

Zane Kun Li

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Citizenship: USA

Education

- Ph.D., Mathematics, June 2019, University of California, Los Angeles
 - Advisor: Terence Tao
 - Thesis: Decoupling for the parabola and connections to efficient congruencing
- A.B. magna cum laude, Mathematics, June 2013, Princeton University
 - Senior Thesis Advisor: Christopher Skinner
 - Thesis: Rank 1 quadratic twists of elliptic curves and 3-Selmer groups

Positions

- Assistant Professor, Department of Mathematics, North Carolina State University
 - 8/16/2023-Present
- NSF RTG Postdoctoral Fellow, Department of Mathematics, University of Wisconsin-Madison
 - 8/1/2022-8/15/2023
 - Mentors: Andreas Seeger and Shaoming Guo
- NSF Mathematical Sciences Postdoctoral Research Fellow and Zorn Postdoctoral Fellow, Department of Mathematics, Indiana University Bloomington
 - 8/1/2019-7/31/2022
 - Mentor: Ciprian Demeter

Visiting Positions

- Visiting Scholar, SMRI International Visitor Program, School of Mathematics & Statistics, University of Sydney
 - 5/12/2024-6/22/2024

Fellowships and Grants

- 2025-2030, Simons Foundation, Travel Support for Mathematicians SFI-MPS-TSM-00013946, PI, USD 37635.
- 2025-2028, National Science Foundation, DMS-2453448 award, PI, USD 226465.
- 2022-2026, National Science Foundation, DMS-2409803 (formerly DMS-2154531 and DMS-2311174), PI, USD 102063.
- 2019-2022 NSF Mathematical Sciences Postdoctoral Research Fellowship, DMS-1902763, USD 150000.
- 2018 UCLA Girsky Fellowship Award, USD 10500.

- 2013-2018 NSF Graduate Research Fellowship, USD 90000.

Publications

1. (with Po-Lam Yung) An improved high-low method for the parabola, arXiv:2609.33949, 24 pages.
2. (with Christopher Boyer) An improved example for an autoconvolution inequality, arXiv:2506.16750, 8 pages, to appear in **Experimental Mathematics**.
3. (with Anthony Carbery, Yixuan Pang, and Po-Lam Yung) A weighted formulation of refined decoupling, and inequalities of Mizohata–Takeuchi-type for the moment curve, **Journal of Geometric Analysis** 36 (2026), article no. 48, 60 pages.
4. (with Jianhui Li and Po-Lam Yung) Strichartz inequalities: some recent developments, arXiv:2310.15306, 23 pages, to appear in the memorial volume dedicated to Robert Strichartz.
5. (with Shival Dasu, Hongki Jung, and José Madrid) Mixed norm l^2 decoupling for paraboloids, **International Mathematics Research Notices** (2023), no. 20, 17972–18000.
6. An introduction to decoupling and harmonic analysis over $\mathbb{Q}_p$, **Contemporary Mathematics** 792 (2024), 67–94.
7. (with Brian Cook, Kevin Hughes, Akshat Mudgal, Olivier Robert, and Po-Lam Yung) A decoupling interpretation of an old argument for Vinogradov’s Mean Value Theorem, **Mathematika** 70 (2024), no. 1, e12231.
8. (with Shaoming Guo and Po-Lam Yung) Improved discrete restriction for the parabola, **Mathematical Research Letters** 30 (2023), no. 5, 1375–1409.
9. (with Alan Chang, Jaume de Dios Pont, Rachel Greenfeld, Asgar Jamneshan, and José Madrid) Decoupling for fractal subsets of the parabola, **Mathematische Zeitschrift** 301 (2022), 1851–1879.
10. (with Shaoming Guo, Po-Lam Yung, and Pavel Zorin-Kranich) A short proof of l^2 decoupling for the moment curve, **American Journal of Mathematics** 143 (2021), no. 6, 1983–1998.
11. (with Shaoming Guo and Po-Lam Yung) A bilinear proof of decoupling for the cubic moment curve, **Transactions of the American Mathematical Society** 374 (2021), no. 8, 5405–5432.
12. An l^2 decoupling interpretation of efficient congruencing: the parabola, **Revista Matemática Iberoamericana** 37 (2021), no. 5, 1761–1802.
13. Effective l^2 decoupling for the parabola (appendix by Jean Bourgain and Zane Kun Li), **Mathematika** 66 (2020), no. 3, 681–712.
14. Quadratic twists of elliptic curves with 3-Selmer rank 1, **International Journal of Number Theory** 10 (2014), no. 5, 1191–1217.
15. (with David Corwin, Tony Feng, and Sarah Trebat-Leder) Elliptic curves with full 2-torsion and maximal adelic Galois representations, **Mathematics of Computation** 83 (2014), no. 290, 2925–2951.
16. (with Alexander W. Walker) Arithmetic properties of Picard–Fuchs equations and holonomic recurrences, **Journal of Number Theory** 133 (2013), no. 8, 2770–2793.
17. A normal form for cubic surfaces, **International Journal of Algebra** 4 (2010), no. 5, 233–239.

18. On a special case of the intersection of quadric and cubic surfaces, **Journal of Pure and Applied Algebra** 214 (2010), no. 11, 2078–2086.
19. (with Stephen P. Humphries) Counting powers of words in monoids, **European Journal of Combinatorics** 30 (2009), no. 5, 1297–1308.

Invited Research Seminar/Colloquium Talks

2026	Nov 11	University of British Columbia, part of Fractal Geometry and Incidence Problems in Harmonic Analysis lecture series (1.5 hour talk)
	Sep 29	Kennesaw State University, Discrete Math Seminar
	Sep 18	University of Rochester, Analysis Seminar
	Jun 22	National Taiwan Normal University, Nonlinear Analysis Seminar
	Jun 5	research seminar talk at Southern University of Science and Technology
	Jun 1	Monash University, Analysis, PDE and Geometry Seminar
	May 28	Australian National University, PDE and Analysis Seminar
	Apr 24	Virginia Tech, Analysis and Mathematical Physics Seminar
	Apr 8	University of Kansas, Differential Equations, Dynamical Systems, and Geometric Analysis Seminar (virtual)
	Jan 20	Seoul National University, Analysis Seminar
2025	Oct 31	University of South Carolina, Quantum Information and Analysis Seminar
	May 2	University of Rochester, Combinatorics Seminar
	Apr 28	University of Mississippi, Number Theory Seminar
	Apr 1	National Taiwan Normal University, Nonlinear Analysis Seminar (virtual)
	Feb 7	Auburn University, Seminar on Analysis and Stochastic Analysis
2024	Dec 13	National Center for Theoretical Sciences (National Taiwan University), Nonlinear PDE and Analysis Seminar
	Jun 21	Monash University, Analysis Seminar
	Jun 10	Australian National University, PDE and Analysis Seminar
	May 21	University of New South Wales, Pure Mathematics Seminar
	May 7	UCLA, Analysis Seminar
	Apr 24	Virginia Tech, Analysis and Mathematical Physics Seminar
	Mar 27	University of North Carolina at Chapel Hill, Analysis Seminar
	Jan 17	North Carolina State University, Differential Equations and Nonlinear Analysis Seminar
2023	Oct 16	Washington University of St. Louis, Analysis Seminar
	Oct 10	Duke University, Applied Math and Analysis Seminar
	Jul 27	Australian National University, Colloquium
	Jul 12	University of New South Wales, Number Theory Seminar
	Feb 7	University of California, Santa Cruz, Colloquium

2022	Nov 28	University of Georgia, Colloquium
	Nov 17	North Carolina State University, Colloquium
	Sep 13	University of Wisconsin-Madison, Analysis Seminar
	May 17	University of California, Riverside, Colloquium
	Mar 23	Virtual Harmonic Analysis Seminar (virtual)
	Mar 15	Australian National University, Analysis Seminar (virtual)
	Feb 21	Caltech, Discrete Analysis Seminar
	Feb 14	UCLA, Analysis Seminar
	Jan 25	Caltech, Discrete Analysis Seminar (virtual)
2021	Nov 25	Shandong University, Number Theory Seminar (virtual)
	Oct 6	University of Kansas, Analysis Seminar (virtual)
	Apr 13	MIT, PDE/Analysis Seminar (virtual)
	Mar 24	Indiana University Bloomington, Analysis Seminar (virtual)
2020	Dec 5	Chinese Webinar on Analysis and PDE (virtual)
	Feb 21	Caltech, UCLA/Caltech Joint Analysis Seminar
	Feb 17	University of Chicago, Calderón-Zygmund Analysis Seminar
	Feb 11	University of Wisconsin-Madison, Analysis Seminar
	Jan 15	Indiana University Bloomington, Analysis Seminar
2019	Nov 5	University of Illinois Urbana-Champaign, Harmonic Analysis and Differential Equations Seminar
	Oct 15	University of Rochester, Combinatorics Seminar
	Oct 2	Purdue University, Analytic Number Theory and Harmonic Analysis Seminar
	Feb 1	University of California, Davis, PDE and Applied Math Seminar
	Jan 21	University of British Columbia, Harmonic Analysis Seminar
2018	Dec 17	Chinese University of Hong Kong, Departmental Seminar
	Dec 13	Chinese University of Hong Kong, Departmental Seminar
	Dec 4	University of Bristol, Analysis and Geometry Seminar
	May 30	Caltech, Analysis Seminar
	May 29	UCLA, Analysis Participating Seminar

Conference Talks

2026	Oct 3	AMS Fall Eastern Sectional Meeting: Special Session on Harmonic Analysis and PDEs, George Washington University
	Jul 19	Philadelphia Harmonic Analysis and Differential Equations (an official satellite conference for 2026 ICM), University of Pennsylvania
	Jun 15	The Tenth Pacific Rim Conference in Mathematics, Academia Sinica (Taiwan)
	Feb 20	Harmonic Analysis and its Interactions @ Nagoya 2026, Nagoya University

2025	Mar 11	The 16th Nagoya Workshop on Differential Equations, Nagoya University
	Feb 21	4th Harmonic Analysis Workshop in Seoul, Seoul National University (virtual)
2024	May 29	Workshop on Harmonic Analytic Connections, Mathematical Research Institute (MATRIX)
	Apr 6	AMS Spring Eastern Sectional Meeting: Special Session on Harmonic Analysis and their Applications to PDE, Howard University
	Mar 7	Pittsburgh Links among Analysis and Number Theory, University of Pittsburgh
2023	Apr 15	AMS Spring Central Sectional Meeting: Special Session on Geometric Measure Theory and Harmonic Analysis, University of Cincinnati
	Mar 25	Harmonic Analysis and Fractal Sets 2023, Ohio State University
	Mar 18	AMS Spring Southeastern Sectional Meeting: Special Session on Harmonic Analysis, Georgia Tech.
2022	Jun 23	Fourier Analysis @ 200: Young Researchers Symposium, International Centre for Mathematical Sciences (University of Edinburgh)
	Mar 26	AMS Spring Central Sectional: Special Session on Harmonic Analysis (virtual)
2021	Nov 5	The 17th Prairie Analysis Seminar, Kansas State University (virtual)
	Aug	Trimester Program on Harmonic Analysis and Analytic Number Theory, Hausdorff Research Institute for Mathematics (University of Bonn) (prerecorded talk with discussion on Aug 13)
	Mar	Fourier Restriction Online 2021 (prerecorded talk with discussions on March 3-4 and 11-13)
	Feb 16	Workshop on Arithmetic Statistics, Discrete Restriction and Fourier Analysis, American Institute of Mathematics (virtual)
2020	Dec 5	Canadian Mathematical Society Winter Meeting: Session on Discrete Analysis (virtual)
	Aug 10	The Eighth Pacific Rim Conference in Mathematics, UC Berkeley (virtual)
2019	Sep 14	AMS Fall Central Sectional Meeting: Special Session on Recent Developments in Harmonic Analysis, University of Wisconsin-Madison
	Jun 17	Heilbronn Focused Research Workshop on Efficient Congruencing and Decoupling, Heilbronn Institute for Mathematical Research (University of Bristol)
	Jan 18	Joint Mathematics Meetings, AMS Special Session on Counting Methods in Number Theory, Baltimore, MD
	Jan 17	Joint Mathematics Meetings, AMS Special Session on Harmonic Analysis: Recent Developments on Oscillatory Integrals (a Mathematics Research Communities Session), Baltimore, MD

Invited Lecture Series

2026	Aug 10-14	9.5-hour lecture series for the 2026 Nanjing University Harmonic Analysis Summer School, Nanjing University
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2025	Mar 24-28	4-hour lecture series for RTG2491 Spring School on Decoupling and More, University of Göttingen
2022	Apr 20, 27 May 4, 11, 25	10-hour lectures series at the National Center for Theoretical Sciences (National Taiwan University), first 4 were in person, last one was virtual, lectures were 2 hours each
2020	Oct 27 Nov 3, 10, 17	4-hour lecture series in the (virtual) Discrete Analysis Working Group, lectures were 1 hour each (virtual)

Poster Presentations

2024	Jun 25	Harmonic Analysis and Differential Equations: In Honour of Professor Jill Pipher, Macquarie University
2013	Jan 11	Joint Mathematics Meetings, Undergraduate Student Poster Session, San Diego, CA

Expository Talks

2025	Sep 12	Flash Talks Seminar, North Carolina State University
	Aug 18, 25	Putnam Seminar (2 lectures on number theory), North Carolina State University
	Mar 19	SUM Series Seminar, North Carolina State University
2024	Oct 28	Putnam Seminar (2 lectures on number theory), North Carolina State University
	Nov 4	
	Feb 21	First Year Research Seminar, North Carolina State University
2023	Sep 13	College of Sciences Excellence Symposium, North Carolina State University
2020	Sep 9	Undergraduate Math Club, Indiana University Bloomington (virtual)
2018	Oct 4	Math Graduate Student Organization Seminar, UCLA: Vinogradov's Mean Value Theorem
2017	Oct 2	Hausdorff Center for Mathematics Summer School on Decoupling and Polynomial Methods in Analysis, Kopp, Germany
2016	Oct 18, 25	Analysis Participating Seminar, UCLA: the l^2 decoupling theorem (two talks)
	Sep 29	Math Graduate Student Organization Seminar, UCLA: the Kakeya conjecture
	Jun 6	Analysis Participating Seminar, UCLA: critical NLS on tori (two talks on the same day)
2015	May 26	Analysis Participating Seminar, UCLA: the least quadratic non-residue (two talks)
	Jun 2	
	May 22, 28	Analytic Number Theory Participating Seminar, UCLA: the GPY argument and Zhang's equidistribution theorem (two talks)
	Apr 16	Math Graduate Student Organization Seminar, UCLA: Dirichlet's theorem on arithmetic progressions
	Apr 7, 9	Analytic Number Theory Participating Seminar, UCLA: the linear sieve and Chen's theorem (two talks)

2014 Apr 14 Applied Mathematics Participating Seminar on Fluid Dynamics, UCLA: an introduction to vortex dynamics for incompressible fluid flows

Selected Workshop and Semester Program Participation

1. 2027 February 7 to March 5: Frontiers in harmonic analysis, elliptic and parabolic PDEs, and geometric measure theory, Isaac Newton Institute for Mathematical Sciences, (University of Cambridge)
2. 2025 July 13 to July 18: Oberwolfach Workshop on Real Analysis, Harmonic Analysis, and Applications
3. 2023 June 4 to June 9: Oberwolfach Workshop on Incidence Problems in Harmonic Analysis, Geometric Measure Theory, and Ergodic Theory
4. 2021 June 20 to July 10: Trimester Program on Harmonic Analysis and Analytic Number Theory, Hausdorff Research Institute for Mathematics (University of Bonn)

Undergraduate and Graduate Mentoring

Fall 2026-Present: HaoYun Yao and Alina Zhu, two PhD students from Duke University

- Reading course on Fourier decoupling and its applications

Fall 2025-Spring 2026: Hiroto Tanaka, undergraduate advisee

- Reading course on “Analytic Number Theory for Beginners”, 2nd Edition by Pongsriam

Fall 2024-Spring 2026: Christopher Boyer, undergraduate advisee

- Research projects on computational examples for autoconvolution and autocorrelation inequalities, Hausdorff-Young on hypercubes
- Resulted in 1 paper: “An improved example for an autoconvolution inequality”, arXiv:2506.16750 that improves upon a result by Google DeepMind’s AlphaEvolve and appeared in Experimental Mathematics

Summer 2025: Mentored a group of 3 graduate students and 1 postdoc on a project on the Mizohata-Takeuchi Conjecture as part of the Reading Groups in Analysis and Research Groups in Analysis workshops

- Graduate students: Kaiwen Jin (University of Wisconsin-Madison), Amy Tierney (University of Birmingham), Zhexiong Zhang (Johns Hopkins University)
- Postdoc: Alexander Ortiz (Rice University)

Spring 2025: Jacob Gordan, PhD research advisee

- Reading course on Terence Tao’s Fall 2006 Math 247A harmonic analysis course notes

Spring 2025: Coleman Hines, undergraduate advisee

- Reading course on “Harmonic Analysis-From Fourier to Wavelets” by Pereyra and Ward

Graduate PhD Thesis Committee Membership

Andrew Murdza	Spring 2024-Spring 2025
Julien Mayrand	Spring 2026-
Alina Zhu (Duke University)	Spring 2027-

Departmental Committee Membership

Committee	Academic Years
Graduate Admissions	2025-2026, 2026-2027
Graduate Recruitment	2024-2025, 2026-2027
International Programs	2024-2025, 2025-2026
Mathematics Distinguished Lecture Series	2024-2025, 2025-2026
Tenure Track Search Committee	2025-2026
Undergraduate Math Competitions	2024-2025, 2025-2026, 2026-2027

Organizational Duties

Conferences and Summer Schools:

1. 2026 December 16-18, NTNU/NCTS Conference in Harmonic Analysis, National Center for Theoretical Sciences (National Taiwan University)
2. 2025 August 31-September 5, Hausdorff Center for Mathematics Summer School on Discrete Directions in Harmonic Analysis, Kopp, Germany
3. 2025 March 29-30, AMS Spring Central Sectional Meeting: Special Session on Recent Trends in Harmonic Analysis and PDE, University of Kansas
4. 2024 December 16-19, NCTS Workshop on Harmonic Analysis, National Center for Theoretical Sciences (National Taiwan University)

Colloquiums and Seminars:

1. American Institute of Mathematics (AIM) Research Community on Fourier Restriction and Related Problems, Fall 2024-Present.
2. Stochastics/Discrete Analysis Seminar, North Carolina State University, Fall 2024-Present.
3. Online Analysis Research Seminar (OARS), Fall 2020-Present.
4. Colloquium/Koh Lectures, North Carolina State University, Fall 2024-Spring 2026.
5. Colloquium, Indiana University Bloomington, Fall 2020.

Outreach Activities

1. 2025 August 12, moderated a career/academic life panel discussion as part of Research Groups in Analysis
2. 2025 August 6, participated in a career/academic life panel discussion as part of Reading Groups in Analysis
3. Evaluator for Regeneron Science Talent Search (a national high school research competition), November 2023 and November 2024.

4. Undergraduate Math Club Faculty Mentor, Indiana University Bloomington, Fall 2021-Spring 2022.
5. 2021 March 17, Spoke at the IU Math Graduate Students Dinner Seminar and chatted with students about graduate student life and finding postdoc positions
6. 2020 July 29, Research Symposium Oral Presentation Evaluator, Research Science Institute (a prestigious high school summer research program at MIT)
7. 2017 August 25, Organizer for Math Graduate Student Organization workshop on applying for the NSF-GRFP, UCLA
8. 2014 November 18, Panelist for discussion on applying to math graduate school, UCLA Undergraduate Math Students Association

Editorial/Reviewer Duties

1. Editor for AMS Contemporary Mathematics volume 792 based on an AMS Special Session on Harmonic Analysis held in March 2022.
2. Reviewed textbooks for publication in Springer Nature and Birkhäuser
3. Served on NSF grant panel in March 2026.
4. Journal Referee for: AIMS Mathematics, Analysis & PDE, Essential Number Theory, Geometric and Functional Analysis (GAFA), International Mathematics Research Notices (IMRN), Journal d'Analyse Mathématique, Journal of Fourier Analysis and Applications, Journal of Functional Analysis, Mathematische Zeitschrift, Mathematische Annalen, Pacific Journal of Mathematics, Proceedings of the Edinburgh Mathematical Society, Revista Matemática Iberoamericana
5. Quick Opinion for: Analysis & PDE, Pacific Journal of Mathematics, Mathematische Annalen, New York Journal of Mathematics, Revista Matemática Iberoamericana
6. AMS Mathematical Reviews Reviewer, 2021-2025.

(last updated October 14, 2026)