Meng-Che "Turbo" Ho

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EMPLOYMENT

8/2025 - present Assistant Professor of Mathematics, New College of Florida

8/2025 - present Associate Professor (with tenure), California State University, Northridge (on leave)

1/2021 - 8/2025 Assistant Professor, California State University, Northridge

8/2020 - 12/2020 Postdoctoral Fellow, Mathematical Sciences Research Institute (now the Simons Laufer Mathematical Sciences Institute), Berkeley, California
Program: Decidability, definability and computability in number theory
Mentor: Theodore A. Slaman

8/2017 - 8/2020 Golomb Visiting Assistant Professor, Purdue University
Mentors: Thomas Sinclair and Ben McReynolds

7/2010 - 5/2017 Graduate Assistant, Department of Mathematics, University of Wisconsin–Madison

VISITING POSITIONS

Fall 2018 Postdoc, Hausdorff Research Institute for Mathematics, Bonn, Germany
Program: Logic and Algorithms in Group Theory

Summer 2013 Research Assistant, Mathematics, Academia Sinica, Taiwan
Advisor: Ching Hung Lam
Topic: Geometry of Sporadic Groups

EDUCATION

2017 Ph.D., Mathematics, University of Wisconsin–Madison
Advisors: Uri Andrews and Tullia Dymarz
Thesis title: Randomizing and Describing Groups

2012 M.A., Mathematics, University of Wisconsin–Madison

2009 B.S., Mathematics, National Taiwan University

PUBLICATIONS

Arxiv author link: `https://arxiv.org/a/ho_m_4.html`
MathSciNet author link: `http://www.ams.org/mathscinet/search/author.html?mrauthid=1200055`

Submitted

1. Algorithmically finite, universal, and $*$-universal groups, with Uri Andrews, *arXiv preprint arXiv:2402.01882* (2024), submitted.
2. Free structures and limiting density, with Johanna N. Y. Franklin and Julia Knight, *arXiv preprint arXiv:2209.04069* (2022), submitted.

Published/Accepted

3. Countable and finitary reductions on equivalence relations, with Stephen C. Jackson, Steffen Lempp, Russell G. Miller, and Noah D. Schweber, *Fundamenta Mathematicae*, accepted.
4. Torsion-free abelian groups of finite rank and fields of finite transcendence degree, with Julia Knight and Russell Miller, *Journal of Symbolic Logic*, accepted.
5. Scott analysis, linear orders and almost periodic functions, with David Gonzalez and Matthew Harrison-Trainor, *Bull. Lond. Math. Soc.*, **57** (2025), no. 4, 1118–1139.
6. Two results on complexities of decision problems of groups, with Uri Andrews and Matthew Harrison-Trainor, *Internat. J. Algebra Comput.*, **35** (2025), no. 2, 311–327.
7. Algorithmic aspects of left-orderings of solvable Baumslag–Solitar groups via its dynamical realization, with Khanh Le and Dino Rossegger, in: Levy Patey, L., Pimentel, E., Galeotti, L., Manea, F. (eds) Twenty Years of Theoretical and Practical Synergies. CiE 2024. Lecture Notes in Computer Science, vol 14773. Springer, Cham.
8. Enumerating word maps in finite groups, with Bogdan S. Chlebus and William Cocke, *Int. J. Group Theory*, **13** (2024), no. 3, 307–318.
9. Rational growth in torus bundle groups of odd trace, with Seongjun Choi and Mark Pengitore, *Proc. Edinb. Math. Soc. (2)*, **65** (2022), *no. 4*.
10. Finitely generated groups are universal among finitely generated structures, with Matthew Harrison-Trainor, *Ann. Pure Appl. Logic*, **172** (2021), *no. 1*, 102855.
11. The conjugacy growth of the soluble Baumslag-Solitar groups, with Laura Ciobanu and Alex Evetts, *New York J. Math.* 26 (2020), 473–495.
12. Word maps in finite simple groups, with William Cocke, *Arch. Math. (Basel)*, **113** (2019), *no. 6*, 565-570.
13. Characterizations of cancellable groups, with Matthew Harrison-Trainor, *Proc. Amer. Math. Soc.*, **147** (2019), *no. 8*, 3533-3545.
14. The probability distribution of word maps on finite groups, with William Cocke, *J. Algebra*, **518** (2019), 440-452.
15. The word problem of $\mathbb{Z}^n$ is a multiple context-free language, *Groups Complex. Cryptol.* **10** (2018), *no. 1*, 9-15.
16. On optimal Scott sentences of finitely generated algebraic structures, with Matthew Harrison-Trainor, *Proc. Amer. Math. Soc.* **146** (2018), *no. 10*, 4473-4485.
17. On the symmetry of images of word maps in groups, with William Cocke, *Comm. Algebra* **46** (2018), *no. 2*, 756-763.
18. Random nilpotent groups I, with Matthew Cordes, Moon Duchin, Yen Duong, and Ayla P. Sánchez, *Int. Math. Res. Not.* (2018), *no. 7*, 1921-1953.
19. Describing groups, *Proc. Amer. Math. Soc.* **145** (2017), *no. 5*, 2223-2239.

Book Chapters

20. Group Theory, with William Cocke, a chapter in the book *Mathematics in Cyber Research*, edited by Paul L. Goethals, Natalie M. Scala, Daniel T. Bennett, CRC Press, 2022

GRANTS AND AWARDS

Extramural

2024-2026 Large Cardinal Axioms and Left Distributive Algebras, Structured Quartet Research Ensembles, American Institute of Mathematics, Pasadena, CA

2021-2025 Principal Investigator, National Science Foundation Grant DMS-2054558 "RUI: Randomness, Computability, and Complexity in Groups", $210,000

2018-2021 AMS Simons Travel Grant

Intramural

2024 Research Bridge Funds, CSUN (canceled due to college budget constraints)

2023, 2024 Summer Grant Program, CSUN

2023, 2024 Pathways to Tenure Grant, CSUN

2023 Research, Scholarship, and Creative Activity Award, CSUN

2022 Probationary Faculty Support Program, CSUN

2015 Excellence in Research Award, Department of Mathematics, University of Wisconsin–Madison

2014 Vilas Conference Presentation Funding, University of Wisconsin–Madison

2013 Mathematics Graduate Teaching Award, Department of Mathematics, University of Wisconsin–Madison

2011 Honored Instructor, Division of University Housing, University of Wisconsin–Madison

STUDENT MENTORING

Master student

David De La Torre, CSUN, Thesis topic: On the finiteness of certain left-distributive algebras (graduated 2024)

Undergraduate student

Georgii Baiev, CSUN, Putnam Exam preparation (expected graduation 2028)
Christian Villalobos, CSUN, Putnam Exam preparation (expected graduation 2026)
Thi My Duyen (Selena) Le, CSUN, logic (expected graduation 2025)
Grant Fisher, CSUN, group theory (graduated 2023)
Andrey Shor, Purdue, formal language theory (graduated 2023)
Alexander McMahon, CSUN, computability theory (graduated 2023)
Noah Trist, CSUN, group theory (graduated 2022)

Master Thesis Committee Member

Petros Mavromichalis, CSUN (graduated 2023, chair: Jason Lo)
Ibrahim Wardan, CSUN (graduated 2023, chair: Daniel Katz)
Joshua Kim, CSUN (graduated 2022, chair: Daniel Katz)

OUTREACH AND SERVICE

2022- Mentor for Math Alliance

2024-2025 Advisor of CSUN Math Club

2024-2025 Graduate Committee (appointed)

2025 Co-organizer of special session on Computability Theory for 2025 North American Meeting of the Association for Symbolic Logic, New Mexico State University, Las Cruces, NM

2023-2024 Curriculum Committee (appointed)

2024 Supervisor of Putnam Exam, CSUN

2024 Co-organizer of special session on Logic in SoCal for AMS Fall Western Sectional Meeting, Riverside, CA

2021-2023 Graduate Committee (appointed)

2022, 2023 Mentor for See Think Wonder Challenge, Twin Oaks Education, Taiwan

2021, 2022 Algebra Comprehensive Exam Committee

2022 Co-organizer of special session on Group Theory and Logic for AMS Spring Central Sectional Meeting, West Lafayette, IN

2021, 2023 Faculty judge of CSUNposium

2021, 2022 Co-organizer of World of Groupcraft conference

2021-2022 Faculty Senate of California State University, Northridge

2020 Co-organizer of the Junior Seminar and the Writing Group of the decidability, definability and computability in number theory, Mathematical Sciences Research Institute

2020 Co-organizer of special session on Group Theory and Logic for AMS Spring Central Sectional Meeting (canceled), West Lafayette, IN

2019-2020 Faculty Advisor of Taiwanese Student Association of Purdue University

2019-2020 Mentor of Supervised Reading Course for Undergraduates, Purdue University

2018 Volunteer in Content Development Team, Junyi Academy, Taiwan

2018 Judge in Undergraduate Research Conference, Purdue University

2016-2017 Mentor in Directed Reading Program, University of Wisconsin–Madison

2014 Co-organizer of the 15th Annual Graduate Student Conference in Logic at University of Wisconsin–Madison

2012-2016 Organizer of semesterly Logic Picnic of University of Wisconsin–Madison logic group

TEACHING

New College of Florida (Instructor)

Fall 2025	MAC 2311	Calculus I
Fall 2025	MAS 3105	Advanced Linear Algebra

California State University, Northridge (Instructor)

Spring 2025	MATH 661A	Advanced Topics in Algebra
Spring 2025	MATH 262	Introduction to Linear Algebra
Spring 2025	MATH 102	Pre-Calculus I
Fall 2024	MATH 102	Pre-Calculus I (3 sections)
Spring 2023	MATH 262	Introduction to Linear Algebra
Fall 2022	MATH 102	Pre-Calculus I
Spring 2022	MATH 560	Abstract Algebra III
Fall 2021	MATH 460	Abstract Algebra II
Spring 2021	MATH 360	Abstract Algebra I (online)
Spring 2021	MATH 262	Introduction to Linear Algebra (online)

Purdue University (Instructor)

Summer 2020	MA262	Linear Algebra And Differential Equations (online)
Spring 2020	MA375	Introduction To Discrete Mathematics (moved online)
Fall 2019	MA265	Linear Algebra
Summer 2019	MA341	Foundations Of Analysis
Spring 2019	MA265	Linear Algebra
Summer 2018	MA341	Foundations Of Analysis
Spring 2018	MA265	Linear Algebra
Fall 2017	MA265	Linear Algebra

University of Wisconsin–Madison (Instructor)

Spring 2015	Math 131	Mathematics for Teaching: Geometry and Measurement
Fall 2014	Math 130	Mathematics for Teaching: Numbers and Operations
Spring 2014	Math 130	Mathematics for Teaching: Numbers and Operations
Fall 2013	Math 130	Mathematics for Teaching: Numbers and Operations
Spring 2013	Math 130	Mathematics for Teaching: Numbers and Operations

University of Wisconsin–Madison (Teaching Assistant)

Spring 2017	Math 211	Calculus
Fall 2015	Math 171	Calculus with Algebra and Trigonometry I
Fall 2012	Math 211	Calculus
Spring 2012	Math 221	Calculus and Analytic Geometry I
Fall 2011	Math 234	Calculus – Functions of Several Variables
Spring 2011	Math 221	Calculus and Analytic Geometry I
Fall 2010	Math 221	Calculus and Analytic Geometry I

University of Wisconsin–Madison (Grader)

Fall 2016	Math 570	Fundamentals of Set Theory

INVITED TALKS

Invited Plenary Talks

4/2022 Small cancellation groups in logic, Plenary Lecture, North American Annual Meeting of the Association for Symbolic Logic, Cornell University, Ithaca, NY

6/2021 Languages of geodesics and rational growths of groups, Beyond Hyperbolicity, Plenary Speaker, The Ohio State University, Columbus, OH

6/2021 Languages of geodesics and rational growth of groups, Plenary Speaker, Geometric and Asymptotic Group Theory with Applications, International Centre for Mathematical Sciences, Edinburgh, United Kingdom

Invited Conference/Workshop Talks

1/2026 TBD, special session on Definability, Decidability, and Computability, Joint Mathematics Meetings, Washington, DC

12/2025 TBD, Definability and Computability, Hausdorff Research Institute for Mathematics, Bonn, Germany

10/2025 TBD, special session on Computability, AMS Fall Central Sectional Meeting, Saint Louis University, St. Louis, MO

6/2025 The first-order theory of torsion-free Tarski monsters, Geometric and Asymptotic Group Theory with Applications, Stevens Institute of Technology, Hoboken, NJ

5/2025 The first-order theory of torsion-free Tarski monsters, Groups in Geometry, Analysis, and Logic, Vanderbilt University, Nashville, TN

5/2025 Isomorphism problems as equivalence relations, special session on Logic and Analysis, AMS Spring Western Sectional Meeting, California Polytechnic State University, San Luis Obispo, CA

6/2024 Decision problems for groups as equivalence relations, special session on Computable Model Theory, 2024 Logic Colloquium, University of Gothenberg, Sweden

6/2024 Word problem for groups as equivalence relations, Groups, Logic and Computation: Interactions between geometric group theory, model theory, and computer science, Stevens Institute of Technology, Hoboken, NJ

5/2024 Word problem of groups as ceers, special session on Computability Theory, North American Annual Meeting of the Association for Symbolic Logic, Iowa State University, Ames, IA

4/2024 Turing computable embeddings between abelian groups and fields, special session on Computability, Complexity, and Algebraic Structure, AMS Spring Eastern Sectional Meeting, Howard University, Washington, DC

3/2024 Decision problem for groups as equivalence relations, Groups, Logic and Dynamics, Rutgers University–New Brunswick, NJ

3/2024 Decision problem for groups as equivalence relations, special session on Geometric Group Theory, The 57th Spring Topology and Dynamics Conference, University of North Carolina at Charlotte, NC

1/2024 Coding structures in groups, special session on "Geometric Group Theory (Associated with the AMS Retiring Presidential Address)", Joint Mathematics Meetings, San Francisco, CA

1/2024 Word problem of groups as ceers, special session on "Computable Mathematics: A Special Session Dedicated to Martin D. Davis", Joint Mathematics Meetings, San Francisco, CA

6/2023 Describing finitely generated groups, Groups and Computation: Interactions between geometric group theory, computability and computer science, Stevens Institute of Technology, Hoboken, NJ

11/2022 Free structures and limiting density, Chinese Annual Conference on Mathematical Logic 2022, Wuhu, Anhui, China

11/2022 Comparing structures computably, Invariant descriptive computability theory, American Institute of Mathematics, San Jose, CA

10/2022 Free structures and limiting density, 2022 Langenhop lecture & SIU probability and statistics conference, Southern Illinois University, Carbondale, IL

10/2022 Free structures and limiting density, Models and Computability, The Mathematics of Julia Knight, University of Notre Dame, Notre Dame, IN

8/2022 A computable functor from torsion-free abelian groups to fields, Definability, Decidability, and Computability in Number Theory, part 2, Mathematical Sciences Research Institute, Berkeley, CA

7/2022 A computable functor from torsion-free abelian groups to fields, Computability in Europe, Swansea University, Swansea, UK

3/2022 Zero-one laws for finitely presented structures, Midwest Computability Seminar, University of Chicago, Chicago, IL

9/2021 Zero-one laws for finitely presented structures, postdoc seminar, Thematic Program on Trends in Pure and Applied Model Theory, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada

5/2021 Rational growth and languages of geodesics of groups, special session on Geometric Group Theory, The 54th Spring Topology and Dynamical Systems Conference, Murray State University, Murray, KY

2/2021 0-1 laws for finitely presented structures, South Eastern Logic Symposium 2021, University of Florida, Gainesville, FL

10/2020 0-1 laws for finitely presented structures, Junior Seminar of the decidability, definability and computability in number theory, Mathematical Sciences Research Institute

9/2020 The word problem for groups, Computability Theory Seminar of the decidability, definability and computability in number theory, Mathematical Sciences Research Institute

7/2020 Rationality of Growths of Groups, Second Workshop on Digitalization and Computable Models, Novosibirsk – virtual, Russia

10/2019 The probability distribution of word maps on finite groups, Special Session on What's New in Group Theory?, AMS Fall Eastern Sectional Meeting, Binghamton University, NY

9/2019 The model theory of random groups, Special Session on Model Theory, AMS Fall Central Sectional Meeting, University of Wisconsin-Madison, Madison, WI

5/2019 The homomorphism spectra of torsion-free abelian groups, Computability Theory Special Session, ASL North American Annual Meeting, City University of New York, NY

4/2019 Scott Sentences of Finitely-Generated Groups, Midwest Model Theory Day, University of Illinois at Chicago, Chicago, IL

11/2018 The Probability Distributions of Word Maps on Finite Groups, Trimester Seminar, Hausdorff Research Institute for Mathematics, Bonn, Germany

6/2018 Scott Sentences of Finitely-Generated Groups, Computability Theory and Applications, University of Waterloo, Waterloo, Canada

4/2018 Finitely Generated Groups Are Universal, Midwest Computability Seminar, University of Chicago, Chicago, IL

3/2018 The Word Problems of Groups as Formal Languages, Geometry, Groups and Dynamics workshops, Purdue University, West Lafayette, IN

4/2017 On the Scott Sentence of Finitely Generated Structures, XVIII Graduate Student Conference in Logic, Urbana, IL

3/2017 The Word Problem of $\mathbb{Z}^n$, 2017 Spring Topology and Dynamical Systems Conference, New Jersey City University, Jersey City, NJ

10/2015 Describing Groups, AMS Central Fall Sectional Meeting, Loyola University Chicago, Chicago, IL

4/2015 Describing Groups, The 16th Annual Graduate Student Conference in Logic, University of Illinois at Chicago, Chicago, IL

4/2014 The 0-1 Conjecture for Groups, The 15th Annual Graduate Student Conference in Logic, University of Wisconsin–Madison, Madison, WI

Invited Colloquium Talks

3/2023 Classification from the point of view of logic, Colloquium, The George Washington University, Washington, DC

8/2021 Classification from the point of view of logic, Colloquium, Academia Sinica, Taipei, Taiwan

3/2020 Groups, Logic, and Languages, Colloquium, National Cheng Kung University, Tainan, Taiwan

3/2020 Groups, Logic, and Languages, Colloquium, National Chiao Tung University, Hsinchu, Taiwan

Invited Seminar Talks

3/2025 Free structures and limiting density, Computability, Complexity, and Algebraic Structure seminar, George Washington University, Washington, DC

6/2024 Decision problems in groups, Topology REU seminar, University of Virginia, Charlottesville, VA

4/2024 Turing embeddings between abelian groups and fields, Logic Seminar, University of Wisconsin-Madison, Madison, WI

4/2024 Decision problem for groups as equivalence relations, Logic Workshop, The City University of New York, NY

4/2024 Decision problem for groups as equivalence relations, Algebra and Cryptology Center Seminar, Stevens Institute of Technology, Hoboken, NY

3/2024 Decision problem for groups as equivalence relations, Mathematics Seminar, Hofstra University, Hempstead, NY

11/2023 Word problems of groups as ceers, Logic Seminar, University of Wisconsin-Madison, Madison, WI

11/2023 Word problems of groups as ceers, Model Theory and Applications Seminar, Purdue University, West Lafayette, IN

11/2023 Word problems of groups as ceers, Logic Colloquium, University of California, Berkeley, CA

10/2023 Word problems of groups as ceers, Logic Seminar, National University of Singapore, Singapore

5/2023 Representative systems of some metabelian groups, Geometry and Topology Seminar, The University of Oklahoma, Norman, OK

3/2023 Describing finitely generated groups, Logic Seminar, The George Washington University, Washington, DC

10/2022 Torsion-free abelian groups of finite rank and fields of finite transcendence degree, UCLA Logic Colloquium, University of California, Los Angeles, CA

10/2021 Word problem for groups, Hofstra math seminar, Hofstra University, Hempstead, NY

3/2021 0-1 laws for finitely presented structures, Purdue University Model Theory and Applications Seminar, Purdue University, West Lafayette, IN

4/2020 The model theory of random groups, Logic Seminar, University of Illinois Urbana-Champaign, Illinois

4/2020 The model theory of random groups, Logic Seminar, University of Notre Dame, Indiana

3/2020 Groups, Logic, and Languages, National Sun Yat-Sen University, Kaohsiung, Taiwan

2/2020 Groups, Logic, and Languages, California State University, Northridge, CA

12/2019 Groups and Logic, Seminar on Algebra, Institute of Mathematics, Academia Sinica, Taipei, Taiwan

12/2019 Groups and Logic, National Central University, Zhongli, Taoyuan City, Taiwan

12/2019 Groups and Logic, Southern University of Science and Technology, Shenzhen, Guangdong, China

3/2019 Rationality of Growths of Groups, Algebra/Topology seminar, Bowling Green State University, Bowling Green, Ohio

2/2019 Rationality of Growths of Groups, Geometry Seminar, The Ohio State University, Columbus, OH

11/2018 Finitely Generated Groups Are Universal, Algebra Seminar, Vienna University of Technology, Vienna, Austria

6/2018 The Word Problems of Groups as Formal Languages, Computability Seminar, University of Waterloo, Waterloo, Canada

5/2018 Logic and Groups, Junior Colloquium, Georg-August-Universität Göttingen, Göttingen, Germany

4/2018 The Word Problems of Groups as Formal Languages, Computability Seminar, University of Notre Dame, Notre Dame, IN

12/2017 The Word Problems of Groups as Formal Languages, Geometric Group Theory and Topology Seminar, Tufts University, Medford, MA

11/2017 Finitely Generated Groups Are Universal, Logic Seminar, University of Wisconsin–Madison, Madison, WI

11/2017 Small Cancellation Theory, Purdue Basic Notions Seminar, Purdue University, Lafayette, IN

9/2017 On the Scott Sentence of Finitely Generated Structures, Logic Seminar, Purdue University, Lafayette, IN

2/2017 On the Scott Sentence of Finitely Generated Structures, Logic Seminar, University of Wisconsin–Madison, Madison, WI

10/2016 Scott Sentences and Index Sets of Groups, Student Logic Colloquium, University of California, Berkeley, CA

1/2016 Describing Groups, Logic Seminar, University of Illinois at Chicago, Chicago, IL

9/2015 Describing Groups, Computability Seminar, University of Notre Dame, Notre Dame, IN

9/2014 Random Nilpotent Groups, Logic Seminar, University of Wisconsin–Madison, Madison, WI

9/2014 0-1 Conjecture of Groups, Geometric Group Theory and Topology Seminar, Tufts University, Medford, MA

Public Talks

5/2022 Hilbert's Tenth Problem and Computability Theory, CSUN Department of Mathematics Open House, Northridge, CA

Professional Development Talks

11/2020 What to do (or what did I do) after getting an interview?, Basic Skills Workshop, Purdue University, West Lafayette, IN

WORKSHOPS ATTENDED BY INVITATION

2022 Invariant descriptive computability theory, American Institute of Mathematics, San Jose, CA

2022 Definability, Decidability, and Computability in Number Theory Program, part 2, Mathematical Sciences Research Institute, Berkeley, CA

2022 New Directions in Computability Theory, Centre International de Rencontres Mathématiques, Marseille, France

2018 Young Geometric Group Theory VII, Les Diablerets, Switzerland

2018 Computability Theory, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany

2016 Geometric Group Theory, Mathematical Science Research Institute, Berkeley, CA

2014 Graduate Mentor, Research Cluster in Random Groups, Tufts University, Medford, MA

2012 Summer Graduate School in Model Theory, Mathematical Science Research Institute, Berkeley, CA

2012 Asian Initiative for Infinity Graduate Summer School, National University of Singapore, Singapore