Yanshu Wang

Curriculum Vitae

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Published Papers

Research Experience

- **Mitacs Globalink Research Internship**, Mentored by Professor Maxence Mayrand, Université de Sherbrooke   *May 2025 – Current*
  - Construct new GKP code from the Abelian varieties on the cyclotomic field and compute the decomposition of the correspondent clifford gate (unitary operator) as H-gate, S-gate and CNOT-gate.
  - Develop sagemath scripts for working with GKP codes constructed from the cyclotomic field.

- **Independent Study mentored by Professor Vasily Dolgushev**, Temple University
  - Revisit the gentle version $\widehat{\mathsf{GT}}_{gen}$ of the   *Jan 2025 – Current* Grothendieck-Teichmueller group $\widehat{\mathsf{GT}}$ and introduce a more streamlined version of the groupoid GTSh of GT-shadows. The paper is in progress.
  - Contribute to sagemath package for working with GT-shadows.

- **Polymath Jr.**, Online   *Jun 2024 – Sep 2024*
  - Our group gives algebraic and complex analytic approaches to computing an affine model for K_9 dessin, and I draw a visualization of K_9 dessin through the morphism $\pi_1(P_8/\sim) \to \mathbb{Z}[\zeta_8]/(1+\sqrt{-2})$.
  - I Work out the algebraic approach and visualization, delivered the final presentation, drafted the algebraic section of the ongoing paper/report, and created the poster submitted to JMM 2025 with the help of mentors.

- **BICMR AI4MATH**, BICMR(Peking University)   *Jan 2024 – Feb 2024*
  - I collaborate with four students to formalize the statement that 'Algebraic integer of $\mathbb{Q}[\sqrt{-3}]$ is PID' in lean4.
  - This project introduced me to functional programming, dependent type theory and proof-assistant design, and sharpened my collaboration and rapid-learning abilities.

Presentations and Workshops

- **JMM 2025 AMS Special Session on Polymath Jr REU Student Research Session**; topics: Dessin d'enfant and Complete Regular Maps ([view slides](#));

- **JMM 2025 AMS-PME Undergraduate Poster Sessions**; topics: Obtaining Equations for K_9 Dessin ([view poster](#)).

Research Grants and Travel Grants

- Mitacs Globalink Research Internship (CA$5,400)
- JMM Student Reimbursement

SCHOLARSHIP

- **Gong Neng Scholarship**

Education

- **Exchange Student, Graduate Mathematics**, Temple University (tuition free)   *Jan 2025 – May 2025*
- **B.S. Mathematics**, Nankai University   *Sep 2022 – Jul 2026*

RELEVANT COURSEWORK:

- MATH0130 Mathematical Analysis I 100 (Honor Class)
- MATH0083 Advanced Algebra and Analytic Geometry 2-1 (Linear Algebra) 100 (Honor Class)
- MATH0068 Computers, Set Theory and Logic (Mathematical Logic) 91
- MATH0133 Mathematical Analysis II 97 (Honor Class)
- MATH0078 Advanced Algebra and Analytic Geometry 2-2 (Linear Algebra) 92 (Honor Class)
- MATH0097 Ordinary Differential Equations 96 (Honor Class)
- MATH0147 Complex Analysis II passed (Honor Class)
- MATH0132 Abstract Algebra I 88 (Honor Class)
- MATH0145 Complex Analysis 97 (Honor Class)
- MATH0146 Mathematical Analysis III 98 (Honor Class)
- MATH0134 Abstract Algebra II 95 (Honor Class)
- MATH0055 Number Theory 92
- MATH0065 Probability Theory 85 (Honor Class)
- MATH0079 General Topology 84
- MATH0102 Commutative Algebra 97
- MATH0136 Galois Theory 96
- MATH0151 Real Analysis 81 (Honor Class)
- MATH0162 Lie Groups and Algebraic Groups 90
- MATH0051 Functional Analysis 93
- MATH9100 Topics in Algebra A- (at Temple, Braid Groups)
- MATH8051 Functions of a Complex Variable I A (at Temple University)
- MATH4082 Senior Year Individual Study A (Grothendieck-Teichmueller group)

AUDITING:

- Elementary Algebraic Topology
- Analytic Number Theory

UNDERGRADUATE SEMINAR:

- Geometric Group Theroy Seminar: This seminar uses UTX book Geometric Group Theory An Introduction. I participated in it in the first semester of the sophomore year.

- Algebraic Number Theory Seminar: This seminar mainly uses lecture notes by Hu Yong. I learned many algebraic number theory from the [video](#).

- Quasi-Conformal Mapping and Potential Theory: I studied this topic using [B. Khoruzhenko's lecture notes](#).

- Analytic Number Theory Online Seminar: Led by a senior alumna (M.S., University of Bonn). The main topic is o-minimality and tame geometry.

MINI COURSE:

- Propagation speed of non-linear parabolic equations on Riemannian manifolds by Prof. Alexander Grigor's yan

- Preliminary Arizona Winter School 2024:Symmetries of root systems and local fields (unofficially following the course)

Skills

- Languages: python(fluent); sagemath(fluent, especially libgap); C++; Mathematica; latex(fluent); lean4; html & css & javascript;
- DevOps: Docker; Github Actions.

Human Languages

- English (fluent); French (beginner); Mandarin (native)