# Aislinn E. Smith

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## EDUCATION

**University of Texas at Austin – College of Natural Sciences**

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| Bachelors of Science - Biophysics (~85% complete) | Aug 2017 - May 2020 |
| Bachelor of Science - Honors Mathematics (completed) | Aug 2020 - Dec 2022 |
| Master of Arts - Mathematics (completed) | Aug 2023 - August 2025 |

**McGill University - Department of Mathematics**

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| Visiting Graduate Trainee | Aug 2025 - Aug 2026 |

## ACADEMIC AWARDS

**NSF Graduate Fellowship – Topology** *2023 - 2028*

**UT Austin Dean's Strategic Fellowship** *2023 - 2028*

**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

**MPI MiS *(Geometry, Groups, and Dynamics group, Sam Fairchild)* - 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 moduli spaces. Co-initiated a reading group on Riemann surfaces and the Deligne–Mumford compactification of moduli space

**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.

**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 Tutor** - Native Friendship Centre of Montreal *Nov 2025 - Present*

- Tutor adult learners from Indigenous Communities in Montreal Area focused on the mathematics portion of their GED curriculum.
- Program is officially run by teachers from the First Nations Regional Adult Education Centre

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

- Coordinated outreach and communication for the 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 - Present*

- 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 - Present*

- 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

## TALKS/CONFERENCES

**Combinatorial and gauge theoretical methods in low-dim topology - CRM De Giorgi** *June 2024*

**Homology Growth in Topology and Group Theory - MPIM Bonn** *May 2024*

**CIRM Research School - Renormalization and Visualization for Packing, Billiards, and Surfaces** *July 2023*

**Joint Mathematics Meeting (JMM)** *Jan. 2023*

- Presented on Yale REU research @ Pi Mu Epsilon undergraduate research forum

**The Young Mathematicians Conference @ Ohio State University** *Aug. 2022*

- Presentation: *Finding the Minimal Splitting Surface of the Ideal Regular Octahedron in the Poincare Ball*

**Texas Undergraduate Mathematicians Conference** *Oct. 2022*

- Presentation: *Finding the Minimal Splitting Surface of the Ideal Regular Octahedron in the Poincare Ball*

## 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