David Harry Richman

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RESEARCH INTERESTS Tropical geometry, curves and Jacobians, graph theory, combinatorics, number theory

EDUCATION University of Michigan, Ann Arbor, MI

Ph.D. Candidate in Mathematics (expected April 2020) 2014 - current

Advisor: David Speyer

Independent University of Moscow, Moscow, Russia

Math in Moscow Study Abroad Program 2013 - 2014

Massachusetts Institute of Technology, Cambridge, MA

S.B. in Mathematics with Computer Science 2009 - 2013

Phi Beta Kappa Society, Xi Chapter

Research Papers "The poset of almost-divisors," with Jeffrey C. Lagarias, in preparation

"The tropical Manin–Mumford conjecture," in preparation

"The distribution of Weierstrass points on a tropical curve," submitted

"Dilated floor functions with nonnegative commutators II: Negative dilations," with Jeffrey C. Lagarias, submitted

"Dilated floor functions with nonnegative commutators I: Positive and mixed sign dilations," with Jeffrey C. Lagarias

Acta Arithmetica 187 (2019) no. 3, 271–299.

"Dilated floor functions that commute," with Jeffrey C. Lagarias and Takumi Murayama Amer. Math. Monthly 123 (2016) no. 10, 1033–1038.

HONORS AND Rackham Predoctoral Fellowship (\$32,640) Fall 2019 - Spring 2020
AWARDS AMS Graduate Student Travel Grant Fall 2019

AMS Graduate Student Travel Grant
Rackham Conference Travel Grant
July 2019
Rackham Conference Travel Grant
July 2017
Prasad Family Fellowship
2017

Rackham Conference Travel Grant

AARMS award for best student poster, CMS Meeting

Mathematics Department Graduate Fellowship, University of Michigan

June 2016

Summer 2016

AMS Math in Moscow Scholarship (\$8000) Fall 2013

Teaching University of Michigan, Ann Arbor, MI, USA

Experience Primary Instructor

Math 116, Calculus II (Primary Instructor)

Winter 2015, Winter 2016,
Winter 2018, Winter 2019

Math 115, Calculus I (Primary Instructor) Fall 2014

| | Teaching Assistant | |
|-----------------|---|----------------------------|
| | Math 215, Multivariable calculus (TA) | Fall 2016 |
| | Math 216, Differential equations (TA) | Fall 2015 |
| | • | |
| | Undergraduate Research Mentor | |
| | Laboratory of Geometry: Origami on a Hexagonal Lattice | Winter 2019 |
| Invited Talks | Weierstrass points on tropical curves | |
| INVITED TALKS | Algebra and Number Theory Seminar, University of Kentucky | November 2019 |
| | Algebra and Algebraic Geometry Seminar, University of Washington | October 2019 |
| | SIAM Applied Algebraic Geometry, Bern Switzerland | July 2019 |
| | (poster) FPSAC, Ljubljana Slovenia | July 2019 |
| | Analysis and Geometry Seminar, Central Michigan University | February 2019 |
| | Algebraic Geometry Seminar, Brown University | November 2018 |
| | Combinatorics Seminar, University of Michigan | November 2018 |
| | Algebraic Geometry Seminar, The Ohio State University | October 2018 |
| | Algebra Seminar, Georgia Tech | October 2018 |
| | (poster) AGNES Fall Meeting, Brown University | September 2018 |
| | Dilated floor functions and their commutators | |
| | AMS Fall Sectional Meeting, Madison WI | September 2019 |
| | Department of Mathematics Colloquium, University of Findlay | December 2018 |
| | INTEGERS Conference 2018, Augusta GA | October 2018 |
| | (poster) MAA MathFest, Chicago IL | July 2017 |
| | (poster) CMS Summer Meeting, University of Alberta | June 2016 |
| | | |
| | Looking for a "local" Gauss-Lucas theorem MAA MathFest, Chicago IL | July 2017 |
| | WAA Mathrest, Chicago il | July 2017 |
| | | |
| Expository Talk | s University of Findlay Colloquium (undergraduate audience) | |
| | Dilated floor functions | December 2018 |
| | Michigan Math Club (undergraduate audience) | |
| | The square tile problem | November 2018 |
| | Descartes' rule of signs and beyond | September 2017 |
| | Descarces The of sights and beyond | September 2011 |
| | Great Talks for a General Audience, MAA MathFest Chicago | |
| | Descartes' rule of signs and beyond | July 2017 |
| | Mili C 1 4 C 1 4 C 1 | |
| | Michigan Graduate Student Seminars What is the Jacobian of a curve? | 0-4-1 |
| | Bidding games and random-turn games | October 2019 March 2019 |
| | Electrifying random trees II: edge correlation | October 2018 |
| | Introduction to p-adic geometry | October 2018 |
| | A brief tour of outer space | October 2018 |
| | Equidistribution of tropical Weierstrass points | September 2018 |
| | Tropical Grassmannians and friends | February 2018 |
| | Exponentially many perfect matchings | October 2017 |
| | Weierstrass subgroup of the Jacobian | February 2017 |
| | The p-adic icosahedron | February 2017 |
| | Matching polynomials and double covers | January 2017 |
| | What is a tropical curve? | October 2016 |
| | Tate curves and Berkovich space | March 2016 |
| | | |

| Partition identities, generating functions, and physics What is a Néron model? Riemann–Roch on graphs Combinatorics of stable curves How to prove the Riemann hypothesis Rationality of motivic zeta functions | February 2016 January 2016 November 2015 November 2015 September 2015 April 2015 | | |
|---|---|--|--|
| Michigan Summer Mini-courses for graduate students Combinatorial Hodge theory Tropical methods in Brill-Noether theory (5 lectures) Moduli space of tropical curves (4 lectures) Algebraic groups (5 lectures) Hodge theory for matroids (3 lectures) | Summer 2019 Summer 2018 Summer 2017 Summer 2016 Summer 2016 | | |
| GATTACA Conference, Georgia Tech, March 2019 Arithmetic of Algebraic Curves, University of Wisconsin, April 2018 Tropical geometry, logarithmic geometry, and curve counting, Stockholm University, Summer 2017 Tropical geometry, mirror symmetry, and GKZ A-determinant philosophy, KIAS (Seoul Korea), Winter 2017 Combinatorial Algebraic Geometry, Fields Institute, Summer 2016 Explicit Methods for Abelian Varieties, PIMS, University of Calgary, Summer 2016 Gaps between Primes and Analytic Number Theory, MSRI, Summer 2015 Arithmetic and Higher-Dimensional Varieties, University of Arizona, March 2015 | | | |
| Referee for: Journal of Integer Sequences | | | |
| Research Mentor, Laboratory of Geometry at Michigan $(\operatorname{LoG}(M))$ | Spring 2019 | | |
| Co-organizer, Student Combinatorics Seminar, University of Michigan | 2018 - 2019 | | |
| Organizer, Junior Colloquium, University of Michigan | Summer 2017 | | |
| Co-Hall Chair, East Campus Dormitory, MIT | Fall 2010 - Spring 2011 | | |
| • Computer: Python, Mathematica, LATEX, Sage, MATLAB | | | |

SKILLS

SERVICE

Workshops and Conferences ATTANDED

- \bullet Computer: Python, Mathematica, L^ATEX, Sage, MATLAB
- Language: English (native), Chinese (proficient), Russian (beginner)