

Arik Wilbert, Ph.D.
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Research Interests

Geometric & combinatorial representation theory, categorification, low-dimensional topology and TQFT

Academic Appointments

Since 2021/08	Assistant Professor (tenure-track) , <i>University of South Alabama</i>
2019/08 – 2021/07	Limited Term Assistant Professor , <i>University of Georgia</i>
2018/01 – 2019/07	Research Fellow , <i>University of Melbourne</i> , Australia

Education & Training

2013/10 – 2017/07	Ph.D. Mathematics , <i>University of Bonn & Max Planck Institute for Mathematics (MPIM)</i> , Germany Advisor: Catharina Stroppel; Thesis: Two-row Springer fibers, foams and arc algebras of type D
2011/10 – 2013/09	Master of Science Mathematics , <i>University of Bonn</i> , Germany Advisor: Catharina Stroppel; Thesis: Khovanov homology from a geometric point of view
2008/10 – 2011/09	Bachelor of Science Mathematics , <i>University of Bonn</i> , Germany Advisor: Catharina Stroppel; Thesis: Algebraic aspects of topological quantum field theories

Visiting Positions

2024/06 – 2024/07	Instructor , <i>Massachusetts Institute of Technology (MIT)</i> Taught Multivariable Calculus in the MITES Summer Program
2019/06	Member , <i>Institute for Advanced Study</i> , Princeton Participant in the Summer Collaborator's Program (jt. with M. S. Im, C.-J. Lai, J. Zhu)
2017/10 – 2017/12	Visitor , <i>Hausdorff Research Institute for Mathematics (HIM)</i> , Bonn, Germany Participant in the Junior Hausdorff Trimester Program on <i>Symplectic geometry and representation theory</i>

Grants

External Funding

[1] AMS–Simons PUI Grant (2023-2026), \$10,800

Internal Funding

- [2] Arts and Sciences Summer Professional Development Grant, *Deep Learning Knot Theory*, 2024, \$5,000
[3] (with Co-PI J. Furno) Arts and Sciences Support and Development Grant, *Mathematics Colloquium and Seminar Series 2023*, \$1,000
[4] (with Co-PI J. Furno) Arts and Sciences Support and Development Grant, *Mathematics Colloquium and Seminar Series 2022*, \$1,500

Publications & Preprints

Journal Articles

- [1] N. Saunders and A. Wilbert, *Exotic Springer fibers for orbits corresponding to one-row bipartitions*, *Transform. Groups* **27** (2022), 1111–1147.
[2] M. S. Im, C.-J. Lai, and A. Wilbert, *Irreducible components of two-row Springer fibers for all classical types*, *Proc. Amer. Math. Soc.* **150** (2022), 2415–2432.

- [3] M. S. Im, C.-J. Lai, and A. Wilbert, *A study of irreducible components of Springer fibers using quiver varieties*, J. Algebra **591** (2022), 217–248.
- [4] J. N. Eberhardt, G. Naisse, and A. Wilbert, *Real Springer fibers and odd arc algebras*, J. Lond. Math Soc. **103** (2021), 1415–1452.
- [5] M. Ehrig, D. Tubbenhauer, and A. Wilbert, *Singular TQFTs, foams and type D arc algebras*, Doc. Math. **24** (2019), 1585–1655.
- [6] C. Stroppel and A. Wilbert, *Two-block Springer fibers of types C and D: a diagrammatic approach to Springer theory*, Math. Z. **292** (2019), no. 3–4, 1387–1430.
- [7] A. Wilbert, *Topology of two-row Springer fibers for the even orthogonal and symplectic group*, Trans. Amer. Math. Soc. **370** (2018), no. 4, 2707–2737.

Preprints

- [8] A. Lacabanne, P. Vaz, and A. Wilbert, *Two-row Delta Springer varieties*, 2024, 32 pages.
- [9] M. S. Im, C.-J. Lai, and A. Wilbert, *Irreducible components of two-row Springer fibers and Nakajima quiver varieties*, 2019, 30 pages, not intended for publication (superseded by [2] and [3]).

Conference Proceedings

- [10] A. Wilbert, *Topology of two-row Springer fibers for the even orthogonal group*, Oberwolfach Reports, Volume 12, Issue 2, 2015.

Books

- [11] M. S. Im, B. Nguyen, and A. Wilbert, *Geometric and Algebraic Aspects of Quantum Groups and Related Topics*, AMS Contemporary Mathematics, Volume 791, 2024, 227 pages.

Teaching Experience

University of South Alabama	Precalculus Algebra Calculus I Calculus II Calculus III Real Analysis I (Graduate Course) Real Analysis II (Graduate Course) Algebra I (Graduate Course) Algebra II (Graduate Course)
Massachusetts Institute of Technology (MIT)	Multivariable Calculus
University of Georgia	Precalculus (Flipped Classroom) Calculus I Topics in Algebra (Graduate Course) Seminar in Algebraic Geometry (Graduate Course)
University of Melbourne	Calculus II Undergraduate Seminar in Algebra Algebraic Geometry (Graduate Course) Graduate Seminar in Topology

Student Supervision

Graduate Students	Master’s Students: <ul style="list-style-type: none"> • Brandon Sisler, <i>University of South Alabama</i>, 2024 Thesis Title: “Model categories and Gorenstein rings” → now doing a Ph.D. at the University of Virginia • Adella Herron, <i>University of South Alabama</i>, 2023 Thesis Title: “The web and polytabloid bases” → now doing a Ph.D. at the University of Alabama - Birmingham
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- Matthew Hamil, *University of Georgia* (co-advised with Brian D. Boe), 2020
Thesis Title: “On parabolic Kazhdan–Lusztig polynomials”
→ now doing a Ph.D. at the University of Georgia
- Undergraduate Students
- UGA Mathematics Undergraduate Research Program:**
- Rose Friend, *University of Georgia*, 2021
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

Research Talks

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| 2024 | May | University of Georgia
<i>Contributed talk at the conference “Representation Theory and Related Geometry: Progress and Prospects”</i> |
| 2024 | Apr | University of Georgia
<i>Algebra Seminar</i> |
| 2024 | Mar | University of Houston - Downtown
<i>Talk at the “Southern Regional Algebra Conference 2024 (SRAC 2024)”</i> |
| 2024 | Mar | Tulane University
<i>Algebraic Geometry and Geometric Topology Seminar</i> |
| 2023 | Nov | Xavier University of Louisiana
<i>Colloquium</i> |
| 2023 | Sep | University of Buffalo - SUNY
<i>Talk at the AMS special session “Combinatorial and Categorical Techniques in Representation Theory”</i> |
| 2023 | May | North Carolina State University
<i>20-minute talk at the “13th Southeastern Lie Theory Workshop”</i> |
| 2023 | Apr | University of Cincinnati
<i>Talk at the AMS special session “Representation Theory, Geometry and Mathematical Physics”</i> |
| 2023 | Mar | Tulane University
<i>Talk at the “Southern Regional Algebra Conference 2023 (SRAC 2023)”</i> |
| 2023 | Mar | Georgia Institute of Technology
<i>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)”</i> |
| 2022 | May | University of Georgia
<i>Talk at the conference “2022 Georgia Topology Conference”</i> |
| 2022 | Apr | University of Virginia
<i>Talk at the workshop “Categorical Methods in Representation Theory and Quantum Topology”</i> |
| 2022 | Apr | University of Massachusetts - Lowell (online)
<i>Colloquium</i> |
| 2022 | Mar | Georgia College & State University
<i>Talk at the “Southern Regional Algebra Conference 2022 (SRAC 2022)”</i> |
| 2022 | Mar | University of Georgia
<i>Topology Seminar</i> |
| 2022 | Feb | University of South Alabama
<i>Lecture Series (seven 60-minute talks) on “Categorification”</i> |
| 2021 | Nov | Okinawa Institute of Science and Technology , Okinawa, Japan (online)
<i>OIST Representation Theory Seminar</i> |
| 2021 | Oct | College of Charleston
<i>20-minute talk at the “Southeastern Lie Theory Workshop XII”</i> |
| 2021 | Jan | Academia Sinica , Taipei, Taiwan (online)
<i>Five 60-minute lectures on “Categorification”</i> |
| 2020 | Mar | University at Buffalo - SUNY
<i>Algebra Seminar</i> |
| 2019 | Nov | University of California - Riverside
<i>Talks at the AMS special sessions “Geometric Methods in Representation Theory” and “Geometry and Representation Theory of Quantum Algebras and Related Topics”</i> |
| 2019 | Sep | University of Georgia
<i>Lecture Series (three 50-minute talks) on “Kazhdan–Lusztig polynomials, Springer fibers, and arc algebras”</i> |

2019	Jan	Vrije Universiteit , Brussels, Belgium <i>25-minute talk at the conference “Aspects of Higher Representation Theory: Quantum Groups and Categorification”</i>
2019	Jan	Erwin Schrödinger International Institute for Mathematics and Physics , Vienna, Austria <i>Talk at the workshop “Categorification in quantum topology and beyond”</i>
2018	Sep	University of Zürich , Switzerland <i>Talk at the conference “Interactions of low-dimensional topology and higher representation theory”</i>
2018	Sep	University of Sydney , Australia <i>Algebra Seminar</i>
2018	Jun	University of Georgia <i>20-minute talk at the “Southeastern Lie Theory Workshop X”</i>
2018	Jun	The Catholic University of America <i>15-minute talk at the conference “Interactions of quantum affine algebras with cluster algebras, current algebras and categorification”</i>
2018	Apr	University of Auckland , New Zealand <i>Geometry Seminar</i>
2018	Mar	Australian National University (ANU) , Canberra, Australia <i>Algebra and Topology Seminar</i>
2018	Feb	University of Melbourne , Australia <i>Topology Seminar</i>
2017	Dec	Macquarie University , Sydney, Australia <i>Sectional speaker at the 61st Annual Meeting of the Australian Mathematical Society (AustMS 2017)</i>
2017	Nov	Hausdorff Research Institute for Mathematics , Bonn, Germany <i>Talk at the workshop “Categorification, representation theory and symplectic geometry”</i>
2017	Jun	University of London - City , England <i>London Algebra Colloquium</i>
2017	Jun	University of Freiburg , Germany <i>Oberseminar: Algebra, Zahlentheorie und algebraische Geometrie</i>
2017	Apr	Columbia University <i>Symplectic Geometry, Gauge Theory, and Categorification Seminar</i>
2017	Apr	University of Virginia <i>Geometry Seminar</i>
2017	Apr	University of North Carolina - Chapel Hill <i>Geometric Methods in Representation Theory Seminar</i>

Outreach Activities

2023	Oct	Talk at the Mobile Math Circle <i>Interactive introduction to knot coloring for middle and high school students</i>
2023	May	Panelist (SE Lie Theory Workshop 2023) <i>Participant in a panel discussion with two other mathematicians sharing experiences on the job market</i>

Industry Experience

2017/8 – 2017/9	Visiting Consultant , <i>d-fine GmbH</i> , Frankfurt, Germany Implementation and testing of a new credit risk software for a major German energy company
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Service & Leadership

- **Peer reviewer** for the journals:
 - Algebras and Representation Theory
 - Contemporary Mathematics (2 x)
 - 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 x)

- **Organizer** of *Special Sessions* at the following *American Mathematical Society (AMS) Sectional Meetings*:

Georgia Southern University (October 2024)
 San Francisco State University (May 2024)
 University of South Alabama (October 2023)
 University of Utah (October 2022)
 University of South Alabama (November 2021 - Online)
 San Francisco State University (May 2021 - Online)
 University of Utah (October 2020 - Online)

Committee Work (University of South Alabama)

College Committees	<ul style="list-style-type: none"> • Arts and Sciences Summer Development Award Committee, 2025 Select awardees for the 2025 A&S Summer Professional Development Grant • Arts and Sciences Support and Development Award Committee, 2024 Select awardees for the 2024 A&S Support and Development Grant
Department Committees	<ul style="list-style-type: none"> • Colloquium Committee (Chair), 2023-today Manage department colloquia and seminars, organize Mishra Memorial Lectures, maintain colloquia/seminar information on the department website • Hiring Committee, 2023-2024 Fill one tenure-track position in mathematics • AMS Meeting Local Organizing Committee, 2023 Help organize the 2023 AMS Fall Southeastern Sectional Meeting at the University of South Alabama • Scholarship Committee, 2021-2024 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