

David Meyer

Curriculum Vitae

Research Interests

Finite-dimensional algebras, persistent homology, topological data analysis, modular representation theory, group cohomology, universal deformation rings.

Positions

- 2022-present **Visiting Assistant Professor**, *Reed College*.
- 2021-2022 **Visiting Assistant Professor**, *Colgate University*.
- 2018-2021 **Lecturer (Visiting Assistant Professor)**, *Smith College*.
- 2015-2018 **Postdoctoral Fellow**, *University of Missouri*.
Mentor: Calin Chindris

Education

- 2015 **PhD Mathematics**, *University of Iowa*.
Title: Universal deformation rings and fusion
Advisor: Frauke Bleher
- 2006 **MA Mathematics**, *Indiana University*.
- 2001 **BS Mathematics**, *University of Hawaii*.

Papers

- B. Collins, D. Meyer, *Rank characters for generalized persistence modules*, In preparation.
- O. Acharya, S. Li, D. Meyer, J. Noory, *Tracking the variety of interleavings*, (arXiv:2010.13199 [math.AT]).
- K. Meehan, D. Meyer, *Persistence and stability of the \mathbb{A}_n quiver* (arXiv:2001.06172 [math.AT]), In preparation.
- D. Meyer, R. Soto, D. Wackwitz, *Universal deformation rings of modules for generalized Brauer tree algebras of polynomial growth*, *Communications in Algebra* 51 (2023), pp. 3543-3555.
- K. Meehan, D. Meyer, *Interleaving distance as a limit*. (arXiv:1710.11489v1 [math.AT]).
- K. Meehan, D. Meyer, *An Isometry theorem for generalized persistence modules* (arXiv:1710.02858v1 [math.AT]).
- D. Meyer, *Universal deformation rings for extensions of finite subgroups of $GL_2(\mathbb{C})$* (arXiv:1602.03164 [math.RA]).
- D. Meyer, *Universal deformation rings and fusion*, *Journal of Algebra*, 417 (2014), pp. 275-289.

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Awards and Recognition

- Dr. Bor-Luh Lin Award (outstanding PhD thesis in Mathematics), University of Iowa, 2015
- Catherine Wegner Outstanding Mathematics TA Award, University of Iowa, 2013
- NSF VIGRE Fellowship, Indiana University, 2002-2005
- Robert E. Weber Memorial Award (best performance on qualifying exams), Indiana University, 2003
- Dorothy Koehler Reed Memorial Scholarship, University of Hawaii, 2001

Conference/Invited Talks

- *Quivers and the shape of data sets*
Departmental Colloquium, Reed College, April 2022
- *Rank of convex modules*
AMS Sectional Meeting, October 2021
- *Tracking the variety of interleavings*
Seventh Conference on Geometric Methods in Representation Theory, November 2019
- *The variety of interleavings*
Kyoto Institute for Advanced Studies, August, 2019
- *Algebraic stability for arbitrary orientations of \mathbb{A}_n*
Sixth Conference on Geometric Methods in Representation Theory, November 2018
- *Representations of incidence algebras and generalized persistence modules*
BIRS-CMO Multiparameter Persistent Homology Workshop, August 2018
- *Representations of quivers and the shape of finite data sets*
Departmental Colloquium, Smith College, May 2018
- *Representations of posets and the topology of data sets*
Departmental Colloquium, Bucknell University, May 2018
- *Some algebraic stability theorems*
Applied Algebraic Topology Research Network Seminar, (online) January 2018
- *Generalized persistence modules and taking limits*
AMS MAA Joint Meetings, January 2018
- *An isometry theorem for incidence algebras*
Fifth Conference on Geometric Methods in Representation Theory, November 2017
- *Finite subgroups of $Gl_2(\mathbb{C})$ and universal deformation rings*
Fourth Conference on Geometric Methods in Representation Theory, November 2016
- *Universal deformation rings and finite subgroups of $Gl_2(\mathbb{C})$*
AMS Sectional Meeting, October 2016
- *Universal deformation rings and groups with faithful irreducible complex representations*
International Conference on Representations of Algebras, August 2016
- *Incidence-like algebras*

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AMS MAA Joint Meetings, January 2016

- *Representations of finite subgroups of $GL_2(\mathbb{C})$ and universal deformation rings*
AMS MAA Joint Meetings, January 2015
- *Universal deformation rings for extensions of finite subgroups of $GL_2(\mathbb{C})$*
Third Conference on Geometric Methods in Representation Theory, November 2014
- *Universal deformation rings for representations of subgroups of $GL_2(\mathbb{F}_p)$*
Maurice Auslander Distinguished Lectures and International Conference, April 2014
- *Universal deformation rings and fusion*
AMS MAA Joint Meetings, January 2014
- *Universal deformation rings in extensions corresponding to faithful representations*
Second Conference on Geometric Methods in Representation Theory, November 2013
- *Do universal deformation rings recognize fusion?*
AMS Sectional Meeting, April 2013
- *Do universal deformation rings recognize fusion?*
Maurice Auslander Distinguished Lectures and International Conference, April 2013
- *Universal deformation rings and fusion*
First Conference on Geometric Methods in Representation Theory, November 2012

Workshops, Summer Schools and Visits

- Visitor to the Kyoto Institute of Advanced Studies, Summer 2019
- Workshop on Multiparameter Persistent Homology, BIRS-CMO, Summer 2018
- PIMS Workshop on Geometric & Topological Aspects of the Representation Theory of Finite Groups, UBC, Summer 2016
- Summer Graduate School on Geometric Group Theory, MSRI, Summer 2015

Courses Taught

- Introduction to Analysis, Reed College, (teaching course in Spring 2025)
- Topology, Reed College, (teaching course in Spring 2025)
- Vector Calculus, Reed College, Fall 2024
- Introduction to Analysis, Reed College, Fall 2024
- Vector Calculus, Reed College, Spring 2024
- Topology, Reed College, Spring 2024
- Discrete Structures, Reed College, Fall 2023
- Vector Calculus, Reed College, Fall 2023
- Discrete Structures, Reed College, Spring 2023
- Topics in Algebra, Reed College, Fall 2022
- Introduction to Analysis, Reed College, Fall 2022

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- Calculus III, Colgate University, Spring 2022
- Calculus II, Colgate University, Spring 2022
- Calculus III, Colgate University, Fall 2021
- Calculus II, Colgate University, Fall 2021
- Introduction to Measure Theory (Special Studies), Smith College, Spring 2021
- Introduction to Modern Algebra, Smith College, Spring 2021
- Calculus II, Smith College, Spring 2021
- Calculus II, Smith College, Interterm 2021
- Calculus II, Smith College, Fall 2020
- Quantum Group Theory (Special Studies), Smith College, Fall 2020
- Graph Theory, Smith College, Spring 2020
- Calculus II, Smith College, Spring 2020
- Honors Project, Smith College, Spring 2020
- Multivariable Calculus, Smith College, Fall 2019
- Calculus II, Smith College, Fall 2019
- Quantum Cryptography (Special Studies), Smith College, Fall 2019
- Topics in Abstract Algebra, Smith College, Spring 2019
- Introduction to Modern Algebra, Smith College, Spring 2019
- Calculus I, Smith College, Fall 2018
- Discrete Mathematical Structures, University of Missouri, Spring 2018
- Calculus III, University of Missouri, Spring 2018
- The Theory of Numbers, University of Missouri, Fall 2017
- Discrete Mathematical Structures, University of Missouri, Fall 2017
- Calculus III, University of Missouri, Spring 2017
- Higher Algebra, University of Missouri, Fall 2016
- Discrete Mathematical Structures, University of Missouri, Fall 2016
- Matrix Theory, University of Missouri, Spring 2016
- Calculus III, University of Missouri, Fall 2015
- Calculus I, University of Iowa, Fall 2014
- Elementary Functions, University of Iowa, Spring 2013
- Finite Mathematics, Indiana University, Fall 2005

■ Courses Coordinated

- Calculus II, Smith College, Fall 2020

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Students Mentored in Research

- Nathan Edwards, BA, Reed College (expected Spring 2025)
- George Hujoel, BA, Reed College (expected Spring 2025)
- Nathan Senters, BA, Reed College (expected Spring 2025)
- Evan Sieden, BA, Reed College (expected Spring 2025)
- Callie Reimann, BA, Reed College
- Eriksen Liu, BA, Reed College
- Thomas Ulmer, BA, Reed College
- Oliver Mansbach, BA, Reed College
- Scott Blair, BA, Reed College
- Wenqin Chen, AB, Smith College
- Ojaswi Acharya, AB, Smith College
- Stella Li, AB, Smith College
- Jasmine Noory, Postbacc, Smith College
- Killian Meehan, PhD, University of Missouri
- Katelyn Gutteridge, MA, University of Missouri

Thesis Committees

- Thesis advisor for Nathan Edwards, Senior Thesis, Reed College, (expected in Spring 2025)
- Thesis advisor for George Hujoel, Senior Thesis, Reed College, (expected in Spring 2025)
- Thesis advisor for Nathan Senters, Senior Thesis, Reed College, (expected in Spring 2025)
- Thesis advisor for Evan Sieden, Senior Thesis, Reed College, (expected in Spring 2025)
- Thesis advisor for Callie Reimann, Senior Thesis, Reed College, Spring 2024
Thesis: Extending Galois Connections Between Posets to their Representations
- Thesis advisor for Eriksen Liu, Senior Thesis, Reed College, Spring 2024
Thesis: Suboptimal Multi-Heuristic Approaches for Solving the Rubik's Cube Incorporating Deep Learning and Group Theory
- Thesis advisor for Thomas Ulmer, Senior Thesis, Reed College, Spring 2024
Thesis: Symbolic Analysis of C Binaries
- Committee member for Taylor Blair, Senior Thesis, Reed College, Spring 2024
Thesis: Topological Data Analysis for Cache Prediction
- Thesis advisor for Oliver Mansbach, Senior Thesis, Reed College, Spring 2023
Thesis: Persisting Through the Convexity: Convex Modules for the Commutative Grid
- Thesis advisor for Scott Blair, Senior Thesis, Reed College, Spring 2023
Thesis: A Taste of Differential Field Theory

- Committee member for Kellen Brosnahan, Senior Thesis, Reed College, Spring 2023
Thesis: Representation Theory, Schur-Weyl Duality, and the Partition Algebra
- Committee member for Anoushka Goenka, Senior Thesis, Reed College, Spring 2023
Thesis: A Study of Performance-Based Compensation in the Indian Premier League
- Committee member for Olivia McGough, Senior Thesis, Reed College, Spring 2023
Thesis: Persistent Homology and Applications to Graph Data
- Thesis advisor for Wenqin Chen, Honors Thesis (highest honors), Smith College, Spring 2020
Thesis: Some Applications of Quantum Entanglement to Cryptography
- Committee member for Killian Meehan, PhD Thesis, the University of Missouri, Spring 2018
Thesis: Persistent Homology: Categorical Structural Theorem and Stability through Representations of Quivers
- Thesis advisor for Katelyn Gutteridge, MA Thesis, the University of Missouri, Spring 2018
Thesis: Calculating the Interleaving Distance
- Committee member for Dan Kline, PhD Thesis, the University of Missouri, Spring 2016
Thesis: Locally Semi-simple Quiver Representations

Conferences and Seminars Organized

- F.L. Griffin MathFest, Reed College, co-organizer (math organizer), April 2025
- F.L. Griffin MathFest, Reed College, co-organizer (math organizer), April 2024
- F.L. Griffin MathFest, Reed College, co-organizer (math organizer), April 2023
- Hudson River Undergraduate Math Conference, Keene State College (virtual conference), co-organizer, April 2021
- Women in Mathematics in New England (WIMIN), Smith College (virtual conference), co-organizer, October 2020
- Hudson River Undergraduate Math Conference, Mount Holyoke College, co-organizer, March 2020 (canceled due to COVID-19)
- Hudson River Undergraduate Math Conference, Smith College, co-organizer and local organizer, March 2019
- Topological Data Analysis Reading Group, Smith College, co-organizer, Fall 2018
- Fifth Conference on Geometric Methods in Representation Theory, University of Iowa, co-organizer, November 2017
- Fourth Conference on Geometric Methods in Representation Theory, University of Missouri, co-organizer, November 2016
- Representation Theory of Algebras Reading Seminar, University of Missouri, organizer Fall 2015-2016
- Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, founder 2011, organizer 2011-2015

Selected Seminar Talks

- *Quivers and the shape of data*
Colloquium, Centenary College of Louisiana, May 2024
- *Ultrafilters and the spectrum of the power set of the natural numbers*
Math Colloquium, Reed College, October 2023
- *The Intermediate value property and discontinuity*
Math Colloquium, Reed College, October 2022
- *IVP functions*
Math Seminar, Fitchburg State College, April 2020
- *Making sense of divergent sums*
Math Lunch, Smith College, February 2020
- *Functions that satisfy the intermediate value property*
Math Lunch, Smith College, October 2019
- *Ultrafilters on \mathbb{N} and prime ideals*
Math Lunch, Smith College, February 2019
- *Persistence modules for arbitrary orientations of \mathbb{A}_n*
Algebra/Topology Seminar, SUNY Albany, October 2018
- *Topological data analysis and representations of posets*
Algebra Seminar, University of Iowa, October 2017
- *The spectrum of the power set of the natural numbers and taking limits*
Graduate Student Algebra Seminar, University of Missouri, September 2016
- *Candidates for robust invariants for generalized persistence modules*
Representation Theory of Algebras Reading Seminar, University of Missouri, February 2016
- *Fusion in group theory and a function into local rings*
Graduate Student Algebra Seminar, University of Missouri, November 2015
- *I spaces of finite representation type*
Representation Theory of Algebras Reading Seminar, University of Missouri, October 2015
- *The function $R(\Gamma, -)$*
Algebra Seminar, University of Iowa, March 2015
- *The image of a function into \widehat{C}*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, February 2015
- *The no loops conjecture*
Algebra Seminar, University of Iowa, December 2014
- *Valuation rings and bezout rings*
Commutative Ring Theory Seminar, University of Iowa, November 2014
- *Finite subgroups of $GL_2(\mathbb{C})$ and the deformation functor*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, September 2014

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- *An exact sequence in group homology*
Algebra Seminar, University of Iowa, February 2014
- *On fusion categories*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, February 2014
- *Universal deformation rings in faithful extensions*
Algebra Seminar, University of Iowa, November 2013
- *Group cohomology and the program for exhaustion*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, November 2013
- *Connections between group cohomology and fusion*
Algebra Seminar, University of Iowa, March 2013
- *Cohomology and fusion*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, February 2013
- *Second cohomology and fusion in dihedral groups*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, November 2012
- *A cohomological computation*
Algebra Seminar, University of Iowa, September 2012
- *On group cohomology and extensions by elementary abelian groups*
Graduate Student Group Representation/Group Cohomology Seminar, University of Iowa, April 2012
- *Exact couples and group cohomology*
Algebra Seminar, University of Iowa, March 2012
- *Ordinary and modular representation theory*
Algebra Seminar, University of Iowa, September 2011
- *Generalizing infinite sums*
GAUSS Seminar, University of Iowa, April 2011

Recitation Sections Taught

- Calculus II, University of Iowa, Summer 2014
- Calculus for the Biological Sciences, University of Iowa, Spring 2014
- Engineering Math I, University of Iowa, Fall 2013
- Introduction to Abstract Algebra (undergraduate level), University of Iowa, Fall 2012
- Calculus for the Biological Sciences, University of Iowa, Spring 2012
- Calculus I, University of Iowa, Fall 2011
- Engineering Math II: Multivariable Calculus, University of Iowa, Spring 2011
- Calculus I, University of Iowa, Fall 2010

- Mathematics for the Biological Sciences, University of Iowa, Fall 2009
- Honors Finite Math, Indiana University, Spring 2006