Quoc P. Ho

Hong Kong University of Science and Technology (HKUST)
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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

Fellowships and Awards

2022-2025 Hong Kong RGC Grant ECS No. 26305322, 640 110HKD

2022-2027 HKUST Startup Grant, 500 000HKD

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

— 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 ellipitic 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 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), Colloqium

Chinese Academy of Sciences (CAS), Colloqium

Pohang University of Science and Technology (POSTECH), Colloqium

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 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.