

Quoc P. Ho

Hong Kong University of Science and Technology (HKUST)

Homepage: quocho.com

E-mail: maqho@ust.hk

Employment

- 2022–present **Assistant professor (tenure-track),**
Hong Kong University of Science and Technology (HKUST), Clear Water Bay, Hong Kong
Interests: algebraic geometry, representation theory, and topology
- 2017–2022 **Postdoctoral researcher,**
Hausel group, IST Austria, Klosterneuburg, Austria
Lise Meitner Fellow, Austrian Science Fund FWF, 2019–2021

Education

- 2011–2017 **PhD Candidate in Mathematics,**
University of Chicago, Chicago, IL, USA
MSc in Mathematics awarded in 2012
PhD in Mathematics awarded in 2017
Advisors: Bảo-Châu Ngô, Dennis Gaitsgory
Thesis: Free factorization algebras and homology of configuration spaces in algebraic geometry
- 2007–2011 **AB in Mathematics,**
Princeton University, Princeton, NJ, USA
Graduated with High Honors
Member of Phi Beta Kappa, the oldest academic honor society in the United States
- 2005–2007 **International Baccalaureate (IB),**
Lester B. Pearson UWC, Victoria, BC, Canada

Grants, Fellowships, and Awards

- 2023–2026 Hong Kong RGC Grant GRF No. 16304923, 877 079HKD (~\$123 000)
- 2022–2025 Hong Kong RGC Grant ECS No. 26305322, 640 110HKD (~\$82 000)
- 2022–2027 HKUST Startup Grant, 500 000HKD (~\$64 000)
- 2019–2021 Lise Meitner Postdoctoral Fellowship, Austrian Science Fund FWF, 159 340€
- 2011–2013 McCormick Fellowship for Graduate Students, University of Chicago
- 2007–2011 Davis Fellowship, *Full 4-year scholarship (tuition, room and board) to attend Princeton University*

Teaching Experiences

- 2022–present **Assistant professor**, *HKUST*, Clear Water Bay, Hong Kong
Full responsibility for all of the following course(s):
◦ MATH 2011: Introduction to Multi-variable Calculus
◦ MATH 2023: Multi-variable Calculus
◦ MATH 5240: Algebraic Topology
◦ MATH 6914V: Topics in Geometric Representation Theory (reading course)
- 2017–2022 **Postdoctoral researcher**, *IST Austria*, Klosterneuburg, Austria
Full responsibility for all of the following courses:
◦ Introduction to Algebraic Geometry
◦ Introduction to Programming with Python
Co-taught *D*-modules (with Sasha Minets)
- 2013–2017 **Lecturer**, *University of Chicago*, Chicago, IL
Full responsibility for all of the following courses:
◦ MATH 195: Multi-variable Calculus (4 times)
◦ MATH 196: Linear Algebra (3 times)
◦ MATH 130s: Freshman Calculus sequence (3 quarters)
- 2014–2016 **Mentor for DRP and REU**, *University of Chicago*, Chicago, IL
Supervised undergraduate student participants in independent study projects
Projects supervised: algebraic topology, de Rham cohomology, Galois theory and fundamental groups via Grothendieck’s fiber functor formalism
- 2012–2013 **College Fellow**, *University of Chicago*, Chicago, IL
Teaching assistant for MATH 160s: Freshman Honors Calculus sequence (3 quarters), IBL (inquiry-based learning) style

Papers

- Graded character sheaves, HOMFLY-PT homology, and Hilbert schemes of points on \mathbb{C}^2 , with P. Li, 63 pages, arXiv: 2305.01306
- Revisiting mixed geometry, with P. Li, 64 pages, arXiv: 2202.04833
- Homological densities (appendix to Configuration spaces as commutative monoids), with O. Randal-Williams, arXiv: 2306.02345
- Diagrammatic Monte Carlo for electronic correlation in molecules: High-order many-body perturbation theory with low scaling, *Physical Review B*, Vol. 108 (2023), Issue 4, with G. Bighin, M. Lemeshko, and T. V. Tscherbul, DOI: 10.1103/PhysRevB.108.045115
- Eisenstein series via factorization homology of Hecke categories, with P. Li, *Advances in Mathematics*, Vol. 404, part A (Aug. 2022), 34 pages, DOI: 10.1016/j.aim.2022.108410
- Higher representation stability for ordered configuration spaces and twisted commutative factorization algebras, 47 pages, arXiv: 2004.00252
- The Atiyah-Bott formula and connectivity in chiral Koszul duality, *Advances in Mathematics*, Vol. 392 (Dec. 2021), 71 pages, DOI: 10.1016/j.aim.2021.107992

- Homological stability and densities of generalized configuration spaces, *Geometry & Topology*, Vol. 25 (2021), No. 2, pp. 813-912 (100 pages), DOI: 10.2140/gt.2021.25.813
- Free factorization algebras and homology of configuration spaces in algebraic geometry, *Selecta Mathematica (N.S.)*, Vol. 23 (2017), No. 4, pp. 2437-2489 (54 pages), DOI: 10.1007/s00029-017-0339-1
- Average size of 2-Selmer groups of elliptic curves over function fields, with B.V.H. Lê and B.C. Ngô, *Mathematical Research Letters*, Vol. 21 (2014), No. 6, pp. 1305-1339 (35 pages), DOI: 10.4310/MRL.2014.v21.n6.a6

Visits

- Winter 2022 **Mathematical Sciences Research Visitor Program (MSRVP)**,
Australian National University, Canberra ACT 2600, Australia
- Summer 2020 **Early Career Research Visitor Program**,
Australian National University, Canberra ACT 2600, Australia
(canceled due to COVID-19)
- Fall 2014 **Program Associate**,
MSRI, Berkeley, California, USA
Geometric Representation Theory semester program

Invited Lecture Series

- 2019 Cambridge University, UK
Lecture series on factorization homology and homological densities (4 one-hour lectures)
- Harbin Institute of Technology, China
Lecture series on factorization homology and homological densities (2 one-hour lectures)
- Pohang University of Science and Technology (POSTECH), South Korea
Lecture series on factorization homology and number theory over function fields (4 two-hour lectures)

Invited Talks

- 2023 Vietnam Institute of Mathematics (Vietnam Academy of Science and Technology),
Conference on Arithmetic and Cohomology of Algebraic Varieties
Universität Wien, Representation Theory and Automorphic Forms Seminar
Universität Hamburg, Colloquium of the Center for Mathematical Physics Hamburg
Chinese University of Hong Kong (CUHK), Representation and Number Theory (RANT) Seminar
The University of Sydney, Conference on Categorification in Representation Theory
- 2022 Australian National University, Algebra and Topology Seminar
Vietnam Institute of Mathematics, Zeta seminar
Edinburgh Hodge Institute, University of Edinburgh, joint Hodge seminar
IST Austria, Algebraic Geometry and Number Theory seminar

- MIT, Infinite Dimensional Algebra Seminar
- AGEA, Seminar of Algebraic Geometry of East Asia
- 2021 the University of Copenhagen, Workshop on Homology and Homotopy of Configuration Spaces
- Tsinghua University, Representation Theory Seminar
- GRT at Home (Geometry Representation Theory at Home) seminar
- University of Toronto, Geometric Representation Theory seminar
- University of Michigan, TAPIRS: Talks About Progress In Representation Stability
- 2020 Hong Kong University of Science and Technology (HKUST), Colloquium
- Chinese Academy of Sciences (CAS), Colloquium
- Pohang University of Science and Technology (POSTECH), Colloquium
- Stockholm University, Algebra/Geometry Seminar
- Purdue University, Topology Seminar
- Universiteit Utrecht, Intercity Number Theory Seminar (canceled due to COVID-19)
- Utrecht Geometry Centre, Geometry Seminar (canceled due to COVID-19)
- 2019 the University of Edinburgh, Conference on Geometric Representation Theory and Low-dimensional Topology
- 2018 Université Paris Diderot, Conference on Local Geometric Langlands
- Factorizable algebras and categories (expository)
- Université Paris Diderot, Algebraic Geometry Seminar
- National University of Singapore, Pan Asian Number Theory Conference
- Kavli IPMU Japan, Vertex Algebras, Conference on Factorization Algebras and Applications
- ETH Zürich, Algebraic Geometry Seminar
- 2017 Duke University, Number Theory Seminar
- IST Austria, Algebraic Geometry Seminar
- 2016 Northwestern University, Topology Seminar
- Rice University, Algebraic Geometry/Number Theory Seminar
- Purdue University, Topology Seminar
- 2015 University of Wisconsin-Madison, Number Theory Seminar
- 2014 MSRI, Geometric Representation Theory Semester
- Working group on the Geometric Satake isomorphism (expository)
- 2013 VIASM, Pan Asian Number Theory Conference
- 2012 Vietnam Institute for Advanced Study in Mathematics (VIASM) Summer School
- The work of Bhargava-Shankar (expository)

Other Activities

Refereed & provided expert opinion for Annals of Mathematics, Algebra & Number Theory, Advances in Mathematics, Canadian Mathematical Bulletin, Journal of Topology, Pacific Journal of Mathematics, Transactions of the AMS.

Organized a weekly seminar series on Algebra and Geometry at HKUST

Screened PhD applications for IST Austria

Organized learning seminars for quantum groups and derived algebraic geometry at IST Austria

Co-organized general topic seminar for graduate students at the University of Chicago

Co-organized a learning seminar on étale cohomology for graduate students at the University of Chicago

Additional Information

Languages	Vietnamese (native), English (fluent), German (intermediate), French (reading knowledge).
Interests and Skills	Programming (Scala, Java, Python, C), Music Composition, Table Tennis.