Kathryn Mann
CV updated 6/2024

Appointments

Associate Professor of Mathematics, Cornell University 2022–
Assistant Professor of Mathematics, Cornell University 2019-22
Manning Assistant Professor of Mathematics, (Tenure-track) Brown University 2017-2019
Morrey Visiting Assistant Professor / NSF postdoctoral researcher, UC Berkeley 2014-2017
Postdoctoral research fellow, Mathematical Sciences Research Institute.  Spring 2015
Visiting positions: Professeur Invité, Inst. Math. Jussieu (Paris) May-June 2016
CNRS poste rouge, Inst. Math. Jussieu (Paris) April-June 2022

Education

Ph.D. Mathematics, University of Chicago Advisor: Benson Farb 2014
B.Sc. Mathematics and Philosophy, University of Toronto 2008

Grants and Recognition

Simons Fellowship in Mathematics Simons foundation 2024
Joyce Yelencsics & Frederick Rosevear Faculty Leadership Fellow, Cornell university fellowship 2022-27
Cornell Topology Festival, NSF conference 3-year grant, $72k 2023-25
Mathematics department teaching award, Cornell university 2021
NSF CAREER award, DMS 1844516 $476,502 2019-2025
Sloan Research Fellowship, Alfred P. Sloan Foundation $70k 2019-2023
Kamil Duszenko Award Wroclaw Mathematicians Foundation 2019
AWM Birman Research Prize in Topology and Geometry AWM early career award 2019
Mary Ellen Rudin young researcher award (annual Elsevier-sponsored award in topology) 2017
NSF Mathematical Sciences Postdoctoral Research Fellowship DMS 1606254 2016–19
Distinguished teaching award, UC Berkeley mathematics 2016
Kowalsky Fellowship for Research Excellence, University of Chicago 2013
NSERC Postgraduate Scholarship (Canadian science and engineering foundation) 2008–10; 2011–13
McCormick Fellowship, University of Chicago Mathematics 2008–2010

Publications and preprints

Promoting Prelaminations. With Thomas Barthelmé and Christian Bonatti. arXiv:2402.06144

Topological stability of relatively hyperbolic groups acting on their boundaries. With Jason Manning and Teddy Weisman. arXiv:2402.06144, submitted

Anosov flows with the same periodic orbits. With Thomas Barthelmé and Sergio Fenley. arXiv:2308.02098, submitted

Orbit equivalences of pseudo-Anosov flows. With Thomas Barthelmé and Steven Frankel. arXiv:2211.10505, submitted
Stability of hyperbolic groups acting on their boundaries.
With Jason Manning and Teddy Weisman. arXiv:2206.14914, submitted

On the action of the (2,3,7)-homology sphere group on its space of left-orders.
With Michele Triestino. Fundamenta. Math. 261 (2023), no. 3, 297-302.

Two results on end spaces of infinite type surfaces.
With Kasra Rafi. arXiv:2201.07690, to appear in Michigan Math J.

Groups acting at infinity.
Proceedings of the International Congress of Mathematicians, 2022.

Stability for hyperbolic groups acting on boundary spheres.
With Jason Manning. Forum Math. Sigma 11 (2023), Paper No. e83.

Rotation sets and actions on curves.
With Jonathan Bowden, Sebastian Hensel, Emmanuel Militon, and Richard Webb.
Advances in Mathematics 408, Part B, October 2022.

Orbit equivalences of R-covered Anosov flows and applications.
With Thomas Barthelme. arXiv:2012.11811, to appear in Geometry & Topology.

The structure of homeomorphism and diffeomorphism groups.
Notices of the American Mathematical Society, vol 68 no. 4, (April 2021) 482–492.

On the bordism group for actions on the torus.
With Sam Nariman. Annales de l’Institut Fourier, Volume 72 (2022) no. 3, pp. 989-1009.

There are no exotic actions of diffeomorphism groups on 1-manifolds.
With Lei Chen. Groups Geometry and Dynamics 17 (2023), no. 1, 91-99.

Large scale geometry of big mapping class groups.
With Kasra Rafi. Geometry & Topology 27(2023), no.6, 2237-2296.

$C^0$ stability of boundary actions and inequivalent Anosov flows.
With Jonathan Bowden. Annales Scientifique de l’ENS. 4e série, t. 55, 2022. p.1003–1046.

Automatic continuity for homeomorphism groups of some noncompact manifolds.
arXiv:2003.01173, to appear in Michigan Math J.

Reconstructing maps out of groups.
With Maxime Wolff. Annales Scientifiques de l’ENS, (4) 56 (2023), no. 4, 1135-1156

Dynamical and topological obstructions to extending group actions.
With Sam Nariman. Mathematische Annalen, 377.3 (2020), 1313-1338.

Structure theorems for actions of homeomorphism groups.
With Lei Chen. Duke Math. J. 172 (2023), no. 5, 915-962.

Rigidity of mapping class group actions on $S^1$.
With Maxime Wolff. Geometry & Topology, 3.24 (2020), 1211-1223.

Realization problems for diffeomorphism groups.
With Bena Tshishiku. Breadth in Contemporary Topology AMS Proceedings of Symposia in Pure Mathematics 102, 2019.

A characterization of Fuchsian actions by topological rigidity.
With Maxime Wolff. Pacific Journal of Math 302.1 (2019), 181-200.

Rigidity and geometricity for surface group actions on the circle.
With Maxime Wolff. To appear in Geometry & Topology

Unboundedness of some higher Euler classes.
Algebr. Geom. Topol. Volume 20, Number 3 (2020), 1221-1234.

Ping-pong configurations and circular orders on free groups.
With Dominique Malicet, Cristobal Rivas, and Michele Triestino. Groups, Geometry, Dynamics 13.4 (2019), 1195-1218.
On the number of circular orders on a group.
With Adam Clay and Cristobal Rivas. Journal of Algebra 504 (2018), 336-363.

Strong distortion in transformation groups.
With Frédéric Le Roux Bulletin of the London Math. Soc. 50.1 (2018), 46-62.

The large-scale geometry of homeomorphism groups.
With Christian Rosendal. Ergodic theory and Dynamical Systems 38.7 (2018), 2748-2779.

Group orderings, dynamics, and rigidity.
With Cristobal Rivas. Annales de l’Institut Fourier, 68.4 (2018), 1399-1445.

PL(M) has no Polish group topology.
Fundamenta Mathematicae 238 (2017), 285-296.

Automatic continuity for homeomorphism groups.
Geometry & Topology 20-5 (2016), 3033-3056. With an appendix with F. Le Roux.

Rigidity and flexibility of groups acting on the circle.
In Handbook of Group Actions, Advanced Lectures in Mathematics Vol. 41. International press, 2018.

A short proof that Diff(M) is perfect.
New York J. Math 22 (2016), 49-55.

Components of spaces of surface group representations.
Inventiones Mathematicae. 201, no. 2 (2015), 669-710.

Left-orderable groups that don’t act on the line.
Mathematische Zeitschrift 280, no. 3 (2015), 905-918.

Homomorphisms between diffeomorphism groups.
Ergodic Theory and Dynamical Systems 35-01 (2015), 192-214.

A counterexample to the simple loop conjecture for PSL(2,R).
Pacific Journal of Math 269-2 (2014), 425-432.

Diffeomorphism groups of balls and spheres.
New York J. Math. 19 (2013) 583-596.

Bounded orbits and global fixed points for groups acting on the plane.
Algebraic & Geometric Topology 12 (2012) 421-433.

Recent invited conference talks (since 2018)

Big ideas in dynamics (AIM research communities online conference) Jan. 2024
International colloquium on randomness, geometry and dynamics (IISER Pune, India) Jan 2024
Midwest dynamical systems (UIUC, Chicago) Oct 2023
Group actions and rigidity: around the Zimmer program (Ventotene International Conference) Sept 2023
Groups and dynamics in geometry conference for U. Hamenstadt (Ascona, Switzerland) June 2023
Workshop on the Geometry and Dynamics of Groups of Transformations (Fields institute, Toronto) Jan 2023
Joint Math Meetings (invited special session talk, Boston MA) Jan 2023
Pacific Rim International Mathematical Association Congress (plenary lecture) Dec. 2022
ICM 2022 (Invited sectional address) July 2022
Hyperbolic groups and their generalisations (Inst. Henri Poincaré, Paris) June 2022
Geometry, Groups and Dynamics conference in honor of Francois Labourie (Corsica) June 2022
Mapping class groups and Out(Fn) (Inst. Henri Poincaré, Paris) April 2022
Texas geometry and topology conference (UT Dallas) Feb 2022
Congreso Latinoamericano de Matematicos (special session talk) Sept. 2021
Recent invited seminar talks

2024: University of Toronto AWM graduate seminar, Queens university (Ontario, Canada) dynamics seminar and colloquium, UCSB math colloquium, Toulouse Geometry and topology seminar, Dynamics day at University of Rennes

2023: Yale University geometry seminar and Colloquium, Courant Topology and geometric analysis seminar, Inst. Fourier (Grenoble) topology seminar. Université Cote d’Azur (Nice) geometric group theory seminar and conference talk, University of Chicago (colloquium).

2022: PATCH seminar at Temple university, Regensburg university SFB lecture (colloquium), Univ. Bourgogne geometry seminar, IHES geometry and discrete groups seminar, Inst. Math Jussieu colloquium, Ithaca College math colloquium, Columbia university topology seminar.

2021: University of Toronto (colloquium), University of Michigan, UC Berkeley topology seminar, Rice University (colloquium), Maryland dynamics seminar, UW Milwaukee (colloquium), Einstein Institute, Hebrew university (colloquium), Zurich Colloquium in Mathematics, Pangolin online seminar in groups geometry and dynamics, Cornell Math colloquium (Oliver club).

2020: Caltech geometry and topology seminar, Boston College dynamics seminar, Harvard colloquium, Penn State University dynamics seminar, Resistencia Dynamica dynamics seminar (IMPA/Brazil), Geometry and Topology Online (Warwick), Regensburg low-dimensional geometry and topology seminar, Binghamton topology seminar, “Big surfaces” online seminar, McGill geometric group theory, Columbia topology seminar, Virtual seminar in geometry and topology (KAIST / KIAS), Inst. Math. Jussieu dynamics seminar (Paris).

2019: Caltech geometry seminar, UIC math colloquium, Wash U. St. Louis geometry/topology seminar and colloquium, University of Chicago geometry/topology, Queens U. colloquium and topology seminar.

2018: Tufts geometric group theory seminar, University of Toronto, Harvard “Open Neighborhood” seminar, Boston graduate topology seminar, University of Virginia geometry seminar and colloquium, University of Chicago dynamics, Monash University math colloquium, Cornell (x2), University of Michigan (x3), Columbia University.
Invited minicourses and lecture series

**Big mapping class groups and dynamics.** Minicourse at “group actions in low dimensions” (IHP, Paris) 
April 2024

**Anosov-like group actions.** Minicourse at Young Geometric Group Theory (Bristol, UK) 
April 2024

**Dynamics of group actions.** Minicourse at Fields Institute (Toronto) 
Jan. 2024

**Surface homeomorphisms and rotation sets.** Minicourse at Surfaces in Banyuls (France) 
Dec. 2024

**Big mapping class groups.** Minicourse with C. Horbez at “Curves, surfaces, 3-manifolds” conference (Haifa) 
May 2023

**Classifying pseudo-Anosov flows on 3-manifolds.** Minicourse at Beyond Uniform Hyperbolicity (Bedlewo) 
May 2023

**Anosov flows in 3 dimensions and Anosov-like actions.** Minicourse w/ T. Barthelme (Anosov dynamics, CIRM) 
April 2023

**Structure of homeomorphism groups.** Minicourse at “Huge groups” Conference (CRM Montreal) 
April 2023

**Anosov flows, bifoliated planes, and ideal circles.** Minicourse (Simons center for geometry and physics) 
March 2023

**Group actions in low dimensions.** Invited lecture series. (KAIST, Korea) 
Dec. 2018

**1-dimensional dynamics.** Undergraduate minicourse at Mathematical Summer in Paris (ENS, Paris) 
July 2018

**Flat bundles, foliations, and group actions on manifolds.** Young Topologists Meeting (Copenhagen) 
July 2018

**Groups, geometry, and rigidity.** 3-week minicourse for graduate students (MIT) 
March 2017

**Groups of circle homeomorphisms.** Beyond Uniform Hyperbolicity 2015 (Olmue, Chile) 
September 2015

**Algebraic structure of diffeomorphism groups.** (Berkeley RTG grad student summer school) 
June 2015

Teaching

**Cornell University**
Math 6320 Riemannian geometry (graduate course) 
Spring 2023

Math 4310 Linear algebra (with active learning components, in cooperation with ALI team) 
Fall 2022

Math 4520 Classical geometries and modern applications (+ development of active learning materials) 
Fall 2021, 2023

Math 7520 Bernstein Seminar in Topology. Graduate topics course on Anosov flows 
Fall 2021

Math 2220 Multivariable calculus, two sections 
Spring 2021

Math 3210 Manifolds and differential forms 
Fall 2020

Math 7520 Bernstein Seminar in Topology. Graduate topics course on Mostow rigidity 
Spring 2020

Math 4530 Introduction to topology 
Fall 2019

**Brown University**
Math 2720 Introduction to dynamical systems (graduate) 
Spring 2019

Math 1230 Graph theory (undergraduate) 
Spring 2018, Spring 2019

**UC Berkeley**
Math 141 Undergraduate differential topology 
2016

Math 113 Abstract algebra 
2015, 2014

Math 130 The classical geometries 
2015

**University of Chicago**
Math 161–2–3 Inquiry Based Learning honors calculus 
2013-2014

Math 196 Linear algebra 
2013

Math 195 Mathematical methods for the social sciences: Multivariable calculus 
2012

Math 113 Introduction to groups and geometry for liberal arts students 
2012

Math 112 Elementary number theory for liberal arts students 
2011

Math 131–2–3 Single variable calculus 
2010-2011
Student supervision

**PhD students:**
Mauro Carmago and Hazel Brenner (expected graduation May 2025), Isaac Broudy (May 2028).
Member of thesis committee for: Aria Beaupre, Colby Keln, Sumun Iyer, Olu Olorode, Nikhil Sahoo, Chaitanya Tappu, Benjamin Thompson.

**Honors theses:**
Undergraduate honors thesis of Taro Shima, Brown University 2019
Undergraduate honors thesis of Sophia Elia, UC Berkeley. 2016

**Project supervision:**
Co-supervisor of graduate student reading group on mapping class groups and geodesic currents Spring 2021
Supervisor of graduate student reading group on mapping class groups of infinite type surfaces Fall 2019
Supervisor of RISD collaborative study project on projective geometry for architecture/engineering students 2018
Undergraduate summer research project on Orderable Groups and Topology, Brown university 2018

Service

I. Program Development

**DRP Network.** Co-developer, and current lead of oversight team for a national network of directed reading (grad–undergrad mathematics mentorship) programs, providing resources and tools for program startup and best-practices and NSF–funded study of efficacy and outcomes. https://sites.google.com/view/drp-network/

II. Organization of thematic semester programs

MSRI program on Topological and Geometric Structures in Low Dimensions (2026)
Group actions and rigidity: around the Zimmer program (Inst. Henri Poincaré thematic trimester, 2024)
Fields institute thematic program in Set-Theoretic Methods in Algebra, Dynamics, and Geometry (2023).

III. Conferences and seminars co-organized

Group actions in low dimensions (Inst. Henri Poincaré) April 2024
Communicating mathematics (NSF funded interdisciplinary conference at Cornell university) August 2022
Cornell topology festival (main organizer) May 2021
Ordered groups and rigidity in dynamics and topology (BIRS workshop) June 2019
Special session on groups in low-dimensional topology and dynamics (AMS sectional meeting) Nov 3-4, 2018
Directed Reading Program Workshop (MIT) May 26-27, 2018
UC Berkeley Topology Seminar 2014-17
Foliations seminar (Joint Stanford-Berkeley seminar/reading group) Spring 2016
RTG Graduate Student Summer School in topology (UC Berkeley) July 8-12, 2015
Groups, Geometry and 3-manifolds, conference in honor of Daryl Cooper (UC Berkeley) May 21-22, 2015
Cohomology of diffeomorphism groups (Joint Stanford-Berkeley research seminar) 2014-15
Special session on geometry of real projective structures (AMS Joint Meetings) January 4-7, 2012

IV. Outreach

Canada/USA Mathcamp (summer program for high school students) visiting instructor Summer 2015, 2018, 2024
Co-organizer, Topology Students Workshop (professional development for grad students) Summer 2018, 2020
Co-organizer of Topology Postdocs Workshop July 2020
Faculty advisor for graduate-undergraduate mathematics Directed Reading Program (at Brown, then Cornell) 2017–
Research Experience for Undergraduates (U. Chicago), Mentor for 8 undergrads 2009, 2011
University of Chicago Directed Reading Program 2010-2013
Supervised 7 independent study projects
Graduate student coordinator for Summer REU at University of Chicago Summer 2011

**Undergraduate/general-audience talks at:**
Cornell University, University of Chicago, UC Berkeley, UC Santa Barbara, Sonoma State University, Harvard University, University of Michigan, Brown, Swarthmore, Cambridge Mathematics Society

**V. Committee work**
Comité de sélection (hiring committee in France) 2022 (MCF), 2024 (Prof)
Cornell math first year advising committee 2020–
Undergraduate math major committee 2022–
Cornell mathematics diversity committee and library committee 2020-21
Brown mathematics department diversity committee and colloquium committees 2017-19

**VI. Editorial work**
Member of editorial board of:
Geometriae Dedicata (2020-24),
Communications of the American Mathematical Society (2021–current),
Journal of Topology (2022–current).