

Xinbo Li

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EDUCATION

University of Texas at Austin <i>B.S. in Mathematics (Option: Mathematics)</i>	<i>Aug 2022 – May 2026 (Expected)</i>
◦ GPA: 3.95/4.0; with <i>Elements of Computing</i> Certificate ◦ Honors: <i>College Scholar</i> 2024 & 2025; <i>University Honors</i> every completed semester	

RESEARCH EXPERIENCE

Texas Experimental Geometry Lab <i>ΨS^3 : Pseudo-self-similar structures</i>	<i>Spring 2025 – Ongoing</i>
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 <i>Poncelet Ellipses and Blaschke Products</i>	<i>Summer 2025</i>
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	<i>Fall 2025</i>
Graduate Mentor: Wang Yao, University of Texas at Austin	
<i>Algebraic Geometry</i>	
◦ Studied the second chapter of Hartshorne’s <i>Algebraic Geometry</i> 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	<i>Summer 2025</i>
Faculty Mentor: William Beckner, University of Texas at Austin	
<i>Lie Groups, Lie Algebras, and Representations</i>	
◦ Read Brian Hall’s <i>Lie Groups, Lie Algebras, and Representations</i> , covering semisimple Lie algebras, compact Lie groups, and their representations; included detailed study of $SL(2; \mathbb{C})$ and the representation of its Lie algebra $\mathfrak{sl}(2; \mathbb{C})$ as foundational examples.	
Directed Reading Program	<i>Summer 2024</i>
Graduate Mentor: Winston Willam, University of Texas at Austin	
<i>Algebraic Curves</i>	
◦ Worked on Fulton’s <i>Algebraic Curves</i> 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	<i>Spring 2025</i>
Introduction to Real Analysis	<i>Fall 2025</i>

- 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

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