Ruoyu P. T. Wang

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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.

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 Early Career Researcher Travel Grant** (ECR-2324-25)

2024 **LMS Scheme 4 Research Grant** (42303)

Publications

[7] Weakly elliptic damping gives sharp decay
Submitted (from 2024/03), with Lassi Paunonen and Nicolas Vanspranghe.

Last updated: April 14, 2024.

[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, published online (2023), 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., published online (2024).

[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.

Reviews and Expositions

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

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, 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.

Instructorships
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: 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.
2013–2014	**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. |

Languages

Mandarin Chinese	Bilingual ■■■■■
Japanese	Fluent ■■■■□
French	Intermediate ■■□□□
Korean	Elementary ■□□□□
German	Elementary ■□□□□