

MICHAEL JOHN GRIFFIN

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PROFESSIONAL EXPERIENCE

Academic:

Senior Lecturer , Vanderbilt University	Aug 2023–Present
Assistant Professor , Brigham Young University	Aug 2017–Aug 2023
Research focus: Number Theory, modular forms, and elliptic curves	
Postdoctoral Fellow , Universität zu Köln	July 2016–July 2017
Postdoctoral Fellow , Princeton University	July 2015–July 2016

Internships:

NPSC Fellow	Summer 2012
Software Development Intern Microsoft	Summer 2011
Built prototype application for intuitive manipulation of very large data sets.	

EDUCATION

PhD Mathematics , Emory University	May 2015
Dissertation: <i>Applications of Harmonic Maass Forms</i>	
MS Mathematics , Emory University	Dec 2014
BS Mathematics with C.S. minor , Brigham Young University	May 2011
Graduated <i>Magna Cum Laude</i> and with University Honors	

AWARDS AND RECOGNITION

Early Career Award for Scholarship, BYU College of Physical & Mathematical Science (2022)
Distinguished Research Award, BYU Department of Mathematics (2019)
Research featured in *Biggest math breakthroughs of 2019*, Popular Mechanics (2019)
NSF postdoctoral fellow, National Science Foundation (2015)
Graduate Student Research Award, Emory Department of Math & CS (2015)
Research featured in *Top 100 science stories of 2015*, Discover Magazine (2016)
Research featured in *Top 100 science stories of 2014*, Discover Magazine (2015)
NSF Graduate Research Fellow, National Science Foundation (2012)
NPSC Graduate Fellow, National Physical Science Consortium (2011)
Orson Pratt Prize for outstanding graduating senior, BYU Dept. of Math. (2011)
Gordon B. Hinckley presidential scholar, Brigham Young University (2005)
Eagle Scout, Boy Scouts of America (2000)

OUTREACH

Vanderbilt Putnam Training Session	2023–Present
BYU Putnam team coach	2017–2023
Intermountain Math Competition organizer	2018–2022
Faculty adviser for USGA (lgbtq+ student organization at BYU)	2019–2023
BYU Math Camp	Summers 2018, 2019
Sterling Scholarship Program (Mathematics) finals judge	2018, 2019
National Museum of Mathematics Expansions Program	2015–2016
Emory Math Circle program	2014–2015
Emory REU project adviser	Summers 2013, 2015

COURSES TAUGHT

- Fundamentals of Mathematics (Intro to proofs)
- Linear Algebra with computer labs
- Mathematical Cryptography
- Graduate Algebra
- Calculus I, II, & III
- Graduate topics courses
- Seminar on Computer-assisted proofs (Lean)
- Co-developed a cohort program for new math majors and minors

RESEARCH

Conferences (co)-organized: 3

Articles Published or submitted: 28

Full list below. Electronic copies available at

<https://math.vanderbilt.edu/griffimj/Research>.

Citations: 253 (MathSciNet), 548 (Google Scholar)

Invited presentations: 38 (including 14 international)

Details of research continued on following pages.

CONFERENCES ORGANIZED

34th Automorphic Forms Workshop. Joint with Andersen, Doud, and Jenkins. Funding offered by NSF, NSA and the Journal of Number Theory. Provo UT. March 2022.

AMS Special Session on Analytic Theory of Automorphic Forms and L-Functions. Joint with Amanda Foslom, Larry Rolen, and Jesse Thorner. Denver, Jan 2020.

Modular Forms are Everywhere conference in honor of the 65th birthday of Don Zagier. Joint with Bringmann, Kontsevich, Moree, Ono, and Raum. Max-Planck-Institut für Mathematik. Funding provided by the European Research Council. Bonn, July 2017.

PUBLICATIONS

Submitted

(28) T. Amdeberhan, M. Griffin, K. Ono, A. Singh *Traces of Partition Eisenstein series*.

Accepted or Published

- (27) M. Griffin, K. Ono *A note on odd partition numbers*, Archiv der Mathematik. Accepted.
- (26) M. Griffin, K. Ono, and W-L. Tsai *Distributions of hook lengths in integer partitions*, Proceedings of the American Mathematical Society. Accepted.
- (25) M. Griffin, P. Jenkins, and G. Molnar *The Arithmetic of Modular Grids*, Mathematika. **68**:4, (2022) 1080-1119.
- (24) M. Griffin, and D. South *Jensen Polynomials for Holomorphic Functions*, Intl. J. Number Theory. **19** (2023), no. 4, 733–745.
- (23) M. Griffin, K. Ono, L. Rolen, W-L. Tsai *Limiting Betti distributions of Hilbert schemes on n points*, Canadian Mathematical Bulletin, **1**:16 (2022).
- (22) M. Griffin, K. Ono, N. Saikia, and W-L. Tsai *AGM and jellyfish swarms of elliptic curves*, Amer. Math. Monthly **130** (2023), no. 4, 355–369.
- (21) M. Griffin, K. Ono K, and W-L Tsai *Tamagawa products of elliptic curves over \mathbb{Q}* , Quarterly Journal of Mathematics. (Oxford), [Sir Michael Atiyah Memorial Issue] **72**, Issue 4 (2021), 1517–1543.
- (20) BYU Computational Number Theory Group, *Odd, spoof perfect factorizations*, Journal of Number Theory. **234**, (2022) 31-47.
- (19) M. Griffin, K. Ono, and W-L. Tsai, *Heights of points on elliptic curves over \mathbb{Q}* , Proceedings of the American Mathematical Society. **149** (2021), 5093-5100.
- (18) M. Griffin, K. Ono, and W-L. Tsai, *Quadratic twists of elliptic curves and class numbers*, Journal of Number Theory. **227**, (2021), 1-29. .

- (17) M. Griffin and K. Ono, *Elliptic Curves and Lower Bounds for Class Numbers*, Journal of Number Theory. **214**, 1-12 (2020).
- (16) M. Griffin, K. Ono, L. Rolén, J. Thorner, Z. Tripp, and I. Wagner, *Jensen Polynomials for Riemann's ξ Function*, Advances in Mathematics. **397**, (2022).
- (15) M. Griffin, L. Rolén, K. Ono, and D. Zagier, *Jensen Polynomials for Riemann's Zeta Function and Suitable Arithmetic Sequences*, Proceedings of the National Academy of Sciences. **116** no. 23 (2019), 11103-11110.
- (14) M. Griffin, *On p -adic Harmonic Maass Functions*, Transactions of the American Mathematical Society. **373** (2020), 7019-7066.
- (13) J. Chahal, M. Griffin, N. Priddis, *When are multiples of polygonal numbers again polygonal numbers?*, Hardy–Ramanujan Journal. **41** (2018), 58-67.
- (12) M. Griffin, M. Mertens, *A Proof of the Thompson Moonshine Conjecture*, Research in the Mathematical Sciences. **3:36** (2016).
- (11) M. Jameson, M. Griffin, and S. Trebat-Leder, *On p -Adic Modular Forms and the Bloch-Okounkov Theorem*, Research in the Mathematical Sciences. **3:11** (2016).
- (10) J. Duncan, M. Griffin and K. Ono, *Proof of the Umbral Moonshine Conjecture*, Research in the Mathematical sciences. **2:26** (2015).
- (9) J. Duncan, M. Griffin and K. Ono, *Moonshine*, Research in the Mathematical Sciences. **2:11** (2015).
- (8) M. Griffin, K. Ono, and S. O. Warnaar, *A Framework of Rogers–Ramanujan Identities and their Arithmetic Properties*, Duke Mathematics Journal. **165**, (2016), 1475-1527.
- (7) C. Alfes, M. Griffin, L. Rolén and K. Ono, *Weierstrass Mock Modular Forms and Elliptic Curves*, Research in Number Theory. **1:24**, (2015).
- (6) V. Dose, N. Green, M. Griffin, T. Mao, L. Rolén, and J. Willis *Singular Moduli for a Distinguished Non-Holomorphic Modular Function*, Proceedings of the American Mathematical Society. **143**, no. 3 (2015), 965-972.
- (5) M. Griffin, K. Ono, and L. Rolén, *Ramanujan's Mock Theta Functions*. Proceedings of the National Academy of Sciences. **110** no. 15 (2013), 5765-5768.
- (4) M. Griffin, A. Malmendier, and K. Ono, *$SU(2)$ Donaldson Invariants of the Projective Plane*, Forum Mathematicum. **27** (2015), 2003-2023.
- (3) M. Griffin, and L. Rolén, *Properties of Class Polynomials for Non-holomorphic Modular Functions*, Journal of the Ramanujan Society. **30**, no. 1 (2015), 83-99.
- (2) M. Griffin, and L. Rolén, *On Matrices Arising in the Finite Field Analogue of Euler's Integral Transform*, Mathematics. **1** (2013), 3-8.
- (1) M. Griffin, *Divisibility Properties of Coefficients of Weight 0 Weakly Holomorphic Modular Forms*, International Journal of Number Theory. **7**, no. 4 (2011), 933-941.

SELECTED INVITE PRESENTATIONS

- *Moonshine for Janko's first group*, AMS-UMI joint meetings, special session on "New Developments in Infinite dimensional Lie algebras, Vertex Operator Algebras and the Monster," Università degli Studi di Palermo, Palermo, 25 July 2024.
- *Distributions on Integer Partitions*, Building Bridges 5, University of Sarajevo, Sarajevo, 11 Aug 2022.
- *Distributions on Integer Partitions*, 100 years of Mock Theta Functions, Vanderbilt, Nashville, 23 May 2022.
- *AGM and jellyfish swarms of elliptic curves*, BYU Math department colloquium, BYU, Provo, 12 Jan 2022
- *Jensen polynomials of the Xi-function and other arithmetic sequences* (Virtual), Algebraic Geometry and Number Theory seminar, Chalmers/University of Gothenburg, Gothenburg, 15 Sept. 2021
- *Class pairings and elliptic curves* (Virtual), International Conference on Number Theory and Algebra, IIT (BHU), Varanasi, 22-23 Dec. 2020
- *Class pairings and elliptic curves* (Virtual), International Seminar on Automorphic Forms, TU Darmstadt, 4 Nov. 2020
- *Monstrous Moonshine*. BYU Physics and Astronomy Colloquium, BYU, 1 Apr. 2019
- *The Modular Parameterization of Elliptic curves*. Conference on Modular Forms and Related Topics, American University of Beirut, Beirut, 29 May 2018
- *Polya's program for the Riemann Hypothesis and related problems*. MPS Conferences on Number Theory, Geometry & Strings II, Simons Foundation, New York, 15 Mar. 2018
- *Umbral Moonshine*. Indefinite theta functions and applications in physics and geometry, Trinity College. Dublin, 7 June 2017
- *Moonshine*. School and Workshop on Modular Forms and Black Holes, NISER. Bhubaneswar India, 12 Jan. 2017
- *Thompson Moonshine*. Plenary talk, UCONN conference on elliptic curves, modular forms and related topics. Storrs CT, 13 Aug. 2016
- *Moonshine, Moonshine and mock modular forms*, and *Umbral moonshine*. (3 talks). KIAS number theory seminars. Seoul, 2-5 Feb. 2016
- *Moonshine*. Purdue automorphic forms and representation theory seminar. West Lafayette IN, 16 April 2015
- *On the distribution of moonshine and umbral moonshine*. UNC-Duke Number Theory Seminar. Durham NC, 21 Jan. 2015
- *Algebraic units arising from a framework of Rogers-Ramanujan identities*. Joint math meetings. San Antonio TX, 11 Jan. 2015
- *Weierstrass mock modular forms and elliptic curves*. SASTRA Prize Conference. Kumbakonam India, 21 Dec. 2014
- *On the distribution of moonshine and other theorems at the interface of number theory and representation theory*. Texas A&M Number Theory Seminar. College Station TX, 3 Dec. 2014
- *Mock modular forms*. TIFR number theory seminar. Mumbai India, 1 Aug. 2013.
- *Mock modular forms*. (2 talks). IMSc number theory colloquium. Chennai India, 22-23 July. 2013.