Emilie Wiesner

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EDUCATION PhD, University of Wisconsin-Madison, August 2005

Dissertation title: Translation Functors and the Shapovalov Determinant

Advisor: Arun Ram

Minor: Mathematics Education

BS, **BA**, Washington and Lee University, June 2000 Mathematics and Spanish, summa cum laude

Employment Professor Ithaca College

Dept of Mathematics 2022-Present

Associate Professor Ithaca College
Dept of Mathematics 2015-2022

Assistant Professor Ithaca College
Dept of Mathematics 2007- 2015

Franklin Fellow (Temp. Asst. Professor)

University of Georgia

Dept of Mathematics 2005- 2007

Research Assistant University of Wisconsin

Dept of Mathematics Spring 2005

Teaching Assistant/Instructor University of Wisconsin

Dept of Mathematics 2001-2002, Spring 2003 Spring 2004-Fall 2004

VIGRE Research Fellow University of Wisconsin

Dept of Mathematics 2000- 2001

Fall 2002, Fall 2003

REFEREED JOURNAL ARTICLES

- E. F. Fulmer, C. Dobbs, A. Weinberg, & E. Wiesner (2022). Disciplinary Literacy, Agency, and Didactical Texts: Findings From a Calculus Textbook Think Aloud Study. *Reading Psychology*, 43 (8), 628-659.
- M. Ondrus & E. Wiesner (2022). The Restriction of Polynomial Modules for the Virasoro Algebra to $\mathfrak{sl}_2(\mathbb{C})$. Algebra Colloquium, 29(3), 491-508.
- A. Weinberg, E. Wiesner, & E. F. Fulmer (2022). Didactical disciplinary literacy in mathematics: Making meaning from textbooks. *International Journal of Research in Undergraduate Mathematics Education*.
- E. Wiesner, A. Weinberg, E. Fulmer, & J. Barr (2020). The roles of textual features, background knowledge, and disciplinary expertise in reading a calculus textbook. *Journal for Research in Mathematics Education* 51 (2), 204-233.
- S. Sierra, S. Spenko, M. Vancliff, P. Veerapen, & E. Wiesner (2019). Associating Geometry to the Lie Superalgebra $sl(1 \mid 1)$ and to the Color Lie Algebra sl_2^c . Proceedings of the AMS 147 (10), 4135-4146.
- M. Ondrus & E. Wiesner (2018). Modules induced from polynomial subalgebras of the Virasoso algebra. J. Algebra 504, 54-84.
- M. Ondrus & E. Wiesner (2017). Whittaker modules for the insertion-elimination algebra. Algebras and Representation Theory. 20(4), 843-856.
- M. Ondrus & E. Wiesner (2016). Automorphisms and derivations of the insertion-elimination algebra and related graded Lie algebras. *Letters in Mathematical Physics*, 106(7), 925-949.
- A. Weinberg, E. Wiesner, & T. Fukawa-Connelly (2016). Mathematics lectures as narratives: Insights from network graph methodology. *Educational Studies in Mathematics*, 91(2), 203-226.
- A. Weinberg, T. Fukawa-Connelly, & E. Wiesner (2015). Characterizing instructor gestures in a lecture in a proof-based mathematics class. *Educational Studies in Mathematics*, 90(3), 233-258.
- V. Mazorchuk & E. Wiesner (2014). Simple Virasoro modules induced from codimension one subalgebras of the positive part. *Proceedings of the American Mathematical Society*, 142, 3695-3703.
- I. Bagci, K. Christodoulopoulou, & E. Wiesner (2014). Whittaker categories and Whittaker modules for Lie superalgebras. *Communications in Algebra*, 42, 4932-4947.
- A. Weinberg, E. Wiesner, & T. Fukawa-Connelly (2014). Students' sense-making practices in a proof-based mathematics lecture. *Journal of Mathematical Behavior*, 33, 168-179.
- M. Ondrus & E. Wiesner (2013). Whittaker categories for the Virasoro algebra. *Communications in Algebra* 41(10), 3910-3930.

- A. Weinberg, E. Wiesner, B. Benesh, & T. Boester (2012). Undergraduate students' selfreported use of mathematics textbooks. PRIMUS 22(2), 152-175.
- A. Weinberg & E. Wiesner (2011). Understanding mathematics textbooks through readeroriented theory. Educational Studies in Mathematics 76(1), 49-63.
- A. Weinberg, E. Wiesner, & T. Pfaff (2010). Using informal inferential reasoning to develop formal concepts. Journal of Statistics Education 18(2).
- B. Boe, D. Nakano, & E. Wiesner (2009). Ext^1 -quivers for the Witt algebra W(1,1). Journal of Algebra 322, 1548-1564.
- M. Ondrus & E. Wiesner (2009). Whittaker modules for the Virasoro algebra, Journal of Algebra and its Applications 8, 363-377.
- B. Boe, D. Nakano, and E. Wiesner (2008). Category \mathcal{O} for the Virasoro algebra: Cohomology and koszulity, Pacific Journal of Mathematics 234, 1-22.
- E. Wiesner (2007). The Shapovalov determinant and translation functors for the Virasoro algebra. Journal of Algebra 307, 899-916.
- E. Wiesner (2001). Backward minimal points for bounded linear operators on finitedimensional vector spaces. Linear Algebra and its Applications 338, 251-259.

- BOOK CHAPTERS J. Jungck, D. Knisley, G. Pangborna, M. Riehl & E. Wiesner (2018) Multi-scale graphtheoretic modeling of biomolecular structures. In R. Robeva & M. McCauley (Ed.) Algebraic and Combinatorial Biology. Academic Press.
 - K. Crona & E. Wiesner. Adaptation and Fitness Graphs (2015). In R. Robeva (Ed.) Algebraic and Discrete Mathematical Methods for Modern Biology. Academic Press.

Conference Proceedings Refereed Article or

- A. Weinberg, E. Fulmer, E. Wiesner, & J. Barr (2018). Didactical Disciplinary Literacy. Proceedings of the 21st Annual Conference on Research in Undergraduate Mathematics Education
- E. Wiesner, A. Weinberg, J. Barr, & N. Upham (2017). Expert vs. novice reading of a calculus textbook: A case study comparison. Proceedings of the 20th Annual Conference on Research in Undergraduate Mathematics Education
- A. Weinberg, E. Wiesner, & J. Barr (2016). Sense-making practices of expert and novice readers. In M. Wood, E. Turner, M. Civil, & J. Eli (Eds). Proceedings of the 38th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, 97-104.

- A. Weinberg, E. Wiesner, & T. Fukawa-Connelly (2015). The narrative structure of mathematics lectures. In T. Bartell, K. Bieda, R. Putnam, K. Brafield, H. Dominguez (Eds). Proceedings of the 37th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, 1306-1313.
- A. Weinberg, T. Fukawa-Connelly & E. Wiesner (2013). Students' sense-making in mathematics lectures. In S. Brown, G, Karakok, K. Hah Roh, M. Oehrtman (Eds). *Proceedings of the 16th Conference on Research in Undergraduate Mathematics Education*, V2, 666-669.
- E. Wiesner, T. Fukawa-Connelly & A. Weinberg (2013). Opportunity to learn from mathematics lectures. In S. Brown, G, Karakok, K. Hah Roh, M. Oehrtman (Eds). *Proceedings of the 16th Annual Conference on Research in Undergraduate Mathematics Education*, V2, 679-683.
- T. Fukawa-Connelly, A. Weinberg, E. Wiesner, S. Berube, & K. Grey. Student Note Taking Behavior in Proof-based Mathematics Classes, In S. Brown, S. Larsen, K. Marrongelle, and M. Oehrtman (Eds). *Proceedings of the 15th Annual Conference on Research in Undergraduate Mathematics Education* (2012), 425-429.
- A. Weinberg, E. Wiesner, and T. Fukawa-Connelly (2012). A framework for analyzing mathematics lectures, In L. Van Zoest J. Lo, J. Kratky (Eds). *Proceedings of the 34th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, 383-386.
- UGA VIGRE Algebra Group (2009). On Kostant's theorem for Lie algebra cohomology, Contemporary Mathematics 478, 39-60.
- B. Benesh, T. Boester, A. Weinberg, and E. Wiesner. Undergraduates' use of mathematics textbooks, In S. Alatorre, J. L. Cortina, M. Siz, and A. Mendez (Eds). *Proceedings of the 28th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (2006).

Professional Presentations * Invited

- *Weight modules for the insertion-elimination algebra. AMS Western Virtual Sectional Meeting, Special Session on Diagrammatic and Combinatorial Methods in Representation Theory: May 2021.
- *Polynomial subalgebras for the Virasoro algebra and Connections to \mathfrak{sl}_2 . AMS Midwest Sectional Meeting, Special Session on Lie Representation Theory. Madison, WI: September 2019.
- *Polynomial subalgebras for the Virasoro algebra and their induced modules. AMS Southeastern Sectional Meeting, Special Session on Categorical Methods in Representation Theory. Orlando, FL: September 2017.
- Expert vs. Novice Reading of a Calculus Textbook: A Case Study Comparison. Twentieth

Annual Meeting of the Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education. San Diego, CA: February 2017.

*Automorphisms, derivations, and subalgebras of the insertion-elimination algebra. Joint Mathematical Meetings, AMS Special Session on New Developments in Noncommutative Algebra & Representation Theory. Atlanta, GA: January, 2017.

*Whittaker modules for the insertion-elimination algebra. AMS Central Sectional Meeting, Special Session on Lie Algebras and Representation Theory. Eau Claire, WI: September, 2014.

Opportunity to Learn From Mathematics Lectures. Sixteenth Annual Meeting of the Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education. Denver, CO, February 2013.

*Modules for the Virasoro algebra with a "nice" action of the positive part. Algebra Seminar (University of Connecticut). Storrs, CT: October, 2012.

Whittaker categories for Lie superalgebras.

- *Algebra and Topology Seminar, Uppsala University. Uppsala, Sweden: May, 2012.
- *AMS Central Sectional Meeting, Special Session on Quantum Groups and Representation Theory. Omaha, NE: October 2011.

Whittaker Categories and the Virasoro Algebra.

*Lie Theory Seminar (University of California-Riverside). Riverside, NY: May, 2011.

*Algebra Seminar (Binghamton University). Binghamton, NY: March, 2011.

Whittaker modules for the Insertion-Elimination Algebra. *AMS Central Section Meeting, Special Session on Lie Algebras and Representation Theory. Eau Claire, WI: September 2014.

*Category O and Filtrations. UGA Summer School on Homological Methods in Representation Theory. Athens, GA: May 2010.

Using Reader-oriented Theory to Understand Students' Textbook Use . MAA Seaway Section Meeting. Oswego, NY: April 2010.

Whittaker Modules for the Virasoro Algebra.

Binghamton University Graduate Conference in Algebra and Topology. Binghamton, NY: November, 2009.

Poster. Connections for Women Conference. Mathematical Sciences Research Institute, Berkeley, CA: January 2008.

*AMS Southeastern Sectional Meeting, Special Session on Lie and Representation Theory. Murphreesboro, TN: November 2007.

Ext Groups for the Lie Algebra W(1,1).

Workshop on Lie Groups, Lie Algebras and their Representations (University of California, Riverside). Riverside, CA: January, 2009.

Binghamton Graduate Conference in Algebra and Topology. Binghamton, NY: November, 2008.

How Undergraduates Use their Textbooks. MAA Seaway Section Meeting. Syracuse, NY: April 2008.

Cohomology of Category \mathcal{O} for the Virasoro algebra.

*AMS SouthEastern Sectional Meeting, Special Session on Geometric and Combinatorial Methods in Representation Theory. Davidson, NC; March 2007.

*Joint Meetings of the AMS and MAA, Special Session on Cohomology and Representation Theory. New Orleans, LA; January 2007.

Undergraduates' Use of Mathematics Textbooks. Poster, with B. Benesh, T. Boester, and A. Weinberg. Psychology of Mathematics Education-North American Chapter Annual Meeting. Merida, Mexico: October 2006.

Translation Functors for the Virasoro Algebra.

University of Freiburg, June 2005.

University of Wuppertal, June 2005.

Conference on Algebraic Groups and Finite Reductive Groups. Lausanne, Switzerland, June 2005.

Blocks and Translation Functors for the Virasoro Algebra, Poster. Conference on Formal Power Series and Algebraic Combinatorics. Taormina, Sicily, June 2005.

Implementing Lesson Study at the Undergraduate Level. Joint Meetings of the AMS and MAA. Atlanta, GA, January 2005.

Talks for Undergraduates

Hats off: The einstein of aperiodic tilings. Colloquium. Ithaca College: September 2023.

Ping Pong and Sleeping Beauty: Playing with Paradoxes. Colloquium. Ithaca College: October 2020.

Graph-theoretic models for RNA secondary structure.

Colloquium. Hobart and William Smith Colleges: July, 2018.

Colloquium. Ithaca College: October, 2018.

Ping-Pong, Hilbert's Hotel, and other oddities of Infinity. World of Mathematics Seminar. Ithaca College: April, 2018; April, 2021.

Fitness graphs: An application of graph theory to evolutionary biology. World of Mathematics Seminar. Ithaca College: April, 2016.

The mathematics of bead crochet. Colloquium. SUNY Geneseo: November, 2012.

Two-faced: The Cantor set and notions of size

Colloquium. Hobart and William Smith Colleges: September, 2011.

Sophomore Seminar. Ithaca College: March, 2011; April, 2013.

Partitions: What does it mean to count? Sophomore Seminar. Ithaca College: March, 2010.

Clever Counting in Sudoku.

Colloquium. SUNY Geneseo: November, 2009. Colloquium. Vassar College: February, 2009.

Teaching
EXPERIENCE

Ithaca College IISP 105: Exploring the Options

ICSM 105: Power and democracy in US government:

A mathematical perspective

Math 108: Calculus for Decision Making

Math 112: Calculus II

Math 144: Business Statistics

Math 145: Statistics for Life Sciences Math 155: Basic Statistical Reasoning Math 165: Quantifying Sustainability Math 185: Math Experimentation Math 211: Multivariable Calculus

Math 231: Linear Algebra Math 303: Abstract Algebra Math 397: Junior Seminar Math 398: Research Experience Math 420: Mathematics of Symmetry

No. 1. 400 400 Mg -1. Company

Math 498-499: Math Capstone (coordinator)

University of Georgia Math 2200: Differential Calculus

Math 3200: Introduction to Higher Mathematics Math 5001: Arithmetic and Problem Solving Math 5002: Geometry and Problem Solving

University of Wisconsin Math 130: Arithmetical Problem Solving

Math 222: Calculus II

Math 221, 222, 234: Calculus I-III (teaching assistant)

SUPERVISION OF INDEPENDENT STUDENT WORK James Belov '25. Tic-tac-toe Symmetries (Math 398: Research Experience, Spring 2023)

• Presentation: 2023 James J. Whalen Symposium, Ithaca College, April 2023

Jay Barret '24. Markov Chains for Chutes and Ladders (Math 398: Research Experience, Spring 2023)

• Presentation: 2023 James J. Whalen Symposium, Ithaca College, April 2023

Madolyn Donaghy-Robinson '24. *Mathematics of Bead Crochet Patterns* (Math 398: Research Experience, Spring 2023)

• Presentation: 2023 James J. Whalen Symposium, Ithaca College, April 2023

Jacob Brown '22. Cut it Out: Counting the Divisions of a Rectangular Grid (Math 398: Research Experience, Spring 2021)

- Presentation: 2021 James J. Whalen Symposium, Ithaca College, April 2021
- Presentation: 2021 MAA MathFest, Virtual, August 2021

Jamie Woodworth '22. Chutes and Ladders: An Analysis (Math 398: Research Experience, Spring 2021; Math 493: Honors in Math, Fall 2021)

• Presentation: 2021 James J. Whalen Symposium, Ithaca College, April 2021

Dylan Carrafiello-Costa '21. Galois Theory (Math 498-499: Math Capstone, Fall 2020).

Kimberly Newman '19. Solving Equations (Math 498-499: Math Capstone, Fall 2018).

Ryan Valentin '19. Gerrymandering and Redistricting (Math 498-499: Math Capstone, Fall 2018).

Dallas Fonseca '18. Comparison of mathematical models for the lactose operon in E. Coli (Math 498-499: Math Capstone, Spring 2018).

Nicole Dardano '15. Symmetry. (Math 498-499: Math Capstone, Fall 2015).

Frank Conde '14. Generalizing Prime-Divisible Sequences (Math 398: Research Experience, Spring 2013).

- Presentation: 20th Hudson River Undergraduate Mathematics Conference, Williams College, April 2013
- Presentation: 2013 James J. Whalen Symposium, Ithaca College, April 2013

Samuel Reed '14. Wallpaper Groups applied to the Hexagonal Bead Pattern of a Bracelet (Math 398: Research Experience, Spring 2013).

- Presentation: 20th Hudson River Undergraduate Mathematics Conference, Williams College, April 2013
- Presentation: 2013 James J. Whalen Symposium, Ithaca College, April 2013

Caleb McWhorter '13. The Critical Thread: The Symmetric Group in Galois Theory, Representation Theory, Representations of Lie Algebras, Combinatorics, and Topology (Math 498-499: Math Capstone, AY 2012-13).

Katharina Carella '10. Group Theory of the Rubik's Cube (Independent Study, Fall 2010).

Jennifer Parker '09. Algebraic Coding Theory (Independent Study, Spring 2009).

• Presentation: 16th Hudson River Undergraduate Mathematics Conference, Union College, April 2009

DEPARTMENTAL SERVICE

Communications Committee: AY 2022-2024

Volunteer, IC Women in Math Day: 2021, 2022.

Curriculum Committee: AY 2019-2020, AY 2015-2016, Fall 2014, AY 2010-2013 (Chair: AY

2012-2013)

Diversity and Inclusion Committee: AY 2020-2022, AY 2017-2019 (Chair)

Merit Award Committee, Spring 2018

Activities Committee: AY 2013-2014

Pi Mu Epsilon advisor: AY 2010-2014

Math Club advisor: AY 2011-2013

Colloquium Committee: AY 2009-2010, AY 2011-2012

Teacher Education Program Committee: AY 2008-2010

Service Course Committee: AY 2007-2009

Faculty mentor for student teachers: Ithaca College-Frederick Douglas Academy Partner-

ship, Fall 2008

Masters in Childhood Education Program Committee: AY 2007-2008

College Service

Organizer, Grading for Equity reading group: AY 2022-2023.

Organizer, STEM anti-racism reading group: Fall 2021.

Moderator, Whalen Symposium: 2021.

H&S Faculty Senate, Fall 2018-2024

- Elections Committee, AY 2019-2022
- Executive Committee, AY 2020-2023
- working group on advising and workload, Fall 2020
- working group on tenure and promotion policy, Fall 2019
- working group on the continuation of the Dean's Advisory Council, Fall 2018

Quantitative Literacy Course Designation Committee, AY 2012-2013

H & S General Education Committee, AY 2011-2013

• Gen Ed Designation Subcommittee, AY 2011-2013 (Chair: AY 2011-2012)

First Year Reading Initiative Facilitator: 2009-2011

Academic Policies Committee: Fall 2009

Professional & Community Service

Organizer, Community Math Day, 2022.

Association for Women in Mathematics

- Student Chapter Awards Committee, 2021-2023.
- Judging Coordinator, Graduate Student Poster Competition (Joint Mathematical Meetings). 2019-2021.
- Meetings Committee, AY 2019-2021.
- Judge, Essay Contest: 2017, 2019, 2020, 2021, 2023.
- Judge, Graduate Student Poster Competition, Joint Mathematical Meetings. 2017.

Co-organizer and mentor, South Hill Elementary School Math Hawks. AY 2018-2021.

Judge, MAA Undergraduate Poster Competition, Joint Mathematical Meetings. Baltimore, MD: 2019, 2020, 2021.

Math Puzzlers (virtual puzzle series), Fall Creek Elementary, AY 2020-2021.

Facilitator, professional development on the Common Core, Fall Creek Elementary, AY 2019-2020.

Chair, local organizing committee: MAA Seaway Section Fall 2019 conference.

Volunteer, Sustainable Tompkins, Summer 2019.

Coach for South Hill Elementary team, Girls' Adventures in Math Competition. Ithaca, NY: 2019.

Mini-session facilitator, Ithaca College Math Exploration Day: 2018, 2019.

Journal Referee

Algebras and Representation Theory

Asian Journal of Mathematics

Communications in Algebra

Forum Mathematicum

Journal of Algebra

Journal of Algebra and its Applications

Journal of Pure and Applied Algebra

Problems, Resources, and Issues in Mathematics Undergraduate Studies

Transactions of the American Mathematical Society

Facilitator, Ithaca College Mathematics Professional Development Day. Ithaca, NY: 2012.

Poster Committee, National Conference on Undergraduate Research. Ithaca College: 2011.

Special Session Organizer: *Lie Algebras and Representation Theory*. Eastern AMS Section Meeting. Syracuse, NY: October 2010.

Session Leader, UGA Summer School on Homological Methods in Representation Theory. Athens, GA: May 2010.

Mathematicians' Representative, Barrow Elementary School Career Day, 2005 & 2006

Mentor, UW-Madison Mentorship Program for Women in Mathematics, AY 2004-2005

INTERNAL GRANTS & AWARDS

Faculty Development Mini-Grant: Transcribing Interviews to Investigate Didactical Disciplinary Literacy (\$850), 2023. Mathematics Department Merit Award (Ithaca College): 2019, 2014, 2013, 2012, 2011.

Instructional Development Fund Grant: Rethinking the first undergraduate mathematics experience: linear algebra (\$500), joint with Matt Thomas and Daniel Visscher, 2019.

Center for Faculty Research and Development Award:

- Research on Literacy for Learning from Textbooks, joint with Ellie Fulmer and Aaron Weinberg, Fall 2021.
- Understanding Students' Textbook Use in a Flipped Classroom, joint with John Barr and Aaron Weinberg, Spring 2014.
- Research on the Insertion-Deletion Algebra (3 credit course release), Fall 2010.
- Using GAP to Explore Symmetric Groups (3 credit course release), Fall 2009.
- "Mathematics for Elementary Teachers" Materials (3 credit course release), Fall 2008.

Ithaca College H&S Educational Grant:

- Pi Mu Epsilon Induction Colloquium, Fall 2011.
- Mathematics Colloquium, Fall 2009.

Ithaca College Provost Academic Project Grant: *Investigating Mathematics Students' Use of Textbooks*, joint with Aaron Weinberg, Fall 2007.

Professional Development Participant: OPEN Math, Inclusive Active Learning in Introductory Mathematics Courses. June, 2022.

Participant: QUBES, Project EDDIE (Environmental Data-Driven Inquiry & Exploration) Faculty Mentoring Network. Spring, 2022.

Participant: Mathematical Sciences Research Institute: Workshop on Mathematics and Racial Justice. June, 2021.

Participant: Ithaca College Center for Faculty Excellence, *Institute on Antiracism and Equity.* 2020.

Participant: National Institute for Mathematical and Biological Synthesis workshop, *Algebraic Mathematical Biology*. Knoxville, TN: July 2016.

Participant: Banff International Research Station workshop, Women in Noncommutative Algebra and Representation Theory. Banff, Alberta CA: April 2016.

Participant: Mathematical Biosciences Institute workshop, *Teaching Discrete and Algebraic Mathematical Biology to Undergraduates*. Columbus, OH: July 2013.

Participant: MAA short course Conceptual Climate Models. San Diego, CA: January 2013.

Participant: Consortium for the Advancement of Undergraduate Statistics Education workshop, *Teaching Modeling-Based Calculus*. Boston, MA: January 2012.

Participant: Conference on Non-Associative Algebras in Action: Past, Present and Future. Charlottesville, VA: September 2011.

Participant: MAA PREP workshop *Mathematical Biology: Beyond Calculus*. Sweet Briar, VA: June 2010.