

Zhiwei Yun

Contact

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Research Interest

Number theory, Algebraic Geometry and Representation Theory.
More specifically the Langlands program.

Professional History

Professor, Massachusetts Institute of Technology	2018–
Professor, Yale University	2016–2017
Associate Professor, Stanford University	2015–2016
Assistant Professor, Stanford University	2012–2015
CLE Moore Instructor, Massachusetts Institute of Technology	2010–2012
Member, the Institute for Advanced Study	2009–2010

Educational History

Ph.D., Princeton University	2004–2009
Thesis: Towards a Springer theory for global function fields	
Advisor: Robert MacPherson	
B.S., Peking University	2000–2004

Awards

SASTRA Ramanujan Prize (for number theorists under 32)	2012
Gold Medal, the 41st International Mathematical Olympiad (IMO), Korea	2000

Current Grants

Packard Fellowship	2013-2018
NSF DMS-1302071	2013-2017

Publications and preprints

1. (with D.Nadler) *Spectral action in Betti Geometric Langlands*.
Submitted, arxiv:1611.04078.

2. (with D.Nadler) *Geometric Langlands correspondence for $SL(2)$, $PGL(2)$ over the pair of pants*.
Submitted, arxiv:1610.08398.
3. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, III: graded double affine Hecke algebra*.
Submitted, arxiv:1607.07916.
4. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, II*.
Representation Theory 21(2017), 322–353.
5. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, I*.
Representation Theory 21(2017), 277–321.
6. *Lectures on Springer theories and orbital integrals*. (Expository)
To appear in the IAS/Park City Mathematical Series 2015, arXiv:1602.01451.
7. (with W.Zhang) *Shtukas and the Taylor expansion of L -functions*.
Annals of Math. 186 (2017), no. 3, 767–911.
8. (with A.Oblomkov) *Geometric representations of graded and rational Cherednik algebras*.
Advances in Math., 92 (2016), 601-706.
9. *Epipelagic representations and rigid local systems*.
Selecta Math. (N.S.), 22 (2016), no. 3, 1195-1243.
10. *Rigidity in the Langlands correspondence and applications*. (Expository)
Proceedings of ICCM 2013, to appear. Available from my web page.
11. *Galois representations attached to moments of Kloosterman sums and conjectures of Evans*
(with an appendix by Christelle Vincent).
Compositio Math. 151 (2015), no. 1, 68-120.
12. *Rigidity in automorphic representations and local systems*.
Current Development in Mathematics 2013, International Press, 2015.
13. (with D.Maulik) *Macdonald formula for curves with planar singularities*.
J. Reine Angew. Math., 694 (2014), 27-48.
14. *The spherical part of local and global Springer actions*.
Math. Ann. 359 (2014), no. 3-4, 557-594.
15. *Motives with exceptional Galois groups and the inverse Galois problem*.
Invent. Math., 196 (2014), Issue 2, 267-337.

16. *Orbital integrals and Dedekind zeta functions.*
The Legacy of Srinivasa Ramanujan, Ramanujan Math. Soc. Lecture Notes Series No.20, 2013, 399-420.
17. (with G.Lusztig) *A $(-q)$ analogue of weight multiplicities.*
Journal of the Ramanujan Math. Soc., 28A (Special Issue-2013) 311-340.
18. (with R.Bezrukavnikov) *On Koszul duality for Kac-Moody groups.*
Represent. Theory 17 (2013), 1-98.
19. (with J.Heinloth and B.C.Ngô) *Kloosterman sheaves for reductive groups.*
Annals of Math., 177 (2013), no.1, 241-310.
20. *Langlands duality and global Springer theory.*
Compositio Math., 148 (2012), no.3, 835-867.
21. *Global Springer Theory.*
Advances in Math. 228 (2011), 266-328.
22. (with X.Zhu) *Integral homology of loop groups via Langlands dual groups.*
Represent. Theory 15 (2011), 347-369.
23. *The fundamental lemma of Jacquet and Rallis* (with an appendix by J.Gordon).
Duke Math. J. 156 (2011), no. 2, 167-227.
24. *Goresky-MacPherson calculus for the affine flag varieties.*
Canad. J. Math. 62 (2010), no. 2, 473-480.
25. *Towards a global Springer theory I, II, III.*
Princeton U. Ph.D. Thesis, 2009. arXiv:0810.2146; arXiv:0904.3371; arXiv:0904.3372
26. *Weights of mixed tilting sheaves and geometric Ringel duality.*
Selecta Math. (N.S.) 14 (2009), no. 2, 29-320.

Selected talks

Invited Lecture, International Congress of Mathematicians, Brazil, Aug. 2018

Spring Lectures, University of Michigan, Mar. 2017

Ritt Lectures, Columbia University, Dec. 2016

Morningside Lecture, Int'l Congress of Chinese Mathematicians, Beijing, Aug. 2016

Lang Lecture, Yale University, Apr. 2016

Bay Area Algebraic Number Theory and Arithmetic Geometry Day, Santa Cruz, Dec. 2015

Invited Address, AMS Western sectional meeting, Fullerton, Oct. 2015
 Invited speaker, AMS Summer Institute in Algebraic Geometry, Salt Lake City, Jul. 2015
 Minicourse on Springer theory, PCMI Graduate Summer School, Jul. 2015
 Southern California Number Theory Day for Tate's 90th birthday, UCSD, May 2015
 Number Theory Day, EPF Lausanne, May 2015
 Categorical Structures in Harmonic Analysis, MSRI, Nov. 2014
 Algebra and Number Theory Day, Johns Hopkins Univ., Baltimore, Apr. 2014
 Current Development in Mathematics, Harvard-MIT, Nov. 2013
 Plenary lecture, International Congress of Chinese Mathematicians, Taipei, Jul. 2013
 Sino-French Conference on Arithmetic Geometry, Chern Institute, June 2013
 WAGS (Western Algebraic Geometry Symposium), Harvey Mudd College, Feb. 2013
 Springer Memorial Conference, Hong Kong, Jan. 2013
 The Legacy of Srinivasa Ramanujan, University of Delhi, Delhi, India, Dec. 2012
 Loo-Keng Hua lecture, Chinese Academy of Science, Beijing, Nov. 2012
 AGNES (Algebraic Geometry Northeastern Series), MIT, Apr. 2011
 Pan-Asian Number Theory Conference, Kyoto, Japan, Sep. 2010

Service work

- Editorial Board: *Advances in Math.*
 - Co-organizer of conferences
- Arbeitsgemeinschaft on Higher Gross-Zagier formula, Oberwolfach, Apr. 2017
 Algebraic Lie Theory and Symplectic Geometry, Sanya, Mar. 2016
 Park City Math Institute (PCMI) Summer School and Research Program, Jul. 2015
 Sanya Math Forum– Representation theory of algebraic groups, Dec. 2014
 Langlands Correspondence and Constructive Galois Theory, Oberwolfach, Feb. 2014
 Sanya Math Forum– Langlands program, Sanya, Dec. 2013
 Workshop on Algebraic and Arithmetic Geometry, BICMR, Aug. 2012
 AMS special session “Geometric Rep. Theory”, Kansas State University, Mar. 2012
 Summer program on Arithmetic Geometry, BICMR, Jul-Aug. 2011

- Served as an NSF panelist
- Reviewer for the Mathematical Reviews (MR)
- Referee for: Annals of Math.; Annals of Math. Studies; Inventiones Math.; Compositio Math.; Duke Math J.; Annales ENS; IMRN etc.