Baiying Liu

Department of Mathematics
Purdue University
150 N. University St
West Lafayette, IN, 47907, USA

Phone: (+1) 765-494-1971
Fax: (+1) 765-494-0548
Email: `liu2053@purdue.edu`
`https://www.math.purdue.edu/~liu2053/`

RESEARCH INTERESTS

Automorphic Forms, L-functions, Langlands Program, Representation Theory, Number Theory

EDUCATION

Ph.D. Mathematics, University of Minnesota   2013
Adviser: Dihua Jiang
Thesis: Fourier coefficients of automorphic forms and Arthur classification
M.S. Mathematics, Harbin Institute of Technology   2008
B.S. Mathematics, Harbin Institute of Technology   2006

EMPLOYMENT

Associate professor, Purdue University   From 2021
Assistant professor, Purdue University   2016–2021
Member, Institute for Advanced Study   2015–2016
Wylie Assistant Professor Lecturer, University of Utah   2013–2015

AWARDS AND HONORS

Ross-Lynn Research Scholars Grants, 2022–2023 (supporting graduate student Chi-Heng Lo).
Ross-Lynn Research Scholars Grants, 2021–2022 (supporting graduate student Alexander Hazeltine).
2019 ICCM Best Paper Award (with Hervé Jacquet, "On the Local Converse Theorem for p-adic GLn". Amer. J. Math. 2018).
NSF CAREER Grant DMS-1848058 (2019–2024).
NSF Grant DMS-1702218 (2017–2022).
Start-up Funds, Purdue University, 2016–2021.
IAS membership for academic year 2015–2016.
NSF Grant DMS-1302122 (2014–2016), later changed to DMS-1620329 (2015–2016).
AMS-Simons Travel Grant Award, 2014–2016.
Postdoc Research Funds, University of Utah, 2013–2015.
Bachelor Thesis Award-Silver Medal for the New World Mathematics Awards, Dec. 2007.

PUBLICATIONS (PUBLISHED AND ACCEPTED)

32. Automorphic descent for symplectic groups: the branching problems and L-functions. *Amer. J. Math.* to appear. (2020) (with Bin Xu). `https://www.math.purdue.edu/~liu2053/S6.pdf`.

31. On a converse theorem for split SO(2n) over finite fields. *Acta Mathematica Sinica, English Series.* to appear. (2022) (with Alexander

Hazeltine).

30. On wave front sets of global Arthur packets of classical groups: upper bound. *J. European Math. Society.* to appear. (2022) (with Dihua Jiang).

29. Jiang's conjecture on local Arthur packets. Kudla Proceedings. to appear. (2022) (with Freydoon Shahidi).

28. On automorphic descent from GL(7) to G2. *J. European Math. Society.* to appear. (2021) (with Joseph Hundley). `https://www.math.purdue.edu/~liu2053/S3.pdf`.

27. On a local converse theorem for G_2 over finite fields. *Math. Annalen.* to appear. (2021) (with Qing Zhang). `https://arxiv.org/pdf/1811.10472.pdf`.

26. Gamma factors and converse theorems for classical groups over finite fields. *J. Number Theory.* to appear. (2021) (with Qing Zhang). `https://www.math.purdue.edu/~liu2053/S2.pdf`.

25. Degenerate principal series for classical and odd GSpin groups in the general case. *Representation Theory* (2020) (with Yeansu Kim and Ivan Matic). `https://www.math.purdue.edu/~liu2053/25.pdf`.

24. A refined Poisson summation formula for certain Braverman-Kazhdan spaces. *Sci. China Math.* (2020). `https://doi.org/10.1007/s11425-018-1616-0`. (with Jayce Getz). `https://arxiv.org/pdf/1707.06091.pdf`.

23. On top Fourier coefficients of certain automorphic representations of GL_n. *Manuscripta Math.* (2020). `https://doi.org/10.1007/s00229-019-01176-z`. (with Bin Xu). `https://www.math.purdue.edu/~liu2053/23.pdf`.

22. A remark on a converse theorem of Cogdell and Piatetski-Shapiro. *J. Reine Angew. Math.* 760 (2020), 195–212. (with Hervé Jacquet).

21. On the local converse theorem and the descent theorem in families. *Math. Z.* (2019). `https://doi.org/10.1007/s00209-019-02350-5`. (with Gilbert Moss). `https://www.math.purdue.edu/~liu2053/21.pdf`.

20. A reciprocal branching problem for automorphic representations and global Vogan packets. *J. Reine Angew. Math.* (2019). `https://doi.org/10.1515/crelle-2019-0016`. (with Dihua Jiang and Bin Xu). `https://www.math.purdue.edu/~liu2053/20.pdf`.

19. Uniqueness of certain Fourier-Jacobi models over finite fields. *Finite Fields Appl.* 58 (2019), 70–123. (with Qing Zhang).

18. A summation formula for triples of quadratic spaces. *Adv. Math.* 347 (2019), 150–191. (with Jayce Getz).

17. Fourier coefficients attached to small autormophic representations of $\mathrm{SL}_n(\mathbb{A})$. *J. Number Theory* 192 (2018), 80–142. (with Olof Ahlén, Henrik P. A. Gustafsson, Axel Kleinschmidt and Daniel Persson).

16. On the sharpness of the bound for the local converse theorem of p-adic GL_{prime}. *Proc. Amer. Math. Soc. Ser. B* 5 (2018), 6–17. (with Moshe Adrian, Shaun Stevens and Kam-Fai Tam).

15. Fourier coefficients and cuspidal spectrum for symplectic groups. *Geometric Aspects of the Trace Formula. Symons Symposia.* 2018, 211–244. (with Dihua Jiang).

14. On the Local Converse Theorem for p-adic GL_n. *Amer. J. Math.* 140 (2018), no. 5, 1399–1422. (with Hervé Jacquet). Received 2019 ICCM Best Paper Award.

13. Raising nilpotent orbits in wave-front sets. *Representation Theory* 20 (2016), 419–450. (with Dihua Jiang and Gordan Savin).

12. On the Jacquet Conjecture on the local converse problem for p-adic $\mathrm{GL}(n)$. *Representation Theory* 20 (2016), 1–13. (with Moshe Adrian, Shaun Stevens and Peng Xu).

11. Models transition under theta correspondence. *J. of Algebra* 448 (2016), 431–445.

10. Some results on simple supercuspidal representations of $\mathrm{GL}_n(F)$. *J. Number Theory* 160 (2016), 117–147. (with Moshe Adrian).

9. The Jacquet-Langlands correspondence via twisted descent. *Int. Math. Res. Not.*, 2016, no. 18, 5455–5492. (with Dihua Jiang, Bin Xu and Lei Zhang).

8. Fourier coefficients of certain residual representations of symplectic groups. *Pacific Journal of Math.* Vol. 281 (2016), No. 2, 421–466. (with Dihua Jiang).

7. Arthur parameters and Fourier coefficients for automorphic forms on symplectic groups. *Ann. Inst. Fourier (Grenoble)*, 66 (2016), no. 2, 477–519. (with Dihua Jiang).

6. Fourier coefficients for automorphic forms on quasisplit classical groups. *Contemporary Mathematics*, Volume 664, 2016, 187–208, AMS. (with Dihua Jiang).

5. On special unipotent orbits and Fourier coefficients for automorphic forms on symplectic groups. *J. Number Theory* 146 (2015), 343–389. (with Dihua Jiang)

4. The generic dual of p-adic split SO_{2n} and local Langlands parameters. *Israel J. Math.* 204 (2014), no. 1, 199–260. (with Chris Jantzen)

3. Poles of certain residual Eisenstein series of classical groups. *Pacific J. Math.* 264 (2013), no. 1, 83–123. (with Dihua Jiang and Lei Zhang)

2. On Fourier coefficients of automorphic forms of GL(n). *Int. Math. Res. Not.* 2013, no. 17, 4029–4071. (with Dihua Jiang)

1. Genericity of representations of p-adic Sp_{2n} and local Langlands parameters. *Canad. J. Math.* 63 (2011), no. 5, 1107–1136.

(SUBMITTED AND PREPRINTS)

1. Erratum to "On the non-vanishing of the central value of the Rankin-Selberg L-functions". Submitted. (2019) (with Dihua Jiang). `https://www.math.purdue.edu/~liu2053/S4.pdf`.

2. Local descent to quasi-split even general spin groups. Submitted. (2020) (with Eyal Kaplan and Jing Feng Lau). `https://www.math.purdue.edu/~liu2053/S5.pdf`.

3. On the local converse theorem for split SO(2n). Submitted. (2022) (with Alexander Hazeltine).

4. The generic dual of p-adic groups and Local Langlands parameters. Preprint. (2022) (with Chris Jantzen).

5. Jiang's conjecture on the wave front sets of local Arthur packets. Preprint. (2022) (with Freydoon Shahidi).

6. On the intersection of local Arthur packets for classical groups. Preprint. (2022) (with Alexander Hazeltine and Chi-Heng Lo). 140 pages. `https://arxiv.org/abs/2201.10539`.

7. Closure ordering conjecture on local L-parameters in local Arthur packets of classical groups. Preprint. (2022) (Alexander Hazeltine, Chi-Heng Lo, and Qing Zhang). 61 pages.

TEACHING EXPERIENCE

Lecturer, Purdue University, 2016–Now:
Linear Algebra (MA 265)
Ordinary Differential Equations (MA 266)
Differential Equations and Partial Differential Equations for Engineering and the Sciences (MA 303)
Elementary Linear Algebra (MA 351)
Linear Algebra II (MA 35301)

Lecturer, University of Utah, 2013–2015:
Engineering Calculus I
Calculus III
TA training leader, Summer 2014
Linear algebra
Introduction to modern algebra II

Teaching Assistant, University of Minnesota, 2008–2013:
IT Calculus I and II
IT Multivariable Calculus and Vector Analysis
Calculus I (summer lecturer, twice)
CSE Calculus I and II
Linear Algebra and Differential Equations

JOURNAL
REFEREE
Canadian Journal of Mathematics
International Mathematics Research Notices
Journal of Number Theory
Journal of the European Mathematical Society
Morningside Center of Mathematics Proceeding
Contemporary Mathematics
Compositio Mathematica
American Journal of Mathematics
Forum Mathematicum
Pacific Journal of Mathematics
Transactions of the American Mathematical Society
Algebra and Number Theory
Research in Number Theory
The Ramanujan Journal
Mathematische Zeitschrift

SERVICE
Co-organizer (with Dihua Jiang, Freydoon Shahidi, Lei Zhang), HAAR (Harmonic Analysis and Representations) Zoominar. From 2021.

Co-organizer (with Daniel Le), Automorphic Forms and Representation Theory Seminar, Purdue University. From 2021.

Co-organizer (with Freydoon Shahidi and David Goldberg), Recent Developments in Automorphic Forms and Representations of p-adic Groups, AMS meeting at Purdue University, March 26-27, 2022.

Co-organizer (with Tong Liu and Freydoon Shahidi), Automorphic Forms and Representation Theory Seminar, Purdue University, 2018–2021.

Organizer, Representation Theory Seminar, University of Utah, Spring 2015.

Thesis committee for: Daniel Shankman, Dongming She

Oral exam committee for: Alexander Hazeltine, Yifu Wang, Farid Hosseinijafari, Chi-Heng Lo

Independent reading courses for: Alexander Hazeltine, Justin Fong, Chi-Heng Lo

POSTDOCS   Rongqing Ye (2019–2021)

GRADUATE   Alexander Hazeltine (co-advising with Freydoon Shahidi, since 2018 Fall)
STUDENTS
                Chi-Heng Lo (co-advising with Freydoon Shahidi, since 2019 Fall)

                Qiyuan Pang (Initial adviser, 2019–2020)

                Shaver Phagan (Initial adviser, 2019–2020)

INVITED TALKS
- Minimal Representations and Theta Correspondence. Erwin Schrodinger Institute, Vienna, April 11-15, 2022.
- Automorphic Forms and Representation Theory Seminar. Purdue University. Feb 3, 2022.
- HAAR zoominar. University of Minnesota. August 9th, 2021.
- HAAR zoominar. University of Minnesota. July 26th, 2021.
- AMS sectional meeting. Brown University. March 20, 2021.
- Seminar on Representation Theory and Algebraic Geometry. Weizmann Institute of Science. Aug 12, 2020.
- Mathematics Colloquium. Rutgers University at Newark. Feb 4, 2020.
- Mathematics Colloquium. University of California, Santa Cruz. Jan 28, 2020.
- 2019 ICCM Best Paper Award Presentation. ICCM, Dec 16, 2019. Sanya. China.
- AMS sectional meeting. University of Wisconsin-Madison. Sep 14-15, 2019.
- AMS sectional meeting. University of Hawaii at Manoa, Honolulu, Hawaii. Mar 22-24, 2019.
- Automorphic Forms and Arithmetic Seminar. Columbia University. Feb 22, 2019.
- Automorphic Forms and Representation Theory Seminar. Purdue University. Feb 14, 2019.
- JHU-UMD Algebra and Number Theory Day. University of Maryland. Nov 3, 2018.
- Lie Theory Seminar. University of Minnesota. March 23, 2018.

- Geometric Methods in Representation Theory Seminar. University of North Carolina at Chapel Hill. February 23, 2018.
- Automorphic Forms and Representation Theory Seminar. Purdue University. September 21, 2017.
- AMS sectional meeting. State University of New York at Buffalo. September 16-17, 2017.
- Number Theory Seminar. Ohio State University. April 24, 2017.
- Algebra Seminar. University of Buffalo. April 3, 2017.
- Number Theory Seminar. University of Chicago. February 14, 2017.
- Number Theory Seminar. Northwestern University. February 13, 2017.
- AMS sectional meeting. University of St. Thomas (Minneapolis campus). October 28-30, 2016.
- Number Theory Seminar. Duke University. October 13, 2016.
- Automorphic Forms and Representation Theory Seminar. Purdue University. September 22, 2016.
- Program: Automorphic forms, mock modular forms and string theory. The Simons Center for Geometry and Physics. September 16, 2016.
- BC-MIT Number Theory Seminar. MIT. September 13, 2016.
- 45 minutes talk. The 7th International Congress of Chinese Mathematicians, Beijing, August 6-11, 2016. (was not able to attend due to family reasons)
- Algebra Seminar. Brown University. April 18, 2016.
- AMS sectional meeting. University of Utah. April 9–10, 2016.
- Number Theory Seminar, Rutgers University in New Brunswick, Feb 9, 2016.
- Colloquium, University of Pittsburgh, January 21, 2016.
- Special colloquium, Purdue University, December 11, 2015.
- Workshop on Automorphic Kernel Functions, American Institute of Mathematics, Nov 30–Dec 4, 2015.
- Junior Number Theory Days, Rutgers University in Newark, Nov 20–21, 2015.
- AMS meeting, Rutgers University in New Brunswick, Nov 14–15, 2015.
- Algebra Seminar and Departmental Colloquium, Kansas State University, Oct 31–Nov 4, 2015.
- AMS meeting, Loyola University, Chicago, October 3–4, 2015.

- IAS short talks by postdoctoral members, IAS, Sep 28, 2015.
- Lie Groups Quantum Mathematics Seminar, Rutgers University in New Brunswick, Sep 25, 2015.
- IAS/PUWorking Algebraic Number Theory Seminar, Princeton University, Sep 24, 2015.
- Joint Algebra and Number Theory/Harmonic Analysis Seminar, Louisiana State University, Sep 15, 2015.
- Algebra seminar, University at Buffalo, May 4, 2015.
- Number Theory Seminar, Ohio State University, Apr 13, 2015.
- Special colloquium, Purdue University, Mar 10, 2015.
- UNC-Duke Number Theory Seminar, Duke University, Feb 11, 2015.
- Representation Theory Seminar, University of Utah, Jan 16, 2015.
- Colloquium Seminar, University of East Anglia, Nov 17, 2014.
- Number Theory Seminar, University of California, Berkeley, Oct 8, 2014.
- Seminar, Mathematical Sciences Center, Tsinghua University, Jul 28, 2014.
- Workshop on Representation Theory, National University of Singapore, Jul 21–23, 2014.
- Workshop on Automorphic Forms and Representations, Math Institute of The Chinese Academy of Sciences, Beijing, Jul 1–11, 2014.
- Lie Theory Seminar, University of Minnesota, Mar 14, 2014.
- Joint Mathematics Meetings Special Session on Recent Progress in the Langlands Program, Baltimore, Jan 15–16, 2014.
- AMS Sectional Meeting Special Session on Automorphic Forms and Representation Theory, St. Louis, Oct 18–20, 2013.
- Representation Theory Seminar, University of Utah, Sep 27, 2013.
- Representation Theory Seminar, University of Utah, Sep 6, 2013.
- Texas-Oklahoma Representations and Automorphic forms IV, University of North Texas, Mar 2013.
- Group, Lie and Number Theory seminar, University of Michigan, Jan 28, 2013.
- Beijing International Center for Mathematical Research, Jan 2, 2013.
- Morningside Center of Mathematics, Chinese Academy of Sciences, Dec 31, 2012.
- Lie Theory Seminar, University of Minnesota, Nov 30, 2012.
- Lie Theory Seminar, University of Minnesota, Oct 19, 2012.

- Midwest Number Theory Conference for Graduate Students and Recent PhDs IX, University of Illinois at Urbana-Champaign, Oct 13, 2012.
- Texas-Oklahoma Representations and Automorphic forms II, Oklahoma State University, Apr 6-8, 2012.
- Lie Theory Seminar, University of Minnesota, Mar 30, 2012.
- Lie Theory Seminar, University of Minnesota, Feb 24, 2012.
- Midwest Number Theory Conference for Graduate Students VI, University of Wisconsin-Madison, Nov 2009.