Yan Yau Cheng

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RESEARCH INTERESTS

Algebraic Number Theory, Arithmetic Geometry, and Arithmetic Topology

EDUCATION

University of Edinburgh – PhD programme in Mathematics 2022–2026
Advisor: Prof. Minhyong Kim
Thesis Title: Arithmetic Path Integrals and Linking Numbers

University of Cambridge – Mathematical Tripos 2018–2022
4 years Integrated Masters Programme, receiving MA and MMath degrees with Merit.
Part III Essay: Deforming Galois Representations

Discovery College – IB Bilingual Diploma — 44/45 points 2007–2018

ACHIEVEMENTS AND SCHOLARSHIPS

School of Mathematics Studentship — University of Edinburgh 2022–2026

Prince Philip Scholar — Fully funded scholarship for my undergraduate studies 2018–2022

Magdalene College Scholar 2019

Olympiads — As a member of the Hong Kong team

- **59th International Mathematical Olympiad** — Honourable Mention 2018
- **3rd International Olympiad of Metropolises** — Gold Medal 2018
- **33rd China Mathematical Olympiad** — Bronze Medal 2017
- **17th China Western Mathematics Invitation** — Gold Medal 2017
- **16th China Western Mathematics Invitation** — Silver Medal 2016
- **12th International Junior Science Olympiad** — Silver Medal 2015

Discovery College Academic Scholarship Student 2012–2018

PUBLICATIONS

A Trace-Path Integral Formula over Function Fields (DOI:10.1112/jlms.70664) 2026
— *Journal of the London Mathematical Society* **114** (2026), e70664.

SELECTED TALKS

A Trace-Path Integral formula over function fields June 2026
— ECR Workshop - EnCounteRs with Don Zagier

A Trace-Path Integral formula over function fields April 2026
— Oberwolfach 2617 - Low Dimensional Topology and Number Theory

A Trace-Path Integral formula over function fields March 2026
— Seoul National University Number Theory Seminar

A Trace-Path Integral formula over function fields March 2026
— Low Dimensional Topology and Number Theory XVII (Kyushu)

A Trace-Path Integral formula over function fields September 2025
— Young Researchers in Algebraic Number Theory VII

Pairings arising from Arithmetic Topological Quantum Field Theory August 2024
— Young Researchers in Algebraic Number Theory VI

Arithmetic Chern Simons Theory and Linking Numbers May 2024
— London Junior Number Theory Seminar

Arithmetic Chern-Simons Theory — Warwick Junior Number Theory Seminar February 2024

Arithmetic Chern-Simons Theory — Glasgow Edinburgh Algebra Research Student Seminar January 2024

Arithmetic Triple Linking Numbers — Young Researchers in Algebraic Number Theory V September 2023

SELECTED CONFERENCES AND TRAVEL

Low Dimensional Topology and Number Theory — Oberwolfach, Germany April, 2026

Research Visit with Dohyeong Kim — Seoul, Korea March, 2026

Low Dimensional Topology and Number Theory XVII — Kyushu, Japan March 2026

Arithmetic, Geometry, Space and Time — Edinburgh, UK November 2024

The Mordell conjecture 100 years later — Boston, USA July 2024

Summer School and Workshop on Relative Langlands Duality — Minnesota, USA June 2024

Arithmetic Quantum Field Theory Conference — Cambridge, USA March 2024

Winter Workshop on Chabauty-Kim — Heidelberg, Germany February 2024

Gauge Fields in Arithmetic, Topology & Physics — Edinburgh, UK March 2023

TEACHING

University of Edinburgh 2022–2026
Tutor

- Served as a tutor in various pure mathematics courses, please refer my webpage for a full list of courses taught.
- Nominated "Student Tutor of the Year" for the EUSA teaching awards in 2023.
- Received the EdTA teaching award in 2025, becoming an Associate Fellow of the Higher Education Academy (AFHEA)

HK International Math Olympiad 2018–2020, 2024
Trainer

- Taught olympiad math classes to the Hong Kong International Mathematics Olympiad trainees.
- Assisted in marking and problem setting of team selection tests.

OTHER EXPERIENCE

Cambridge Summer Research in Mathematics Programme 2021
Undergraduate Student Researcher

- Worked with Dr. Rong Zhou on a project titled "On the q-analogue of Kostant's partition function".
- Investigated the asymptotic behavior of an alternating sum of the q-analogue of Kostant's partition function around an orbit of the Weyl group, with focus on the A_n root systems.

SERVICE AND LEADERSHIP

AGQ-CDT Conference Organiser 2025

– One of the student organisers of the AGQ (Algebra, Geometry and Quantum Fields) student conference.

Hodge Club Seminar Organiser 2023–2024

– Organiser of the University of Edinburgh Postgraduate Seminar for Algebra and Geometry.

Archimedeans External Secretary 2021–2022

– Invited guest speakers and organised regular talks for the Archimedeans (The Cambridge University Maths Society).

CHOICE Service Trip in Nepal 2019

– Taught Mathematics and English to classes of children in Grades 6-9 at Sindhuli, Nepal.

Discovery College Maths Club - Leader/Co-ordinator 2014–2018

– Initiated and organised structured lessons for competitive mathematics at Discovery College
– Guided and supervised others to assist in teaching.

Committee member of the Hong Kong Joint School Mathematics Society 2017

– Helped organise and write problems for the Hong Kong Inter-School Math Competition (ISMC), a mathematics competition open to all secondary students in Hong Kong.

SKILLS & INTERESTS

Languages: Cantonese (Native), English (Native), Mandarin (Proficient), Korean (Beginner)

Computer Skills: LaTeX(Proficient), Python (Proficient), Sage (Working Proficiency), Magma (Working Proficiency), MATLAB (Working Proficiency), HTML (Working Proficiency), CSS (Working Proficiency)

ABRSM Piano: Grade 5