

Jeff Breeding-Allison

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RESEARCH INTERESTS representations of p -adic reductive groups, automorphic forms, modularity

EDUCATION University of Oklahoma

- Ph.D., Mathematics, May 2011
 - Thesis: *Irreducible non-cuspidal characters of $\mathrm{GSp}(4, \mathbb{F}_q)$*
 - Advisor: Ralf Schmidt
- M.A., Mathematics, July 2008
- B.S., Mathematics, May 2005
 - With Special Distinction

ACADEMIC POSITIONS Boston College

- Visiting Assistant Professor, September 2016 - Present

Fordham University

- Peter M. Curran Visiting Assistant Professor, September 2012 - August 2016

Saint Louis University

- Visiting Assistant Professor, August 2011 - June 2012

University of Oklahoma

- Graduate Assistant, August 2006 - May 2011

PUBLICATIONS

1. *Computations of spaces of paramodular forms of general level* (with C. Poor and D. Yuen), J. Korean Math. Soc. **53** (2016), No. 3, pp. 645–689.
2. *The Gelfand-Graev representation of $\mathrm{GSp}(4, \mathbb{F}_q)$* (with J. Rainbolt), Comm. Algebra (2016), accepted. DOI: 10.1080/00927872.2016.1206341
3. *Irreducible characters of $\mathrm{GSp}(4, q)$ and dimensions of spaces of fixed vectors*, Ramanujan J. 36 (2015), no. 3, 305–354.
4. *Irreducible non-cuspidal characters of $\mathrm{GSp}(4, \mathbb{F}_q)$* , Ph.D. thesis, University of Oklahoma, 2011.

CONFERENCES AND WORKSHOPS

AMS Spring 2017 Eastern Sectional Meeting, Special Session on Automorphic Forms and Arithmetic, Hunter College of CUNY, May 6–7, 2017

- Talk: *Depths of representations expressed in terms of conductors*

31st Automorphic Forms Workshop, East Tennessee State University, March 6–9, 2017

- Talk: *Saito-Kurokawa and Borcherds liftings*

2016 Paul J. Sally, Jr. Midwest Representation Theory Conference, The University of Iowa

30th Automorphic Forms Workshop, Wake Forest University, March 7–10, 2016

- Talk: *Depth zero representations and dimensions of spaces of modular forms*

AMS 2016 JMM, AMS Session on Number Theory I, January 6–9, 2016

- Talk: *Siegel modular forms: Representations, computing spaces, and abelian varieties*

AMS Fall 2015 Eastern Sectional Meeting, Rutgers University, November 14–15, 2015

PANTS XXIV, Emory University, September 12–13, 2015

- Talk: *Paramodular forms restricted to Humbert surfaces*

40th Anniversary Midwest Representation Theory Conference, The University of Chicago, September 5–7, 2014

ACA 2014, Fordham University, July 9–12, 2014

- Local chair

Representations of reductive groups: A conference dedicated to David Vogan on his 60th birthday, MIT, May 19–23, 2014

TORA VI, University of Oklahoma, March 7–9, 2014

- Talk: *Computing spaces of paramodular forms*

AMS Fall 2013 Central Sectional Meeting, Special Session on Automorphic Forms and Representation Theory I, Washington University in St. Louis, October 18–20, 2013

- Talk: *Dimension formulas via the Jacquet functor*

AMS Fall 2013 Eastern Sectional Meeting, Contributed Paper Session I, Temple University, October 12–13, 2013

- Talk: *Jacquet modules and dimensions of spaces of fixed vectors*

CANT 2013, CUNY Graduate Center, May 21–24, 2013

- Talk: *The Jacobsthal function and dimensions of spaces of Siegel modular forms*

Upstate New York Number Theory Conference, Binghamton University, April 26–28, 2013

Automorphic Forms and L-Functions, TU Darmstadt, March 17–19, 2013

TORA III, University of Oklahoma, September 28–30, 2012

- Talk: *Paramodular forms, representations, and varieties*

AMS 2012 JMM, AMS Session on Number Theory, Field Theory, and Polynomials, IV, January 4–7, 2012

- Talk: *Bounds for dimensions of degree 2 new forms*

TORA I, University of North Texas, September 17–18, 2011

- Talk: *Siegel cusp forms of degree two and dimension formulas*

25th Automorphic Forms Workshop, Oregon State University, March 23–26, 2011

- Talk: *Local data for dimensions of Siegel cusp forms*

AMS 2011 JMM, AMS Session on Number Theory, III, January 6–9, 2011

- Talk: *The representation theory of $\mathrm{GSp}(4)$*

Western Number Theory Conference, Utah Valley University, December 15–18, 2010

- Talk: *Admissible representations and cuspidality*

Midwest Number Theory Conference for Graduate Students and Recent PhD's, University of Michigan, November 13–14, 2010

- Talk: *Actions of congruence subgroups on admissible non-supercuspidal representations*

Automorphic Forms and Representation Theory, University of Oklahoma, October 2–3, 2010

- Talk: *Cuspidality of characters of $\mathrm{GSp}(4, \mathbb{F}_q)$*

Modular/Geometric Iwasawa Theory and p -adic L -functions, UCLA, June 14–20, 2010

PCMI 2009 Graduate Summer Sessions, June 28 – July 18, 2009

- Research Theme: *Arithmetic of L -functions*

AMS 2009 JMM, January 5–8, 2009

SEMINAR TALKS

Boston College - Mathematics Department

- Mathematics of Neural Networks Seminar
 - November 8, 2017 - Training neural networks
 - November 1, 2017 - Convolutional neural networks
 - October 4, 2017 - Feedforward neural networks
- Number Theory and Algebraic Geometry Seminar
 - March 16, 2017 - Modularity of abelian varieties

Boston University - Department of Mathematics

- Number Theory Seminar
 - November 6, 2017 - Paramodular forms and Siegel modular threefolds

James Madison University - Department of Mathematics

- Reading Seminar
 - February 16, 2015 - Explicitly computing spaces of paramodular forms

Southern Illinois University - Department of Mathematics

- Reading Seminar
 - March 8, 2012 - Paramodular forms, representations, and varieties

Saint Louis University - Department of Mathematics and Computer Science

- Algebra Seminar
 - Sept. 15, 2011 - The passage of modular forms to automorphic representations

University of Oklahoma - Department of Mathematics

- Representation Theory Seminar
 - Oct. 23, 2009 - Iwasawa theory and étale cohomology groups
 - Sept. 4, 2009 - A pre-motivic approach to motivic L-functions II
 - Aug. 28, 2009 - A pre-motivic approach to motivic L-functions I
 - Oct. 31, 2008 - The Irreducible Characters of $\mathrm{Sp}(4)$ over a Finite Field
 - March 9, 2007 - Riemann Zeta Function: Special Values
- Student Algebra Seminar
 - Sept. 30, 2010 - Siegel cusp forms
 - March 9, 2010 - Algebraic Geometry II
 - March 2, 2010 - Algebraic Geometry I
 - Oct. 2, 2009 - Iwasawa Theory of the Selmer Group II
 - Sept. 25, 2009 - Iwasawa Theory of the Selmer Group I
 - April 30, 2009 - Galois Number Fields
 - Jan. 29, 2009 - The Chord-Tangent Group Law for Elliptic Curves
 - Sept. 9, 2008 - Artinian K -algebras
 - April 8, 2008 - Representations of $\mathrm{GSp}(6, \mathbb{R})$
 - March 11, 2008 - Lie Superalgebras and the Dirac Operator II
 - March 4, 2008 - Lie Superalgebras and the Dirac Operator I
 - Jan. 29, 2008 - Structure Theory of Semisimple Groups and Linear Connected Reductive Groups
 - Jan. 22, 2008 - Formal Systems: Paradox and Meaning
 - Nov. 6, 2007 - Modular Forms and L -functions
 - Sept. 11, 2007 - Semisimple Rings and Modules II
 - Sept. 4, 2007 - Semisimple Rings and Modules I
 - Feb. 20, 2007 - Introduction to Category Theory II
 - Feb. 13, 2007 - Introduction to Category Theory I
 - Dec. 7, 2006 - First-order Languages and Zermelo-Fränkel Set Theory
- Student Topology and Geometry Seminar
 - February 17, 2010 - Étale sheaves and étale cohomology II
 - February 10, 2010 - Étale sheaves and étale cohomology I
- Graduate Student Seminar
 - Oct. 8, 2007 - Frame Fields and the Frenet Formulas
 - Feb. 12, 2007 - Roots of Unity and Cyclotomic Polynomials
 - Dec. 4, 2006 - Model Theory

TEACHING
EXPERIENCE

Boston College

- Complex Variables - Fall 2016
- Introduction to Abstract Mathematics - Spring 2017
- Multivariable Calculus - Fall 2016, Spring 2017
- Calculus I - Fall 2017

Fordham University

- Number Theory - Fall 2014
- Differential Equations - Spring 2014, Spring 2015
- Linear Algebra I - Spring 2014
- Discrete Mathematics - Summer 2013, Summer 2014, Summer 2015
- Mathematical Modeling - Fall 2013
- Multivariate Calculus II - Spring 2016
- Multivariate Calculus II (recitation) - Spring 2013, Fall 2015
- Multivariate Calculus I - Spring 2013, Fall 2015
- Calculus II - Spring 2013
- Calculus I - Fall 2015
- Calculus I (recitation) - Spring 2013, Spring 2015, Fall 2015
- Applied Calculus I - Fall 2012, Spring 2016
- Math for Business: Calculus - Fall 2012, Summer 2015
- Precalculus - Summer 2013, Summer 2014
- Finite Mathematics - Fall 2013, Fall 2014

Saint Louis University

- Introduction to Linear Algebra - Spring 2012
- Differential Equations - Fall 2011
- Calculus II - Spring 2012
- Calculus I - Fall 2011

University of Oklahoma

- Calculus III - Summer 2010
- Calculus II (recitation) - Spring 2010
- Calculus I (recitation) - Fall 2008, Fall 2009, Spring 2011
- Precalculus for Business, Life and Social Sciences - Summer 2008
- Elementary Functions/Precalculus and Trigonometry - Spring 2007, Spring 2008, Spring 2009, Fall 2010
- Intro. to Elementary Functions/College Algebra - Fall 2006, Summer 2007, Fall 2007

SERVICE

Boston College

- Mathematics of Neural Networks
 - Co-organizer (with Eli Grigsby): Fall 2017
- College of Arts and Sciences
 - Academic Misconduct and Appeals Board Member: Spring 2008 - Spring 2011

Fordham University

- Putnam Team supervisor: 2012, 2013, 2014, 2015
- Math Club faculty advisor: 2012-2013, 2013-2014, 2014-2015, 2015-2016
- Mathematics Placement Exam Committee member: 2014, 2015
- Undergraduate Committee member: 2013
- Fordham University Math Program for Talented Youth instructor: Spring 2013

Saint Louis University

- Mathematics and Computer Science Club Blogmaster: 2011-2012
- Judge for the 18th Annual Graduate Student Association Research Symposium, April 27, 2012

University of Oklahoma

- Mathematics Graduate Students Association
 - Co-founder
 - President: Fall 2009, Spring 2010
 - Vice President: Fall 2008, Spring 2009
- Student Algebra Seminar
 - Organizer: Fall 2007, Spring 2008, Fall 2008
- College of Arts and Sciences
 - Academic Misconduct and Appeals Board Member: Spring 2008 - Spring 2011

MEMBERSHIPS

American Mathematical Society
Society for Industrial and Applied Mathematics