

Aislinn E. Smith

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EDUCATION

University of Texas at Austin – College of Natural Sciences

Bachelors of Science - Honors Mathematics w/ Data Sciences Certificate Aug 2017 - Dec 2022

(initial Biophysics-major changed to Mathematics from 2020-2022)

Master of Arts - Mathematics Aug 2023 - Aug 2025

McGill University - Department of Mathematics

Visiting Graduate Student Trainee Aug 2025 - Aug 2026

ACADEMIC AWARDS

NSF Graduate Fellowship – Topology 2023 - 2026

UT Austin Dean’s Strategic Fellowship 2023 - 2026

Nancy Francis and William Arnold McMinn Presidential Scholarship Aug. 2021 - May 2022

NSF Undergraduate Research Training Grant Aug. 2020 - May 2021

NSF RTG Undergraduate Fellowship - UT Austin Analysis and PDEs group Aug. 2020 - May 2022

RESEARCH/PROJECTS

Mathematics MA Thesis - In Progress May 2026 - Aug 2026

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

MPI MiS (Geometry, Groups, and Dynamics group) - Visiting Student June 2023 - July 2024

- Participated in a hybrid research internship in the Geometry, Groups, and Dynamics group, gaining experience in an international research environment and exploring connections between low-dimensional topology, dynamics, and algebraic geometry. Co-initiated a reading group on Riemann surfaces and the Deligne-Mumford compactified moduli space of curves

Mathematics BSc Thesis: “Minimal surfaces in hyperbolic manifolds and link complements” August 2022 - Dec. 2022

- Building upon my REU research, my undergraduate honors thesis studied how such minimal surfaces can be realized as covers of incompressible submanifolds with boundary in aspherical three-manifolds that are complements of specific hyperbolic knots; focusing on the covering action as a Kleinian subgroup, the polyhedral decomposition of the ambient manifold, and the structure of the resulting closed minimal surface in the knot complement.

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
- This project was motivated by the converging interests of Karen Uhlenbeck and William Thurston on closed geodesics within hyperbolic surfaces of constant mean curvature.
- Contributed 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 w/ The UT 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 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)