

# Arik Wilbert

## Curriculum Vitae

Department of Mathematics & Statistics  
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### Research Interests

- Geometric & Combinatorial Representation Theory
- Categorification
- Low-Dimensional Topology & Topological Quantum Field Theory

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### Employment

- Since 2021/08 **Assistant Professor (Tenure-Track)**, *University of South Alabama, USA.*  
2019/08-2021/07 **Limited Term Assistant Professor**, *University of Georgia, USA.*  
2018/01-2019/07 **Research Fellow**, *University of Melbourne, Australia.*

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### Education

- 2013/10-2017/07 **Ph.D.**, *University of Bonn & Max Planck Institute for Mathematics (MPIM), Germany.*  
Advisor: *Prof. Dr. Catharina Stroppel*  
Thesis Title: *Two-row Springer fibers, foams and arc algebras of type D*  
(My Ph.D. was funded by a *Hausdorff Scholarship* of the *Bonn International Graduate School* and a scholarship of the *International Max Planck Research School*.)
- 2011/10-2013/09 **Master of Science**, *University of Bonn, Germany.*  
Advisor: *Prof. Dr. Catharina Stroppel*  
Thesis Title: *Khovanov homology from a geometric point of view*
- 2008/10-2011/09 **Bachelor of Science**, *University of Bonn, Germany.*  
Advisor: *Prof. Dr. Catharina Stroppel*  
Thesis Title: *Algebraic aspects of topological quantum field theories*

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### Visiting Positions

- 2019/06 **Member**, *Institute for Advanced Study, Princeton, USA.*  
Participant in the “Summer Collaborators Program” (jt. with M. S. Im, C.-J. Lai and J. Zhu)
- 2017/10-2017/12 **Visitor**, *Hausdorff Research Institute for Mathematics (HIM), Bonn, Germany.*  
Participant in the Junior Hausdorff Trimester Program “Symplectic geometry and representation theory”

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### Grants

- 2023/07-2026/06 AMS-Simons PUI Grant (\$9,000)

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### Publications & Preprints

#### *Journal Articles:*

- **Exotic Springer fibers for orbits corresponding to one-row bipartitions**, (jt. with N. Saunders), arXiv:1810.03731, *Transform. Groups* **27** (2022), 1111-1147
- **Irreducible components of two-row Springer fibers for all classical types**, (jt. with M. S. Im and C.-J. Lai), arXiv:2011.13138, *Proc. Amer. Math. Soc.* **150** (2022), 2415-2432
- **A study of irreducible components of Springer fibers using quiver varieties**, (jt. with M. S. Im and C.-J. Lai), arXiv:2009.08778, *J. Algebra* **591** (2022), 217-248
- **Real Springer fibers and odd arc algebras**, (jt. with J. N. Eberhardt and G. Naisse), arXiv:2003.07297, *J. Lond. Math. Soc.* **103** (2021), 1415-1452
- **Singular TQFTs, foams and type D arc algebras**, (jt. with M. Ehrig and D. Tubbenhauer), arXiv:1611.07444, *Doc. Math.* **24** (2019), 1585-1655

- **Two-block Springer fibers of types C and D: a diagrammatic approach to Springer theory**,  
(jt. with C. Stroppel),  
arXiv:1611.09828, Math. Z. **292** (2019), no. 3-4, 1387-1430
  - **Topology of two-row Springer fibers for the even orthogonal and symplectic group**,  
arXiv:1511.01961, Trans. Amer. Math. Soc. **370** (2018), no. 4, 2707-2737
- Preprints:*
- **Irreducible components of two-row Springer fibers and Nakajima quiver varieties\***,  
(jt. with M. S. Im and C.-J. Lai),  
arXiv:1910.03010, 2019  
\*not intended for publication; this paper is superseded by “Springer fibers via quiver varieties using Maffei-Nakajima isomorphism” and “Irreducible components of two-row Springer fibers for all classical types”
- Conference Proceedings:*
- **Topology of two-row Springer fibers for the even orthogonal group**,  
Oberwolfach Reports, Volume 12, Issue 2, 2015

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### Membership on Editorial Boards

2021-2023 **Editor** (jt. with M. S. Im and B. Nguyen) of the volume *Geometric and Algebraic Aspects of Quantum Groups and Related Topics* (to appear in 2024) as part of the AMS *Contemporary Mathematics* series

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### Teaching Experience

**University of South Alabama** *I taught or am currently teaching the following courses as the **instructor of record**:*

- **MA 125 Calculus I**  
Fall 2023 (2 sections), Spring 2022 (1 section), Fall 2021 (2 sections)
- **MA 126 Calculus II**  
Spring 2022 (2 sections)
- **MA 227 Calculus III**  
Spring 2023 (1 section), Fall 2022 (1 section)
- **MA 511 Algebra I**  
Fall 2023 (1 section)
- **MA 535 Real Analysis I**  
Fall 2022 (1 section)
- **MA 536 Real Analysis II**  
Spring 2023 (1 section)

**University of Georgia** *I taught the following courses as the **instructor of record**:*

- **MATH 1113 Precalculus (Flipped Classroom)**  
Fall 2019 (2 sections)
- **MATH 2250 Calculus I**  
Spring 2020 (2 sections), Fall 2020 (2 sections)
- **MATH 8030 Topics in Algebra**  
*Topic: Representation Theory of Finite-Dimensional Algebras and Quivers*  
Spring 2021 (1 section)
- **MATH 8930 Seminar in Algebraic Geometry**  
*Topic: Link Invariants, Categorification, and Algebraic Geometry*  
Summer 2020 (1 section)

**University of Melbourne** *I taught the following courses and co-organized the following learning seminars as the **instructor of record**:*

- **MAST10006 Calculus 2**  
Semester 2 2018 (1 section)
- **MAST90097 Algebraic Geometry (co-taught with A. Ram)**  
Semester 2 2018 (1 section)

- **Undergraduate Student Seminar in Algebra**  
*Topic: Coxeter Groups and Hecke Algebras*  
Semester 1 2019 (1 section)
- **Graduate Student Seminar in Topology**  
*Topic: Cohomology Operations and the Steenrod Algebra*  
Semester 1 2018 (1 section)

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## Student Mentoring

### Master's Thesis Students:

- Since 2023 Brandon Sisler, *University of South Alabama*  
Working Title: "Model categories and quiver representations"
- 2022–2023 Adella Herron, *University of South Alabama*  
Thesis Title: "The web and polytabloid bases"  
(now doing a Ph.D. at the University of Alabama at Birmingham)
- 2019–2020 Matthew Hamil, *University of Georgia* (co-advised with B. D. Boe)  
Thesis Title: "On parabolic Kazhdan-Lusztig polynomials"  
(now doing a Ph.D. at the University of Georgia)

### Undergraduate Research:

- 2020–2021 Rose Friend, *University of Georgia (Mathematics Undergraduate Research Program)*  
Project Title: "A categorification of the Jones polynomial"  
\*\*Rose presented her work at the campus-wide *CURO Undergraduate Research Symposium* and won the *Mathematics Undergraduate Research Award* at UGA\*\*  
(now an ACT/SAT Prep Tutor with Edison Prep)

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## Research Talks (Selection)

*Here is a selection of past and future research talks:*

- 2023/11 **Xavier University of Louisiana**, New Orleans, USA  
*Colloquium*
- 2023/09 **University at Buffalo - SUNY**, Buffalo, USA  
*Talk at the AMS special session "Combinatorial and Categorical Techniques in Representation Theory"*
- 2023/05 **North Carolina State University**, Raleigh, USA  
*20-minute talk at the "13th Southeastern Lie Theory Workshop"*
- 2023/04 **University of Cincinnati**, Cincinnati, USA  
*Talk at the AMS special session "Representation Theory, Geometry and Mathematical Physics"*
- 2023/03 **Tulane University**, New Orleans, USA  
*Talk at the "Southern Regional Algebra Conference 2023 (SRAC 2023)"*
- 2023/03 **Georgia Tech**, Atlanta, USA  
*Talks at the AMS special sessions "Geometric and Combinatorial Aspects of Lie Theory" and "Representation Theory of Algebraic Groups and Quantum Groups: A Tribute to Cline-Parshall-Scott (CPS)"*
- 2022/05 **University of Georgia**, Athens, USA  
*Talk at the conference "2022 Georgia Topology Conference"*
- 2022/04 **University of Virginia**, Charlottesville, USA  
*Talk at the workshop "Categorical Methods in Representation Theory and Quantum Topology"*
- 2022/04 **University of Massachusetts**, Lowell, USA  
*Colloquium (ON ZOOM)*
- 2022/03 **Georgia College & State University**, Milledgeville, USA  
*Talk at the "Southern Regional Algebra Conference 2022 (SRAC 2022)"*
- 2022/03 **University of Georgia**, Athens, USA  
*Topology Seminar*
- 2022/02 **University of South Alabama**, Mobile, USA  
*Lecture Series (seven 60-minute talks) on "Categorification"*
- 2021/11 **Okinawa Institute of Science and Technology**, Okinawa, Japan  
*OIST Representation Theory Seminar (ON ZOOM)*
- 2021/10 **College of Charleston**, Charleston, USA  
*20-minute talk at the "Southeastern Lie Theory Workshop XII"*

- 2021/01 **Academia Sinica**, Taipei, Taiwan  
*Lecture Series (five 60-minute talks) on “Categorification” (ON ZOOM)*
- 2020/03 **University at Buffalo - SUNY**, Buffalo, USA  
*Algebra Seminar*
- 2019/11 **University of California - Riverside**, USA  
*Talks at the AMS special sessions “Geometric Methods in Representation Theory” and “Geometry and Representation Theory of Quantum Algebras and Related Topics”*
- 2019/09 **University of Georgia**, Athens, USA  
*Lecture Series (three 50-minute talks) on “Kazhdan-Lusztig polynomials, Springer fibers and arc algebras”*
- 2019/01 **Vrije Universiteit**, Brussels, Belgium  
*25-minute talk at the conference “Aspects of Higher Representation Theory: Quantum Groups and Categorification”*
- 2019/01 **Erwin Schrödinger International Institute for Mathematics and Physics**, Vienna, Austria  
*Talk at the workshop “Categorification in quantum topology and beyond”,*
- 2018/09 **University of Zürich**, Switzerland  
*Talk at the conference “Interactions of low-dimensional topology and higher representation theory”*
- 2018/09 **University of Sydney**, Australia  
*Algebra Seminar*
- 2018/06 **University of Georgia**, Athens, USA  
*20-minute talk at the “Southeastern Lie Theory Workshop X”*
- 2018/06 **The Catholic University of America**, Washington D.C., USA  
*15-minute talk at the conference “Interactions of quantum affine algebras with cluster algebras, current algebras and categorification”*
- 2018/04 **University of Auckland**, New Zealand  
*Geometry Seminar*
- 2018/03 **Australian National University (ANU)**, Canberra, Australia  
*Algebra and Topology Seminar*
- 2018/02 **University of Melbourne**, Australia  
*Topology Seminar*
- 2017/12 **Macquarie University**, Sydney, Australia  
*Sectional speaker at the 61st Annual Meeting of the Australian Mathematical Society (AustMS 2017)*
- 2017/11 **Hausdorff Research Institute for Mathematics**, Bonn, Germany  
*Talk at the workshop “Categorification, representation theory and symplectic geometry”,*
- 2017/06 **University of London - City**, England  
*London Algebra Colloquium*
- 2017/06 **University of Freiburg**, Germany  
*Oberseminar: Algebra, Zahlentheorie und algebraische Geometrie*
- 2017/04 **Columbia University**, New York City, USA  
*Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar*
- 2017/04 **University of Virginia**, Charlottesville, USA  
*Geometry Seminar*
- 2017/04 **University of North Carolina**, Chapel Hill, USA  
*Geometric Methods in Representation Theory Seminar*

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### Service (Mathematical Community)

- **Referee** for the journals: *Algebras and Representation Theory*; *Contemporary Mathematics*; *International Mathematics Research Notices (IMRN)*; *Journal of Algebra*; *Journal of Combinatorial Theory - Series A*; *Journal of Pure and Applied Algebra*; *Manuscripta Mathematica*; *Transformation Groups* (3 ×)

- **Co-organizer** of the following AMS special sessions:
  - “*Diagrammatic Algebras and Related Topics*” at San Francisco State University (May 2024)
  - “*Categorical Representations, Quantum Algebra, and Related Topics*” at the University of South Alabama (October 2023)
  - “*Geometry and Representation Theory of Quantum Algebras and Related Topics*” at the University of Utah (October 2022)
  - “*Geometric and Algebraic Aspects of Quantum Groups and Related Topics*” formerly at the University of South Alabama, moved online (November 2021)
  - “*Categorical and Combinatorial Methods in Representation Theory, and Related Topics*” formerly at San Francisco State University, moved online (May 2021)
  - “*Geometry, Combinatorics, and Representation Theory of Quantum Groups and Related Topics*” formerly at the University of Utah, moved online (October 2020)

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## Service (University of South Alabama)

### College Committees:

Spring 2024 **2024 Arts and Sciences Support and Development Award Committee (Member)**

(select awardees for the internal Arts and Sciences Support and Development grant)

### Departmental Committees:

Since Fall 2023 **Colloquium Committee (Chair)**

(manage department colloquiums and seminars, organize Mishra Memorial Lectures, maintain colloquia/seminar information on the department website)

Fall 2023 **AMS Meeting Local Organizing Committee (Member)**

(help organize the 2023 AMS Fall Southeastern Sectional Meeting at the University of South Alabama)

Since Fall 2021 **Scholarship Committee (Member)**

(recommend students for departmental scholarships/awards, oversee annual math competition for undergraduate students, identify and encourage students to apply for different scholarships and help them with the application process)

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## Service (University of Georgia)

2019/08-2021/07 **Co-organizer** of the *Algebra Seminar*

(selected and invited speakers to give research talks, created a Youtube channel for the seminar, [www.youtube.com/channel/UCkuDot-tLWcIX9W8ql0DGmw](http://www.youtube.com/channel/UCkuDot-tLWcIX9W8ql0DGmw))

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## Outreach

10/09/2023 **Mobile Math Circle**

(organized a session on knot coloring for middle and high school students)

05/13/2023 **Panel Discussion about the Job Market at the SE Lie Theory Workshop**

(participated in a panel discussion about trends and experiences on the job market with Chelsea Walton and Richard Ng)