CURRICULUM VITAE

Liang Xiao

Contact Information

University of California at Irvine,
Department of Mathematics,
510H Rowland Hall, Irvine, CA 92697, U.S.

http://math.uci.edu/~lxiao/

(949) 824–8778

Academic Interests

- Slopes of modular forms

- Geometrization of representation theory

- Geometry of Shimura varieties.

- p-adic automorphic forms.

- p-adic Hodge theory and (φ, Γ)-modules.

- Iwasawa theory for non-ordinary modular forms.

- Slopes of Newton polygons.

- Theory of nonarchimedean differential modules and its applications to ramification theory.

Employment

- Dickson Instructor at Mathematics Department, University of Chicago, September 2009–February 2013.

- Assistant Professor at Mathematics Department, University of California at Irvine, March 2013–June 2014

- Assistant Professor at Mathematics Department, University of Connecticut, Storrs, August 2014–present

Education

- Ph.D. in Mathematics Science, Massachusetts Institute of Technology, June 2009 (Advisor: Kiran S. Kedlaya).

- B.S. in Mathematics Science, Peking University, China, in June 2005.

Awards

- CORCL faculty research grant, UC Irvine (2014)

- Simons Foundation Collaboration Grants (Fall 2013 - Summer 2018)

- Newton International Fellowship 2009 (not taken).

- International Mathematics Olympiad: Gold medal, 2001.

Publications

1. (*Joint with Kiran S. Kedlaya*) Differential modules on p-adic polyannuli, **Journal de l'Institut de Mathematiques de Jussieu 9** (2010), 155–201.

2. On ramification filtrations and p-adic differential equations, I: equal characterisitc case, **Algebra and Number Theory 4** (2010), no.**8**, 969–1027.

3. On ramification filtrations and p-adic differential equations, II: mixed characteristic case, **Compositio Mathematica 148** (2012), no.**2**, 415–463.

4. On refined ramification filtrations in the equal characteristic case, **Algebra and Number Theory 6** (2012), no.**8**, 1579–1667.

5. (*Joint with Igor Zhukov*) Ramification of higher local fields, approaches and questions, submitted.

6. (*Joint with Kiran S. Kedlaya and Jonathan Pottharst*) Cohomology of arithmetic families of (φ, Γ)-modules, *to appear in* **Journal of the American Mathematical Society**, `arXiv:1203.5718v3`.

7. (*Joint with Matthew Emerton and Davide Reduzzi*) Galois representations and torsions in the coherent cohomology of Hilbert modular varieties, *to appear in* **Journal für die reine und angewandte Mathematik (Crelle's Journal)**, `arXiv:1307.8003`.

8. Cleanness and log-characteristic cycles of vector bundles with flat connections, *to appear in* **Mathematische Annalen**, `arXiv:1104.1224`.

9. (*Joint with Robert Harron*) On p-adic family of Gauss-Manin connections for nearly overconvergent modular forms, *to appear in* **Annales de l'Institut Fourier**, `arXiv:1308.1732`.

Preprints

1. (*Appendix to "On automorphy of certain Galois representations of GO_4-type" by Tong Liu and Jiu-Kang Yu*) Tensor being crystalline implies each factor being crystalline up to twists, *preprint.*

2. (*Joint with Yichao Tian*) On Goren-Oort strataification for quaternionic Shimura vareities, `arXiv:1308.0790`.

3. (*Joint with Yichao Tian*) p-adic cohomology and classicality of overconvergent Hilbert modular forms, *submitted*, `arXiv:1308.0779`.

4. (*Joint with Chris Davis and Daqing Wan*) Newton slopes for Artin-Scheier-Witt towers, *submitted*, `arXiv:1310.5311`.

5. (*Joint with Davide Reduzzi*) Galois representations and torsions in the coherent cohomology of Hilbert modular varieties, II, *submitted*.

Papers in preparation

1. (*Joint with Jonathan Pottharst*) On the parity conjecture in finite slope.

2. (*Joint with Yichao Tian*) Tate cycles on some quaternionic Shimura varieties over finite fields.

3. (*Joint with David Helm and Yichao Tian*) Tate cycles on some unitary Shimura varieties mod p.

4. (*Joint with Daqing Wan and Jun Zhang*) Slopes of eigencurves over boundary disks.

Conference talks

- Ekedahl-Oort stratification and classicality of overconvergent automorphic forms, *Arithmetic Geometry and Automorphic Form*, Morningside Center, China, August 2012.

- Global triangulation over eigenvarieties, *Second Annual Upstate Number Theory Conference Second Annual Upstate Number Theory Conference*, Rochester University, April 2012.

- On family versions of some arithmetic conjectures, *Arithmetic geometry and representation theory*, Institute for Advanced Study, Hong Kong University of Science and Technology, December 2011.

- Computing log-characteristic cycles using ramification theory, *Memorial Lecture and Conference*, Chicago, April 2011.

- Computing log-characteristic cycles using ramification theory, *AMS Special Session*, March 2011.

- Computing log-characteristic cycles using ramification theory, *Midwest Number Theory Conference for Graduate Students and Recent PhD's*, November 2010.

- Computing log-characteristic cycles using ramification theory, *Berkovich Spaces and p-adic Differential Equations*, IRMA Strasbourg, France, November 2010.

- Non-archimedean differential modules and ramification theory (poster), *Journées de Geometrie Arithmetique de Rennes*, Rennes, July 2009.

Seminar Talks

- Slopes of modular forms, University of California at Irvine, May 2014.

- Galois representations and torsion in the cohomology of Hilbert modular varieties, University of California at San Diego, April 2014

- Slopes of the eigencurve over boundary disks, University of Chicago, February 2014.

- Slopes of the eigencurve over boundary disks, Northwestern University, February 2014.

- Supersingular loci and Tate conjecture for some Shimura varieties mod p, M.I.T., February 2014.

- Galois representations and torsion in the cohomology of Hilbert modular varieties, Boston University, September 2013.

- Cycles on the special fiber of Hilbert modular varieties, University of Connecticut at Storrs, September 2013.

- Goren-Oort stratification of Hilbert modular varieties and Tate conjecture, University of California at Los Angeles, May 2013.

- Goren-Oort stratification of Hilbert modular varieties and Tate conjecture, University of California at San Diego, May 2013.

- Goren-Oort stratification of Hilbert modular varieties and Tate conjecture, Caltech, April 2013.

- Goren-Oort stratification of Hilbert modular varieties and Tate conjecture, University of California at Berkeley, April 2013.

- Goren-Oort stratification of Hilbert modular varieties, University of California at Irvine, April 2013.

- Goren-Oort stratification of Hilbert modular varieties, University of Illinois at Chicago, March 2013.

- Goren-Oort stratification of Hilbert modular varieties and Tate conjecture, Princeton University, March 2013

- Goren-Oort stratification of Hilbert modular varieties, Michigan State University, Feburary 2013.

- Goren-Oort stratification of Hilbert modular varieties, University of Chicago, December 2012.

- On the parity conjecture for Selmer groups of modular forms, Purdue University, February 2012.

- On the parity conjecture for Selmer groups of modular forms, Northwestern University, February 2012.

- On the parity conjecture for Selmer groups of modular forms, University of Texas at Austin, February 2012.

- On the parity conjecture for Selmer groups of modular forms, University of Indiana at Bloomington, January 2012.

- On the parity conjecture for Selmer groups of modular forms, University of California at Irvine, January 2012.

- Computing log-characteristic cycles using ramification theory, Boston College, December 2011.

- On the parity conjecture for Selmer groups of modular forms, University of Minnesota, December 2011.

- On the parity conjecture for Selmer groups of modular forms, Iowa State University, December 2011.

- On the parity conjecture for Selmer groups of modular forms, MIT, November 2011.

- Global triangulation on the eigencurve, Boston University, November 2011.

- On the parity conjecture for Selmer groups of modular forms, University of Illinois at Chicago, November 2011.

- On family versions of some arithmetic conjectures, University of Chicago, November 2011.

- Lecture series: *Euler Systems*, Morningside Center, China, Summer 2011.

- Computing log-characteristic cycles using ramification theory, University of Wisconsin at Madison, April 2011.

- Cohomology of (φ, Γ)-modules and application, Beijing Normal University, China, September 2010.

- Lecture series: *Introduction to p-adic Hodge Theory*, Morningside Center, China, Summer 2010.

- Ramification theory and p-adic differential modules, Northwestern University, May 2010.

- Slope filtration d'après Kedlaya, University of Chicago, May 2010.

- Ramification theory and p-adic differential modules, Nottingham University, May 2009.

- Ramification theory and p-adic differential modules, Columbia University, February 2009.

- Ramification theory and its application to algebraic geometry, MIT STAGE, October 2008.

- Ramification theory for local fields with imperfect residue field, MIT STAGE, November 2007.

- Semistable reduction in p-adic cohomology, MIT STAGE, March 2007.

- Conductors of Galois representations à la Colmez, MIT STAGE, November 2006.

- p-adic modular forms (after Katz), MIT STAGE, September 2006.

- An introduction to algebraic fundamental groups, MIT BAGS, April 2006.

- p-divisible groups, MIT STAGE, March 2006.

Synergistic Activities

- Co-organized University of California Irvine Number Theory Seminar.

- Co-organized University of Chicago Number Theory Seminar.

- Co-organized a workshop on *local proof of local Langlands correspondence*.

- Teach for the REU program at University of Chicago, Summer 2012.

- Referee for *Journal of American Mathematical Society*, *Journal de l'Institut de Math. de Jussieu*, *Journal of Algebraic Geometry*, *Transactions of the American Mathematical Society*, and *Milan Journal of Mathematics*.

- Reviewer for *Mathematics Reviews*.

- Reviewer for *Zentralblatt MATH*.

Teaching Experience

- Fall 2014, Math 5230 Algebraic Number Theory, University of Connecticut, Storrs.

- Spring 2014, Math 232C Algebraic Number Theory, University of California at Irvine.

- Winter 2014, Math 232B Algebraic Number Theory, University of California at Irvine.

- Fall 2013, Math 232A Algebraic Number Theory, University of California at Irvine.

- Spring 2013, Math 121B Linear Algebra, University of California at Irvine.

- Winter 2013, Math 25400 Basic Algebra I, and Math 25500 Basic Algebra II, University of Chicago.

- Spring 2012, Math 25500 Basic Algebra II, and Math 25600 Basic Algebra III, University of Chicago.

- Fall 2011, Math 19620 Linear Algebra, University of Chicago.

- Spring 2011, Math 25500 Basic Algebra II, and Math 25600 Basic Algebra II, University of Chicago.

- Winter 2010, Math 19900 Introduction to Analysis and Linear Algebra, and Math 25400 Basic Algebra I, University of Chicago.

- Spring 2010, Math 16300 Honors Calculus III, University of Chicago.

- Winter 2009, Math 16200 Honors Calculus II, and Math 26200 Point Set Topology, University of Chicago.

- Fall 2008, Recitation for 18.01 Calculus, MIT.

- Spring 2007, Recitation for 18.03 Differential Equations, MIT.

Advising

- Current Graduate students: Rufei Ren (co-advising).

- UC Irvine Undergraduate research project: Craig Skeinke.

- MIT Undergraduate Research Opportunity Program, Fall 2008: Hansheng Diao.

- MIT Research Science Institute, Summer 2008: Edwards Miles, Sung-hun Song.

Personal Information

Born: September 1982
Citizenship: China

Last update May 2014