Junxian Li

CONTACT INFORMATION

University of California, Davis
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https://jligit.github.io/

RESEARCH INTERESTS

Analytic Number theory: L-functions, Primes, Exponential sums, Additive Combinatorics
Automorphic Forms, Harmonic analysis, Dynamical systems

EMPLOYMENT

Assistant Professor 2023–Now
University of California, Davis

Postdoctoral Researcher (Mentor: Valentin Blomer)
Universität Bonn 2021–2023
Max Planck Institute for Mathematics 2019–2021
Georg-August Universität Göttingen 2018–2019

EDUCATION

Ph.D. in Mathematics (Advisor: Alexandru Zaharescu) 2013–2018
University of Illinois at Urbana-Champaign

B. A. in Mathematics 2009–2013
Nanjing University

PUBLICATIONS

21. Simultaneous extreme values of zeta and L-functions (with W. Heap), arXiv:2306.07777, 37 pp.

20. Simultaneous large values and dependence of Dirichlet L-functions in the critical strip (with S. Inoue), arXiv:2211.15165, 23 pp.

19. Correlations of values of random diagonal forms (with V. Blomer), to appear in **Int. Math. Res. Not.**, arXiv:2211.02469, 28 pp.

18. Additive problems with almost prime squares (with V. Blomer, L. Grimmelt and S. Rydin Myerson), to appear in **Geom. Funct. Anal.**, arXiv:2111.01601, 50 pp.

17. Joint value distribution of L-functions on the critical line (with S. Inoue), arXiv:2102.12724, 50 pp.

16. Lower bounds for discrete negative moments of the Riemann zeta function (with W. Heap and J. Zhao), **Algebra Number Theory** *16* (2022), no. 7, 1589-1625.

15. Large values of Dirichlet L-functions at zeros of a class of L-functions, **Canad. J. Math.** *73* (2021), no. 6, 1459–1505.

14. Uniform Titchmarsh divisor problems (with E. Assing and V. Blomer), **Adv. Math.** *393* (2021), Paper No. 108076, 51 pp.

13. Leading Digits of Mersenne Numbers (with Z. Cai, M Faust, A. J. Hildebrand, and Y. Zhang), **Exp. Math.** *30* (2021), no. 3, 405–421.

12. The surprising accuracy of Benford's law in mathematics (with Z. Cai, M. Faust, A. J.

Hildebrand and Y. Zhang), **Amer. Math. Monthly** *127* (2020), no. 3, 217–237. (*winner of the* **Paul R. Halmos-Lester R. Ford Award**)

11. Ducci iterates and similar ordering on sets of visible points (with A. Tamazyan and A. Zaharescu), **Int. J. Number Theory** *16* (2020), no. 1, 1–28.

10. A binary quadratic Titchmarsh divisor problem **Acta Arithmetica** *192* (2020), no. 4, 341–361.

9. The final problem: an identity from Ramanujan's lost notebook (with B. Berndt and A. Zaharescu), **J. Lond. Math. Soc.** (2) *100* (2019), no. 2, 568–591.

8. Almost Beatty Partitions (with A. J. Hildebrand, X. Li, and Y. Xie), **J. Integer Seq.** *22* (2019), no. 4, Art. 19.4.6, 34 pp.

7. Value distribution of $L'(\rho)$ (with A. Zaharescu), **J. Math. Anal. Appl.** *480* (2019), no. 1, 123400, 24 pp.

6. A local Benford Law for a class of arithmetic sequences (with Z. Cai and A. J. Hildebrand), **Int. J. Number Theory** *15* (2019), no. 3, 613–638.

5. On distinct consecutive r-differences (with G. Shakan), **J. Number Theory** *199* (2019), 363–376.

4. Exact evaluation of second moments associated with some families of curves over a finite field (with R. Donepudi and A. Zaharescu), **Finite Fields Appl.** *48* (2017), 331–355.

3. A lower bound for the least prime in an arithmetic progression (with K. Pratt and G. Shakan), **Q. J. Math.** *68* (2017), no. 3, 729–758.

2. Smooth L^2 distances and zeros of approximations of Dedekind zeta functions (with M. Nastasescu, A. Roy, and A. Zaharescu), **Manuscripta Math.** *154* (2017), no. 1-2, 195–223.

1. Zeros of a family of approximations of Hecke L-functions associated with cusp forms (with A. Roy and A. Zaharescu), **Ramanujan J.** *41* (2016), no. 1-3, 391–419.

Conference Proceedings

2. The Final Problem: A Series Identity from the Lost Notebook (with B. C. Bruce and A. Zaharescu), *George E. Andrews 80 Years of Combinatory Analysis*, K. Alladi, B. C. Berndt, P. Paule, J. Sellers, and A. J. Yee, eds., Birkhäuser, 783–790, 2021.

1. On primes in arithmetic progressions Automorphic forms and related topics, 165–167, *Contemp. Math.* 732, Amer. Math. Soc., Providence, RI, 2019.

Honors and Awards

- **The Paul R. Halmos-Lester R. Ford Award** 2021
  for outstanding expository papers in The American Mathematical Monthly
- **Bateman Fellowship** 2018
  for excellence in Number Theory
- **On the List of Teachers Ranked as Excellent by their Students** Fall 2017

Teaching

- **Graduate Courses and Seminars**
  - Topic course: Sieve Methods, Instructor Bonn, 2022
  - Number Theory Learning Seminar Göttingen, 2018-2019
- **Undergraduate Courses**

- Math 415 Linear Algebra, Instructor — UIUC, 2017
- Math 231 Calculus II, Instructor — UIUC, 2016
- Math 241 Calculus III, Instructor — UIUC, 2016–2015

Student Mentoring

- **Master thesis supervision**
  - Ivan Chan Kai Chin (Universität Bonn) — 2022-
- **Undergraduate Student Mentoring in Illinois Geometry Lab (10 projects)**
  - Almost Beatty Partitions; Beatty sequences, and Partitions of the Integers — 2018
  - Chaotic maps and exotic number systems — Fall 2017
  - Finding integers in group orbits — Spring 2017
  - Local Benford's Law; Leading digit distribution — 2016
  - Fractals, Patterns and Randomness in Number Theory — 2015
  - Fourier Series with Number theoretic coefficients — Fall 2014
  - Symmetry in Nature — Spring 2014

Professional Services

- **Organizer of a workshop at Universität Bonn** — 2022
  - Young Scholars in the Analytic Theory of Numbers and Automorphic Forms
- **Organizer of AMS Special Session at the Joint Mathematics Meeting** — 2019
  - Number Theoretic Methods in Hyperbolic Geometry
- **Organizer of Graduate Student Number Theory Seminar in UIUC** — 2016–2018

Invited Seminar Talks and Conferences

- **Correlations of random quadratic forms**
  - Antha-PDE, University of Warwick — July 2023
- **Two dimensional Kloosterman's refinement of the circle method**
  - Number Theory Seminar, Lille — Sept 2022
  - Oberseminar Analytic Number Theory and Automorphic Forms, Bonn — Apr 2022
- **Hardy-Littlewood problems with almost primes**
  - Analytic Number Theory Meetings, IHP. — Sept 2022
  - Number Theory Days, HKU (online). — July 2022
  - Workshop in Number theory and Harmonic Analysis, SDU (online). — July 2022
  - Number Theory Seminar, UIUC (online). — Mar 2022
  - Heilbronn Number Theory Seminar, Bristol (online). — Jan 2022
  - Number Theory Seminar, XJTU (online). — Dec 2021
- **Simultaneous large values of Dirichlet L-functions in the critical strip**
  - Oberseminar Analytic Number Theory and Automorphic Forms, Bonn. — Oct 2021
- **Joint Value distribution of L-functions**
  - Number Theory Seminar, PIMS Collaborative Research Group (online). — Sept 2022
  - Qilu Youth Forum, SDU (online). — Sept 2021
  - Number theory lunch seminar, MPIM (online). — Sept 2021
- **Uniform Titchmarsh Divisor Problems**
  - ArStAFANT Workshop, EPF Lausanne. — June 2023
  - Séminaire ADA, Calais. — Sept 2022
  - Number theory Seminar, SDU (online). — May 2021
  - PIMS-Lethbridge Number Theory Seminar, Lethbridge (online). — Mar 2021
  - Japan Europe Number Theory Exchange Seminar. — Jan 2021
- **Joint Value Distribution of L-functions.**
  - Oberseminar Analytic Number Theory, Bonn (online). — Nov 2020
- **Derivative of the Riemann zeta function at its zeros.**
  - Analytic Number Theory Meeting, IHP (online). — June 2020
- **Extreme values of L-functions**
  - Number theory lunch seminar, MPIM. — Oct 2019
  - Oberseminar number theory, Georg-August Universität Göttingen. — Nov 2018
- **The Unreasonable Effectiveness of Benford's Law in Mathematics**

– Joint with A. J. Hildebrand, Number Theory Seminar, UIUC. Apr 2018

- **Primes in arithmetic progressions**
  – Junior Mathematics Colloquium, Georg-August Universität Göttingen. Dec 2017
- **Randomness in Number Theory**
  – Graduate Student Colloquium, UIUC. Nov 2017
- **Primes in arithmetic progressions**
  – Where Geometry meets Number Theory, a conference in honor of the 60th birthday of Per Salberger, Gothenburg. July 2017
- **The least prime in an arithmetic progression**
  – Joint Mathematics Meeting, Atlanta. Jan 2017
  – Number Theory Seminar, UIUC. Sept 2016
  – Workshop on Automorphic Forms and Related Topics, Sarajevo . Jul 2016
- **Approximations of L-functions**
  – Midwest Number Theory Conference for Graduate Students and Recent Ph.D's. Oct 2015
  – Graduate Student Number Theory Seminar, UIUC. Nov 2015
- **Bailey Pairs and Bailey chains**
  – q-series Seminar, UIUC. Apr 2015
- **Basic Hypergoemetric functions**
  – q-series Seminar, UIUC. Mar 2015

Conferences and Summer schools

- RHB70: Analytic Number Theory and Its Interfaces, Oxford July 2023
- Women and Mathematics, IAS May 2023
- Analytic Number Theory Workshop, Oberwolfach Nov 2022
- 50 years of Number Theory and Random Matrix Theory, IAS June 2022
- Harmonic Analysis and Number Theory, ETH Mar 2022
- Zeta functions, CIRM Dec 2019
- Second Symposium on Analytic Number Theory, Cetraro July 2019
- Rational points on irrational varieties, IHP June 2019
- L-functions and Multiplicative Number Theory, U of Mississippi May 2019
- Distribution of values of zeta functions and L-functions, RIKEN Mar 2019
- Workshop and Winter School on Local Statistics of Point Sequences, Linz Feb 2019
- Building Bridges: 4th EU/US Summer School and Workshop on Automorphic Forms and Related Topics July 2018
- Hausdorff School: L-functions: Open Problems and Current Methods June 2018
- MRC: Number Theoretic Methods in Hyperbolic Geometry June 2018
- Probability in Number Theory May 2018
- Arbeitsgemeinschaft in Oberwolfach Oct 2017
- MSRI Summer Graduate School on Automorphic Forms and the Langlands Program Aug 2017
- PCMI Graduate Summer School on random matrices June 2017
- University of Houston Summer School on Dynamical Systems May 2017
- MSRI: Analytic Number Theory Jan, May 2017
- West Coast Algebraic Topology Summer School Aug 2016
- Building Bridges: 3rd EU/US Summer School and workshop on Automorphic Forms July 2016
- UNCG Summer School in Computational Number Theory June 2016
- Houston Summer School on Dynamical Systems May 2016
- UNCG Summer School in Computational Number Theory May 2015
- Exchange in University of Wisconsin-Madison Fall 2012

Outreach Activities

- Four Color Fest Nov 1-4 2017
- A Math Carnival at Illinois-Gathering for Gardener Jan 28 2017

- Science at the Market Aug 2013

Skills

Programming: C++, Mathematica, Matlab, Python
Languages: Chinese, English