## Junxian Li


**Contact Information**

Max Planck Institute for Mathematics
Vivatsgasse 7, 53111 Bonn
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https://jligit.github.io/


**Research Interests**

$L$-functions, Primes, Exponential sums, Additive Combinatorics
Automorphic Forms

**Employment**

Max Planck Institute for Mathematics — Sept 2019–
Mentors: Valentin Blomer and Pieter Moree

Georg-August Universität Göttingen — Sept 2018–Aug 2019
Mentors: Valentin Blomer and Harald Helfgott

**Education**

University of Illinois at Urbana-Champaign — Sept 2013–Aug 2018
Ph.D. in Mathematics
Advisor: Alexandru Zaharescu

Nanjing University — Sept 2009–Aug 2013
B. A. in Mathematics

**Publications**

1. Zeros of a family of approximations of Hecke $L$-functions associated with cusp forms (with A. Roy and A. Zaharescu), *Ramanujan J.* 41(1-3): 391–419, 2016.

2. Smooth $L^2$ distances and zeros of approximations of Dedekind zeta functions (with M. Nastasescu, A. Roy, and A. Zaharescu), *Manuscripta Math.* 154(1-2): 195–223, 2017.

3. A lower bound for the least prime in an arithmetic progression (with K. Pratt and G. Shakan), *Q. J. Math.*, 68(3): 729–758, 2017.

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: 331–355, 2017.

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

6. A local Benford Law for a class of arithmetic sequences (with Z. Cai and A. J. Hildebrand), *Int. J. Number Theory* 15(3): 613–638, 2019.

7. Value distribution of $L'(\rho)$ (with A. Zaharescu), *J. Math. Anal. Appl.* 480(1): 123400, 24 pp, 2019.

8. Leading Digits of Mersenne Numbers (with Z. Cai, M Faust, A. J. Hildebrand, and Y. Zhang), *Exp. Math.* 1-17, 2019.

9. Almost Beatty Partitions (with A. J. Hildebrand, X. Li, and Y. Xie), *J. Integer Seq.* 22(4): Art. 19.4.6, 34 pp, 2019.

10. The final problem: an identity from Ramanujan's lost notebook (with B. Berndt and A.

Zaharescu), *J. Lond. Math. Soc.* 100(2): 568–591, 2019.

11. A binary quadratic Titchmarsh divisor problem *Acta Arithmetica* 192(4): 341–361, 2020.

12. Ducci iterates and similar ordering on sets of visible points (with A. Tamazyan and A. Zaharescu), *Int. J. Number Theory* 16(1): 1–28, 2020.

13. The surprising accuracy of Benford's law in mathematics (with Z. Cai, M. Faust, A. J. Hildebrand and Y. Zhang), *Amer. Math. Monthly* 127(3): 217–237, 2020.

14. Large values of Dirichlet $L$-functions at zeros of a class of $L$-functions *Canad. J. Math.* to appear.

15. Lower bounds for discrete negative moments of the Riemann zeta function (with W. Heap and J. Zhao), arXiv:2003.09368.

16. Uniform Titchmarsh divisor problems (with E. Assing and V. Blomer), arXiv:2005.13915.

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

## Conference Proceedings

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

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.

## Honors and Awards

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|---|---|
| Bateman Fellowship in Number Theory | Spring 2018 |
| On the List of Teachers Ranked as Excellent by their Students | Fall 2017 |

## Teaching Experience

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| Math 415 Linear Algebra, Instructor | UIUC, Fall 2017 |
| Math 415 Linear Algebra, Instructor | UIUC, Spring 2017 |
| Math 231 Calculus II, Instructor | UIUC, Spring 2016 |
| Math 241 Calculus III, Instructor | UIUC, Fall 2016 |
| Math 241 Calculus III, Instructor | UIUC, Spring 2015 |

## Undergraduate Mentoring

❑ Illinois Geometry Lab Graduate Student Mentor

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|---|---|
| • Almost Beatty Partitions | Fall 2018 |
| • Beatty sequences, and Partitions of the Integers | Spring 2018 |
| • Chaotic maps and exotic number systems | Fall 2017 |
| • Finding integers in group orbits | Spring 2017 |
| • Local Benford's Law | Fall 2016 |
| • Leading digit distribution | Spring 2016 |
| • Random Walk in number theory | Fall 2015 |
| • Fractals, Patterns and Randomness in Number Theory | Spring 2015 |
| • Fourier Series with Number theoretic coefficients | Fall 2014 |
| • Symmetry in Nature | Spring 2014 |

## Professional Services

❑ Organizer of AMS Special Session at the Joint Mathematics Metting 2019
- Number Theoretic Methods in Hyperbolic Geometry

❑ Organizer of Graduate Student Number Theory Seminar in UIUC 2016–2018

❑ Referee:

- J. Number Theory
- Math. Reports
- Rev. Roumaine Math. Pures Appl.
- J. Math. Sci. Adv. Appl.

## Conferences and Seminar Talks

- ❑ Uniform Titchmarsh Divisor Problems
  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). Jun 2020
- ❑ Extreme values of $L$-functions
  Number theory lunch seminar, MPIM. Oct 2019
- ❑ Extreme values of $L$-functions
  Oberseminar analytic 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
- ❑ On the least prime in an arithmetic progression
  Number Theory Seminar, UIUC. Sept 2016
- ❑ A lower bound on the least prime in an arithemetic progression,
  Workshop on Automorphic Forms and Related Topics, Sarajevo . Jul 2016
- ❑ Approximations of $L$-functions
  2015 Midwest Number Theory Conference for Graduate Students
  and Recent Ph. D's. Oct 2015
- ❑ Approximations of $L$-functions
  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

## Research Experience

- ❑ 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

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| | 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: English, Chinese | |