

Dept. of Mathematics
University of Michigan
530 Church St
Ann Arbor, MI 48104

Positions

University of Michigan, Department of Mathematics, Ann Arbor, MI
RTG Postdoctoral Assistant Professor September 2016–present

Education

Tufts University, Department of Mathematics, Medford, MA MS 2013, PhD 2016
Mathematics
Advisor: Professor Boris Hasselblatt

Hamilton College, School of Arts and Sciences, Clinton, NY BA 2011
Mathematics

Research Interests

My research interests are in geometry, topology, and dynamical systems. More specifically, I am interested in ergodic theory, thermodynamic formalism, nonuniformly hyperbolic geodesic flows, convex real projective structures, and higher Teichmüller spaces.

Preprints and Publications

1. Harrison Bray. *Geodesic flow of nonstrictly convex Hilbert geometries*. (preprint, submitted).
2. Harrison Bray. *A measure of maximal entropy for nonuniformly hyperbolic Hilbert geometries*. (preprint, submitted).
3. Ilesanmi Adeboye, Harrison Bray, and David Constantine. *Entropy rigidity and Hilbert volume*. (preprint, submitted).

Grants and Awards

Outstanding Academic Scholarship Nominee (Finalist). Tufts University Graduate School of Arts and Sciences. April 2016

Tufts Mathematics Distinguished Teaching Prize for exceptional graduate student teaching. October 2015

The Robert P. Guertin Graduate Student Leadership Award. Tufts University Graduate School of Arts and Sciences. April 2015

Graduate Institute for Teaching Fellowship. Tufts University Graduate School of Arts and Sciences. May – Dec 2015

GEAR Graduate Internship Travel Grant. Aug 2016

AMS Graduate Student Travel Grant. January 2016

Tufts Graduate School of Arts & Sciences Conference Travel Grant. 2012 – 2014

Mentoring

- Jennifer Jones-Baro (Centro de Investigacion en Matemáticas) and Adam Holeman (University of Montana). Summer 2017
Michigan REU program. Co-supervised with Caleb Ashley.

Service and Leadership

Lab of Geometry at Michigan (LoG-M)
Director July 2017 – present

LoG(M) is Michigan's chapter of the Geometry Labs United. The goal of the organization is to create avenues into research for interested undergrads via mentoring, community, and visualization. Students in

groups of 2-3 participate in research projects run by faculty with a graduate student assistant. Thus far, Michigan is running 3-4 projects per semester. The role of the director is to manage the local chapter.

Wolverine Pathways

Math circle leader for 8th and 11th graders on three different Saturdays in fall 2017. Oct – Nov 2017

Wolverine Pathways is a program which, after completion, provides financial support for students from the greater Detroit metropolitan area to attend the University of Michigan if admitted. The math department runs math circles on a volunteer basis as part of the program.

Mathematical Research Community Workshop on Dynamical Systems: Smooth, Symbolic, and Measurable.

Assistant to the Organizers June – July 2017

With two other assistants, helped the organizers set up certain components of the workshop, ran an ice-breaker activity for participants, and coauthored a summary of the results of the workshop as part of an NSF proposal to fund the MRC program.

FEMMES (Females Excelling in Math, Engineering, and the Sciences) Capstone Event

Activity facilitator for 4-6th grade girls Nov 2016 & Mar 2017

Tufts University Student Chapter of the Association for Women in Math (AWM)

President Sept 2014 – Present
Vice President Dec 2013 – Sept 2014
Cofounder Dec 2013

As President of the Tufts student chapter of the AWM, I organized outreach activities at local high schools, panel discussions with women in mathematics from the greater Boston area, coffee & donuts meet-ups with female guest seminar speakers, and regular group meetings to create a community centered around encouraging the participation of underrepresented genders in mathematics.

Tufts University Org. of Graduate Students in Mathematics

Second Year Class Representative Sept 2012 – Aug 2013

MISE Math Camp, Accra, Ghana

Instructed number theory for exceptional high school students in Ghana. The month long summer camp included three weeks of course work and culminated in one week of small groups research projects. July 2012

Memberships

American Mathematical Society (AMS)

Association for Women in Mathematics (AWM)

Conferences, Seminars, Workshops, and Visits

Invited Presentations

- Joint Mathematics Meeting Special Session: Boundaries for groups and spaces. San Diego, CA. 10-13 Jan 2018
- Dynamical Systems Seminar. Northwestern Univ. Evanston, IL. 2 May 2017
- [Junior Geometry and Topology in the Midwest Conference](#). Madison, WI. 22 Apr 2017
- Geometry and Topology Seminar. Univ. of Toronto. Toronto, ON, Canada. 13 Mar 2017
- Ergodic Theory/Probability Seminar. Ohio State Univ. Columbus, OH. 9 Feb 2017
- Complex Analysis, Dynamics, and Geometry seminar. University of Michigan. Ann Arbor, MI 28 Nov 2016
- Howard University Mathematics Colloquium. Washington, D.C. 4 Nov 2016
- [Workshop in Dynamical Systems](#). Penn State University. State College, PA. 27-30 Oct 2016
- Minicourse on ergodic geometry in a nonuniformly hyperbolic setting (4 courses). University of Maryland, College Park, MD. 2-11 Aug 2016
- Dynamics and Algebra seminar. Wesleyan University. Middletown, CT. 26 April 2016

- [Workshop on Dynamical Systems and Related Topics](#).
University of Maryland. College Park, MD. 15-17 Apr 2016
- Dynamics seminar. University of Chicago. Chicago, IL. 15 Feb 2016
- Everytopic seminar. Brandeis University. Waltham, MA. 3 Dec 2015
- [Poster; Midwest Dynamical Systems Meeting](#). Ohio State Univ. Columbus, OH. 31 Oct 2015
- [Second Annual Graduate Student Math Conference](#), Brown University. 21 Feb 2015
- IRMA Master Class: student-postdoc seminar. Strasbourg, France. 12 May 2014
- Finsler Geometry and Applications. Galatasaray University, Turkey. Apr 2014
- [Poster](#); School on Geometry and Dynamics. CIRM, Luminy, France. 31 Mar 2014
- Séminaire Teich. Aix-Marseille University, Marseille, France. 28 Mar 2014
- Young Mathematicians in Dynamical Systems. CIRM, Luminy, France. 29 Nov 2013

Seminars Organized

- Dynamics Seminar: Tufts University. Sept 2014 – April 2016, Sept 2013 – Dec 2013

Conferences Organized

- Research in Pairs, with M. Crampon. CIRM, Luminy, France. May 2014

Conferences Attended

- [Geometry Labs United 2017](#). Seattle, WA. 12-13 Aug 2017
- [Mathematical Research Community Workshop on Dynamical Systems: Smooth, Symbolic, and Measurable](#). Snowbird Resort, UT. 18-24 June 2017
- [Workshop on Moduli Spaces of Geometric Structures](#). IMS, Singapore. 15-19 Aug 2016
- [Geometries, surfaces and representations of fundamental groups](#).
University of Maryland, College Park, MD. 22-24 June 2016
- [Fractal Geometry, Hyperbolic Dynamics and Thermodynamical Formalism](#).
ICERM, Providence, RI. 7-11 Mar 2016
- [Joint Mathematics Meetings](#). Seattle, WA. 6-9 Jan 2016
- [AMS Fall Eastern Sectional Meeting](#). Rutgers Univ, New Brunswick, NJ. 14-15 Nov 2015
- [Women In Mathematics In New England \(WiMiN\)](#). Smith College, Northampton, MA. 19 Sept 2015
- MSRI Connections for Women: Dynamics on Moduli Spaces of Geometric Structures.
Berkeley, CA. 15-16 Jan 2015
- MSRI Introductory Workshop: Dynamics on Moduli Spaces of Geometric Structures.
Berkeley, CA. 20-23 Jan 2015
- [ICTP-NLAGA School in Dynamical Systems and Ergodic Theory](#). Mbour, Senegal. 4-14 June 2014
- Master Class: Around Thurston-Grothendieck-Teichmüller theories. IRMA,
Strasbourg, France. 9-17 May 2014
- Young Researchers in Geometric Group Theory. CIRM, Luminy, France. 20-24 Jan 2014
- Hyperbolicity and Dimension. CIRM, Luminy, France. 2-6 Dec 2013
- Beyond Uniform Hyperbolicity. Będlewo, Poland. 27 May – 6 June 2013

Seminar Participation

- Geometric Group Theory and Topology Seminar. Tufts University. Sept 2014 – Present,
Sept 2012 – Dec 2013
- Séminaire: Dynamique, Arithmétique et Combinatoire.
Institut de Mathématiques de Marseille. Feb – Apr 2014
- Séminaire: Teich, Aix Marseille Université. Jan – Apr 2014
- Dynamics Seminar, Tufts University. Sept 2012 – Dec 2013
- Working seminar on Ergodic Geometry, Tufts University. Spring 2013

Invited Guest

- CIRM, Luminy, France. Jan 2014 – Apr 2014

Teaching Experience

- Primary Instructor:** Linear Algebra, IBL Sept – Dec 2017
University of Michigan
– Managed all facets of my own section.
– Taught the course in an Inquiry Based Learning (IBL) style.
- Primary Instructor:** Exploration in Probability, IBL Jan – Apr 2017
University of Michigan
– Managed all facets of my own section.
– Taught the course in an Inquiry Based Learning (IBL) style.
- Primary Instructor:** Intro to Topology, IBL Sept – Dec 2016
University of Michigan
– Managed all facets of my own section.
– Taught the course in an Inquiry Based Learning (IBL) style.
- Online Course Moderator and Research Assistant,** Jan-Aug 2016,
Poincaré Institute for Mathematics Education. Sept 2012 – Aug 2014
– Moderated online discussion, composed and edited course materials, provided supplementary office hours using Adobe Connect.
- Primary Instructor:** Applied Calculus II. Fall 2015
Tufts University
– Managed my own section: this included delivering all lectures.
– Collaborated with a mentor to produce course materials, including the syllabus, weekly quizzes, exams, in-class activities, and other resources.
– Experimental teaching: during select class periods, created and shared video lectures electronically with students to view preceding class time, then assigned activities and problems during class. Assigned exercises to engage students actively in the material every class period.
– Created the first public [course webpage for Math 36](#) at Tufts.
– Wrote [Mathematica CDFs](#) to supplement course material.
- Primary Instructor:** The Mathematics of Social Choice. Spring 2015, Fall 2014
Tufts University
– Managed my own section: included delivering the lectures and generating all course materials, such as the syllabus, homework, daily quizzes, exams, and other resources.
– Created the first public [course webpage for Math 19](#) at Tufts.
– Wrote [Mathematica CDFs](#) to supplement course material.

Pedagogical Training

- IBL Workshop.** University of Michigan Aug 2016 & Aug 2017
– The annual three day IBL workshop consists of observing and analyzing an inquiry-based learning (IBL) classroom on mathematical proof, which extends to semi-monthly lunches with discussion on IBL techniques and ideologies in mathematics.
- Michigan Teaching Training** Aug 2016
– Michigan has an extensive teacher training program for new hires, run by the math department in conjunction with the Michigan Center for Research on Learning and Teaching (CRLT).
- Graduate Institute for Teaching (GIFT).** Tufts University May-Dec 2016
– The Tufts Graduate Student Institute for Teaching (GIFT) awards fellowships on a competitive basis across all fields of scholarship at Tufts. Teaching fellows participate in an intensive summer workshop on pedagogy before working with a faculty mentor in the classroom the following semester.