

# Carl Mautner

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## CONTACT INFORMATION

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## EMPLOYMENT AND EDUCATION

**Associate Professor**, University of California, Riverside  
As of July 2020

**Assistant Professor**, University of California, Riverside  
January 2015 - June 2020

**Visiting Lecturer**, Dartmouth College  
Fall 2019 - Spring 2020

**Visiting Postdoctoral Researcher**, Max-Planck-Institut für Mathematik in Bonn  
Fall 2013 - Summer 2014

**NSF Mathematical Sciences Postdoctoral Research Fellow**  
Harvard University, Sponsoring Scientist: Dennis Gaitsgory  
Fall 2010 - Summer 2013.

**University of Texas at Austin** Ph.D. in Mathematics, May 2010  
Thesis: Sheaf Theoretic Methods in Modular Representation Theory  
Advisor: David Ben-Zvi

**University of California - Berkeley** BA in Pure Mathematics with Honors  
Minor in Russian Language, Literature, and Culture, May 2005.

## GRANTS AND AWARDS

National Science Foundation Grant DMS - 1802299, \$167,104, 2018-2023.

National Science Foundation Conference Grant 2003536, \$18,750.

Simons Foundation Collaboration Grant, \$42,000, 2017-2022. (Declined in 2018 to accept NSF grant)

Frank Gerth III Graduate Dissertation Award from the Department of Mathematics at UT Austin.

## EXTENDED RESEARCH VISITS

Mathematical Sciences Research Institute in Berkeley, Program on Geometric Representation Theory, Fall 2014.

Institute for Advanced Studies at the Hebrew University in Jerusalem, 'Langlands Duality in Representation Theory and Gauge Theory,' Fall 2010.

Institute for Advanced Study in Princeton, 'New Connections of Representation Theory to Algebraic Geometry and Physics,' Spring 2008.

## PAPERS AND PREPRINTS

**Perverse sheaves on symmetric products of the plane**, (with T. Braden)  
*preprint*, [arXiv:2208.14351](https://arxiv.org/abs/2208.14351).

**Category  $\mathcal{O}$  for oriented matroids**, (with E. Kowalenko)

preprint, [arXiv:2102.11320](https://arxiv.org/abs/2102.11320).

**Ringel duality for perverse sheaves on hypertoric varieties**, (with T. Braden)  
*Advances in Mathematics*, 344 (2019), 35–98.

**Matroidal Schur algebras**, (with T. Braden)  
*J. Algebraic Combin.* 46 (2017), no. 1, 51–75.

**Affine pavings and the enhanced nilpotent cone**,  
*Proc. Amer. Math. Soc.* 145 (2017), no. 4, 1393–1398.

**Exotic tilting sheaves, parity sheaves on affine Grassmannians, and the Mirković-Vilonen conjecture**, (with S. Riche)  
*J. Eur. Math. Soc.* 20 (2018), no. 9, 2259–2332.

**On the exotic t-structure in positive characteristic**, (with S. Riche)  
*Int. Math. Res. Not.* (2016), no. 18, 5727–5774.

**Parity sheaves and tilting modules**, (with D. Juteau and G. Williamson)  
*Ann. Sci. Éc. Norm. Supér.* (4) 49 (2016), no. 2, 257–275.

**A geometric Schur functor**,  
*Selecta Math. New Ser.* (2014) 20:961–977, doi: 10.1007/s00029-014-0147-9,

**Sheaves on nilpotent cones, Fourier transform, and a geometric Ringel duality**,  
(with P. N. Achar) *Mosc. Math. J.* 15 (2015), no. 3, 407–423.

**Parity sheaves**, (with D. Juteau and G. Williamson)  
*J. Amer. Math. Soc.* 27 (2014), 1169–1212.

**Perverse sheaves and modular representation theory**, (with D. Juteau and G. Williamson)  
*Séminaires et Congrès 24-II* (2012), 313–350.

#### ADVISING

Ethan Kowalenko (PhD, Spring 2021)

#### PROFESSIONAL ACTIVITIES

- Co-organizer, *Geometric Representation Theory: a double conference*, Perimeter Institute/Max Planck Institute for Mathematics, June 2020. (switched to on-line format)
- Co-organizer, *Workshop on Geometry and Representation Theory*, UC Riverside, December 2019.
- Co-organizer, *Riverside Mathematics Workshop for Excellence and Diversity*, UC Riverside, October 2018.
- Co-organized AIM workshop, *Sheaves and modular representations of reductive groups*, American Institute of Mathematics, March 2016.
- Local co-organizer for a workshop on *Lie Groups, Lie Algebras and their Representations*, UC Riverside, February 2015.
- Co-organized a learning workshop on the Hitchin fibration and fundamental lemma in Dunroon, Ontario, August 2010.
- Co-organized the *Austin Winter Workshop on Knot Theory and Representations*, Jan 2006.
- Referee for *J. Amer. Math. Soc.*, *Compositio Mathematica*, *Annales de l'ENS*, *Advances Math.*, *Mathematische Zeitschrift*, *Selecta Math.*, *Transactions of the AMS*, *Proceedings of*

*the AMS, Transformation Groups, Journal of Algebra, Journal of Pure and Applied Algebra, Pacific Journal of Mathematics.* Reviewer for *Zentralblatt MATH*.

- Served on NSF grant review panel.
- Served on review panel for UC MEXUS-CONACYT Collaborative Grant and Postdoctoral Fellowship applications.

DEPARTMENT  
SERVICE

- Mentoring Committee (2021– )
- Graduate Admissions Committee (2019)
- Department Representative to MSRI (2017-2019)
- Hiring Committee in Pure Math (2015-2016, 2016-2017)
- Visiting Assistant Professor Hiring Committee (2015, 2022)
- Undergraduate Committee (2015-2019)

UNIVERSITY  
SERVICE

- Chancellor Research Fellowship Selection Committee (for undergraduate research) 2018, 2019.
- Academic Integrity Committee (2018-)

TEACHING  
EXPERIENCE

- *Undergraduate Courses at UC Riverside:*
  - First-Year Calculus (9A, 9B)
  - Linear Algebra I,II (131,132)
  - Modern Algebra II (172)
  - First-Year Learning Community Seminar (NASC 93)
- *Graduate Courses at UC Riverside:*
  - Algebra (201C)
  - Topology (205B)
  - Algebraic Analysis (226)
  - Algebraic Geometry (243A)
  - Algebraic Topology (246A and 246B)
  - Representation Theory of Finite Groups (260)
- *at Dartmouth:*
  - Accelerated Multivariable Calculus (11)
  - Linear Algebra with Applications (22)
- *at Harvard:* Toric Varieties (232br) and Perverse Sheaves (262y).
- *at UT Austin:* Teaching Assistant for Vector Calculus (M427L-AP), Introduction to Differential Equations (M427K and M427K-H), and Linear Algebra (M341 and M341-H).

INVITED LECTURE  
SERIES

- **Institute of Mathematics, Chinese Academy of Sciences, Beijing**, two week course, 17 hours of lectures, *Applications of Parity Sheaves to the Modular Representation Theory of Reductive Groups*, August, 2018.
- **Lunts dacha seminar, Moscow, Russia**, 3 lectures, *Representations of algebraic groups: constructible, coherent and categorical viewpoints*, July 2019.

SEMINAR AND  
CONFERENCE TALKS  
SINCE APRIL 2014

- **Northeastern University**, Geometry, Physics, and Representation Theory Seminar, December 2022.
- **MIT**, Lie Groups Seminar, November 2022.
- **Université du Québec à Montréal**, Algebraic Geometry Seminar, October 2022.
- **AMS Virtual Sectional Meeting in Medford, MA**, March 2022.
- **Universität Bonn**, Oberseminar Darstellungstheorie, May 2021.
- **Cornell University**, Algebraic Geometry and Representation Theory Seminar, November 2020.
- **University of Calgary**, Algebra and Number Theory Seminar, November 2020.
- **University of Massachusetts, Amherst**, Representation Theory Seminar, April 2020.
- **MIT**, Lie Groups Seminar, April 2020.
- (cancelled) **AMS Sectional Meetings in Charlottesville, VA and Medford, MA**, March 2020.
- **Clay Workshop on Modular Representation Theory**, Oxford, October 2019.
- **Yale University**, Geometry, Symmetry and Physics, September 2019.
- **Springer Fibres and Geometric Representation Theory**, Workshop at University of Greenwich, August 2019.
- **UC Berkeley**, Representation Theory and Mathematical Physics Seminar, April 2019.
- **AMS Western/Central Sectional Meeting**, Special Session, Honolulu, March 2019.
- **Université Clermont Auvergne**, Géométrie, Algèbre, Algèbres d'opérateurs, September 2018.
- **University of British Columbia**, Algebraic Geometry Seminar, March 2018.
- **Caltech**, Algebra and Geometry Seminar, February 2018.
- **University of Sydney**, Algebra Seminar, September 2017.
- **University of Melbourne**, Pure Mathematics Seminar, August 2017.
- **University of Queensland**, Pure Mathematics Seminar, August 2017.
- **Dartmouth College**, Combinatorics Seminar, April 2017.
- **AMS Southeastern Sectional Meeting**, Special Session, Charleston, March 2017.
- **Joint Mathematics Meetings**, AMS Special Session on Representation Theory of Algebraic Groups, Seattle, January 2016.
- **Shanghai Conference on Representation Theory**, Shanghai, China, December 2015.
- **University of Southern California**, Algebra Seminar, October 2015.
- **University of Massachusetts, Amherst**, Workshop on Springer Theory and Related Topics, October 2015.
- **Park City Mathematics Institute**, Research Seminar, July 2015.
- **Caltech**, Algebraic Geometry Seminar, May 2015.
- **MSRI Berkeley**, Geometric Representation Theory Member Seminar, December 2014.
- **Friedrich-Schiller-Uni. Jena**, Reprs. of Alg. Groups and Related Objects, September 2014.
- **Université de Lyon**, Workshop: Representations of algebraic groups, July 2014.
- **Emmy-Noether-Zentrum, Erlangen**, Seminar on Conformal Field Theory, June 2014.
- **University of Glasgow**, Algebra Seminar, May 2014.
- **University of Edinburgh**, Algebra Seminar, May 2014.

- **Université Denis-Diderot (Paris 7)**, Quiver Varieties and Geom. Rep. Theory, April 2014.