

# Sheng-Chi Liu

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## Employment

2019 - present Associate Professor, Washington State University  
2013 - 2019 Assistant Professor, Washington State University  
2009 - 2013 Visiting Assistant Professor, Texas A&M University

## Education

2003 - 2009 Ph.D. in Mathematics, The Ohio State University  
Thesis Advisor: Wenzhi Luo  
1996 - 2000 B.S. in Mathematics, National Tsing Hua University, Taiwan

## Research Interests

Number Theory, Automorphic Forms and Representation Theory

## Publications

1. *Moments of central  $L$ -values for Maass forms over imaginary quadratic fields* (with Zhi Qi) **Transactions of the American Mathematical Society**, (2022).
2. *Moments of  $S(t, f)$  associated with holomorphic Hecke cusp forms* (with Jemin Shim), **Taiwanese Journal of Mathematics**, (2021).
3. *A  $CL_3$  analog of Selberg's result on  $S(t)$*  (with Shenhui Liu), **Ramanujan Journal**, 56 (2021), 163-181.
4. *Low-lying zeros of  $L$ -functions for Maass forms over imaginary quadratic fields* (with Zhi Qi), **Mathematika**, 66 (2020), 777-805.
5. *The  $L^2$  restriction norm of a Maass form on  $SL_{n+1}(\mathbb{Z})$*  (with Xiaoqing Li and Matt Young), **Mathematische Annalen**, 371 (2018), 1301-1335.
6. *Low-lying zeros for  $L$ -functions associated to Hilbert modular forms of large level* (with Steven J. Miller), **Acta Arithmetica** 180 (2017), 251-266.
7. *A note on mass equidistribution of holomorphic Siegel modular forms*. **Journal of Number Theory** 170 (2017), 185-190.
8. *Rankin-Selberg  $L$ -functions and the reduction of CM elliptic curves* (with Riad Masri and Matt Young), **Research in Mathematical Sciences** (2015), 2:22.
9. *A Kronecker limit formula for totally real fields and arithmetic applications* (with Riad Masri), **Research in Number Theory** (2015), 1:8.
10.  *$L^4$ -norms of the holomorphic dihedral forms of large level*, **Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg** (2015) 85:53-57.

11. *Simultaneous nonvanishing of automorphic L-functions*, **Journal of Number Theory** 147 (2015), 620-632.
12. *Hybrid bounds for quadratic Weyl sums and arithmetic applications* (with Riad Masri), **Forum Mathematicum** 27 (2015), Issue 6, 3397-3423.
13. *The average of the divisor function over values of a quadratic polynomial* (with Riad Masri), **Proceedings of the American Mathematical Society** 143 (2015), 4143-4160.
14. *Simultaneous nonvanishing of  $GL(2) \times GL(2)$  and  $GL(2)$  L-functions*, **Proceedings of the American Mathematical Society** 142 (2014), 1953-1964.
15. *Growth and nonvanishing of restricted Siegel modular forms arising as Saito-Kurokawa lifts* (with Matt Young), **American Journal of Mathematics** Vol. 136, No. 1 (2014), 165-201.
16. *Nonvanishing of Rankin-Selberg L-functions for Hilbert modular forms* (with Riad Masri), **Ramanujan Journal** 34 (2014), No. 2, 227-236.
17. *Simple zeros of primitive Dirichlet L-functions and the asymptotic large sieve* (with Vorrapan Chandee, Yoonbok Lee, and Maksym Radziwill), **Quarterly Journal of Mathematics** 65 (2014), No. 1, 63-87.
18. *Subconvexity and equidistribution of Heegner points in the level aspect* (with Riad Masri and Matt Young), **Compositio Mathematica** 149 (2013), No. 7, 1150-1174.
19. *A note on the variance of the distribution of Heegner points*, **International Journal of Number Theory**, Vol. 8, No. 2 (2012), 525-529.
20. *Determination of  $GL(3)$  cusp forms by central values of  $GL(3) \times GL(2)$  L-functions, level aspect*, **Journal of Number Theory** 131 (2011), 1397-1408.
21. *Determination of  $GL(3)$  cusp forms by central values of  $GL(3) \times GL(2)$  L-functions*, **International Mathematics Research Notices** 2010, Art. ID rnq021, 17pp.
22. *Equidistribution of Hecke eigenforms on the Hilbert modular varieties*, **Journal of Number Theory** 127 (2007), 1-9.

## Grants and Awards

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| 2015 - 2022 | Collaboration Grant for Mathematicians, Simons Foundation  |
| 2016 - 2019 | AIM SQuaRE Award, joint with R. Hoilowinsky (Ohio State Univ.),<br>X. Li (SUNY-Buffalo) and M. Young (Texas A&M Univ.) |
| 2015 - 2016 | CAS external mentor grant  |
| 2013 - 2015 | AMS-Simons Travel Grant  |

## Service

1. Reviewer for MathSciNet
2. Reviewer for NSA proposals
3. Referee for Acta Arithmetica, Annales de L'Institut Fourier, Annales mathématiques du Québec, Annales Academiae Scientiarum Fennicae Mathematica, Bulletin of the Australian Mathematical Society, Compositio Mathematica, Canadian Journal of Mathematics, Forum Mathematicum, International Mathematics Research Notices, International Journal of Number Theory, Journal of Number Theory, Mathematische Annalen, The Ramanujan Journal, The Royal Society of Edinburgh: Proceedings A, Proceedings of the American Mathematical Society, Quarterly Journal of Mathematics, Research in Number Theory.

4. Co-organizer of *Special Session on Analytic Number Theory and Automorphic Forms*, AMS Sectional Meeting, April 22-23, 2017
5. Co-organizer of Combinatorics, Linear Algebra and Number Theory Seminar, Washington State University, 2014 - present
6. Co-organizer of Colloquium at Department of Mathematics, Washington State University, 2013 - present
7. GQE committee Fall 2016; Fall 2018
8. Co-organizer of Texas A&M University Number Theory Seminar, 2009 - 2013

### **Graduate Supervision**

1. **Matthew Jorback**, Ph.D., May 2020.  
Current position: Assistant Professor (tenure-track), Ramapo College.
2. **Jemin Shim**, Ph.D., May 2021.  
Current position: Visiting Assistant Professor, The University of Louisiana Monroe.
3. **Jakob Streipel**, Ph.D., May 2022 (expected).

## Selected Talks

- February 2020 Number Theory Seminar, Texas A&M University  
June 2019 Number Theory Seminar, Zhejiang University, Hangzhou, China  
March 2019 Number Theory Seminar, Oregon state University, OR  
October 2018 Colloquium, University of Idaho, Moscow, ID  
October 2018 Number/Representation Theory Seminar, University of Toronto, Canada  
July 2018 Number Theory Seminar, Institute of Mathematics, Academia Sinica, Taiwan  
May 2017 Number Theory Seminar, Xi'an Jiaotong University, Xi'an, China  
May 2017 Number Theory Seminar, Capital Normal University, Beijing, China  
May 2017 Number Theory Seminar, Morningside Center of Mathematics, Beijing, China  
December 2016 Colloquium, National Tsing Hua University, Hsinchu, Taiwan  
December 2016 Number Theory Seminar, National Center for Theoretical Science, Taiwan  
September 2016 Colloquium, University of Idaho  
June 2016 Number Theory Seminar, Morningside Center of Mathematics, Beijing, China  
February 2016 Number Theory Seminar, The Ohio State University  
November 2015 Number Theory Seminar, Simon Fraser University, BC, Canada  
May 2015 Number Theory Seminar, Stanford University  
May 2014 28th Automorphic Forms Workshop,  
Moab Arts and Recreation Center, Moab, Utah  
October 2013 Colloquium, University of Idaho, Moscow, Idaho  
April 2013 Colloquium, Washington State University, Pullman, WA  
April 2013 Number Theory Seminar, Yale University  
March 2013 TORA IV, University of North Texas, Denton, Texas  
January 2013 Colloquium, Oklahoma State University, Stillwater, OK  
January 2013 AMS joint meeting, San Diego, CA  
December 2012 Number Theory - Representation Theory Seminar,  
University of Wisconsin-Madison  
October 2012 Analysis Seminar, SUNY at Buffalo  
September 2012 Texas-Oklahoma Representations and Automorphic forms conference,  
Oklahoma State University  
May 2012 Noncommutative Geometry: Multiple Connections,  
The Ohio State University  
April 2012 26th Automorphic Forms Workshop,  
University of British Columbia, Vancouver, Canada  
April 2012 Number Theory Seminar, Texas A&M University  
January 2012 Number Theory Seminar, National Taiwan University  
December 2011 Number Theory Seminar, National Center for Theoretical Science, Taiwan  
October 2011 Number Theory Seminar, Texas A&M University  
September 2011 Texas-Oklahoma Representations and Automorphic forms conference,  
University of North Texas  
May 2011 Number Theory Seminar, The Ohio State University  
May 2010 AMS meeting, New Jersey Institute of Technology

February 2010	Number Theory Seminar, Texas A&M University
January 2010	Number Theory Seminar, National Taiwan University
December 2009	Number Theory Seminar, National Center for Theoretical Science, Taiwan
September 2009	Number Theory Seminar, Texas A&M University
March 2007	Graduate Student Number Theory Seminar, The Ohio State University
October 2006	Number Theory Seminar, The Ohio State University

### Conferences and workshops

May 2017	Recent developments in Analytic Number Theory, MSRI, Berkeley, CA
April 2017	Special Session on Analytic Number Theory and Automorphic Forms AMS Sectional Meeting, Washington State University, Pullman, WA
November 2015	Computational Aspect of L-functions, ICERM, Brown University
December 2014	Analysis, Spectra, and Number Theory Princeton University, NJ
April 2014	Applications of Automorphic Forms in Number Theory and Combinatorics Louisiana State University, LA
April 2013	Combinatorics, Multiple Dirichlet Series and Analytic Number Theory ICERM, Brown University
June 2012	Arithmetic Statistics Mathematics Research Communities, Snowbird Resort, Utah
June 2011	The Pretentious View of Analytic Number Theory Mathematics Research Communities, Snowbird Resort, Utah
March 2011	25th Automorphic Forms Workshop Oregon State University, Corvallis, Oregon
March 2010	Workshop on Analytic Number Theory, Institute for Advanced Study, New Jersey
May 2008	Analytic number theory and higher rank groups, the Courant Institute of Mathematical Sciences, New York
June 2008	Conference on Equidistribution on homogeneous spaces, The Ohio State University
July 2007	A Conference on Certain L-Functions on the occasion of Freydoon Shahidi's 60th Birthday, Purdue University
October 2006	Midwest Number Theory Conference for Graduate Students, University of Illinois at Urbana-Champaign
June 2006	Instructional workshop: Automorphic Galois Representation, L-functions and Arithmetic, Columbia University
November 2005	Midwest Number Theory Conference for Graduate Students, University of Wisconsin-Madison

## Teaching Experience

### Washington State University

Fall 2021 Math 220 (Introductory Linear Algebra)  
Math 505 (Abstract Algebra)  
Spring 2021 Math 507 (Advanced Theory of Numbers)  
Fall 2020 Math 525 (General Topology)  
Math 581 (Introduction to Lie Groups and Lie Algebras)  
Fall 2019 Math 505 (Abstract Algebra)  
Math 581 (Complex Analysis)  
Spring 2019 Math 421 (Algebraic Structure)  
Math 507 (Advanced Theory of Numbers)  
Fall 2018 Math 525 (General Topology)  
Spring 2018 Math 421 (Algebraic Structure)  
Math 507 (Advanced Theory of Numbers)  
Fall 2017 Math 505 (Abstract Algebra)  
Spring 2017 Math 302 (Theory of Numbers)  
Math 421 (Algebraic Structure)  
Fall 2016 Math 453/553 (Graph Theory)  
Fall 2015 Math 505 (Abstract Algebra)  
Math 581-2 (Random Matrix Theory)  
Spring 2015 Math 302 (Theory of Numbers)  
Math 421 (Algebraic Structure)  
Fall 2014 Math 453/553 (Graph Theory)  
Spring 2014 Math 421 (Algebraic Structure)  
Fall 2013 Math 453/553 (Graph Theory)

### Texas A&M University

Summer 2013 Research Experience for Undergraduates (Number theory)  
Spring 2013 Math 470 (Communications and Cryptography)  
Fall 2012 Math 221 (Several Variable Calculus)  
Math 251 (Engineering Mathematics III)  
Summer 2012 Math 433 (Applied Algebra)  
Summer Educational Enrichment in Math (for 6th, 7th and 8th grades)  
Spring 2012 Math 251 (Engineering Mathematics III)  
Fall 2011 Math 251 (Engineering Mathematics III)  
Summer 2011 Math 602 (Methods and Applications of PDE)  
Spring 2011 Math 251 (Engineering Mathematics III)  
Fall 2010 Math 308 (Differential Equations)  
Spring 2010 Math 308 (Differential Equations)  
Fall 2009 Math 141 (Business Mathematics I)

## **The Ohio State University**

Summer 2009 Instructor for Math 366 (Discrete Mathematical Structures I)  
Spring 2009 Instructor for Math 131N (Mathematical Analysis for Business II)  
Winter 2009 Instructor for Math 131N (Mathematical Analysis for Business II)  
Autumn 2008 Instructor for Math 150N (Elementary Functions)  
Spring 2008 Instructor for Math 150N (Elementary Functions)  
Winter 2008 Instructor for Math 150N (Elementary Functions)  
Autumn 2007 Instructor for Math 150N (Elementary Functions)  
Spring 2007 Teaching Associate for Math 254 (Calculus and Analytic Geometry IV)  
Winter 2007 Teaching Associate for Math 153 (Calculus and Analytic Geometry III)  
Autumn 2006 Teaching Associate for Math 150 (Elementary Functions)  
Spring 2006 Teaching Associate for Math 152 (Calculus and Analytic Geometry II)  
Autumn 2005 Teaching Associate for Math 151 (Calculus and Analytic Geometry I)  
Spring 2005 Teaching Associate for Math 151 (Calculus and Analytic Geometry I)