YUNHAN (ALEX) SHENG

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EDUCATION

University of Chicago **September 2020 - June 2024 (expected)**

B.S. in Mathematics with honors ⋄ Minor in Germanic Studies ⋄ GPA: 3.74/4.00

RESEARCH EXPERIENCE

The University of Chicago Mathematics REU 2022 **June 2022-August 2022**
- **Mentor: Wei Yao & Pallav Goyal**
- **Expository Paper: *Complex Multiplication of Elliptic Curves and Abelian Varieties.* *PDF***
- **Participant talk: *On the complex multiplication of elliptic curves.* *PDF***

The University of Chicago Mathematics REU 2021 **June 2021-August 2021**
- **Mentors: J. Peter May & Xiaolin Danny Shi**
- **Expository Paper: *On Realizing Rational and Polynomial Cohomology Rings.* *PDF***

RELEVANT COURSEWORK

- **MATH 37392 Arithmetic Geometry*, Winter 2023, Grade: A**
- **MATH 29700 Proseminar in Mathematics (scheme theory), Winter 2023, in progress**
- **MATH 31800 Topology and Geometry II (differential topology)*, Winter 2023, in progress**
- **MATH 29700 Proseminar in Mathematics (characteristics classes and K-theory), Grade: A**
- **Preliminary Arizona Winter School 2022: Heights in Diophantine geometry**
- **Midwest Algebraic Geometry Graduate Conference 2022**

Sophomore year
- **MATH 27400 Introduction to Differentiable Manifolds and Integration on Manifolds, Grade: A-**
- **MATH 25700 Honors Basic Algebra I, Grade: A**
- **MATH 25800 Honors Basic Algebra II, Grade: A**
- **MATH 32600 Algebra II (commutative algebra)*, Grade: B+**
- **MATH 32700 Algebra III (algebraic number theory)*, Grade: A**
- **MATH 38511 Brownian Motion and Stochastic Calculus*, Grade: A-**
- **MATH 31700 Topology and Geometry I (algebraic topology)*, Grade: A-**
- **Direct Reading Program: classical invariant theory of finite groups**

Freshmen year
- **MATH 20250 Abstract Linear Algebra, Grade: A**
- **MATH 20310 Analysis in Rn I (accelerated), Grade: A-**
- **MATH 20410 Analysis in Rn II (accelerated), Grade: A-**
- **MATH 20510 Analysis in Rn III (accelerated), Grade: A**
- **STAT 38300 Measure-Theoretic Probability II*, Grade A**
- **Direct Reading Program: fundamental groups and homology**

∗ indicates graduate courses

EXPOSITORY WRITINGS

***Elements of Complex K-theory.* PDF** **December 2022**
Final project for the course *Proseminar in Mathematics* with Prof. Akhil Mathew.

***Kähler manifolds and Hodge theory.* PDF** **March 2023**
Final project for the course *Topology and Geometry II with Prof. Eduard Looijenga.**

***Commutative ring theory.* PDF** **March 2022**
Class notes for *Algebra II (commuative algebra) with Prof. Ngo Bao Chau.**

Brownian motion and stochastic calculus. PDF **December 2021**
Class notes for *Brownian Motion and Stochastic Calculus with Prof. Gregory Lawler.**

Algebraic Topology. PDF **December 2021**
Class notes *Topology and Geometry I (algebraic topology) with Prof. Shmuel Weinberger.**

TEACHING EXPERIENCE

MATH 24400 Introduction to Algebraic Geometry ⋄ Reader	**Winter 2022**
MATH 25400 Basic Algebra I ⋄ Super reader	**Autumn & Winter 2022**
MATH 15300 Calculus III ⋄ Grader (VCA)	**Spring 2022**
MATH 15200 Calculus II ⋄ Grader (VCA)	**Autumn & Winter 2021**

Note: readers and super readers are teaching assistant positions.

MISCELLANEOUS

Music: I am passionate about classical music. I am a classically trained pianist and organist. I also play the carillon. To access my recordings and writings, please go to my homepage.

Languages: native fluency in Mandarin and English, can read basic German (still learning), Python.

Citizenship: Hefei, China

Date of Birth: December 22, 2001.