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## Research Interests

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

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## 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.

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## Appointments

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

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## Visiting Appointments

2024/05,11 **Chercheur Invité**, Institut des Hautes Études Scientifiques, France.

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## 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.

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## Grant Support

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

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## Publications

- [7] Weakly elliptic damping gives sharp decay  
Submitted (from 2024/03), 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)*, to appear.

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## Reviews and Expositions

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

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## 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.

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## Research Visits

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

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## Instructorships

### Northwestern University

- 2023/03 Single-Variable Integral Calculus

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## Minicourses

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

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## 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.

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## Professional Service

### Referee Service

Journals: J. Math. Pures Appl..

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## 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.

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## 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.  
2013–2014 **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.

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## Languages

Mandarin Chinese  
Japanese  
French  
Korean  
German

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