Curriculum Vitae
JAMES S. WISEMAN

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Positions

- Professor of Mathematics, Agnes Scott College, July 2014 – present
- Visiting Professor of Mathematics, Economics Department, University of Texas, July 2014 – present (summers)
- Associate Professor of Mathematics, Agnes Scott College, July 2008 – June 2014
- Assistant Professor of Mathematics, Agnes Scott College, August 2005 – June 2008
- Visiting Assistant Professor of Mathematics, Swarthmore College, September 2001 – August 2005

Education

- Northwestern University, Evanston, Illinois
  Ph.D., Mathematics, June 2001
  M.S., Mathematics, December 1997
  Thesis advisor: John Franks
  Thesis title: "Sofic shifts and the Conley index"
- Massachusetts Institute of Technology, Cambridge, Massachusetts
  S.B., Mathematics, June 1996
  Minor: History

Research Interests

- Dynamical systems, rigorous computation and topological data analysis, dynamics from the topological viewpoint, Conley index, dynamics on noncompact spaces, fixed point theory, set-valued maps, voting theory, social choice, game theory

Publications

- Persistence of Morse decompositions over grid resolution for maps and time series, *Journal of Applied and Computational Topology* (2022).
- (with Olga Bernardi and Anna Florio), A Conley-type Lyapunov function for the strong chain recurrent set, *Topology and its Applications* 307 (2022).
- (with Thomas Wiseman), When do traffic reports make traffic better?, submitted.
- (with Olga Bernardi and Anna Florio), The generalized recurrent set, explosions and Lyapunov functions, *Journal of Dynamics and Differential Equations* 32 (2020), no. 4, 1797–1817.
- (with Ethan Akin), Chain recurrence and strong chain recurrence on uniform spaces, in Dynamical Systems and Random Processes, *Contemporary Mathematics* 736 (2019), 1–29.

- (with Ethan Akin), Varieties of mixing, *Transactions of the American Mathematical Society* 372 (2019), no. 6, 4359–4390.
- Generalized recurrence and the nonwandering set for products, *Topology and its Applications* 219 (2017), 111–121.
- The generalized recurrent set and strong chain recurrence, *Ergodic Theory and Dynamical Systems* 38 (2018), no. 2, 788–800.
- (with Phil Everson (statistics), Rick Valelly (political science), and Arjun Vishwanath (Swarthmore College '16)), NOMINATE and American political history: a primer, *Studies in American Political Development* 30 (October 2016), no. 2, 97–115.
- (with Fabio Drucker (Dickinson College '11) and David Richeson) Entropy for symbolic dynamics with overlapping alphabets, *Journal of Dynamics and Differential Equations* 28 (2016), no. 2, 301–315.
- (with Tarun Das, Keonhee Lee, and David Richeson) Spectral decomposition for topologically Anosov homeomorphisms on noncompact and non-metrizable spaces, *Topology and its Applications* 160 (2013), 149–158.
- (with David Richeson) Symbolic dynamics for nonhyperbolic systems, *Proceedings of the American Mathematical Society* 138 (2010), no. 12, 4373–4385.
- (with David Richeson and Paul Winkler (Dickinson College '07)) Itineraries of rigid rotations and diffeomorphisms of the circle, *Theoretical Computer Science* 411 (2010), no. 1, 259–265.
- (with David Richeson) Chain recurrence rates and topological entropy, *Topology and its Applications* 156 (2008), no. 2, 251–261.
- (with Amber Garcia (psychology), Meara Habashi (psychology), and Sarah Winget (chemistry)) Women in Math and Science: Examining Psychological Barriers to Learning, poster, 7th Biennial Society for the Psychological Study of Social Issues Conference, Chicago, IL, June 2008.
- The square of a map, symbolic dynamics, and the Conley index, *Rocky Mountain Journal of Mathematics* 37 (2007), no. 1, 327–342.
- (with David Richeson) Positively expansive dynamical systems, *Topology and its Applications* 154 (2007), no. 3, 604–613.
- (with Danielle Silverman (Swarthmore College '04)) Noting the difference: musical scales and permutations, *American Mathematical Monthly* 113 (2006), no. 7, 648–651.
- (with David Richeson) Positively expansive homeomorphisms of compact spaces, *International Journal of Mathematics and Mathematical Sciences* 54 (2004), 2907–2910.
- Symbolic dynamics from signed matrices, *Discrete and Continuous Dynamical Systems*, 11 (2004), nos. 2&3, 621–638.
- (with David Richeson) Bounded homeomorphisms of the open annulus, *New York Journal of Mathematics* 9 (2003), 55–68
- Detection of renewal system factors via the Conley index, *Transactions of the American Mathematical Society* 354 (2002), no. 12, 4953–4968.
- (with David Richeson) A fixed point theorem for bounded dynamical systems, *Illinois Journal of Mathematics* 46 (2002), no. 2, 491–495, and addendum, 48 (2004), no. 3, 1079–1080.
- Approval voting in subset elections, *Economic Theory* 15 (2000), no. 2, 477–483.

Other Publications

- (with Thomas Wiseman) Calculating grades, *Math Horizons*, November 2019.
- (with Thomas Wiseman) How should self-driving cars drive?, *Math Horizons*, September 2018.
- Impossible redistricting, *Math Horizons*, February 2018.
- (with Thomas Wiseman) Thinking backwards: strength through weakness, *Math Horizons*, April 2017.
- (with Thomas Wiseman) Electing to disagree, *Math Horizons*, September 2016.
- Review of *How Not to Be Wrong: The Power of Mathematical Thinking*, The Bookshelf, *Math Horizons*, February 2015.
- Review of *The Mathematical Experience*, The Bookshelf: Summer Reading List, *Math Horizons*, April 2014.
- Review of *The Simpsons and Their Mathematical Secrets*, The Bookshelf, *Math Horizons*, February 2014.
- Antiquated runoff system does not reflect voters' views, op-ed page, *Atlanta Journal-Constitution*, November 17, 2008.

Recent Talks

- "Persistence in topological dynamics," AMS Southeastern Sectional Meeting, Special Session on Topological Dynamics and its Applications, University of South Alabama/online, November 2021.
- "Persistence for finite-resolution dynamics," Little School Dynamics Seminar, online, August 2021.
- "Persistence for finite-resolution dynamics," Spring Topology and Dynamics Conference, Murray State University/online, May 2021.
- "Persistence of Morse decompositions for finite-resolution dynamics," Jagiellonian University Computational Mathematics Seminar, April 2021.
- "Mixing and explosions for the generalized recurrent set," Georgia Tech Dynamical Systems Seminar, October 2019.
- "Notions of recurrence and transitivity for discrete dynamical systems," Università di Padova, Italy, October 2019.
- "Generalized recurrence, transitivity, and mixing," 25th International Conference on Difference Equations and Applications, University College London, June 2019.
- "Generalized transitivity and mixing," SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2019.
- "Varieties of mixing," Carolina Dynamics Symposium, Furman University, April 2019.
- "Generalized recurrence for products and powers," AMS Eastern Sectional Meeting, Special Session on Topological Dynamics, New York, NY, May 2017.
- "Recurrence for powers and products," Carolina Dynamics Symposium, Charlotte, NC, April 2017.
- "The wrong ballot for the wrong reasons," Agnes Scott College ACME series, November 2015.
- "Rigorous computation for chaotic systems," Brigham Young University, February 2015.
- "Ambiguous symbolic dynamics and the Conley index," Dynamical Systems Seminar, Brigham Young University, February 2015.
- "Computation and chaos," Dickinson College, February 2012.

- "Ambiguous shifts: symbolic dynamics from open covers," Joint Mathematics Meetings, Boston, January 2012.
- "Symbolic dynamics with overlapping alphabets," Carolina Dynamics Symposium, Furman University, March 2011.
- "Symbolic dynamics from overlapping covers," International Congress of Mathematicians Satellite Conference on Various Aspects of Dynamical Systems, The Maharaja Sayajirao University of Baroda, Gujarat, India, August 2010.
- "Counting votes: the mathematics of social choice," Mercer University, March 2010.

Teaching

- Nominated for Agnes Scott Vulcan Teaching Award, 2021.
- Courses taught: precalculus, finite mathematics, statistics, single- and multivariable calculus, sequences and series, linear algebra (honors and regular), ordinary differential equations, partial differential equations, mathematical modeling, chaotic dynamics, probability and mathematical statistics, abstract algebra, topology, complex variables, mathematics for economics, introduction to computer programming (Python), how to think like a data scientist
- Supervised masters student from Bryn Mawr College, 2004-2005

College Service

- Ad Hoc Committee on Curricular Review, co-chair, 2021-present
- Faculty Executive Committee, President, 2019-2020, 1st Vice President, 2018-2019, 2nd Vice President, 2017-2018
- Mathematics Department Chair, 2019-2021, 2012-2015
- Committee on Academic Standards and Admissions, 2008-2009, 2013-2015, Spring 2016, Spring 2021; Chair, 2008-2009 and 2013-2014
- Academic Assessment Committee, 2015-2020
- Reappointment, Promotion, and Tenure Committee, 2010-2013, 2016; chair, 2012-2013
- Judicial Review Committee, 2014
- Faculty Executive Committee, 2012-2014
- Dual-degree engineering program faculty advisor, 2006-2013, 2021–present
- QEP Committee, 2012-present
- Public Health Advisory Committee, 2011-present
- Community Day Committee, 2010-2014, 2016
- Agnes Reads Committee, 2011-2014
- Agnes Scott Cares Campaign Committee, 2010-2013
- ACME (Academic Colloquium Monthly Exchange) organizer, 2011-2012
- Vice President for Enrollment/Dean of Admissions search committee, 2010-2011
- Public Health Planning Committee, 2009
- Ad Hoc Committee on Faculty Governance and Committee Organization, 2008-2010
- Committee on Committees, 2008-2010
- Pre-health professions advisor, 2008-2009
- Vice President for Student Life/Dean of Students search committee, 2008
- Ad Hoc Committee on Course Evaluations, 2007-2009
- Library Advisory Group, 2006-2009
- Professional Development Committee, 2006-2008
- SpARC Committee, publicity committee 2006-2007, co-chair 2007-2008
- Natural and Mathematical Sciences Conference co-convener, 2006-2008

- Swarthmore Mathematics First Year Curriculum Revision Committee, 2004-2005
- Swarthmore Mathematics Department Community Building Committee, 2004-2005
- Swarthmore Mathematics and Statistics Colloquium Chair, 2003-2004
- Faculty sponsor, Swarthmore Putnam exam team, 2001 & 2002 (team finished eighth overall in 2001)
- Departmental representative, Sigma Xi, 2002-2003
- Organized Northwestern mathematics teaching assistant orientation, 1997-2000

Professional Service

- *Math Horizons* editorial board, 2013-2019.
- Co-editor, *Contemporary Mathematics* proceedings volume, Carolina Dynamics Symposium, 2018
- Co-organizer, Carolina Dynamics Symposium, Agnes Scott College, April 2018
- Co-organizer, Special Session on Dynamical Systems, Joint Mathematics Meetings, Atlanta, GA, January 2017
- Mathematical Association of America Committee on Minicourses, 2011-2017
- Reviewer for *Mathematical Reviews*, 2005-present
- Referee for *Journal of Applied and Computational Topology*, *SIAM Journal on Applied Dynamical Systems*, *Nonlinearity*, *Mathematische Zeitschrift*, *Journal of Differential Equations*, *Geometry & Topology*, *Topology and its Applications*, *American Mathematical Monthly*, *Mathematics Magazine*, *Geometriae Dedicata*, *International Journal of Mathematics and Mathematical Sciences*, *Publications de l'Institut Mathématique*, *Annales Polonici Mathematici*, *Open Mathematics*, *Qualitative Theory of Dynamical Systems*, *Filomat*, *Chaos Solitons & Fractals*, *Topological Methods in Nonlinear Analysis*, *Bulletin of Mathematical Analysis and Applications*, *Advances in Mathematics*, *Journal of Mathematical Analysis and Applications*, *Journal of Difference Equations and Applications*, *Reports on Mathematical Physics*
- Honors Examiner, Swarthmore College, 2012, 2014, 2015, 2017, 2018
- Proposal reviewer for Narodowe Centrum Nauki (Polish National Centre for Science), 2013
- Co-organizer, Special Session on Dynamical Systems, AMS Spring Southeastern Section Meeting, Davidson, NC, March 2007
- Co-organizer, AMS-SIAM Special Session on Contemporary Dynamical Systems, Joint Mathematics Meetings, San Antonio, TX, January 2006
- Organized the weekly Graduate Dynamical Systems Seminar at Northwestern University, 1998-2001

Fellowships and grants

- Co-PI, NSF Grant for Carolina Dynamics Symposium, 2020-2023
- Simons Foundation Collaboration Grant for Mathematicians, 2013-2019
- Senior personnel, NSF Grant for Carolina Dynamics Symposium, 2016-2018
- Holder Fund for Faculty Innovation Award, Agnes Scott College, for "Rigorous Computation for Chaotic Dynamical Systems," 2012
- Professional Development Awards, Agnes Scott College, 2009, 2010, 2011, 2013
- Bevier Public Health Initiative course development stipend for "Mathematical Modeling of the Spread of Disease," 2007-2008

- (with Amber Garcia, psychology) Agnes Scott College Center for Teaching and Learning summer stipend for "Women in Math and Science: Examining Psychological Barriers to Learning," 2006
- U.S. Department of Education GAANN Fellowship, 1997-2000
- Northwestern University Fellowship, 1996-1997