LIKUN XIE

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RESEARCH INTEREST

Number Theory

EDUCATION

Postdoctoral Fellow, Max Planck Institute for Mathematics *July 2025 – present*

University of Illinois Urbana-Champaign *2020-2025*
Ph.D. in Mathematics
Advisors: Prof. Alexandru Zaharescu, Prof. Bruce Berndt

University of Warwick, UK *2018-2019*
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 *2016-2018*
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*

2. Xie, L. (2025). Almost Prime Orders of Elliptic Curves modulo Prime Powers (submitted). *arXiv: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*

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* (submitted).

6. Berndt, B. C., Bhat, R., Meyer, J. L., Xie, L., & Zaharescu, A. (2024). An arithmetic sum associated with the classical theta function. *Results in Mathematics*, 81, Article 25.

7. Xie, L. (2024). Negative Real Moments of Restricted Factors in Arithmetic Progression. *The Ramanujan Journal*, 67(41).

8. Xie, L. (2024). On an Instance of the Small Cohen-Macaulay Conjecture. *Journal of Pure and Applied Algebra*, 228(3), 107491.

9. 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