

Zhiwei Yun

Contact

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Research Interest

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

Professional History

Professor, Massachusetts Institute of Technology	2018–present
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 and Honors

AMS Fellow	2019
New Horizons Prize in Mathematics (shared with Wei Zhang)	2018
Packard Fellow	2013
SASTRA Ramanujan Prize (for number theorists under 32)	2012
Gold Medal, the 41st International Mathematical Olympiad (IMO), Korea	2000

Publications and preprints

1. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, IV.*
arXiv:1805.10550.

2. (with A.Oblomkov) *The cohomology ring of certain compactified Jacobians.*
Submitted, arXiv:1710.05391.
3. *Hitchin type moduli stacks in automorphic representation theory.*
Proceedings of ICM 2018.
4. (with W. Zhang) *Shtukas and the Taylor expansion of L-functions (II)*
To appear in Annals of Math, arXiv:1712.08026.
5. (with D.Nadler) *Geometric Langlands correspondence for $SL(2)$, $PGL(2)$ over the pair of pants.*
To appear in Compositio Math., arxiv:1610.08398.
6. (with D.Nadler) *Spectral action in Betti Geometric Langlands.*
To appear in Israel Journal of Math. arxiv:1611.04078.
7. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, III: graded double affine Hecke algebra.*
Representation Theory 22(2018), 87–118.
8. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, II.*
Representation Theory 21(2017), 322–353.
9. (with G.Lusztig) *\mathbf{Z}/m -graded Lie algebras and perverse sheaves, I.*
Representation Theory 21(2017), 277–321.
10. *Lectures on Springer theories and orbital integrals.* (Expository)
In “Geometry of Moduli Spaces and Representation Theory”, IAS/Park City Mathematical Series vol 24.
11. (with W.Zhang) *Shtukas and the Taylor expansion of L-functions.*
Annals of Math. 186 (2017), no. 3, 767–911.
12. (with A.Oblomkov) *Geometric representations of graded and rational Cherednik algebras.*
Advances in Math., 92 (2016), 601-706.
13. *Epipelagic representations and rigid local systems.*
Selecta Math. (N.S.), 22 (2016), no. 3, 1195-1243.
14. *Rigidity in the Langlands correspondence and applications.* (Expository)
Proceedings of ICCM 2013, to appear. Available from my web page.
15. *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.

16. *Rigidity in automorphic representations and local systems.*
Current Development in Mathematics 2013, International Press, 2015.
17. (with D.Maulik) *Macdonald formula for curves with planar singularities.*
J. Reine Angew. Math., 694 (2014), 27-48.
18. *The spherical part of local and global Springer actions.*
Math. Ann. 359 (2014), no. 3-4, 557-594.
19. *Motives with exceptional Galois groups and the inverse Galois problem.*
Invent. Math., 196 (2014), Issue 2, 267-337.
20. *Orbital integrals and Dedekind zeta functions.*
The Legacy of Srinivasa Ramanujan, Ramanujan Math. Soc. Lecture Notes Series No.20, 2013, 399-420.
21. (with G.Lusztig) *A $(-q)$ analogue of weight multiplicities.*
Journal of the Ramanujan Math. Soc., 28A (Special Issue-2013) 311-340.
22. (with R.Bezrukavnikov) *On Koszul duality for Kac-Moody groups.*
Represent. Theory 17 (2013), 1-98.
23. (with J.Heinloth and B.C.Ngô) *Kloosterman sheaves for reductive groups.*
Annals of Math., 177 (2013), no.1, 241-310.
24. *Langlands duality and global Springer theory.*
Compositio Math., 148 (2012), no.3, 835-867.
25. *Global Springer Theory.*
Advances in Math. 228 (2011), 266-328.
26. (with X.Zhu) *Integral homology of loop groups via Langlands dual groups.*
Represent. Theory 15 (2011), 347-369.
27. *The fundamental lemma of Jacquet and Rallis* (with an appendix by J.Gordon).
Duke Math. J. 156 (2011), no. 2, 167-227.
28. *Goresky-MacPherson calculus for the affine flag varieties.*
Canad. J. Math. 62 (2010), no. 2, 473-480.
29. *Towards a global Springer theory I, II, III.*
Princeton U. Ph.D. Thesis, 2009. arXiv:0810.2146; arXiv:0904.3371; arXiv:0904.3372
30. *Weights of mixed tilting sheaves and geometric Ringel duality.*
Selecta Math. (N.S.) 14 (2009), no. 2, 29-320.

Selected talks

Distinguished Lecture, UMass Amherst, Oct. 2018
Invited Lecture, International Congress of Mathematicians, Brazil, Aug. 2018
Duke Math Journal conference, Apr. 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

Geometric Satake and beyond, Sanya, Oct. 2018

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.

PhD students

- Shotaro Makisumi (2017 Stanford, currently Ritt Asst Prof. at Columbia)
- Current: Gurbir Dhillon (Stanford), Yau Wing Li (MIT), Andrew Salmon (MIT).