

# Junxian Li

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CONTACT INFORMATION	Universität Bonn Mathematisches Institut Endenicher Allee 60 53115 Bonn, Germany	jli135@math.uni-bonn.de <a href="https://jligit.github.io/">https://jligit.github.io/</a>
RESEARCH INTERESTS	Analytic Number theory: $L$ -functions, Primes, Exponential sums, Additive Combinatorics Automorphic Forms, Harmonic analysis, Dynamical systems	
EMPLOYMENT	<b>Postdoctoral Researcher</b> (Mentor: Valentin Blomer) Universität Bonn Max Planck Institute for Mathematics Georg-August Universität Göttingen	2021–Now 2019–2021 2018–2019
EDUCATION	<b>Ph.D. in Mathematics</b> University of Illinois at Urbana-Champaign Advisor: Alexandru Zaharescu  <b>B. A. in Mathematics</b> Nanjing University	2013–2018  2009–2013
PUBLICATIONS	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), arXiv:2211.02469, 28 pp.  18. Additive problems with almost prime squares (with V. Blomer, L. Grimmelt and S. Rydin Myerson), 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), <b>Algebra Number Theory</b> 16 (2022), no. 7, 1589–1625.  15. Large values of Dirichlet $L$ -functions at zeros of a class of $L$ -functions, <b>Canad. J. Math.</b> 73 (2021), no. 6, 1459–1505.  14. Uniform Titchmarsh divisor problems (with E. Assing and V. Blomer), <b>Adv. Math.</b> 393 (2021), Paper No. 108076, 51 pp.  13. Leading Digits of Mersenne Numbers (with Z. Cai, M Faust, A. J. Hildebrand, and Y. Zhang), <b>Exp. Math.</b> 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), <b>Amer. Math. Monthly</b> 127 (2020), no. 3, 217–237. ( <i>winner of the Paul R. Halmos-Lester R. Ford Award</i> )  11. Ducci iterates and similar ordering on sets of visible points (with A. Tamazyan and A. Zaharescu), <b>Int. J. Number Theory</b> 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. Nastaescu, 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** 2022-  
– Ivan Chan Kai Chin (Universität Bonn)

- **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
- **Referee:**
  - Canad. J. Math.; Res. Number Theory; Monatsh. Math.
  - Ramanujan J.; J. Number Theory
  - Math. Reports; Rev. Roumaine Math. Pures Appl.; J. Math. Sci. Adv. Appl.

INVITED SEMINAR  
TALKS AND  
CONFERENCES

- **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**
  - 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

	<ul style="list-style-type: none"> <li>• <b>Primes in arithmetic progressions</b> <ul style="list-style-type: none"> <li>– Where Geometry meets Number Theory, a conference in honor of the 60th birthday of Per Salberger, Gothenburg.</li> </ul> </li> </ul>	July 2017
	<ul style="list-style-type: none"> <li>• <b>The least prime in an arithmetic progression</b> <ul style="list-style-type: none"> <li>– Joint Mathematics Meeting, Atlanta.</li> <li>– Number Theory Seminar, UIUC.</li> <li>– Workshop on Automorphic Forms and Related Topics, Sarajevo .</li> </ul> </li> </ul>	Jan 2017 Sept 2016 Jul 2016
	<ul style="list-style-type: none"> <li>• <b>Approximations of <math>L</math>-functions</b> <ul style="list-style-type: none"> <li>– Midwest Number Theory Conference for Graduate Students and Recent Ph.D's.</li> <li>– Graduate Student Number Theory Seminar, UIUC.</li> </ul> </li> </ul>	Oct 2015 Nov 2015
	<ul style="list-style-type: none"> <li>• <b>Bailey Pairs and Bailey chains</b> <ul style="list-style-type: none"> <li>– <math>q</math>-series Seminar, UIUC.</li> </ul> </li> </ul>	Apr 2015
	<ul style="list-style-type: none"> <li>• <b>Basic Hypergeometric functions</b> <ul style="list-style-type: none"> <li>– <math>q</math>-series Seminar, UIUC.</li> </ul> </li> </ul>	Mar 2015
CONFERENCES AND SUMMER SCHOOLS	<ul style="list-style-type: none"> <li>• Analytic Number Theory Workshop, Oberwolfach</li> <li>• 50 years of Number Theory and Random Matrix Theory, IAS</li> <li>• Harmonic Analysis and Number Theory, ETH</li> <li>• Zeta functions, CIRM</li> <li>• Second Symposium on Analytic Number Theory, Cetraro</li> <li>• Rational points on irrational varieties, IHP</li> <li>• <math>L</math>-functions and Multiplicative Number Theory, U of Mississippi</li> <li>• Distribution of values of zeta functions and <math>L</math>-functions, RIKEN</li> <li>• Workshop and Winter School on Local Statistics of Point Sequences, Linz</li> <li>• Building Bridges: 4th EU/US Summer School and Workshop on Automorphic Forms and Related Topics</li> <li>• Hausdorff School: <math>L</math>-functions: Open Problems and Current Methods</li> <li>• MRC: Number Theoretic Methods in Hyperbolic Geometry</li> <li>• Probability in Number Theory</li> <li>• Arbeitsgemeinschaft in Oberwolfach</li> <li>• MSRI Summer Graduate School on Automorphic Forms and the Langlands Program</li> <li>• PCMI Graduate Summer School on random matrices</li> <li>• University of Houston Summer School on Dynamical Systems</li> <li>• MSRI: Analytic Number Theory</li> <li>• West Coast Algebraic Topology Summer School</li> <li>• Building Bridges: 3rd EU/US Summer School and workshop on Automorphic Forms</li> <li>• UNCG Summer School in Computational Number Theory</li> <li>• Houston Summer School on Dynamical Systems</li> <li>• UNCG Summer School in Computational Number Theory</li> <li>• Exchange in University of Wisconsin-Madison</li> </ul>	Nov 2022 June 2022 Mar 2022 Dec 2019 July 2019 June 2019 May 2019 Mar 2019 Feb 2019 July 2018 June 2018 June 2018 May 2018 Oct 2017 Aug 2017 June 2017 May 2017 Jan, May 2017 Aug 2016 July 2016 June 2016 May 2016 May 2015 Fall 2012
OUTREACH ACTIVITIES	<ul style="list-style-type: none"> <li>• Four Color Fest</li> <li>• A Math Carnival at Illinois-Gathering for Gardener</li> <li>• Science at the Market</li> </ul>	Nov 1-4 2017 Jan 28 2017 Aug 2013
SKILLS	Programming: C++, Mathematica, Matlab, Python Languages: Chinese, English	