

# Peter K. Johnson

## Curriculum Vitae

### Education

Ph.D. in Mathematics, University of Virginia, May 2022.

Thesis advisor: Thomas Mark. Thesis: Small Seifert Fibered Zero-Surgery.

M.S. in the Division of Physical Sciences, University of Chicago, December 2014.

Thesis advisor: John Boller. Thesis: The Conjugacy Classes of  $O(3, q)$ .

B.S. in Mathematical Economics, University of Richmond, May 2012.

The General Course Study Abroad Program, London School of Economics and Political Science, 2010-2011 Academic Year.

### Employment

- 2022-2024 Visiting Assistant Professor, Michigan State University.
- 2016-2022 Graduate Teaching Assistant, University of Virginia.

### Research Interests

Low dimensional topology. More specifically, using Floer homology to study 3- and 4-dimensional manifolds. I am also interested in connections between lattice homology and the  $\widehat{Z}$  invariant.

### Publications and Preprints

- Knot lattice homology and  $q$ -series invariants for plumbed knot complements, with R. Akhmechet and S. Park.  
arXiv:2403.14461
- Lattice cohomology and  $q$ -series invariants of 3-manifolds, with R. Akhmechet and V. Krushkal.  
*J. Reine Angew. Math.* 796 (2023), 269–299. arXiv:2109.14139
- On the involutive Heegaard Floer homology of negative semi-definite plumbed 3-manifolds with  $b_1 = 1$ .  
To appear in *Algebraic & Geometric Topology*. arXiv:2108.13548

### Awards

- Jefferson Scholars Foundation Research Prize, 2021.
- All-University Graduate Teaching Award, UVa 2020-2021.

## Talks Given

- Michigan Topology Intercity Symposium (MITIS), November 2023.
- AMS Spring Southeastern Sectional - Special Session on Contact and Symplectic Topology in Dimensions 3 and 4, March 2023.
- ICTP - Learning Workshop on BPS States and 3-Manifolds, March 2023.
- AMS Fall Southeastern Sectional - Special Session on Interactions Between 3- and 4-Manifolds, October 2022.
- Michigan State University - Geometry and Topology Seminar, October 2022.
- University of Richmond - Math and Computer Science Colloquium, February 2022.
- University of Michigan - Topology Seminar, January 2022.
- University of Virginia - Geometry Seminar, November 2021.
- Rutgers University - Topology/Geometry Seminar, September 2021 (virtual).
- University of Maryland - Geometry-Topology Seminar, September 2021.
- Michigan State University - Geometry and Topology Seminar, September 2021 (virtual).
- University of Alabama - Algebra-Topology Seminar, March 2021 (virtual).
- University of Virginia - Geometry Seminar, March 2021 (virtual).
- University of Virginia - Graduate Students Seminar, April 2020 (virtual).
- Georgia Tech Topology Conference - Lightning Talk, December 2019.

## Teaching

### Michigan State University:

- Spring 2024
  - Course coordinator for MTH 299 Transitions.
  - MTH 299 Transitions, 1 section.
- Fall 2023
  - MTH 132 Calculus I, 1 section.
  - MTH 132 Calculus I recitation, 2 sections and curriculum development.

- Spring 2023 - MTH 299 Transitions, 1 section.
- Fall 2022 - MTH 103A College Algebra I, 2 sections.

University of Virginia:

- Fall 2021 - MATH 1320 Calculus II, 1 section.
- Fall 2020 - MATH 1140 Financial Mathematics, 1 section.
- Fall 2018 - MATH 1320 Calculus II, 1 section.
- Spring 2018 - MATH 1210 A Survey of Calculus I (formerly called Applied Calculus I), 1 section.
- Fall 2017 - MATH 1210 A Survey of Calculus I (formerly called Applied Calculus I), 1 section.
- Spring 2017 - MATH 1210 A Survey of Calculus I (formerly called Applied Calculus I), 1 section.
- Fall 2016 - MATH 1310 Calculus I, 2 discussion sections.

Additional teaching experience:

- MSU Summer Topology Program 2023, Knot Theory mini course lecturer.
- UVa Directed Reading Program, mentor Spring 2021.
- UVa Research Experiences for Undergraduates (REU), teaching assistant Summer 2021 and Summer 2020.
- UVa Pre-semester Teaching Workshop, participant Summer 2021.
- UVa Teaching mentor for 2nd year math graduate students, Fall 2020 and Fall 2018.
- UVa Math Circle, teaching assistant Fall 2019 and Fall 2018.
- UVa Flipped Calculus Workshop, participant Summer 2018.

**Other Professional Activities**

- Co-organizer of Michigan State University Topology and RTG Seminars, 2022-2023 and 2023-2024.
- Participant in American Institute of Mathematics 4d Topology Community, Spring 2021 (virtual).

- Student in Current Progress in Low Dimensions Summer School: Institut des sciences mathématiques Université du Québec à Montréal, August 2019.
- Student in Park City Mathematics Institute Graduate Summer School: Quantum Field Theory and Manifold Invariants, Park City, Utah, June-July 2019.