Jingrui Niu

Curriculum Vitae

Institute for Advanced Study in Mathematics
Harbin Institute of Technology
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Positions

2026 – Now **Associate professor(tenure-track).**
Institute for Advanced Study in Mathematics, Harbin Institute of Technology.

2023 – 2025 **Post-doc.**
LJLL, Sorbonne Université & INRIA.
Mentor : *Ugo Boscain & Kévin Le Balc'h & Mario Sigalotti*

2021 – 2023 **Post-doc.**
LJLL, Sorbonne Université & CNRS. Mentor : *Oana Ivanovici*

Education

2017 – 2021 **PhD in Fundamental Mathematics.**
LMO, Université Paris-Saclay. Supervisors : *Nicolas Burq & Pierre Lissy*
-*Dissertation* : The Controllability of the Coupled Wave Systems

2016 – 2017 **M2 in Analysis, Modelization, Simulation**
Université Paris-Saclay, Supervisor : *Nicolas Burq*
– *Mémoire :* On the proof of the Strichartz estimates on the compact manifold

2014 – 2016 **Master student**
Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing. Supervisor : *Ping Zhang*

2010 – 2014 **Bachelor of Science in Pure and Applied Mathematics**
Nankai University, Tianjin.
-Enrolled in Nankai Bo-Ling Mathematics Class-2010

Research Interests

I am interested in various domains of partial differential equations and control theory,
— Control and stabilization on dispersive equations and their coupled systems ;
— Microlocal and semi-classical analysis ;

— Unique continuation.

List of publications

1. **Simultaneous Control of Wave Systems**
   J. Niu, *SIAM J. Control Optim.*, vol. 59, no. 3, pp. 2381–2409, 2021.
2. **Controllability of a coupled wave system with a single control and different speeds**
   P. Lissy and J. Niu, *J. Math. Pures Appl.*, vol. 205, Paper No. 103808, 55 pp, 2026.
3. **Controllability of quasi-linear Hamiltonian Schrödinger equations on tori**
   F. Iandoli and J. Niu, *J. Differential Equations*, vol. 390, pp. 125–170, 2024.
4. **Small-time local controllability of a KdV system for all critical lengths**
   J. Niu and S.Xiang, *Preprint*, 2025
5. **Observability and controllability for Schrödinger equations in the semi-periodic setting**
   J. Niu and Z. Zhao, *Preprint*, 2025.
6. **Geometric condition for the observability of electromagnetic Schrödinger operators on $\mathbb{T}^2$**
   K. Le Balc'h, J. Niu and C. Sun, *Preprint*, 2025.
7. **The periodic KdV with control on space-time measurable sets**
   J. Niu, M. Wang and S. Xiang, *Preprint*, 2025
8. **Symmetry for the wave equation on torus : sharp unique continuation and observability conditions for spacetime regions**
   J. Niu, M. Wang and S. Xiang, *Preprint*, 2025

Academic Activities

1. Séminaire Analyse Numérique et EDP "Contrôle du système des ondes couplées", Orsay, 16 May 2019.
2. Workshops on nonlinear fluids and PDEs, "Simultaneous Control of Wave Systems", Nanjing, 06-09, August 2019.
3. Invited talk, "Microlocal methods on the controllability of wave equations", Fudan University, Shanghai, 20 August 2019.
4. Conference "Control and dynamics of PDE", Strasbourg, 28-31 October 2019.
5. Workshop "Nonlinear Waves and Hamiltonian PDEs", La Thuile, February 20-26, 2022.
6. Invited talk, "Controllability of nonlinear Schrödinger equations on tori", Beijing Institut of Technology, Beijing, 19 August 2023.
7. ICIAM2023 Minisymposium "Control and stabilization of PDEs : recent advances and applications", "The controllability of a special class of coupled wave systems", Tokyo, 20-26 August 2023.
8. Séminaire McTAO, "Local controllability of nonlinear Schrödinger equations on tori", Inria Sophia Antipolis, 19 October 2023.
9. Equadiff 2024 Minisymposium "Nonlinear waves in dispersive equations", "Quantitative controllability and stability for KdV equations", Karlstad, 10-14 June 2024.
10. Invited talk, "Local controllability of nonlinear Schrödinger equations", Nanjing University, 2 August 2024.

11. PDE workshop, “Local controllability of nonlinear Schrödinger equations", Peking University, 30 August 2024.
12. Séminaires EDP, “Quantitative control of KdV equations", Laboratoire de Mathématiques de Besançon, 19 September 2024.
13. Invited talk, “Control of wave equations and coupled wave systems", Northwest University, Xi’an, 30 December 2024.
14. Online talk, “On the small-time controllability of KdV equations", Central South University, Changsha, 19 March 2025.
15. Online talk, “On the small-time controllability of KdV equations", Beijing Institute of Technology, Beijing, 28 April 2025.
16. Invited talk, “Geometric condition for the observability of the Schrödinger equations with magnetic potential on two-dimensional tori", Beijing Institute of Technology, Beijing, 16 August 2025
17. CAGE seminar, “Geometric condition for the observability of the Schrödinger equations with magnetic potential on two-dimensional tori", LJLL, 16 September 2025.

Teaching

2020-2021 **TD Geometry and Differential Equations,** Université Paris Dauphine - PSL, Master 1 Mathématiques approfondies