# Bin Guan

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CONTACT
INFORMATION

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https://bguanmath.github.io/

RESEARCH
INTERESTS

Number theory, representation theory — especially automorphic forms, automorphic representations, and $L$-functions.

POSITIONS

**Xi'an Jiaotong–Liverpool University, Jiangsu, China**

Teaching Fellow (August 2024 — present)

**Shandong University, Shandong, China**

Postdoctoral Fellow (August 2020 — July 2024)
- Advisor: Prof. Jianya Liu

EDUCATION

**The Graduate Center, The City University of New York, NY, USA**

Ph.D. in Mathematics, June 2020
- Dissertation Topic: Averages and nonvanishing of central values of triple product $L$-functions via the relative trace formula
- Advisor: Prof. Brooke Feigon

**Shandong University, Shandong, China**

M.S. in Mathematics, June 2015
- Dissertation Topic: On application of $(\mathfrak{g}, K)-$cohomology to calculation of cohomology of locally symmetric spaces
- Advisor: Prof. Jing–Song Huang

B.S. in Mathematics, June 2012
- Dissertation Topic: The Clebsch–Gordan problem of the category of nilpotent representations of $\tilde{A}_n$ and its nilpotent representation ring
- Advisor: Prof. Hualin Huang

PUBLICATIONS

1. An explicit Watson–Ichino formula with CM newforms.
   *Acta Arith.*, 203(1):25–58, 2024.

2. On the analytic strong multiplicity one for $SL(2)$.
   *Int. J. Number Theory*, 19(10):2419–2426, 2023.

PREPRINTS

- Averages and nonvanishing of central values of triple product $L$-functions.
  *ArXiv preprint*, submitted, 67 pp, 2021. arXiv:2101.12400.

Article in progress:
- *Exact averages of central values of Asai L-functions.*

- (with Bingrong Huang) *Cubic moments of Hecke–Maass cusp forms in the level aspect.*

- (with Hongbo Yin) *Selmer groups for elliptic curves over $\mathbb{Q}(\sqrt{-3})$.*

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| CONFERENCE TALKS | *Averages of central values of triple product L-functions*, Junior Number Theory Days 2019, Johns Hopkins University. December 2019 |
| | *Averages of central values of triple product L-functions*, 2019 Maine/Québec Number Theory Conference, The University of Maine. October 2019 |
| | *Exact averages of central values of triple product L-functions via the relative trace formula*, 33rd Automorphic Forms Workshop, Duquesne University. March 2019 |
| INVITED TALKS | *Relative trace formula and averages of central values of triple product L-functions*, Shandong University. March 2021 |
| | *Averages of central values of triple product L-functions*, Binghamton University. March 2020 |
| | *Exact averages of central values of triple product L-functions via the relative trace formula*, Shenzhen University. July 2019 |
| | *Exact averages of central values of triple product L-functions via the relative trace formula*, Shandong University at Weihai. June 2019 |
| | *An introduction to Jacquet–Langlands correspondence and the relative trace formula*, series lectures, Shandong University. May 2019 |
| SEMINAR TALKS | Co-organizer and speaker at the *Automorphic Forms and L-functions Student Seminar*, The Graduate Center, CUNY. Summer 2016 — Fall 2018 |
| | Abstracts available at `https://bit.ly/2XONOqE`. |

Co-organizer and speaker at the *Pure Math Student Seminar of Shandong University*, Shandong University, Jinan, China. Fall 2009 — Spring 2014
I was the organizer and one of the lecturers of the following seminars:

- Automorphic forms on $GL_2$     Fall 2013
- Lie algebras and Lie groups     Fall 2012 — Fall 2013
- Structure theory of reductive Lie groups     Fall 2013
- Group cohomology     Spring 2013
- Representation theory of compact Lie groups     Spring 2013
- Semisimple Lie algebras     Fall 2012
- Algebraic Number Theory     Spring 2012 — Spring 2013
- Undergraduate Algebraic Geometry     Spring 2012
- Algebraic topology     Spring 2011
- General topology     Fall 2010
- Calculus on manifolds     Fall 2009

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| OTHER TALKS | *Local Langlands conjecture*, Student seminar on *L*-functions of Prof. Bingrong Huang and Prof. Yongxiao Lin, Shandong University. March 2024 |
| | *Baby case of the Arthur–Selberg trace formula*, Summer school on Dirac cohomology and Langlands functoriality, Shandong University. July 2022 |

*Proof sketch of the Jacquet–Langlands correspondence*, Reading seminar on David Whitehouse's notes, Shandong University.                                   December 2020

*Overview of the Langlands conjectures*, Oral exam talk, The Graduate Center, CUNY.
                                                                          September 2017

*Elliptic curves*, Prof. L. Szpiro's course, The Graduate Center, CUNY.
                                                                          December 2016

*The Hilbert function and the dimension of a variety*, Algebraic Geometry Student Seminar, The Graduate Center, CUNY.                                      March 2016

*Sheaf structure of* $\mathrm{Spec}\,A$ *on an A-module*, Prof. L. Szpiro's course, The Graduate Center, CUNY.                                                      October 2015

*Representation theory of symmetric groups*, Prof. Hualin Huang's course, Shandong University.                                                                    May 2014

*Group algebra and its representation of a topological group and a Lie group*, Prof. Hualin Huang's course, Shandong University.                           April 2014

*Leray–Schauder degree*, Prof. Xijun Hu's course, Shandong University.
                                                                          December 2013

*Higher composition laws and applications*, Discussion on Manjul Bhargava's thesis, Shandong University.                                                  November 2013

*Branching law from* $U(n)$ *to* $U(n-1)$, Reading seminar on the branching law, Shandong University.                                                              June 2013

*Expanding maps on the circle* $S^1$, Prof. Xijun Hu's course, Shandong University.
                                                                          April 2013

*Schur–Weyl duality of symmetric group* $S_n$ *and* $GL(n,\mathbb{C})$, Prof. Hualin Huang's course, Shandong University.                                          December 2012

TEACHING
EXPERIENCE

**Xi'an Jiaotong–Liverpool University**

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| Fall | 2024 | MTH013 | Calculus (Science and Engineering) |

**Shandong University**

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|---|---|---|
| Spring | 2023 | Advanced Abstract Algebra (Graduate Level) |
| Fall | 2022 | Basics in Algebra and Geometry |
| Spring | 2022 | Abstract Algebra |
| Fall | 2021 | Basics in Algebra and Geometry |

**The City College of New York**

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|---|---|---|---|
| Spring | 2019 | Math 39200 | Linear Algebra and Vector Analysis for Engineers |
| Fall | 2018 | Math 20500 | Elements of Calculus |
| Spring | 2018 | Math 20200 | Calculus II |
| Fall | 2017 | Math 20500 | Elements of Calculus |
| Spring | 2017 | Math 20200 | Calculus II |
| Fall | 2016 | Math 20100 | Calculus I |

**Shandong University (Recitation classes)**

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|---|---|---|---|
| Fall | 2014 | Teaching Assistant | Basics in Algebra and Geometry |
| Spring | 2014 | Teaching Assistant | Advanced Abstract Algebra |
| Fall | 2013 | Teaching Assistant | Differential Geometry |
| Spring | 2013 | Teaching Assistant | Abstract Algebra |
| Fall | 2012 | Teaching Assistant | Differential Geometry |

EXTENDED PROFESSIONAL TRAVEL

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| July | 2024 | The International Number Theory Conference in Commemoration of Chengdong Pan, Shandong University, Jinan, Shandong, China |
| January | 2024 | Workshop on Number Theory, Shenzhen University, Shenzhen, Guangdong, China |
| November | 2023 | Workshop on Number Theory of Shandong University: on the occasion of Professor Tonghai Yang's 60th birthday, Shandong University, Jinan, Shandong, China |
| October | 2023 | Workshop on Number Theory of Shandong University, Shandong University, Jinan, Shandong, China |
| August | 2023 | SDU—RUC Mathematical Frontier Forum, Shandong University at Weihai, Weihai, Shandong, China |
| August | 2023 | Workshop on Automorphic Representations, Shandong University, Jinan, Shandong, China |
| August | 2023 | The Eleventh Pan Asian Number Theory (PANT) Conference, Institute for Advanced Study in Mathematics — Harbin Institute of Technology, Harbin, Heilongjiang, China |
| July | 2023 | Conference on Representation theory and Post-quantum Cryptography, Shandong University, Jinan, Shandong, China |
| July | 2023 | SDU Summer school: Representation Theory and Quantum Computing, Shandong University, Jinan, Shandong, China |
| April | 2023 | USTC-XJTU Number Theory Conference, University of Science and Technology of China, Hefei, Anhui, China |
| April | 2023 | XJTU-USTC Number Theory Conference, Xi'an Jiaotong University, Xi'an, Shaanxi, China |
| March | 2023 | SDU Number Theory Pi Day, Shandong University, Jinan, Shandong, China |
| December | 2022 | SDU Number Theory Day, Shandong University, Jinan, Shandong, China |
| November | 2022 | (Online) The Seventh Qilu Youth Forum, Shandong University, Jinan, Shandong, China |
| July | 2022 | SDU Summer school: Dirac Cohomology and Langlands Functoriality, Shandong University, Jinan, Shandong, China |
| December | 2021 | SCU Online Workshop on Algebra and Number Theory, Tianyuan Mathematical Center in Southwest China — Sichuan University, Chengdu, Sichuan, China |
| December | 2021 | (Online) The Tenth Pan Asian Number Theory (PANT) Conference, Research Institute for Mathematical Sciences — Kyoto University, Kyoto, Japan |
| December | 2021 | (Online) SDU Number Theory Day, Shandong University, Jinan, Shandong, China |
| December | 2021 | Mathematics and Technology: The Second National Postdoctoral Academic Forum, Shandong University, Jinan, Shandong, China |
| November | 2021 | (Online) Symposium on Number Theory and Representation Theory, Zhejiang University, Hangzhou, Zhejiang, China |
| June | 2021 | Jintan Conference on Number Theory (The 8th National Conference on Number Theory), Hua Loo-Keng Center for Mathematical Sciences, Jintan, Jiangsu, China |

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| April | 2021 | When Number Theory meets Algebraic Geometry (NTAG-1st), University of Science and Technology of China, Hefei, Anhui, China |
| November | 2020 | Mathematics and Technology: The First National Postdoctoral Academic Forum, Shandong University, Jinan, Shandong, China |
| November | 2020 | (Online) SCU Workshop on Modern Number Theory and Related Topics: in Memory of Professor Chao Ko's 110th birthday, Tianyuan Mathematical Center in Southwest China — Sichuan University, Chengdu, Sichuan, China |
| May | 2020 | (Online) Conference on Representation Theory and Algebraic Analysis: in honor of Joseph Bernstein on the occasion of his 75th birthday, Weizmann Institute of Science, Rehovot, Israel |
| January | 2020 | Joint Mathematics Meetings, Denver, CO, USA |
| December | 2019 | Johns Hopkins Junior Number Theory Days, Johns Hopkins University, Baltimore, MD, USA |
| October | 2019 | Maine/Québec Number Theory Conference, The University of Maine, Orono, ME, USA |
| June | 2019 | Workshop on Number Theory and Dynamic Systems, Shandong University at Weihai, Weihai, Shandong, China |
| April | 2019 | Ninth Annual Upstate Number Theory Conference, Cornell University, Ithaca, NY, USA |
| March | 2019 | 33rd Automorphic Forms Workshop, Duquesne University, Pittsburgh, PA, USA |
| December | 2018 | On the Langlands Program: Endoscopy and Beyond, Institute for Mathematical Sciences — NUS, Singapore |
| May | 2018 | Representation Theory, Geometry, and Quantization: The Mathematical Legacy of Bertram Kostant, Massachusetts Institute of Technology, Cambridge, MA, USA |
| July | 2017 | MSRI Summer school: Automorphic Forms and the Langlands Program, Mathematical Sciences Research Institute, Berkeley, CA, USA |
| June | 2015 | The 17th National Workshop on Algebra and Representation Theory, Shandong University, Jinan, Shandong, China |
| May | 2015 | The 7th National Conference on Number Theory, Shandong University, Jinan, Shandong, China |
| May | 2015 | Conference on Arithmetic Algebraic Geometry in honor of Professor Nicholas Katz's 71 birthday, Academy of Mathematics and Systems Science, Chinese Academy of Science, Beijing, China |
| June | 2014 | International Workshop on Representation Theory and Harmonic Analysis, Chern Institute of Mathematics, Tianjin, China |
| January | 2014 | Number Theory Conference in Honor of Peter Sarnak, Shandong University, Jinan, Shandong, China |
| August | 2012 | Workshop on Algebraic and Arithmetic Geometry, Beijing International Center for Mathematical Research, Beijing, China |
| July | 2012 | Summer Course: Arithmetic, Algebra and Geometry, Mathematical Sciences Center in Tsinghua University, Beijing, China |

| GRANTS | | |
|---|---|---|
| | 2024—2026 | Natural Science Foundation for Excellent Young Scholars of Shandong Province, China (Participate) <br> Shandong University |
| | 2024—2026 | Natural Science Foundation for General Programs of Shandong Province, China (Participate) <br> Shandong University |
| | 2021—2026 | The National Key R&D Program of China (Participate) <br> Shandong University |
| | 2019—2020 | Doctoral Student Research Grant (Round 14) <br> The Graduate Center, CUNY |

| HONORS AND AWARDS | 2020 | Graduate Center Dissertation Year Award |
| | | The Graduate Center, CUNY |
| | 2015—2020 | Graduate Assistantship 5-year PhD Fellowship |
| | | The Graduate Center, CUNY |
| | 2009—2011 | Outstanding Student Scholarship |
| | | Shandong University |

| RELEVANT SKILLS | Languages: | English (Fluent), Chinese (Native), French (Basic) |
| | Computing: | C++, MATLAB, Magma, SageMath |
| | Writing: | LaTeX |