Dana C. Ernst

Curriculum Vitae

Contact Information

Northern Arizona University
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Research Interests

General

Interplay between combinatorics and algebraic structures; scholarship of teaching and learning (SoTL) and undergraduate mathematics education.

Specific

Combinatorics of Coxeter groups and their associated Hecke algebras, Kazhdan–Lusztig theory, generalized Temperley–Lieb algebras, diagram algebras, heaps of pieces; combinatorial game theory; inquiry-based learning (IBL).

MSC

05A15, 06A07, 20B10, 20C08, 20F55, 57M15, 91A46, 97D40

Education

University of Colorado, Boulder, CO — Aug 2008
PhD, Mathematics, Advisor: Dr. R.M. Green
Thesis: *A diagrammatic representation of an affine C Temperley–Lieb algebra*

Northern Arizona University, Flagstaff, AZ — May 2000
MS, Mathematics, Advisor: Dr. M. Falk
Thesis: *Cell complexes for arrangements with group actions*

George Mason University, Fairfax, VA — May 1997
BS, Mathematics

Academic Positions

Northern Arizona University, Flagstaff, AZ
Assistant Professor, Department of Mathematics & Statistics — Aug 2012–Present

Academy of Inquiry-Based Learning
Special Projects Coordinator — Oct 2012–Present

Plymouth State University, Plymouth, NH
Assistant Professor, Mathematics Department — Aug 2008–May 2012

University of Colorado, Boulder, CO
Graduate Teaching Instructor, Department of Mathematics — Aug 2003–May 2008
Lead Graduate Teacher, Graduate Teacher Program — Aug 2006–May 2007

Front Range Community College, Boulder, CO
Full-time Faculty, Department of Mathematics — Aug 2001–May 2003

Northern Arizona University, Flagstaff, AZ
Instructor, Mathematics & Statistics Department — Jun 2000–May 2001
Graduate Assistant, North Learning Assistance Center — Jan 2000–May 2000
Graduate Teaching Instructor, Mathematics & Statistics Department — Jan 1998–Dec 1999
Graduate Assistant, South Learning Assistance Center — Aug 1997–Dec 1997

Teaching Experience

Summary

Over 15 years of teaching experience; recipient of several teaching awards (most recent: 2016 MAA Southwest Section Teaching Award).

Courses Taught

Reflection Groups and Coxeter Groups (graduate), Real Analysis, Abstract Algebra (graduate and undergraduate), Number Theory, Linear Algebra, Introduction to Proof, Problem Solving, Calculus I–III, Precalculus, Trigonometry, College Algebra, Survey of Algebra, Finite Math, Quantitative Reasoning, College Math with Applications, Mathematics for Elementary School Teachers I, Math Teacher Training.

Academic Writing

Publications

B.J. Benesh, D.C. Ernst, and N. Sieben. Impartial avoidance and achievement games for generating symmetric and alternating groups. Accepted to *Int. Electron. J. Algebra*. [arxiv:1508.03419]

D.C. Ernst, M. Hastings, and S. Salmon. Factorization of Temperley–Lieb diagrams. Accepted to *Involve*. [arXiv:1509.01241]

D.C. Ernst and A. Hodge. Within ϵ of Independence: An Attempt to Produce Independent Proof-Writers via IBL. Accepted as book chapter to *Beyond Lecture: Techniques to Improve Student Proof-Writing Across the Curriculum*, MAA Notes.

N. Diefenderfer, D.C. Ernst, M. Hastings, L.N. Heath, H. Prawzinsky, B. Preston, J. Rushall, E. White, A. Whittemore. Prime Vertex Labelings of Several Families of Graphs. Accepted to *Involve*. [arXiv:1503.08386]

B.J. Benesh, D.C. Ernst, and N. Sieben. Impartial avoidance games for generating finite groups. *North-W. Eur. J. of Math.* 2, 83–101, 2016. [arXiv:1506.07105] [ePrint]

H. Denoncourt, D.C. Ernst, and D. Story. On the number of commutation classes of the longest element of the symmetric group. *Open Problems in Mathematics* Vol 4, 2016. [arXiv:1602.08328] [ePrint]

E. Kennedy, B. Beaudrie, D.C. Ernst, and R. St. Laurent. Inverted Pedagogy in Second Semester Calculus. *PRIMUS* 25(9–10), 892–906, 2015.

B. Love, A. Hodge, C. Corritore, and D.C. Ernst. Inquiry-Based Learning and the Flipped Classroom Model. *PRIMUS* 25(8), 745–762, 2015.

D.C. Ernst, A. Hodge, M. Jones, and S. Yoshinobu. The many faces of IBL. In *Handbook of Research on Pedagogical Practice in STEM Education*, E. Ostler (Ed.), 2015. Elkhorn, NE.

D.C. Ernst, M. Leingang, and R. Taylor. To friend or not to friend? Facebook for professional educators. *MAA FOCUS* June/July 2015. [ePrint]

D.C. Ernst, A. Hodge, and A. Schultz. Enhancing Proof Writing via Cross-Institutional Peer Review. *PRIMUS* 25(2), 121–130, 2015.

B. Beaudrie, D.C. Ernst, and B. Boschmans. Redesigning an Algebra for Precalculus Course. In T. Bastiaens & G. Marks (Eds.), Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education, 2013. Chesapeake, VA: AACE.

B. Beaudrie, D.C. Ernst, and B. Boschmans. First Semester Experiences in Implementing a Mathematics Emporium Model. In R. McBride & M. Searson (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference*, 2013. New Orleans, LA: AACE.

D.C. Ernst. Diagram calculus for a type affine C Temperley–Lieb algebra, I. *J. Pure Appl. Alg.* 216(11), 2012. [arXiv:0910.0925]

T. Boothby, J. Burkert, M. Eichwald, D.C. Ernst, R.M. Green, and M. Macauley. On the Cyclically Fully Commutative Elements of Coxeter Groups. *J. Algebraic Combin.* 36(1), 2012. [arXiv:1202.6657]

D.C. Ernst. Non-cancellable elements in type affine C Coxeter groups, *Int. Electron. J. Algebra* 8, 2010. [arXiv:0910.0923]

Theses

D.C. Ernst. A diagrammatic representation of an affine C Temperley-Lieb algebra, PhD Thesis, University of Colorado Boulder, 2008. [arXiv:0905.4457]

D.C. Ernst. Cell Complexes for Arrangements with Group Actions, MS Thesis, Northern Arizona University, 2000. [arXiv:0905.4434]

Submitted/Preprints

D.C. Ernst and N. Sieben. Impartial achievement and avoidance games for generating finite groups. Submitted to *Int. J. Game Theory*. [arXiv:1407.0784]

D.C. Ernst. Diagram calculus for a type affine C Temperley–Lieb algebra, II. Submitted to *J. Pure Appl. Alg.* [arXiv:1101.4215]

In Preparation

D.C. Ernst and R.M. Green. Cominuscule elements of Coxeter groups of type affine C.

B. Benesh, D.C. Ernst, and N. Sieben. Impartial achievement and avoidance games for generating generalized dihedral groups.

B.J. Benesh, D.C. Ernst, and N. Sieben. Impartial achievement games for generating finite groups.

D.C. Ernst and B. Fox. Conjugacy classes of cyclically fully commutative elements in Coxeter groups of type A.

D.C. Ernst and T. Laird. T-avoiding elements of Coxeter groups.

Open-Source Course Materials

D.C. Ernst. *An Introduction to Proof via Inquiry-Based Learning*. IBL course materials for an introduction to proof course. [dcernst.github.io/IBL-IntroToProof]

D.C. Ernst. *An Inquiry-Based Approach to Abstract Algebra*. IBL course materials for an abstract algebra course. [dcernst.github.io/IBL-AbstractAlgebra]

Blogging

In addition to the posts that I write for my personal blog, I am a coauthor for *Math Ed Matters*, which is a monthly column sponsored by the MAA. The column explores topics and current events related to undergraduate mathematics education. Joint with A. Hodge (UNO).

D.C. Ernst. Teaching Calculus 1 with a Focus on Student Presentations. *Discovering the Art of Mathematics Blog*. Oct 2015. [artofmathematics.org]

D.C. Ernst. 4+1 interview with Dana Ernst. *Casting Out Nines* by R. Talbert. The Chronicle Blog Network. Aug 2013. [chronicle.com/blognetwork/castingoutnines]

S. Yoshinobu. IBL Instructor Perspectives: Professor Dana Ernst. *The IBL Blog*. Feb 2012. [TheIBLBlog.com]

Honors & Awards

National

MAA Southwest Section Teaching Award Spring 2016
Recipient of 2016 MAA Southwest Section Award for Distinguished College or University Teaching of Mathematics, nominated by colleagues.

Project NExT Fellow Fall 2008–Spring 2009
MAA professional development and mentoring program for new PhDs in mathematics.

Northern Arizona University, Flagstaff, AZ

University College Faculty Fellow Fall 2012–Present
Chosen as a Faculty Fellow of the NAU University College via a selection process. Includes annual stipend.

Educator of Influence Fall 2015
Named by two NAU Golden Axe Award recipients as most influential educator.

Chair's Award for Research Spring 2015
Awarded by chair of Department of Mathematics and Statistics at NAU.

Provost's Award for Excellence in Undergraduate Inquiry & Creativity Spring 2014
Award honors a faculty mentor who has demonstrated initiative, productivity, and dedication in contributing to the university community in the areas of research, scholarly, and/or creative activities.

Plymouth State University, Plymouth, NH

Finalist for NH Excellence in Education Award Spring 2012
I was PSU's sole nominee for this statewide teaching award.

Distinguished Professor of Mathematics May 2009 & 2011
Teaching award determined by mathematics majors at PSU.

University of Colorado, Boulder, CO

Graduate Part-Time Instructor Teaching Excellence Award Spring 2008
University-wide award given to outstanding graduate teaching instructors.

Burton W. Jones Teaching Excellence Award May 2007
Recognizes outstanding accomplishments in teaching.

Thron Fellowship Summer 2007
Financial award to support summer research, given to most outstanding graduate student.

Best Should Teach Award Fall 2006
Awarded to outstanding Lead Graduate Teachers.

Honorable Mention for Burton W. Jones Teaching Excellence Award May 2006
Recognizes outstanding accomplishments in teaching.

Mathematics Department Summer Fellowship Summer 2006
Financial award to support summer research.

Residence Life Academic Teaching Award Dec 2003
Awarded to instructors based on nominations from students.

Front Range Community College
Finalist for Master Teacher Award May 2002 & 2003
Awarded to instructors based on nominations from students.

George Mason University, Fairfax, VA
Mary K. Cabell Award May 1997
Awarded to the most outstanding graduating mathematics major.

Grant Activity

PRODUCT ($2,800,000) 2015–2020
Senior Personnel, NSF-IUSE. Participate in the development of facilitators for Inquiry-Based Learning workshops and assist in the delivery of workshops.

SPIGOT ($540,000) 2013–2015
Senior Personnel, NSF-TUES II. The IBL Workshop provides an intensive four-day program for math instructors interested in learning to implement IBL in college-level mathematics courses. A comprehensive follow-up program is also provided after the workshop that includes mentoring, course materials, and continued interaction at upcoming conferences.

ROPE: Resource of Open Problems for Education (unfunded) Fall 2014 & Spring 2014
Co-PI, NSF-IUSE. Requested funds to develop an online, electronic library that provides a large number of innovative, well-tested, and documented problems that instructors and students may use in a wide range of courses and for a wide range of assignment types. Joint with G. LaRose (University of Michigan) and S. Hamblen (McDaniel College).

Applets for Calculus (awarded $1296) Fall 2013
PI, Interns to Scholars (I2S) Program at NAU. Awarded funds to support one undergraduate intern during the Spring 2014 and Fall 2014 semesters to work 6 hours per week for 10 weeks on creating applets for first semester calculus.

Prime labelings of graphs (awarded $33,100) Fall 2013
PI, Center for Undergraduate Research in Mathematics (CURM). Awarded funds to support seven undergraduate students to conduct research for 2014–2015 academic year. Joint with J. Rushall (NAU).

Toward's a Cyclic Version of Matsumoto's Theorem (unfunded) Fall 2013
PI, Faculty Grants Program at NAU. Requested one month of summer salary to support my research program in the combinatorics of Coxeter groups.

Undergraduate Research Program in Mathematics (unfunded) Fall 2013
Senior Personnel, NSF-DMS: Workforce Division. Requested support for REU program at NAU for summers of 2014–2016.

An open problem library for mathematics (awarded $7500) Summer 2013–Spring 2014
PI, Faculty Grants Program at NAU. Awarded summer salary to support development of an online open problem library for undergraduate mathematics courses.

Toward a factorization of Temperley–Lieb diagrams (unfunded) Spring 2013
PI, NAU NASA Space Grant Program. Requested support for two undergraduate research students for the 2013–2014 academic year.

Undergraduate Research Program in Mathematics (unfunded) Fall 2012
Senior Personnel, NSF-DMS: Workforce Division. Requested support for REU program at NAU for summers of 2013–2015.

Combinatorics of the CFC elements Coxeter groups (unfunded) Fall 2012
PI, Center for Undergraduate Research in Mathematics (CURM). Requested funds to support three undergraduate students to conduct research for academic year.

An Open Problem Library for Mathematics (unfunded) Spring 2012
Co-PI, NSF-TUES. Proposal seeks to develop an online, electronic library that will provide a large number of innovative, well-tested, and documented problems that instructors and students may use in a wide range of courses and for a wide range of assignment types. Joint with G. LaRose (University of Michigan) and S. Hamblen (McDaniel College).

IBL course materials for group theory (awarded $2500) Summer 2013
PI, Academy of Inquiry-Based Learning. Awarded Category 2 Small Grant to fund development of course materials for an IBL abstract algebra course that emphasizes visualization and incorporates technology.

Conjugacy and reducibility in Coxeter groups (unfunded) Fall 2010
Co-PI, NSF-DMS: Number Theory, Algebra, and Combinatorics. Requested funds to support summer research and travel for PIs and full-year support for undergraduate research assistants. Joint with R.M. Green (University of Colorado) and M. Macauley (Clemson University).

Combinatorics of the CFC-finite Coxeter groups (unfunded) Spring 2010
PI, Center for Undergraduate Research in Mathematics (CURM). Requested funds to support two undergraduate students to conduct research for academic year.

The conjugacy problem for Coxeter groups (unfunded) Fall 2009
Co-PI, NSF-DMS: Number Theory, Algebra, and Combinatorics. Requested funds to support summer research and travel for PIs and full-year support for undergraduate research assistants. Joint with R.M. Green (University of Colorado) and M. Macauley (Clemson University).

Undergrad Research

Cominuscule elements of Coxeter groups of type affine C Spring 2016
Students: Joni Hazelman, Parker Montfort, Robert Voinescu, Ryan Wood. Presentations: ArizMATYC/MAA-Southwest Section Meeting, Southwestern Undergraduate Mathematics Research Conference (SUnMaRC).

A simplified version of Conway's Sylver Coinage Fall 2015–Spring 2016
Students: Joni Hazelman, Parker Montfort, Robert Voinescu, Ryan Wood. Presentations: NAU Research Symposium (poster), ArizMATYC/MAA-Southwest Section Meeting, Southwestern Undergraduate Mathematics Research Conference (SUnMaRC), Nebraska Conference for Undergraduate Women in Mathematics (poster).

Commutation classes of the longest element in the symmetric group Fall 2015–Spring 2016
Student: Dustin Story. Presentations: NAU Research Symposium (poster), Joint ArizMATYC and MAA-Southwest Section Meeting, Southwestern Undergraduate Mathematics Research Conference (SUnMaRC). One publication.

Prime vertex labelings of graphs Fall 2014–Spring 2015
Students: Nathan Diefenderfer, Michael Hastings, Levi Heath, Hannah Prawzinsky, Briahna Preston, Emily White, and Alyssa Whittemore. Presentations: NAU Research Symposium (poster), MAA/CURM Spring Conference, Southwestern Undergraduate Mathematics Research Conference (SUnMaRC), Nebraska Conference for Undergraduate Women in Mathematics, Friday Afternoon Mathematics Undergraduate Seminar (FAMUS). Joint with J. Rushall (NAU). Research funded by a mini-grant from the Center for Undergraduate Research in Mathematics (CURM). Two publications.

Diagrammatic representation of the canonical basis for a TL-algebra Spring 2014
Student: Molly Green. Presentations: NAU Research Symposium (poster), Southwestern Undergraduate Mathematics Research Conference (SUnMaRC).

Factorization of Temperley–Lieb diagrams Fall 2013–Spring 2014
Students: Michael Hastings and Sarah Salmon. Presentations: NAU Research Symposium (poster), Southwestern Undergraduate Mathematics Research Conference (SUnMaRC), Nebraska Conference for Undergraduate Women in Mathematics, Undergraduate Student Poster Session at 2014 JMM, Friday Afternoon Mathematics Undergraduate Symposium. One publication.

Exploration of T-avoiding elements in Coxeter groups of type F Spring 2013
Student: Selina Gilbertson. Presentations: NAU Research Symposium (poster), Southwestern Undergraduate Mathematics Research Conference (SUnMaRC).

Mathematics of Spinpossible Spring 2013–Spring 2014
Students: Dane Jacobson and Michael Woodward. Presentations: NAU Research Symposium (poster), Algebra Combinatorics Geometry and Topology Seminar (3 talks), Southwestern Undergraduate Mathematics Research Conference (SUnMaRC), Friday Afternoon Mathematics Undergraduate Symposium.

Exploration of T-avoiding elements in Coxeter groups of type F Fall 2011–Spring 2012
Students: Ryan Cross, Katie Hills-Kimball, and Christie Quaranta. Presentations: PSU Research Symposium (poster), Hudson River Undergraduate Mathematics Conference.

T-avoiding permutations in Coxeter groups of types A and B Fall 2010–Spring 2011
Students: Joseph Cormier, Zachariah Goldenberg, Jessica Kelly, and Christopher Malbon. Presentations: Hudson River Undergraduate Mathematics Conference, AMS Spring Eastern Sectional Meeting, Undergraduate Student Poster Session at 2012 JMM.

Counting generators in Temperley–Lieb algebras of types A and B Spring 2010
Students: Sarah Otis and Leal Rivanis. Presentation: Hudson River Undergraduate Mathematics Conference.

Synergistic Activities

Guest editor for *PRIMUS* Spring 2015–Present
One of three guest editors for *PRIMUS* Special Issue on Inquiry-Based Learning in First and Second Year Courses. Joint with A. Hodge (UNO) and T.J. Hitchman (University of Northern Iowa).

Editorial Board for Math Horizons Spring 2014–Present
Math Horizons is the undergraduate magazine of the Mathematical Association of America.

Co-author for Math Ed Matters Spring 2013–Present
Math Ed Matters is a monthly column sponsored by the MAA. The column explores topics and current events related to undergraduate mathematics education. Posts aim to inspire, provoke deep thought, and provide ideas for the mathematics classroom. Joint with A. Hodge (UNO).

Editor for `MathBlogging.org` Summer 2013–Present
`Mathblogging.org` is a site devoted to aggregating math-related blogs and news sources across the Internet. My job as editor is to select a few blog posts each week to be included in the Editors' Picks list.

Special Projects Coordinator for Academy of Inquiry-Based Learning Fall 2012–Present
Help organize, promote, and run IBL-related events including workshops, special sessions, and conferences. Includes annual stipend.

Blogger at `DanaErnst.com` Spring 2012–Present
Author of several blog posts per semester related to mathematics, teaching, and technology.

IBL Mentor for Academy of Inquiry-Based Learning Fall 2011–Present
Mentor for small cohort of mathematics instructors that are new to IBL.

List Moderator of 2008-2009 Project NExT Listserv Fall 2009–Present
Manage users (NExT fellows and consultants) and bounced messages.

Facilitator for IBL Workshops Summers 2013–2016
The IBL Workshop provides an intensive four-day program for math instructors interested in learning to implement IBL in college-level mathematics courses. A comprehensive follow-up program is also provided after the workshop that includes mentoring, course materials, and continued interaction at upcoming conferences. Sponsored by the NSF.

Volunteer for Navajo Math Festival Spring 2015
Organized activities for two-day math festival for grades 2–12 at Diné College, Navajo Nation

Co-organizer for session on IBL in 1st and 2nd Year Courses Fall 2014–Spring 2015
Associated with a special issue of *PRIMUS*. 2015 JMM, San Antonio, TX.

Moderator for 2014 Legacy of R.L. Moore Conference Summer 2014
Moderator for multiple sessions at the 2014 Legacy of R.L. Moore Conference, which is a three-day conference devoted to inquiry-based learning (IBL).

Co-organizer for poster session on IBL Best Practices Spring–Summer 2014
2014 MathFest, Portland, OR.

Co-organizer for AIBL booth at 2014 MathFest Spring–Summer 2014
Organized and managed booth for Academy of Inquiry-Based Learning at exhibit hall for MathFest. This included organizing "IBL office hours" for prospective IBL practitioners. 2014 MathFest, Portland, OR.

Co-organizer for session on IBL Best Practices Spring–Summer 2013
2013 MathFest, Hartford, CT.

Planning Committee of 2013 Legacy of R.L. Moore Conference Spring–Summer 2013
Help plan and organize the 2013 Legacy of R.L. Moore Conference, which is a three-day conference devoted to inquiry-based learning (IBL).

Co-organizer & presenter for UNO IBL Workshop Summer 2012
Ran three-day workshop at the University of Nebraska at Omaha on nuts and bolts of how to effectively implement an inquiry-based learning approach in mathematics and other STEM fields. Joint with S. Yoshinobu (Cal Poly) and A. Hodge (UNO). Funding provided by Kelly Foundation, Educational Advancement Foundation, and Haddix Initiatives.

Facilitator of Round Table on IBL in Linear & Abstract Algebra Summer 2012
Legacy of R.L. Moore Conference, Austin, TX.

Co-organizer for session on IBL Best Practices Spring–Summer 2012
2012 MathFest, University of Wisconsin, Madison, WI.

Participant in Project NExT funding video by MAA Jan 2012
Interviewed about impact of Project NExT on my career.

Judge for Undergraduate Student Poster Session Jan 2012
Volunteered as judge for undergraduate poster session at 2012 JMM.

Co-organizer of AMS Special Session on Combinatorics of Coxeter groups Spring 2011
AMS Spring Eastern Sectional Meeting, College of the Holy Cross, Worcester, MA.

Presentations

Transitioning students from consumers to producers (opening address) Apr 2016
ArizMATYC/MAA-Southwest Section, Coconino Community College, Flagstaff, AZ

Several representations of my favorite open problem Feb 2016
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

The mathematics of Boggle logic puzzles Jan 2016
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Student presentations in calculus Jan 2016
Increasing Student Engagement & Understanding through Active Learning Strategies in Calculus I minicourse, 2016 JMM, Seattle, WA

Counting commutation classes of the longest element in the symmetric group Dec 2015
Algebra, Combinatorics, Geometry, & Topology Seminar, NAU, Flagstaff, AZ

The Futurama Theorem Dec 2015
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Explorations of Sylver Coinage (2 talks) Nov 2015
Algebra, Combinatorics, Geometry, & Topology Seminar, NAU, Flagstaff, AZ

The Kirkman Schoolgirls Problem Nov 2015
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Proofs Without Words Sep 2015
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

The Friendship Paradox Sep 2015
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

An Iterated Prisoner's Dilemma Apr 2015
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Impartial achievement and avoidance games for generating finite groups Apr 2015
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

One step forward, one step back: A puzzle approach to Erdös discrepancy problem Feb 2015
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

A discussion about inquiry-based learning (part 2) Jan 2015
NAU Mathematics and Statistics Teaching Showcase, NAU, Flagstaff, AZ

A guide-on-the-side approach to calculus Jan 2015
First-Year Calculus: Fresh Approaches for Jaded Students, 2015 JMM, San Antonio, TX

Transitioning students from consumers to producers Jan 2015
Teaching Inquiry, 2015 JMM, San Antonio, TX

A discussion about inquiry-based learning (part 1) Nov 2014
NAU Mathematics and Statistics Teaching Showcase, NAU, Flagstaff, AZ

T-avoiding elements in Coxeter groups (2 talks) Oct 2014
Algebra, Combinatorics, Geometry, & Topology Seminar, NAU, Flagstaff, AZ

Open problems with monetary rewards Oct 2014
2014 NAU High School Math Day, NAU, Flagstaff, AZ

Open problems with monetary rewards Oct 2014
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

What is MAT 220? Oct 2014
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Mathematics as a Creative Endeavor: Is Mathematics Communication? Sep 2014
Liberal Studies Town Hall, NAU, Flagstaff, AZ
Joint with T. Blows (NAU)

Creating Independent Learners Aug 2014
NAU Fall 2014 Tutor Training, NAU, Flagstaff, AZ
Joint with E. Kennedy (NAU)

Soup to Nuts: My Approach to IBL Aug 2014
Plenary talk at 2014 IBL Workshop, Portland, OR

Inquiry-Based Education in Mathematics: Models, Methods, & Effectiveness Jul 2014
Workshop on Innovations in Higher Education Mathematics Teaching, Cardiff University, Cardiff, Wales

A Pentagon of Assessments Apr 2014
NAU 12th Annual Assessment Fair, NAU, Flagstaff, AZ
Joint with B. Beaudrie and B. Boschmans (NAU)

Tried & True Practices for IBL & Active Learning Jan 2014
Project NExT Panel Discussion, 2014 JMM, Baltimore, MD

An Iterated Prisoner's Dilemma Oct 2013
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

The nim-values of combinatorial games on groups respect parity (3 talks) Oct 2013
Algebra, Combinatorics, Geometry, & Topology Seminar, NAU, Flagstaff, AZ

Proofs without Words Sep 2013
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Lumberjack Mathematics Center Poster Sep 2013
Showcase at the President and Provost Speaker Series, NAU, Flagstaff, AZ
Joint with B. Beaudrie and B. Boschmans (NAU)

Introduction to Inquiry-Based Learning Aug 2013
NAU Mathematics and Statistics Teaching Showcase, NAU, Flagstaff, AZ

Implementing IBL in an Introduction to Proof Course Jun 2013
Legacy of R.L. Moore Conference, Austin, TX

Teaching Strategies for Improving Student Learning May 2013
Michigan Project NExT Panel Discussion, 2013 Spring MAA Michigan Section Meeting, Lake Superior State University, Sault Ste. Marie, MI

Games on Groups Apr 2013
Omaha Area Math Teachers Circle, University of Nebraska at Omaha, Omaha, NE

Impartial games for generating groups Apr 2013
Cool Math Talks, University of Nebraska at Omaha, Omaha, NE

A diagrammatic representation of the Temperley–Lieb algebra Feb 2013
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

The Stargate Switch Feb 2013
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Using IBL as an assessment strategy Jan 2013
Project NExT Alternative Assessment Panel Discussion, 2013 JMM, San Diego, CA

The Futurama Theorem and some refinements Nov 2012
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

Eulers characteristic, soccer balls, and golf balls Nov 2012
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Conjugacy and reducibility in Coxeter groups (5 talks) Oct–Nov 2012
Algebra, Combinatorics, Geometry, & Topology Seminar, NAU, Flagstaff, AZ

Inquiry-Based Learning Panel Discussion Oct 2012
Indiana MAA Section Meeting, Butler University, Indianapolis, IN

Designing Inquiry-Based Learning Experiences Oct 2012
NAU Faculty Development Workshop, NAU, Flagstaff, AZ

Inquiry-Based Learning: What, Why, and How? Oct 2012
ArizMATYC Conference, Yavapai College, Prescott, AZ

Inquiry-Based Learning: What, Why, and How? Oct 2012
UA Mathematics Instructional Colloquium, University of Arizona, Tucson, AZ

An open problem of the symmetric group Sep 2012
Friday Afternoon Mathematics Undergrad Seminar, NAU, Flagstaff, AZ

Effective and efficient grading for an IBL course Jun 2012
Legacy of R.L. Moore Conference, Austin, TX

Permutation Puzzles Feb 2012
Math Teachers' Circle at University of Nebraska at Omaha, Omaha, NE

The Futurama Theorem Feb 2012
UNO Mathematics Colloquium, University of Nebraska at Omaha, Omaha, NE

Collaborative peer review between two IBL number theory courses Jan 2012
Scholarship of Teaching and Learning in Collegiate Mathematics, 2012 JMM, Boston, MA

The Futurama Theorem Dec 2011
PSU Mathematics Seminar, PSU, Plymouth, NH

What can you do with a degree in mathematics? Nov 2011
PSU Mathematics Association Panel Discussion, PSU, Plymouth, NH

The prisoner of Benda and the Futurama Theorem Nov 2011
Mathematics Forum, Gordon College, Wenham, MA

Diagram algebras as combinatorial tools for exploring Kazhdan–Lusztig theory Oct 2011
Dartmouth Combinatorics Seminar, Dartmouth College, Hanover, NH

Mendeley: Reference manager meets social networking Aug 2011
PSU Faculty Workshop Days, PSU, Plymouth, NH

Mendeley: Reference manager meets social networking Mar 2011
Spotlight on Faculty Using Technology, PSU, Plymouth, NH

Diagram algebras and applications to Kazhdan–Lusztig theory Mar 2011
CU Algebraic Lie Theory Seminar, CU at Boulder, Boulder, CO

Within ϵ of independence: An attempt to produce independent proof-writers via an IBL approach in a real analysis course Jan 2011
Getting Students Involved in Writing Proofs, 2011 JMM, New Orleans, LA

Technology Sampler Aug 2010
Issues for Early Career Mathematicians in Academia, 2010 MathFest, Pittsburgh, PA

On an open problem of the symmetric group Apr 2010
PSU Mathematics Seminar, PSU, Plymouth, NH

A diagrammatic representation of the Temperley–Lieb algebra Apr 2010
Hudson River Undergraduate Mathematics Conference, Keene State College, Keene, NH

Using wikis to enhance collaboration Apr 2010
2010 Spotlight on Faculty Using Technology, PSU, Plymouth, NH

On the cyclically fully commutative elements of Coxeter groups Jan 2010
AMS Session on Discrete Mathematics, 2010 JMM, San Francisco, CA

On an open problem of the symmetric group Feb 2009
KSC Mathematics Seminar, Keene State College, Keene, NH

A diagrammatic representation of an affine C Temperley–Lieb algebra Jan 2009
MAA Project NExT-YMN Poster Session, 2009 JMM, Washington, DC

Diagram calculus for the Temperley–Lieb algebra Nov 2008
MAA Northeastern Section Meeting, Bentley University, Waltham, MA

A diagrammatic representation of an affine C Temperley–Lieb algebra May 2008
Thesis Defense, CU, Boulder, CO

Diagram algebras and Kazhdan–Lusztig polynomials Jan 2008
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

Weak star reducibility in Coxeter groups Nov 2007
Algebraic Lie Theory Seminar, CU, Boulder, CO

Temperley–Lieb algebras of types A and B and their associated diagram algebras Oct 2007
Slow Pitch Colloquium, CU, Boulder, CO

Diagram calculus for the Temperley–Lieb algebra Apr 2007
Graduate Student Combinatorics Conference, University of Washington, Seattle, WA

10 Things I Wish I Would Have Known Before I Started Teaching Nov 2006
Graduate Teacher Program, CU, Boulder, CO

Introduction to finite reflection groups Oct 2006
Coxeter Groups Seminar, CU, Boulder, CO

Diagram calculus for the Temperley–Lieb algebra Oct 2006
Slow Pitch Colloquium, CU, Boulder, CO

Classification of the FC-finite Coxeter groups Oct 2006
Slow Pitch Colloquium, CU, Boulder, CO

Cell complexes for arrangements with group actions May 2000
NAU Mathematics & Statistics Colloquium, NAU, Flagstaff, AZ

A cell complex for configuration space Apr 2000
MAA Southwest Section Meeting, Arizona State University, Tempe, AZ

Service

National

Member, MAA Open Access Task Force Summer 2016
Member, MAA Social Media Task Force Spring 2016

Northern Arizona University, Flagstaff, AZ

Member, Steering Committee for NASA Space Grant Fall 2015–Present
Co-organizer, ACGT Seminar Fall 2014–Present
Member, Math Circles/Problem Bank Team Fall 2013–Present
Faculty Fellow, University College Fall 2012–Present
Member, ArizMATYC/MAA-Southwest Section Organizing Committee Spring 2016
Coordinator, Friday Afternoon Mathematics Undergraduate Seminar Fall 2015–Spring 2016
Coordinator, NAU Mathematics Undergraduate Research Fall 2015–Spring 2016
Faculty Advisor, NAU Math Club Fall 2015–Spring 2016
Member, Honors Week Committee Fall 2015–Spring 2016
Member, Department Webpage Committee Fall 2015–Spring 2016

Member, Scholarship Annual Review Committee — Fall 2014 & Fall 2015
Member, Instructor Screening Committee — Spring 2013, Spring 2015
Co-coordinator, MAT 136/137 — Fall 2014–Spring 2015
Member, Scholarship Committee — Fall 2014–Spring 2015
Member, Interns 2 Scholars Ranking Committee — Fall 2014
Member, LMC Assessment Committee — Fall 2012–Summer 2014
Member, Department Graduate Operations Committee — Fall 2013–Spring 2014
Member, Department Assessment Committee — Fall 2012–Spring 2013
Co-organizer, Yavapai County Math Contest — Spring 2001
Member, Lecturer Hiring Committee — Spring 2001
Faculty Advisor, NAU Cycling Club — Fall 2000–Spring 2001
Co-organizer, High School Math Day — Fall 2000 & Fall 1999
Member, GTA Training Committee — Fall 2000–Spring 2001

Plymouth State University, Plymouth, NH
Organizer, PSU Mathematics Seminars — Spring 2009–Spring 2012
Member, Academic Technology Committee — Fall 2011–Spring 2012
Chair, Online/Blended Learning in Mathematics Policy Committee — Fall 2011–Spring 2012
Member, Learning Technology Online Education Director Hiring Committee — Fall 2011
Member, Academic Technology Advisory Group — Fall 2010–Spring 2011
Member, Contract Faculty Hiring Committee — Summer 2010
Advisor, PSU Cycling Club — Spring 2010–Spring 2012
Co-organizer, 2010 Plymouth Bike/Walk to Work Day — Spring 2010
Coauthor, PSU Carbon Action Plan — Spring 2010
Member, Wellness Works Committee — Fall 2009–Spring 2012
Co-organizer, New Faculty Orientation — Summer 2009
Member, President's Commission on Environmental Sustainability — Spring 2009–Fall 2011
Member, Mathematics Curriculum Committee — Spring 2009

University of Colorado, Boulder, CO
Co-organizer, Workshop on Inquiry-Driven Learning — Spring 2007
Co-organizer, Graduate Student Orientation — Summer 2006 & Summer 2007

Front Range Community College, Boulder, CO
Advisor, STEM Club — Fall 2002–Spring 2003
Co-organizer, π Day — Spring 2002
Co-organizer, FRCC Fun Run — Spring 2002

Selected Workshops

An Introduction to GeoGebra — Aug 2010
MAA Minicourse at 2010 MathFest, Pittsburgh, PA

2010 Inquiry-Based Learning Workshop — Jul 2010
Austin, TX

Sage: Using Open-Source Mathematics Software with Undergraduates — Summer 2010
2010 MAA PREP online workshop

Sage Education Days 1 Dec 2009
Clay Mathematics Institute, Cambridge, MA

Themes in the Interface of Representation Theory and Physics Dec 2006
Centre for Mathematical Sciences, City University, London, UK

Cellular and Diagram Algebras Apr 2004
University of Oxford, Oxford, UK

References

Available upon request