

# Grant Molnar

# Curriculum Vitae

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

**PhD, Mathematics**, *Dartmouth College*, Hanover, NH Fall 2018 - expected May 2023  
Advisor: John Voight

**MA, Mathematics**, *Dartmouth College*, Hanover, NH Fall 2018 - Winter 2020  
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

## Teaching Experience

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

Math 8 (Calculus of One and Several Variables) Fall 2021

Math 1 (Algebra and Calculus) Fall 2020

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

Math 100 / Computer Science 49/149 (Random Walk) Spring 2022

Math 100 / Computer Science 49/149 (Decision Theory) Spring 2021

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

## Other Work Experience

BYU Putnam Team Captain 2014 - 2016

Undergraduate Researcher 2013 - 2016

Math Circles Counselor 2013 - 2015

## 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

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

Submitted for publication. [arXiv:2111.09938](#)

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

Submitted for publication. [arXiv:2105.04592](#)

**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*

Journal of Number Theory (2021). *Quanta* article. [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](#)

## Expository Notes

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

Unpublished. [arXiv:2102.12995](#)

## Manuscripts in Preparation

**Counting 7-isogenies**, *with John Voight*

**LCM-products and the Ramanujan-Robin criterion**, *with Steve Fan and Mits Kobayashi*

**Visualizing Basel's problem**, *with Mits Kobayashi*

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

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

## Git Projects

**Spoof Quasiperfect Factorizations**

Fall 2021

<https://github.com/grantmolnar/Spoof-Quasiperfect-Factorizations>

## Conference Talks

<b>The LCM product and Grönwall's theorem</b> 2021 Maine-Québec Number Theory Conference (virtual)	October 3, 2021
<b>Formal summation of divergent series</b> 2020 Conférence de Théorie des Nombres Québec-Maine (virtual)	September 26, 2020
<b>The arithmetic of modular grids</b> 2019 Maine-Québec Number Theory Conference	October 5, 2019
<b>The arithmetic of modular grids</b> 33 <sup>rd</sup> Automorphic Forms Workshop	March 8, 2019
<b>The arithmetic of modular grids</b> Building Bridges: 4th EU/US Summer School + Workshop on Automorphic Forms	July 17, 2018
<b>Zagier duality in level <math>p</math> modular spaces</b> 32 <sup>nd</sup> Automorphic Forms Workshop	March 21, 2018
<b>Zagier duality in level <math>p</math> modular spaces</b> 2018 BYU Student Research Conference	March 3, 2018
<b>Zagier duality in level <math>p</math> modular spaces</b> Modular Forms are Everywhere Conference	May 24, 2017
<b>Weakly holomorphic modular forms of level 11</b> 31 <sup>st</sup> Automorphic Forms Workshop	March 7, 2017
<b>Weakly holomorphic modular forms of level 11</b> 2017 BYU Student Research Conference	March 4, 2017
<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

## Other Talks

<b>Universal algebra and coalgebra</b> Dartmouth Graduate Student Seminar	March 30, 2022
<b>Cogalois theory</b> Dartmouth Graduate Student Seminar	February 16, 2022
<b>Cyclic resolution of singularities</b> Reading Seminar on Hilbert Modular Surfaces	January 25, 2022
<b>What if the Riemann hypothesis is false?</b> Dartmouth Graduate Student Seminar	January 19, 2022
<b>Inverse semigroups: groups without identity</b> Dartmouth Graduate Student Seminar	November 9, 2021
<b>Counting 7-isogenies</b> Dartmouth Algebra and Number Theory Seminar	November 8, 2021
<b>A sober look at pointless topology</b> Dartmouth Graduate Student Seminar	September 21, 2021
<b>Fast-growing series are transcendental</b> Dartmouth Graduate Student Seminar (virtual)	April 21, 2021

<b>Coalgebras and Hopf algebras</b> Reading Seminar on Affine Group Schemes (virtual)	April 15, 2021
<b>Absurd equalities and Runge's method: the degenerate case</b> Dartmouth Algebra and Number Theory Seminar (virtual)	March 30, 2021
<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>Congruence relations in modular forms of prime levels greater than 7</b> BYU Number Theory Seminar	March 19, 2015
<b>Hensel's lemma</b> BYU Number Theory Seminar	February 12, 2015
<b>Newton polynomials</b> BYU Number Theory Seminar	March 27, 2014

## Leadership and Community Service

### Referee

<i>Journal of Number Theory</i>	2018 - Present
<i>Mathematische Zeitschrift</i>	2022 - Present

### Reviewer

<i>zbMATH Open</i>	2021 - Present
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### K-12 Outreach

Utah Math Olympiad Committee Member	2015 - Present
Session Leader at Dartmouth Sonia Kovalevsky Day (Arithmetic)	May 21, 2022
Activity Station Leader at Lebanon Ward Pi Day (Random Walk)	April 8, 2022
Exploring Mathematics Camp Leader (Graph Theory)	July 27-31, 2020
Exploring Mathematics Camp Leader (Cryptography)	July 13-17, 2020
Activity Station Leader at Lebanon Ward Pi Day (Random Walk)	March 7, 2020
Volunteer at Dartmouth Sonia Kovalevsky Day	May 11, 2019
Activity Station Leader at Dartmouth Science Day (Nim)	May 4, 2019
Math Circles Guest Speaker (Tropical Algebra)	February 24, 2018
Math Circles Guest Speaker (Continued Fractions)	October 21, 2017
Proofreader for Utah State Math Contest	February 2017

### Other

Dartmouth Algebra and Number Theory Seminar Organizer	2019 - Present
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Dartmouth Graduate Student Council Healthcare Committee Co-Chair	2022 - Present
Dartmouth Graduate Student Council Finance Officer	2021 - 2022
◦ <i>Budget Committee Member</i>	Summer 2021
Dartmouth Directed Reading Program Mentor (Decision Theory)	Spring 2022
Dartmouth Directed Reading Program Mentor (Fractional Calculus)	Winter 2022
Dartmouth Graduate Student Council Representative for Math Department	2020 - 2021
◦ <i>Service Committee Member</i>	2020 - 2021
◦ <i>Budget Committee Member</i>	Summer 2020

## Computer Skills

### Fluent in...

Bash •  $\text{\LaTeX}$  • Python • SageMath

### Experience with...

C++ • Git • HTML • Magma • Mathematica • MatLab • PARI/GP

## Other

### 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
Gold Palm Eagle Scout	December 2012
Black Belt (Taekwondo)	August 2012

### Special Training

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

### Academic Interests

Analytic Number Theory • Arithmetic Geometry • Game Theory • Logic

### Personal Interests

Reading • Writing • Philosophy • Hiking

## Conferences and Workshops Attended

<i>Big Data Conference 2022</i>	August 26, 2022
Virtual (Harvard University, Cambridge)	
<i>Explicit Methods for Modularity</i>	April 11-15, 2022
Virtual (Simons Collaboration)	
<i>Arizona Winter School 2022: Automorphic Forms Beyond <math>GL_2</math></i>	March 5-9, 2022
Virtual (University of Arizona, Tucson)	
<i>Hilbert Modular Forms Infrastructure Week 2.0</i>	February 21-25, 2022
Dartmouth College, Hanover	
<i>2021 Maine-Québec Number Theory Conference</i>	October 2-3, 2021
Virtual (University of Maine, Orono)	

<i>Spring 2021 Algebraic Geometry Northeastern Series</i> Virtual (Brown University, Providence)	May 4-5, 2021
21 <sup>st</sup> <i>Algebra, Geometry and Combinatorics Day</i> Virtual (University of Notre Dame, Notre Dame)	April 10, 2021
2021 <i>Joint Mathematics Meetings</i> Virtual (American Math Society, Mathematical Association of America)	January 6-9, 2021
<i>Fall 2020 Algebraic Geometry Northeastern Series</i> Virtual (Stony Brook University, Stony Brook)	October 23-25, 2020
2020 <i>Conférence de Théorie des Nombres Québec-Maine</i> Virtual (Université Laval, Québec)	September 26-27, 2020
14 <sup>th</sup> <i>Algorithmic Number Theory Symposium</i> Virtual (University of Auckland, Auckland)	June 29 - July 4, 2020
<i>UNCG Summer School in Computational Number Theory and Algebra: Ergodic Theory with Applications to Continued Fractions</i> Virtual (University of North Carolina, Greensboro)	May 18-22, 2020
2019 <i>Maine-Québec Number Theory Conference</i> University of Maine, Orono	October 5-6, 2019
<i>Fall 2019 Algebraic Geometry Northeastern Series</i> Boston College, Boston	September 20-22, 2019
33 <sup>rd</sup> <i>Automorphic Forms Workshop</i> Duquesne University, Pittsburgh	March 6-10, 2019
<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
32 <sup>nd</sup> <i>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
31 <sup>st</sup> <i>Automorphic Forms Workshop</i> East Tennessee State University, Johnson City	March 6-9, 2017
2017 <i>BYU Student Research Conference</i> Brigham Young University, Provo	March 4, 2017
2016 <i>Connecticut Summer School in Number Theory</i> University of Connecticut, Storrs	August 8-14, 2016
2015 <i>BYU Student Research Conference</i> Brigham Young University, Provo	March 21, 2015
2014 <i>BYU Student Research Conference</i> Brigham Young University, Provo	March 15, 2014