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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 - present, Palmetto Assistant 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:

- classical modular forms
- Maass forms
- algebraic number theory
- partitions

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 **12** (2008), no. 3.
- (13) Integer weight mock theta analogues.
submitted.
- (14) Modular forms, complex multiplication, and moonshine. (with E. Jurisich)
in preparation.

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.

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.
- Fall 2008: Department colloquium, Washington & Lee 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.

Teaching:

- University of Wisconsin at Madison:
 - Calculus teaching assistant: Fall 2001, Spring 2002.
- University of Illinois at Urbana-Champaign:
 - Differential equations and orthogonal functions: Fall 2002.
 - Mathematics for high school teachers: Spring 2003.
 - Number theory: Fall 2003, Spring 2005.
 - Discrete mathematics: Spring 2004.
 - Combinatorics: Fall 2004.
- University of South Carolina:
 - Calculus I: Fall 2005.
 - Linear algebra: Spring 2006, Spring 2007, Fall 2007.
 - Introduction to modular forms: Fall 2006.
 - Algebraic number theory: Spring 2008.
 - Arithmetic of elliptic curves: Fall 2008.
 - Calculus for business administration and social science: Fall 2008.

Other Professional Activities:

- Seminar and conference organization at the University of Illinois:
 - Fall 2003 - Spring 2004: Math 500, graduate student seminar series, co-organizer with Patrick Bahls.
 - Spring 2004: seminar on “Topics in Modular Forms and Number Theory”, co-organizer with Scott Ahlgren.
 - May 2004: Illinois Number Theory Conference, co-organizer with Scott Ahlgren.
 - Fall 2004: Department number theory seminars, co-organizer with Alexandru Zaharescu.
 - Spring 2005: Department number theory seminars, co-organizer with Bruce Berndt.

- Seminar and conference organization at the University of South Carolina:
 - Fall 2005 - Spring 2006: Department number theory seminar, co-organizer with Michael Filaseta.
 - Fall 2006 - Spring 2008: Department number theory seminar, organizer.
 - Special Session on “Modular Forms and Analytic Number Theory,” Fall 2006 Southeast Sectional Meeting of the AMS, Fayetteville, AR, co-organizer with Gang Yu.
 - Fall 2006: Palmetto Number Theory Series (PANTS I), co-organizer with Nigel Boston and Michael Filaseta.
 - Fall 2007: PANTS IV, co-organizer with Michael Filaseta and Ognian Trifonov.
- Departmental Committee Work:
 - High School Math Contest Committee (Fall 2005).
 - Undergraduate Advising Committee, Upper Division Majors (Fall 2005 - Spring 2008).
 - Qualifying Exam Committee, Chair (Spring 2006 - Fall 2006).
 - Hiring Committee (Fall 2006 - Spring 2007).
 - Faculty Senate representative (Fall 2007-).
 - Faculty Advisory Committee (Fall 2007-).
 - Mathematics Department Chair Search Committee (Spring 2008).
- Contest Judging:
 - May 2004, 2005: Illinois Council of Mathematics Teachers Math Contest High School State Finals, University of Illinois at Urbana-Champaign.
 - Spring 2006: University of South Carolina 21st High School Math Contest.
 - Spring 2006 - 2008: University of South Carolina Region II Science and Engineering Fair.

Referee and Review Work:

- Referee work (34 articles): Acta Arithmetica, American Mathematical Monthly, Annals of Combinatorics, Discrete Mathematics, Electronic Journal of Combinatorics, 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 Computational Mathematics and Optimization, Journal of Number Theory, Proceedings of the American Mathematical Society, Ramanujan Journal, Rocky Mountain Journal of Mathematics.
- Review work (47 articles): Mathematical Reviews (2002-present).
- Reviewer of National Science Foundation (NSF) and National Security Agency (NSA) grants: (2006-present).

Advising:

- External advisor for Senior Thesis of Catherine Menge, Heathwood Hall Episcopal High School (Fall 2005 - Spring 2006).
- 2005- : 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).
- MA students: Jonathan Mason (July 2007), Jennifer Larson (May 2008).
- MS students: Mohamad Youssef (July 2007).
- 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 (in progress).
- Doctoral Students: John Webb (in progress).

Grants:

- 2006 - 2009 PI for National Science Foundation Standard Grant DMS-0600400, Modular Forms and Number Theory (PI), \$109,930.
- 2007 - 2008 Co-PI for National Science Foundation Conference Grant DMS-0703547, Palmetto Number Theory Series (co-PI), \$7413.
- 2008 - 2009 PI for National Science Foundation Conference Grant DMS-0801150, Palmetto Number Theory Series (PI), \$7950.
- 2008 - 2009 PI for National Security Agency Conference Grant, Palmetto Number Theory Series, \$10,070.

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).