

Aislinn E. Smith

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EDUCATION

University of Texas at Austin – College of Natural Sciences

B.Sc. in Mathematics (Honors) w/ Data Sciences Certificate (GPA: 3.87/4.00)

December 2022

Bio-Physics Major (Pre-Med): Aug. 2017 - Dec 2020

Mathematics Major: Dec. 2020 - Dec. 2022.

M.A. in Mathematics (GPA: 3.91/4.00)

Aug 2025

McGill University – Department of Mathematics and Statistics

Visiting Student (funded by NSF GRFP)

Aug 2025 – Aug 2026

ACADEMIC AWARDS

NSF Graduate Fellowship (NSF GRFP)

2023 - 2026

UT Austin Dean's Strategic Fellowship

2023 - 2026

Nancy Francis and William Arnold McMinn Presidential Scholarship

2021 - 2022

NSF Undergraduate Research Training Grant Fellowship

2020-2021

RESEARCH/PROJECTS

Mathematics MA Report - In Progress

May 2025 - Aug 2026

- Cumulative write-up and results from research and reading with Piotr Przytycki (McGill) and Maggie Miller (UT Austin). Focused on topics including mapping class groups, surface braid groups, and group automata/bi-automaticity.

MPI Mathematics in the Sciences - Visiting Student (Hybrid)

June 2024 - Aug 2024

- Visited the Geometry, Groups, and Dynamics group at the Max Planck Institute for Mathematics in the Sciences (MPI MiS), gained experience in an international research environment, explored connections between low-dimensional topology and algebraic geometry, and used computer algebra software. Co-initiated a reading group on Riemann surfaces and the Deligne–Mumford compactification of the moduli space of curves

Mathematics BSc Thesis: “Minimal surfaces in hyperbolic manifolds and link complements”

August 2022 - Dec. 2022

- Building on my REU research, my undergraduate honors thesis was an expository study of the realization of minimal surfaces as covers of incompressible submanifolds in hyperbolic knot complements, emphasizing Kleinian group actions, polyhedral decompositions, and the resulting closed minimal surfaces.

SUMRY REU – Yale U.: “Combinatorial and geometric aspects of hyperbolic manifolds”

May 2022 - July 2022

- Undergraduate NSF-funded research in low-dimensional topology and combinatorial hyperbolic geometry mentored by Dr. Franco Vargas-Pallete
- Main contribution was to the development of a finite element method that could simulate mean curvature flow such that it was compatible with a hyperbolic metric

Moncrief Internship – The ODEN Institute for Computational Sciences

May 2021 - May 2022

- Undergraduate research in statistical optimization/robotic path planning using Monte Carlo methods under advisement of Dr. Takashi Tanaka
- Compared the computational complexity and success of two different models of diffusion-based optimal control (reinforcement learning vs numerical solutions to Hamilton-Jacobi-Bellman PDE) [2]

Complex Systems REU – University of Minnesota*May 2020 - July 2020*

- Undergraduate NSF-funded research in nonlinear fluid dynamics led by Dr. Arnd Scheel
- Researched the stability and resonances of non-linear Fischer KPP reaction-diffusion equations [1]

TEACHING/ WORK EXPERIENCE/SKILLS**Volunteer Lecturer - Waterloo CEMC Online Math Circle***March 2026 - April 2026*

- Led the 7th and 8th week of the [CEMC online math circle](#) for ~150 students
- Designed lectures and exercises on Finite State Computing Machines, Decision Problems, Group Theory, and Cayley Graphs w/ goal of teaching the “Fundamental Theorem of Automatic Groups”

Co-Organizer of Math for All in Austin 2025 Conference*Aug 2024 - April 2025*

- Coordinated outreach and communication for the [2025 Math for All](#) conference, expanded undergraduate participation to 7+ Texas colleges and organized a mathematical career-planning and networking forum for attendees

Graduate Teaching Assistant - UT Austin Department of Mathematics*Aug 2024 - Aug 2025*

- Teaching Assistant for M408C (Differential and Integral Calculus), M427J (Differential Equation and Linear Algebra), M341 (Linear Algebra), and M367K (Topology I)

Directed Reading Program Mentor - UT Austin Department of Mathematics*Dec 2024 - Aug 2025*

- Worked as a graduate mentor to a group of three undergraduate students. Together, we worked to understand the basics of abstract algebra, geometric group theory, and braid groups. The main goal of our project was to read recent publications on hierarchically hyperbolic groups.

College Math and Physics Tutor - UT Austin Sanger Learning Center*July 2019 - Dec 2021*

- Employed as an math and physics tutor by UT Austin’s School of Undergraduate Education, and provided 1-on-1 as well as group tutoring sessions in all levels of undergraduate math and physics

Math and Physics Instructor/Tutor - The Liberal Arts and Science Academy*Aug 2019 - Dec 2021*

- Worked as an in-person after-school tutor, and was later hired as an instructor for an online pre-calculus class

Undergraduate Learning Assistant - UT Austin Department of Physics*Aug 2020 - Jan 2021*

- Responsible for assisting a team of professors, TAs, and other Learning Assistants to teach a 200+ person section of an engineering-focused physics class

PUBLICATIONS

[1] Avery, M., Dedina, C., Smith, A., Scheel, A. (2021). Instability in large bounded domains—branched versus unbranched resonances. *Nonlinearity*, 34(11), 7916–7937. <https://doi.org/10.1088/1361-6544/ac2a15>

[2] Patil, A., Duarte, A., Smith, A., Tanaka, T., & Bisetti, F. (2022). Chance-Constrained Stochastic Optimal Control via Path Integral and Finite Difference Methods. *arXiv*. <https://doi.org/10.48550/arXiv.2205.00628>

Coding Knowledge: C++, Python, SciPy (intermediate); HTML (basic)