

Chris Jennings-Shaffer

Curriculum Vitae

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Employment

- 2017–present **Postdoc**, *University of Cologne*.
- 2015–2017 **Visiting Assistant Professor**, *Oregon State University*.
- 2011–2015 **Graduate Teaching Assistant**, *University of Florida*.
- 2008–2011 **Graduate Teaching Assistant**, *Oregon State University*.
- 2006–2008 **Information Technology Specialist**, *Water Resources - Washington State Department of Ecology*.

Education

- 2011–2015 **PhD, Mathematics**, *University of Florida, Gainesville, FL*.
- 2008–2011 **MS, Mathematics**, *Oregon State University, Corvallis, OR*.
- 2003–2006 **BS**, *The Evergreen State College, Olympia, WA*.

Doctoral Thesis

- Title *Analytic and Arithmetic Properties of Smallest Parts Partition Functions and Generalizations*
- Advisor Frank Garvan

Preprints

1. Some q-series Identities Extending Work of Andrews, Crippa, and Simon on Sums of Divisors Functions (with K. Bringmann), preprint, 8 pages

Publications

1. *Unimodal Sequence Generating Functions Arising from Partition Ranks* (with K. Bringmann), *Research In Number Theory*, to appear, 17 pages
2. *Proofs and Reductions of Various Conjectured Partition Identities of Kanade and Russell* (with K. Bringmann and K. Mahlburg), *Journal für die Reine und Angewandte Mathematik (Crelle's Journal)*, ahead of print, 27 pages

3. *A Note on Andrews' Partitions with Parts Separated by Parity* (with K. Bringmann), accepted for publication in *Annals of Combinatorics* (special issue in honor of George Andrews' 80th birthday),
4. *Asymptotic Formulas Related to the M_2 -rank of Partitions without Repeated Odd Parts* (with D. Reihill), accepted for publication in *The Ramanujan Journal*
5. *Peak Positions of Strongly Unimodal Sequences* (with K. Bringmann, K. Mahlburg, and R. Rhoades) *Transactions of the American Mathematical Society*, online ready, 23 pages
6. *The Generating Function of the M_2 -rank of Partitions without Repeated Odd Parts as a Mock Modular Form*, *Transactions of the American Mathematical Society*, Vol. 371 Number 1, pages 249–277 (2019)
7. *When Fourth Moments are Enough* (with D. Skinner and E. Waymire), *Rocky Mountain Journal of Mathematics*, Vol. 48 Number 6, pages 1917–1924 (2018)
8. *Mock Modularity of the M_d -rank of Overpartitions* (with H. Swisher), *Journal of Mathematical Analysis and Applications*, Vol. 466 Issue 2, pages 1144–1189 (2018)
9. *On a Modularity Conjecture of Andrews, Dixit, Schultz, and Yee for a Variation of Ramanujan's $\omega(q)$* (with K. Bringmann and K. Mahlburg), *Advances in Mathematics*, Vol. 325, pages 505–532 (2018)
10. *Some Smallest Parts Functions from Variations of Bailey's Lemma*, in *Frontiers in Orthogonal Polynomials and q -Series*, Chapter 18, pages 343–372 (2018)
11. *Ranks For Two Partition Quadruple Functions*, *Journal de Théorie des Nombres de Bordeaux*, Vol. 29 number 2, pages 425–443 (2017)
12. *Two Partition Functions with Congruences modulo 3, 5, 7, and 13*, *Annals of Combinatorics*, Vol. 21 number 3, pages 397–443 (2017)
13. *Exotic Bailey-Slater SPT-Functions I: Group A*, *Advances in Mathematics*, Vol. 305, pages 479 – 514 (2017)
14. *Higher Order Smallest Parts Functions and Rank-Crank Moment Inequalities from Bailey Pairs* (with C. Babecki and Geoffrey Sangston), *Research in Number Theory*, Vol. 2(1), pages 1–35 (2016)
15. *Exotic Bailey-Slater SPT-Functions II: Hecke-Rogers-Type Double Sums and Bailey Pairs From Groups A, C, E* (with F. Garvan), *Advances in Mathematics*, Vol. 299, pages 605–639 (2016)
16. *Exotic Bailey-Slater SPT-Functions III: Bailey Pairs from Groups B, F, G, and J*, *Acta Arithmetica*, Vol. 173, No. 4, (2016), pages 317–364.
17. *Overpartition Rank Differences Modulo 7 By Maass Forms*, *Journal of Number Theory*, Vol. 163, (2016), pages 331–358.
18. *Congruences for Partition Pairs with Conditions* (formerly titled “Congruences for a Certain Partition Pair by a Crank”), *Quarterly Journal of Mathematics*, Vol. 66, No. 3, pages 837–860 (2015).

19. *Rank and Crank Moments for Partitions without Repeated Odd Parts*, International Journal of Number Theory, Vol. 11, No. 03, pages 683-703 (2015).
20. *Higher order spt functions for overpartitions, overpartitions with smallest part even, and partitions without repeated odd parts*, Journal of Number Theory, Vol. 149, (2015), pages 285-312.
21. *Another SPT crank for the number of smallest parts*, Journal of Number Theory, Vol. 148, (2015), pages 196-203.
22. *The spt-crank for overpartitions* (with F. Garvan), Acta Arithmetica, Vol. 166, No. 02 (2014), pages 141-188.
23. *Hecke-type congruences for Andrews' spt-function modulo 16 and 32* (with F. Garvan), International Journal of Number Theory, Vol. 10, No. 02 (2014), pages 375-390.
24. *A note on the transcendence of zeros of a certain family of weakly holomorphic modular forms* (with H. Swisher), International Journal of Number Theory, Vol. 10, No. 02 (2014), pages 309-317.

Teaching

Lecturer

Oregon State University MTH649 Partitions & q-series: Spring 2016
 Oregon State University MTH441 Computational Number Theory: Fall 2016
 Oregon State University MTH355 Discrete Mathematics: Fall 2015, Winter 2016
 Oregon State University MTH342 Linear Algebra II: Winter 2016
 Oregon State University MTH341 Linear Algebra I: Fall 2015, Winter 2017, Spring 2017
 Oregon State University MTH254 Vector Calculus I : Summer 2010
 Oregon State University MTH111 College Algebra: Summer 2009
 University of Florida MAC2312 Analytic Geometry and Calculus 2: Spring 2014
 University of Florida MAC1114 Trigonometry: Fall 2013
 University of Florida MAC1105 Basic College Algebra: Summer 2012, Summer 2013

Assistant

University of Florida MAC2312 Analytic Geometry and Calculus 2: Spring 2014, Fall 2014, Spring 2015
 University of Florida MAC2311 Analytic Geometry and Calculus 1: Fall 2012, Spring 2013
 University of Florida MAC1147 Precalculus Algebra and Trigonometry: Fall 2011, Spring 2012
 Oregon State University MTH254 Vector Calculus I: Spring 2010, Fall 2010
 Oregon State University MTH251 Differential Calculus: Fall 2009, Winter 2010
 Oregon State University MTH231 Elements of Discrete Mathematics: Winter 2011, Spring 2011
 Oregon State University MTH111 College Algebra: Fall 2008, Winter 2009, Spring 2009

Awards

- 2015 **Certificate of Excellence for Outstanding Teaching**, Math Department University of Florida.
- 2015 **Graduate Student Travel Grant to 2015 JMM**, Programs and Travel Grants, American Mathematical Society.

2014 **Chat Yin Ho Scholarship for Excellence in Pure Mathematics**, Math Department University of Florida.

Talks and Presentations

- *Some q -series Conjectures Related to Rogers-Ramanujan Type Identities of Kanade and Russell* at 15th International Symposium on Orthogonal Polynomials, Special Functions and Applications, Hagenberg, Austria (invited speaker July 2019)
- *Proofs and Reductions of Kanade and Russell's Partition Identities* at AMS Spring Central and Western Joint Sectional Meeting, Honolulu, Hawaii, USA (invited speaker, March 2019)
- *On Some Conjectured Partition Identities of Kanade and Russell* at Johannes Kepler University RISC Algorithmic Combinatorics Seminar, Hagenberg, Austria (invited speaker, March 2019)
- *Classical and New Identities with q -series and Modular Forms* at University of Denver Math Department Colloquium, Denver, Colorado, USA (invited speaker, February 2019)
- *Even More Rogers-Ramanujan Identities* at 16th Annual International Conference on Srinivasa Ramanujan, Kumbakonam, India (invited speaker, December 2018)
- *A Depth 2 Mock Modular Form Coming From a Partition Function and Conjecture of Andrews, Dixit, Schultz, and Yee* at Combinatory Analysis, State College Pennsylvania, USA (June 2018)
- *Workshop on Integer Partitions - 5 Lectures* at Nesin Maths Village, Turkey (invited speaker, May 2018)
- *Bailey Pairs - 3 Lectures* at University of Cologne Number Theory Seminar, Cologne, Germany (May 2018)
- *Modular Forms From Partitions* at University College Dublin Algebra and Number Theory Seminar, Dublin, Ireland (invited speaker, April 2018)
- *The Mock Modularity of a Partition Function of Andrews, Dixit, Schultz, and Yee* at Oregon State University Math Department Number Theory Seminar, Corvallis, Oregon, USA (April 2017)
- *Bailey's Lemma* at Washington State University Math and Stats Department Colloquium, Pullman, Washington, USA (invited speaker, March 2017)
- *Bailey's Lemma* at Oregon State University Math Department Colloquium Corvallis, Oregon, USA (February 2017)
- *Harmonic Maass Forms Applied to Partition and q -series Identities* at Oregon State University Math Department Number Theory Seminar, Corvallis, Oregon, USA (November 2016)
- *Rank-Crank Moment Inequalities From Bailey Pairs* at Penn State University Math Department Combinatorics/Partitions Seminar, State College, Pennsylvania, USA (invited speaker, October 2016)
- *Rank-Crank Moment Inequalities From Bailey Pairs* at Oregon State University Math Department Number Theory Seminar, Corvallis, Oregon, USA (October 2016)
- *Partition Rank Functions Transforming Like Their Partition Functions* at The 2016 Pacific Northwest Number Theory Conference, Corvallis, Oregon, USA (invited speaker, May 2016)
- *Partition Rank Functions Transforming Like Their Partition Functions* at The 2016 Gainesville International Number Theory Conference, Gainesville, Florida, USA (invited speaker, March 2016)
- *Higher Order Smallest Parts Functions* at Oregon State University Math Department Number Theory Seminar, Corvallis, Oregon, USA (February 2016)
- *A Few Applications of Bailey's Lemma* at Oregon State University's Number Theory Seminar, Corvallis, Oregon, USA (November 2015)
- *Partition Congruences Then and Now* at Oregon State University's Number Theory Seminar, Corvallis, Oregon, USA (November 2015)

- *A Few Exotic Bailey Slater Smallest Parts Partition Functions* at International Conference on Orthogonal Polynomials and q-Series, Orlando, Florida, USA (May 2015)
- *Congruences for the Number of Smallest Parts in Partitions* at Joint Mathematics Meetings AMS Special Session on Partitions, q-Series, and Modular Forms, San Antonio, Texas, USA (invited speaker, January 2015)
- *Congruences for a Smallest Parts Function via Quasi-Modular Forms* at 28th Automorphic Forms Workshop, Moab, Utah, USA (May 2014)
- *Higher Order Overpartition Spt Functions* at University of Florida Math Department Number Theory Seminar, Gainesville, Florida, USA (April 2014)
- *The spt-crank for Overpartitions* at Palmetto Number Theory Series XXII, Orangeburg, South Carolina, USA (September 2014)
- *Hecke-Type Congruences for Andrews' SPT Function Modulo 16 and 32* at University of Florida Math Department Number Theory Seminar, Gainesville, Florida, USA (October 2013)

Conferences and Workshop Participation

- Joint Mathematics Meetings, Denver, USA, January 2020
- 15th International Symposium on Orthogonal Polynomials, Special Functions and Applications, Hagenberg, Austria, July 2019
- AMS Spring Central and Western Joint Sectional Meeting, Hawaii, USA, March 2019
- 16th Annual International Conference on Srinivasa Ramanujan, Kumbakonam, India, December 2018
- Combinatory Analysis, State College, USA, June 2018
- Workshop on Integer Partitions, Nesin Maths Village, Turkey, May 2018
- Modular Forms and Quantum Knot Invariants, Banff International Research Station, Canada, March 2018
- The 2016 Pacific Northwest Number Theory Conference, Corvallis, USA, May 2016
- The 2016 Gainesville International Number Theory Conference, Gainesville, USA, March 2016
- Joint Mathematics Meetings, Seattle, USA, January 2016
- ICERM workshop on Explicit Methods for Modularity of K3 Surfaces and Other Higher Weight Motives, Providence, USA, October 2015
- International Conference on Orthogonal Polynomials and q-Series, Orlando, USA, May 2015
- Joint Mathematics Meetings, San Antonio, USA, January 2015
- Palmetto Number Theory Series XXII, South Carolina, USA, September 2014
- 28th Automorphic Forms Workshop, Moab, USA, May 2014.
- Ramanujan 125, Gainesville, USA, November 2012.
- 25th Automorphic Forms Workshop, Corvallis, USA, March 2011.

Professional Service

Research Experience for Undergraduates

- Faculty mentor for the Oregon State University 2016 Research Experience for Undergraduates in Mathematics

Program Organization

- AMS special session on Interactions Among Partitions, Basic Hypergeometric Series, and Modular Forms at the 2020 Joint Mathematics Meeting, Denver, January 2020
- AMS special session on Modular Forms, q-Series, and Mathematics Inspired by Ramanujan at the 2016 Joint Mathematics Meeting, Seattle, January 2016

Refereed Journals (36 articles)

- Advances in Mathematics
- Annals of Combinatorics
- Bulletin of the Australian Mathematical Society
- Contributions to Discrete Mathematics
- Discrete Mathematics
- Experimental Mathematics
- Indagationes Mathematicae
- Integral Transforms and Special Functions
- International Journal of Number Theory
- Journal of Combinatorial Theory Series A
- Journal of Inequalities and Applications
- Journal of Integer Sequences
- Journal of Number Theory
- Journal of Symbolic Computation
- Rendiconti del Circolo Matematico di Palermo
- The Ramanujan Journal