

Department of Mathematics • University of Wisconsin-Eau Claire • Eau Claire, WI 54701

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a B a M b i r i k a

C.V. last updated on January 24, 2022

Education

- 2004–2010** **University of Iowa**, Iowa City, Iowa
Ph.D., Mathematics, conferred in July 2010
Thesis Title: Analysis of symmetric function ideals: towards a combinatorial description of the cohomology ring of Hessenberg varieties
Advisors: Professors Julianna Tymoczko and Frederick Goodman
M.S., Mathematics, conferred in December 2006
- 2000–2003** **Sonoma State University**, Rohnert Park, California
B.A., Mathematics, Summa Cum Laude

Employment

- 2017–Present** **University of Wisconsin-Eau Claire**, Eau Claire, Wisconsin
Associate Professor of Mathematics
- 2013–2017** **University of Wisconsin-Eau Claire**, Eau Claire, Wisconsin
Assistant Professor of Mathematics
- 2010–2013** **Bowdoin College**, Brunswick, Maine
Postdoctoral Fellow and Instructor of Mathematics
- 2004–2010** **University of Iowa**, Iowa City, Iowa
Graduate Teaching Assistant and Instructor of Mathematics

Research Interests

Combinatorics, commutative algebra, algebraic geometry and topology, combinatorial representation theory, and number theory. Undergraduate student research interests also include lattice point geometry, prime labelings of graphs, complex reflection groups, Euler-phi function and primitive roots in the Gaussian and Eisenstein integer rings, Fibonacci and Lucas sequences, and the generalized Fibonacci sequence.

Mathematics Research Publications

Refereed Journal Articles

1. Guyer, D., Mbirika A.: *GCD of sums of k consecutive Fibonacci, Lucas, and generalized Fibonacci numbers*. Journal of Integer Sequences, **24** No.9, Article 21.9.8 (2021), 25pp. (Available at http://people.uwec.edu/mbirika/paper_GCDs_of_sums_of_Gibonacci_numbers.pdf).
Guyer was a UWEC research student of Dr. aBa.
2. Goodrich, A., Mbirika, A., Nielsen, J.: *New methods to find patches of invisible integer lattice points*. Involve: A Journal of Mathematics, **14** No.2 (2021), 283–310. (Available at http://people.uwec.edu/mbirika/paper_lattice_point_visibility.pdf)
Goodrich and Nielsen were UWEC research students of Dr. aBa.

3. Mbirika, A., Tymoczko, J.: *Representation stability of Springer varieties and some combinatorial consequences*. Journal of Algebraic Combinatorics, **53** No.3, 897–920, 2021 (Available at http://people.uwec.edu/mbirika/paper_representation_stability_Author_Version_2021.pdf).
4. Gullerud, E., Mbirika, A.: *An Euler phi function for the Eisenstein integers and some applications*. Integers: Electronic Journal of Combinatorial Number Theory, **20**, Paper No. A20, 28pgs., 2020. (Available at http://people.uwec.edu/mbirika/Eisenstein_euler_phi_paper.pdf).
Gullerud was a UWEC research student of Dr. aBa.
5. Goins, E., Harris, P., Kubik, B., Mbirika, A.: *Lattice point visibility on generalized lines of sight*. American Mathematical Monthly, **125** No.7, 593–601, 2018.
(Available at http://people.uwec.edu/mbirika/lattice_point_paper_published_in_American_Mathematical_Monthly_2018.pdf).
6. Berliner, A., Dean, N., Hook, J., Marr, A., Mbirika, A., McBee, C.: *Coprime and prime labelings of graphs*. Journal of Integer Sequences, **19** No.5, Article 16.5.8, 14pgs., 2016.
(Available at: <https://cs.uwaterloo.ca/journals/JIS/VOL19/Mbirika/mbi3.pdf>)
7. Mbirika, A., Pietraho, T., Silver, W.: *On the sign representations for the complex reflection groups $G(r, p, n)$* . Beiträge zur Algebra and Geometrie, **57** No.4, 851–858, 2016.
(Available at http://people.uwec.edu/mbirika/Mbirika-Pietraho-Silver_paper_Nov_2016_issue.pdf)
8. Mbirika, A., Tymoczko, J.: *Generalizing Tanisaki's ideal via ideals of truncated symmetric functions*. Journal of Algebraic Combinatorics, **37** No.1, 167–199, 2013.
(Available at http://people.uwec.edu/mbirika/JACO_Mbirika-Tymoczko_2013_paper.pdf)
9. Mbirika, A.: *A Hessenberg generalization of the Garsia-Procesi basis for the cohomology ring of Springer varieties*. Electronic Journal of Combinatorics, **17** No.1:Research Paper 153, 2010.
(Available at http://www.combinatorics.org/Volume_17/PDF/v17i1r153.pdf)

Submitted or Ready to Submit

- Guyer, D., Mbirika, A., and Scott, M.: *Tantalizing properties of subsequences of the Fibonacci sequence modulo 10*, 2021. (Available at http://people.uwec.edu/mbirika/aBa_Dan_Miko_paper_arXiv_11.25.21.pdf).
Guyer and Scott were UWEC research students of Dr. aBa.
- Gullerud, E., Mbirika, A., Post, R.: *Tridiagonal real symmetric matrices with a connection to Pascal's triangle and the Fibonacci sequence*, 2022. (Available at http://people.uwec.edu/mbirika/paper_tridiagonal_symmetric_matrices_arXiv_2022.pdf).
Gullerud and Post were UWEC research students of Dr. aBa.

In Preparation

- Mbirika, A.: *Towards a Schur-Weyl duality for the alternating group*, 2009.
(Draft available at http://people.uwec.edu/mbirika/MSRI-result-Summer2009_draft.pdf).
- Mbirika, A., Post, R., Stodola, R.: *Involutions in the hyperoctahedral group*.
Post and Stodola were UWEC research students of Dr. aBa.

Interdisciplinary Research Publications

- Mbirika, A., Saiber, A.: *The three giri of Paradiso XXXIII*. (An interdisciplinary essay merging Mathematics and Late Medieval Italian Literature of the poet Dante). *Dante Studies*, **131**, pgs.237–272, 2013. (Available at: http://people.uwec.edu/mbirika/Saiber-Mbirika-The_three_giri_of_Paradiso_33-Dante_Studies_Journal-Volume_131--2013.pdf)

Expository Mathematics Writings

- Mbirika, A.: *Hidden trees in the forest: On lattice points and prime labelings of graphs*. (Contains some unpublished results of myself and my collaborators Berliner, A., Dean, N., Hook, J., Marr, A., and McBee, C.), 2012. (Available at http://people.uwec.edu/mbirika/invisible_points_claim.pdf).
- Mbirika, A.: *On a coin-flip problem and its connection to π* . (I wrote this with the intention of using it as a teaching/learning tool for other faculty/students. Hence many exercises are included), 2011. (Available at <http://people.uwec.edu/mbirika/CoinFlipProblem.pdf>).

Textbooks and Course Packets (Self-published with Creative Commons License)

This textbook was written by myself and co-author Rita Post over the Summer 2018 and Fall 2019 semester. It was first used in my Spring 2019 number theory course Math 341 at UWEC.

- Mbirika, A., Post, R.: *The Power of Proofs [AND] Number Theory*, 262 pages. Self-published with Creative Commons License (CC BY-NC-SA), 2019. The book has two versions as follows:
 - https://people.uwec.edu/mbirika/Number_Theory_Book_student_version.pdf (last revision in January 2020)
 - http://people.uwec.edu/mbirika/Number_Theory_Book_teacher_version.pdf (last revision in June 2019)

The following two course packets were written by me for my students in Math 104 and Math 425, respectively.

- Mbirika, A.: *Finite Mathematics - The Power of [Math 104]*, 224 pages. Self-published with Creative Commons License (CC BY-NC-SA), 2020.
 - http://people.uwec.edu/mbirika/Math_104_Course_Packet_by_aBa.pdf (last revision in January 2022).
- Mbirika, A.: *Abstract Algebra I - The Power of [Math 425]*, 242 pages. Self-published with Creative Commons License (CC BY-NC-SA), 2021.
 - https://people.uwec.edu/mbirika/Math_425_Course_Packet_by_aBa.pdf (last revision in August 2021).

Teaching Experience (at University of Wisconsin-Eau Claire)

Finite Mathematics [Math 104]: (Spring 2014, Fall 2014, Spring 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021, and Fall 2021). This course is primarily for non-science majors who have little or no intention to go on to higher level mathematics courses. I developed problems in WeBWorK (an open-source online homework system). This is the first time that anyone at UWEC has used WeBWorK with this course. I assembled assignments for every topic that is covered in this course so that future instructors can use these same materials.

Algebra for Calculus [Math 109]: (Fall 2013). This course is primarily attended by first-year students who intend to go on to take a calculus course as part of their non-math science major. I made substantial use of the open-source online homework system called WeBWorK not only by using pre-existing problems in their National Problem Library, but also by altering the code on these problems so that they catered specifically to my classes here at UWEC.

Discrete Mathematics [Math 314]: (Fall 2013, Spring 2014, Fall 2015, and Fall 2017). This course is a 300-level undergraduate course geared especially for Computer Science students and is used also as an elective for mathematics majors. We covered both graph theory and enumeration.

Real Analysis I [Math 316]: (Fall 2016 and Fall 2019). This is the 1st semester course in real analysis. We cover the real number system \mathbb{R} , basic topology, numerical sequences and series, continuity, and sequences and series of functions. In this course, I emphasize a metric space approach to analysis.

Point Set Topology [Math 335]: (Fall 2020). This proofs-based course covers topological spaces, interior/closure/boundary, creating new topological spaces, continuous functions and homeomorphisms, metric spaces, connectedness, and compactness.

Classical Number Theory [Math 341]: (Spring 2019). This proofs-intensive course covers divisibility, primes and their properties, theory of congruences, Diophantine equations, number theoretic functions, primitive roots, and an introduction to group theory.

Beauty of Math [Math 395]: (Fall 2014). This is a directed studies course that I developed which is focused on beautiful proofs in mathematics. The class takes turns presenting and discussing proofs from the book titled *Proofs from The Book*—an approximation of the fictitious text called *The Book* which the eminent mathematician Paul Erdős maintained that God kept the perfect proofs for mathematical theorems. In the course, a variety of topics are covered from Number Theory, Geometry, Analysis, Combinatorics, and Graph Theory.

Riemann Hypothesis Connection to the Distribution of Prime Numbers [Math 395]: (Spring 2017). This is a directed studies course that I developed to explore the famous unsolved problem known as the Riemann Hypothesis. The class had a seminar style in that enrolled students and I took turns presenting material from the course textbook and our investigations outside the textbook. Many non-enrolled students and community members and one emeritus math faculty were also participating in the course.

Abstract Algebra I [Math 425]: (Fall 2014, Spring 2016, Fall 2018, Spring 2020, and Fall 2021). This course covers groups, rings, and field theory. I introduced a WeBWorK portion to this course which is primarily a proofs-driven class. This is the first time that anyone at UWEC has used WeBWorK with this course.

Abstract Algebra II [Math 426]: (Spring 2014, Spring 2017, Spring 2018, Spring 2019, and Spring 2021). This is the 2nd semester course in abstract algebra. We cover the standard topics of advanced group and field theory, beginning with semidirect products, then field extensions and concluding with Galois theory and special topics (time-permitting).

Commutative Algebra [Math 499]: (Spring 2018, Summer 2018, and Fall 2018). This course covers an introduction to the topic of commutative algebra using the Atiyah-Macdonald textbook.

Number Theory Topics Course: Primitive Roots and Quadratic Reciprocity [Math 499]: (Spring 2020 and Fall 2020). This course continues from where the Math 341 Elementary Number Theory ends. In particular, we investigate primitive roots of an integer. We will prove Gauss' well-known result that an integer n has a primitive root if and only if $n = 1, 2, 4, p^k$, or $2p^k$, where p is an odd prime. In studying primitive roots, we will also study the related Theory of Indices. Lastly, this course covers the Quadratic Reciprocity Law on the solvability of quadratic congruences.

Algebraic Number Theory [Math 499]: (Spring 2021). In this course, we covered the first five chapters of the book *Problems in Algebraic Number Theory* by M. Ram Murty and Jody Esmonde. Topics covered were: (1) elementary number theory, (2) Euclidean rings, (3) algebraic numbers and integers, (4) integral bases, and (5) Dedekind domains.

Teaching Experience (at Bowdoin College)

Differential Calculus: (Fall 2010 and Spring 2013). This course and its textbook follows the goals of the NSF-sponsored *Calculus Reform Initiative*. The calculus curriculum is built around the following: (1) development of *conceptual understanding* of the material, not solely computational skills, (2) significant *problems in the natural and social sciences* that require calculus techniques, and (3) the use of *computational power* (especially as implemented with *Mathematica* software) to tackle problems and applications of surprising complexity.

Integral Calculus: (Fall 2011 and Spring 2012). This course is the second part in a three-part sequence of calculus courses. It is designed in the spirit of the *Calculus Reform Initiative* (see the Differential Calculus entry).

Combinatorics and Graph Theory: (Spring 2011 and Fall 2012). This is a theory and proof-writing based course designed for mathematics and computer science majors. Topics include graph algorithms/analysis, enumeration, generating functions, and selected topics from my own research.

Bowdoin Science Experience (BSE): (Summers 2010, 2011, and 2012). The week-long BSE pre-orientation program is designed to give primarily underrepresented, female, and first-generation college students an opportunity to acclimatize to college life, and to explore the sciences in small groups with a faculty member. In the three summers I have taught and supervised BSE projects, I covered linear algebra, multivariable calculus, mathematical induction, number theory, lattice point geometry, and graph theory.

Teaching Experience (at University of Iowa)

Basic Algebra II: (Fall 2008). This was a remedial algebra course. Designed and delivered all aspects of the course including lectures, exams, and grades.

Various Teaching Assistant Courses: Led discussion sections which complement the lectures, determined grades, designed quizzes, graded tests, quizzes, and homework, held office hours, and worked at The University of Iowa Math Tutorial Lab.

- Abstract Algebra I: Introduction to abstract algebra (groups, rings) and proofs for math majors. (Spring 2009)
- Calculus I: Differential calculus for math majors. (Fall 2007)
- Logic of Arithmetic: Math education class for prospective elementary/secondary teachers. (Spring 2006)
- Calculus and Matrix Algebra for Business: Calculus class for business majors. (Fall 2005)

NSF-VIGRE Graduate Research Mentor and Teaching Assistant: Assisted students with $\text{T}_\text{E}\text{X}$, sharpened students' mathematical reasoning, proof writing, and problem solving skills for a graph theory class, facilitated discussion sections, and evaluated student work. Oversaw an undergraduate research project.

- NSF-VIGRE Heartland REU in Graph Theory, The University of Iowa. (Summer 2007)

Alliance/AGEP Diversity Program Mentor: Program for underrepresented minority students in mathematics. Led a daily discussion section in linear algebra for four weeks. Assisted with a variety of undergraduate research projects for the remaining four weeks.

- Alliance/AGEP REU in Linear Algebra, The University of Iowa. (Summer 2006)

Presentations

Invited Research Talks

1. High Point University Math Colloquium - Title: Mind-blowingly awesome subsequences in the Fibonacci sequence modulo 10 - High Point, NC. (Sept 17, 2021)
2. Providence College Math Colloquium - Title: Tantalizing explorations in the Fibonacci and Gibonacci Sequences - Providence, RI. (Apr 29, 2021)
3. Sonoma State University Math Festival (Main Invited Speaker) - Title: Mathematics Research Inspired by Astrology: The Fibonacci Sequence Modulo 10 - Rohnert Park, CA. (Apr. 22, 2020)
4. Winona State Math Colloquium - Title: Two Research Projects Birthed from Curiosity, Recreation, and Joy - Winona, MN. (Feb 28, 2020)
5. AMS-MAA Joint Mathematics Meeting [MAA Invited Address] - Title: Two Research Projects Birthed from Curiosity, Recreation, and Joy - January 14-18, 2020 - (Denver, CO)
Video of Talk available at <https://www.youtube.com/watch?v=JaWM6kaGceg>
6. AMS-MAA Joint Mathematics Meeting [AMS Contributed Paper Session on Matrices and Matroids] - Title: *Characteristic polynomials and eigenvalues for a family of tridiagonal real symmetric matrices and a tantalizing connection to Pascal's triangle* - San Diego, CA. (January 2018)
7. Florida Gulf Coast University Mathematics Colloquium (a joint talk with Emily Gullerud) - Title: *An Euler phi function for the Eisenstein integers and some tantalizing applications* - Fort Meyers, FL. (November 2017)
Gullerud was a UWEC research student of Dr. aBa.
8. AMS Central Sectional Meeting [Special Session on Algebraic Combinatorics of Flag Varieties] - Title: *Combinatorial consequences of the representation stability of the cohomology of Springer varieties* - University of North Texas at Denton, TX. (September 2017)
9. AMS Central Sectional Meeting [Special Session on Combinatorics and Representation Theory of Reflection Groups: Real and Complex] - Title: *Involutory and orientation-preserving symmetries in the hyperoctahedral group* - University of North Texas at Denton, TX. (September 2017)
10. Smith College - Northampton, MA. (March 2017)
 - Student Lunch Talk - Title: *The Riemann-zeta function and lattice point visibility on curved lines of sight.*
 - Research Colloquium - Title: *Stability of the Springer representation and some combinatorial consequences.*
11. AMS-MAA Joint Mathematics Meeting [AMS Special Session on Discrete Structures in Number Theory] - Title: *Lattice point visibility on straight and curved lines of sight* - Atlanta, GA - (January 2017)
12. AMS-MAA Joint Mathematics Meeting [AMS Special Session on RE(UF)-search on Graphs and Matrices] - Title: *Coprime and prime labelings of ladder graphs and complete bipartite graphs* - Atlanta, GA - (January 2017)
13. AMS Eastern Sectional Meeting [Special Session on Combinatorial Aspects of Nilpotent Orbits] - Title: *Combinatorial questions related to the representation stability of the cohomology of Springer varieties* - Bowdoin College in Brunswick, ME. (September 2016)
14. NSF USTARS Conference (Underrepresented Student in Topology and Algebra Research Symposium) - Invited Faculty Keynote Speaker - Title: *My combinatorial journey through algebra and topology* - Sam Houston State University in Huntsville, TX. (April 2016)

15. Fields Institute [Workshop on Recent Developments in the Geometry and Combinatorics of Hessenberg Varieties] - Title: *A co-FI-module structure on Springer representations* - Toronto, Canada. (July 2015)
16. AMS-MAA Joint Mathematics Meeting [AMS Special Session on Graphs, Matrices, and Other Related Problems] - Title: *Finding square patches of invisible lattice points using quasiprime matrices* - San Antonio, TX. (January 2015)
17. SACNAS Annual Conference [Special Session on Abstract Algebra Research Topics for Undergraduates] - Title: *Applying the Chinese remainder theorem to a lattice point geometry problem* - Los Angeles, CA. (October 2014)
18. AMS Central Section Meeting [Special Session on Patterns in Permutations and Words, and Applications] - Title: *A Robinson-Schensted correspondence between complex reflection groups $G(r, p, n)$* - Eau Claire, WI. (September 2014)
19. University of Minnesota Combinatorics Seminar - Title: *A Robinson-Schensted correspondence between complex reflection groups $G(r, p, n)$* - Minneapolis, MN. (April 2014)
20. NSF USTARS Conference (Underrepresented Student in Topology and Algebra Research Symposium) - Invited Postdoctoral Speaker - Title: *Robinson-Schensted correspondence between complex reflection groups $G(r, p, n)$ and pairs of multitableaux* - Purdue University. (April 2013)
21. University of Wisconsin-Eau Claire - Title: *Visible lattice points: A number theory and graph theory approach* - Eau Claire, WI. (February 2013)
22. Reed College - Title: *Generalizing a correspondence between permutations and tableaux to complex reflection groups $G(r, p, n)$* - Lewisburg, PA. (February 2013)
23. Harvey Mudd College - Title: *Generalizing a correspondence between permutations and tableaux to complex reflection groups $G(r, p, n)$* - Lewisburg, PA. (February 2013)
24. Bucknell University - Title: *Generalizing a correspondence between permutations and tableaux to complex reflection groups $G(r, p, n)$* - Lewisburg, PA. (February 2013)
25. Smith College - Northampton, MA. (February 2013)
 - Student Lunch Talk - Title: *Visible lattice points: A number theory and graph theory approach.*
 - Research Colloquium - Title: *Generalizing a correspondence between permutations and tableaux to complex reflection groups $G(r, p, n)$.*
26. SACNAS Annual Conference [Scientific Symposia Session in Number Theory] - Title: *A number theoretic connection to a problem in graph theory* - Seattle, WA. (October 2012)
27. NSF USTARS Conference (Underrepresented Student in Topology and Algebra Research Symposium) - Invited Postdoctoral Speaker - Title: *Two families united as one - A symmetric functions tale* - University of Iowa. (April 2012)
28. AMS Southeastern Section Meeting [Special Session on Symmetric functions] - Title: *Truncated symmetric functions with an application to generalized Springer theory* - Wake Forest University in Winston Salem, NC. (September 2011)
29. AMS Northeast Section Meeting [Special Session on Combinatorial Representation Theory] - Title: *Combinatorial commutative algebra meets an object from geometric representation theory* - College of the Holy Cross in Worcester, MA. (April 2011)
30. AMS Central Section Meeting [Special Session on Combinatorial Representation Theory] - Title: *Commutative algebra meets geometric representation theory* - University of Iowa. (March 2011)

31. M.I.T. Combinatorics Seminar - Title: *Ideals of partial symmetric functions and a generalization of the Tanisaki ideal* - Massachusetts Institute of Technology. (October 2010)
32. MAA MathFest [Special Session on Combinatorial Games and Schubert Calculus] - Title: *Ideals of symmetric functions and their application to cohomology rings of Hessenberg varieties* - Pittsburgh, PA. (August 2010)
33. AMS Central Section Meeting [Special Session on Combinatorial Representation Theory] - Title: *Exploring the cohomology ring of generalized Springer varieties* - Macalester College. (April 2010)
34. MAA Iowa Sectional Meeting - Title: *Cool combinatorics arising in a cohomology hunt!* - University of Northern Iowa. (October 2009)
35. Algebraic Geometry Seminar - Title: *A combinatorial description of the cohomology of regular nilpotent Hessenberg varieties* - University of Iowa. (September 2009)
36. VIGRE Conference on Combinatorial Algebraic Geometry of Flag Varieties - Title: *Introduction to Schubert Calculus* - University of Iowa. (June 2009)
37. AMS Midwest Section Meeting [Special Session on Algebra, Geometry and Combinatorics] - Title: *Cohomology of Hessenberg Varieties* - University of Illinois in Urbana-Champaign. (March 2009)

Invited Expository Talks

1. STEM Summer Bridge Math Presentation - Title: *My Path to Becoming a Math Major and The Beauty of Math* - Sam Houston State University in Huntsville, TX. (July 20, 2020)
2. Madison Area Technical College Math Colloquium - *Pi is transcendental* (a more math-rigorous version of the April 2015 talk) - Madison, WI. (March 2016)
3. Winona State University Math Colloquium - *Pi is transcendental* (a more math-rigorous version of the April 2015 talk) - Winona, MN. (February 2016)
4. Ask a Scientist! Lecture Series - Title: *Pi is transcendental - not like Emerson or Thoreau but in the math sense* - Acoustic Cafe in Eau Claire, WI. (April 2015).
5. Sonia Kovalevsky Day - Delivered the opening talk for the *Special Session on Permutations and Combinations* - UWEC. (March 2015)
6. Meals with Honors Students - Title: *Combinatorics and a connection to the value π* - UWEC. (March 2014)
7. Progressive Valley Cooperative of the Third Ward in Eau Claire - Title: *A general math audience talk on two counting problems* - UWEC. (February 2014)
8. Math Colloquium - Invited Keynote Speaker for PI Day - Title: *Do you value the value of Pi?* - Sonoma State University in Rohnert Park, CA. (March 2012)
9. MAA Northeast Section Meeting - Title: *What's cool about combinatorics?* - Providence College. (November 2010)
10. Math Colloquium - Title: *From Lewis Carroll to an Interesting Conjecture – The Rabbit Hole Exposed!?* - Colby College. (October 2010)
11. Math Colloquium - Title: *Are algebraic geometers trying to take over the world?* - Wake Forest University. (March 2010)
12. Heartland Math Talk - Title: *Interesting Aspects of Number Partitions* - UW-La Crosse. (April 2009)
13. History talk to undergrads - Title: *Euler, Da Man!* - Winona State University in Minnesota. (April 2009)

Organizing Special Sessions at Professional Conferences

1. AMS Eastern Sectional Meeting - Co-organizer of the Special Session on Algebraic Geometry and Combinatorics - Rutgers University in New Brunswick, NJ. (November 2015)

Research-related Programs and Workshops

- Workshop on Applications of Schubert Calculus at the University of Iowa. (March 2011)
- [MSRI] Semester-long Residence as a Program Associate at MSRI in their Combinatorial Representation Theory Program at Berkeley, CA. (Spring 2008)
- [Field's Institute] Workshop on the Representation Theory of p -adic Groups at the University of Ottawa. (January 2007)
- MSRI and VIGRE-funded mini-course on $SL(2, \mathbb{R})$ at the University of Utah to precede the AMS Summer Research Conference at Snowbird. (May/June 2006)

Teaching-related Programs and Workshops

- [UWEC Community of Practice] This ORSP-sponsored semester-long program focused on mentoring undergraduate research students. Each participant selected a mentoring practice to modify, implemented a change in practice, and assessed its success. (Fall 2015)
- [MAA] PREP Workshop on WeBWorK Problem Authoring - An 8-session one month workshop to develop the technical skills necessary to identify, edit and create high-quality WeBWorK problems. WeBWorK is an open source, web-based homework delivery system designed to make homework more effective and efficient for students of mathematics and the sciences. (Summer 2014)
- [AIM, ICERM, and NSF] Workshop on Research Experiences for Undergraduate Faculty - A week-long intensive program/workshop intended to introduce undergraduate faculty to several fields of mathematics that will equip them with the tools to mentor students in undergraduate research in mathematics. Hosted at ICERM (Institute for Computational and Experimental Research in Mathematics) in Providence, RI. (Summer 2012)
- [Project NExT Fellow] Pedagogy workshops at MAA MathFest in Pittsburgh, PA (Fall 2010), at Joint Mathematics Meeting in New Orleans, LA (January 2011), and at MAA MathFest in Lexington, KY (August 2011)
- [Iowa-NExT Fellow] Various workshops in mathematics pedagogy at MAA Iowa Sectional. (Fall 2009)
- Seminar in College Teaching - A semester-long weekly class addressing various facets of teaching in the college setting. Course was geared to prepare graduate students planning to teach. University of Iowa. (Fall 2009)

Teaching Awards

- UWEC Certificate of Recognition for Contributions to Students - 39 total awarded campus-wide. (2016)
- UWEC Certificate of Recognition for Contributions to Students - 22 total awarded campus-wide. (2014)
- The University of Iowa Housing Academic Excellence Award for a significant contribution to students' academic success - 34 total awarded campus-wide. (2009)
- The University of Iowa Outstanding Teaching Award - 25 total awarded campus-wide. (2006)
- Catherine Wegner Outstanding Mathematics Teaching Assistant Award, The University of Iowa. (2005)

Committee Positions and Advising (at University of Wisconsin-Eau Claire)

- **DPC (Department Personnel Committee):** This committee is for all tenured math faculty. (Fall 2017–Present)
- **Assistant Professor and Associate Professor Subcommittee of the DPC:** These are subcommittees within the DPC. (Fall 2017–Present)
- **SEI (Student Evaluation Instrument) Workgroup Committee:** This committee met over Summer 2021 and had a main task of studying various student evaluations forms and completely revising the UWEC Math Department Student Evaluation Form. Two other tasks were as follows:
 - We created a mid-semester evaluation form that the DPC (Department Personnel Committee) wish all math faculty to use.
 - We suggested changes to the DEP (Department Evaluation Plan) to reflect some of the changes we made to the evaluation forms and also to clarify language on what is expected from faculty under review.
- **Department Liaison to the MAA Wisconsin Section:** My main duties are keeping faculty on top of what is happening with the MAA Wisconsin Section and also collecting news and writing the entries for both the UWEC Eau Claire campus and UWEC Barron County campus news for the MAA Wisconsin newsletter each semester. (Fall 2018–Present)
- **UWEC Internal Review Committee:** I was invited to be on the Internal Review Committee of the Latin American Studies Program for Fall 2018. I accepted this invitation but was sadly not selected.
- **ULEC Arts and Science Committee:** Having taught the LE course Math 104 for so many years, I had a strong desire to work with the ULEC Committee. In March 2021, I nominated myself, but I was sadly told that since my teaching schedule in Fall 2021 overlaps with one of the meeting dates of the committee that I could not be considered. I will try to join this committee the next time a position opens up.
- **Leadership Fellows Committee:** The purpose of the Student Affairs Leadership Fellows Cohort is to make UWEC a stronger institution by providing opportunities for selected individuals to take part in a structured program of professional development. As a group, we worked on a project to create a Leadership Clearinghouse Website to collect in one central location all opportunities on campus and the community for leadership opportunities for students, faculty, and staff. My individual project focused on creating an initiative to help bridge the gap between students and faculty outside of the classroom—via meeting for food at Davies, Hilltop Caf, and instructors’ homes. (2014–2015 Academic Year)
- **Mathematics Department Student Affairs Committee:** We coordinate the math department’s involvement in campus events such as the Majors Fair, STEM Visit Day, Blugold Spotlight Days, etc.
- **First Friday Social Gatherings:** This is not an official UWEC committee, but I firmly believe that the event fosters community and retention in the faculty and staff here at UWEC. In Fall 2013, when I arrived to UWEC, a small group of faculty and staff formed a social committee to gather people from across campus on the first Friday of each month. This committee was composed of myself and faculty members Wil Taylor (Biology), Rachel Woodward (English/CJ), and Andrew Sturtevant (History), and Teresa O’Halloran (Affirmative Action Director). In the nine continuous years this event has occurred (minus the times we paused the event due to Covid-19), this event has grown in size and reach across campus. The event is attended by not only faculty, but also many staff and sometimes an appearance of the Chancellor or Deans of the colleges. My role in this committee is to work with CETL and Denise Stewart in acquiring as updated lists as possible of not only new faculty, but also new staff across campus. Each month, I send an invitation to everyone on these lists starting back as far as the cohort of 2013, my start date. Hence I call my list of invitees the “UWEC newbies”. Over the years, many of these newbies have written me that this event has meant a lot to them. It not only helps new faculty/staff meet people outside of their immediate department, but also fosters a community that creates a welcoming and inclusive environment for all, regardless of job title.

- **Mathematics Department Library Committee:** Along with Ursula Witcher, we coordinated the library purchases for the department. (Fall 2013–Spring 2017)
- Faculty advisor for the Math Club. (Fall 2014–Spring 2018)
- Faculty advisor for Kappa Mu Epsilon math honors society (Spring 2016–Spring 2018)
- **Mathematics Department Awards Committee:** We coordinate the math department’s scholarships and awards each semester. (Fall 2019–Present)
- Academic Advisor to the following students:
 1. Nicole Violet Jones (2014–2018)
 2. Lucas Albert Morgan (2014–Dec. 2015)
 3. Molly Mae Petersen (2014–2018)
 4. Rita Laraine Post (2014–2018)
 5. Michael Scott Vaughn (2014–2018)
 6. Kelsey Marie Weister (2014–Dec. 2015)
 7. Stephanie Zahara (2014–2017)
 8. Sarah Reukema (2015–2017)
 9. Brenna Hennessy (2015–2017)
 10. Erin Jackson (2016–2017)
 11. Geoffrey Glover (2016–2020)
 12. Benjamin LukeStickney (2016–2020)
 13. Alexandria Nicole Blankenship (2017–2020)
 14. Derek Ryan Salewski (2017–2020)
 15. James Race Wolf (2017–2020)
 16. Emily Jane Zarnoti (2017–2020)
 17. Robert Michael Prescott (2016–2019)
 18. Alexander William Putnam (2016–2020)
 19. Bryce Bjorkman (2017–2021)
 20. Bryant Callaghan (2017–2021)
 21. Lauren Destiche (2018–2021)
 22. Miranda Fejzowski (2018–2021)
 23. Collin Goldsworthy (2017–2021)
 24. Gabriel Hamilton (2019–Present)
 25. Lily Leith (2019–2021)
 26. Elizabeth Mullis (2018–2021)
 27. Jack Saunders (2019–Dec. 2021)
 28. Jacqueline Stanscheit (2018–2021)
 29. Ethan Olden (2021–Present)
 30. Janee Schrader (2021–Present)
 31. Layla Lemley (2022–Present)

- Research Advisor to the following students:
 1. Austin Goodrich (Fall 2013–Summer 2014)
 2. Jasmine Nielsen (Fall 2013–Summer 2014)
 3. Sara DeBrabander (Fall 2015–Spring 2016)
 4. Michele Gebert (Fall 2015–Spring 2016)
 5. Jingtai Liu (Summer 2016–Spring 2017)
 6. Rita Post (Summer 2016–Fall 2018)
 7. Ryan Stodola (Summer 2016–Fall 2017)
 8. Emily Gullerud (Summer 2017–Spring 2018)
 9. McKenzie Scanlan (Fall 2017–Spring 2018)
 10. Miko Scott (Summer 2019–Fall 2019)
 11. Dan Guyer (Summer 2019–Present)
 12. Maggie Reardon (Spring 2020)
 13. Lily Leith (Fall 2020–2021)
 14. Javier Sanchez (Fall 2021–Present)
 15. Alyssa Franks (Fall 2021–Present)

Service (at University of Wisconsin-Eau Claire)

- Organized the 8th Annual UWEC Math Dept “Math in the Woods” event at Carson Park’s Oak Pavilion in Eau Claire, WI. (September 2021)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. **Virtual Version due to Pandemic** (March 2021)
- Organized the 7th Annual UWEC Math Dept “Math in the Woods” event at Carson Park’s Oak Pavilion in Eau Claire, WI. **Erbert and Gerbert’s Version due to Pandemic** (September 2020)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. (March 2020)
- Volunteer (in charge of the runners) for High School Math Meet. (February 2020)
- Campus Tour Guide with Students for Prospective Job Candidates. (November 2019 and December 2019)
- Organized the 6th Annual UWEC Math Dept “Math in the Woods” event at Carson Park’s Oak Pavilion in Eau Claire, WI. (September 2019)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. (March 2019)
- Volunteer for High School Math Meet. (February 2019)
- Campus Tour Guide with Students for Prospective Job Candidates. (December 2018 and February 2019)
- Organized the Math Department presence at the Blugold Spotlights Majors and Student Services Fair. (October 2018)
- Organized the 5th Annual UWEC Math Dept “Math in the Woods” event at Carson Park’s Pine Pavilion in Eau Claire, WI. (September 2018)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. (March 2018)

- STEM Visit Day math faculty representative - gave a presentation to prospective students and their parents (attended with student Rita Post). (March 2018)
- Faculty representative at the Admitted Student Day Academic Breakout Session Panel - spoke with students and parents. (February 2018 and March 2018)
- Volunteer for High School Math Meet. (February 2018)
- Organized the Math Department presence at the Blugold Spotlights Majors and Student Services Fair. (October 2017)
- Organized the 4th Annual UWEC Math Dept “Math in the Woods” event at Carson Park’s Pine Pavilion in Eau Claire, WI. (September 2017)
- STEM Visit Day math faculty representative - gave a presentation to prospective students and their parents (attended with student Nellie Brushaber). (March 2017)
- Volunteer to speak with admitted math students and their parents on Admitted Students Day (attended with student Nellie Brushaber). (February 2017)
- Volunteer for High School Math Meet. (February 2017)
- STEM Visit Day math faculty representative - gave a presentation to prospective students and their parents (attended with my math research students Rita Post and Ryan Stodola). (November 2016)
- Organized the Math Department presence at the Blugold Spotlights Majors and Student Services Fair. (October 2016)
- Organized the 3rd Annual UWEC Math Dept “Math in the Woods” event at Carson Park’s Birch Pavilion in Eau Claire, WI. (September 2016)
- Math representative at the 4th Annual Chippewa Falls STEAM Night. (March 2016)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. (March 2016)
- Participated in the *Greek Week Faculty and Staff Progressive Dinner* – visited all three campus sorority houses ΔZ , $A\Xi\Delta$, and $\Sigma\Sigma\Sigma$ and met with house members and visiting members of the three campus fraternities $\Phi\Gamma\Delta$, $\Delta\Sigma\Phi$, and $\Delta T\Delta$. (March 2016)
- Faculty representative at the *Admitted Student Day Meet and Greet* - spoke with students and parents. (February 2016 and March 2016)
- Invited by students to attend the *Faculty Appreciation Meet* for the UWEC Women’s Gymnastics Team. (February 2015 and 2016)
- STEM Visit Day math faculty representative - gave a presentation to prospective students and their parents. (November 2015)
- College Coach mentor for Blugold Beginnings Learning Community – mentees Katrina Idarraga and Chester-Mar Rihn. (September 2015 to May 2016)
- Organized the 2nd Annual UWEC Math Dept “Math in the Woods” event at Lake Wissota, WI. (September 2014)
- Phase II Orientation faculty mentor for small-group meeting of incoming first year students. (August 2015)
- Judge for Blugold Beginnings Education Fair poster presentations (Davies Center UWEC) – I (along with Vice Chancellor Beth Hellwig) judged the Middle School students’ posters. (May 2015)

- Judge for Bold and Blugold Pageant at the Lookout in Upper-campus UWEC. (May 2015)
- Andrew Balas Speaker Organizer for the Math Retreat. (April 2015)
- Math representative at the 3rd Annual Chippewa Falls STEAM Night. (March 2015)
- Speaker at Sonia Kovalevsky Day–Delivered the introductory talk on permutations and combinations to audience of female middle school and high school students. (March 2015)
- Student volunteer coordinator for the 33rd Annual High School Math Meet at UWEC. (February 2015)
- Volunteered to speak with prospective math students and their parents on STEM visit Day. (November 2014)
- Student-elected judge for the Yell-Like-Hell Competition and Pep Rally for UWEC Homecoming. (October 2014)
- Video-interviewed by Abby Reimer for BNN (Blugold News Now) for UWEC TV-10’s series *Behind the Desk* to help current/prospective students get to know faculty. (October 2014) – Video available at: <https://www.youtube.com/watch?v=jDdCXf0hEJI&list=UUa41KwhDioFW-DoAJjggrEw>
- Video-interviewed by Glen Mabie in the UWEC News Bureau Department for the Power-of-AND campaign. (September 2014) – Video available at: <https://www.youtube.com/watch?v=NPY71aBKvfU>
- Organized the 1st Annual UWEC Math Dept “Math in the Woods” event at Lake Wissota, WI. (September 2014)
- Represented the student group Foodlums at the information table at the UWEC Grounds Crew Concert in Philips garden. (August 2014)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. (March 2014)
- Volunteer for the high school Math Meet. (February 2014)
- 4th Annual “Eau Cares” House Calls Program - Volunteered to check in with students inside their dorm rooms and see how their first few weeks are going. (October 2013)
- Organized the Inaugural UWEC Math Dept “Math in the Woods” event at Lake Wissota, WI. (September 2013)

Service (at Bowdoin College)

- International Students Week Talent Show. Faculty participant. (April 2013)
- Discussing Difference: Led a panel discussion with students on topics regarding diversity, privilege and difference. Sponsored by Bowdoin ResLife. (November 2012)
- Explore Bowdoin: Met with prospective students from various diverse backgrounds. (November 2012)
- Judge for Class of 2014’s Mr. Polar Bear Contest. (February 2012)
- Sat on faculty panel for Lincoln Middle School’s ELL visit from Portland, ME. (January 2011 and 2012)
- Runway model for Bowdoin Career Planning’s *Do’s and Dont’s Fashion Show*. (October 2011 and 2012)
- Judge for Bowdoin Entertainment Board’s *Battle of the Bands* for Ivies concert. (April 2011 and April 2013)
- MAA American Mathematics Competitions AMC10/12 for Maine High Schools (hosted at Bowdoin College), Volunteer. (Spring 2011 and 2012)
- Searles Building Atmosphere Coordinator: Created a better environment (via posters, more blackboards, and room redesigning) in the math majors study room in Searles Room 214. (2010–present)

- Common Good Day: Volunteer at People Plus in Brunswick, ME, and at ArtVan, a mobile arts therapy program in Bath, ME. (Fall 2010 and September 2012, respectively)

Service (at University of Iowa)

- Mentor/Advisor for the undergraduate Math Club. (2005–2010)
- English Buddy Program: assisted foreign math graduate students in preparing for the SPEAK exam in English language. (2008–2010)
- Co-editor of Mathematics Departmental Newsletter. (2008–2010)
- Mathematics Graduate Board (2005–Present) and Social Chair. (2006)
- Volunteer for Sonia Kovalevsky Day for female middle school and high school students. (2006, 2007)
- The University of Iowa High School Mathematics Competition, Volunteer. (2005, 2006)
- Tutor for displaced victims of Hurricane Katrina. (2005)

Refereeing for Mathematics Journals

- *Integers: Electronic Journal of Combinatorial Number Theory* (2021)
- *Journal of Integer Sequences* (2020)
- *Involve: A Journal of Mathematics* (2020)
- *Journal of Integer Sequences* (2017)

Related Computer and Language Skills

- Fluency in \TeX , Mathematica, Matlab, SAGE, and WeBWorK (PERL and PGML coding).
- Some fluency in German (sufficient for research). Some fluency in Hebrew.

Professional Memberships

- **AMS:** American Mathematical Society
- **MAA:** Mathematical Association of America
- **Project NExT:** Fellow (Blue10 Dot)

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