

Amie Wilkinson

Department of Mathematics, University of Chicago
5734 S. University Avenue
Chicago, Illinois 60637
(773) 702-7337
e-mail: wilkinso@math.uchicago.edu

ACADEMIC POSITIONS

- Professor of Mathematics, University of Chicago, 2012 – present.
- Professor of Mathematics, Northwestern University, 2005 – 2011.
- Associate Professor of Mathematics, Northwestern University, 2002 – 2005.
- Assistant Professor of Mathematics, Northwestern University, 1999 – 2002.
- Boas Assistant Professor of Mathematics, Northwestern University, 1996 – 1999.
- Benjamin Peirce Instructor, Harvard University, 1995 – 1996.

Visiting Positions

- Visiting Professor, University of Chicago, Fall and Spring Quarters 2003–2004, Fall Quarter 2011.
- Professeur Invité, Université de Bourgogne, May 2002 and Sept 2003.
- Member, Institut des Hautes Etudes Scientifiques (IHES), Summer 1993, 1996, 1998.
- Visitor, IBM T.J. Watson Labs, Yorktown NY, Winter 1992 and 1994, Summer 1997, 1998, 2000, and 2001.
- Graduate Research Assistant, The Center for Nonlinear Studies, Los Alamos National Laboratories, Summer, 1992.

EDUCATION

- Ph.D. in Mathematics, University of California, Berkeley, May 1995
- A.B. in Mathematics, Harvard University, June 1989

DATE OF BIRTH April, 1968. U.S. citizen.

RESEARCH INTERESTS

- Ergodic theory and smooth dynamical systems
- Geometry and regularity of foliations
- Actions of discrete groups on manifolds
- Dynamical systems of geometric origin

GRANTS, FELLOWSHIPS AND AWARDS

- Fellow of the AMS, 2013.
- Ruth Lyttle Satter Prize, 2011.
- NSF Grant “Innovations in Bright Beam Science” (co-PI) \$680,000, 2015-2018.
- NSF Grant “RTG: Geometry and topology at the University of Chicago” (co-PI) \$1,377,340, 2014-2019.
- NSF Grant “Robust and generic mechanisms in smooth dynamics,” \$600,000, 2014-2019.
- NSF Conference Grant “Conference on Global Dynamics Beyond Uniform Hyperbolicity,” \$49,400. 2013.
- NSF Conference Grant “From Dynamics to Complexity” (\$33,000) 2012.
- NSF Grant “Partial Hyperbolicity and rigidity” (\$300,000) 2010-13
- NSF Grant “Emphasis Year in Dynamical Systems at Northwestern University,” \$105,238 (co-PI) 2010-2011.
- NSF Grant “Partial Hyperbolicity and the Structure of Diffeomorphism Groups” (\$260,381) 2007-2010.
- NSF Grant “Partial Hyperbolicity and Rigidity” (\$216,277) 2005-2007.
- NSF Grant “International Workshop on Global Dynamics Beyond Uniform Hyperbolicity” (\$22,100) 2006.
- NSF Grant “Ergodic and Geometric Properties of Diffeomorphisms” (\$108,000) 2002–2005.
- NSF Grant “Conference on Robustness and Partial Hyperbolicity” (\$21,000) 2003.
- NSF Grant “Conference on Partial Hyperbolicity” (\$17,800) 2001.

- NSF Grant, Interdisciplinary Graduate Education, Research and Training (IGERT) program, 1999–2005.
- NSF Postdoctoral Research Fellowship, 1998–2001
- IBM Graduate Research Fellowship, 1994–1995
- NSF Graduate Research Fellowship, 1990–1993

PhD STUDENTS

- Elizabeth Burslem (Ph.D. 2002, postdoc at U. Michigan).
- Todd Fisher (Ph.D. 2004, VIGRE postdoc at U. Maryland; Currently tenured Associate Professor at Brigham Young).
- Anne McCarthy (Ph.D. 2006, postdoc at Temple; currently tenured Associate Professor at Fort Lewis College).
- Kalman Nanes (Ph.D. 2009, Lecturer at U. Maryland, Baltimore County).
- Daniel Visscher (Ph.D. 2012, postdoc at U. Michigan; tenure-track Assistant Professor at Ithaca College).
- Zhenghe Zhang (Ph.D. 2014, postdoc at Rice; tenure-track Assistant Professor at U.C. Riverside).
- Yun Yang (unofficial co-advisor; Ph.D. 2016; postdoc at CUNY).
- Clark Butler (Ph.D. 2018, Veblen Research Instructor, Princeton/IAS)
- Kiho Park (entered, Fall 2015).
- Jonathan DeWitt (entered, Fall 2016).
- Meg Doucette (entered, Fall 2018).
- Isabella Scott (entered, Fall 2018).

NSF POSTDOCTORAL FELLOWS

- Kathryn Lindsey (2014; Currently tenure-track Assistant Professor at Boston College).
- Nyima Kao (2017).

PUBLICATIONS

All preprints are available at:

<http://www.math.uchicago.edu/~wilkinso/papers/papers.html>.

1. Op-Ed piece: With Snowflakes and Unicorns, Marina Ratner and Maryam Mirzakhani Explored a Universe in Motion, *New York Times*, Aug 7, 2017.
2. Dynamics, Rigidity and Geometry (book), in preparation.
3. Pathology and asymmetry: virtual trivial centralizer for diffeomorphisms with singular foliations (working title, with D. Damjanović and D. Xu). In preparation.
4. Partially hyperbolic abelian actions with a compact center foliation. (working title, with D. Damjanović and D. Xu). In preparation.
5. Density of local accessibility and its applications (working title, with A. Avila and S. Crovisier). In preparation.
6. C^1 density of stable ergodicity (with A. Avila and S. Crovisier). September, 2017 preprint (58 pages).
7. Finding stability domains and escape rates in kicked Hamiltonians (fourth author, with Archishman Raju, Sayan Choudhury, David L. Rubin, and James P. Sethna), 2017, submitted.
8. Rigidity of some Abelian-by-cyclic solvable group actions on \mathbf{T}^N (with J. Xue), 2017 preprint.
9. Projective cocycles over $SL(2, \mathbf{R})$ -actions: measures invariant under the upper triangular group. (with Ch. Bonatti and A. Eskin), 2017, submitted.
10. What is... a blender? (with Ch. Bonatti, S. Crovisier and L. Díaz), *Notices of the AMS*, **63** (2016), 1175–1178.
11. What are Lyapunov exponents, and why are they interesting?, *Bulletin of the AMS*, **54** (2017), 79–105.
12. Rates of mixing for the Weil-Petersson geodesic flow: Exponential mixing in exceptional moduli spaces (with K. Burns, C. Matheus and H. Masur), *Geom. Funct. Anal.* **27** (2017), no. 2, 240–288.
13. Rates of mixing for the Weil-Petersson geodesic flow I: No rapid mixing in non-exceptional moduli spaces. (with K. Burns, C. Matheus and H. Masur), *Adv. in Math.*, **306** (2017) 589–602.
14. Diffeomorphisms with positive metric entropy (with A. Avila and S. Crovisier), *Publ. Math. IHES*, **124** (2016), 589–602.
15. Absolute continuity, Lyapunov exponents and rigidity I : geodesic flows (with A. Avila and M. Viana), *J. Eur. Math. Soc. (JEMS)* **17** (2015), no. 6, 14351462.

16. Lectures on marked length spectrum rigidity, *IAS/Park City Math. Ser.*, **21**, Amer. Math. Soc., Providence, RI, 2014.
17. Cocycles over partially hyperbolic maps (with A. Avila, J. Santamaria and M. Viana), *Astérisque*, No. 358 (2013), 112.
18. The cohomological equation for partially hyperbolic diffeomorphisms, *Astérisque*, No. 358 (2013), 75165.
19. The Weil-Petersson geodesic flow is ergodic (with K. Burns and H. Masur), *Annals of Math*, **175** (2012), 835–908.
20. Hölder foliations, revisited (with C. Pugh and M. Shub) *Journal of Modern Dynamics*, **6** (2012), 79–120.
21. Conservative partially hyperbolic dynamics, Proceedings of the International Congress of Mathematicians. Volume III, 1816-1836 (2010).
22. Nonuniform center bunching and the genericity of ergodicity among C^1 partially hyperbolic symplectomorphisms (with A. Avila and J. Bochi), *Ann. Sci. École Norm. Sup.* **42** (2009), no. 6, 931–979.
23. The C^1 -generic diffeomorphism has trivial centralizer (with C. Bonatti and S. Crovisier) *Publ. Math. IHES* **109** (2009), 185–244.
24. Smooth ergodic theory (expository article for *Encyclopedia of Complexity and System Science*, Springer-Verlag.) (25 pages).
25. C^1 -generic conservative diffeomorphisms have trivial centralizer, (with C. Bonatti and S. Crovisier) *J. Mod. Dyn.* **2** (2008) 359–373.
26. Local density of diffeomorphisms with large centralizers, (with C. Bonatti, S. Crovisier, and G. Vago) *Ann. Sci. École Norm. Sup.* **41** (2008), 925–954.
27. Dynamical coherence and center bunching (with K. Burns) *Discrete Contin. Dyn. Syst.*, **22** (2008), 89–100.
28. The centralizer of a C^1 generic diffeomorphism is trivial (with C. Bonatti and S. Crovisier), *Elect. Res. Ann. Math. Sci.* **15** (2008), 33–43.
29. On the ergodicity of partially hyperbolic systems (with K. Burns), *Ann. Math.* **171**, (2010) 451-489.
30. A note on stable holonomy between centers (with K. Burns), preprint (10 pages).
31. Transitive partially hyperbolic diffeomorphisms on 3-manifolds, (with C. Bonatti), *Topology* **44** (2005), no. 3, 475–508.

32. Global rigidity of solvable group actions on S^1 , (with L. Burslem), *Geometry and Topology*, **8** (2004), 877–924.
33. Abundance of stable ergodicity, (with C. Bonatti, C. Matheus and M. Viana), *Comment. Math. Helv.*, **79** no. 9 (2004) 753–757.
34. Partial differentiability of invariant splittings, (with C. Pugh and M. Shub), *J. Stat. Phys.*, **144** (2004), 891–921.
35. Random versus deterministic exponents in a rich family of diffeomorphisms, (with F. Ledrappier, C. Simo and M. Shub), *J. Stat. Phys.*, **113** (2003), no. 85–149.
36. Stable accessibility is C^1 dense (with D. Dolgopyat), *Astérisque*, **287** (2003), 33–60.
37. Recent results about stable ergodicity (with K. Burns, C. Pugh and M. Shub), *Proc. Symposia A.M.S.*, **69** (2001) 327–366.
38. Absolutely singular dynamical foliations (with D. Ruelle), *Commun. Math. Phys.*, **219** (2001), no. 3, 481–487.
39. Pathological foliations and removable zero exponents (with M. Shub), *Invent. Math.*, **139** (2000), no. 3, 495–508.
40. Hölder regularity of horocycle foliations (with M. Gerber), *J. Diff. Geom.*, **52** (1999), no. 1, 41–72.
41. Stable ergodicity of skew products (with K. Burns), *Ann. Scient. de l'Ecole Norm. Sup.*, **32** (1999), no. 6, 859–889.
42. Stably accessible approximations: two examples (with M. Shub), *Ergod. Th. Dynam. Syst.*, **20** (2000), no. 3, 875–893.
43. Stable ergodicity and Anosov flows (with K. Burns and C. Pugh), *Topology*, **39** (2000), no. 1, 149–159.
44. Prevalence of non-Lipschitz Anosov foliations (with B. Hasselblatt), *Ergod. Th. and Dynam. Syst.*, **19** (1999), no. 3, 643–656.
45. Prevalence of non-Lipschitz Anosov foliations (with B. Hasselblatt), *Elect. Res. Ann. – AMS*, **3** (1997), 93–98.
46. Hölder foliations (with C. Pugh and M. Shub), *Duke Math. J.* **86**, no.3 (1997), 517–546.
47. Stable Ergodicity of the Time-One Map of a Geodesic flow, *Ergod. Th. Dynam. Syst.*, **18** (1998), no. 6, 1545–1587.
48. When an infinitely-renormalizable endomorphism of the interval can be smoothed (with C. Tresser), *Fractals* **3** no. 4 (1995), 701–711.

49. Circuits in Cayley digraphs of finite abelian groups, *J. Graph Theory*, **14** no.1 (1990), 111-116.

SELECTED INVITED TALKS AND LECTURE SERIES

- **Lectures:**

1. Moursand Lectures, University of Oregon, April, 2019.
2. Opening Public Lecture of the 2018 Fields Medal Symposium, November 5, 2018.
3. Distinguished Lecture Series, UCLA, May 21-25, 2018.
4. Distinguished Lecture Series, Indiana University, April 16-19, 2018.
5. Fields Lecture Series, Queen's University, April 5, 2018.
6. Keynote address, ETHS Chem Phys Reunion, Evanston, September 23, 2017.
7. Dr. Simon Marais Public Lecture (Inaugural lecture), Sydney, April 27, 2017.
8. Peter Hilton Memorial Lecture, Binghamton, April 28, 2016.
9. Boston College Distinguished Lecturer in Mathematics Series, Boston, April 13-15, 2016.
10. Julian Clancy Frazier Colloquium, USNA, Feb 11, 2016.
11. Hahn Lectures, Yale, Dec 9-12, 2015.
12. Shoemaker Lecture Series, University of Toledo, September 23-26, 2015.
13. Göran Gustaffson Lectures in Mathematics, KTH, Stockholm, May 22-26, 2015.
14. Math Across the Cannon Speaker, Carleton/St. Olaf, April 23, 2015.
15. Grosswald Lectures, Temple University, September 2-4, 2014.
16. Horton-Jacobs/Women in Natural Science Lecture Series, UT Austin, March 24, 2014.
17. Beatrice Yormack Lecture, Stanford University, February 14, 2013.
18. Christie Lectures, Bowdoin College, April 23-24, 2012.

- **Minicourses:**

1. Summer School in Dynamics (Introductory and Advanced), ICTP, Trieste, July 23-27, 2018.

2. Séminaire de Mathématiques Supérieures, CRM, Montréal, July 10–21, 2017 (3 hours).
 3. Geometry and Topology RTG Summer School, University of Chicago, June 2015 (4 hour minicourse).
 4. Analysis RTG Summer School, University of Chicago, June 2014 (4 hour minicourse).
 5. Geometric, Analytic and Probabilistic Approaches to Dynamics in Negative Curvature, INdAM Workshop, Rome, May 13-17, 2013 (6 hour minicourse on “The Weil-Petersson geodesic flow is ergodic”).
 6. Geometric Group Theory, Park City Mathematics Institute - - Institute for Advanced Study, July 7-15, 2012 (Graduate Summer School Lectures).
 7. International Workshop on Global Dynamics Beyond Uniform Hyperbolicity, CIRM Marseille Luminy, France June 5-17 2011 (5 hour minicourse).
 8. Hyperbolic Dynamical Systems, Schrödinger Institute, Vienna, June, 2008 (5 hour minicourse).
 9. School and Workshop on Dynamical Systems IMPA, Rio de Janeiro, January, 2006 (5 hour minicourse).
- **Invited Addresses:**
1. British Mathematical Colloquium, Bristol, March 21-24 2016.
 2. AMS Current Events Bulletin, Joint Meetings, Seattle, January 2016.
 3. Mathematical Congress of the Americas, Guanajuato Mexico, August 5-9, 2013
 4. MathFest, Madison, WI, August 2, 2012 (MAA Invited Address).
 5. International Congress of Mathematicians, Hyderabad, August 2010 (Invited speaker, Dynamical systems and ordinary differential equations session).
 6. AMS-MAA Joint Meeting, San Francisco, January, 2010 (AMS Invited Address).
 7. International Congress in Mathematical Physics, Prague, August 2009 (Invited speaker, Mechanics and Dynamical Systems session), August 2009.
 8. AMS-SBM Joint Meeting, Rio de Janeiro, June, 2008.
 9. Equadiff, Vienna, August 2007.

10. SIAM Conference on Applications of Dynamical Systems, Snowbird Utah. May, 2005.
11. American Mathematical Society Western Sectional Meeting, Salt Lake City, October 2002.

• **Plenary talks at conferences:**

1. Workshop in Dynamics and Related Topics, Penn State, October 4–7, 2018.
2. The Mathematical Legacy of Maryam Mirzakhani, May 18–20, 2018.
3. Workshop in Dynamics and Related Topics, Penn State, October 5 - 8, 2017.
4. Workshop on Nonlinear Dynamics and Collective Effects in Particle Beam Physics, Arcidosso, Italy, September 19-22, 2017.
5. International Conference on Statistical Properties of Nonequilibrium Dynamical Systems, Shenzhen, July 27-August 2, 2016.
6. Dynamics, Geometry and Number Theory, Paris, June 13-17, 2016.
7. Benjamin Peirce Centennial Conference, Harvard, June 10-12, 2016.
8. Women and Mathematics, IAS, May 12, 2016 (colloquium).
9. Clay Research Conference on Geometry and Dynamics on Moduli Spaces, Oxford, September 28-October 2, 2015.
10. Third Palis-Balzan International Symposium on Dynamical Systems, Paris, June 15-19, 2015.
11. Midwest Topology Seminar, University of Chicago, May 16-17, 2015.
12. Penn State Dynamics Conference, October 17-19, 2014.
13. Young Mathematicians Conference, Ohio State, August 22, 2014.
14. International Conference on Surveys of Modern Mathematics I, Chinese Academy of Sciences, Beijing, June 30 - July 2, 2013.
15. Workshop on Ergodic Theory and Dynamical Systems, University of North Carolina at Chapel Hill, March 21-24, 2013 (Keynote speaker).
16. Spring Dynamics Conference with session in honor of Mike Boyle, University of Maryland, April 1-5, 2011.
17. Fifth Ahlfors-Bers Colloquium, Rice University, Houston, March 24-27, 2011.

18. “Geometry and analysis of Riemann surfaces and their moduli” in honor of Scott Wolpert, Maryland, September 24-26 2010.
19. International Conference on Dynamical Systems. Celebrating the 70th anniversary of Jacob Palis, Buzios, Rio de Janeiro, February 2010.
20. Progress in Dynamics, Institut Henri Poincare, Paris, November, 2009.
21. From braid groups to Teichmüller spaces CIRM, Luminy, June, 2009.
22. Communicating Mathematics, Duluth, July 2007.
23. Nonuniformly Hyperbolic Dynamics and Smooth Ergodic Theory (Pesin birthday conference), Lisbon, June 2007.
24. Southern California Topology Conference, Pasadena, January 2007.
25. Differentiable Dynamics and Smooth Ergodic Theory, CMS Winter Meeting, Toronto, December, 2006.
26. Workshop in Dynamics and Related Topics, Penn State, November 2006.
27. International Conference on Dynamical Systems, Angra dos Reis, Brazil, August, 2005.
28. Colloquium in Dynamical Systems and Smooth Ergodic Theory, Bordeaux, France, June, 2005.
29. International Conference on Robustness and Partial Hyperbolicity, Buzios, Brazil. October, 2003.
30. Conference in Honor of Michael Shub, Berkeley, August, 2003 (conference organizer).
31. Midwest Dynamical Systems, Spring 2003.
32. Bloomington Geometry Workshop, April 2002.
33. International Conference on Dynamical Systems, IMPA (Rio de Janeiro), July 2000.
34. International Conference on Dynamical Systems and Differential Equations, Kennesaw State University, May, 2000.
35. International Seminar on Dynamics, Abbaye de la Bussière, Bourgogne, July 1999.
36. Global Analysis: 30 years later, University of Cincinnati, March 1998.
37. Spring Topology and Dynamics Conference, George Mason University, March 1998.

- 38. Penn State Dynamics Workshop, October 1997, and October 2000.
- 39. Midwest Dynamics Seminar, Austin TX, February 1997.
- 40. Workshop on Ergodic Theory, Geometry and Arithmetic, Vienna, February 1997.
- **Colloquia:** Berkeley, Brigham Young, Caltech, Chicago, De Paul, Georgia Tech, Harvard, Houston, IAS, Indiana, UIC, UIUC, Maryland, Michigan State, Notre Dame, Penn State, Queens, Rice, Rutgers, Texas, Vassar, Wayne State, U. de Bourgogne.

SERVICE TO MATHEMATICAL COMMUNITY

- Conferences co-organized:
 - Dynamics Beyond Uniform Hyperbolicity, CIRM Luminy, May 13–24, 2019.
 - Summer School in Dynamics (Introductory and Advanced), ICTP, Trieste, July 16–27, 2018.
 - New Methods for Zimmer’s Conjecture, IPAM, January 22 - 26, 2018.
 - Dynamics Beyond Uniform Hyperbolicity, Provo, UT, June 5-16, 2017.
 - Workshop on Beam Dynamics, IPAM, January 23-19, 2017.
 - Fractal Geometry, Hyperbolic Dynamics and Thermodynamical Formalism, ICERM, March 7-11, 2016.
 - International Conference on Global Dynamics Beyond Uniform Hyperbolicity, Olmue, Chile September, 2015.
 - Equadiff 2015, Lyon.
 - International Conference on Global Dynamics Beyond Uniform Hyperbolicity, Banach Center, Bedlewo, June, 2013.
 - Dynamics of the Weil-Petersson geodesic flow, American Institute of Mathematics, June 18-22, 2012 .
 - From Dynamics to Complexity, Fields Institute, Toronto, May 07-11, 2012.
 - International Conference on Global Dynamics Beyond Uniform Hyperbolicity, CIRM, Luminy, June, 2011.
 - Trends in Dynamics, Northwestern University, May 2011.
 - International Conference on Global Dynamics Beyond Uniform Hyperbolicity, Beijing, August, 2009.

- Spring 2008 Meeting of the Workshop on Dynamical Systems and Related Topics in honor of Michael Brin, University of Maryland, March, 2008.
- Dynamics and Complexity in People and Societies (Northwestern Institute on Complex Systems Lecture Series), Northwestern, October, 2007.
- International Conference on Global Dynamics Beyond Uniform Hyperbolicity, Chicago, May, 2006.
- Conference in Honor of Michael Shub, Berkeley, August, 2003.
- Conference on Partially Hyperbolic Dynamics, Northwestern, May, 2001.
- Midwest Dynamical Systems Conference, Northwestern, Fall, 2000, Spring 2001 and Fall, 2005.
- Editorial boards: *Journal de l'École polytechnique – Mathématiques* (2018–), *Compositio Mathematica* (2017–) *Journal of the European Math Society* (2016 –) *Commentarii Math Helvetici* (2014–) *Algebraic and Geometric Topology* (2007–2014), *Chaos* (2002–), *Ergodic Theory and Dynamical systems* (2007–), *Journal of Modern Dynamics* (2006–2014), and *Transactions of the AMS* (2006–2007).
- Panelist, National Science Foundation, Washington D.C. 2003, 2008, 2009, 2011, 2012, 2015, 2018. AMS-appointed member, NSF Post-doctoral Fellowships panel, 2005, 2006. MSRI Scientific Evaluation Committee, 2017.
- Judge, Intel Science Talent Search, 2013–2015.
- Scientific Advisory Board, Institute for Pure and Applied Mathematics, 2011–
- Scientific Advisory Board, Serrapilheira Institute, 2018 –
- AMS Committees: Program Committee for National Meetings, 2011–2014; Nominating Committee 2013– 2016; Program Committee for Central Section, 2017–2020, Editorial Boards Committee 2018 –21.
- Member, Sectional Panel in Dynamical Systems, International Congress of Mathematicians, 2014; Chair, 2018.