Hang Chen

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Education

Peking University | ***School of Mathematical Sciences*** Sep. 2020 – Jun. 2024
Major: Mathematics and Applied Mathematics Beijing, China

GPA
Overall: **3.84/4**, Major: **3.88/4**, Rank **10/130**

Research Interests
Number Theory, particularly Arithmetic Geometry

Research Projects

Undergraduate Research Program Apr. 2022 – Present
Advised by Prof. Liang Xiao Peking University

- Read 10+ books and notes on number theory and algebraic geometry
- Gave presentations every other week
- Studied some algebraic geometry, including intersection theory refering to Fulton's book
- Learned theories of elliptic curves and abelian varieties refering to Silverman's books and Mumford's book
- Learned the proofs of the Mordell-Weil theorem and Mazur's theorem and further results

The University of Chicago Mathematics REU Jun. 2023 – Aug. 2023
Organized by Prof. Peter May, and mentored by Micah Gay The University of Chicago

- Wrote an expository paper ***Introduction to Shimura Varieties***, covering the definition of Shimura varieties, moduli interpretation of Siegel and PEL-type Shimura varieties, and some discussion on canonical models
- Read on Shimura variety, mainly refering to Milne's and Ngo's notes
- Attended courses for 8 weeks focusing on various fields of pure math

Reading Projects and Expository Papers

Notes on Chern-Weil theory June 2023

- Summarized and translated Appendix C of Milnor and Stasheff's book *Characteristic Classes*
- Outlined the Chern-Weil description of characteristic classes

A Concise Explanation of the Sphere Packing Problem in Dimension 8 June 2023

- Explains the main methods in Viazovska's paper "The sphere packing problem in dimension 8"

Introduction to Dessins d'Enfants Feb. 2022 – Jun. 2022

- Covered Belyi's theorem, Grothendieck's correspondence, Galois actions on dessins d'enfants with applications and examples
- Gave a 3-hour presentation with partner

Introduction to Linear Representation of Finite Groups Sep. 2021 – Dec. 2021

- Presented the basic theory of linear representation of finite groups, including character theory and induced representation, with some examples provided

Seminars and Talks

Weil Conjecture Seminar Autumn 2023
Organized by Prof. Enlin Yang Peking University

- Main material: Kiehl and Weissauer's book *Weil Conjectures, Perverse Sheaves and l-adic Fourier Transform*
- Gave several talks on Chapter 2 "The Formalism of Derived Categories"

Stacks Seminar Autumn 2023
Organized by Prof. Qizhen Yin Peking University

- Main material: Alper's book *Stacks and Moduli*
- Gave one talk on the geometry of Deligne-Mumford stacks

Algebraic K-Theory Seminar Autumn 2023
Held by students Peking University

- Main material: Sriniva's book *Algebraic K-Theory*
- Gave several talks on the first few chapters

SELECT COURSES

Upper-lever Courses	Grades	Graduate Courses	Grades
Algebra(I)(H)	96	Algebraic Geometry I	88
Algebra II	94	Algebraic Geometry II	93.5
Topology	94	Homology Theory	P
Differentiable manifolds and topology(H)	93	Modular Form and Number Theory	95
Complex Analysis(H)	95	Lie Groups and Lie Algebras	90
Functional Analysis	99	Fiber bundles and characteristic classes	96

(H) = Honor, P = Pass (due to COVID-19)

OTHER EXPERIENCES

China Undergraduate Mathematical Contest in Modeling September 2021

- Won first prize of Beijing area
- Cooperated with team members to propose a model and write a paper on it

Teaching Assistant in High School Mathematics Olympiad Jul. 2020–Sep.2020

- Gave lectures and helped correct exam papers

HONORS AND AWARDS

three-time student scholarships Oct. 2023/2022/2021
Awarded for outstanding performance of top 10%

three-time Merit Student Oct. 2023/2022/2021
Ranked 3/30 in my class for three years

The President's Fund for Research April 2023
In Peking University Undergraduate Research Program

Winning prizes in S-T Yau College Student Mathematics Contest Jun. 2023/Aug. 2022
In Analysis and Partial Differential Equations Track and Algebra and Number Theory Track

Gold medal in Chinese Mathematics Olympiad November 2019
Entered the national training team ranking 19

TEST SCORES

TOEFL iBT: 105
GRE Subject Test in Mathematics: 970

SKILLS

Programming: Python, MATLAB, C++
Document Creation: Microsoft Office Suite, LaTex