

Eric S. Egge

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Education

- **Ph. D.** in Mathematics, University of Wisconsin, Madison, WI, May, 2000
Minor: Computer Science
Research Area: Algebraic and Enumerative Combinatorics (MR #05A,#05E)
Advisor: Paul M. Terwilliger
- **M. A.** in Mathematics, University of Wisconsin, Madison, WI, December, 1995
- **B. A.** in Mathematics, *summa cum laude*, Carleton College, Northfield, MN, June, 1994

Positions Held

- **Assistant Professor of Mathematics**, Carleton College, Fall, 2005–Present
- **Assistant Professor of Mathematics**, Gettysburg College, Fall, 2000–Spring, 2005
- **Teaching Assistant, Teaching Assistant Coordinator, Lecturer, and Curriculum Materials Author**, University of Wisconsin-Madison, Fall, 1994 - Spring, 2000

Honors and Awards

- **Carleton College Hewlett Mellon and Elledge Fellowship**, November, 2007
- **Carleton College HHMI Student Research Grant**, March, 2007
- **Carleton College HHMI Curriculum Development Grant**, with Sam Patterson, February, 2007
- **Gettysburg College Research and Professional Development Grant**, December, 2003
- **Gettysburg College Research and Professional Development Grant**, with Darla Kremer, December, 2002
- **Johnson Center for Creative Teaching Fellowship**, with Steven J. Gimbel, 2002
- **Gettysburg College Research and Professional Development Grant**, May, 2002
- **Gettysburg College Research and Professional Development Grant**, December, 2001

- **Project NExT Fellow (Gold Dot)**, 2000-01
- **University of Wisconsin Graduate School Excellence in Teaching Award**, 2000
- **University of Wisconsin Vilas Travel Grant**, 2000
- **University of Wisconsin College of Letters and Science Teaching Fellow**, 1999
- **GAANN Research Fellowship**, 1997, 1998, 1999
- **University of Wisconsin Department of Mathematics Excellence in Teaching Award**, 1998
- **Phi Beta Kappa**, Carleton College Chapter, 1994
- **National Forensic Association Nationals in Impromptu Speaking**, 1992, 1993

Courses Taught

- **Lower Level**
Mathematical Ideas, Calculus with Precalculus I, Calculus with Precalculus II, Calculus I, Calculus II, Mathematical Modeling
- **Intermediate Level**
Multivariable Calculus, Inquisitive Problem Solving, Linear Algebra
- **Upper Level**
Differential Equations, Abstract Mathematics II, Introduction to Combinatorics, Complex Analysis, Numerical Analysis, From Zero to Infinity: Philosophical Revolutions in Mathematics (with Steven J. Gimbel), Abstract Algebra, From the Shape of the Nile to the Shape of Space: Philosophical Revolutions in the History of Geometry (with Steven J. Gimbel), Topics in Graph Theory, Topics in Combinatorics: The Alternating Sign Matrix Conjectures
- **Independent Studies**
Advanced Abstract Algebra, Chaotic Dynamical Systems, Commutative Algebra and Zero-Divisor Graphs, Mathematical Writing, Probability and Statistics

Undergraduate Research Supervised

- Anna Duane, *Kepler Towers, Kepler Walls, and Narayana Statistics*, Spring 2007 to Spring 2008.
- David Lonoff and Jonah Ostroff, *Restricted Symmetric Permutations*, supported by a Carleton grant from the Howard Hughes Medical Institute, Summer 2007.

- Tracale Austin, Hans Bantilan, Isao Jonas, and Paul Kory, *The Pfaffian Transform*, Mathematics capstone project, Fall 2006 to Winter 2007.

Research Publications

- Kepler Walls, with Anna Duane, *Annals of Combinatorics*, submitted.
- The Pfaffian Transformation, with Tracale Austin, Hans Bantilan, Isao Jonas, and Paul Kory, *Journal of Integer Sequences*, submitted.
- Restricted Symmetric Permutations, *Annals of Combinatorics*, vol. 11, pp. 405–434, 2007.
- Restricted Colored Permutations and Chebyshev Polynomials, *Discrete Mathematics*, vol. 307, pp. 1792–1800, 2007.
- Restricted Signed Permutations Counted by the Schröder Numbers, *Discrete Mathematics*, vol. 306, pp. 552–563, 2006.
- Bivariate Generating Functions for Involutions Restricted by 3412, with Toufik Mansour, *Advances in Applied Mathematics*, vol. 36, pp. 118–137, 2006.
- Restricted Permutations, Fibonacci Numbers, and k -Generalized Fibonacci Numbers, with Toufik Mansour, *Integers: The Electronic Journal of Combinatorial Number Theory*, vol. 5, article A1, 2005.
- 231-Avoiding Involutions and Fibonacci Numbers, with Toufik Mansour, *Australasian Journal of Combinatorics*, vol. 30, pp. 75–84, 2004.
- Restricted 3412-Avoiding Involutions, Continued Fractions, and Chebyshev Polynomials, *Advances in Applied Mathematics*, vol. 33, issue 3, pp. 451–475, 2004.
- 132-Avoiding Two-stack Sortable Permutations, Fibonacci Numbers, and Pell Numbers, with Toufik Mansour, *Discrete Applied Mathematics*, vol. 143, issue 1–3, pp. 72–83, 2004.
- A Schröder Generalization of Haglund’s Statistic on Catalan Paths, with James Haglund, Kendra Killpatrick, and Darla Kremer, *Electronic Journal of Combinatorics*, vol. 10, article #R16, 2003.
- Permutations Which Avoid 1243 and 2143, Continued Fractions, and Chebyshev Polynomials, with Toufik Mansour, *Electronic Journal of Combinatorics*, vol. 9(2), article #R7, 2003.
- A Weight-Preserving Bijection between Schröder Paths and Schröder Permutations, with Jason Bandlow and Kendra Killpatrick, *Annals of Combinatorics*, vol. 6, pp. 235–248, 2002.

- The Generalized Terwilliger Algebra and its Finite Dimensional Modules when $d = 2$, *Journal of Algebra*, vol. 250, pp. 178–216, 2002.
- A Generalization of the Terwilliger Algebra, *Journal of Algebra*, vol. 233, pp. 213–252, 2000.

Other Publications

- How a Math Class Can be Two Places at Once: A Proposed Mathematical/Philosophical Collaboration, with Steven J. Gimbel, *Proceedings of the Fifth Annual International Conference of Bridges: Mathematical Connections in Art, Music, and Science*.

Conference Talks

- The Tableaux Graph of a Permutation, Joint Mathematics Meetings, AMS Session on Combinatorics, San Diego, CA, January 9, 2008.
- Restricted Symmetric Permutations, Contributed Talk, Fifth Annual International Conference on Permutation Patterns, St. Andrews University, St. Andrews, Scotland, June 15, 2007.
- The Binomial and Hankel Transforms of a Sequence, Spring Meeting of the North Central Section of the MAA, St. Paul, MN, April 14, 2007.
- Restricted Symmetric Permutations, Joint Mathematics Meetings, AMS Session on Combinatorics, New Orleans, LA, January 8, 2007.
- Signed Permutations Counted by the Schröder Numbers, Workshop on Permutation Patterns, University of Haifa, Haifa, Israel, May 30, 2005.
- 3412-Avoiding Involutions, Continued Fractions, and Chebyshev Polynomials, Contributed Talk, Second Annual International Conference on Permutation Patterns, Malaspina University-College, Nanaimo, British Columbia, July 5, 2004.
- Connections Between Diagonal Harmonics and Schröder Paths, Invited Lecture, Minisymposium on Macdonald Polynomials and the Combinatorics of the Space of Diagonal Harmonics, SIAM Conference on Discrete Mathematics, Nashville, TN, June 13, 2004.
- The Generalized Terwilliger Algebra of a Finite Group, Invited Lecture, AMS Special Session on Character Theory of Finite Groups and Algebraic Combinatorics, SUNY-Binghamton, Vestal, NY, October 11, 2003.
- Permutations Which Avoid 1243 and 2143, Continued Fractions, and Chebyshev Polynomials, Invited Lecture, AMS Special Session on Algebraic and Enumerative Combinatorics, University of Central Florida, Orlando, FL, November 10, 2002.

- How a Math Class Can be Two Places at Once: A Proposed Mathematical/Philosophical Collaboration, with Steven J. Gimbel, Fifth Annual International Conference of Bridges: Mathematical Connections in Art, Music, and Science, Towson, MD, July 29, 2002.
- Restricted Permutations, Fibonacci Numbers, and k -Generalized Fibonacci Numbers, Contributed Talk, Tenth International Conference on Fibonacci Numbers and Their Applications, Flagstaff, AZ, June 25, 2002.
- Restricted Permutations Related to Fibonacci Numbers and k -Generalized Fibonacci Numbers, Contributed Talk, AMS Special Session on Algebraic Combinatorics, Joint Mathematics Meetings, San Diego, CA, January 9, 2002.
- Modules for the Generalized Terwilliger Algebra in the Diameter Two Case, Contributed Talk, Algebraic Combinatorics, Monster and Vertex Operator Algebras Conference, University of California, Santa Cruz, CA, July 27, 2000.
- The Generalized Terwilliger Algebra of a Strongly-Regular Graph, Invited Lecture, Com²Mac Conference on Association Schemes, Codes and Designs, Pohang, Korea, July 4, 2000.
- Modules for the Generalized Terwilliger Algebra in the Diameter Two Case, Contributed Talk, AMS Session on Associative Rings and Algebras, Joint Mathematics Meetings, Washington, DC, January 22, 2000.
- Modules for the Generalized Terwilliger Algebra, Poster Presentation, MAA - Project NExT - YMN Poster Session, Joint Mathematics Meetings, Washington, D.C., January 20, 2000.
- A Generalization of the Terwilliger Algebra of a Commutative Association Scheme, Contributed Talk, DIMACS Workshop on Codes and Association Schemes, DIMACS Center, Rutgers University, Piscataway, NJ, November 11, 1999.
- The Generalized Terwilliger Algebra of Certain Strongly Regular Graphs, Contributed Talk, Geometric and Algebraic Combinatorics Conference in honor of J. J. Seidel on his 80th birthday, Oisterwijk, The Netherlands, August 18, 1999.
- A Generalization of the Terwilliger Algebra, Invited Lecture, AMS Special Session on Algebraic Combinatorics: Association Schemes, DePaul University, Chicago, IL, September 13, 1998.
- A Generalization of the Terwilliger Algebra, Poster Presentation, Formal Power Series and Algebraic Combinatorics 10th Annual Conference, Fields Institute, Toronto, Ontario, June 15, 1998.

Selected Lectures

- The Catalan Numbers and Kepler Towers, Research Seminar Talk, St. Olaf College, Northfield, MN, May 2, 2008.

- The Alternating Sign Matrix Conjectures, Colloquium Talk, St. Olaf College, Northfield, MN, November 14, 2006.
- Wilf-Equivalence in Pattern-avoiding Permutations and Involutions, Research Seminar Talk, St. Olaf College, Northfield, MN, April 21, 2006.
- An Introduction to Pattern-avoiding Permutations and Involutions, Visiting Lecture, Macalester College, St. Paul, MN, April 21, 2006.
- The Alternating Sign Matrix Conjectures, Colloquium Talk, Carleton College, Northfield, MN, February 17, 2005.
- The Alternating Sign Matrix Conjectures, Student Seminar Talk, Bucknell University, Lewisburg, PA, October 28, 2004.
- The Alternating Sign Matrix Conjectures, Colloquium Talk, Gettysburg College, Gettysburg, PA, September 23, 2004.
- Mathematical Teflon: How Mathematics Made Music Scratch Resistant, Pi Mu Epsilon Induction Talk, Hood College, Frederick, MD, April 18, 2004.
- 3412-Avoiding Involutions, Continued Fractions, Chebyshev Polynomials, and Enumerations, Combinatorics Seminar Talk, University of Pennsylvania, Philadelphia, PA, November 11, 2003.
- Permutations Which Avoid 1243 and 2143, Continued Fractions, and Chebyshev Polynomials, Combinatorics Seminar Talk, Howard University, Washington, DC, June 25, 2003.
- The Alternating Sign Matrix Conjectures, Colloquium Talk, St. Olaf College, Northfield, MN, February 11, 2003.
- The Alternating Sign Matrix Conjectures, Colloquium Talk, Beloit College, Beloit, WI, February 4, 2003.
- The Alternating Sign Matrix Conjectures, Colloquium Talk, Swarthmore College, Philadelphia, PA, October 1, 2002.
- The Mathematics of the Compact Disc, Central Pennsylvania Mathematics Association Annual Conference, Shippensburg University, Shippensburg, PA, April 4, 2002.
- The Alternating Sign Matrix Conjectures, Math Club Talk, St. Mary's College, MD, October 11, 2001.
- The Mathematics of the Compact Disc, Division of Natural Sciences and Mathematics Colloquium Talk, St. Mary's College, MD, October 10, 2001.
- The Mathematics of the Compact Disc, Colloquium Talk, Gettysburg College, Gettysburg, PA, September 6, 2001.

- Restricted Permutations, Sorting, and a Remarkable Continued Fraction, Combinatorics Seminar Talk, Colorado State University, April 6, 2001.
- The Terwilliger Algebra of a Commutative Association Scheme and a Generalization, Combinatorics Seminar Talk, The George Washington University, February 23, 2001.
- Voting Paradoxes, Arrow's Theorem, and the Case of the Math Department Mascot, Colloquium Talk, Shippensburg University, February 20, 2001.
- Voting Paradoxes, Arrow's Theorem, and the Case of the Math Department Mascot, Division of Natural Sciences and Mathematics Colloquium Talk, St. Mary's College, MD, November 15, 2000.
- Voting Paradoxes, Arrow's Theorem, and the Case of the Math Department Mascot, Colloquium Talk, Gettysburg College, Gettysburg, PA, September 7, 2000.
- Modules for the Generalized Terwilliger Algebra of a Strongly Regular Graph, Seminar Talk, National Security Agency, Fort Meade, MD, March 16, 2000.
- The Alternating Sign Matrix Conjectures, Colloquium Talk, Gettysburg College, Gettysburg, PA, March 7, 2000.
- Modules for the Generalized Terwilliger Algebra of a Strongly Regular Graph, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, February 7, 2000.
- Catalan-like Numbers and Determinants of Hankel Matrices, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, October 4, 1999.
- Transfer Matrices and the Partition Function, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, February 8, 1999.
- The Tutte Polynomial and the Partition Function, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, November 23, 1998.
- The T-Algebra and the Primary Module, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, February 23, 1998.
- Alternating Sign Matrices, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, November 10, 1997.
- The Local Structure of the Johnson Graph, Combinatorics Seminar Talk, University of Wisconsin, Madison, WI, October, 1996.

Department Service

- **Website Coordinator**, Carleton College, Fall, 2006–Present
- **Problem Solving Group Co-Coordinator**, Carleton College, Fall, 2005–Present
- **Website Coordinator**, Gettysburg College, 2003–05

- **Problems of the Month Coordinator**, Gettysburg College, 2000–05
- **Putnam Exam Coordinator**, Gettysburg College, 2003-04
- **Moravian Conference Coordinator**, Gettysburg College, 2001-02
- **MAA Student Chapter Advisor**, Gettysburg College, 2000-01
- **Colloquium Co-Coordinator**, Gettysburg College, 2000-01
- **Sidewalk Math Co-Coordinator**, University of Wisconsin-Madison, 1997–2000

Professional Service

- **Referee** for *Ars Combinatoria*, *Annals of Combinatorics*, *College Mathematics Journal*, *Communications in Algebra*, *Discrete Applied Mathematics*, *Discrete Mathematics*, *Electronic Journal of Combinatorics*, *Journal of Integer Sequences*, *Journal of Combinatorial Theory, Series B*, *Mathematics Magazine*, and *Proceedings of the International Conference of Renaissance Banff*
- **MAA EPaDel Section Undergraduate Presentation Coordinator**, 2002–05
- **AP Calculus Reader**, 2002–Present
- **Reviewer for Math Reviews**, 2001–Present
- **Johnson Center for Creative Teaching Advisory Board Member**, Spring, 2005
- **Unleash Your Mathematical Magnetism: All About Attracting Math Majors, Project NExT Panel Organizer**, with Donna L. Flint (South Dakota State University), July, 2001
- **Writing Letters of Recommendation, Project NExT Panel Organizer**, with Emily Hynds (Samford University), January, 2001