

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 2023 **Research Fellow**, *University College London*, UK.

Visiting Appointments

2024/05,11 **Chercheur Invité**, *Institut des Hautes Études Scientifiques*, 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 Scheme 4 Research Grant** (42303), “*Singular Damped Waves on the Torus*”.

Publications

- [6] Optimal backward uniqueness and polynomial stability of second order equations with unbounded damping (with Perry Kleinhenz). Preprint (2023).
- [5] Control estimates for 0th order pseudodifferential operators (with Hans Christianson and Jian Wang). *Int. Math. Res. Not. IMRN*, published online (2023).

- [4] Sharp polynomial decay for polynomially singular damping on the torus (with Perry Kleinhenz). Submitted (2023).
- [3] Stabilisation of waves on product manifolds by boundary strips. *Proc. Amer. Math. Soc.*, to appear (2022).
- [2] Sharp polynomial decay for waves damped from the boundary in cylindrical waveguides. *Math. Res. Lett.*, to appear (2022).
- [1] Exponential decay for damped Klein–Gordon equations on asymptotically cylindrical and conic manifolds. *Ann. Inst. Fourier (Grenoble)*, to appear (2022).

Reviews and Expositions

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

Research Talks

- [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

- 2024/11–12 IHÉS.
- 2024/05–06 IHÉS, and Université Paris–Saclay, Orsay.
- 2024/04 Inst. Henri Poincaré, and Université Paris–Est Créteil.
- 2024/01 Tampere University.
- 2023/11 Université Paris–Saclay, Orsay.
- 2023/10 Northwestern University, and UNC Chapel Hill.

Instructorships

Northwestern University

- 2023/03–06 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

- 2022/09–12 MATH321: Real Analysis. Also in 2021/01–06, 2020/01–06, 09–12.
- 2022/09–12 MATH351: Fourier Analysis and Boundary Value Problems.
- 2021/01–06 MATH368: Introduction to Optimization.
- 2020/09–12 MATH342: Introduction to Differential Geometry.
- 2020/06–08 MATH100: Quantitative Reasoning (Northwestern Bridge Program).
- 2020/04–06 MATH230-2: Multivariable Integral Calculus.
- 2020/01–03 MATH226: Sequences and Series.
- 2019/09–12 MATH250: Elementary Differential Equations.
- 2019/09–12 MATH228-1: Multivariable Differential Calculus for Engineering.
- 2019/01–06 MATH230: Differential Calculus of Multivariable Functions.
- 2018/09–12 MATH224: Integral Calculus of One Variable Functions.

Professional Service

Referee Service

- Journals: *J. Math. Pures Appl.*.

Educational Service

Mentorship

- From 2023/10 *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

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

Volunteering

- 2018–2023 *Volunteer*, Evanston Math Circle.
 2013/12–14/06 *Academic Supporting*, IntoUniversity, London.
 2014/01–06 *Mentor*, UCL Academy.

Expository and Outreach Talks

- 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

Bilingual ■■■■■
 Fluent ■■■■□

French
Korean
German

Intermediate 
Elementary 
Elementary 