

TOM EDGAR
Curriculum Vitae

Department of Mathematics
Pacific Lutheran University
Tacoma, WA

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EDUCATION

Ph.D., Mathematics, August 2009, University of Notre Dame, Notre Dame, Indiana

Ph.D. Thesis: *Dominance and Regularity in Coxeter Groups*

Ph.D. Advisor: Matthew Dyer

M.S., Mathematics, May 2004, Colorado State University, Fort Collins, Colorado

M.S. Thesis: Finite Projective Geometries and Linear Codes

M.S. Advisor: Anton Betten

B.S. Mathematics (summa cum laude), February 2002, Dickinson College, Carlisle, Pennsylvania

ACADEMIC POSITIONS

DEPARTMENT OF MATHEMATICS, PACIFIC LUTHERAN UNIVERSITY

Associate Professor, Fall 2015-present.

Assistant Professor, Fall 2009-Spring 2014.

DEPARTMENT OF MATHEMATICS, SEATTLE UNIVERSITY

Visiting Faculty Mentor for NSF SUMMER Program, Summer 2016 and 2017.

DEPARTMENT OF MATHEMATICS, UNIVERSITY OF NOTRE DAME

Graduate Teaching Assistant, Fall 2004-Spring 2009.

DEPARTMENT OF MATHEMATICS, COLORADO STATE UNIVERSITY

Graduate Teaching Assistant, Fall 2002-Summer 2004.

TEACHING EXPERIENCE

PACIFIC LUTHERAN UNIVERSITY - Professor

M105: Personal Finance (F-17)

M115: College Algebra

M151: Calculus I

M245: Discrete Structures

M317: Introduction to Proofs

M381: Problem Solving Seminar

M433: Abstract Algebra

M480: Providing the Proofs for PWW

M499: Senior Capstone

M107: Mathematical Explorations

M128: Linear Models and Calculus

M152: Calculus II

M253: Calculus III

M331: Linear Algebra

M381: Mathematical Modeling Seminar

M480: Enumerative Combinatorics

M495: Algebraic Topology Independent Study

UNIVERSITY OF NOTRE DAME - Instructor

M10360: Calculus B (for Life Sciences)

M10250: Elements of Calculus I (for Business)

M10240: Principles of Calculus

COLORADO STATE UNIVERSITY - Instructor

M130: Math for Social Sciences

M155: Calculus I for Biological Sciences

M125: Numerical Trigonometry

M161: Calculus II for Physical Sciences

M124: Logarithms and Exponents

M126: Analytic Trigonometry (F-02, S-03, Su-03)

NSF RESEARCH EXPERIENCE FOR TEACHERS - Workshop Leader

Voting Theory with Linear Algebra Workshop

Probability and Statistics Workshop

Number Theory and Symmetry Workshop

UNIVERSITY OF NOTRE DAME - Teaching Assistant

M20550: Calculus III

M10350: Calculus A

M10560: Calculus II,

M13150: Freshman Seminar: Number Theory

UNIVERSITY OF NOTRE DAME - Undergraduate Reading Seminar Leader

Coxeter Groups and Finite Reflection Groups,

COLORADO STATE UNIVERSITY - Teaching Assistant

Tutor in Individualized Mathematics Program

PUBLICATIONS - * INDICATES UNDERGRADUATE

Proof without words: pentagonal decomposition, to appear in CMJ.

Proof without words: Abel's transformation, with Y. An, to appear in Math. Mag.

Counting binomial coefficients divisible by a prime power, with P. de Castro*, D. Domini*, S. Klee, D. Johnson*, and R. Sundaresan* to appear in The Amer. Math. Monthly.

Staircase series, to appear in Math. Mag.

Consecutive factorial base Niven numbers, with P. Dalenberg*, to appear in The Fibonacci Quarterly.

Proof without words: Rearranged alternating harmonic series, with Y. An, College Math. J. 49 (2018), no. 1.

Digital representations of rows of Pascal's triangle with no entries divisible by a fixed prime power, with P. de Castro*, D. Domini*, S. Klee, D. Johnson*, and R. Sundaresan*, to appear in Pi Mu Epsilon.

The dist. of the number of parts of m -ary partitions mod m , Rocky Mountain J. Math. 47, no. 6 (2017).

Proof without words: series of perfect powers, Math Mag. 90 (2017), no. 4.

Happiness is integral, but not rational, with A. Bland*, Z. Cramer*, P. de Castro*, D. Domini*, S. Klee, D. Johnson*, J. Koblitz*, and R. Sundaresan*, Math Horizons. September 2017.

A visual validation of Viète's verification, with N.C. Meyer, College Math J. 48 (2017), no. 2.

Proof without words: a recursion for triangular numbers and more, Math Mag. 90 (2017), no. 2.

Proof without words: Factorial sums, Math Mag. 89 (2016), no. 5.

Proof without words: the average of square pyramidal and triangular is tetrahedral, Math. Gaz. 100 (2016), no. 549.

Approximating the Fibonacci sequence, with H. Olafson* and J. van Alstine*, Integers. 16 (2016), A63.

Proof without words: matchstick triangles, College Math. J. 47 (2016), no. 3.

Proof without words: sums of powers of $\frac{4}{9}$, Math Mag. 89 (2016), no. 3.

Proof without words: sums of reciprocals of binomial coefficients, Math Mag. 89 (2016), no. 3.

A confused electrician uses Smith normal form, with J.K. Sklar, Math Mag. 89 (2016), no. 1.

Extending some Fibonacci–Lucas relations, The Fibonacci Quarterly, **54** (2016) no. 1.

Mult. funcs. and their gen. bin. coeffs. and Catalan numbers, with M. Spivey, J. of Integer Sequences, **19** (2016), Art. 16.1.6.

On the structure of involutions and symmetric spaces of dihedral groups, Note Mat. **34** (2014) no. 2, 23–40.

Totientomial coefficients, Integers. 14 (2014), A62.

Cryptographic word search, with A. Lloyd*, Math Horizons. November 2014, 26-27.

Dominance orders, generalized binomial coefficients, Kummer's thm, with T. Ball* and D. Juda*, Math Mag. 87 (2014), no. 2.

Universal reflection subgroups and exponential growth in Coxeter groups, Comm. in Algebra. **41** (2013), no. 4, 1558-1569.

A case-free characterization of hyperbolic Coxeter groups, J. of Group Theory. **14** (2011), no. 5, 777-782.

Reduced expressions in semidirect products of Coxeter groups, J. of Group Theory. **13** (2010), no. 1, 109-115.

Dominance and Regularity in Coxeter Groups, Ph.D. Thesis, University of Notre Dame (2009).

Sets of reflections defining twisted Bruhat orders, J. Algebraic Combin. **26** (2007), no. 3, 357-362.

GRANTS AND AWARDS

REGENCY ADVANCEMENT AWARD, Pacific Lutheran University, 2017.

Received \$4000 award to have PLU student participate alongside NSF REU at Seattle University in Summer 2017.

FACULTY-STUDENT RESEARCH AWARD, Scandinavian Cultural Center at Pacific Lutheran University, 2015.

Received \$2000 to work with undergraduate to investigate contributions of Scandinavian mathematicians.

REGENCY ADVANCEMENT AWARD, Pacific Lutheran University, 2015.

Received \$3990 award for department and students to attend the Joint Mathematics Meetings in Seattle, WA.

NSCI UNDERGRAD RESEARCH PROGRAM, Pacific Lutheran University, Summer 2014.

Received \$16,440 to act as Summer Undergraduate Research Mentor with two PLU undergraduates.

ACADEMY OF INQUIRY BASED LEARNING SMALL GRANT, Academy of Inquiry Based Learning, 2013.

Received \$1500 to develop course notes to run M480: Enumerative Combinatorics in IBL style.

NSF GRANT DMS-0846477 THROUGH THE MAA RUMC PROGRAM, MAA/NSF, 2013.

Received \$2990 award for hosting the Northwest Undergraduate Mathematics Symposium.

AMERICAN INSTITUTE OF MATHEMATICS TRAVEL GRANT, Palo Alto, CA, Summer 2012.

Received \$500 to travel to MathFest with undergraduate researchers.

REGENCY ADVANCEMENT AWARD, Pacific Lutheran University, 2012.

Received \$4000 award for installing a Sage server at Pacific Lutheran University.

NSCI UNDERGRAD RESEARCH PROGRAM, Pacific Lutheran University, Summer 2012.

Received \$16,440 to act as Summer Undergraduate Research Mentor with two PLU undergraduates.

TEACHING AND LEARNING WITH TECHNOLOGY GRANT, Pacific Lutheran University, Fall 2011.

Received a one-course release (in lieu of \$5000) to implement the use of Sage in M331: Linear Algebra.

AMERICAN INSTITUTE OF MATHEMATICS WORKSHOP, Palo Alto, CA, Summer 2011.

Received full funding to attend the week-long "Research experiences for undergraduate faculty" workshop.

RELATED WORK EXPERIENCE

Authored OEIS Sequences

A187813, A214681, A228179, A234957, A226636, A226969, A227062, A227080, A235384, A227092, A227095, A227238, A234959, A235127, A238453, A238498, A238688, A238743, A238754, A239682, A239619, A239702, A239672, A239633, A239695, A239694, A239692, A239691, A239690, A239693, A242848, A242849, A242954, A243756, A243757, A243758, A243759, A245321, A245338, A245345, A245350, A245355, A245400, A245417, A245420, A245425, A245430, A245798, A246458, A246465, A246466, A253628, A254609, A255199, A255219, A254730, A247503, A248101, A248909, A255914, A255915, A253203, A256799, A257087, A258073, A258074, A260119, A261640, A261691, A267959, A268081, A268127, A268128, A267856, A268269, A268354, A268355, A268357, A268443, A268444, A270360, A270390, A270774, A270775, A262354, A272079, A272080, A272177, A272178, A272328, A272329, A272344, A272270, A273000, A273035, A273036, A273181, A273183, A273184, A273317, A273338, A273867

AP Calculus Exam Reader, College Board, 2005

Helped to develop MapleTA for the Trigonometry Intensive Review at Colorado State University, 2004

Coauthor of "Instructor Resources for Workshop Calculus," Key College Publishing, 2000-2002

Agentsmart LLC - Developed math problems for a computer-learning precalculus tutorial, 2002

Whitaker Research Grant, Assistant, Dickinson College, 2001

<http://users.dickinson.edu/richesod/waves/>

SELECTED PRESENTATIONS

Invited

Keynote Speaker, Western Washington Community College Student Mathematics Conference at Bellevue College

The Power of Positional Representations, February 2018

Colloquium, Seattle University

Generalized Binomial Coefficients via the Dominance Order on Natural Numbers, October 2014

Colloquium, University of Puget Sound

Generalized Binomial Coefficients via the Dominance Order on Natural Numbers, October 2013

Dickinson College Math/CS Chats, Dickinson College

A Fascinating Connection Between Number Theory and Combinatorics, October 2013

International Linear Algebra Society - 2013 Meeting (*Linear Algebra Education Issues*), Providence, Rhode Island

Flipping the Technology in Linear Algebra, June 2013

Teaching Seminar, University of Notre Dame

Picking up the SLAC: Life at a small liberal arts college, April 2013

Colloquium, University of Puget Sound

Rock the Vote or Vote the Rock, October 2012

Colloquium, Western Washington University

Coxeter Groups and Root Systems via Automatic Structures, February 2012

Colloquium, University of Puget Sound

Connecting the Dots: Posets and Inversion to Understand Finite Sums, Combinatorics and Number Theory, April 2010

Colloquium, Kalamazoo College

Unlocking the Mysterious Möbius Function, November 2008

Contributed

Joint Meetings of the AMS and MAA, San Diego, CA

An inquiry-based approach to elementary number theory via proofs without words, January 2018

Joint Meetings of the AMS and MAA, Seattle, WA

Confused Electrician Games, January 2016

PNW Sectional Meeting of the MAA, University of Washington, Tacoma

Families of Generalized Catalan Numbers, April 2015

Faculty Development Workshop Series, Pacific Lutheran University

Improving Pedagogy in the Classroom—the Interactive Lecture, October 2014

MAA MathFest 2014, Portland, OR

6959 Open Problems for Undergraduates, August 2014

PNW Sectional Meeting of the MAA, University of Montana

Totientomial Coefficients, June 2014

Faculty Scholarship Lecture Series, Pacific Lutheran University

The Mathematics Behind Mathematical Modeling, November 2016

Incorporating Technology in Linear Algebra, November 2012

PNW Sectional Meeting of the MAA, University of Portland

Symmetric Spaces of Dihedral Groups, April 2012

Joint Meetings of the AMS and MAA, Boston, MA

Web 2.0 for Linear Algebra Classes, January 2012

Western Sectional Meeting of the AMS, University of Utah

A Conjectural Normal Form for Elements of Coxeter Groups, October 2011

PNW Sectional Meeting of the MAA, Seattle University

Adopt-a-Group Project with a Course Wiki, April 2010

Mathematics Seminar, Pacific Lutheran University

What Color is Your Molecule (with Justin Lytle), March 2016

Generalized Binomial Coefficients via the Dominance Order on Natural Numbers, February 2014

Rock the Vote or Vote the Rock, September 2012

An Introduction to the Beamer package for \LaTeX , November 2011, November 2012

How to use \LaTeX , October 2010, September 2011, September 2012, September 2013

Abstract Algebra in our World, October 2009

Algebra Seminar, University of Notre Dame

Coxeter Groups and Automata, October 2008*Hecke Algebras and Kazhdan-Lusztig Polynomials*, March 2005*Coxeter Groups, Root Systems, and Bruhat Order*, February 2005

Indiana Sectional Meeting of the MAA, St. Mary's College

An Introduction to Posets and Möbius Inversion, March 2008

Commutative Algebra Seminar, University of Notre Dame

Twisted Bruhat Orders and Shellability, December 2006

Graduate Student Seminar, University of Notre Dame

Rock the Vote or Vote The Rock, October 2008*Root Systems for the Infinite Dihedral Group*, April 2007*Wild Weyl and Twisted Bruhat*, October 2007

Rocky Mountain Algebraic Combinatorics Seminar, Colorado State University

Linear Codes and Finite Projective Geometries, April 2004**HONORS, AWARDS, AND MEMBERSHIPS**

Honors

Phi Beta Kappa

Pi Mu Epsilon

Awards and Scholarships

Kaneb Center Outstanding Graduate Student Teacher Award, University of Notre Dame, 2007

Striving For Excellence in Teaching Certification, Kaneb Center, 2004-2008

University Graduate Fellowship Award, Colorado State University, 2002

The Lance E. Kohlhaas Memorial Prize in Mathematics, Dickinson College, 2002

Caroline H. Clarke Scholarship for Mathematics (2), Dickinson College, 2000-2002

Benjamin Rush Scholarship, Dickinson College, 1998-2002

Memberships

American Mathematics Society, 2002-2016

Mathematical Association of America, 2006-Present

UNDERGRADUATE RESEARCH PROJECTS AND CAPSTONES ADVISED

Research Projects

NSF SUMMER Program (REU) at Seattle University Summer 2017, with Rachel Chaiser, Dean Dustin, and Paul Lagarde (co-mentor Tyler Ball).

Awarded "Outstanding" Poster at the MAA Poster Session at JMM 2018.

NSF SUMMER Program (REU) at Seattle University Summer 2017, with Joanne Beckford, Paul Dalenberg, and Tina Rajabi (co-mentor Tyler Ball).

Scandinavian Cultural Center Faculty-Student Research, 2016-2017, with Benjamin Haffly.

NSF SUMMER Program (REU) at Seattle University Summer 2016, with Philip de Castro, Desiree Domini, Devon Johnson, and Ranjani Sundaresan (co-mentor Steven Klee).

NSF SUMMER Program (REU) at Seattle University Summer 2016, with Andre Bland, Zoe Cramer, and Joseph Koblitz (co-mentor Steven Klee).

PLU NSCI Undergrad Research Program Summer 2014, with Hailey Olafson and James Van Alstine.

Olafson, H. and J. Van Alstine, "Elementary construction of rational base representations," in preparation.

PLU NSCI Undergrad Research Program Summer 2012, with Tyler Ball and Dan Juda.

Ball, Tyler and Dan Juda, "Dominance over \mathbb{N} ," Rose-Hulman Undergraduate Mathematics Journal.

Capstones Advised

- 2017-2018 *Spot it!*, Sian Beck
Chebyshev Polynomials, Paul Dalenberg
Stern-Brocot Tree, Matthew Dixon
Frieze Patterns, Caroline Dreher
Kirkman's School Girls, Megan Hall
The Cap Set Problem, Curtis Sorgenfrey
- 2016-2017 *Testing for compositeness*, Miguel Amezola
Mathematics in RSA Cryptosystem, Hannah Bortel
Division algorithm for polynomials, Leanna Davis
Lie groups and Lie algebras, Jason Gomez
The Prouhet-Thue-Morse sequence, Benjamin Haffly
Quadratic Reciprocity Law, Kenyah Huskey
Multinomial coefficients and divisibility by prime powers, Devon Johnson
Group theory applied to chemistry, Ashlee McGovern
That's not fair! Who really won the election?, Devin Tracy
- 2014-2015 *Group actions on sets and how it relates to combinatorics*, Kyle Geinzer
Investigating elusive perfect numbers, Owen Hunt
The Lucas numbers, Daisy Johnson
q-Analogs and the equidistribution of t-subset sums modulo m, Noah Kime
Linear/Integer programming, Rachel Kinkella
Latin squares and their relevance to Sudoku puzzles, Mathilde Moller
Generalizing valuation maps to rational base representations, James Van Alstine
- 2013-2014 *Direct products of cyclic groups*, Lewis Hitchiner
The transfer matrix method, Andrew Lloyd
Light's Out-type problems, Ashley Morrison
Applications of block designs and the Hamming code, Hailey Olafson
Symmetry point group classification and construction, Victoria Richmond
The (n, q, k)-liar game, Peter Rise (co-adviser)
The "interestingness" of numbers viewed through the lens of Sloane's gap, Lance Winchell
Public key cryptosystems, Leanna VanZanten
- 2012-2013 *Can every tree be graceful?*, Tyler Ball
Properties of $\text{Aut}(\mathbb{Z}_n \times \mathbb{Z}_n)$, Dan Juda
Equivalence relations, Jym Kinney (co-adviser)
Vertex coloring of graphs, Rita Than
- 2011-2012 *Perfect information games*, Matthew Christopher (co-adviser)
Square roots of 1 modulo n, Andrew Clear
RSA encryption, Rachael Devlaeminck
The Stirling numbers, Stacey Hagensen
Voting, Eric Herde
- 2010-2011 *Dance and mathematics*, Monica Boldizar
Deciphering the secrets of cryptography, Andrew Carpenter
Finite state automata and automata theory, Daniel Case
The Riemann hypothesis, Janessa Gramson
An analysis of communications between the Mars rover and Earth, Graham Malek (co-adviser)
The complexities of voting, Linda Nusser
Pairs of circles and their intersections, Sam Rise (co-adviser)

2009-2010 *Galois theory and its applications*, Ahmed Benkhalti
 Fermat's last theorem, Dustin Hunt
 Permutation groups acting for the Enigma machine, Shallan Ley
 Error correcting codes, Shayne Smith

SERVICE

Pacific Lutheran University

Member of the ARTS Committee, 2017-2020; Secretary, 2017-2018
 ARTS Representative to SEMAC, 2017-2018
 Division of Natural Sciences Representative to General Education Council, 2016-2017
 Explore! Retreat Facilitator, January 2014
 Common Reading Book Selection Committee, Spring 2013-Spring 2015
 Secretary of Areté Society, Fall 2012-Spring 2016
 Member of Long-Range Planning Committee, Spring 2012
 President's and Regents' Scholarships Interviewer, Spring 2012, 2013, 2014
 Mathematics Curriculum Committee Member, 2009-present (Chair 2012-2014)
 Major Advisor, Spring 2010-present
 First-Year and Transfer Advisor, Fall 2010-present
 Department Webmaster, Fall 2009-present
 Mathematics Seminar Coordinator, 2010-2011
 Math Club Advisor, Fall 2009-present
 Putnam Exam Advisor, Fall 2010, 2011, 2012, 2013
 Mathematical Modeling Contest Advisor, Spring 2011
 Academic Festival Coordinator, 2011
 Smash Club Advisor, 2010-2011
 MESA Day Judge, Spring 2011
 Math Day Workshop Coordinator, Fall 2011
 Mathematics Tutor, Lincoln Center at Lincoln High School, Fall 2011

Mathematics Community

Associated Editor for Math Horizons, October 2017-present
 Co-organizer for MAA Contributed Paper Session: "Addressing the Needs of Mathematics and Computer Science Majors in Discrete Mathematics Courses," at the Joint Mathematics Meetings in Seattle, WA, January 2016
 Peer Reviewer for Discrete Mathematics (1 time).
 Peer Reviewer for PRIMUS (2 times).
 Peer Reviewer for Mathematics Magazine (20 times).
 Peer Reviewer for Journal of Integer Sequences (3 times).
 Peer Reviewer for the American Mathematical Monthly (4 times).
 Peer Reviewer for the College Mathematics Journal (1 time).
 Volunteer at Julia Robinson Festival: Calgary, March 2015; Seattle, April 2016
 Grant Peer Reviewer for the American Mathematical Society, May 2014
 Associate Editor for the Online Encyclopedia of Integer Sequences, March 2013-present
 Co-organizer of NUMS Undergraduate Research Symposium, Pacific Lutheran University, April 2013
 Judge for Undergraduate Poster Session, Joint Mathematics Meetings, San Diego, 2013; Seattle, 2016

University of Notre Dame

Organizer for Mathematics Graduate Teaching Assistants, Fall 2007-Spring 2009
 Speaker, "Experiences in Teaching," Mathematics Teaching Seminar, University of Notre Dame, Spring 2008
 Co-organizer for SUMR Graduate/Undergraduate Reading Seminars, Spring 2007
 Panelist, Mathematics Teaching Seminar, University of Notre Dame, Spring 2007
 Judge, The Northern Indiana Regional Science and Engineering Fair, Spring 2006
 Graduate Representative of Parking Appeals Committee, University of Notre Dame, 2005-2006
 GSU Representative to Ad Hoc Parking Committee, University of Notre Dame, 2005-2006

CONFERENCES ATTENDED

Western Washington Community College Student Mathematics Conferences, Bellevue, WA, February 2018
AMS-MAA Joint Meetings, San Diego, January 2018
NUMS, Western Washington University, October 2017
AMS-MAA Joint Meetings, Atlanta, January 2017
Combinatorial Potlatch, Seattle University, November 2016
AMS-MAA Joint Meetings, Seattle, January 2016
PNW-MAA Annual Meeting, University of Washington Tacoma, April 2015
Integer Sequences K-12, Banff International Research Station, February 2015
Combinatorial Potlatch, Western Washington University, November 2014
MAA MathFest, Portland, August 2014
PNW-MAA Annual Meeting, University of Montana, June 2014
PNW-MAA Annual Meeting, Willamette University, April 2013
NUMS, Pacific Lutheran University, April 2013
AMS-MAA Joint Meetings, San Diego, January 2013
MAA MathFest, Madison, August 2012
PNW-MAA Annual Meeting, University of Portland, April 2012
AMS-MAA Joint Meetings, Boston, January 2012
Combinatorial Potlatch, Seattle University, November 2011
AMS Sectional Meeting, University of Utah, October 2011
Research experiences for undergraduate faculty, American Institute of Mathematics, Palo Alto, CA, July 2011
Scottfest, University of Puget Sound, April, 2010
PNW-MAA Annual Meeting, Seattle University, March 2010
AMS-MAA Joint Meetings, San Francisco, January 2010
AMS-MAA Joint Meetings, Washington, D.C., January 2009
MAA Sectional Meeting, St. Mary's College, March, 2008
AMS Sectional Meeting, University of Notre Dame, April 2006
Midwest Algebra, Geometry and Interactions Conference, University of Notre Dame, October 2005
Midwest Representation Theory Conference, University of Michigan, October 2005
CBMS Regional Conference on Algebraic and Topological Combinatorics, August 2005
MAA Rocky Mountain Sectional Meeting, Colorado College, April 2004
AMS Sectional Meeting, University of Colorado, October 2003