

# Robert Dougherty-Bliss

✉ robert.w.bliss@gmail.com • 🌐 rwdb.xyz • 🌐 rdbliss

## Research interests

---

Experimental mathematics; symbolic-numeric computation; difference equations; combinatorics; number theory

## Academic positions

---

### Dartmouth College

*Instructor of Applied and Computational Mathematics*

2024–

Mentor: Peter Winkler

### Johannes Kepler University, Linz

*Visitor*

August 2023

Host: Manuel Kauers

## Education

---

### Rutgers University — New Brunswick

*Ph.D. Mathematics*

2019–2024

Advisor: Doron Zeilberger

### Oglethorpe University

*B.S. Mathematics; Computer Science*

2014–2019

*Summa cum laude*, with honors

## Publications

---

- [1] Robert Dougherty-Bliss, Natalya Ter-Saakov, Mits Kobayashi, and Eugene Zima. “Dyadically resolving trinomials for fast modular arithmetic”. 2025+. URL: <https://arxiv.org/abs/2508.11043>.
- [2] Robert Dougherty-Bliss, Charles Kenney, and Doron Zeilberger. “Creating Decidable Diophantine Equations”. In: *The American Mathematical Monthly* (2025). DOI: 10.1080/00029890.2025.2555161.
- [3] Robert Dougherty-Bliss, Christoph Koutschan, Natalya Ter-Saakov, and Doron Zeilberger. “The (Symbolic and Numeric) Computational Challenges of Counting 0-1 Balanced Matrices”. In: *Enumer. Comb. Appl.* 5.2 (2025), Paper No. S2R14, 8.
- [4] Robert Dougherty-Bliss and Natalya Ter-Saakov. “The Comma Sequence is Finite in Other Bases”. In: *J. Integer Seq.* 28.5 (2025), Art. 25.5.5, 18.
- [5] Robert Dougherty-Bliss and Manuel Kauers. “Hardinian Arrays”. In: *Electronic Journal of Combinatorics* 30 (2023).
- [6] Robert Dougherty-Bliss and Doron Zeilberger. “Exploring general Apéry limits via the Zudilin–Straub t-transform”. In: *Journal of Difference Equations and Applications* 29.1 (2023), pp. 32–42.
- [7] Robert Dougherty-Bliss and Doron Zeilberger. “Lots and Lots of Perrin-Type Primality Tests and Their Pseudo-Primes”. In: *Integers* 23 (2023).
- [8] Robert Dougherty-Bliss. “Integral Recurrences from A to Z”. In: *The American Mathematical Monthly* 129.9 (2022), pp. 805–815.

- [9] Robert Dougherty-Bliss. “The Meta-C-Finite Ansatz”. In: *Fibonacci Quart* 60.5 (2022), pp. 143–150.
- [10] Robert Dougherty-Bliss, Christoph Koutschan, and Doron Zeilberger. “Tweaking the Beukers integrals in search of more miraculous irrationality proofs á la Apéry”. In: *The Ramanujan Journal* 58.3 (2022), pp. 973–994.
- [11] AJ Bu and Robert Dougherty-Bliss. “Enumerating restricted Dyck paths with context-free grammars”. In: *Integers* 21 (2021), pp. 1–14.
- [12] Robert Dougherty-Bliss and Doron Zeilberger. “Experimenting with Apéry Limits and WZ pairs”. In: *Maple Transactions* 1.2 (2021).
- [13] Robert Dougherty-Bliss and Doron Zeilberger. “Automatic conjecturing and proving of exact values of some infinite families of infinite continued fractions”. In: *The Ramanujan Journal* (2020), pp. 1–17.
- [14] K. Abernathy, Z. Abernathy, R. Dougherty-Bliss, C. Mayer, and H. Whiteside. “Global dynamics of a cancer stem cell treatment model”. In: *International Journal of Dynamical Systems and Differential Equations* 9.2 (2019), pp. 176–186.

## Invited talks and presentations

---

- [1] *p-adically resolving trinomials*. 6th International Computer Algebra Conference, Moscow (online). 2025.
- [2] *Enumerating Balanced Matrices*. MAA MathFest, Sacramento. 2025.
- [3] *Modular arithmetic with trinomial moduli*. Rutgers Experimental Mathematics Seminar. 2025.
- [4] *Modular arithmetic with trinomial moduli*. Waterloo Symbolic Computation Seminar. 2025.
- [5] *On relative primality and other properties of trinomials*. *Computer Assisted Mathematics*, St. Petersburg (online). 2025.
- [6] *Balanced Matrices*. Dartmouth Combinatorics Seminar. 2024.
- [7] *Enumerating Balanced Matrices*. Differential Algebra and Related Topics XII (Beijing). 2024.
- [8] *Rectangular Hardinian Arrays*. Poster at ISSAC. 2024.
- [9] *The Comma Sequence is Finite in Other Bases*. Fall AMS Central Sectional. 2024.
- [10] *New primality tests and their (very large) pseudoprimes*. Institute für Algebra Seminar. Linz, Austria, 2023.
- [11] *New primality tests and their (very large) pseudoprimes*. Fall AMS Southeastern Sectional. Mobile, Alabama, 2023.
- [12] *Gosper’s algorithm and Bell numbers*. Fall AMS Southeastern Sectional. Chattanooga, Tennessee, 2022.
- [13] *The Meta C-finite ansatz*. 20th International Fibonacci Conference. Sarajevo, Bosnia e Herzegovina, 2022.
- [14] *The Meta-C-finite ansatz*. Rutgers Experimental Mathematics Seminar. 2022.
- [15] *Combinatorial Union Busting with Stopped Strings*. New York Combinatorics Seminar. 2021.
- [16] *More irrationally good approximations from Beukers integrals*. Combinatorial and Additive Number Theory. 2021.

- [17] *Automagic Inverse Continued Fraction Calculators*. Rutgers Experimental Mathematics Seminar. 2020.
- [18] *The Ergonomics of Computer Algebra*. Rutgers Experimental Mathematics Seminar. 2019.

## Outreach talks

---

- [1] *How to compute with big numbers*. Rutgers Undergraduate Mathematical Association. 2025.
- [2] *What to do when you don't know*. Dartmouth Mathematical Society. 2025.
- [3] *Identities*. Baruch College REU. 2024.
- [4] *Proofs by Example*. DIMACS / Baruch College REU. 2023.
- [5] *Proofs by Example*. Rutgers Undergraduate Mathematical Association. 2023.
- [6] *When does a sum have an answer?* Rutgers Undergraduate Mathematical Association. 2022.
- [7] *Mathematical biology for fun and profit*. Central Washington University Math Club. 2021.

## Teaching

---

**Dartmouth College**.....

Linear Algebra, Differential Equations, Multivariable Calculus, Introduction to Calculus

**Rutgers University**.....

As instructor: Number Theory (Summer 2021, 2022)

As teaching assistant: Real Analysis (Spring 2021, Fall 2021, Fall 2023), Abstract Algebra (Fall 2023), Calculus III (Fall 2022), Calculus II (Spring 2022, Spring 2023), Calculus I (Fall 2020)

## Professional service

---

<b>Invited Paper Session: Computers and Combinatorics</b>	<b>MAA MathFest</b>
<i>Co-organizer</i>	<i>2026</i>
<b>Invited Paper Session: Probability and Combinatorics</b>	<b>MAA MathFest</b>
<i>Co-organizer</i>	<i>2026</i>
<b>Symbolic Combinatorics Minisymposium</b>	<b>SIAM AG</b>
<i>Co-organizer</i>	<i>2025</i>
<b>Experimental Mathematics Seminar</b>	<b>Rutgers University</b>
<i>Co-organizer</i>	<i>2020–2024</i>
<b>American Mathematical Society Graduate Chapter</b>	<b>Rutgers University</b>
<i>President</i>	<i>2020–2024</i>
<b>Undergraduate Directed Reading Program</b>	<b>Rutgers University</b>
<i>Mentor</i>	<i>2023</i>
<b>Arkansas Undergraduate Mathematics Competition</b>	
<i>Problem writer / grader</i>	<i>2023</i>
<b>DIMACS REU</b>	
<i>Graduate school panel panelist</i>	<i>2022</i>
<b>MoMath Masters</b>	<b>National Museum of Mathematics</b>
<i>Problem writer</i>	<i>2021</i>
<b>Graduate Liaison Committee</b>	<b>Rutgers University</b>
<i>Member</i>	<i>2020–2022</i>

## Combinatorics and Algebras from A to Z

*Co-organizer*

2021

Birthday conference in honor of Doron Zeilberger and Amitai Regev.

**Reviewer for:** Journal of Number Theory, The American Statistician, Discrete Mathematics, Discrete Mathematics Letters, Journal of Computational Algebra, European Journal of Combinatorics

## Awards

---

### Rutgers University.....

*Excellence in Leadership and Teaching Award* 2024

University-wide award for leadership and teaching.

*TA Teaching Excellence Award* 2022, 2023

In recognition of valuable contributions to undergraduate teaching in the math department.

### Oglethorpe University.....

*James Edward Oglethorpe Award* 2019

In recognition of scholarship, leadership, and character. Awarded by university faculty vote.

*Sally Hull Weltner Award for Scholarship* 2019

Awarded to Senior with highest grade-point average.

*Ronald L. Carlisle Prize* 2019

Given to outstanding Senior in mathematics and computer science.

## Past Positions

---

### Data Scientist

*Government Accountability Office*  2023

### Statistical Consultant

*League of Women Voters of New Jersey* 2022

### Summer Fellow and Instructor

*Metric Geometry and Gerrymandering Group, Tufts University and MIT* 2018, 2019

### Summer Instructor

*Oglethorpe University* 2017

### Summer Fellow

*Winthrop University* 2016