

# Nathan McNew

Department of Mathematics, Towson University  
8000 York Road, Towson, MD 21252  
nmcnew@towson.edu  
www.nathanmcnew.com

---

## Employment

### Towson University

Assistant Professor

Fisher Endowed Chair in Mathematics

August 2015-Present

December 2016-Present

---

## Education

### Dartmouth College

Ph.D. Mathematics, Advisor: Carl Pomerance

*Thesis: Multiplicative problems in combinatorial number theory*

A.M. Mathematics

Fall 2010 - Spring 2015

June 2015

June 2012

### University of Denver

B.S. Mathematics and Physics, Summa Cum Laude, Phi Beta Kappa

Fall 2006 - Spring 2010

June 2010

---

## Publications

### Counting Primitive Sets and other statistics of the divisor graph of $\{1, 2, \dots, n\}$

*Submitted for publication.*

### Primitive and geometric-progression-free sets without large gaps

*Submitted for publication.*

### Avoiding 3-term geometric progressions in non-commutative settings

With M. Asada, E. Fourakis, S. Manski, S. J. Miller and G. Moreland. *Submitted for publication.*

### When sets can and cannot have MSTD subsets

With S. J. Miller, V. Xu and S. Zhang. *Submitted for publication.*

### The convex hull of the prime number graph

In *Irregularities in the Distribution of Prime Numbers* Pintz J., Rassias M. (eds) Springer, Cham. 2018, pp. 125–141.

### Random multiplicative walks on the residues modulo $n$

*Mathematika*. **63** (2017), 602–621.

### Ramsey theory over the integers: avoiding generalized progressions

With A. Best, K. Huan, S. J. Miller, J. Powell, K. Tor and M. Weinstein. In *Combinatorial and Additive Number Theory II. CANT 2015, 2016*. Nathanson, M. (eds) Springer Proceedings in Mathematics & Statistics. **220**. Springer, New York, NY, 2017, pp. 39–52.

### Numbers divisible by a large shifted prime and large torsion subgroups of CM elliptic curves

With P. Pollack and C. Pomerance. *International Math Research Notices*. **18** (2017), 5525–5553.

### The most frequent values of the largest prime divisor function

*Experimental Mathematics*. **26** (2017), 210–224.

### Subsets of $\mathbb{F}_q[x]$ free of 3-term geometric progressions

With M. Asada, E. Fourakis, S. Manski, S. J. Miller and G. Moreland. *Finite Fields and Their Applications*. **44** (2017), 135–147.

**Geometric-progression-free sets over quadratic number fields**

With A. Best, K. Huan, S. J. Miller, J. Powell, K. Tor and M. Weinstein. *Proceedings of the Royal Society of Edinburgh Section A*. **147** (2017), 245–262.

**Infinitude of  $k$ -Lehmer numbers that are not Carmichael**

With T. Wright. *International Journal of Number Theory*. **12** (2016), 1863–1869.

**On sets of integers which contain no three terms in geometric progression**

*Mathematics of Computation*. **84** (2015), 2893–2910.

**Efficient realization of nonzero spectra by polynomial matrices**

With N. Ormes. *Involve, A Journal of Mathematics*. **8** (2015), 1–24.

**Radically weakening the Carmichael and Lehmer conditions**

*International Journal of Number Theory*. **9** (2013), 1215–1224.

**Awards and Honors and Grants**

<b>Grant to adapt OpenStax for Calculus I</b>	PI, Maryland Open Source Textbook Initiative	Fall 2018
<b>Grant for MASON II-IV</b>	Co-PI, National Science Foundation Foundation	2018-2020
<b>Jess and Mildred Fisher Endowed Chair in the Mathematical and Computing Sciences</b>	Towson University	2016-2019
<b>Grant for MASON I</b>	Number Theory Foundation	October 2016
<b>Dartmouth Graduate Poster Session Winner</b>		Spring 2015
<b>Outstanding Graduate Student Teaching Award</b>	Dartmouth Center for the Advancement of Learning	April 2014
<b>NSF Graduate Student Fellowship Honorable Mention</b>		Spring 2012

**Teaching****Assistant Professor, Towson University**

<b>Math 273: Calculus I</b>		Fall 2015, Fall 2016, Fall 2018
<b>Math 275: Calculus III</b>		Spring 2016 ( $\times 2$ )
<b>Math 314: Cryptography</b>	Fall 2016, Sp. 2017, Fall 2017, Sp. 2018 ( $\times 2$ ), Fall 2018	
<b>Math 315: Applied Combinatorics</b>		Fall 2017
<b>Math 451: Graph Theory</b>		Spring 2018
<b>Math 467: Algebraic Structures</b>		Fall 2015
<b>Math 490: Senior Seminar</b>		Spring 2017

**Instructor, Dartmouth College**

<b>Math 10: Introduction to Statistics</b>		Spring 2013
<b>Math 20: Discrete Probability</b>		Fall 2013

**Co-Instructor, Dartmouth College**

<b>Math 25: Elementary Number Theory</b>		Fall 2014
------------------------------------------	--	-----------

**Teaching Assistant, Dartmouth College**

<b>Math 8: Calculus of Functions of One and Several Variables</b>		Fall 2010
<b>Math 13: Calculus of Vector Valued Functions</b>		Fall 2011
<b>Math 23: Differential Equations</b>		Winter 2011, Spring 2012

---

## Professional Activities

- MASON II Conference** April 2018  
*Co-organized (with Angel Kumchev) the second in the MASON series of number theory conferences.*
- Regional Undergraduate Math Conference** April 2017, April 2018  
*Co-organized (with Alexei Kolesnikov, Sergei Borodachov and Seth Chart) a regional undergraduate math conference hosted at Towson for undergraduate students to present research, hear about opportunities for graduate school and network with students from nearby universities.*
- MASON Conference** October 2016  
*Co-organized (with Angel Kumchev) the first in a new series of regional number theory conferences (the Mid-Atlantic Seminar On Numbers) for the Mid-Atlantic region.*
- Project NExT** August 2016-August 2017  
*MAA program for new faculty to explore innovative new teaching techniques and transition from graduate school into a teaching position.*
- MSRI Summer School: Gaps Between Primes** July 2015  
*A two week program with lectures and problem sessions on recent progress on gaps between primes.*
- Arizona winter school: Arithmetic Statistics** March 2014  
*Workshop with lectures and problem sessions on topics in Arithmetic Statistics. I participated in the problem group for Melanie Matchett Wood's section on asymptotics for number fields and class groups.*
- Warwick University summer school: number theory for cryptography** June 2013  
*Course for PhD students in number theory and related fields on cryptology. Topics included high-speed cryptography, complex multiplication of elliptic curves, discrete logarithms and integer factorization.*
- Dartmouth Mathematics Teaching Seminar** Summer 2012  
*An intensive course taken by graduate students who have advanced to PhD candidacy. Involves discussion of educational philosophies, classroom techniques, and course design. Culminates in the design and instruction of two week long math camps for middle and high school students.*
- Banff International Research Center: Diophantine equations** June 2012  
*A workshop on contemporary techniques in Diophantine equations including the modular approach, the Brauer-Manin obstruction, Chabauty methods, and linear forms in logarithms.*

---

## Service

- MASON MidAtlantic Seminar On Numbers**
- Local Co-Organizer (Towson University) Fall 2016
  - Local Co-Organizer (Towson University) Spring 2018
  - Co-Organizer (James Madison University) 2018-2019
- Regional Undergraduate Mathematics Conference, Co-organizer** April 2017, April 2018
- Baltimore Number Theory Seminar Cofounder and co-organizer** Fall 2015-Present
- Graduate Committee-Applied and Industrial Math Program Towson U.** 2016-Present
- Pure Math Committee Towson University** 2015-Present
- Department Representative to MAA Towson University** 2016-Present
- Colloquium Committee Towson University** 2015-2018
- Chair 2017-2018

<b>Math Club Faculty Sponsor</b> Towson University	2015-Present
<b>Problem Solving Team Coach</b> Towson University	2015-Present
<b>Dartmouth Number Theory Seminar</b> Organizer	Fall 2011-Spring 2013
<b>Dartmouth Graduate Student Council</b> Math department Rep.	Fall 2013-Summer 2014
<b>Referee:</b> Journal of Number Theory, Information Security Journal, Mathematics Magazine, Mathematics of Computation, Experimental Mathematics, Integers	2014-Present
<b>Reviewer:</b> Mathematical Reviews	2015-Present

---

## Educational Outreach

<b>Williams College REU Graduate Mentor</b> <i>Worked with undergraduates at the Williams College REU on research in combinatorial number theory.</i>	Summer 2014, 2015
<b>Putnam Supervisor at Dartmouth College and Towson University</b> <i>Helped students to prepare for the Putnam competition, and proctored the exam.</i>	2013-Present
<b>Extreme Academics, University of Denver</b> Nov '11, Mar '13, Feb '14, Apr '15, Mar '16, Apr '17 <i>Invited to participate in a panel discussion about applying to and doing research in grad school.</i>	
<b>Young Mathematicians Conference, Ohio State University</b> <i>Mentor to students and served on a panel discussion about applying to graduate school.</i>	August 2014
<b>Dartmouth College Science Day</b> <i>Showed visiting elementary school students about the mathematics of hexaflexagons.</i>	April 2014
<b>Johns Hopkins Center for Talented Youth</b> <i>Designed and led three workshops for middle and high school students. Topic: Cryptography</i>	May 2011
<b>Vermont Southeast Regional MATHCOUNTS Volunteer</b> <i>Gave a talk to middle school students about math research, helped proctor and grade competition.</i>	February 2011
<b>MATHCOUNTS Coach: Jefferson Academy Middle School, Broomfield CO</b> <i>Led weekly problem sessions with the team, discussed problem solving strategies and concepts.</i>	2006-2010

---

## Selected Presentations

<b>Counting primitive sets and other statistics of the divisor graph of <math>\{1, 2, \dots, n\}</math></b> INTEGERS, Augusta GA Combinatorial and Additive Number Theory, CUNY	October 2018 May 2018
<b>Unknotted Cycles</b> Permutation Patterns, Dartmouth College	July 2018
<b>Primitive and geometric-progression-free sets without large gaps</b> Canadian Number Theory Association Meeting XV, Laval University Combinatorial and Additive Number Theory, CUNY Colloquium, U. of Denver	July 2018 May 2017 April, 2017
<b>Random multiplicative walks on the integers modulo <math>n</math></b> Canadian Number Theory Association Meeting XIV, U. of Calgary INTEGERS, U. of West Georgia JMM Special Session on Analytic Number Theory, Atlanta GA	June 2016 October 2016 January 2017

<b>Numbers divisible by a large shifted prime</b>	
SouthEast Regional Meeting On Numbers, James Madison University	April 2016
Combinatorial and Additive Number Theory, CUNY	May 2016
<b>The convex hull of the prime number graph</b>	
Combinatorial and Additive Number Theory, CUNY	May 2015
Elementary, analytic, and algorithmic number theory, U. of Georgia	June 2015
Illinois Number Theory Conference, UIUC	August 2015
<b>Popular values of the largest prime divisor function</b>	
Combinatorial and Additive Number Theory, CUNY	May 2014
Canadian Number Theory Association Meeting XIII, Carleton College	June 2014
Quebec/Maine Number Theory Conference, Université Laval	September 2014
Department Colloquium, University of Maine	October 2014
Joint Mathematics Meetings, Austin TX	January 2015
Southeastern AMS Sectional Meeting, Huntsville, AL	April 2015
Penn State Number Theory Seminar, Penn State University	April 2016
<b>Unconventional Results in Multiplicative Combinatorial Number Theory</b>	
Invited Graduate Speaker, SERMON, Wofford College	April 2014
<b>Using congruences to cover the integers</b>	
Graduate Student Seminar, Dartmouth College	February 2014
<b>Things you can prove with a degree from DU, two results in number theory</b>	
Department Colloquium, University of Denver	February 2014
<b>On sets of integers which contain no three terms in geometric progression</b>	
Maine/Quebec Number Theory Conference, University of Maine	October 2013
INTEGERS, University of West Georgia	October 2013
West Coast Number Theory, Pacific Grove, CA	December 2013
Joint Math Meetings, Baltimore, MD	January 2014
Exciting New Faces in Analytic Number Theory, Hausdorff Center for Mathematics, Bonn Germany	June 2014
Department Colloquium, Williams College	July 2014
<b>When does each prime dividing <math>\varphi(n)</math> also divide <math>n - 1</math>?</b>	
Quebec/Maine Number Theory Conference, Université Laval	October 2012
Canadian Mathematics Society Winter Meeting, Montreal	December 2012
<b>Probabilistic Galois Theory</b>	
Graduate Student Seminar, Dartmouth College	October 2011
<b>Efficient realization of nonzero spectra by polynomial matrices</b>	
Graduate Student Seminar, Dartmouth College	October 2010
Departmental Colloquium, University of Denver	May 2010

---