

Xinbo Li

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EDUCATION

University of Texas at Austin

B.S. in Mathematics (Option: Mathematics)

Aug 2022 – May 2026

(Expected)

- GPA: 3.95/4.0; with *Elements of Computing* Certificate
- Honors: *College Scholar* 2024 & 2025; *University Honors* every completed semester

RESEARCH EXPERIENCE

Texas Experimental Geometry Lab

[ΨS³ : Pseudo-self-similar structures](#)

Spring 2025 – Ongoing

Mentor: Jianlong Liu, University of Texas at Austin

- Studying pseudo-substitutions and their associated tiling spaces, with a specific focus on the square, chair, and Penrose tilings. With other members in the lab, developed Sage scripts to compute n -collars and $(n + 0.5)$ -collars of these tilings, enabling explicit analysis of their local configuration structure. Working toward a computer implementation of the Anderson–Putnam (AP) construction to model each tiling space as CW-complexes and compute topological invariants.

Polymath Jr. REU

Summer 2025

Poncelet Ellipses and Blaschke Products

Mentors: Yunus Zeytuncu, Nathan Wagner, Valentin Kunz

- Investigated decomposability and geometric structure of Blaschke products and their envelopes; analyzed degree-6 cases and constructed a counterexample showing decomposability is insufficient to capture geometric behavior. Gave an end-of-program talk with several other people in the group. Coauthored and delivered a presentation at 2026 JMM (Joint Mathematics Meetings).

INDEPENDENT READING AND PROJECTS

Directed Reading Program

Fall 2025

Graduate Mentor: Wang Yao, University of Texas at Austin

Algebraic Geometry

- Studied the second chapter of Hartshorne’s *Algebraic Geometry* on scheme theory; completed all exercises from 2.1 and 2.2, and selected exercises from 2.3. Gave a symposium talk on a fully faithful functor t from varieties over k to schemes over k at the end of the program.

Reading Course

Summer 2025

Faculty Mentor: William Beckner, University of Texas at Austin

Lie Groups, Lie Algebras, and Representations

- Read Brian Hall’s *Lie Groups, Lie Algebras, and Representations*, covering semisimple Lie algebras, compact Lie groups, and their representations; included detailed study of $\mathrm{SL}(2; \mathbb{C})$ and the representation of its Lie algebra $\mathfrak{sl}(2; \mathbb{C})$ as foundational examples.

Directed Reading Program

Summer 2024

Graduate Mentor: Winston Willam, University of Texas at Austin

Algebraic Curves

- Worked on Fulton’s *Algebraic Curves* with emphasis on affine/projective varieties, morphisms, and rational maps. Concluded with a symposium talk on the Nullstellensatz, illustrating the duality of varieties and coordinate rings through the example that $\mathbb{A}^2 \setminus \{(0, 0)\}$ is not affine.

WORK AND TEACHING

Grader (Department of Mathematics, UT Austin)

Topology 1

Spring 2025

Introduction to Real Analysis

Fall 2025

- Provided detailed written feedback on students' proof-based assignments, emphasizing logical clarity, rigor, and structure. Guided students to improve their proof-reading skills and foster a deeper understanding of course material.

CONFERENCES AND WORKSHOPS

Joint Mathematics Meetings (JMM) 2026

AMS Special Session on Polymath Jr Student Research Session, II

January 7, 2026

Washington D.C.

"Finding Ellipses: Blaschke Products, Poncelet's Theorem, and the Numerical Range"

Speaker, Coauthor

CMND 2025 Thematic Program in Discrete Groups in Topology and Algebraic Geometry

Undergraduate week participant

June 2-6, 2025

University of Notre Dame

Texas Undergraduate Math Conference (TUMC)

Participant

Oct 27-28, 2023

Stephen F. Austin State

University