction to Partial Differential Equations
- 2025/08 Microlocal Analysis
- 2025/01 Introduction to Partial Differential Equations
- 2024/08 Introduction to Functions and Calculus I

Northwestern University

- 2023/03 Single-Variable Integral Calculus

Minicourses

- 2023/06 Analysis Preliminary Bootcamp (4 hours), Northwestern.
- 2019/09 Analysis Preliminary Bootcamp (3 hours), Northwestern.

Teaching Assistantships

Northwestern University

- 2022/09 MATH321: Real Analysis. Also in 2021/01, 2020/01,03,09.
- 2022/09 MATH351: Fourier Analysis and Boundary Value Problems.
- 2021/01 MATH368: Introduction to Optimization.
- 2020/09 MATH342: Introduction to Differential Geometry.
- 2020/06 MATH100: Quantitative Reasoning (Northwestern Bridge Program).
- 2020/04 MATH230-2: Multivariable Integral Calculus.
- 2020/01 MATH226: Sequences and Series.
- 2019/09 MATH250: Elementary Differential Equations.
- 2019/09 MATH228-1: Multivariable Differential Calculus for Engineering.
- 2019/01 MATH230: Differential Calculus of Multivariable Functions.
- 2018/09 MATH224: Integral Calculus of One Variable Functions.

Professional Service

Referee Service

Journals: Ann. Henri Poincaré, Comm. Math. Phys., Invent. Math., Involve, J. Math. Pures Appl., Mathematika.

Educational Service

Mentorship

- 2025/06–08 **Mentor**, Summer Undergraduate Math Research at Yale.
- 2025/01–06 **Mentor**, Undergraduate Reading Course, Yale.
- 2023/10–24/06 **Mentor**, Undergraduate Research, UCL.
- 2022/06–09 **Mentor**, Undergraduate Summer Research, Northwestern University.
- 2021/09–22/06 **Mentor**, Directed Reading Program, Northwestern University.
- 2021/09–22/06 **Mentor**, Causeway Postbaccalaureate Program, Northwestern University.
- 2020/06–09 **Mentor**, Undergraduate Summer Research, Northwestern University.

- 2020/06–08 **Teaching Assistant**, Northwestern Bridge Program.
 2019/01–06 **Mentor**, Directed Reading Program, Northwestern University.
- Examinations and Assessment**
- 2025/01–06 **Advisor**, Senior Project, Yale.
 2025/01 **Committee Member**, Senior Project, Yale.
 2025/01 **Committee Member**, Senior Project, Yale.
 2024/03 **Examiner**, MSci Project, UCL Maths.
 2024/01 **Reviewer**, Undergraduate Poster Session, Joint Math Meetings, San Francisco.
 2023/12 **Judge**, Undergraduate Summer Projects Poster Competition, UCL Maths.
- Committees and Panels**
- 2023/04 Graduate Panel in Mathematics, Northwestern.
 2022/05 Graduate Panel in Mathematics, Northwestern.
 2013–2016 Staff-Student Consultative Committee, UCL Maths.

Community Service

Seminar Organisation

- From 2024 Analysis Seminar, Yale University.
 2023 Analysis Seminar, University College London.
 2022–2023 Analysis Seminar, Northwestern University.
 2023 PDE Seminar, Northwestern University.

Volunteering

- 2018–2023 **Volunteer**, Evanston Math Circle.
 2013–2014 **Academic Supporting**, IntoUniversity, London.
 2014/01–06 **Mentor**, UCL Academy.

Expository and Outreach Talks

- 2025/06 SUMRY Colloquium, Yale.
 2024/12 Graduate Student Seminar, Yale.
 2022/01 Graduate Student Seminar, Northwestern.
 2021/10 Undergraduate Math Society, Northwestern.
 2020/10 Graduate Student Seminar (virtual), Northwestern.
 2019/10 Undergraduate Math Society, Northwestern.
 2017/03 Part III Seminar, Cambridge.
 2017/03 Undergraduate Colloquium, UCL.
 2016/12 Part III Seminar, Cambridge.
 2016/10 Undergraduate Colloquium, UCL.
 2016/02 Tomorrow's Mathematicians Today, Greenwich.

Professional Training and Certificates

- 2023/02 Universal Design for Learning Practicum, Northwestern University.
 2021/12 *"Mentoring Up & Down"* Workshop, Northwestern University.

Languages

Mandarin Chinese
Japanese
French
Korean
German

Bilingual ■■■■
Fluent ■■■■
Intermediate ■■■■
Elementary ■■■■
Elementary ■■■■