

LAU KAI KWAN

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EDUCATION

- The Chinese University of Hong Kong (CUHK)** **Aug 2022 - Present**
- B.Sc in Mathematics (expected graduation date: 07/2026), major GPA (3.33/4.00)
 - Enrichment Stream and Computational and Applied Mathematics Stream
- The Hong Kong University of Science and Technology** **Aug 2021 - Dec 2021**
- Science (Group A) with an extended major in artificial intelligence
- Ng Yuk Secondary School** **Sep 2015 - Jun 2021**
- Sir Edward Youde Memorial Prize
 - HKDSE: 29/35 for best five score subjects
 - SAT: 800/800 Math II, 750/800 Math I
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PUBLICATIONS & PREPRINTS

- [Are Vocaloid Songs Getting Denser? A Longitudinal Audio Analysis of 1,900 Hatsune Miku Songs \(2007--2025\)](#), **Kaikwan Lau**, Knowledge Commons Preprint
 - [Geometric and Statistical Analysis of Avian Skull Morphology](#), **Kaikwan Lau and Gary P. T. Choi**, ArXiv Preprint
 - [Efficient Score Pre-computation for Diffusion Models via Cross-Matrix Krylov Projection](#), **Kaikwan Lau, Andrew S. Na, and Justin W. L. Wan**, ArXiv Preprint
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PROFESSIONAL & RESEARCH EXPERIENCE

- University of Wollongong College Hong Kong**, Lecturer **Jan 2026 - Present**
- Facilitate specialized tutorials and lectures on applied mathematics and probability theory for the Diploma of Applied Education.
 - Deliver complex mathematical concepts to diverse student groups, ensuring high engagement and comprehension.
- The Chinese University of Hong Kong**, Research Assistant **Mar 2025 - Present**
- Developed custom MATLAB and Python algorithms to perform high-dimensional geometric and statistical analysis on biological structures.
 - Quantified complex avian skull morphology under the supervision of Prof. Gary P. T. Choi.
- Quality Education Fund Project Funded by the Education Bureau**, Programmer and Designer **Jan 2024 - Dec 2025**
- Collaborated with EdTech company OneEd to secure HKD 250 million in funding for educational innovation.
 - Architected "Lambda Math," a comprehensive digital learning ecosystem serving secondary students across Hong Kong.
 - Developed AI-driven generative models to produce dynamic, adaptive HKDSE-style examination questions.
- The University of Waterloo**, Visiting Scholar **Jun 2025 - Aug 2025**
- Conducted research on numerical methods for Generative AI under the supervision of Prof. Justin Wan.
 - Optimized Generative AI inference by reformulating score computation through Partial Differential Equations (PDEs) via PyTorch, achieving 100x faster generation speeds compared to standard DDPM.
 - Engineered a novel Cross-Matrix Krylov Projection algorithm, successfully reducing computational overhead by 40%.
- The Chinese University of Hong Kong**, Research Assistant **Jan 2025 - Mar 2025**
- Supervised by Dr. WONG Chak Fu Jeff in Department of Mathematics and Information Technology.
 - Summarized and checked research papers about Game Theory.
- The Education University of Hong Kong**, Research Assistant **Aug 2024 - Oct 2024**
- Supervised by Prof. SUEN Chun Kit Anthony of Department of Mathematics and Information Technology.
 - Summarized and analyzed research papers about Partial Differential Equations using LaTeX.
 - Designed master-level mathematics course assignments.

TEACHING & MENTORSHIP EXPERIENCE

- First-Year Mathematics Honours Scheme (CUHK), Teaching Assistant** **Sep 2023 - May 2025**
- Conducted and designed university-mathematics notes weekly for Year 1 Mathematics major students
- Training Programme for Young Mathematics Talents (CUHK), Teaching Assistant** **Jul 2024 - Aug 2024**
- Instructed advanced courses in Linear Algebra I and Game Theory for high-achieving high school students. in the Greater Bay Area.
 - Mentored 4 students in independent mathematical research on Game Theory; successfully guided the team to achieve awards for "Best Research Topic" and "Best Presentation."
 - Cooperated with all teaching assistants to hold final exams and tutorials.
- Enrichment Programme for Young Mathematics Talents (CUHK), Teaching Assistant** **Jul 2024 - Aug 2024**
- Delivered instructional materials and assessments in English for the Differential Geometry course.
 - Mentored young talents by fostering their mathematical maturity to prepare them for university-level courses.
- University of Wollongong College Hong Kong, Teaching Assistant** **Dec 2024 - Dec 2025**
- Conducted tutorial classes and lectures for students about applied mathematics in probability theory in Diploma of Applied Education.
- Program for the Gifted and Talented (CUHK), Teaching Assistant** **Dec 2023**
- Communicated to gifted and talented students effectively.
 - Maintained a disciplined classroom environment.
- Ng Yuk Secondary School, Mathematics Tutor** **Jan 2022 - Present**
- Raised at least one DSE exam levels in core maths subject for low banding students.
 - Organized and led study groups.

LEADERSHIP, HONORS, & AWARDS

- Chung Chi Astronomy Club (CUHK), President** **Apr 2024 - March 2026**
- Oversaw all administrative affairs and college-level communications to ensure institutional compliance and operational excellence.
 - Managed an 8-member executive committee to deliver high-impact programming organization.
- CUHK Astronomy Club, Publicity Secretary** **Mar 2023 - Feb 2024**
- Published astronomy-related posts on social media and produced a souvenir for the public at the art fair.
 - Designed website and 24-page reports for a 400-member student body.
 - Organized an astronomy open contest with participation from 20 teams.

SCHOLARSHIPS

- Hsin Chong-K.N. Godfrey Yeh Education Fund Bursaries 2024/26
- Faculty Exchange Scholarship Scheme 2026
- Centaline Charity Fund Scholarship 2025-2026
- Yasumoto International Exchange Scholarships
- 1978 Mathematics Alumnus Li Sze-lim Scholarship 2025/26
- Spring Dinner Scholarship 2025
- Hsin Chong-K.N. Godfrey Yeh Education Fund Bursaries 2024/25
- Centaline Charity Fund Scholarship 2024-2025
- ~Angel~ Care Student Assistance Project
- Centaline Charity Fund Scholarship 2023-2024
- Mathematics scholarship by Department of Mathematics, CUHK
- Chung Chi College admission scholarship for outstanding extra-curricular performance
- Faculty admission scholarship by Faculty of Science, CUHK
- Centaline Charity Fund Scholarship 2022-2023
- Sir Edward Youde Memorial Prize 2020-2021

LEADERSHIP, HONORS, & AWARDS

Hong Kong and Macau Math Olympiad Open Contest

- Bronze Award (2015-2017)
- Silver Award (2018-2019)

China National Math Olympiad - Hua Xia Cup

- Third Class Award (2017-2018)

Hong Kong International Youth Performance Arts Festival

- Champion in Flute
- First-runner up in Flute