Armin Straub
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Department of Mathematics and Statistics
University of South Alabama
Mobile, AL 36688 (USA)

http://arminstraub.com
containing preprints, slides of talks, and a current CV

Academic employment

since 2021
University of South Alabama
Associate Professor

2015 – 2021
University of South Alabama
Assistant Professor

2012 – 2015
University of Illinois at Urbana-Champaign
J. L. Doob Research Assistant Professor

2013
Max-Planck-Institut für Mathematik, Bonn (DE)
Postdoctoral fellow

Research Interests

My research lies at the interface of number theory, combinatorics and special functions.
Common threads are connections with modular forms and symbolic computation.

Academic education

2008 – 2012
Ph.D. in Mathematics from Tulane University
thesis: “Arithmetic aspects of random walks and methods in definite integration”
advisor: Victor H. Moll
co-advisor: Jonathan M. Borwein, University of Newcastle (AU)

2007 – 2008
Diplom in Mathematics from TU Darmstadt (DE)
thesis: “Local recognition of reflection graphs on Coxeter groups”
supervisor: Ralf Köhl (né Gramlich)
(with distinction)

2006 – 2007
M.S. in Mathematics from Tulane University

2003 – 2006
Student of Mathematics at TU Darmstadt (DE)
minor in Computer Science

Extended research visits for collaboration

2022, Jun–Jul
Inria Saclay (FR)
hosted by Alin Bostan
(1 week)

2022, Jun
University of Vienna (AT)
hosted by Michael Schlosser
(1 week)

2022, Apr
Research Institute for Symbolic Computation (AT)
invited by Veronika Pillwein
(3 weeks)

2022, Jan
Mathematisches Forschungsinstitut Oberwolfach (DE)
Research in Pairs program with Jehanne Dousse, Jeremy Lovejoy, Robert Osburn
(2 weeks)
2019, Jul
Research Institute for Symbolic Computation (AT)
invited by Veronika Pillwein
(3 weeks)

2017, Nov
Erwin Schroedinger Institute (AT)
invited participant and speaker at the program Algorithmic and Enumerative Combinatorics
(2 weeks)

2015, Mar–Apr
Max-Planck-Institut für Mathematik, Bonn (DE)
visiting researcher
(8 weeks)

2014, Aug
Singapore University of Technology and Design (SG)
invited by James G. Wan
(2 weeks)

2013, Oct
Research Institute for Symbolic Computation (AT)
invited by Veronika Pillwein and Peter Paule
(1 week)

2009, 2010, 2011
University of Newcastle (AU)
invited by Jonathan M. Borwein
(4+12+4 weeks)

2009, Jun
Grinnell College
invited by Marc Chamberland
(4 weeks)

Preprints

[3] Gessel–Lucas congruences for sporadic sequences
submitted, 2023, arXiv:2301.12248

[2] (with Alin Bostan, Sergey Yurkevich) On the representability of sequences as constant terms
submitted, 2022, arXiv:2212.10116

[1] (with John Pomerat) On the integrality of powers of power series
submitted, 2022

Refereed publications

[55] (with Wadim Zudilin) Sums of powers of binomials, their Apéry limits, and Franel’s suspicions
accepted for publication in International Mathematics Research Notices, 2022, DOI

[54] (with Joel A. Henningsen) Generalized Lucas congruences and linear $p$-schemes
Advances in Applied Mathematics, Vol. 141, 2022, #102409, p. 1-20, DOI

[53] On congruence schemes for constant terms and their applications
Research in Number Theory, Vol. 8, Nr. 3, 2022, #42, p. 1-21, DOI

[52] (with Marc Chamberland) Apéry limits: Experiments and proofs
American Mathematical Monthly (special issue in memory of Jonathan Borwein), Vol. 128, Nr. 9, 2021,
p. 811-824, DOI

[51] (with Tewodros Amdeberhan, Victor H. Moll, Christophe Vignat)
A triple integral analog of a multiple zeta value
International Journal of Number Theory, Vol. 17, Nr. 2, 2021, p. 223-237, DOI

[50] (with Hannah E. Burson, Simone Sisneros-Thiry) Refined counting of core partitions into $d$-distinct parts
Electronic Journal of Combinatorics, Vol. 28, Nr. 1, 2021, #P1.37, p. 1-21, DOI

[49] Trigonometric Dirichlet series and Eichler integrals
accepted for publication in Encyclopedia of Srinivasa Ramanujan and His Mathematics; Editors:
K. Alladi, G. E. Andrews, B. C. Berndt and K. Ono; Springer, 2021

[48] (with Karl Dilcher, Christophe Vignat)
Identities for Bernoulli polynomials related to multiple Tornheim zeta functions
Journal of Mathematical Analysis and Applications, Vol. 476, Nr. 2, 2019, p. 569-584, DOI
[47] (with Sam Formichella) Gaussian binomial coefficients with negative arguments
Annals of Combinatorics (special issue dedicated to George E. Andrews), Vol. 23, Nr. 3, 2019, p. 725-748, DOI

[46] (with Drew Lewis, Kaitlyn Perry)
An algorithmic approach to the Polydegree Conjecture for plane polynomial automorphisms
Journal of Pure and Applied Algebra, Vol. 223, Nr. 12, 2019, p. 5346-5359, DOI

[45] (with Robert Osburn)
Interpolated sequences and critical $L$-values of modular forms
Chapter 14 of the book: Elliptic Integrals, Elliptic Functions and Modular Forms in Quantum Field Theory; Editors: J. Blümlein, P. Paule and C. Schneider; Springer, 2019, p. 327-349, DOI

[44] Supercongruences for polynomial analogs of the Apéry numbers
Proceedings of the American Mathematical Society, Vol. 147, 2019, p. 1023-1036, DOI

[43] (with Dermot McCarthy, Robert Osburn)
Sequences, modular forms and cellular integrals
Mathematical Proceedings of the Cambridge Philosophical Society, Vol. 168, Nr. 2, 2020, p. 379-404, DOI

[42] (with Frits Beukers, Marc Houben)
Gauss congruences for rational functions in several variables
Acta Arithmetica, Vol. 184, 2018, p. 341-362, DOI

[41] (with Yuliy Baryshnikov, Stephen Melczer, Robin Pemantle)
Diagonal asymptotics for symmetric rational functions via ACSV
Leibniz International Proceedings in Informatics (Analysis of Algorithms 2018), Vol. 110, 2018, p. 12:1–12:15, DOI

[40] (with Wadim Zudilin)
Short walk adventures (in memory of Jon Borwein)
Springer Proceedings in Mathematics & Statistics (From Analysis to Visualization: JBCC 2017), Vol. 313, 2020, p. 423-439, DOI

[39] (with Robert Osburn, Wadim Zudilin)
A modular supercongruence for $6F_5$: An Apéry-like story
Annales de l’Institut Fourier, Vol. 68, Nr. 5, 2018, p. 1987-2004, DOI

[38] (with Shaun Cooper, Jesús Guillera, Wadim Zudilin)
Crouching AGM, hidden modularity
Chapter 9 of the book: Frontiers in Orthogonal Polynomials and $q$-Series; Editors: Z. Nashed and X. Li; World Scientific, 2018, p. 169-187, DOI

[37] (with Bruce C. Berndt)
Ramanujan’s formula for $\zeta(2n + 1)$
Chapter 2 of the book: Exploring the Riemann Zeta Function; Editors: H. Montgomery, A. Nikeghbali, and M. Rassias; Springer, 2017, p. 13-34, DOI

[36] Core partitions into distinct parts and an analog of Euler’s theorem
European Journal of Combinatorics, Vol. 57, 2016, p. 40-49, DOI

[35] (with Bruce C. Berndt)
On a secant Dirichlet series and Eichler integrals of Eisenstein series
Mathematische Zeitschrift, Vol. 284, Nr. 3, 2016, p. 827-852, DOI

[34] (with Amita Malik)
Divisibility properties of sporadic Apéry-like numbers
Research in Number Theory, Vol. 2, Nr. 1, 2016, #5, p. 1-26, DOI

[33] (with Jonathan M. Borwein, Christophe Vignat)
Densities of short uniform random walks in higher dimensions
Journal of Mathematical Analysis and Applications, Vol. 437, Nr. 1, 2016, p. 668-707, DOI

[32] (with Bruce C. Berndt)
Certain integrals arising from Ramanujan’s notebooks
SIGMA (special issue on Orthogonal Polynomials, Special Functions and Applications), Vol. 11, Nr. 083, 2015, 11 p., DOI
[31] (with Harold G. Diamond) *Bounds for the logarithm of the Euler gamma function and its derivatives* 
*Journal of Mathematical Analysis and Applications*, Vol. 433, Nr. 2, 2016, p. 1072-1083, DOI

[30] *Special values of trigonometric Dirichlet series and Eichler integrals* 
*The Ramanujan Journal* (special issue dedicated to Marvin Knopp), Vol. 41, Nr. 1, 2016, p. 269-285, DOI

[29] *Congruences for Fishburn numbers modulo prime powers* 
*International Journal of Number Theory*, Vol. 11, Nr. 5, 2015, p. 1679-1690, DOI

[28] *Multivariate Apéry numbers and supercongruences of rational functions* 
*Algebra & Number Theory*, Vol. 8, Nr. 8, 2014, p. 1985-2008, DOI

[27] (with Robert Osburn, Brundaban Sahu) *Supercongruences for sporadic sequences* 
*Proceedings of the Edinburgh Mathematical Society*, Vol. 59, Nr. 2, 2016, p. 503-518, DOI

[26] (with Wadim Zudilin) *Positivity of rational functions and their diagonals* 
*Journal of Approximation Theory* (special issue dedicated to R. Askey), Vol. 195, 2015, p. 57-69, DOI

[25] (with Luis A. Medina) *On multiple and infinite log-concavity* 
*Annals of Combinatorics*, Vol. 20, Nr. 1, 2016, p. 125-138, DOI

[24] (with David Borwein, Jonathan M. Borwein) *On lattice sums and Wigner limits* 
*Journal of Mathematical Analysis and Applications*, Vol. 414, Nr. 2, 2014, p. 489-513, DOI

[23] (with Marc Chamberland) *On gamma quotients and infinite products* 
*Advances in Applied Mathematics*, Vol. 51, Nr. 5, 2013, p. 546-562, DOI

[22] (with Jonathan M. Borwein) *Relations for Nielsen polylogarithms* 
*Journal of Approximation Theory* (special issue dedicated to R. Askey), Vol. 193, 2015, p. 74-88, DOI

[21] (with Mark W. Coffey, Valerio De Angelis, Atul Dixit, Victor H. Moll, Christophe Vignat) 
*The Zagier polynomials. Part II: Arithmetic properties of coefficients* 
*The Ramanujan Journal*, Vol. 35, Nr. 3, 2014, p. 361-390, DOI

[20] (with Mathew Rogers) *A solution of Sun’s $520 challenge concerning $\frac{\pi}{2}$* 
*International Journal of Number Theory*, Vol. 9, Nr. 5, 2013, p. 1273-1288, DOI

[19] (with Tewodros Amdeberhan, David Borwein, Jonathan M. Borwein) 
*On formulas for $\pi$ experimentally conjectured by Jauregui–Tsallis* 
*Journal of Mathematical Physics*, Vol. 53, Nr. 7, 2012, p. 073708:1-15, DOI

[18] (with Jonathan M. Borwein) *Mahler measures, short walks and log-sine integrals* 
*Theoretical Computer Science* (special issue on Symbolic and Numeric Computation), Vol. 479, Nr. 1, 2013, p. 4-21, DOI

[17] (with David Borwein, Jonathan M. Borwein, James Wan) *Log-sine evaluations of Mahler measures, II* 
*Integers* (Selfridge memorial volume), Vol. 12, Nr. 6, 2012, p. 1179-1212, DOI

[16] (with David Borwein, Jonathan M. Borwein) *A sinc that sank* 
*American Mathematical Monthly*, Vol. 119, Nr. 7, Aug-Sep 2012, p. 535-549, DOI

[15] (with Jonathan M. Borwein) *Special values of generalized log-sine integrals* 
*Proceedings of ISSAC 2011* (36th International Symposium on Symbolic and Algebraic Computation), ACM Press, Jun 2011, p. 43-50, DOI

[14] (with Jonathan M. Borwein, James Wan, Wadim Zudilin) 
*Densities of short uniform random walks (with an appendix by Don Zagier)* 
*Canadian Journal of Mathematics*, Vol. 64, Nr. 5, 2012, p. 961-990, DOI
Research talks

2022, Oct 6  
Sums of powers of binomials, their Apéry limits, and Franel’s suspicions
Colloquium, Dalhousie University

2022, Sept 29  
Gaussian binomial coefficients with negative arguments
Colloquium, University of South Alabama

2022, Sept 18  
Sums of powers of binomials, their Apéry limits, and Franel’s suspicions
AMS Fall Central Sectional Meeting, Special Session on The Intersection of Number Theory and Combinatorics, University of Texas at El Paso
2022, Jul 1  Sums of powers of binomials, their Apéry limits, and Franel’s suspicions  
Joint Seminar: MATHXP-PolSys & Transcendence and Combinatorics, Inria Saclay &  
Sorbonne University (FR)

2022, Jun 10  Lucas congruences and congruence schemes  
Combinatorics Seminar, University of Vienna (AT)

2022, Apr 27  Sums of powers of binomials, their Apéry limits, and Franel’s suspicions  
Algorithmic Combinatorics Seminar, RISC, Johannes Kepler University (AT)

2022, Apr 25  Lucas congruences and congruence schemes  
RISC Colloquium, RISC, Johannes Kepler University (AT)

2022, Mar 12  Sums of powers of binomials, their Apéry limits, and Franel’s suspicions  
(invited plenary lecture) Southern Regional Number Theory Conference, Louisiana State  
University

2021, Dec 8  Algebraic relations between modular functions  
Modular Forms Seminar, Tulane University

2021, Nov 17  Modular functions and the inevitable $j$-function  
Modular Forms Seminar, Tulane University

2020, Nov 2  Gaussian binomial coefficients with negative arguments  
(invited plenary lecture) International Conference on Mathematical Analysis and  
Applications (MAA 2020), National Institute of Technology Jamshedpur (IND)

2020, Mar 22  Gaussian binomial coefficients with negative arguments  
Southern Regional Number Theory Conference, Louisiana State University

2019, Nov 3  Interpolated sequences and critical $L$-values of modular forms  
AMS Fall Southeastern Sectional Meeting, Special Session on Partition Theory and Related  
Topics, University of Florida

2019, Jul 26  Negative thinking and polynomial analogs  
(invited plenary lecture) 15th International Symposium on Orthogonal Polynomials, Special  
Functions and Applications, RISC, Johannes Kepler University (AT)

2019, Jul 25  Interpolated sequences and critical $L$-values of modular forms  
15th International Symposium on Orthogonal Polynomials, Special Functions and Applications,  
Minisymposium on Computer Algebra and Special Functions, RISC, Johannes Kepler  
University (AT)

2019, Jun 7  On the Gaussian binomial coefficients, the simplest of $q$-series  
(invited plenary lecture) Analytic and Combinatorial Number Theory: The Legacy of  
Ramanujan (in honor of Bruce Berndt’s 80th birthday), UIUC

2019, Apr 14  Interpolated sequences and critical $L$-values of modular forms  
(invited plenary lecture) Southern Regional Number Theory Conference: Modular Curves,  
Modular Forms, and Hypergeometric Functions, Louisiana State University

2018, Oct 22  The congruences of Fermat, Euler, Gauss and stronger versions thereof  
Algebra and Number Theory Seminar, Louisiana State University

2018, Oct 5  Supercongruences for polynomial analogs of the Apéry numbers  
Integers Conference, Augusta University

2018, Jun 21  Gauss congruences  
Combinatory Analysis 2018 (in honor of George Andrews’ 80th birthday), Penn State University

2018, May 8  Gauss congruences  
International Conference on Mathematics and Statistics (ICOMAS 2018), Special Session on  
Analytic Number Theory, University of Memphis

2017, Nov 14  Properties of Laurent coefficients of multivariate rational functions  
Workshop on Computer Algebra in Combinatorics, Erwin Schroedinger Institute (AT)

2017, Sept 17  A modular supercongruence for $qF_5$: An Apéry-like story  
Palmetto Number Theory Series (PANTS XXVIII), University of Tennessee
2017, Jul 31  Congruences connecting modular forms and truncated hypergeometric series
AG17—SIAM Conference on Applied Algebraic Geometry, Minisymposium on Symbolic
Combinatorics, Georgia Tech

2017, Mar 16  A gumbo with hints of partitions, modular forms, special integer sequences and
supercongruences
Number Theory Seminar, University of Illinois at Urbana-Champaign

2017, Jan 6  Core partitions into distinct parts and an analog of Euler’s theorem
AMS Joint Mathematics Meetings 2017, Special Session on Partition Theory and Related
Topics, Atlanta

2016, Oct 6  Core partitions into distinct parts and an analog of Euler’s theorem
Integers Conference, University of West Georgia

2016, Sept 15  An analog of Euler’s theorem on integer partitions
Colloquium, University of South Alabama

2016, Mar 19  Core partitions into distinct parts and an analog of Euler’s theorem
International Conference on Number Theory in honor of Krishna Alladi’s 60th birthday,
University of Florida

2016, Mar 6  Divisibility properties of sporadic Apéry-like numbers
AMS Spring Southeastern Sectional Meeting, Special Session on Experimental Mathematics,
University of Georgia

2016, Jan 7  Divisibility properties of sporadic Apéry-like numbers
AMS Joint Mathematics Meetings 2016, Session on Number Theory, Seattle

2015, Jun 3  Special values of trigonometric Dirichlet series
13th International Symposium on Orthogonal Polynomials, Special Functions and Applications,
Minisymposium on the Legacy of Ramanujan, NIST

2015, Jun 2  Divisibility properties of sporadic Apéry-like numbers
13th International Symposium on Orthogonal Polynomials, Special Functions and Applications,
Minisymposium on Symbolic Computation and Special Functions, NIST

2015, May 12  On a $q$-analog of the Apéry numbers
International conference on orthogonal polynomials and $q$-series (celebrating Mourad E.H.
Ismail), University of Central Florida

2015, Mar 11  Supercongruences for Apéry-like numbers
Seminar Aachen-Köln-Lille-Siegen on Automorphic Forms, University of Cologne (DE)

2015, Feb 26  Properties and applications of Apéry-like numbers
Colloquium, University of South Alabama

2015, Jan 11  Congruences for Fishburn numbers modulo prime powers
AMS Joint Mathematics Meetings 2015, Special Session on Partitions, $q$-Series, and Modular
Forms, San Antonio

2014, Oct 20  Trigonometric Dirichlet series and Eichler integrals
Number Theory and Experimental Mathematics Day, Dalhousie University

2014, Oct 18  On a $q$-analog of the Apéry numbers
AMS Fall Eastern Sectional Meeting 2014, Special Session on Experimental Mathematics in
Number Theory, Analysis, and Combinatorics, Dalhousie University

2014, Oct 18  Positivity of rational functions and their diagonals
AMS Fall Eastern Sectional Meeting 2014, Special Session on Special Functions and Their
Applications, Dalhousie University

2014, Sept 18  Properties and applications of Apéry-like numbers
Colloquium, Tulane University

2014, Aug 14  Supercongruences for Apéry-like numbers
Number Theory Seminar, National University of Singapore (SG)

2014, Aug 13  Supercongruences for Apéry-like numbers
Number Theory Seminar, National Institute of Education (SG)
| Year  | Event                                                                 |
|-------|----------------------------------------------------------------------|
| 2014, Aug 8 | Properties and applications of Apéry-like numbers  
(invited plenary lecture) International Conference on Algebra and Number Theory, Samsun (TR) |
| 2014, Jul 22 | Apéry numbers and their experimental siblings  
Challenges in 21st Century Experimental Mathematical Computation, ICERM |
| 2014, Jul 9 | Supercongruences for Apéry-like numbers  
Building Bridges: 2nd EU-US Workshop on Automorphic Forms and Related Topics, University of Bristol (GB) |
| 2014, Jun 3 | Multivariate Apéry numbers  
Midwest Number Theory Conference for Graduate Students and Recent PhDs XI, University of Illinois at Urbana-Champaign |
| 2014, May 12 | On a secant Dirichlet series and Eichler integrals of Eisenstein series  
28th Automorphic Forms Workshop, Moab |
| 2014, Apr 13 | Multivariate Apéry numbers and supercongruences of rational functions  
AMS Spring Central Sectional Meeting 2014, Special Session on Recent Developments in Number Theory, Texas Tech University |
| 2014, Apr 3 | Properties and applications of Apéry-like numbers  
Number Theory Seminar, University of Illinois at Urbana-Champaign |
| 2013, Nov 18 | On the ubiquity of modular forms and Apéry-like numbers  
Algebra and Number Theory Seminar, University College Dublin (IE) |
| 2013, Nov 12 | On a secant Dirichlet series and Eichler integrals of Eisenstein series  
Number Theory Seminar, University of Cologne (DE) |
| 2013, Oct 17 | On the ubiquity of modular forms and Apéry-like numbers  
Algebra and Combinatorics Seminar, Tulane University |
| 2013, Oct 12 | On a secant Dirichlet series and Eichler integrals of Eisenstein series  
AMS Fall Eastern Sectional Meeting 2013, Special Session on Modular Forms and Modular Integrals in Memory of Marvin Knopp, Temple University |
| 2013, Oct 9 | On the ubiquity of modular forms and Apéry-like numbers  
Algorithmic Combinatorics Seminar, RISC, Johannes Kepler University (AT) |
| 2013, Jul 10 | A solution of Sun’s $520/\pi$ challenge concerning $520/\pi$  
SIAM Annual Meeting, Minisymposium on Symbolic Computation and Special Functions, San Diego |
| 2013, Mar 14 | A solution of Sun’s $520/\pi$ challenge concerning $520/\pi$  
27th Automorphic Forms Workshop, University College Dublin (IE) |
| 2013, Feb 13 | Arithmetic aspects of short random walks  
Number Theory Lunch Seminar, Max-Planck-Institut für Mathematik, Bonn (DE) |
| 2013, Jan 29 | Arithmetic aspects of short random walks  
Number Theory Seminar, University of Cologne (DE) |
| 2012, Nov 15 | On the $q$-binomial coefficients and binomial congruences  
$q$-Series Seminar, University of Illinois at Urbana-Champaign |
| 2012, Oct 28 | An application of modular forms to short random walks  
AMS Fall Western Sectional Meeting 2012, Special Session on Harmonic Maass Forms and $q$-Series, University of Arizona |
| 2012, Oct 13 | A $q$-analog of Ljunggren’s binomial congruence  
Midwest Number Theory Conference for Graduate Students and Recent PhDs IX, University of Illinois at Urbana-Champaign |
| 2012, Sept 27 | Arithmetic aspects of short random walks  
Number Theory Seminar, University of Illinois at Urbana-Champaign |
| 2012, Aug 10 | An application of modular forms to short random walks  
Building Bridges: 1st EU-US Conference on Automorphic Forms and Related Topics, RWTH Aachen (DE) |
2012, Jan 7  Symbolic evaluation of log-sine integrals in polylogarithmic terms  
AMS Joint Mathematics Meetings 2012, Boston

2011, Oct 6  Hypergeometric evaluations of the densities of short random walks  
AG11—SIAM Conference on Applied Algebraic Geometry, Minisymposium on Symbolic  
Combinatorics, North Carolina State University

2011, Aug 24  $q$-binomial coefficient congruences  
CARMA Analysis and Number Theory Seminar, University of Newcastle (AU)

2011, Jun 9  Special values of generalized log-sine integrals  
ISSAC 2011—International Symposium on Symbolic and Algebraic Computation, San Jose

2011, May 19  Applications and evaluations of log-sine integrals  
JonFest 2011—Workshop on Computational and Analytical Mathematics in honour of  
Jonathan Borwein’s 60th birthday, The IRMACS Centre, Simon Fraser University (CA)

2011, Jan 9  On the method of brackets  
AMS Joint Mathematics Meetings 2011, Special Session on Mathematics Related to Feynman  
Diagrams, New Orleans

2010, Oct 14  On infinite logconcavity  
Colloquium, University of Newcastle (AU)

2010, Aug 2  Random walks in the plane  
FPSAC 2010—Formal Power Series & Algebraic Combinatorics, SFSU

2009, Aug 18  Random walk integrals  
CARMA Workshop on Multidimensional Numerical Integration and Special Function  
Evaluation, University of Newcastle (AU)

Educational and outreach talks

2018, Apr 11  Special numbers and how to recognize them numerically  
Association for Computing Machinery (ACM) Student Seminar, University of South Alabama

2014, Feb 20  An introduction to infinite log-concavity  
Graduate Student Number Theory Seminar, University of Illinois at Urbana-Champaign

2013, Oct 15  Tools for special functions and special numbers  
Graduate Student Colloquium of the Mathematics Department, Tulane University

2012, Apr 26  On the distance traveled in a few random steps  
GSSA Interdisciplinary Colloquium Series, Tulane University

2012, Mar 7  Pre $\pi$ fest: A short portrayal of random facts  
Pi Day Pre-Game by Science and Engineering Honor Society (SEHS), Tulane University

2011, Oct 27  Random walks and where to find a drunkard  
Science and Engineering Honor Society (SEHS) Student Seminar, Tulane University

2011, Apr 12  How far does a drunkard get?  
Graduate Student Colloquium of the Mathematics Department, Tulane University

2007, Dec 10  Nonstandard analysis  
Student Colloquium (StuVo) of the Mathematics Department, TU Darmstadt (DE)
Teaching experience

2023, Spring  Differential Equations II, Linear Algebra II & Cryptography
2022, Fall   Differential Equations I & Numerical Analysis
2021, Spring Linear Algebra II & Cryptography
2020, Fall   Differential Equations II, Intro to Number Theory & Precalculus Algebra
2020, Spring Linear Algebra II & Cryptography
2019, Fall   Differential Equations II, Intro to Number Theory & Calculus and its Applications
2019, Spring Calculus I, Linear Algebra II & Cryptography
2018, Fall   Intro to Number Theory & Precalculus Algebra
2018, Spring Linear Algebra II & Cryptography
2017, Fall   Calculus and its Applications (3 sections)
2017, Spring Linear Algebra II & Cryptography
2016, Fall   Linear Algebra & Intro to Number Theory (2+1 sections)
2016, Summer Invited lecturer for the 2016 AARMS Summer School at Dalhousie University designed and taught the graduate course Introduction to Special Functions and WZ Theory
2016, Spring Calculus III (2 sections)
2015, Fall   Calculus II & Linear Algebra

University of Illinois at Urbana-Champaign

2014, Fall   Applied Linear Algebra (2 large sections)
2014, Spring Introduction to Differential Equations Plus (2 sections)
2012, Fall   Introduction to Differential Equations Plus
2012, Spring Real Analysis
2011, Fall   Calculus I
2011, Spring Statistics for Business
2010, Spring Statistics for Scientists
2009, Fall   Calculus II

Tulane University

2012, Spring Real Analysis
2011, Fall   Calculus I
2011, Spring Statistics for Business
2010, Spring Statistics for Scientists
2009, Fall   Calculus II

Early work as teaching assistant

2007, Summer Supervised undergraduate students on the research project “Experimental Mathematics” lead by Victor H. Moll, Tulane University
2006 – 2008 Course Assistant at Tulane University for
    • Calculus I,
    • Calculus II,

2004 – 2008 Course Assistant at TU Darmstadt for
    • Numerical Analysis,
    • Linear Algebra,
    • Statistics,

    • Linear Algebra,
    • Experimental Mathematics.

    • Stochastic Analysis,
    • Algebra.
Teaching awards

2015	“Distinguished Teaching Award in Mathematics for Non-Tenure-Track Faculty”
   University of Illinois at Urbana-Champaign

2012, 2014	Appeared on the List of Teachers Ranked as Excellent by their Students for each
class taught at the University of Illinois at Urbana-Champaign

2012	“Excellent Graduate Student Teacher Award”
   Mathematics Department, Tulane University

Academic grants, honors and awards (non-teaching)

2017 – 2024	Simons Collaboration Grant
   Simons Foundation ($42,000)

2021/2022	Sabbatical leave granted for Fall 2021 and Spring 2022
   College of Arts & Sciences, University of South Alabama

2019	Junior Faculty Award for Scholarship and Academic Achievement
   College of Arts & Sciences, University of South Alabama ($1,500)

2019	Invited plenary speaker at OPSFA15
   International Symposium on Orthogonal Polynomials, Special Functions and Applications
   (1 of 9 plenary speakers, 150+ parallel talks)

2017	Arts & Sciences Support and Development Award
   College of Arts & Sciences, University of South Alabama ($1,500)

2015 – 2017	AMS-Simons Travel Grant
   American Mathematical Society & Simons Foundation ($4,800)

2016	Arts & Sciences Summer Professional Development Award
   College of Arts & Sciences, University of South Alabama ($1,000)

2015	SIAM Early Career Travel Award to attend OPSFA13
   International Symposium on Orthogonal Polynomials, Special Functions and Applications ($650)

2014	Co-recipient of the G. de B. Robinson Award for the paper Densities of short
   uniform random walks (with an appendix by Don Zagier)
   Canadian Mathematical Society ($400)

2014	Invited plenary speaker at ICA2014
   International Conference on Algebra and Number Theory, Samsun (TR)

2011, Jun	ISSAC 2011 Distinguished Student Author Award for the paper Special values of
   generalized log-sine integrals
   International Symposium on Symbolic and Algebraic Computation, San Jose ($300)

2011, May	“Excellence in Mathematics Graduate Student Award”
   Mathematics Department, Tulane University ($250)

2010, Apr	Poster Random Walk Integrals selected 1st place in Graduate Division
   School of Science and Engineering Research Day Poster Session, Tulane University ($250)

2009 – 2010	IBM Fellow in Computational Science
   Center for Computational Science, Tulane University ($4,000)

2007, Apr	“Outstanding First Year Graduate Student Award”
   Mathematics Department, Tulane University (fine dinner)
Student mentoring

Graduate students who wrote a Master’s thesis under my direction:

2018 – 2019
Joel Henningsen — *Sequences modulo primes and finite state automata*
awarded a Ph.D. position at Baylor University, including teaching assistantship; joint follow-up paper on generalized Lucas congruences published in Advances in Applied Mathematics

2017 – 2018
Emily L. Grinstead — *Multiple log-concavity of finite sequences*
awarded a Ph.D. position at UTK, including teaching assistantship and graduate fellowship

Undergraduate students mentored:

2019 – 2022
John Pomerat
directed studies in Fall 2019 (Gröbner bases and their applications) and Spring 2020 (Number theoretic aspects of differential equations); awarded Goldwater scholarship; selected for 2020 REU Program at Maryland; joint paper on the integrality of powers of power series submitted for publication

2019 – 2020
Preston Stanfield (graduate student)
introduced to a project on computer algebraic approaches to continued fractions; created poster for Annual Graduate Research Forum

2020
Jahdia Feurtado
introduced to a project on integer partitions with a negative number of parts

2016 – 2019
Sam Formichella
introduced to a project on \(q\)-binomial coefficients; awarded Summer Undergraduate Fellowship (SURF) 2017; published a first paper in JOURACA on a \(q\)-analog of Legendre’s formula; second joint paper on \(q\)-binomials with negative arguments published in Annals of Combinatorics; awarded SURF 2018 (turned down); selected for 2018 REU Program at Auburn; several oral conference and poster presentations

2017, Spring
Kevin McKeown
introduced to a project on periods of \(C\)-finite sequences; applied to SURF (unsuccessfully)

2014, Fall
IGL project: \(p\)-adic properties of sequences and finite state automata
mentored Amita Malik (graduate student team leader) and Arian Daneshvar, Pujan Dave, Zhefan Wang (undergraduate students) on a semester-long research project

Ph.D. Thesis Committee Member for the following students:

*since 2022*
Reeve Cabral (advisor: Jeffrey T. McDonald, Computer Science)

2020 – 2022
Matthew Peterson (advisor: Todd R. Andel, Computer Science)

2019 – 2022
Colby B. Parker (advisor: Jeffrey T. McDonald, Computer Science)

2020
Edward Harshany (advisor: Ryan Benton, Computer Science)

2019 – 2020
Thomas H. Watts (advisor: Ryan Benton, Computer Science)

Master’s Thesis Committee Member for the following students:

2021
Robert C. Cox (advisor: Ryan Benton, Computer Science)

2020
A. Austin Chandler (advisor: Ryan Benton, Computer Science)

2019 – 2020
James Bell (advisor: Jeffrey T. McDonald, Computer Science)

2019 – 2020
Joseph A. Mullins (advisor: Jeffrey T. McDonald, Computer Science)

2019 – 2020
Nathan B. Herron (advisor: Jeffrey T. McDonald, Computer Science)

2017 – 2018
Colby B. Parker (advisor: Jeffrey T. McDonald, Computer Science)

2017 – 2018
Thanh Nguyen (advisor: Jeffrey T. McDonald, Computer Science)

2016 – 2017
Rafi Qumsieh (advisor: Maria Byrne, Mathematics)
Academic services and memberships

since 2017  Editor for The Ramanujan Journal (Springer)  (90+ papers handled)
since 2012  Reviewer for Mathematical Reviews  (29 reviews)
since 2014  Reviewer for the NSA Mathematical Sciences Grant Program  (2 reviews)
since 2007  Referee for the following journals and proceedings:
  • The Ramanujan Journal  (10+ times)
  • International Journal of Number Theory  (10+ times)
  • Journal of Mathematical Analysis and Applications  (10+ times)
  • The American Mathematical Monthly (14 times), Acta Arithmetica (7 times),
    Proceedings of the AMS (6 times), Journal of Symbolic Computation (6 times),
    Research in Number Theory (6 times), Discrete Mathematics (4 times), Journal of
    Combinatorial Theory Series A (4 times), Monatshefte für Mathematik (4 times),
    Advances in Applied Mathematics (3 times), Annals of Combinatorics (3 times),
    Integers (3 times), Journal of Difference Equations and Applications (3 times),
    Journal of Number Theory (3 times), Advances in Mathematics (2 times), Ars
    Combinatoria (2 times), Bulletin of the LMS (2 times), Electronic Journal of
    Combinatorics (2 times), European Journal of Combinatorics (2 times), Research in
    the Mathematical Sciences (2 times), Rocky Mountain Journal of Mathematics (2
    times), Alabama Journal of Mathematics, Applied Mathematics Letters, Arnold
    Mathematical Journal, Artificial Intelligence and Symbolic Computation, Bulletin
    of the London Mathematical Society, Canadian Journal of Mathematics,
    Communications in Number Theory and Physics, Compositio Mathematica,
    Comptes-Rendus de l’Académie des Sciences, Computer Physics Communications,
    Contemporary Mathematics, Experimental Mathematics, Israel Journal of
    Mathematics, Journal of the London Mathematical Society, Journal of Integer
    Sequences, Pacific Journal of Mathematics, Proceedings of the Edinburgh
    Mathematical Society, Results in Mathematics, Séminaire Lotharingien de
    Combinatoire

2021 – 2022  Program committee member for FPSAC 2022
2021  Organized the special session Experimental Mathematics in Number Theory and
       Combinatorics with Luis Medina & Eric Rowland at the 2021 AMS Fall
       Southeastern Sectional Meeting
2019  Organized the special session Experimental Mathematics in Number Theory and
       Combinatorics with Hannah Burson & Tim Huber at the 2019 AMS Fall
       Southeastern Sectional Meeting
2019  Organized the special session Experimental Mathematics in Number Theory,
       Analysis, and Combinatorics with Amita Malik at the 2019 AMS Spring
       Southeastern Sectional Meeting
2018 – 2019  Program committee member for FPSAC 2019
2018  Co-organized the USA/USM/SELU Mini-Conference on Undergraduate Research
       in Science and Mathematics held April 26 at the University of South Alabama
2017  Organized the special session Arithmetic Properties of Sequences from Number
       Theory and Combinatorics with Eric Rowland at the AMS JMM 2017
2017  Reviewer for Banff International Research Station (BIRS) workshop proposal
since 2007  Member of the American Mathematical Society (AMS)
since 2013  Member of the Society for Industrial and Applied Mathematics (SIAM)
since 2021  Member of the Mathematical Association of America (MAA)
Departmental and university service

2023  
Hiring Committee for a tenure-track position (chair)

2022 – 2023  
Scholarship Committee (chair)

2022  
Arts & Sciences Sabbatical Committee

2017 – 2021  
Scholarship Committee (chair)

2021  
Hiring Committee for three tenure-track positions

2020, 2021  
Joe & Audrey Shewmake Computing and Math Scholarship Committee

2019, 2020  
Arts & Sciences Faculty Awards Committee

2016, 2018, 2020  
Judge for the Mobile Regional Science & Engineering Fair

2017 – 2018  
Arts & Sciences Support and Development Awards Committee

2016 – 2017  
Hiring Committee for two tenure-track positions

2016 – 2017  
Scholarship Committee

2016 – 2017  
Arts & Sciences Summer Professional Development Committee

2015 – 2016  
Library Committee (chair)

before University of South Alabama

2014 – 2015  
Organizer of the Number Theory Seminar at UIUC

2009 – 2010  
Coorganizer of the Graduate Student Colloquium at Tulane University

2008 – 2010  
GSSA (Graduate Studies Student Association) representative of the Mathematics Department, Tulane University

Other qualifications

Languages  
German (native), English (fluent)

Computer algebra  
Experience in several computer algebra systems including Mathematica and SAGE

Programming  
Experience in various programming environments including Python, PHP, SQL, HTML