

Department of Mathematics, Dartmouth College, 245 Kemeny Hall, Hanover, NH 03755  
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## Education

**PhD, Mathematics**, *Dartmouth College*, Hanover, NH Fall 2018 - Present

Advisor: John Voight

**MS, Mathematics**, *Brigham Young University*, Provo, UT Winter 2017 - Summer 2018

Advisors: Michael Griffin and Paul Jenkins

Thesis: *The arithmetic of modular grids*

**BS, Mathematics**, *Brigham Young University*, Provo, UT Fall 2013 - Fall 2016

## Awards and Fellowships

Dartmouth Graduate Fellowship Fall 2018 - Summer 2023

Gridley Fund for Graduate Mathematics Fall 2018 - Summer 2019

NSF Graduate Research Fellowship Honorable Mention April 2018

BYU Academic Scholarship Spring 2015 - Winter 2016

BYU Math Department Scholarship Fall 2016

BYU Math Department Scholarship Fall 2015

BYU Academic Scholarship Fall 2013 - Winter 2014

## Research Publications and Preprints

**The arithmetic of modular grids**, with *Michael Griffin and Paul Jenkins*

Submitted for publication. arXiv:2012.14403

**Odd, spoof perfect factorizations**, with the *BYU Computational Number Theory Group*

Submitted for publication. arXiv:2006.10697

**Zagier duality for level  $p$  weakly holomorphic modular forms**, with *Paul Jenkins*

The Ramanujan Journal **50**, 93–109 (2019). arXiv:1709.10023

**Graphs with the strong Havel-Hakimi property**, with *Michael Barrus*

Graphs and Combinatorics **32**, 1689–1697 (2016). arXiv:1505.00085

## Manuscripts in Preparation

**Reactive means and the prisoner's dilemma**, with *Feng Fu*

**Telescopic, multiplicative, and rational extensions of summations**, with *Robert Dawson*

**Multiplicative summations into algebraically closed fields**, with *Robert Dawson*

**Odd, spoof quasiperfect factorizations**, with *Jonathan Hales*

## Expository Notes

**Fast-growing series are transcendental**, *with Robert Dawson*

Unpublished. arXiv:2102.12995

## Teaching Experience

**Dartmouth College**, Hanover, NH (Instructor)

Math 1 (Algebra and Calculus) Fall 2020

**Dartmouth College**, Hanover, NH (Teacher's Assistant)

Math 23 (Differential Equations) Winter 2020

Math 3 (Calculus) Fall 2019

Math 22 (Linear Algebra) Spring 2019

Math 22 (Linear Algebra) Fall 2018

**Brigham Young University**, Provo, UT (Instructor)

Math 112 (Calculus I) Summer 2017

**Brigham Young University**, Provo, UT (Teacher's Assistant)

Math 112 (Calculus I) Fall 2017

Math 113 (Calculus II) Winter 2017

**Brigham Young University**, Provo, UT (Grader)

Math 570 (Matrix Analysis) Winter 2017

Math 112 (Calculus I) Fall 2015

## Conference Talks

**Formal summation of divergent series**

September 26, 2020

2020 Maine-Québec Number Theory Conference (virtual)

**The arithmetic of modular grids**

October 5, 2019

2019 Maine-Québec Number Theory Conference

**The arithmetic of modular grids**

March 8, 2019

33<sup>rd</sup> Automorphic Forms Workshop

**The arithmetic of modular grids**

July 17, 2018

Building Bridges: 4th EU/US Summer School + Workshop on Automorphic Forms

**Zagier duality in level  $p$  modular spaces**

March 21, 2018

32<sup>nd</sup> Automorphic Forms Workshop

**Zagier duality in level  $p$  modular spaces**

March 3, 2018

2018 BYU Student Research Conference

**Zagier duality in level  $p$  modular spaces**

May 24, 2017

Modular Forms are Everywhere Conference

**Weakly holomorphic modular forms of level 11**

March 7, 2017

31<sup>st</sup> Automorphic Forms Workshop

**Weakly holomorphic modular forms of level 11**

March 4, 2017

2017 BYU Student Research Conference

<b>Congruence relations in modular forms of prime levels greater than 7</b> 2015 BYU Student Research Conference	March 21, 2015
<b>Residues and independence numbers of graphs</b> 2014 BYU Student Research Conference	March 15, 2014

## Seminar Talks

<b><math>p</math>-adic Hodge theory</b> Reading Seminar on Classical and Quadratic Chabauty (virtual)	March 2, 2021
<b>Odd, spoof quasiperfect factorizations</b> Dartmouth Algebra and Number Theory Seminar (virtual)	February 9, 2021
<b>A primer in social choice theory</b> Dartmouth Graduate Student Seminar (virtual)	January 20, 2021
<b>Examples of Kedlaya's algorithm</b> Reading Seminar on Classical and Quadratic Chabauty (virtual)	November 19, 2020
<b>The LCM product and Grönwall's theorem</b> Dartmouth Algebra and Number Theory Seminar (virtual)	November 17, 2020
<b>Reactive means and the prisoner's dilemma</b> Dartmouth Graduate Student Seminar (virtual)	October 7, 2020
<b>Formal summation of divergent series: an algebraic approach</b> Dartmouth Algebra and Number Theory Seminar (virtual)	April 28, 2020
<b>On the infinitude of the natural numbers</b> Dartmouth Graduate Student Seminar	February 12, 2020
<b>Variations of Hodge structures</b> Reading Seminar on Shimura Varieties	November 26, 2019
<b>Hodge structures</b> Reading Seminar on Shimura Varieties	November 14, 2019
<b>Savage's expected utility and making good decisions</b> Dartmouth Graduate Student Seminar	November 13, 2019
<b>Geometric and generalized calculus</b> Dartmouth Graduate Student Seminar	October 8, 2019
<b>Summing divergent series</b> Dartmouth Graduate Student Seminar	July 31, 2019
<b>Real analysis: a nonstandard approach</b> Dartmouth Graduate Student Seminar	April 17, 2019
<b>Why save the universe? Set theory with a universal set</b> Dartmouth Graduate Student Seminar	January 16, 2019
<b>The arithmetic of modular grids</b> Dartmouth Graduate Student Seminar	September 26, 2018
<b>The arithmetic of modular grids</b> BYU Master's Thesis Defense	June 22, 2018
<b>Dioids and idempotent geometry II</b> BYU Algebra Seminar	March 13, 2018
<b>Dioids and idempotent geometry I</b> BYU Algebra Seminar	February 27, 2018

<b>Zagier duality in level <math>p</math> modular spaces</b> BYU Number Theory Seminar	February 22, 2018
<b>Average values of arithmetic functions</b> BYU Number Theory Seminar	October 12, 2017
<b>Weakly holomorphic modular forms of level 11</b> BYU Number Theory Seminar	February 9, 2017
<b>Generating functions for canonical bases of certain level 11 weakly holomorphic modular forms</b> BYU Number Theory Seminar	January 26, 2017
<b>High rank elliptic curves with prescribed torsion</b> BYU Number Theory Seminar	December 1, 2016
<b>Heuristics for elliptic curves of high rank</b> BYU Number Theory Seminar	October 20, 2016
<b>A lemma regarding the Feit-Thompson conjecture</b> BYU Number Theory Seminar	November 12, 2015
<b>Algebraic number theory and the Feit-Thompson conjecture</b> BYU Number Theory Seminar	October 1, 2015
<b>On Hensel's lemma</b> BYU Number Theory Seminar	February 12, 2015
<b>On Newton polynomials</b> BYU Number Theory Seminar	March 27, 2014

## Service and Synergistic Activities

<b>Reviewer</b> <i>zbMATH Open</i>	2021 - Present
<b>Referee</b> <i>Journal of Number Theory</i>	2018
<b>K-12 Outreach</b> Utah Math Olympiad Committee Member Exploring Mathematics Camp Leader (Graph Theory) Exploring Mathematics Camp Leader (Cryptography) Activity Station Leader at Lebanon Ward Pi Day Volunteer at Dartmouth Sonia Kovalevsky Day Activity Station Leader at Dartmouth Science Day Math Circles Guest Speaker on Tropical Algebra Math Circles Guest Speaker on Continued Fractions Proofreader for Utah State Math Contest Math Circles Counselor	2015 - Present July 27-31, 2020 July 13-17, 2020 March 7, 2020 May 11, 2019 May 4, 2019 February 24, 2018 October 21, 2017 February 2017 2013 - 2015
<b>Other</b> Dartmouth Graduate Student Council Representative for Math Department ◦ <i>Service Committee Member</i> ◦ <i>Sexual Misconduct Survey Committee Member</i>	2020 - Present 2020 - Present February 2021

◦ <i>Budget Committee Member</i>	August 2020
Dartmouth Algebra and Number Theory Seminar Coordinator	2019 - Present
BYU Putnam Team Captain	2014 - 2016

## Other

### Mathematical Work

Math Tutor	2013 - Present
Undergraduate Researcher	2013 - 2016

### Achievements and Honors

3 <sup>rd</sup> Place in Virginia Tech Regional Math Competition	October 2016
2 <sup>nd</sup> Place in Search for High Rank Elliptic Curve at 2016 CTNT	August 2016
Eagle Scout	December 2012
Black Belt in Taekwondo	August 2012

### Special Training

Dartmouth Mathematics Teaching Seminar	Spring 2020
BYU Mathematics Teaching Seminar	Fall 2018

### Computer Skills

Python • C++ • SageMath • Magma • Mathematica

### Academic Interests

Analytic Number Theory • Arithmetic Geometry • Game Theory • Logic

### Personal Interests

Reading • Writing • Philosophy • Rock-Climbing

## Conferences and Summer Schools Attended

<i>2021 Joint Mathematics Meetings</i>	January 6-9, 2021
Virtual	
<i>Fall 2020 Algebraic Geometry Northeastern Series</i>	October 23-25, 2020
Virtual	
<i>2020 Maine-Québec Number Theory Conference</i>	September 26-27, 2020
Virtual	
<i>14<sup>th</sup> Algorithmic Number Theory Symposium</i>	June 29 - July 4, 2020
Virtual	
<i>UNCG Summer School in Computational Number Theory and Algebra: Ergodic Theory with Applications to Continued Fractions</i>	May 18-22, 2020
Virtual	
<i>2019 Maine-Québec Number Theory Conference</i>	October 5-6, 2019
University of Maine, Orono	
<i>Fall 2019 Algebraic Geometry Northeastern Series</i>	September 20-22, 2019
Boston College, Boston	
<i>33<sup>rd</sup> Automorphic Forms Workshop</i>	March 6-10, 2019
Duquesne University, Pittsburgh	

<i>Building Bridges: 4<sup>th</sup> EU/US Summer School + Workshop on Automorphic Forms and Related Topics</i> Alfréd Rényi Institute of Mathematics, Budapest	July 9-20, 2018
<i>32<sup>nd</sup> Automorphic Forms Workshop</i> Tufts University, Medford	March 19-22, 2018
<i>Modular Forms are Everywhere</i> Max Planck Institute for Mathematics, Bonn	May 15-26, 2017
<i>31<sup>st</sup> Automorphic Forms Workshop</i> East Tennessee State University, Johnson City	March 6-9, 2017
<i>2017 BYU Student Research Conference</i> Brigham Young University, Provo	March 4, 2017
<i>2016 Connecticut Summer School in Number Theory</i> University of Connecticut, Storrs	August 8-14, 2016
<i>2015 BYU Student Research Conference</i> Brigham Young University, Provo	March 21, 2015
<i>2014 BYU Student Research Conference</i> Brigham Young University, Provo	March 15, 2014