Xingyu Cheng
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Education

University of North Carolina at Chapel Hill   **2021—2026 (Expected)**

PhD Mathematics
Advisor: Prakash Belkale

Purdue University, West Lafayette, IN   **2017—2021**

BS Mathematics (Honors) *with distinction*
Minors: German, Computer Science

Online

Website: https://www.tigercheng.xyz/
Github: https://github.com/Xyxyxx

Publications

In preparation:

3. **Stability of parabolic systems of Hodge bundles over punctured $\mathbb{P}^1$**

   Undergraduate Publications:

2. **Linking number of monotonic cycles in random book embeddings of complete graphs** (joint with Yasmin Aguillon, Eric Burkholder, Spencer Eddins, Emma Harrell, Kenji Kozai, Elijah Leake, Pedro Morales). *J. Knot Theory Ramif.*. https://www.worldscientific.com/doi/pdf/10.1142/S0218216523500438 (2023)

1. **The Mean Sum of Squared Linking Numbers of Random Piecewise-Linear Embeddings of K_n** (joint with Yasmin Aguillon, Spencer Eddins, Pedro Morales). *Rose-Hulman Undergrad. Math. J.*. https://scholar.rose-hulman.edu/rhumj/vol24/iss2/3/ (2023)

Conferences attended

- **Richmond Geometry Meeting**, Virginia Commonwealth University, 2025. (Poster presented)

- **SRI in Algebraic Geometry (week 2)**, Colorado State University, 2025.

- **GAGS 2025**, University of Georgia Athens, 2025.

- **MAAGC**, Virginia Commonwealth University, 2023.

- **SLMATH/MSRI Summer School Commutative Algebra and its Interaction with Algebraic Geometry**, Notre Dame University, Summer 2023.

- **Georgia Algebraic Geometry Symposium**, University of Georgia, 2023.

- **Summer 2020 Indiana REU Conference**, Indiana University, 2020.
  Talk given: 'Extensions of the uniform random polygon model' (joint talk with Pedro Morales).

Teaching

Courses taught:

- **Fall 2025:** Math 381 Discrete Mathematics

- **Summer 2025:** Math 533 Elementary Number Theory

- **Fall 2024:** Math 152 Business Calculus

- **Summer 2023:** Math 118 Aspects of Modern Mathematics

- **Fall 2022:** Math 110 College Algebra

Recitations lead:

- **Spring 2024:** Math 233 Multivariate Calculus

- **Fall 2022:**

    - Math 231H Calculus I Honors
    - Math 110L Recitation for College Algebra

- **Spring 2022:** Math 233 Multivariate Calculus

- **Fall 2021:** Math 233 Multivariate Calculus

Service

- **Graduate Mathematics Association Visions Seminar Organizer** (2024—2025)

- **Geometry/Topology Comprehensive Exam Review Leader** (Summer 2024)

    This is a 9 week review session designed to prepare graduate students for the written comprehensive exam

- **Tea Time Coordinator (Tea Tsar)** (2023—2024)

Directed Reading Program

From `https://math.unc.edu/undergraduate/opportunities/`: "The Directed Reading Program (DRP) pairs undergraduate students with graduate student mentors for semester-long independent study projects. It is an opportunity for motivated students to get one-on-one mentorship as they learn about a math topic of their interest but is out of the scope of the courses offered at UNC."

- **Fall 2025:** With Vanessa Almelor. We will follow *Ideals, Varieties, and Algorithms* by Cox, Little, and O'Shea.

- **Spring 2025:** With Yuxin Ge. We learned some basics of Galois theory through Milne's notes. In particular, we focused on learning about fields and field automorphisms.

- **Spring 2024:** with Yan Zhu. We learned some basic number theory and abstract algebra from Ireland and Rosen.

- **Fall 2023:** with Paul Hamrick. We went through Reid's *Undergraduate Algebraic Geometry* with a particular focus on the proof of the 27 lines on a cubic.

- **Spring 2023:** with Aryan Kokkanti. 'Foundations of Knot Theory.'

- **Fall 2022:** with Marleigh Purgar-Mcdonald. 'Hilbert Nullstellensatz, Affine Varieties and Ideals.'