

Tom Edgar
Curriculum Vitae

Department of Mathematics
Pacific Lutheran University
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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, University of Notre Dame

Graduate Teaching Assistant, Fall 2004-Spring 2009.

Department of Mathematics, Colorado State University

Graduate Teaching Assistant, Fall 2002-Summer 2004.

GRANTS AND AWARDS

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 in Spring 2013.

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 via the M.J. Murdock Charitable Trust, 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.

 TEACHING EXPERIENCE

Pacific Lutheran University - Assistant Professor

M107: Mathematical Explorations (J-11, J-14, J-15)	M115: College Algebra (F-11)
M128: Linear Models and Calculus (F-12, S-14)	M151: Calculus I (F-09, S-10, Su-10, S-13, F-13)
M152: Calculus II (F-10, S-11, F-14)	M253: Calculus III (S-12)
M317: Introduction to Proofs (S-10, S-11, S-12, S-14, S-15)	M331: Linear Algebra (F-11, F-12, F-14)
M381: Problem Solving Seminar (F-10)	M381: Mathematical Modeling Seminar (J-11)
M433: Abstract Algebra (F-09, F-10, F-12, F-13)	M480: Enumerative Combinatorics (S-13)
M495: Algebraic Topology Independent Study (S-14)	M499: Senior Capstone (F-10, S-11)

University of Notre Dame - Instructor

M10360: Calculus B (for Life Sciences) (S-08)	M10240: Principles of Calculus (F-05)
M10250: Elements of Calculus I (for Business) (S-05)	

Colorado State University - Instructor

M130: Math for Social Sciences (Su-04)	M161: Calculus II for Physical Sciences (S-04)
M155: Calculus I for Biological Sciences (F-03)	M124: Logarithms and Exponents (F-02, S-03, Su-03)
M125: Numerical Trigonometry (F-02, S-03, Su-03)	M126: Analytic Trigonometry (F-02, S-03, Su-03)

NSF Research Experience for Teachers - Workshop Leader

Voting Theory with Linear Algebra Workshop (Su-08)	Number Theory and Symmetry Workshop (Su-07)
Probability and Statistics Workshop (Su-06)	

University of Notre Dame - Teaching Assistant

M20550: Calculus III (Fa-08)	M10560: Calculus II, (S-07 TA Chair, F-07)
M10350: Calculus A (F-06 TA Chair, F-07 TA Chair)	M13150: Freshman Seminar: Number Theory (S-06)

University of Notre Dame - Undergraduate Reading Seminar Leader

Coxeter Groups and Finite Reflection Groups, (S-06)

Colorado State University - Teaching Assistant

Tutor in Individualized Mathematics Program (F-02, S-03, Su-03)

 PUBLICATIONS

“On the family of automatic normal forms for Coxeter groups,” submitted.

“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,” *Math Horizons.* November 2014, 26-27.

“Dominance orders, generalized binomial coefficients, and Kummer’s theorem,” *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.

 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

AP Calculus Exam Reader, College Board, 2005

Math Education Research, Colorado State University, 2004

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

Workshop Calculus Solution Manual

Helped write "Instructor Resources for Workshop Calculus," Key College Publishing

Agentsmart LLC

Developed math problems for a computer pre-calculus tutorial

Whitaker Research Grant, Assistant, Dickinson College, 2001

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

 SELECTED PRESENTATIONS

Invited

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

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

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
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
An Introduction to \LaTeX , September 2011
How to use \LaTeX , October 2010
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-Present
- Mathematical Association of America, 2006-Present

 UNDERGRADUATE RESEARCH PROJECTS AND CAPSTONES ADVISED

Research Projects

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

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

Properties of $\text{Aut}(\mathbb{Z}_n \times \mathbb{Z}_n)$, Dan Juda

Can Every Tree be Graceful?, Tyler Ball

Purple, Because Aliens Don't Wear Hats, Jym Kinney (co-adviser)

Vertex Coloring of Graphs, Rita Than

2011-2012

Perfect Information Games, Matthew Christopher (co-adviser), submitted to Rose-Hulman Undergrad-Math Journal

Finding the Square Roots of 1 in Modular Arithmetic Rings, Andrew Clear

RSA Encryption, Rachael Devlaeminck

The Stirling Numbers, Stacey Hagensen

Voting, Eric Herde

2010-2011

Dance and Mathematics, Monica Boldizsar

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

Explore! Retreat Facilitator, January 2014

Common Reading Book Selection Committee, Spring 2013-Spring 2015

Secretary of Areté Society, Fall 2012-present

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 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

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

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

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