

Contact Information

Address: Max Planck Institute for Mathematics
Vivatsgasse 7
53111 Bonn
Germany
E-mail: jlang@mpim-bonn.mpg.de
Website: <http://guests.mpim-bonn.mpg.de/jlang>

Positions Held

Postdoctoral Fellow, Max Planck Institute for Mathematics, August 2017 – July 2018

NSF Postdoctoral Research Fellow, Université Paris 13, September 2016 – July 2017

Education

University of California, Los Angeles, mathematics, Ph.D., 2016

Thesis adviser: Haruzo Hida

Thesis title: Images of Galois representations associated to Hida families

University of Cambridge, pure mathematics, CASM, 2010

Bryn Mawr College, mathematics, B.A./M.A., 2009

summa cum laude, with honors in mathematics

Publications and Preprints

1. (with L. Flapan) *Chow motives associated to certain algebraic Hecke characters*. (submitted)
2. *On images of Galois representations in non-CM Hida families*. *Algebra Number Theory*, Volume 10, No. 1, (2016), 155–194.
3. (with J. Balakrishnan, M. Çiperiani, B. Mirza, and R. Newton) *Shadow lines in the arithmetic of elliptic curves*. *Directions in number theory*, Assoc. Women Math. Ser., 3, Springer, (2016), 33–55.
4. (with M. Daub, M. Merling, N. Pitiwan, A. Pacelli, and M. Rosen) *Function fields with class number indivisible by a prime ℓ* . *Acta Arith.*, Volume 150, No. 4, (2011), 339–359.

Research Interests Galois representations, modular forms, elliptic curves, p -adic interpolation, p -adic L -functions, motives

Honors and Awards

- *Fulbright Research Grant*, 2016, (€1,200), up to 20/year nationally, Fulbright Commission of the U.S. State Department
- *NSF Mathematical Sciences Postdoctoral Research Fellowship*, 2016, (\$150,000), about 35/year nationally, National Science Foundation

- *Fondation Sciences Mathématiques de Paris Postdoctoral Fellowship*, 2016, (€30,000), about 8/year, Fondation Science Mathématiques de Paris (declined)
- *Charles E. and Sue K. Young Graduate Student Award*, 2015, (\$10,000), 4/year out of all UCLA graduate students, UCLA Graduate Division
- *Teaching Award*, 2014, 4/year out of UCLA math graduate teaching assistants, UCLA Department of Mathematics
- *Edward A. Bouchet Graduate Honor Society Inductee*, 2014, 5/year out of all graduate students at UCLA, UCLA Graduate Division
- *NSF Graduate Research Fellowship*, 2010, (~\$121,500), 2,000/year nationally, National Science Foundation
- *Eugene V. Cota Robles Fellowship*, 2010, (~\$96,000), 71/year out of all graduate students at UCLA, UCLA Graduate Division
- *Churchill Scholarship*, 2009, (~\$50,000), 14/year nationally, The Winston Churchill Foundation of the United States

Talks

Invited lectures:

Arithmetic and Algebraic Geometry Seminar, University of Amsterdam (April 2017), *Images of Galois representations associated to Hida families*

Séminaire Mathjeunes, IHES (March 2017), *Images of Galois representations associated to Hida families*

p -adic methods for Galois representations and modular forms workshop, Universitat de Barcelona (February 2017), *Images of Galois representations associated to Hida families*

Number Theory Seminar, Heidelberg University (February 2017), *Images of Galois representations associated to Hida families*

Number Theory Seminar, University of Cambridge (January 2017), *Images of Galois representations associated to Hida families*

AMS Special Session on An Amicable Combination of Algebra and Number Theory (Dedicated to Dr. Helen G. Grundman), Joint Mathematics Meetings, Atlanta, Georgia (January 2017), *Modularity for Schreieder's varieties*

London Number Theory Seminar, Imperial College (December 2016), *Images of Galois representations associated to Hida families*

Bay Area Algebraic Number Theory and Arithmetic Geometry Day, University of California – Berkeley (April 2016), *Images of Galois representations associated to Hida families*

SouthEastern Regional Meeting on Numbers (SERMON XXIX), Graduate Student Invited Speaker, James Madison University (April 2016), *Images of Galois representations*

Distressing Math Collective, Bryn Mawr College (March 2016), *The BSD Conjecture*

Philadelphia Area Number Theory Seminar, Bryn Mawr College (March 2016), *Images of Galois representations*

Number Theory Seminar, University of Oregon (February 2016), *Images of Galois representations associated to Hida families*

Arithmetic Geometry Seminar, University of Regensburg (January 2016), *Images of Galois representations associated to Hida families*

Five Colleges Number Theory Seminar, Amherst College (September 2015), *Images of Galois representations of Hida families*

Number Theory Seminar, Massachusetts Institute of Technology (September 2015), *Images of Galois representations of Hida families*

Mathematics Colloquium, Loyola Marymount University (February 2015), *p-adic interpolation*

Number Theory Seminar, University of Texas at Austin (March 2014), *Images of non-CM Galois representations associated to Hida families of modular forms*

Mathematics Colloquium, California State Polytechnic University (January 2014), *p-adic interpolation*

Contributed talks:

30th Automorphic Forms Workshop, Winston–Salem (March 2016), *Images of Galois representations associated to Hida families*

JMM Contributed Paper Session, Seattle (January 2016), *Images of Galois representations associated to Hida families*

AMS Western Sectional Meeting, CSU – Fullerton (October 2015), *Images of Galois representations associated to Hida families*

BU–Keio U. Workshop, Boston University (September 2015), *Images of Galois representations associated to Hida families*

Number Theory Conference, University of Illinois at Urbana–Champaign (August 2015), *Images of Galois representations associated to Hida families*

Graduate Summer School on New Geometric Techniques in Number Theory, Mathematical Sciences Research Institute (July 2013), *On images of Galois representations associated to non-CM Hida families of modular forms*

Women in Mathematics in Southern California Symposium, Loyola Marymount University (October 2012), *Introduction to p-adic modular forms*

Talks at home institution:

Paris area working group seminars:

January, March 2017, Paris 13: Aspects of Hida's work on the anticyclotomic cyclicity conjecture

February 2017, Jussieu: Kottwitz Sets

April 2017, Paris 13: Weil's Whittaker functions

Mini course at Université Paris 13, Fall 2016: *Images of Galois representations in Hida families* (10 hours of lectures)

UCLA Number Theory Seminar, March 2014: *On the image of non-CM Galois representations attached to Hida families*

Advancement to Candidacy, June 2013: *Images of Big Galois Representations*

UCLA Participating Number Theory Seminar:

Winter 2016: *Basics of Étale Cohomology*

Fall 2015: *Applications of Mazur's Control Theorem*

Winter 2015: *Deformation Theory towards Serre's Conjecture* (4 lectures)

Fall 2014: *Iwasawa's Theorem and the Main Conjecture* (2 lectures)

Spring 2014: *Heuristics for completed cohomology* (2 lectures)

Winter 2014: *Abelian class field theory, via duality theorems*

Fall 2013: *Duality for abelian varieties over local fields and Global Duality Theorems* (2 lectures)

Spring 2013: *Serre's proof of a special case of the Mumford-Tate Conjecture* (2 lectures)

Winter 2013: *Introduction to Abelian Varieties* (2.5 lectures)

Fall 2012: *Families of p -adic modular forms* (2 lectures)

Spring 2012: *Classifying pro- p subgroups of $SL(2, A)$ for a p -adic ring A*

UCLA Graduate Student Seminar:

October 2014: *The Art of Giving a Math Talk*

January 2014: *What is the BSD conjecture?*

November 2012: *The Local-Global Principle*

Part III 2010 Lent seminars: *How to add points on a hyperelliptic curve of genus two*

Part III 2009 Michaelmas seminars: *The Local-Global Principle*

Conference and Workshops Attended

re:boot number theory, June 2017, Duke University (funded participant)

Journées Arithmétiques à Villetaneuse, March 2017, Université Paris 13

p -adic methods in Galois representations and modular forms workshop, February 2016 (planned), Universitat de Barcelona

London-Paris Number Theory Seminar: Perfectoid Spaces, November 2016, Jussieu, Paris

Galois Representations and Automorphic Forms, August 2016, Polish Academy of Sciences Conference Center in Będlewo

The p -adic Langlands Program and Related Topics, May 2016, University of Indiana – Bloomington, presented poster (funded participant)

Bay Area Algebraic Number Theory and Arithmetic Geometry Day, April 2016, University of California – Berkeley (funded participant)

SouthEastern Regional Meeting on Numbers (SERMON XXIX), April 2016, James Madison University (funded participant)

30th Automorphic Forms Workshop, March 2016, Wake Forest University (funded participant)

AMS Western Sectional Meeting, October 2015, CSU – Fullerton

Boston University/Keio University Workshop: Number Theory, September 2015, Boston University, presented poster (funded participant)

Sage Days 69: Women in Sage 6, September 2015, La Jolla (funded participant)

Illinois Number Theory Conference, August 2015, University of Illinois – Urbana-Champaign (funded participant)

p -adic methods in number theory: A conference inspired by the mathematics of Robert Coleman, May 2015, University of California – Berkeley (funded participant)

Southern California Number Theory Day, May 2015, University of California – San Diego

Southern California Number Theory Day, April 2015, California Institute of Technology

p -adic methods in the theory of classical automorphic forms, March 2015, Centre de recherches mathématiques, Montreal (funded participant)

Automorphic forms, Shimura varieties, Galois representations and L -functions, December 2014, Mathematical Sciences Research Institute, Berkeley (funded participant)

Southern California Number Theory Day, October 2014, University of California – Irvine

Introductory Workshop: New Geometric Techniques in Number Theory, August 2014, Mathematical Sciences Research Institute, Berkeley (funded participant)

Connections for Women: New Geometric Techniques in Number Theory, August 2014, Mathematical Sciences Research Institute, Berkeley (funded participant)

Graduate Summer School: Counting Arithmetic Objects, June 2014, Centre de recherches mathématiques, Montreal (funded participant)

p -adic variation in number theory, June 2014, Boston University (funded participant)

Women in Numbers 3, April 2014, Banff International Research Station, Banff, Shadow Lines project group (funded participant)

11th Annual Yale Bouchet Conference on Diversity and Graduate Education, March 2014, Yale University (funded participant)

Arizona Winter School: Arithmetic Statistics, March 2014, University of Arizona, Bjorn Poonen's Project Group (funded participant)

Hot Topics Workshop: Perfectoid Spaces and their Applications, March 2014, Mathematical Sciences Research Institute, Berkeley (funded participant)

Conference on Stark's Conjectures and related topics, September 2013, University of California – San Diego (funded participant)

Graduate Summer School: New Geometric Techniques in Number Theory, July 2013, Mathematical Sciences Research Institute, Berkeley (funded participant)

p-adic modular forms, L-functions, and Galois representations, May 2013, University of California – Los Angeles

Cohomology of Arithmetic Groups Graduate Workshop, May 2013, Chicago (funded participant)

Arizona Winter School: Modular Forms and Modular Curves, March 2013, University of Arizona, Frank Calegari's Project Group (funded participant)

p-adic modular forms and arithmetic, June 2012, University of California – Los Angeles

Joint Mathematics Meetings, January 2017, 2016, 2013, 2012 (funded participant)

Teaching Experience

Teaching Assistant for Graduate Summer School “Automorphic Forms and the Langlands Program”, Mathematical Sciences Research Institute, Summer 2017

University of California – Los Angeles

Teaching Assistant Consultant, Fall 2013 (trained new teaching assistants)

Teaching Fellow, Discrete Mathematics, Spring 2014

Teaching Fellow, Group Theory, Winter 2014

Teaching Fellow, Integration and Infinite Series, Fall 2013

Teaching Assistant, Integration and Infinite Series, Summer 2013

Teaching Assistant, Integration and Infinite Series, Spring 2011

Teaching Assistant for Summer Program for Women in Mathematics, George Washington University, Summer 2012

Counselor for Program in Mathematics for Young Scientists (PROMYS), Boston University, Summer 2010

Bryn Mawr College

Problem Session Holder and Grader, Abstract Algebra II, Spring 2009

Problem Session Holder and Grader, Abstract Algebra I, Fall 2008

Peer Instructor, Linear Algebra, Spring 2008

Peer Instructor, Multivariable Calculus, Fall 2007

Problem Session Holder and Grader, Transitions to Higher Mathematics, Spring 2007

Problem Session Holder, Calculus 101, Fall 2006

Grader, Multivariable Calculus (enriched), Fall 2006

Service and Outreach Activities

Nominated Dr. Helen G. Grundman for AWM Gweneth Humphreys Award for mentorship of undergraduate women in mathematics (Dr. Grundman won the award.)

Served as a referee for *Math Research Letters*, *Documenta Mathematica*, and a Conference Proceedings

Write reviews for Math Reviews

Contributed functionality to the open source software package Sage

Organized and ran advising workshops for UCLA math graduate students applying for NSF Graduate Research Fellowship, 2014, 2015

Co-created and ran a booth on the Monty Hall Problem at UCLA EmpowHer STEM Day, 2014, 2015

President of Graduate Student Organization in the UCLA mathematics department, 2012–2014

Co-founded and co-organized UCLA women in math group (2010–2016)

Panelist at Aftermath Conference for undergraduate math majors interested in graduate school, Harvey Mudd College, February 2013

Served on panel for undergraduate math majors interested in graduate school, University of California – Los Angeles, October 2011

Professional Memberships

American Mathematical Society (AMS)

Association for Women in Mathematics (AWM)

Languages

English (native)

French (intermediate reading, writing, speaking)

German (beginner)