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Curriculum Vitae

Citizenship: USA

Date of Birth: October 9, 1976

Place of Birth: Stevens Point, Wisconsin

Professional Positions:

- August 2002 - August 2005, NSF VIGRE Visiting Research Assistant Professor, University of Illinois at Urbana-Champaign.
- August 2005 - August 2009, Palmetto Assistant Professor, University of South Carolina.
- August 2009 - present, Associate Professor, University of South Carolina.

Education:

- Ph.D., August 2002, Pure Mathematics, University of Wisconsin at Madison. Advisor: K. Ono.
- B.S., May 1999, Pure Mathematics, University of Wisconsin at Madison.

Research Interests:

- modular forms.
- Maass forms.
- partitions and q -series.

Grants:

- 2006 - 2009: National Science Foundation Standard Grant
DMS-0600400, Modular Forms and Number Theory (PI), \$109,930.
- 2007 - 2008: National Science Foundation Conference Grant
DMS-0703547, Palmetto Number Theory Series (co-PI), \$7413.
- 2008 - 2009: National Science Foundation Conference Grant
DMS-0801150, Palmetto Number Theory Series (PI), \$7950.
- 2008 - 2009: National Security Agency Conference Grant
Palmetto Number Theory Series (PI), \$10,070.
- 2009 - 2010: National Science Foundation Conference Grant
DMS-0901732, Palmetto Number Theory Series (co-PI), \$11,096.
- 2009 - 2012: National Science Foundation Standard Grant
DMS-0901068, Harmonic Maass Forms (PI), \$121,000.
- 2010 - 2011: National Science Foundation Conference Grant
DMS-1001553, Palmetto Number Theory Series (PI), \$13,423.
- 2010 - 2011: National Security Agency Conference Grant
Palmetto Number Theory Series (PI), \$15,513.
- 2011 - 2012: National Science Foundation Conference Grant
DMS-1101301 Palmetto Number Theory Series (co-PI), \$11,223.

Publications:

- (1) Congruences for ${}_2F_1$ hypergeometric functions over finite fields.
Ramanujan Journal **5** (2001), no. 4, 385-390.
- (2) Swinnerton-Dyer type congruences for certain Eisenstein series.
q-Series with Applications to Combinatorics, Number Theory, and Physics
(Urbana, IL, 2000), 93-108, Contemporary Mathematics, 291, Amer. Math. Soc.,
Providence, RI, 2001.
- (3) Parity of the partition function in arithmetic progressions, II. (with K. Ono)
Bulletin of the London Mathematical Society **33** (2001), no. 5, 558-564.
- (4) Congruences for 2^t -core partition functions.
Journal of Number Theory **92** (2002), no. 1, 131-138.
- (5) Exceptional congruences for coefficients of certain eta-product newforms.
Journal of Number Theory **98** (2003), no. 2, 377-389.
- (6) Arithmetic properties of the partition function. (with S. Ahlgren)
Inventiones Mathematicae **153** (2003), no. 3, 487-502.
- (7) Exceptional congruences for powers of the partition function.
Acta Arithmetica **111** (2004), no. 2, 187-203.

- (8) Coefficients of half-integral weight modular forms modulo ℓ^j . (with S. Ahlgren)
Mathematische Annalen **331** (2005), no. 1, 219-241.
- (9) 2-adic properties of Hecke traces of singular moduli.
Mathematics Research Letters **12** (2005), no. 4, 593-609.
- (10) Non-vanishing of the partition function modulo small primes.
International Mathematics Research Notices (2006), Art. ID 46120, 17 pp.
- (11) Central critical values of modular L -functions and coefficients of half-integral weight modular forms modulo ℓ . (with S. Ahlgren)
American Journal of Mathematics **129** (2007), no. 2, 429-454.
- (12) Odd coefficients of weakly holomorphic modular forms. (with S. Ahlgren)
Mathematics Research Letters **15** (2008), no. 3, 409-418.
- (13) Arithmetic properties of certain level one mock modular forms.
International Journal of Number Theory **6** (2010), no. 1, 185-202.
- (14) Quadratic AGM and p -adic limits arising from modular forms. (with S. Garthwaite)
Bulletin of the London Mathematical Society **42** (2010), no. 3, 527 - 537.
- (15) On the vanishing of Fourier coefficients of certain genus zero newforms.
(with S. Garthwaite and J. Webb).
International Journal of Number Theory, **7** (2011), no. 5, 1229-1245.
- (16) Congruences for the partition function modulo prime powers. (with J. Webb)
Transactions of the American Mathematical Society, accepted (36 pages).

Invited Conference Talks:

- March 2002: *Exceptional congruences for modular form coefficients*, AMS Special Session on Number Theory, Atlanta, GA.
- October 2002: *Arithmetic properties of the partition function*, AMS Special Session on Arithmetic Algebraic Geometry, Madison, WI.
- May 2003: *Arithmetic properties of the partition function*, AMS Special Session on q -Series and Partitions, San Francisco, CA.
- November 2003: *Coefficients of half-integral weight modular forms modulo ℓ^j* , Integers Conference 2003, Carrollton, GA.
- November 2004: *Arithmetic properties of the partition function*, Conference on Additive Number Theory, Gainesville, FL.
- March 2005: *Non-vanishing of central critical values of modular L -functions modulo ℓ* , AMS Special Session on L -functions, Bowling Green, KY.
- April 2006: *Non-vanishing of the partition function modulo small primes*, AMS Special Session on Number Theory, South Bend, IN.
- April 2006: *Non-vanishing of the partition function modulo small primes*, AMS Special Session on q -series and Partitions, San Francisco, CA.
- October 2006: *Non-vanishing of the partition function modulo small primes*, 21st Annual Clemson University Mini-Conference on Combinatorics and Optimization, Clemson, SC.
- October 2007: *Odd coefficients of weakly holomorphic modular forms*, Integers Conference 2007, Carrollton, GA.
- January 2008: *Odd coefficients of weakly holomorphic modular forms*, AMS Special Session on Automorphic Forms and Related Topics, San Diego, CA.
- March 2008: *Mock modular forms on $SL_2(\mathbb{Z})$* , Conference on Partitions, q -series, and Modular Forms, Gainesville, FL.
- March 2008: *Eulerian series and modularity*, MAA Special Session on Combinatorial Number Theory, Charleston, SC.
- January 2009: *Mock modular forms on $SL_2(\mathbb{Z})$* , AMS Special Session on Automorphic and Modular Forms, Washington, D.C.
- October 2009: *The arithmetic-geometric mean and p -adic limits of modular forms*, AMS Special Session on Modular and Automorphic Forms, Boca Raton, FL.
- December 2009: *The arithmetic-geometric mean and p -adic limits of modular forms*, International Conference on Number Theory, SASTRA University, Kumbakonam, India.

Invited Seminar and Colloquium Talks:

- February 2004: *Coefficients of half-integral weight modular forms modulo ℓ^j* , Number theory seminar, University of Wisconsin at Madison.
- October 2004: *Half-integral weight modular forms with few non-vanishing coefficients modulo ℓ* , Number theory seminar, University of Wisconsin at Madison.
- October 2004: *Non-vanishing of central critical values of modular L -functions modulo ℓ* , Number theory seminar, Purdue University.
- November 2004: *Non-vanishing of central critical values of modular L -functions modulo ℓ* , Number theory seminar, Texas A&M University.
- January 2005: *Arithmetic properties of the Fourier coefficients of modular forms*, Department colloquium, University of Oregon.
- January 2005: *Arithmetic properties of the Fourier coefficients of modular forms*, Department colloquium, University of South Carolina.
- January 2005: *Arithmetic properties of the Fourier coefficients of modular forms*, Department colloquium, University of Pittsburgh.
- February 2005: *Arithmetic properties of the Fourier coefficients of modular forms*, Department colloquium, Texas A&M University.
- February 2005: *Arithmetic properties of the Fourier coefficients of modular forms*, Department colloquium, University of Colorado.
- February 2005: *Arithmetic properties of the Fourier coefficients of modular forms*, Department colloquium, University of Iowa.
- April 2005: *Non-vanishing of central critical values of modular L -functions modulo ℓ* , Number theory seminar, Johns Hopkins University.
- October 2005: *Non-vanishing of central critical values of modular L -functions modulo ℓ* , Number theory seminar, University of Georgia.
- October 2005: *Modular forms and partitions*, VIGRE seminar, University of Georgia.
- February 2006: *Modular forms and partitions*, Department colloquium, Furman University.
- April 2006: *Arithmetic properties of the partition function*, Number theory seminar, Clemson University.
- April 2006: *Non-vanishing of $p(n)$ modulo 3*, Number theory seminar, Penn State University.
- June 2006: *Ramanujan's congruences*, REU seminar, University of Wisconsin at Madison.

- June 2006: *Ramanujan's congruences*,
REU seminar, Clemson University.
- March 2008: *Mock modular forms on $SL_2(\mathbb{Z})$* ,
Number theory seminar, Texas A&M University.
- June 2008: *Theta cycles in the study of partition congruences*,
REU seminar, University of Wisconsin at Madison.
- April 2009: *Modular forms and partitions*,
Department colloquium, Bucknell University.
- April 2009: *Hecke operators in the study of harmonic Maass forms*,
Seminar, Bucknell University.
- June 2009: *Quadratic AGM and p -adic limits of modular forms*,
REU seminar, University of Wisconsin at Madison.
- September 2009: *Modular forms and partitions*,
Department colloquium, Georgia Southern University.
- February 2010: *Quadratic AGM and p -adic limits of modular forms*,
Number theory seminar, University of Florida.
- February 2010: *Modular forms and partitions*,
Department colloquium, University of Florida.
- June 2010: *The irrationality of $\zeta(3)$ and arithmetic properties of Apery numbers*,
REU seminar, Clemson University.
- September 2010: *Quadratic AGM and p -adic limits of modular forms*,
Number theory seminar, Emory University.
- November 2010: *Quadratic AGM and p -adic limits of modular forms*,
Number theory seminar, Brigham Young University.
- August 2011: *The partition function modulo prime powers*,
Number theory seminar, Emory University.

Other Talks:

- May 2000: *Congruences for 2^t -core partition functions*, Millennial Conference on Number Theory, Urbana, IL.
- October 2000: *Parity of the partition function in arithmetic progressions*, q -Series with Applications to Combinatorics, Number Theory, and Physics, Urbana, IL.
- December 2000: *Parity of the partition function in arithmetic progressions*, West Coast Number Theory Conference, San Diego, CA.
- May 2001: *Exceptional congruences for modular form coefficients*, Illinois Number Theory Conference, Urbana, IL.
- December 2001: *Exceptional congruences for modular form coefficients*, West Coast Number Theory Conference, Pacific Grove, CA.
- May 2002: *Exceptional congruences for modular form coefficients*, 7th Meeting of the Canadian Number Theory Association, Montreal, Canada.
- October 2003: *Coefficients of half-integral weight modular forms modulo ℓ^j* , Midwest Number Theory Conference for Graduate Students and Recent PhDs, Madison, WI.
- December 2003: *Coefficients of half-integral weight modular forms modulo ℓ^j* , West Coast Number Theory Conference, Pacific Grove, CA.
- March 2004: *2-adic properties of traces of singular moduli*, 18th Annual Workshop on Automorphic Forms and Related Topics, Santa Barbara, CA.
- April 2004: *Coefficients of half-integral weight modular forms modulo ℓ^j* , Conference in Honor of Morris Newman's 80th Birthday, Santa Barbara, CA.
- June 2004: *2-adic properties of traces of singular moduli*, 8th Meeting of the Canadian Number Theory Association, Toronto, Canada.
- December 2004: *2-adic properties of traces of singular moduli*, West Coast Number Theory Conference, Las Vegas, NV.
- December 2005: *Central critical values of modular L -functions modulo ℓ* , West Coast Number Theory Conference, Pacific Grove, CA.
- March 2006: *Non-vanishing of the partition function modulo small primes*, Southeast Regional Meeting on Numbers, Greenville, SC.
- July 2006: *Non-vanishing of the partition function modulo small primes*, 9th Meeting of the Canadian Number Theory Association, Vancouver, Canada.
- April 2007: *Non-vanishing of weakly holomorphic modular form coefficients modulo ℓ and applications*, Southeast Regional Meeting on Numbers, Winston-Salem, NC.

- May 2007: *Coefficients of weakly holomorphic modular forms modulo ℓ* , Illinois Number Theory Fest, Urbana, IL.
- October 2007: *Odd coefficients of weakly holomorphic modular forms*, Palmetto Number Theory Series III, Charleston, SC.
- April 2008: *Mock modular forms on $SL_2(\mathbb{Z})$* , Southeast Regional Meeting on Numbers, Clemson, SC.
- September 2009: *Quadratic AGM and p -adic limits of modular forms*, Palmetto Number Theory Series X, Savannah, GA.

Teaching:

- University of Wisconsin at Madison:
 - Calculus teaching assistant: Fall 2001, Spring 2002.
- University of Illinois at Urbana-Champaign:
 - Differential equations and orthogonal functions (Math 285): Fall 2002.
 - Mathematics for high school teachers (Math 305): Spring 2003.
 - Number theory: (Math 353) Fall 2003, (Math 453) Spring 2005.
 - Discrete mathematics: (Math 213) Spring 2004.
 - Combinatorics: (Math 413) Fall 2004.
- University of South Carolina:
 - Algebra I (undergraduate): (Math 546) Fall 2009.
 - Algebra I (graduate): (Math 701) Fall 2012.
 - Algebra II (undergraduate): (Math 547) Spring 2010.
 - Algebra II (graduate): (Math 702) Spring 2012.
 - Algebraic number theory: (Math 784) Spring 2008, Spring 2010.
 - Arithmetic of elliptic curves: (Math 788E) Fall 2008.
 - Calculus I: (Math 141) Fall 2005.
 - Calculus II: (Math 142) Fall 2010, Spring 2011.
 - Calculus for business administration and social science: (Math 122) Fall 2008.
 - Discrete structures: (Math 374) Spring 2009.
 - Foundations of geometry: (Math 531) Fall 2011.
 - Introduction to modular forms: (Math 788B) Fall 2006, Spring 2012.
 - Linear algebra: (Math 544) Spring 2006, Spring 2007, Fall 2007, Fall 2010.
 - Number theory: (Math 580) Fall 2009.
 - Vector calculus: (Math 241) Spring 2009, Fall 2011.
 - Vector analysis: (Math 550) Spring 2011.

Seminar and Conference Organization:

- At the University of Illinois:
 - Math 500, graduate student seminar series, co-organizer with Patrick Bahls (Fall 2003, Spring 2004).
 - Seminar on “Topics in Modular Forms and Number Theory”, co-organizer with Scott Ahlgren (Spring 2004).
 - Illinois Number Theory Conference, co-organizer with Scott Ahlgren (Spring 2004).
 - Department number theory seminars, organizer (Fall 2004, Spring 2005).
- At the University of South Carolina:
 - Department number theory seminar, organizer (Fall 2005-).
 - Special Session on “Modular Forms and Analytic Number Theory,” Fall 2006 Southeast Sectional Meeting of the AMS, Fayetteville, AR, co-organizer with Gang Yu.
 - Special Session on “Modular Forms in Number Theory,” Fall 2011 Southeast Sectional Meeting of the AMS, Winston-Salem, NC, co-organizer with Jeremy Rouse.
 - Palmetto Number Theory Series (PANTS): I (Fall 2006), IV (Fall 2007), VIII (Fall 2008), XI (Fall 2009), XIV (Fall 2010), co-organizer with Michael Filaseta.

Departmental Service:

- Committee Work:
 - Assessment Committee (Fall 2010 - Spring 2011).
 - Colloquium Committee (Chair, Fall 2011-).
 - Faculty Advisory Committee (Fall 2007- Spring 2012).
 - Faculty Senate representative (Fall 2007 - Spring 2010).
 - Graduate Student Placement Committee (Fall 2011-).
 - High School Math Contest Committee (Fall 2005, Fall 2009 - Spring 2011).
 - Hiring Committee (Fall 2006 - Spring 2007; Chair, algebra search Fall 2010 - Spring 2011).
 - MAA Liaison (Fall 2008 - Spring 2011).
 - Mathematics Department Chair Search Committee (Spring 2008).
 - Qualifying Exam Committee (Chair, Spring 2006 - Fall 2006, Fall 2011).
 - Undergraduate Advising, Upper Division Majors (Fall 2005-).
 - Undergraduate Advisory Council (Fall 2008 - Spring 2011).

- Contest Judging:
 - Illinois Council of Mathematics Teachers Math Contest High School State Finals, University of Illinois at Urbana-Champaign (2004, 2005).
 - University of South Carolina High School Math Constest (2006, 2010-).
 - University of South Carolina Region II Science and Engineering Fair (2006-).
 - University of South Carolina Junior Science and Humanities Symposium (2009-).

Professional Service:

- American Mathematical Society Southeast Section Program Committee (2010 - 2012); Chair: (2011 - 2012).
- Referee work (59 articles): Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg, Acta Arithmetica, Advances in Mathematics, American Mathematical Monthly, Annals of Combinatorics, Canadian Journal of Mathematics, Discrete Mathematics, Electronic Journal of Combinatorics, Fields Institute Communications Series, Integers, International Journal of Mathematics and Mathematical Sciences, International Journal of Number Theory, International Mathematics Research Notices, Israel Journal of Mathematics, Involve, Journal de Théorie des Nombres Bordeaux, Journal of Combinatorial Theory, Series A, Journal of Computational Mathematics and Optimization, Journal of Number Theory, Monatshefte für Mathematik, Proceedings of the American Mathematical Society, Ramanujan Journal, Rocky Mountain Journal of Mathematics. Transactions of the American Mathematical Society.
- Review work:
 - Mathematical Reviews (2002 - present, 65 articles).
 - Reviewer of National Science Foundation (NSF) and National Security Agency (NSA) grants: (2006 - present).

Advising:

- High school students:
 - External advisor for Senior Thesis of Catherine Menge, Heathwood Hall Episcopal High School (Fall 2005 - Spring 2006).
 - Jake Baker, Spring Valley High School (Fall 2009).
- Undergraduate students:
 - 2005-2008 : University of South Carolina Pi Mu Epsilon and Gamecock Math Club co-advisor with Maria Girardi and Ronda Sanders.
 - Second reader for Senior Honors Thesis of Matt Elder (2006), Jennifer Mason (2007).
 - Faculty mentor for Hudson Harper, Magellan Scholar 2009 - 2010 (internal research grant: \$2500).

- Graduate students:
 - MA students: Jonathan Mason (July 2007), Jennifer Larson (May 2008).
 - MS students: Mohamad Youssef (July 2007).
 - Doctoral Students:
 - * John Webb (Ph.D. May 2011);
Visiting Assistant Professor, Wake Forest University, Fall 2011 - .
 - * Kenny Brown (in-progress).
 - Doctoral Defense Committees (at the University of Illinois):
Boon Pin Yeap (2003), Heekyoung Hahn (2004), Hamza Yesilyurt (2004).
 - Doctoral Defense Committees (at the University of South Carolina):
Dan Baczkowski (2009), Pradipto Banerjee (2010).

Awards and Honors:

- Phi Beta Kappa,
University of Wisconsin at Madison, 1998.
- NSF VIGRE Graduate Student Fellow,
University of Wisconsin at Madison, 1999-2001.
- Selfridge Prize for Excellence in Mathematics Presentation,
West Coast Number Theory Conference, 2003.
- Incomplete List of Teachers Ranked as Excellent by Their Students,
University of Illinois at Urbana-Champaign, 2004.
- 2005 - 2006 American Mathematical Society Project NExT Fellow
(New Experiences in Teaching).
- 2011 University of South Carolina Rising Star Award.