

Xinbo Li

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EDUCATION

University of Texas at Austin

Aug 2022 – May 2026

B.S. in Mathematics (Option: Mathematics)

(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

Spring 2025 – Ongoing

ΨS^3 : *Pseudo-self-similar structures* [🔗](#)

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 a [presentation](#) [🔗](#) in 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 William, 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

Introduction to Number Theory

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

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

June 2-6, 2025

Undergraduate week participant

University of Notre Dame

Texas Undergraduate Math Conference (TUMC)

Oct 27-28, 2023

Participant

*Stephen F. Austin State
University*