

Curriculum Vitae (Sug Woo Shin)

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Education

- Ph.D., Mathematics, Harvard University, Sep 2002–Jun 2007
Thesis: Counting points on Igusa varieties, supervised by Richard Taylor
- B. Sc., Mathematics, Seoul National University, Mar 1997–Feb 2000
(Military service, May 2000–Jul 2002)

Position

- Associate Professor, UC Berkeley, Jul 2014–present
- Assistant Professor, MIT, Jul 2011–Jun 2014
- Member, Institute for Advanced Study, Sep 2010–Jun 2011
- Dickson Instructor, University of Chicago, Sep 2008–Aug 2010 (on leave: Sep–Dec 2008)
- Member, Institute for Advanced Study, Sep 2007–Dec 2008

Visiting Position

- KIAS scholar, Korea Institute for Advanced Study, 2011–present
- Associate member, Pohang Mathematics Institute, 2011–present

Research Interests

number theory, Langlands program, Shimura varieties, automorphic forms, trace formula

Fellowships/Awards/Grants

- NSF grant DMS-1802039, 2018–2021
- France–Berkeley grant, 2017–2019 (PIs: Stefano Morra and S. W. Shin)
- RTG grant DMS-1646385 (PI: Martin Olsson, co-PIs: S.W. Shin and Xinyi Yuan), 2017–2022
- NSF grant DMS-1501882, 2015–2018
- Sloan Fellowship, 2013–2017
- NSF grant DMS-1162250/1449558, 2012–2015
- MIT NEC Research funds (competitive internal fellowship), 2011–2013
- Clay Math Institute Liftoff Fellowship, 2007
- Harvard Merit Fellowship, 2006–2007
- Juan Carlos I scholarship (funding for travel to the ICM 2006)
- Samsung Scholarship for graduate studies, 2003–2006
- Undergraduate Scholarship from Korea Foundation of Advanced Studies, 1998–2000
- International Mathematical Olympiad (2 golds, 1 bronze), 1994–1996

Publication

- (1) (with Mark Kisin and Keerthi Madapusi Pera) Honda–Tate theory for Shimura varieties, 34 pages, preprint
- (2) (with Simon Marshall) Endoscopy and cohomology of $U(n,1)$, 36 pages, preprint
- (3) (with Julee Kim and Nicolas Templier) “Asymptotic behavior of supercuspidal representations and Sato–Tate equidistribution for families”, 33 pages, preprint
- (4) (with Ana Caraiani, Matthew Emerton, Toby Gee, David Geraghty, and Vytautas Paškūnas) “Patching and the p-adic Langlands program for $GL(2, \mathbb{Q}_p)$ ”, *Compos. Math.* 154 (2018), no. 3, 503–548
- (5) (with Arno Kret) “Galois representations for general symplectic groups”, 66 pages, preprint (2016)
- (6) (with Julee Kim and Nicolas Templier) “Asymptotics and local constancy of characters of p-adic groups”, *Families of automorphic forms and the trace formula, Simons Symposia Proceedings* (2016), 259–295
- (7) (with Tasho Kaletha, Alberto Minguez, and Paul-James White) “Endoscopic classification of representations: inner forms of unitary groups”, 220 pages, preprint (2014)
- (8) (with Peter Sarnak and Nicolas Templier) “Families of L-functions and their symmetry”, *Families of automorphic forms and the trace formula, Simons Symposia Proceedings* (2016), 531–578
- (9) (with Ana Caraiani, Matthew Emerton, Toby Gee, David Geraghty, and Vytautas Paškūnas) “Patching and the p-adic Langlands correspondence”, *Camb. J. Math.* 4 (2016), no.2, 197–287

- (10) (with Sara Arias-de-Reyna, Luis Dieulefait, and Gabor Wiese) “Compatible systems of symplectic Galois representations and the inverse Galois problem III. Automorphic construction of compatible systems with suitable local properties”, *Math. Ann.* 361 (2015), no.3, 909–925
- (11) (with Junehyuk Jung) “More examples” (*appendix* to On sparsity of positive-definite automorphic forms in a family by Junehyuk Jung), *J. Analyse Math.* 129 (2016), no.1, 105–138
- (12) (with Nicolas Templier) “On fields of rationality for automorphic representations”, *Compositio Math.* 150 (2014), no.12, 2003–2053
- (13) (with Nicolas Templier) “Sato-Tate theorem for families and low-lying zeros of automorphic L -functions” (with Appendix A by R. Kottwitz and Appendix B by R. Cluckers, J. Gordon and I. Halupczok), *Invent. Math.* 203 (2016), no. 1, 1–177
- (14) “Supercuspidal part of the mod l cohomology of $GU(1, n - 1)$ -Shimura varieties”, *J. Reine Angew. Math.* 705 (2015), 1–21
- (15) (with Peter Scholze) “On the cohomology of compact unitary group Shimura varieties at ramified split places”, *J. Amer. Math. Soc.* 26 (2013), no.1, 261–294
- (16) “On the cohomological base change for unitary similitude groups” (*appendix* to the paper “Galois representations associated to holomorphic limits of discrete series I: Unitary Groups” by Wushi Goldring), *Compositio Math.* 150 (2014), no.2, 191–228
- (17) “Geometric reductive dual pairs and a mod p theta correspondence”, preprint
- (18) “Abelian varieties and the Weil representations”, *Algebra and Number Theory* 6 (2012), no.8, 1719–1772
- (19) “Automorphic Plancherel density theorem”, *Israel J. Math.* 192 (2012), no.1, 83–120
- (20) “Construction of Galois representations” (survey paper), to appear in *Book Shimura Varieties* (edited by Haines and M. Harris)
- (21) “On the cohomology of Rapoport-Zink spaces of EL-type”, *Amer. J. Math* 134 (2012), no.2, 407–452
- (22) “Galois representations arising from some compact Shimura varieties”, *Ann. of Math.* 173 (2011), no.3, 1645–1741
- (23) “Stable trace formula for Igusa varieties”, *J. Inst. Math. Jussieu* 9 (2010), no.4, 847–895.
- (24) “Counting points on Igusa varieties”, *Duke Math. J.* 146 (2009), no.3, 509–568.

Conferences, Workshops, Schools, and Research Groups I have co-organized

- Intensive lecture series on Logarithmic Riemann-Hilbert correspondences for rigid varieties and applications to Shimura varieties, KIAS, Aug 5–9, 2018
- Simons Symposium: Relative trace formula, Apr 23–27, 2018
- Oberwolfach workshop: Harmonic analysis and the trace formula, May 21–27, 2017
- The Langlands correspondence in arithmetic and geometry, KIAS, Aug 1–5, 2016
- Simons Symposium: Geometric aspects of the trace formula, Apr 10–16, 2016
- AIM Square: The p-adic Langlands Program for non-split groups 3, Sep 13–17, 2015
- AMS Summer Institute in Algebraic Geometry, session co-organizer, Jul 22–27, 2015
- HIM Research in Groups: Families of automorphic forms and the trace formula 2, Jul 5–Jul 17, 2015
- Banff 5-day half workshop: Families of Automorphic Forms and the Trace Formula, Nov 30–Dec 5, 2014
- AIM Square: The p-adic Langlands Program for non-split groups 2, Sep 22–26, 2014
- HIM Research in Groups: Families of automorphic forms and the trace formula, Jun 22–Jul 5, 2014
- Simons Symposium: Families of Automorphic Forms and the Trace Formula, Puerto Rico, Jan 26–Feb 1, 2014
- KIAS intensive lecture series on Shimura varieties and Rapoport-Zink spaces, Jan 13–16, 2014
- AIM Square: The p-adic Langlands Program for non-split groups 1, Jul 15–19, 2013
- Workshop on Modular Forms and Galois Representations, KIAS, Jan 2013
- Banff FRG: The p-adic Langlands Program for non-split groups, Aug 2012
- 2012 Conference on L-functions, Shineville Resort, Jeju island, Aug 2012
- Cohomology of Shimura varieties: Arithmetic Aspects and the Construction of Galois representations, Fields Institute, Mar 2012
- Rigid Geometry and the Local Langlands Correspondence, KIAS, Jan 2–5, 2012
- Theta Festival, Postech, South Korea, Aug 13–19, 2011
- Congruences of modular forms and Galois representations (summer school), Postech, South Korea, Jul 18–30, 2010

Workshops and Conferences attended as a speaker

- 44th Paul Sally Midwest Representation Theory Conference, U Chicago, Apr 12–14, 2019 (projected)
- Conference on Arithmetic Geometry in honor of Rapoport's 71st birthday, Beijing, Mar 18–22, 2019 (projected)
- On the Langlands Program: Endoscopy and Beyond, NUS, Jan 7–11, 2019 (projected)
- p-adic Langlands correspondence, Shimura varieties and perfectoids, Luminy, Jul 2–6, 2018
- Intensive lectures on the Langlands–Rapoport conjecture (10 hour lectures), U Tokyo, May 7–11, 2018
- Arithmetic Geometry and Related Topics, Matsuyama, Japan, Nov 20–22, 2017
- Workshop on Shimura varieties, representation theory and related topics, Kyoto, Japan, Nov 21–25, 2016
- The Asian Mathematical Conference (plenary speaker), Bali, Indonesia, Jul 25–29, 2016
- 2016 Seoul-Tokyo Conference on Number Theory, KIAS, Jun 16–17, 2016
- 2016 AS-NCTS Workshop on Shimura Varieties and Related Topics, Taipei, May 30–Jun 3, 2016
- Workshop on New Developments in Representation Theory, NUS Singapore, Mar 14–25, 2016
- Motives and Automorphic Forms, Oxford, Sep 28–Oct 2, 2015
- AMS Summer Institute in Algebraic Geometry, Utah, Jul 22–27 (3rd week), 2015
- Arithmetic geometry, representation theory and applications, Luminy, Jun 22–26, 2015
- Arithmetic geometry and automorphic representations (workshop II), Vienna, May 6–22, 2015
- p-adic methods in the theory of classical automorphic forms, Montreal, Mar 9–14, 2015
- 2014 Pan Asian Number Theory Conference (ICM satellite), Postech (S. Korea), Aug 5–9, 2014
- The Bellairs workshop in Number Theory: The cohomology of arithmetic groups and the Langlands program, Barbados, May 2–9, 2014
- Simons Symposium: Families of Automorphic Forms and the Trace Formula, Puerto Rico, Jan 26–Feb 1, 2014
- The 4th conference of Tsinghua Sanya international mathematics forum, Sanya, Dec 17–22, 2013
- Conference on arithmetic algebraic geometry, Paderborn, Oct 7–11, 2013
- Modular Representation Theory of Finite and p-adic Groups, IMS (Singapore), Apr 1–26, 2013
- Arithmetic geometry of Shimura varieties, representation theory, and related topics, Hokkaido Univ, Jul 18–22, 2012
- Arithmetic geometry of orthogonal and unitary Shimura varieties, BIRS, Jun 3–8, 2012
- Cohomology of Shimura varieties: Arithmetic Aspects and the Construction of Galois representations, Fields Institute, Mar 19–23, 2012 (speaker/co-organizer)
- Automorphic Forms: Arithmetic and Geometry, ESI, Jan–Feb, 2012
- Rigid Geometry and the Local Langlands Correspondence, KIAS, Jan 2–5, 2012 (speaker/co-organizer)
- Palmetto Number Theory Series XVII, Clemson, Dec 3–4, 2011
- Theta Festival, Postech, South Korea, Aug 13–19, 2011 (speaker/co-organizer)
- Durham Symposium - Automorphic forms and Galois representations, Durham Univ, Jul 18–28, 2011
- Workshop on the arithmetic geometry of Shimura varieties and Rapoport-Zink spaces, Kyoto Univ, Japan, Jul 4–8, 2011
- FRG/RTG Workshop on L-functions, Galois Representations and Iwasawa theory, U of Michigan, May 17–22, 2011
- Automorphic forms: New directions, Oberwolfach, Mar 6–12, 2011
- The 2nd Pan Asian Number Theory Conference, RIMS, Kyoto, Sep 13–17, 2010
- Congruences of modular forms and Galois representations (summer school), Postech, South Korea, Jul 18–30, 2010 (speaker/co-organizer)
- Workshop on Arithmetic Geometry and Related Topics, National Taiwan Univ, Taipei, Jul 12–16, 2010
- Southern California Number Theory Day, UCSD, Mar 6, 2010
- Workshop on Arithmetic Geometry in Kanazawa, Japan, Nov 24–28, 2009
- Midwest Number Theory Day, Univ of Wisconsin, Madison, Nov 6, 2009
- Workshop on Automorphic Representations, Geometry, and Arithmetic, Taipei, Jul 21–24, 2009
- Clay Summer School on Galois Representations, Hawaii, Jun 15–Jul 10, 2009
- Workshop on Shimura Varieties, Automorphic Representations and Related Topics, Kyoto, Japan, Nov 25–28, 2008
- The stable trace formula, automorphic forms, and Galois representations (summer school/workshop), Banff, Canada, Aug 10–22, 2008
- Current developments and directions in the Langlands program, Northwestern Univ., May 10–14, 2008
- Asian conference in Arithmetic Geometry, KIAS, South Korea, Sep 15–19, 2007
- France-Japan conference on Automorphic Endoscopy, Luminy, France, Jun 11–15, 2007
- Mini-workshop on Automorphic Representations and Shimura Varieties, Kyoto, Japan, May 30–31, 2007

PhD advising

- John Binder, MIT, PhD 2016 (currently at Jane Street)
- Alex Youcis, 6th year, UC Berkeley
- Alexander Bertoloni Meli, 5th year, UC Berkeley
- Rahul Dalal, 4th year, UC Berkeley
- Ian Gleason, 4th year, UC Berkeley
- Sander Mack-Crane, 4th year, UC Berkeley
- Zixin Jiang, 3rd year, UC Berkeley
- Dong Gyu Lim, 3rd year, UC Berkeley

Postdoctoral mentoring

- Nahid Walji (visited from U. of Zurich), UC Berkeley, 2014–2015
- Koji Shimizu (Morrey postdoc), UC Berkeley, 2018–2021

As of October 2018