# JOSHUA RUITER

Grinnell College Department of Mathematics

#### CONTACT INFORMATION

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#### **EDUCATION**

**Ph.D.**, Mathematics, Michigan State University Advisor: Igor Rapinchuk

**B.A.**, Mathematics, Calvin College Thesis advisor: Christopher Mosely

September 2016 - May 2022

September 2012-May 2016

#### RESEARCH

**Current interests:** Abstract homomorphisms and representations of algebraic groups, special unitary and special orthogonal groups, algebraic K-theory, group cohomology, Brauer groups.

#### **Publications:**

- On abstract homomorphisms of some special unitary groups. With coathor Igor Rapinchuk. Proceedings of the American Mathematical Society. https://www.ams.org/journals/proc/ 0000-000-00/S0002-9939-2022-15991-7/home.html
- Consensus and clustering in opinion formation on networks. With coauthors Julia Bujalski, Grace Dwyer, Todd Kapitula, Quang-Nhat Le, Harjasleen Malvai, Jordan Rosenthal-Kay. 376. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences. http://doi.org/10.1098/rsta.2017.0186
- An Algebraic Characterization of Highly Connected 2n-Manifolds. With coathors Shamuel Auyeung, Daiwei Zhang. *Rose-Hulman Undergraduate Mathematics Journal*: Vol. 17 : Iss. 2, Article 5. https://scholar.rose-hulman.edu/rhumj/vol17/iss2/5

#### Seminars participated in:

• Derived categories (MSU)	Spring 2022
• St. Petersburg University algebraic groups seminar	
• Quadratic forms, linear algebraic groups, and beyond (QFLAG)	
• ALGAR 2021: Systems of quadratic forms over arithmetic fields (University of Antwerp)	Summer 2021
• MSU Student algebra seminar (organizer 2020-2021)	
• Group cohomolgy, Brauer groups, and local class field theory (Lead organizer, MSU)	Spring 2019
• Derived categories (MSU)	Spring 2018
• Algebraic K-theory (MSU)	Spring 2018

### Talks:

• Abstract homomorphisms of some special unitary groups Algebra 2022 and beyond, Indiana University	Summer 2022
• Abstract homomorphisms of algebraic groups: sometimes you get more than BUGCAT online conference	you ask for Fall 2021
• Abstract homomorphisms of some special unitary groups University of Virginia Algebra Seminar	Fall 2021
• Abstract homomorphisms of some special unitary groups St. Petersburg University algebraic groups seminar	Fall 2021
• $\operatorname{GL}_n(\mathbb{R})$ is a beautiful butterfly Calvin University Math Colloquium	Fall 2021
• Abstract homomorphisms of special unitary groups MSU Student Algebra Seminar	Fall 2021
• Pinnings of algebraic groups MSU Student Algebra Seminar	Spring 2021
• An algebraic approach to musical scales MSU GAUSS Seminar	Fall 2020
• Galois descent MSU Student Algebra Seminar	Fall 2020
• The norm torus MSU Student Algebra Seminar	Fall 2019
• Extending the norm map to $\mathbb{G}_m$ MSU Student Algebra Seminar	Fall 2019
Root systems with plentiful examples     MSU Student Algebra Seminar	Fall 2019
• Universal central extensions of groups with connections to K-theory MSU Student Algebra Seminar	Fall 2018
• Absolute values on the rational numbers and Ostrowski's theorem Calvin College Math Colloquium	Fall 2018
• Absolute values, Ostrowski's theorem, and completions of fields MSU Student Algebra Seminar	Fall 2018
• The Galois correspondence for infinite Galois extensions MSU Student Algebra Seminar	Spring 2018
• Lie algebras and their root systems Calvin College Math Colloquium	Spring 2016
Classification of manifolds via homotopy Calvin College Math Colloquium	Spring 2015
• Is it possible to play in tune? Calvin College Math Colloquium	Fall 2015

# TEACHING

• Math 321 - Abstract Algebra, Grinnell College	Fall 2022
• Math 131 - Calculus 1, Grinnell College	Fall 2022
• Math 234 - Multivariable calculus, Lead TA, MSU	Fall 2021-Spring 2022
• Math 299 - Transitions to proofs, MSU	Spring 2021

• Math 299 - Transitions to proofs, MSU	Fall 2020
• Math 235 - Ordinary differential equations, MSU	Summer 2020
• Math 299 - Transitions to proofs, MSU	Spring 2020
• Math 299 - Transitions to proofs, MSU	Fall 2019
• Math 133 - Calculus 2, MSU	Summer 2019
• Math 124 - Survey of calculus, MSU	Spring 2019
• Math 124 - Survey of calculus, MSU	Fall 2018
• Math 234 - Multivariable calculus, MSU	Summer 2018
• Math 234 - Multivariable calculus, MSU	Summer 2017
EXPERIENCE AND TRAINING	
• Facilitating accessible and inclusive mathematics learning environments	s (seminar) Spring 2022
<ul><li>Facilitating accessible and inclusive mathematics learning environments</li><li>Diversity, equity, and inclusion training seminar</li></ul>	s (seminar) Spring 2022 August 2021
<ul> <li>Facilitating accessible and inclusive mathematics learning environments</li> <li>Diversity, equity, and inclusion training seminar</li> <li>Student mentoring workshop with Council on Undergraduate Research</li> </ul>	s (seminar) Spring 2022 August 2021 June 2020
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<ul> <li>Facilitating accessible and inclusive mathematics learning environments</li> <li>Diversity, equity, and inclusion training seminar</li> <li>Student mentoring workshop with Council on Undergraduate Research</li> <li>Spartan Online Instructional Readiness Education Experience (workshop on online teaching)</li> <li>Instructor for Mathnasium of Okemos.</li> </ul>	s (seminar) Spring 2022 August 2021 June 2020 May 2020 August 2019-December 2020
<ul> <li>Facilitating accessible and inclusive mathematics learning environments</li> <li>Diversity, equity, and inclusion training seminar</li> <li>Student mentoring workshop with Council on Undergraduate Research</li> <li>Spartan Online Instructional Readiness Education Experience (workshop on online teaching)</li> <li>Instructor for Mathnasium of Okemos.</li> <li>Graduate assistant for summer REU in dynamical systems at ICERM,</li> </ul>	s (seminar) August 2022 August 2021 June 2020 May 2020 August 2019-December 2020

## SERVICE

<ul><li>Graduate student panel for SURIEM REU</li><li>Graduate student panel for Marian University AWM chapter</li></ul>	June 2021 February 2022	
HONORS AND AWARDS		
Dissertation Completion Fellowship	Summer 2021	
• TA Award for Excellence in Teaching, MSU Department of Mathematics	Spring $2021$	

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•	Herbert T. Graham Scholarship	Spring 2021
•	MSU College of Natural Science Recruiting Fellowship	2016-2017

• MSU College of Natural Science Recruiting Fellowship