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**Research interests:** combinatorial optimization, applied algebraic geometry, operations research, proof complexity, polyhedral combinatorics, theoretical computer science

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## ACADEMIC POSITIONS AND EDUCATION

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- **University of Massachusetts** **January 2018-**  
Tenure-Track Assistant Professor in the Mathematics Department
- **Mathematical Sciences Research Institute** **Fall 2017**  
Gamelin Endowed Postdoctoral Fellow
- **University of Washington** **2014-2017**  
Acting Assistant Professor in the Mathematics Department
- **Technische Universität Berlin - Berlin Mathematical School** **2009-2014**  
Ph.D. in Mathematics under the supervision of Martin Grötschel
- **Massachusetts Institute of Technology** **2005-2009**  
Bachelor of Science in Mathematics - Bachelor of Science in Music

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## PUBLICATIONS

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- **The Bullet Problem with Discrete Speeds** (with Brittany Dygert\*, Matthew Junge, Christoph Kinzel\*, Erik Slivken, and Jennifer Zhu\*), *submitted to Forum of Mathematics Sigma*, arXiv:1610.00282. (\*undergrads)
- **The Turán Polytope**, *Electronic Journal of Combinatorics*, Volume 25, Issue 3 (2018), P3.43.
- **Symmetric Sums of Squares over  $k$ -Subset Hypercubes** (with James Saunderson, Mohit Singh and Rekha Thomas), *Math. Programming Series A*, Volume 167, Issue 2 (2018), pp. 315-354.
- **Symmetry in Turán Sums of Squares Polynomials from Flag Algebras** (with Mohit Singh and Rekha Thomas), *Algebraic Combinatorics*, Volume 1, Number 2 (2018), pp. 249-274.
- **New Conjectures for Union-Closed Families** (with Jonad Pulaj and Dirk Theis), *The Electronic Journal of Combinatorics*, Volume 23, Number 3 (2016), P3.23.
- **Integer Programming and Standings in Competitions** (with Christian Raack, Thomas Schlechte and Axel Werner), *Journal of Quantitative Analysis in Sports*, Volume 10, Issue 2 (2014), pp. 131-138.

- **Multiband Robust Optimization and its Adoption in Harvest Scheduling** (with Fabio D'Andreagiovanni), *FORMATH*, Volume 13 (2013).
- **Robust Optimization under Multiband Uncertainty** (with Christina Büsing and Fabio D'Andreagiovanni), *Proceedings of the Workshop on Mixed Integer Programming 2013*.
- **0-1 Multiband Robust Optimization** (with Christina Büsing and Fabio D'Andreagiovanni), *Operations Research Proceedings 2013*, pp. 89-96.
- **Small Chvátal Rank** (with Tristram Bogart and Rekha Thomas), *Mathematical Programming, Series B*, Volume 124, Numbers 1-2 (2010), pp. 45-68.
- **The Centers of Gravity of the Associahedron and of the Permutohedron Are the Same** (with Christophe Hohlweg and Jonathan Lortie), *The Electronic Journal of Combinatorics*, Volume 17, Number 1 (2010), R72.

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## TEACHING

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- **Introduction to Discrete Structures** (UMass) Fall 2018
- **Introduction to Discrete Structures** (UMass) Spring 2018
- **Elementary Algebra** (San Quentin State Prison) Fall 2017  
Through the program *Prison University Project*
- **College Algebra** (Monroe Correctional Complex) Spring 2017  
Through the program *University Beyond Bars* and Adams State University
- **Introduction to Mathematical Reasoning** (UW) Spring 2017
- **Advanced Multivariable Calculus I** (UW) Spring 2017
- **Proofs from the Book - Lecture Series** (Monroe Correctional Complex) Fall 2016  
Through the program *University Beyond Bars*
- **Advanced Multivariable Calculus I - two sections** (UW) Fall 2016
- **Finite Mathematics** (Monroe Correctional Complex) Spring 2016  
Through the program *University Beyond Bars* and Adams State University
- **Special Topics in Mathematics (Undergrad Research)** (UW) Spring 2016
- **Combinatorial Optimization** (UW) Spring 2016
- **Advanced Multivariable Calculus I - two sections** (UW) Winter 2016
- **Advanced Multivariable Calculus I - two sections** (UW) Fall 2015
- **Matrix Algebra With Applications** (UW) Spring 2015
- **Matrix Algebra With Applications** (UW) Winter 2015
- **Advanced Multivariable Calculus I - two sections** (UW) Fall 2014
- **Proof Techniques in Polyhedral Combinatorics** (TU Berlin) Winter 2011-2012

## STUDENT SUPERVISION

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- **Reading course** on Ramsey theory with Fil Dul and GaYee Park Fall 2018
- **REU** on the Frankl conjecture with Lucien Dalton, Drew Polakowski and Bertram Thomas Fall 2018
- **REU** on the Frankl conjecture with Lucien Dalton and Bertram Thomas Summer 2018
- **Reading course** on sums of squares with GaYee Park Spring 2018
- **Reading course** on approximation algorithms with Natalie Frank Winter 2017
- **REU** on the Frankl conjecture with Judy Tu Spring 2016

## RESEARCH TALKS

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- **Symmetric Sums of Squares over  $k$ -Subset Hypercubes**

International Symposium on Mathematical Programming	July 2, 2018
Mixed Integer Programming Workshop	June 20, 2018
Valley Geometry Seminar at UMass	April 27, 2018
AMS Sectional at Northeastern	April 21, 2018
TCS/Discrete Math Seminar at IAS	April 16, 2018
CS Colloquium at McGill University	April 13, 2018
Theory Reading Group at KTH	March 12, 2018
Colloquium at Santa Clara University	November 28, 2017
Algebra Geometry Combinatorics Seminar at San Francisco State University	October 18, 2017
Hierarchies Workshop at the Simons Institute	November 6, 2017
MSRI GTC Workshop on Modern techniques and methods	October 10, 2017
MSRI Postdoc Seminar	October 6, 2017
Oberwolfach Workshop on Proof Complexity and Beyond	August 17, 2017
Seminar at ZIB	August 7, 2017
SIAM Conference on Applied Algebraic Geometry	August 1, 2017
SIAM Optimization Conference	May 23, 2017
Colloquium at the University of California, Davis	February 3, 2017
Colloquium at Wesleyan University	January 27, 2017
Colloquium at CUNY Baruch College	January 26, 2017
Colloquium at University of Richmond	January 23, 2017
Combinatorics & Optimization at the University of Waterloo	January 19, 2017
Joint Mathematics Meetings	January 4, 2017
Colloquium at UMass Amherst	December 21, 2016
Theory Seminar at the University of Washington	November 15, 2016
LIDS Seminar at the Massachusetts Institute of Technology	October 20, 2016
BAD Math Day at the University of California, Davis	October 1, 2016
Discrete Math and Optimization Seminar at McGill University	September 19, 2016
Algebraic Statistics Seminar at the Illinois Institute of Technology	September 15, 2016
Theory Seminar at the University of Chicago	September 13, 2016
GERAD Seminar at the Université de Montréal	August 31, 2016
SIAM Annual Meeting	July 14, 2016

- **Symmetry in Turán Sums of Squares Polynomials from Flag Algebras**
  - Math/Stat Club at Mount Holyoke College September 21, 2016
  - ACO Colloquium at Georgia Tech April 18, 2016
  - Claremont Colleges Mathematics Colloquium March 23, 2016
  - Applied Algebra Seminar at the University of California, Berkeley March 14, 2016
  - Department Colloquium at Western Washington University February 4, 2016
  - Combinatorics Seminar at the University of Washington January 27, 2016
  - Joint Mathematics Meetings - Non-Linear Algebra Session January 9, 2016
  - Department Colloquium at Reed College October 15, 2015
  - Current Topics Seminar at the University of Washington October 13, 2015
  - SIAM Conference on Applied Algebraic Geometry August 3, 2015
  - International Symposium on Mathematical Programming July 13, 2015
  - MSR Talk Series at Microsoft Research (Redmond) July 7, 2015
- **New Conjectures for Union-Closed Families**
  - Combinatorics Seminar at Georgia Tech April 19, 2016
  - Combinatorics Seminar at the University of Washington December 3, 2014
  - Combinatorial Optimization Seminar at EPFL January 23, 2014
- **The Turán Polytope**
  - TOPS Seminar at the University of Washington October 14, 2014
  - Discrete Lunch at the University of Tartu October 21, 2013
- **Integer Programming and Standings in Competitions**
  - MathSport International Conference June 5, 2013
- **0-1 Multiband Robust Optimization**
  - Cologne-Twente Workshop on Graphs & Combinatorial Optimization May 23, 2013
  - Mathematical Modeling for Issues on Ecosystem Services March 18, 2013
  - Forest Resource Management and Math Modeling Symposium March 14, 2013
- **Introductory talk on the Theta body**
  - What Is...? Seminar at the Berlin Mathematical School April 23, 2010
- **The Small Chvátal Rank**
  - International Symposium on Mathematical Programming August 26, 2009
  - Concordia Computational Combinatorial Optimization Seminar July 15, 2009
  - Canadian Undergraduate Mathematics Conference July 11, 2008

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## SCHOLARSHIPS AND AWARDS

- Gamelin Endowed Postdoctoral Fellowship for the Geometric and Topological Combinatorics program at the Mathematical Sciences Research Institute 2017
- Research Fellowship for the program on ‘Bridging Continuous and Discrete Optimization’ at the Simons Institute for the Theory of Computing (declined) 2017
- Association for Women in Mathematics Travel Grant 2016

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- Konrad-Zuse-Zentrum Scholarship 2011-2014
- Berlin Mathematical School Scholarship 2009-2011
- Killam Scholarship for MIT 2005-2009
- LaCIM Summer Research Scholarship 2008
- NSERC Undergraduate Student Research Award 2007
- Québec's Lieutenant Governor's Youth Medal 2005
- Archimède à Zola Scholarship for Collège André-Grasset 2003-2005
- Québec's Lieutenant Governor's Youth Medal 2003

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## OUTREACH

- Runs a Math Circle at the Hampshire County Jail for the Fall Semester of 2018
- Runs the instagram feed `_forall` featuring minorities in mathematics and computer science
- Mentor at the Career Mentoring Workshop for Women in Mathematics (CaMeW) in 2018
- Co-teacher for *Elementary Algebra*, a semester-long course in the fall of 2017, at the San Quentin State Prison through the Prison University Project
- Teacher for *SIMUW*, a math camp for high school students for two weeks in the summer of 2017, introducing them to combinatorial optimization
- Judge for the Math Hour Olympiad at the University of Washington on June 4, 2017
- Teacher for *College Algebra*, a semester-long course in the spring of 2017, at the Monroe Correctional Center through University Beyond Bars and Adams State University
- Organizer of a lecture series on *Proofs from the Book* in the fall of 2016 at the Monroe Correctional Center through University Beyond Bars
- Teacher for *Finite Math*, a semester-long course in the spring of 2016, at the Monroe Correctional Center through University Beyond Bars and Adams State University
- Co-organizer (with Matthew Junge) of the session *Thinking Outside the Circle: Alternate Outreach* at the Annual Meeting of the Pacific Northwest Section of the MAA - also speaker on *Girls' Day or Mädchen-Zukunftstag*
- Organizer of several events in 2015 and 2016 for younger women in mathematics at the REU Summer Program at the University of Washington and at the SIMUW Summer Camp
- Panelist for *Women in Science* at the Pop Science Cafe in Berlin in 2014, an organization that brings science to the general public
- Local organizer at the Konrad-Zuse-Zentrum for Girls' Day 2012, a Germany-wide outreach event to get more girls interested in science and technology

- Instigator and first organizer of the Berlin Mathematical School Women in Mathematics Lecture Series
- Founding member of Berlin's Women in Mathematics
- Speaker at different outreach events with interactive talks on *Math and your Love Life*, on *Alcuin's Mathematical Puzzle* and/or on *An Introduction to Optimization*
  - Undergrad Math Club at UMass April 11, 2018
  - Center for Women in Mathematics Lunch talk at Smith College March 22, 2018
  - Engage As You Age October 28, 2017
  - Berkeley Math Circle October 3, 2017
  - Berkeley Math Circle September 26, 2017
  - MathILy-Er Math Camp July 11, 2017
  - Math Club at Cascadia Elementary School May 9, 2017
  - Math Day at the University of Washington March 20, 2017
  - Advisory Period at Highline High School in Seattle March 2, 2017
  - Girls in Science Program at the Burke Museum October 15, 2016
  - Collège Jean-Eudes in Montreal September 20, 2016
  - REU Summer Program at the University of Washington June 30, 2016
  - SIMUW Summer Camp June 29, 2016
  - Math Day at the University of Washington March 21, 2016
  - Girls in Science Program at the Burke Museum October 3, 2015
  - REU Summer Program at the University of Washington July 1, 2015
  - Math Day at the University of Washington March 23, 2015
  - Pop Science Cafe Berlin February 6, 2014
  - Girls' Day at the Konrad-Zuse-Zentrum April 25, 2012

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## RESEARCH VISITS

- **University of Chicago** September 5 to 16, 2016  
visiting Alexander Razborov
- **University of Tartu** October 20 to 25, 2013  
visiting Dirk Theis
- **University of Washington** June 10 to July 1, 2009  
visiting Rekha Thomas
- **University of Washington** August 22 to 30, 2008  
visiting Rekha Thomas
- **Université du Québec à Montréal** June 1 to August 21, 2008  
visiting François Bergeron (through LaCIM REU grant)
- **Université du Québec à Montréal** June 1 to August 25, 2007  
visiting Olivier Collin (through NSERC REU grant)