

Aaron Benda

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EDUCATION

The University of Texas at Austin

August 2021 - Present

Mathematics Ph.D. candidate; expected 2027

Advisor: Jeff Danciger

University of Maryland, College Park

August 2017 - May 2021

B.S. in Mathematics, minor in Philosophy - May 2021

Cum Laude, with High Honors in Mathematics; academic honors every eligible semester

Montgomery Blair High School

August 2013 - June 2017

High School Diploma, Certificate of Merit - June 2017

PUBLICATIONS

1. Weakly Mixing Systems with Dense Prime Orbits

[Colloquium Mathematicum 169 \(2022\), 11-23](#); [arXiv:2010.09812](#)

2. Extremizers of the J functional with respect to the d_1 metric

Joint with Sam Bachhuber, Benjamin Christophel, and Tamás Darvas

[Analysis Mathematica 48 \(2022\), no. 2, 307-330](#); [arXiv:2304.06323](#)

Note: all articles above can be found in .pdf form at aaronbenda.com/research.

WORK, TEACHING, AND MENTORSHIP

Assistant Instructor

Summer 2023, Fall 2025

Sole instructor for two math courses at UT (M w408C - Differential and Integral Calculus in Summer '23; M 371E - Learning Assistant Experience in Mathematics in Fall '25)

Teaching Assistant

Fall 2020 - Spring 2024, to resume

Work as a TA for calculus, discrete math, differential equations, linear algebra (at both UMD and UT)

Responsibilities including running discussion sections, grading assignments, holding office hours

Private Math Tutoring Business

August 2018 - May 2025

Work primarily with undergraduate students on math (calculus, linear algebra, topology, etc.)

Typically five to ten hours per week, with some variance ([more details on my website](#))

Texas Experimental Geometry Lab Project Mentor

Spring 2025 - Present

Mentored three students (Joseph Hummel, Kaius Noble, and Prajith Velicheti)

Project webpage: [Visualizing Markov Codings for Geodesic Flow](#)

Directed Reading Program (mentor; UT Math Department)*Spring 2022 - Present*

Mentored undergraduates on reading projects in advanced math, outside the scope of usual coursework:

Spring '22: Abhinav Rachakonda - Complex Analysis and the Prime Number Theorem

Summer '22: Amy Somers (UCSB) - An Introduction to Dynamical Systems

Fall '22: Thor Preimesberger - Benamou-Brenier and Metric Geometry

Spring '23: Ryan Charrette - L-functions and Modern Problems in Number Theory;

Amanda Yin - Chaotic Dynamical Systems: Hyperbolic Toral Automorphisms

Summer '23: Brandon Paez (UTEP) - Introduction to Riemannian Geometry and Ricci Flow

Fall '23: Ryan Charrette - Harmonic Analysis on Locally Compact Groups: p-Adics/Applications

Spring '24: Allison Podanoffsky - Finite fields and Algebraic Number Theory

Summer '24: Giancarlo Villatoro - Essence of Analytic and Probabilistic Number Theory

Fall '24: Joseph Hummel - Geometry on Manifolds;

Yanrong Yu - Bifurcation Theories and Chaos

Spring '25: Luke Hospenthal - The Birkhoff Ergodic Theorem;

Group Project on Randomness and Recurrence in Dynamics (see 3 students below):

Sanay Salvi - Dynamical Systems and the Recurrence Theorem;

William Hao - Benford's Law: From Logarithms to Dynamical Systems;

Arnav Lahoti - Measure Theory

Summer '25: Arnav Lahoti - Mathematical Foundations of Machine Learning

Fall '25: Krithi Prasad - Topology and Geometry of Surfaces

Spring '26: Anna Iskra - The Role of Architecture in Stochastic Gradient Descent Convergence

Student-Teaching*Spring 2018, Spring 2019, and Fall 2019 Semesters*

With Tanay Wakhare, courses on topics in number theory (faculty supervisor: Dr. Larry Washington)

Each course was one credit (lecture once a week for one hour), offered in the math department at UMD

AWARDS AND HONORS

UT Groups & Dynamics RTG Fellowship*Summer '24 - Summer '25, Spring - Summer '26*

Provided financial support for me to focus on research as a graduate student

Nomination for SLMath Summer School*December 2024*

One of only four annual nomination spots for graduate students at UT

Frank Gerth III Teaching Excellence Award, UT Math Department*May 2024*

An award for the top teaching assistants in the UT math department in a given academic year

Outstanding Senior Award, UMD Math Department*May 2021*

An award for the top graduating senior studying mathematics at UMD

Strauss Teaching Assistantship*May 2020*

A competitive award allowing undergraduates at UMD to TA Calculus I/II for a full academic year

Maryland Summer Scholars Research Award*March 2019*

Provided funding for my research work under Dr. Adam Kanigowski in Summer 2019

Excellence in Mathematics Award*May 2017*

From Montgomery Blair HS "in recognition of exceptional performance in honors and AP math courses"

PRESENTATIONS/TALKS GIVEN

1. The Green-Tao Theorem*	<i>April 2026</i>
2. The Congruence Subgroup Conjecture*	<i>February 2026</i>
3. Convex Real Projective Structures on Surfaces	<i>September 2025</i>
4. The Nielsen Realization Theorem	<i>September 2025</i>
5. Dynamics of Geodesic Flow*	<i>April 2025</i>
6. The Eight Geometries and Thurston's Geometrization	<i>April 2025</i>
7. The Pressure Metric for Hitchin Components (Candidacy Talk)	<i>April 2025</i>
8. Geodesic Flows and Ergodicity in Negative Curvature	<i>February 2025</i>
9. Ratner's Theorem on Unipotent Flows*	<i>December 2024</i>
10. Symbolic Dynamics for Hyperbolic Groups*	<i>December 2024</i>
11. Geometry Through the Ages	<i>October 2024</i>
12. Teichmüller Space via Hyperbolic Geometry	<i>October 2024</i>
13. Hyperbolic Groups and Gromov's Geodesic Flow	<i>September 2024</i>
14. Measures on Homogeneous Spaces*	<i>April 2024</i>
15. Geodesic Currents, Laminations, and Teichmüller Space	<i>April 2024</i>
16. Symmetric Spaces	<i>November 2023</i>
17. Group Actions, Dynamics, and Geometry	<i>October 2023</i>
18. Mysterious Patterns in the Primes	<i>February 2023</i>
19. Deforming Convex Real Projective Structures*	<i>December 2022</i>
20. Sarnak's Conjecture	<i>November 2022</i>
21. An Introduction to Dynamics and Ergodic Theory	<i>September 2022</i>
22. Free Groups	<i>June 2022</i>
23. Topological Entropy	<i>June 2022</i>
24. An Introduction to Ergodic Theory and Prime Orbits	<i>February 2022</i>
25. An Introduction to Prime Number Theory	<i>December 2021</i>
26. Frobenius' Theorem on Integrable Distributions*	<i>December 2020</i>
27. Clifford Algebras and Spinor Groups*	<i>December 2020</i>
28. Embedded Cobordisms (UVa REU)	<i>July 2020</i>
29. Exponential Mixing for Skew Products	<i>May 2020</i>
30. Weakly Mixing Systems with Dense Prime Orbits	<i>September 2019</i>
31. A Topological Proof of the Fundamental Theorem of Algebra (DRP)	<i>December 2018</i>
32. A Proof of the Prime Number Theorem*	<i>May 2017 and December 2017</i>
33. The Historical Development of Non-Euclidean Geometries*	<i>October 2016</i>

*Note: files for many of the above can be found on [my website](#); *indicates a talk given for a course.*

CONFERENCES ATTENDED

1. UW Madison: Geometry Labs United IV *June 2026*
2. SL Math: Anosov Representations and Homogeneous Dynamics *April 2026*
3. SL Math: Graduate School on Geometry and Dynamics in Higher Rank Lie Groups *July 2025*
4. IHP: Workshop on Low Dimensional Phenomena in Geometry and Dynamics *June 2025*
5. UT Austin: Mini-school in Analytic Group Theory *March 2025*
6. UIC: Big Ideas in Dynamics and Geometry (attended virtually) *September 2024*
7. UMD: Dynamics Workshop *April 2024*
8. Texas A&M: Workshop on Groups and Dynamics *March 2024*
9. UT Austin: Graduate Mini-school in Groups, Dynamics, and Probability *June 2023*
10. UMD: Workshop on Partial Hyperbolicity *May 2023*
11. UT Austin: Graduate Mini-school in Groups and Dynamics *July 2022*
12. Rice University: Ergodic Theory and its Connections (in honor of Misha Boshernitzan) *May 2022*
13. Penn State: Dynamics Workshop *September 2019*

OTHER MATH EXPERIENCES, SERVICE

Directed Reading Program Organizer *Spring 2025 - Spring 2026*
Board of math grad students organizing UT math's DRP for grad students to mentor undergrads

Graduate Representative Committee (UT Math Department) *Fall 2023 - Spring 2024*
Served on the committee of graduate students representing student interests to the math department

Summer Research Experiences (at UMD) *Summer 2019 and Summer 2021*
Worked on research projects under Dr. Adam Kanigowski and Dr. Tamás Darvas, respectively

UMD Graduate Qualifying Exams *August 2020*
Passed qualifying exams (in Algebra and Analysis) for the math PhD program at UMD

University of Virginia Differential Topology REU (Online) *Summer 2020*
Group work under Dr. Julie Bergner on algebraic structure and TQFT for 2D embedded cobordisms

Reading/Research Course (UMD Math Department) *Spring 2020 Semester*
Under Dr. Giovanni Forni, on the subject of decay of correlations for partially hyperbolic systems

Directed Reading Program (student; UMD Math Department) *Fall 2018 Semester*
Reading in algebraic topology under the guidance of Zach Greenberg, a graduate student at UMD
Culminated in a talk given to peers and some UMD faculty on my readings

(Unofficial) Volunteer Work Helping Peers in Math and Physics *August 2015 - May 2018*
Helped friends/peers in their math and physics courses (thirty minutes to an hour daily)

TECHNICAL STRENGTHS

Coding	Python, Java, Matlab, Wolfram Mathematica (all basic familiarity)
Software & Tools	Microsoft Office, Google Drive, L ^A T _E X (all self-taught; very comfortable)

OTHER INTERESTS

Soccer

Played competitive travel soccer until college (Goalkeeper and Team Captain)

Music and Guitar

Participated in numerous music groups throughout high school and earlier

Concert series, jazz band, guitar ensemble, individual/small group performances, and more

Roles: lead and rhythm guitarist, bass guitarist

Casual guitar play throughout my life; play in several bands with friends in middle and high school

Gaming

Member and administrator for the UMD and UT Rocket League Clubs

Competed for competitive teams in national tournaments

UT club president (Fall '23 - Fall '24); UMD competitive team director ('20-'21 academic year)

Chess

Casual chess play sporadically since elementary school (almost entirely self-taught)

Player for UT's Collegiate Chess League team in Spring 2024

LANGUAGES

English (native), French (proficient)