Wei Ho

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Research Interests

Number theory, algebraic geometry, arithmetic geometry, representation theory.

Employment

Institute for Advanced Study, Princeton, NJ   2022–present
  Director of Women and Mathematics Program & Visiting Professor

Princeton University, Princeton, NJ   2022–present
  Research Scholar & Lecturer with the Rank of Professor

University of Michigan, Ann Arbor, MI   2014–present
  Associate Professor, with tenure   2019–present
  Assistant Professor   2014–2019

Columbia University, New York, NY   2010–2014
  Joseph Fels Ritt Assistant Professor

Princeton University, Princeton, NJ   2012–2013
  Visiting Fellow (NSF Postdoctoral Fellow)

Harvard University, Cambridge, MA   2009–2010
  NSF Postdoctoral Fellow

Temporary Visiting Positions

Institute for Advanced Study, Princeton, NJ   Spring 2020

Mathematical Sciences Research Institute, Berkeley, CA   Spring 2019

Columbia University, New York, NY   Fall 2018

Max Planck Institute for Mathematics, Bonn, Germany   June 2017

Center for Communications Research (IDA-CCR-P), Princeton, NJ   intermittent

Education

Princeton University
Ph.D. in Mathematics, 2009.
Dissertation under the supervision of Manjul Bhargava: *Orbit Parametrizations of Curves.*

Cambridge University
Certificate of Advanced Study in Mathematics (Part III of the Tripos), with *distinction*, 2004.

Harvard University
A.M. in Mathematics and A.B. in Mathematics, *summa cum laude*, 2003.
Senior honors thesis with Noam Elkies: *The Main Conjecture of Iwasawa Theory.*

Awards and Grants

Fellow of the American Mathematical Society, 2023
University of Michigan Margaret and Herman Sokol Faculty Award, 2021-23
National Science Foundation RTG Grant DMS-1840234, 2019–24 (co-PI)
National Science Foundation CAREER Grant DMS-1844763, 2019–24 (PI)
National Science Foundation Grant DMS-1701437, 2017–21 (PI)

Sloan Research Fellowship, 2017–21
National Science Foundation Grant DMS-1406066, 2014–17 (PI)
National Security Agency Young Investigator's Grant, 2013-14 (PI)
National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship
National Defense Science and Engineering Graduate Fellowship
National Science Foundation Graduate Fellowship
Centennial Fellowship, Princeton University
Herman Peries Prize, Emmanuel College, Cambridge University
Association for Women in Mathematics Alice T. Schafer Prize runner-up, 2003
Harvard Herchel Smith Fellowship in Science (for study at Cambridge University)
Gold medal at the 31st International Chemistry Olympiad, 1999
USA TODAY All-USA High School Academic First Team, 1999

Conference Grants

National Science Foundation Grant DMS-2012061 (for Women in Numbers 5 and 6)
National Science Foundation Grant DMS-2005847 (for MAGNTS 2020–2024)
Foundation Compositio Mathematica (for Stacks Project Workshop)
The Ohio State University Mathematics Research Institute (for MAGNTS 2019)
National Science Foundation Grant DMS-1601160 (subcontract for Stacks Project Workshop 2017)

Publications

"Splitting Brauer classes using the universal Albanese," with M. Lieblich, *Enseign. Math.* **67** (2021), 209–224.

"Everywhere local solubility for hypersurfaces in products of projective spaces," with T. Fisher and J. Park, *Res. Number Theory* **7** (2021), no. 6.

"Galois closures of non-commutative rings and an application to Hermitian representations," with M. Satriano, *Int. Math. Res. Not. IMRN* **2020** (2020), no. 21, 7944–7974.

"Odd degree number fields with odd class number," with A. Shankar and I. Varma, *Duke Math. J.* **167** (2018), no. 5, 995–1047.

"Orbit parametrizations for K3 surfaces," with M. Bhargava and A. Kumar, *Forum Math. Sigma* **4** (2016), e18 (86 pages).

"Coregular spaces and genus one curves," with M. Bhargava, *Camb. J. Math.* **4** (2016), no. 1, 1–119.

"Databases of elliptic curves ordered by height and distributions of ranks and Selmer groups," with J. Balakrishnan, N. Kaplan, S. Spicer, W. Stein, and J. Weigandt, *LMS J. Comput. Math.* **19** (2016), issue A, 351–370.

"Zeta functions of a class of Artin-Schreier curves with many automorphisms," with I. Bouw, B. Malmskog, R. Scheidler, P. Srinivasan, and C. Vincent, *Directions in Number Theory: Proceedings of the 2014 WIN3 Workshop*, Springer, 2016, 87–124.

"How many rational points does a random curve have?" *Bull. Amer. Math. Soc.* **51** (2014), no. 1, 27–52.

"How many rational points does a random curve have?" *AMS Current Events Bulletin*, Joint Mathematics Meetings, 2013.

"Genus one curves and Brauer-Severi varieties," with A. J. de Jong, *Math. Res. Lett.* **19** (2012), no. 06, 1357–1359.

"Moduli of products of stable varieties," with B. Bhatt, Z. Patakfalvi, and C. Schnell, *Compos. Math.* **149** (2013), no. 12, 2036–2070.

"The m-step, same-step, and any-step competition graphs," *Discrete Appl. Math.* **152** (2005), no. 1-3, 159–175.

"A time-of-flight mass spectrometric analysis of fluence dependencies in SnO_2 ablation: Implications for pulsed laser deposited tin oxide thin films" with H. Fan and S. A. Reid, *Int. J. Mass Spectrometry* **230** (2003), 11–17.

"Pulsed laser ablation of Sn and SnO_2 target: Neutral composition, energetics, and wavelength dependence," with F. Lamelas and S. A. Reid, *J. Phys. Chem. B* **104** (2000), no. 22, 5324–5330.

PREPRINTS

"The second moment of the number of integral points on elliptic curves is bounded," with L. Alpöge, preprint, submitted.

"On average sizes of Selmer groups and ranks in families of elliptic curves having marked points," with M. Bhargava, preprint, submitted.

"Quadratic enrichment of the logarithmic derivative of the zeta function," with M. Bilu, P. Srinivasan, I. Vogt, and K. Wickelgren, preprint, submitted.

COLLOQUIA AND INVITED CONFERENCE TALKS

Arithmetic, Algebra, and Algorithms, ICMS, Edinburgh	Apr 2023
UConn Number Theory Day	Mar 2023
Simons Collaboration on Arithmetic Geometry, Number Theory, and Computation, NYC	Jan 2023
Dalhousie University Colloquium	Dec 2022
Temple University Colloquium	Sep 2022
Arithmetic Geometry, Cryptography, and Coding Theory, CIRM, Luminy	Jun 2021
Rutgers University Colloquium (virtual)	Dec 2020
Yale University Colloquium	Oct 2019
University of Illinois at Chicago Colloquium	Sep 2019
Topics in Rational and Integral Points, Basel	Sep 2019
Arithmetic and Algebraic Geometry, Michigan	Aug 2019
Rational Points 2019, Schney	Jul 2019
Recent Progress in Moduli Theory, MSRI	May 2019
Cornell University Oliver Club (Colloquium)	May 2019
Special Session: Arithmetic Geometry and Its Connections, AMS Sectional Meeting, Hawaii	Mar 2019
Special Session: Emerging Connections in Number Theory, AMS Sectional Meeting, Hawaii	Mar 2019
Penn State Colloquium	Jan 2019
Arithmetic and L-functions, Besançon	Nov 2018
Open questions in number theory and cryptography, UC Irvine	Sep 2018
Rational and integral points via analytic and geometric methods, BIRS Oaxaca	May 2018
Arithmetic of algebraic curves, UW-Madison	Apr 2018
Southern California Number Theory Day, UC Irvine	Oct 2017
Western Algebraic Geometry Symposium, UCLA	Oct 2017
Arithmetic of Hyperelliptic Curves, Trieste	Sep 2017
Geometric Methods in Number Theory and Representation Theory, Northwestern	May 2017
Elliptic Curves, Torsors, and L-functions, UVA	Mar 2017
Fields Medal Symposium, Fields Institute, Toronto	Nov 2016
Clay Research Workshop: Recent Developments on Elliptic Curves, Oxford	Sep 2016
Algorithmic Number Theory Symposium XII, Kaiserslautern	Aug 2016
Arithmetic statistics and the Cohen–Lenstra heuristics, Warwick	Jun 2016

Brandeis-Harvard-MIT-Northeastern Joint Mathematics Colloquium	Mar 2016
JHU-UMD Algebra and Number Theory Day, College Park	Nov 2015
Explicit Methods in Number Theory, Oberwolfach	Jul 2015
Chicago Number Theory Day, UIC	May 2015
University of Colorado Boulder Colloquium	Mar 2015
Bay Area Algebraic Number Theory and Arithmetic Geometry Day, Stanford	Feb 2015
Counting Arithmetic Objects, CRM, Montreal	Nov 2014
Counting Arithmetic Objects, CRM Summer School, Montreal	Jul 2014
Women in Numbers 3, Banff	Apr 2014
University of Minnesota Colloquium	Feb 2014
Southern California Algebraic Geometry Seminar, USC	Feb 2014
Rutgers University Colloquium	Jan 2014
UCLA Colloquium	Jan 2014
University of Washington & PIMS Colloquium	Jan 2014
University of California Santa Cruz Colloquium	Jan 2014
Hausdorff Center for Mathematics, Bonn	Dec 2013
University of Utah Colloquium	Dec 2013
Cornell University Oliver Club (Colloquium)	Nov 2013
University of Chicago Colloquium	Nov 2013
University of Michigan Colloquium	Oct 2013
Rational Points 2013, Schloss Thurnau	Jul 2013
Atkin Memorial Workshop, UIC	May 2013
Special Session: Arithmetic Statistics & Big Monodromy, AMS Sectional Meeting, Boulder	Apr 2013
AMS Current Events Bulletin, Joint Mathematics Meetings, San Diego	Jan 2013
Special Session: Number Theory & Geometry, Joint Mathematics Meetings, San Diego	Jan 2013
Special Session: Arithmetic Statistics, Joint Mathematics Meetings, San Diego	Jan 2013
Palmetto Number Theory Series, University of South Carolina	Dec 2012
Arithmetic of Abelian Varieties in Families, CIB, Lausanne	Nov 2012
Selmer Groups, Descent and Rank Distributions, Warwick	Sep 2012
Rutgers Newark Colloquium	Feb 2012
Special Session: Rational Points on Varieties, Joint Mathematics Meetings, Boston	Jan 2012
Explicit Methods in Number Theory, Oberwolfach	Jul 2011
The Cohen-Lenstra Heuristics for Class Groups, AIM	Jun 2011
Workshop on Arithmetic Statistics, MSRI	Apr 2011
Algebraic Geometry Northeastern Series (AGNES), MIT	Apr 2011
International Congress of Chinese Mathematicians, Beijing	Dec 2010
Higher Degree Forms, Gainesville, Florida	May 2009

SELECTED SEMINAR TALKS

Harvard Number Theory Seminar	Mar 2023
Joint IAS/Princeton Number Theory Seminar	Feb 2023
Chalmers University of Technology and the University of Gothenburg Algebraic Geometry and Number Theory seminar (virtual)	Apr 2021
VaNTAGe (virtual)	Oct 2020
Number Theory Web Seminar (virtual)	Oct 2020

Stanford Algebraic Geometry Seminar (virtual)	Jun 2020
BC-MIT Number Theory Seminar	Feb 2020
Duke Number Theory Seminar	Jan 2020
Stanford Number Theory Seminar	May 2019
Cornell Number Theory Seminar	May 2019
University of Utah Representation Theory and Number Theory Seminar	Mar 2019
UC Davis Algebraic Geometry Seminar	Feb 2019
Penn State Algebra and Number Theory Seminar	Jan 2019
University of Texas Number Theory Seminar	Dec 2018
Stony Brook Algebraic Geometry Seminar	Nov 2018
Duke Algebraic Geometry Seminar	Nov 2018
Harvard Number Theory Seminar	Oct 2018
Johns Hopkins Number Theory Seminar	Oct 2018
Quebec-Vermont Number Theory Seminar	Oct 2018
Boston College Number Theory and Algebraic Geometry Seminar	May 2018
University of Washington Algebra and Algebraic Geometry Seminar	Apr 2018
UCSD Number Theory Seminar	Oct 2017
UC Berkeley Arithmetic Geometry and Number Theory Seminar	Oct 2017
Max Planck Institute Number Theory Seminar	Jun 2017
University of Chicago Algebraic Geometry Seminar	May 2017
Tata Institute of Fundamental Research Seminar	Dec 2016
UC Irvine Number Theory Seminar	May 2016
University of Michigan Algebraic Geometry Seminar	Nov 2015
Michigan State Algebra Seminar	Apr 2015
Front Range Algebra, Geometry and Number Theory Seminar	Mar 2015
Minnesota Algebra Seminar	Feb 2014
UCLA Number Theory Seminar	Jan 2014
University of Utah Representation Theory Seminar	Dec 2013
Johns Hopkins Algebraic Geometry and Number Theory Seminar	Nov 2013
Georgia Tech Algebra Seminar	Nov 2013
UNC–Duke Number Theory Seminar	Nov 2013
University of Chicago Number Theory Seminar	Nov 2013
Northwestern Number Theory Seminar	Nov 2013
Boston College Number Theory and Algebraic Geometry Seminar	Oct 2013
SUNY Buffalo Algebra Seminar	Oct 2013
Princeton Ergodic Theory and Statistical Mechanics Seminar	Oct 2013
Universiteit Leiden Algebra, Geometry and Number Theory Seminar	Jul 2013
University of Wisconsin Number Theory Seminar	May 2013
MIT Number Theory Seminar	Apr 2013
Valley Geometry Seminar, University of Massachusetts Amherst	Apr 2013
Fields Institute Number Theory Seminar	Apr 2013
University of Georgia Number Theory Seminar	Dec 2012
University of Washington Algebra and Algebraic Geometry Seminar	Jul 2012
CUNY Representation Theory Seminar	May 2012
Caltech Number Theory Seminar	Apr 2012

Northeastern University Quivers and Invariant Theory Seminar	Jan 2012
University of Michigan Number Theory Seminar	Jan 2012
Brown University Algebra Seminar	Apr 2011
Stanford University Number Theory Seminar	Apr 2011
Stanford University Algebraic Geometry Seminar	Apr 2011
University of Wisconsin Number Theory Seminar	Feb 2011
University of Texas Algebra, Number Theory, and Combinatorics Seminar	Feb 2011
Columbia-CUNY-NYU Joint Number Theory Seminar	Nov 2010
Five College Number Theory Seminar	Mar 2010
Boston University Number Theory Seminar	Nov 2009
Rice University Algebraic Geometry Seminar	Nov 2009
Harvard-MIT Algebraic Geometry Seminar	Oct 2009
University of Maryland Lie Groups and Representation Theory Seminar	Apr 2009

MINI-COURSES

Building Relationships for an Inclusive and Diverse Group of Emerging Students, Utah	Jul 2021
Arithmetic Topology, PIMS	Jun 2019
Women and Mathematics program, IAS	May 2015

OTHER SELECTED EXPOSITORY TALKS

What's Happening in Fine Hall, Princeton	Feb 2023
Noetherian Ring Speaker Series, Princeton	Feb 2023
Math Conversations, IAS	Dec 2022
Departmental Award Ceremony, Michigan	Apr 2021
RTG Seminar on Number Theory, Michigan	Nov 2019
Recruitment Symposium, Michigan	Mar 2018
Women in Mathematics, Michigan	Mar 2015
Arithmetic Geometry Learning Seminar, Michigan	2014–2021
"Counting Arithmetic Objects" summer school, CRM, Montreal	Jun 2014
Columbia University Undergraduate Mathematics Society	Mar 2011
MIT Seminar on Topics in Arithmetic, Geometry, Etc. (STAGE)	Apr 2010
Princeton University Graduate Student Seminar	2005–09
Institute for Advanced Study Women in Mathematics Program	May 2007
CUNY Graduate Center	Feb 2007
Workshop on Rings of Low Rank, Lorentz Center, Leiden	Jun 2006

TEACHING

Numbers, Equations, and Proofs (undergraduate)	Princeton University, Fall 2022
Elliptic Curves (graduate)	University of Michigan, Fall 2021
Matrix Algebra [remote] (undergraduate/graduate)	University of Michigan, Fall 2020
Distributions of Arithmetic Invariants (graduate topics)	University of Michigan, Winter 2020
Arithmetic Statistics (graduate topics)	Columbia University, Fall 2018
Arithmetic of Surfaces (graduate topics)	University of Michigan, Winter 2018
Analytic Number Theory (graduate)	University of Michigan, Fall 2017
Matrix Algebra (undergraduate/graduate)	University of Michigan, Winter 2016 and Winter 2017

Algebraic Geometry (graduate)	University of Michigan, Fall 2015 and Fall 2016
Coding Theory (graduate)	University of Michigan, Winter 2015 and Winter 2022
Commutative Algebra (graduate)	University of Michigan, Fall 2014
Number Theory and Cryptography (undergraduate)	Columbia University, Spring 2014
Algebraic Curves (advanced undergraduate)	Columbia University, Spring 2014
Linear Algebra (undergraduate)	Columbia University, Fall 2013
Representations of Finite Groups (advanced undergraduate)	Columbia University, Fall 2011
Calculus I (one section, 100 students)	Columbia University, Fall 2011
Calculus I (two sections, 180 students)	Columbia University, Fall 2010
Algebraic Curves (graduate) [teaching assistant]	Princeton University, Fall 2009
Quadratic Forms (advanced undergraduate) [teaching assistant]	Princeton University, Fall 2005

ORGANIZATIONAL ACTIVITIES

Stacks Project Workshop, Ann Arbor, August 2023.

100 Years of Noetherian Rings, IAS, June 2023.

Women And Mathematics Program, IAS, Director, 2022–.

Minerva Research Program, IAS, 2022–.

Arithmetic statistics, CIRM, May 2023 (Scientific Committee).

Degeneracy of algebraic points, MSRI, April 2023.

Special Semester on Diophantine Geometry, MSRI, Spring 2023.

Spring Opportunities Workshop, IAS, January 2023.

MAGNTS: Midwest Arithmetic Geometry and Number Theory Series, Oct 2019/Aug 2021/Oct 2022/etc.

Women in Numbers 5 (virtual), Summer/Fall 2020.

SPONGE: Stacks Project ONline Geometry Event (virtual), August 2020.

MAGIC (Michigan - Arithmetic Geometry Initiative - Columbia) Online Seminars, 2020.

MANTIS: Michigan Algebra and Number Theory Intercity Symposium, September 2019.

Stacks Project Workshop, Ann Arbor, July–August 2017.

AWM Symposium Special Session on Number Theory, April 2015.

AMS Mathematics Research Communities Workshop on Arithmetic Statistics, Snowbird, June 2012.

EDITORIAL BOARDS

Publications Mathématiques de Besançon, 2020–.

Research in Number Theory, 2021–.

International Mathematics Research Notices (IMRN), 2023–.

DEPARTMENTAL MENTORING

PhD students: Jiayu Jason Liang (PhD 2022), Gary Hu.

Postdocs: Stephanie Chan, Peter Koymans, Yuan Liu, Jennifer Park, Nick Rome, Myungjun Yu.

Undergraduates (junior papers / senior theses): Zander Hill (Princeton 2024).

Number theory and representation theory "professional skills" workshop (2021), organizer.

Dissertation committee member for Xia Jie (Columbia 2014), Ari Shnidman (Michigan 2015), Brandon Carter (Michigan 2018), Patricia Klein (Michigan 2018), Andrew O'Desky (Michigan 2020).

Reading courses with graduate students (Fall 2014, Fall 2017, Winter 2018, Winter 2021).

Graduate student mentoring, e.g., reading courses, advising panels, research statement sessions.

Departmental Service

Organizer of IAS Members' Colloquium, 2022–.

Co-organizer of IAS Postdoctoral Short Talks, 2022–.

PU Junior Hiring Committee, 2022–23.

UM Personnel (senior hiring) Committee, 2019–2022.

UM Number Theory Area Leader, 2019–2022.

UM Diversity, Equity, and Inclusion Recruiting, 2019–2022.

UM Climate Committee, 2017–19.

UM Executive Committee, 2016–18.

Co-organizer of UM Colloquium, 2021–2022.

Co-organizer of UM Group, Lie, and Number Theory seminar, 2014–2022.

Co-organizer of UM Arithmetic Geometry Learning Seminar, 2014–2022 (some terms).

UM Graduate admissions committee, 2015–16.

Co-advisor of UM Undergraduate Math Club, 2014–15.

Faculty advisor for joint graduate/undergraduate women-in-math activities at Michigan (IAS WAM Graduate Ambassadorship), 2017–18.

UM Honors Committee, 2015–16, 2019–2020.

UM REU committee, 2014–16.

Princeton Departmental Graduate Student Committee, 2005–09.

Departmental representative to the Princeton Graduate Student Government, 2005–06.

Other Teaching and Mentoring Activities

University of Michigan Math Circle Instructor, Fall 2016.

Lecturer at "Counting Arithmetic Objects" summer school, CRM, Montreal, Jun 2014.

Mentor at "Algebraic Geometry: New connections for recent PhDs", Seattle, Aug 2014.

Problem session leader at Arizona Winter School, Tucson, Mar 2014.

2012 International Chemistry Olympiad, Organizing Committee.

Boston Math Circle Instructor for a semester-long class with 7- to 10-year-olds, Spring 2010.

Girls' Angle Mentor, 2009-10.

Graduate school / career advice panels (Harvard Math Table, Nov 2009; Michigan AWM-WIM, Feb 2018; GROW Conference, Oct 2018; MSRI Connections for Women, Jan 2019; MAGNTS, Oct 2019).

Graduate Fellow and Resident Graduate Student in Butler College, Princeton University, 2006-09. Advised undergraduates on course selection and organized lecture series to foster interest in mathematics and other sciences.

Co-organizer of Women-in-Science seminars and panels for the Women in Mathematics Program at the Institute for Advanced Study, 2006-08. Committee member for the affiliated 2009 Summer Workshop in Mathematics for High School Students.

Teaching assistant for advanced course at the Women and Mathematics program at IAS, May 2007.

Lecturer in mini-course at Lorentz Center Stieltjes Onderwijsweek on Rings of Low Rank, Jun 2006.

U.S. National Chemistry Olympiad Peer Mentor, 2005.

Women-in-Math chair of the Harvard University Undergraduate Math Club, 2002-03. Established a graduate/undergraduate student mentoring program.

Other Service

AMS Morgan Prize Committee, 2019–2022 (chair 2019-2020).

Women in Numbers Steering Committee, 2020–.

University of Michigan LSA Teaching Academy Alumni Panel, 2019.

External qualifying exam committee member.

NSF grant review panels, 2015, 2019, 2020.

Current Events Bulletin Committee, 2014.

Referee/quick opinion for numerous math journals and conference proceedings.