

LIKUN XIE

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RESEARCH INTEREST

Number Theory

EDUCATION

Postdoctoral Fellow, Max Planck Institute for Mathematics	<i>July 2025 – present</i>
University of Illinois Urbana-Champaign	<i>2020-2025</i>
Ph.D. in Mathematics	
Advisors: Prof. Alexandru Zaharescu, Prof. Bruce Berndt	
University of Warwick, UK	<i>2018-2019</i>
M.Sc. in Mathematics, Distinction	
Dissertation “Descent, Affine Representability and Classifying Space in \mathbb{A}_1 -Homotopy Theory”; Advisor: Prof. Marco Schlichting	
University of Manchester, UK	<i>2016-2018</i>
B.Sc.(Hons) in Mathematics and Physics, First Class	
Dissertation “Topos Foundation for Set Theory”; Advisor: Prof. Michael Prest	

PAPERS AND PREPRINTS

1. Xie, L. (2025). On a Conjecture of Erdős over Function Fields (submitted). [arXiv:2510.17612](https://arxiv.org/abs/2510.17612)
2. Xie, L. (2025). Almost Prime Orders of Elliptic Curves modulo Prime Powers (submitted). [arXiv:2504.18732](https://arxiv.org/abs/2504.18732)
3. Nath, K., Xie, L. (2024). Almost primes and primes of the form $p = 1 + m^2 + n^2$ (To appear in *Acta Arithmetica*). [arXiv:2501.16723](https://arxiv.org/abs/2501.16723)
4. Berndt, B. C., Xie, L. (2024). Identities for the product of Two Dirichlet Series Satisfying Hecke’s Functional Equation. *Journal of Mathematical Analysis and Applications*, 550(1), 129514.
5. Xie, L. (2024). On Primes p Such That $p - b$ Has Large Prime Power Factor and Few Other Divisors. [arXiv:2410.14133](https://arxiv.org/abs/2410.14133) (submitted).
6. Xie, L. (2024). Negative Real Moments of Restricted Factors in Arithmetic Progression. *The Ramanujan Journal*, 67(41).
7. Xie, L. (2024). On an Instance of the Small Cohen-Macaulay Conjecture. *Journal of Pure and Applied Algebra*, 228(3), 107491.
8. Berndt, B. C., Xie, L., & Zaharescu, A. (2023). Proofs of McIntosh’s Conjecture on Franel Integrals and Two Generalizations. *Advances in Mathematics*, 423, 109041.

TALKS AND PRESENTATIONS

1. Almost Prime Orders of Elliptic Curves Modulo Prime Powers, ÖMG-DMV Annual Meeting 2025, Linz, Austria, September 2025 (Number Theory Section).
2. On a Conjecture of Erdős over Function Fields, Number Theory Seminar, University of Cologne, December 2025.

GRANTS AND AWARDS

Dr. Lois M. Lackner Mathematics Fellowship, University of Illinois at Urbana-Champaign, Academic Year 2023-2025

TEACHING EXPERIENCES

- **Mentor for MPIM Internship Program**

September 2025

Guided talented high school and undergraduate interns at the Max Planck Institute for Mathematics in number theory projects related to sieve theory.

- **MATH 542: Complex Variables I, MATH 540: Real Analysis, MATH 518: Differentiable Manifolds I (Grader)**

Fall 2024

Graded weekly homework assignments.

- **MATH 112: Algebra (TA)**

Fall 2023

Taught weekly discussion sessions.

- **MATH 241: Calculus III (TA)**

Spring 2023

Taught weekly discussion sessions; graded weekly homework assignments.

- **MATH 502: Commutative Algebra, MATH 427: Honors Abstract Algebra (Grader)**

Fall 2022

Held office hours, answered students' questions; graded homework assignments.

- **MATH 417: Abstract Algebra I & II (Grader)**

Spring 2022

- **MATH 417: Abstract Algebra (Grader)**

Fall 2021

- **MATH 285: Intro to Differential Equations (Grader), MATH 220: Calculus (TA, online)**

Spring 2021

- **MATH 231: Calculus II (Grader)**

Fall 2020