John Engbers
Curriculum Vitae

Department of Mathematics, Statistics and Computer Science

Marquette University

340 Cudahy Hall

Milwaukee, WI 53233

Work: 414.288.6880

Fax: 414.288.5472

Email: john.engbers@marquette.edu

EDUCATION

Ph.D. Mathematics, University of Notre Dame, May 2013

>Thesis Title: *Some problems involving H-colorings of graphs*
>Thesis Adviser: David Galvin

M.S. Mathematics, University of Tennessee, August 2008

B.S. Mathematics (Secondary Education), Calvin College, May 2006

ACADEMIC EMPLOYMENT

Department of Mathematical and Statistical Sciences, Marquette University

>Associate Professor, 2020-present
>Assistant Professor, 2013-2020

PUBLICATIONS

27. "Extremal graphs for average sizes of maximal matchings" (with A. Erey)
>Submitted

26. "Maximizing the number of H-colorings of graphs with a fixed minimum degree"
>Submitted

25. "Tomescu's graph coloring conjecture for ℓ-connected graphs"
>(with A. Erey, J. Fox, and X. He[1]),
>*SIAM J. Disc. Math.* **35(2)** (2021), 1478–1502.

24. "Independent sets in n-vertex k-chromatic ℓ-connected graphs" (with L. Keough and T. Short),
>*Discrete Math.* **344** (2021), 112376.

23. "Inextricably linked: a trigonometric coupling" (with A. Hammett and I. Hogan),
>*Math. Mag.* **93(5)** (2020), 352–362.

22. "To Replace or Not To Replace — That Is The Question" (with A. Hammett),
>*College Math. J.* **51(2)** (2020), 117–123.

21. "Colored multipermutations and a combinatorial generalization of Worpitzky's identity"
>(with J. Pantone and C. Stocker),
>*Australas. J. Combin.* **78(2)** (2020), 335–347.

20. "Silos, snow cones, railroad spikes, and spherical coordinates" (with A. Hammett),
>*Math. Mag.* **93(2)** (2020), 143–147.

19. "The n-children problem" (with A. Hammett),
>*College Math. J.* **50(4)** (2019), 242–249.

18. "Maximizing and minimizing the number of generalized colorings of trees" (with C. Stocker),

---

[1]Graduate student

Discrete Math. **342** (2019), 1048–1055.

17. "Restricted Stirling and Lah numbers and their inverses" (with D. Galvin and C. Smyth),
    J. Combin. Theory Ser. A **161** (2019), 271–298.

16. "Extremal colorings and independent sets" (with A. Erey),
    Graphs Combin. **34(6)** (2018), 1347–1361.

15. "Combinatorial proofs of identities of Alzer and Prodinger and some generalizations"
    (with C. Stocker),
    Integers **18** (2018), #A49.

14. "On comparability of bigrassmannian permutations" (with A. Hammett),
    Australas. J. Combin. **71(1)** (2018), 121–152.

13. "Merging peg solitaire on graphs" (with R. Weber[2]),
    Involve **11-1** (2018), 53–66.

12. "Maximizing H-colorings of connected graphs with fixed minimum degree,"
    J. Graph Theory **85** (2017), 780–787.

11. "Extremal H-colorings of trees and 2-connected graphs" (with D. Galvin),
    J. Combin. Theory Ser. B **122** (2017), 800–814.

10. "A direct proof of the integral formulae for the inverse hyperbolic functions"
    (with A. Hammett),
    College Math. J. **47(4)** (2016), 297-299.

9. "Two combinatorial proofs of identities involving sums of powers of binomial coefficients"
    (with C. Stocker),
    Integers **16** (2016), #A58.

8. "Reversible peg solitaire on graphs" (with C. Stocker),
    Discrete Math. **338** (2015), 2014-2019.

7. "Extremal H-colorings of graphs with fixed minimum degree,"
    J. Graph Theory **79** (2015), 103-124.

6. "Combinatorially interpreting generalized Stirling numbers" (with D. Galvin and J. Hilyard),
    European J. Combin. **43** (2015), 32-54.

5. "Trivial meet and join within the lattice of monotone triangles" (with A. Hammett),
    Electronic J. Combin. **21(3)** (2014), #P3.13.

4. "Counting indepedent sets of a fixed size in graphs with a given minimum degree"
    (with D. Galvin),
    J. Graph Theory **76** (2014), 149-168.

3. "H-coloring tori" (with D. Galvin),
    J. Combin. Theory Ser. B **102** (2012), 1110-1133

2. "H-colouring bipartite graphs" (with D. Galvin),
    J. Combin. Theory Ser. B **102** (2012), 726-742

1. "Constructing PL 2-knot complements" (with J. Dent and G. Venema),
    Proceedings of the 22nd Workshop in Geometric Topology, Colorado College (2005)

OTHER PUBLICATIONS

1. Problem 1146 (with A. Hammett),
    College Math J. **50(2)** (2019), p.Ĩ43.

---

[2]Undergraduate student

SELECTED PRESENTATIONS

Conference Presentations

Invited

AMS Spring Eastern Sectional Meeting, Special Session on Chromatic
Graph Theory, virtual
Maximizing the number of colorings and independent sets in k-chromatic graphs,
April 2023

AMS Spring Southeastern Sectional Meeting, Special Session on Recent
Developments in Graph Theory, Georgia Tech
Maximizing the number of colorings and independent sets in k-chromatic graphs,
March 2023

International Conference on Advances in Interdisciplinary Statistics and Combinatorics,
Session on Advances in Combinatorics, UNC — Greensboro, Greensboro, NC
Extremal independent sets and colorings in k-chromatic graphs, October 2018

5th Lake Michigan Workshop on Combinatorics and Graph Theory, University of
Notre Dame, Notre Dame, IN
Maximizing colorings of graphs, April 2018

AMS Fall Western Sectional Meeting, Special Session on Recent Advances in Structural
and Extremal Graph Theory, University of Denver
Maximizing colorings of graphs, October 2016

AMS Spring Central Sectional Meeting, Special Session on Probabilistic and
Extremal Combinatorics, North Dakota State University
Extremal H-colorings of graphs with fixed minimum degree, April 2016

AMS Fall Southeastern Sectional Meeting, Special Session on Probabilistic Combinatorics,
University of Memphis
How often do two monotone triangles meet in the minimal element?, October 2015

AMS Fall Central Sectional Meeting, Special Session on Graphs/Hypergraphs,
University of Notre Dame
The Typical Structure of H-colorings of the Hamming Cube, November 2010

Contributed

53rd Southeastern International Conference on Combinatorics, Graph Theory, and
Computing, Florida Atlantic University
Extremal vertex colorings of graphs, March 2022

51st Southeastern International Conference on Combinatorics, Graph Theory, and
Computing, Florida Atlantic University
Extremal colorings and independent sets in k-chromatic graphs, March 2020

31st Cumberland Conference on Combinatorics, Graph Theory and Computing,
University of Central Florida
Extremal independent sets and colorings in k-chromatic graphs, May 2019

MIGHTY LVIII (58th Midwest Graph Theory Conference), GVSU
Extremal colorings and independent sets in k-chromatic graphs, October 2017

MIGHTY LVI (56th Midwest Graph Theory Conference), IPFW
Reversible peg solitaire on graphs, October 2014

MAA MathFest, Portland, OR
Extremal H-colorings of trees, August 2014

9th Graduate Student Combinatorics Conference, University of Minnesota - Twin Cities
Extremal H-colorings of forests and trees, April 2013

MIGHTY LIV (54th Midwest Graph Theory Conference), Miami (OH) University
Extremal H-colorings of forests and trees, April 2013

MIGHTY LIII (53rd Midwest Graph Theory Conference), Iowa State University
Counting Graph Homomorphisms, September 2012

MIGHTY LII (52nd Midwest Graph Theory Conference), Indiana State University
Counting Independent Sets of a Fixed Size in Graphs with Given Minimal Degree, April 2012

Graduate Student Combinatorics Conference, University of Illinois - Urbana Champaign
Counting Independent Sets of a Fixed Size in Graphs with Given Minimal Degree, April 2012

Michigan Undergraduate Mathematics Conference, Grand Valley State University
Knotted Spheres in Four Dimensions, October 2003

Seminars and Colloquia

Discrete Math Seminar, Illinois Institute of Technology (virtual)
Extremal questions for vertex colorings of graphs, September 2022

ANT-CoG Seminar, UNC-Greensboro (virtual)
Extremal questions for vertex colorings of graphs, April 2022

Atlantic Graph Theory Seminar, Dalhousie University (virtual)
Extremal questions for vertex colorings of graphs, April 2022

Math Seminar, Marquette University
How many ways can you color a tree?, October 2019

Math Seminar, Marquette University
Erdös' Proof of Bertrand's Postulate, April 2019

Math Seminar, Marquette University
Graph Colorings and Independent Sets, October 2018

Colloquium, Marquette University
Variations on Peg Solitaire on Graphs, October 2015

Colloquium, Calvin College
Graph Theory — to the Extreme!, April 2014

Colloquium, Marquette University
Extremal questions for H-colorings of graphs, December 2012

Graph Theory Seminar, Western Michigan University
Extremal questions for H-colorings, November 2012

New York Combinatorics Seminar, CUNY Graduate Center
Extremal questions for H-colorings of graphs, October 2012

Discrete Mathematics Seminar, University of Notre Dame
Extremal questions for H-colorings of graphs, September 2012

Colloquium, Ferris State University
Graph Theory — to the Extreme!, January 2012

Graduate Student Seminar, University of Notre Dame
Graph Theory — to the Extreme!, September 2011
Conway's Solitaire Army Problem, March 2010

Combinatorics & Logic Seminar, University of Notre Dame

> *Roth's Theorem on 3-term Arithmetic Progressions*, March 2011
>
> *Random Graphs & Threshold Functions I, II, and III*, October - November 2010

Colloquium, Calvin College
> *Conway's Solitaire Army*, April 2010

Poster Presentations

EXCILL2: Extremal Combinatorics at Illinois, University of Illinois - Urbana Champaign
> *Extremal H-colorings of graphs*, March 2013

2013 Joint Mathematics Meetings, YMN/Project NExT Poster Session, San Diego, CA
> *Extremal H-colorings of graphs*, January 2013

GSU Graduate Student Research Symposium, University of Notre Dame
> *The Typical Structure of Proper Colorings of the Discrete Hypercube*, February 2011

TEACHING EXPERIENCE

Marquette University, 2013-present

> Calculus 1 (Math 1450), Calculus 2 (Math 1451), Discrete Mathematics (Math 2100), Discrete Mathematics for Engineers (Math 2105), Foundations of Mathematics (Math 2350), Abstract Algebra 1 (Math 4120), Abstract Algebra 2 (Math 4121), Foundations of Geometry (Math 4420), Topology (Math 4450), Variations on Peg Solitaire in Graphs (Independent study; Math 4995), Explorations in Combinatorics and Graph Theory (Independent study; Math 4995), Advanced Readings in View Obstructions (Independent study; Math 6995)

University of Notre Dame, 2009-2013

> Linear Algebra (SUMR) [co-instructor with Martha Precup], Summer 2011
> Boeing Academic Excellence Workshop - Calculus, Summer 2011
> ACMS 20350 — Statistics for Life Sciences, Spring 2011
> Math 10260 — Elements of Calculus II for Business, Fall 2010
> Linear Algebra (SUMR), Summer 2010
> Book Proofs: Aesthetic Mathematics (Undergraduate Reading Seminar), Fall 2009

University of Tennessee - Knoxville, 2007-2008

> Math 119 — College Algebra (2 sections), Fall 2007

The Potter's House Christian High School, 2006

> High School AP Calculus/Pre-Calculus Teacher, January-June 2006

TEACHING AWARDS/CERTIFICATIONS

Kaneb Center Outstanding Graduate Student Teacher Award, University of Notre Dame, 2012

Kaneb Center Striving for Excellence in College and University Teaching Certificate,
> University of Notre Dame, 2011

Dorothea & Edgar D. Eaves Teaching Award, University of Tennessee - Knoxville, 2007

Michigan Provisional Secondary Teaching Certificate (Mathematics, Chemistry), 2006-2014

GRANTS

Principal Investigator, Simons Foundation Collaboration Grant for Mathematicians
> Project title: *Investigating Graph Colorings*

09/01/2017–08/31/2022, $42,000

Summer Faculty Fellowship, Marquette University
    Project title: *Extremal Colorings of Graphs*
    06/2014-07/2014, $5,500

HONORS, AWARDS, AND MEMBERSHIPS

Honors & Awards

Project NExT Fellow (Brown13 Dot), 2013-2014

Notebaert Professional Development Award, The Graduate School, University of
    Notre Dame, 2013

First place, GSU Symposium Poster Presentation (Science Division), University of
    Notre Dame, 2011

Richard Sady Prize (Outstanding Mathematics Graduate Student in First-Year Courses),
    University of Notre Dame, 2009

Yueh-er, Hong-hsu & Clarence Cheng Kuo Fellowship (Outstanding Mathematics Master's
    Student), University of Tennessee - Knoxville, 2008

Rinck Memorial Prize (Outstanding Mathematics Student), Calvin College, 2006

Memberships

American Mathematical Society, 2006-Present

Mathematical Association of America, 2011-Present

CONFERENCES ATTENDED

AMS Spring Eastern Sectional Meeting, Virtual, April 2023

AMS Spring Southeastern Sectional Meeting, Georgia Tech, March 2023

AMS Fall Western Sectional Meeting, University of Utah, October 2022

53rd Southeastern International Conference on Combinatorics, Graph Theory, and Computing,
    Florida Atlantic University, March 2022

52nd Southeastern International Conference on Combinatorics, Graph Theory, and Computing,
    Virtual, March 2021

AMS Western Fall Sectional Meeting, Virtual, October 2020

51st Southeastern International Conference on Combinatorics, Graph Theory, and Computing,
    Florida Atlantic University, March 2020

AMS Central Fall Sectional Meeting, University of Wisconsin-Madison, September 2019

31st Cumberland Conference on Combinatorics, Graph Theory, and Computing, University of
    Central Florida, May 2019

6th Lake Michigan Area Workshop on Combinatorics and Graph Theory, Western Michigan
    University, April 2019

AMS Central Fall Sectional Meeting, University of Michigan, October 2018

International Conference on Advances in Interdisciplinary Statistics and Combinatorics,
    UNC Greensboro, October 2018

5th Lake Michigan Area Workshop on Combinatorics and Graph Theory, University of
    Notre Dame, April 2018

PME Undergraduate Math Conference, St. Norbert College, November 2017 (with 3 students)

MIGHTY LVIII (58th Midwest Graph Theory Conference), GVSU, October 2017

4th Lake Michigan Area Workshop on Combinatorics and Graph Theory, Western Michigan
          University, April 2017

AMS Central Spring Sectional Meeting, Indiana University, April 2017

AMS Western Fall Sectional Meeting, University of Denver, October 2016

AMS Central Spring Sectional Meeting, North Dakota State University, April 2016

AMS Southeastern Fall Sectional Meeting, University of Memphis, October 2015

AMS Central Fall Sectional Meeting, Loyola University Chicago, October 2015

2nd Lake Michigan Workshop on Combinatorics and Graph Theory, University of
          Notre Dame, March 2015

PME Undergraduate Math Conference, St. Norbert College, November 2014 (with 2 students)

MIGHTY LVI (56th Midwest Graph Theory Conference), IPFW, October 2014

2014 MAA MathFest, Portland, OR, August 2014

1st Lake Michigan Area Workshop on Combinatorics and Graph Theory, Western Michigan
          University, March 2014

2014 Joint Mathematics Meetings, Baltimore, MD, January 2014

2013 MAA MathFest, Hartford, CT, August 2013

9th Graduate Student Combinatorics Conference, University of Minnesota, April 2013

MIGHTY LIV (54th Midwest Graph Theory Conference), Miami (OH) University, April 2013

EXCILL2: Extremal Combinatorics at Illinois, University of Illinois - Urbana Champaign,
          March 2013

2013 Joint Mathematics Meetings, San Diego, CA, January 2013

MIGHTY LIII (53rd Midwest Graph Theory Conference), Iowa State University, September 2012

MIGHTY LII (52nd Midwest Graph Theory Conference), Indiana State University, April 2012

8th Graduate Student Combinatorics Conference, University of Illinois - Urbana Champaign,
          April 2012

AMS Central Fall Sectional Meeting, University of Notre Dame, November 2010

CONFERENCE ORGANIZATION

2022 AMS Western Fall Sectional Meeting, Special Session on Topics in Graph Theory,
          Hypergraphs, and Set Systems, University of Utah (with D. Galvin and C. Smyth)

2020 AMS Western Fall Sectional Meeting, Special Session on Topics in Graph Theory,
          Hypergraphs, and Set Systems, University of Utah (Virtual; with D. Galvin and C. Smyth)

2018 AMS Central Fall Sectional Meeting, Special Session on Graph Theory, Hypergraphs,
          and Set Systems, University of Michigan (with C. Smyth)

2017 AMS Central Spring Sectional Meeting, Special Session on Topics in Extremal, Probabilistic,
          and Structural Graph Theory, Indiana University (with D. Galvin)

2015 AMS Central Fall Sectional Meeting, Special Session on Graph Theory, Hypergraphs,
          and Set Systems, Loyola University Chicago (with D. Galvin)

UNIVERSITY SERVICE

Marquette University Library Board, 2019-2022

Marquette MSSC Executive Commitee, 2019-2021

Marquette MSSC Undergraduate Committee, 2019-2020

Marquette MSCS Calculus Online Homework Coordinator, Spring 2018-Summer 2020

Marquette MSCS Graudate Committee, Fall 2018-Spring 2019

Marquette MSCS Teacher Education Committee, Spring 2016-Spring 2017, Fall 2022-Spring 2023 (chair in Fall)

Marquette Math Assessment Update Committee Member, Spring 2017

Marquette Math Calculus Textbook Selection Committee Member, Spring 2017

Marquette MSCS Search Committee Member, 2016-2017

Marquette MATH Transfer Course Evaluator, Spring 2015-Spring 2016

Program Assessment Leader (PALS) for Mathematics Major Assessment, 2014-2016

Marquette MSCS Undergraduate Committee, Fall 2014-Spring 2016

Marquette Scholarship Competition Browsing Session Volunteer (MSCS), February 2015

OTHER SERVICE AND OUTREACH

Reviewer, *Australasian Journal of Combinatorics*, *College Math Journal*, *Discrete Mathematics*, *Discussiones Mathematicae Graph Theory*, *Involve*, *Journal of Combinatorial Mathematics and Combinatorial Computing*, *Journal of Combinatorial Theory Series A*, *Journal of Graph Theory*, *Journal of Integer Sequences*, *Minnesota Journal of Undergraduate Mathematics*, *Rocky Mountain Journal of Mathematics*, 2014-present

Reviewer, Math Reviews (20 papers), 2014-present

Masters presentation examiner (Emily Soley-Johnson), Summer 2017

Ph.D. defense examiner (Zac Buelow), Spring 2016

Judge, MAA Student Paper Session, MathFest, August 2014

Judge, MAA Undergraduate Student Poster Session, JMM, January 2014

Co-organizer/Speaker, TA Orientation Session for Science, Math, and Engineering (through the Kaneb Center for Teaching and Learning), University of Notre Dame, August 2012

Judge, GSU Symposium Poster Presentation (Science Division), University of Notre Dame, February 2012

Poster Presentation for the Graduate Studies and Research Advisory Council, University of Notre Dame, October 2011

Judge, Northern Indiana Regional Science and Engineering Fair, February 2010

Volunteer, Pro2Serve Math Competition, University of Tennessee - Knoxville, October 2006, October 2007