Curriculum Vitae of Nok To Omega TONG

2023 – present

09/22 - 07/23

Website: <u>https://gatmeo.github.io/</u> Email: omegatongnt at gmail dot com

#### Education

# The Chinese University of Hong Kong, MPhil in Mathematics

- Supervisor: Prof. Michael McBREEN
- Topics: Additive and Multiplicative Hypertoric Varieties, Hodge Theory of Matroids, Poisson Manifolds and Quantum Groups, Quiver Varieties, Quantum Field Theory
- Coursework: Topics in Geometry by Prof. Conan Nai Chung LEUNG (about Deformation Quantization, Equivariant Cohomology, and Mirror Symmetry), Topology of Manifolds

The Chinese University of Hong Kong, BSc in Enrichment Mathematics (First Class Honor) 2019 - 2023

## Publication

The Group Cohomology of the Periodized Hypertoric Variety, with Sum Kiu Law. arxiv.org:2411.04853 (2024)

#### **Research Experience**

Seminar on Quiver Variety and Quantum Cohomology (www.math.cuhk.edu.hk/~physicsseminar/) 11/23 – present • Quantum group action on the cohomology of quiver varieties and stable envelops

Seminar on Supersymmetric Gauge Theory (www.math.cuhk.edu.hk/~physicsseminar/2324/) 09/23 - 05/24• Symplectic reduction (toric and hypertoric varieties), quantization of classical mechanics, (SUSY) QFT, CFT

Seminar on Quantum Group and Quiver Variety (<u>www.math.cuhk.edu.hk/~sdeg</u>/) 11/23 • One week seminar on Hoft algebra, quantization of poisson manifolds, Drinfeld center, R-matrix, Yangians

## Coxeter Matroids (Prof. Xuhua HE), Final Year Project, CUHK

• Coxeter Matroids (A. Borovik et al.), Introduction to Lie Algebras and Representation Theory (J. Humphreys)

- Defined matroids in terms of the symmetric group (or Coxeter group for the generalization) (Ordinary matroids have a natural symmetric group action on the set of bases by the Exchange Property)
- Learned Lie Theory from a combinatorics viewpoint by studying Symplectic and Orthogonal matroids
- Studied Coxeter Building and its application in constructing Coxeter Matroids

Elliptic Curve Cryptography (Dr. Kelvin LIU), University Research Project, CUHK 03/21 - 07/21

- Elliptic Curve in Cryptography (I. Blake et al.), The Arithmetic of Elliptic Curves (J. Silverman), AG (J. Milne)
- Learned EC theorems (Dual Isogeny, Hasse Theorem) and EC cryptography (Diffie-Hellman, ECDSA, ECIES)
- Implemented Elliptic Curve point counting algorithm with log complexity using Julia (Schoof's Algorithm)

# Experience

Mathematical Olympiad Trainer, The Hong Kong Academy for Gifted Education 09/19 - Present

- Lectured and trained Hong Kong's International Mathematical Olympiad Team members
- Served as the Leader of the Hong Kong team to take part in the 22<sup>nd</sup> China Girls' Mathematics Olympiad (2023)

Data Scientist / Quantitative Researcher, Th3ia, Caldera Capital Limited 07/21 - 08/21

Awards and Achievements		
Math Olympiad	International Mathematics Olympiad (IMO) 2019 (Bath), Bronze Medal	
Blockchain Competition	<ul> <li>International Blockchain Olympiad 2020, <i>Gold Medal &amp; Most Privacy Centric Award</i></li> <li>Designed and presented a Blockchain Platform for Academic Credentials (BCred)</li> </ul>	
Coding Award	Hong Kong Olympiad in Informatics 2018, Gold Award	
Scholarships (CUHK)	Mathematics Scholarship (Top mathematics student for admission) CCC Mathematics Scholarship (Top math students in Chung Chi College) Talent Development Scholarship	2019 2020 & 2021 2019 & 2020

## Additional Information

Language	English (proficient), Cantonese (native), Mandarin (fluent), Japanese (proficient)
Skills	Programming (Julia, Python, C++, Bash), Linux, Latex
Interests	Cello (AT level), Guitar, Piano, Classical Music, Movies, Magic