

# Lei Zhang

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EDUCATION Ph.D. in Math., The University of Minnesota 2011  
B.S. in Math., Peking University 2005

ACADEMIC APPOINTMENTS

- Associate Professor, National University of Singapore 2021–present
- Assistant Professor, National University of Singapore 2014–2021
- Visiting Assistant Professor, Boston College 2011–2014

RESEARCH INTERESTS Langlands program, Automorphic Forms and  $L$ -functions, Representation Theory of Topological Groups.

PUBLICATIONS

1. *Converse Theorem of Gauss Sums*, with an appendix by Zhiwei Yun, a J. Number Theory 221 (2021), 365–388.
2. *Arthur parameters and cuspidal automorphic modules of classical groups*, Ann. of Math. (2) 191 (2020), no. 3, 739–827, joint with Dihua Jiang.
3. *On the Non-vanishing of the Central Value of Certain  $L$ -functions: Unitary Groups*, JEMS, 22 (2020), no. 6, 1759–1783, joint with Dihua Jiang.
4. *Bessel Descents and Branching problems*, Relative Trace Formulas, Simon’s Symposia, 2020, joint with Dihua Jiang.
5. *Local root numbers and spectrum of the local descents for orthogonal groups:  $p$ -adic case*. Algebra Number Theory 12 (2018), no. 6, 1489–1535 joint with Dihua Jiang.
6. *Whittaker-Shintani Functions for General Linear Groups*, Sci. China Math. 61 (2018), no. 1, 95–110.
7. *Automorphic Integral Transforms for Classical Groups II: Twisted Descents*, Automorphic integral transforms for classical groups II: Twisted descents. Representation theory, number theory, and invariant theory, 303–335, Progr. Math., 323, Birkhäuser/Springer, Cham, 2017, joint with Dihua Jiang.
8. *The Jacquet Langlands correspondence via twisted descent*. Int Math Res Notices, 2016 (18): 5455–5492, joint with Dihua Jiang, Baiying Liu, and Bin Xu.
9. *Tokuyama-type formulas for type B*. Israel J. Math. 216 (2016), no. 2, 617–655, joint with Solomon Friedberg.
10. *Distinguished Tame Supercuspidal Representations of Symmetric Pairs  $(\mathrm{Sp}_{4n}(F), \mathrm{Sp}_{2n}(E))$* , With an appendix by Dihua Jiang and Lei Zhang, Manuscripta Math. 148 (2015), no. 1–2, 213–233.

11. *Eisenstein Series on Covers of Odd Orthogonal Groups*. Amer. J. Math. 137 (2015), no. 4, 953–1011, joint with Solomon Friedberg.
12. *A Product of Tensor Product L-functions of Quasi-splits Classical Groups of Hermitian Type*. Geom. Funct. Anal. 24 (2014), no. 2, 552–609, joint with Dihua Jiang.
13.  $\mathrm{Sp}_{2n}(\mathbb{F}_{q^2})$ -invariants in irreducible unipotent representations of  $\mathrm{Sp}_{4n}(\mathbb{F}_q)$ . J. Algebra 395 (2013), 24–46.
14. *Poles of certain residual Eisenstein series of classical groups*. Pacific J. Math. 264 (2013), no. 1, 83–123, joint with Dihua Jiang and Baiying Liu.
15. *Gelfand pairs*  $(\mathrm{Sp}_{4n}(F), \mathrm{Sp}_{2n}(E))$ . J. Number Theory 130 (2010), no. 11, 2428–2441.

#### PREPRINTS

1. *Periods of Automorphic Forms Associated to Strongly Tempered Spherical Varieties*, arXiv:2102.03695, preprint 2021, joint with Chen Wan.
2. *Harmonic Analysis and Gamma Functions on Symplectic Groups*, arXiv:2006.08126, preprint 2020, joint with Dihua Jiang and Zhilin Luo.
3. *Simple Fourier Trace Formulas of Cubic Level and Applications*, arXiv:1906.06103, preprint, 2019, joint with Qinghua Pi and Yingnan Wang.
4. *The Exterior Cube L-function for  $\mathrm{GU}_6$  and Unitary Automorphic induction*, arXiv:1903.04322, preprint, 2019.
5. *The multiplicity problems for the unitary Ginzburg-Rallis models*, arXiv:1808.02203, preprint, 2018, joint with Chen Wan.

#### ORGANIZING CONFERENCES

- Representation Theory Workshop 2019, Aug. 21 2019 – Aug. 22 2019.
- On the Langlands Program: Endoscopy and Beyond, Institute for Mathematics Science, Singapore, Dec. 17 2018 – Jan. 18 2019.
- Pan Asia Number Theory Conference 2018, Institute for Mathematics Science, Singapore, 25 – 29 June 2018.
- New Developments in Representation Theory, Institute for Mathematics Science, Singapore, Mar. 2016.
- Workshop on Automorphic Kernel Functions, The American Institute of Mathematics, Nov. 30 – Dec. 4, 2015.

#### GRANTS

- National University of Singapore tier-1 grant, 2021–2023.
- National University of Singapore tier-1 grant, 2017–2020.
- National University of Singapore start-up grant, 2014–2017.
- Junior Research Fellowship at The Erwin Schrödinger International Institute for Mathematical Physics, Vienna, Austria, 2009.

#### SELECTED TALKS AND INVITED EVENTS

- The Mathematics Colloquium, Rutgers University, Mar. 31, 2021
- Automorphic Forms and Arithmetic Seminar, Columbia University, USA, Mar. 26, 2021
- ICCM 2020 Annual Meeting, University of Science and Technology of China, China, Dec. 28, 2020.

- Algebraic Geometry and Representation Theory Seminar, The Weizmann Institute of Science, Israel, Oct. 28, 2020.
- Number Theory Seminar, Kyoto University, Kyoto, Japan, Jan., 2020.
- Number Theory Seminar, Zhejiang University, Hanzhou, China, Dec. 27, 2019.
- HKUST-KAIST-NUS Joint Workshop in Mathematics: Algebra, Algebraic Geometry and Lie Theory, NUS, Nov. 7 – Nov. 9, 2019.
- International Conference on Representation Theory VIII, Harbin Engineering University, July 8 – July 12, 2019.
- Representation Theory and Automorphic Form Forum, Zhejiang University, June 27 – June 28, 2019.
- Automorphic Forms and Geometric Representation Theory, Institute for Advanced Study in Mathematics, Harbin Institute of Technology, May 28 – June 6, 2019.
- Lie Theory Day, NUS, March 22, 2019.
- BRL-PMI Intensive lecture series, The Langlands Conjectures and  $L$ -functions, Pohang Mathematics Institute, Postech, Pohang, Korea, Feb. 11 – Feb. 14 2019.
- A series of Lectures, On the Langlands Program: Endoscopy and Beyond, Institute for Mathematics Science, Singapore, Dec 17 2018 – Jan 18 2019.
- Workshop on Automorphic Forms, Representations of Lie Groups and Several Complex Variables, Academy of Mathematics and Systems Science (AMSS), Chinese Academy of Sciences, Beijing, July 9–14, 2018.
- Automorphic forms on reductive groups and their covers: A conference in honour of Solomon Friedberg Forschungsinstitut für Mathematik, (ETH), Zürich, Switzerland, June 25–28, 2018.
- Automorphic Forms, Geometry and Representation Theory, Zhejiang University, June 4–June 8, 2018.
- Functoriality and the trace formula, The American Institute of Mathematics, Dec. 4 – Dec. 8, 2017.
- Number Theory Seminar, Chinese Academy of Sciences, Beijing, Aug. 10, 2017.
- Automorphic Representations and L-functions, Shandong University at Weihai, Aug. 6–7, 2017.
- Workshop on Automorphic Forms and Automorphic Representations, Shanghai Center for Mathematical Sciences, Fudan University, July 10–11, 2017
- Workshop on Lie Group Representations and Automorphic Forms, Beijing International Center for Mathematical Research, July 3 –8, 2017.
- Automorphic Forms on Metaplectic Groups and Related Topics at IISER, Pune, India, July 4–9, 2016.
- Relative Trace Formula, Periods,  $L$ -Functions and Harmonic Analysis, CIRM, France, May 23 – 27, 2016.
- New Developments in Representation Theory, Institute for Mathematics Science, Singapore, Mar. 2016.
- Workshop on automorphic kernel functions, The American Institute of Mathematics, Nov. 30 – Dec. 4, 2015.
- Automorphic Forms, Geometry and Representation Theory in Hangzhou, Zhejiang University, July 26–31, 2015.

- Pan Asia Number Theory Conference 2015 in Sanya, July 21–24, 2015.
- Workshop on Automorphic Forms and Representations in Beijing, July 1–11, 2014.
- Workshop on The Future of Trace Formulas, Banff International Research Station, Canada, Jun. 1–6, 2014.
- AMS Sectional Meeting, The University of Maryland, Jan. 15–16, 2014.
- MIT Number Theory Seminar, Dec. 3, 2013.
- Number Theory Seminar, Boston University, Nov. 18, 2013.
- Automorphic Forms and Arithmetic Seminar, Columbia University, Nov. 15, 2013.
- MIT Lie Groups Seminar, Part (II), MIT, Nov. 13, 2013.
- MIT Lie Groups Seminar, Part (I), MIT, Nov. 6, 2013.
- Advances in the theory of automorphic forms and their L-functions The Schrödinger International Institute for Math Physics (Vienna), Austria, Oct. 16–26, 2013.
- Workshop on Whittaker Functions: Number Theory, Geometry and Physics, Banff International Research Station, Canada, Oct. 13–18, 2013.
- Maine-Québec Number Theory Conference, The University of Maine, Oct. 5–6, 2013.
- Summer Workshop on Arithmetic Geometry, Tsinghua University, Jul. 22–25, 2013.
- The Sixth International Congress of Chinese Mathematicians at Taiwan, Jul. 14–19, 2013.
- Mini-Workshop on Langlands Functoriality, The University of Minnesota, May 6–10, 2013.
- ICERM Semester Program on Automorphic Forms, Combinatorial Representation Theory and Multiple Dirichlet Series, ICERM, Apr. 2013.
- Number Theory Seminar, University of Wisconsin at Madison, Nov. 2012.
- Number Theory Seminar, Peking University, China, Jul. 2012.
- Working Seminar at Morningside Center of Mathematics, Chinese Academy of Science, Beijing, Jul. 2013.
- Lie Theory Seminar, The University of Minnesota, Jun. 2012.
- Number Theory and Algebraic Geometry Seminar, Boston College, Feb. 2012.
- AMS Eastern Sectional Meeting, Cornell University, Sept. 2011.
- Midwest Number Theory Conference for Graduate Students and Recent PhD's 2010, University of Michigan, Nov. 2010.
- Conference on Automorphic Forms and Representation Theory, University of Oklahoma, Oct. 2010.
- Working Seminar on Representations of  $p$ -adic Groups, The University of Minnesota, 2009–2010.
- Midwest Conference on Automorphic Forms, Representation Theory, and Number Theory, University of Iowa, Oct. 2009.