

Matthew B. Day

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Department of Mathematical Sciences, SCEN 309
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Date of birth: May 17th, 1981

Citizenship: U.S.A.

Research interests: geometric group theory, combinatorial group theory, low dimensional topology, mapping class groups, right-angled Artin groups, automorphism groups of groups, braid groups

Employment:

- 2011–present **The University of Arkansas**, Fayetteville, AR
Department of Mathematical Sciences
Assistant Professor (2011–2016),
Associate Professor (2016–present)
- 2008–2011 **The California Institute of Technology**, Pasadena, CA
Department of Mathematics
National Science Foundation Postdoctoral Scholar (2008–2011)
Taussky-Todd Instructor (2010–2011)

Education:

- 2002–2008 **The University of Chicago**, Chicago, IL
Ph.D. in Mathematics, June 2008 (Advisor: Benson Farb)
M.S. in Mathematics, August 2004
- 1998–2002 **The University of Texas at Austin**, Austin, TX
B.S. in Mathematics, B.A. double major in Linguistics and Philosophy,
May 2002, with highest honors

Research papers in refereed journals (continues on page 2):

1. *Quotients of the braid group that are extensions of the symmetric group*, joint with Trevor Nakamura, Journal of Pure and Applied Algebra, Volume 229, Issue 12, 2025, 108138, 46 pages.
2. *A 3-skeleton for a classifying space for the symmetric group*, joint with Trevor Nakamura, Journal of Computational Algebra, Volume 15, 2025, 100038, 28 pages.
3. *Calculating the virtual cohomological dimension of the automorphism group of a RAAG*, joint with Richard D. Wade and Andrew W. Sale, Bulletin of the London Mathematical Society 53 (1), 2021, 259-273.
4. *Relative automorphism groups of right-angled Artin groups*, joint with Richard D. Wade, Journal of Topology, 12 (3), 2019, 759-798.
5. *Subspace arrangements, BNS invariants, and pure symmetric outer automorphisms of right-angled Artin groups*, joint with Richard D. Wade, Groups, Geometry and Dynamics 12 (2018), no. 1, 173–206.

6. *On the second homology group of the Torelli subgroup of $Aut(F_n)$* , joint with Andrew Putman, *Geometry & Topology* 21-5 (2017), 2851-2896.
7. *A Birman exact sequence for the Torelli subgroup of $Aut(F_n)$* , joint with Andrew Putman, *International Journal of Algebra and Computation* 26, 03 (2016), 585-617.
8. *Full-featured peak reduction in right-angled Artin groups*, *Algebraic & Geometric Topology* 14 (2014), pp 1677-1743.
9. *A Birman exact sequence for $Aut(F_n)$* , with Andrew Putman, *Advances in Mathematics* 231 (1), 2012, pp 243-275.
10. *The complex of partial bases for F_n and finite generation of the Torelli subgroup of $Aut(F_n)$* , with Andrew Putman, *Geometriae Dedicata* 164 (1), 2013, pp 139-153.
11. *Finiteness of outer automorphism groups of random right-angled Artin groups*, *Algebraic & Geometric Topology* 12, 2012, pp 1553–1583.
12. *On solvable subgroups of automorphism groups of right-angled Artin groups*, *International Journal of Algebra and Computation* 21 (61), 2011, pp 61-70.
13. *Extensions of Johnson's and Morita's homomorphisms that map to finitely generated abelian groups*, *Journal of Topology and Analysis* 5 (1), 2013, pp 57-85.
14. *Extended flux maps on surfaces and the contracted Johnson homomorphism*, *Journal of Symplectic Geometry* 9 (4), 2011, pp 445-482.
15. *Symplectic structures on right-angled Artin groups: Between the mapping class group and the symplectic group*, *Geometry & Topology* 13, 2009, pp 857–899.
16. *Peak reduction and finite presentations for automorphism groups of right-angled Artin groups*, *Geometry & Topology* 13, 2009, pp 817–855.
17. *Extending Johnson's and Morita's homomorphisms to the mapping class group*, *Algebraic & Geometric Topology* 7, 2007, pp 1297–1326.

Teaching (continues on page 3):

2011–present

The University of Arkansas:

'11–'12, '13–'14, '25–'26	MATH 57003/57103	Graduate Differential Topology I/II
Fall 2025	MATH 31003	Combinatorics
Spring 2025	MATH 6790V	Topics course: Group Cohomology
Spring 2018, Spring 2025	MATH/STAT 30103	Introduction to Probability
Fall 2024	MATH 57003	Graduate Topology I
Spring 2024, Fall 2024	MATH 45103/52103	Advanced Calculus I
Fall 2023	MATH 4503	Differential Geometry
Fall 2021	MATH 679V	Topics Course: Homological Algebra
F. '21, S. '22, F. '22, F. '23	MATH 2603	Discrete Mathematics
2018–2019	MATH 5703/5713	Graduate Topology I/II
Fall 2018	MATH 2754	Calculus III
Fall 2017	MATH 679V	Topics course: Automorphism groups
S. 2016, F. 2020, S. 2021	MATH 3093	Abstract Linear Algebra
Spring 2016, Spring 2022	MATH 2083	Transition to Advanced Math

Teaching, continued:

2011–present	The University of Arkansas, continued:		
S. 2015, S. 2017, S. 2021	MATH 4113		Introduction to Abstract Algebra II
F. 2014, F. 2015, S. 2015, S. 2017, S. 2019, F. 2020	MATH 3113		Introduction to Abstract Algebra I
Fall 2014	MATH 499V		Topics course: Representation Theory
F.'13, F. '15, F.'16, F.'19, S.'20	MATH 3083		Linear Algebra
Fall 2012, Spring 2024	MATH 2584		Differential Equations/Laplace Transf.
'12–'13, '17–'18, '19–'20, F.'22	MATH 5123/5133		Graduate Algebra I/II
Fall 2011	MATH 2654		Calculus II
2010–2011	The California Institute of Technology:		
	Fall 2010	Math 109a	Introduction to geometry and topology I
	Winter 2011	Math 191a	Automorphism groups of free groups
	Spring 2011	Math 109c	Introduction to geometry and topology III
2002–2008	The University of Chicago:		
	2007–2008	Math 152/3	Calculus II/III (Instructor)
	2004–2005	Math 131/2/3	Elem. Functions and Calc. I/II/III (Instructor)
	2003–2004	Math 203/4/5	Analysis in \mathbb{R}^n (Teaching Assistant)

Fellowships and Grants:

2015–2016	National Science Foundation conference grant for Arkansas SLS conference
2012–2015	National Science Foundation standard grant DMS-1206981
2008–2010	National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship
2002–2007	National Science Foundation Graduate Research Fellowship

Professional Service:

- Principal organizer for 2015 Arkansas Spring Lecture Series conference.
- Co-organizer of *Redbud topology conference*, regional topology conference series for AR/OK, 2011–2013.
- Co-organizer of special session *Geometric group theory and dynamics*, in the 2011 spring western sectional meeting of the AMS.
- Co-organizer of special session *Topics in geometric group theory*, in the 2010 spring western sectional meeting of the AMS.
- Referee for Journal of Algebra, Algebraic & Geometric Topology, Geometry & Topology, Transactions of the American Mathematical Society, Communications in Algebra, Geometriae Dedicata, Journal of the London Mathematical Society, the Journal of Topology, Proceedings of the AMS, the International Journal of Algebra and Combinatorics, the Journal of Algebraic Combinatorics, Topology and its Applications, and others.

Service at the University of Arkansas:

- Mathematical Sciences Graduate Committee, 2012–2015 and 2026-present
- Mathematical Sciences Undergraduate Committee, 2016–2019 and 2023-2026
- Mathematical Sciences VAP Search Committee, Chair, 2024-2026
- Mathematical Sciences Ad-Hoc Qualifying exam Committee, 2024-2025
- Mathematical Science Ad-Hoc Bylaws Committee, 2023-2024
- Mathematical Sciences Steering Committee, 2020–2023
- Mathematical Sciences Calculus Task Force Committee, 2021.
- Mathematical Sciences third-year review committee, 2017-2018
- Mathematical Sciences Hiring Committee, 2011–2012

Selected Talks:

- *Lower central series obstructions to symplectic fillings*, invited talk, Redbud Topology Conference, November 2025.
- *Quotients of the braid group and the integral pair module of the symmetric group*, invited talk, Georgia Tech Geometry/Topology Seminar, March 2023.
- *Calculating the virtual cohomological dimension of the automorphism group of a right-angled Artin group*, invited talk, Spring Topology and Dynamics Conference (virtual event), May 2021.
- *Calculating the virtual cohomological dimension of the automorphism group of a right-angled Artin group*, University of Virginia Algebra Seminar, October 2019.
- *Relative outer automorphisms of RAAGs and restriction maps*, invited talk, Geometry of Outer Spaces and Outer Automorphism Groups Workshop, the University of Warwick, April 2018.
- *Basis conjugating outer automorphisms of RAAGs*, invited talk, Effective and Algorithmic Methods in Hyperbolic Geometry and Free Groups Workshop, ICERM, Brown University, May 2016.
- *The geometry of mapping class groups and $Out(F_n)$* , mini-course, Geometric Group Theory Summer School, MSRI, June 2015
- *On the second homology group of the Torelli subgroup of $Aut(F_n)$* , Stanford University Topology Seminar, February 2015
- *Automorphism orbit membership for right-angled Artin groups*, at *Geometric and Asymptotic Group theory with Applications 7*, City College of New York, May 2013.
- *Automorphism group orbits of sets of conjugacy classes in right-angled Artin groups*, at the *2nd Fall Redbud Topology Conference*, University of Oklahoma, November 2012.
- *Relations in the Torelli subgroup of $Aut(F_n)$* , at the AMS Spring Western Sectional Meeting, special session *Asymptotic Group Theory*, March 2012.
- *A Birman exact sequence for $Aut(F_n)$* , at the AMS Fall Central Sectional Meeting, special session *Algorithmic and Geometric Properties of Groups and Semigroups*, October 2011.
- *The connectivity threshold and automorphisms of random right-angled Artin groups*, at the AMS sectional meeting, special session *Geometric group theory and dynamics*, May 2011
- *An analogue of the Birman exact sequence for automorphism groups of free groups*, at the *6th William Rowan Hamilton Geometry and Topology Workshop*, Trinity College, Dublin, Ireland, September 2010.
- *Crossed homomorphisms of mapping class groups via nilpotent homogeneous spaces*, topology seminar, UC Santa Barbara, February 2009.
- *Finite generation of subgroups of automorphism groups of right-angled Artin groups*, geometric group theory seminar, Tufts University, April 2008.
- *Peak reduction on right-angled Artin groups*, geometric group theory seminar, the Ohio State University, April 2008.