

# CURRICULUM VITAE

## WILLIAM CHAN

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### 1. EDUCATION

- California Institute of Technology, Ph.D Mathematics, 2017. Advisor: Alexander Kechris. Thesis: “Aspects of Definability for Equivalence Relations”.
- University of Chicago, B.A. Mathematics, 2012.

### 2. EMPLOYMENT

- TU Wien, Project Assistant; 2023- .
- University of North Texas, Postdoctoral Research Associate, 2022-2023.
- Carnegie Mellon University, Fang Zheng Postdoctoral Fellow, 2020-2022.
- University of North Texas, NSF Postdoctoral Fellow and Research Assistant Professor, 2017-2020.

### 3. GRANTS

NSF grant DMS-1703708. NSF Mathematical Sciences Postdoctoral Research Fellowship. 2017-2021.

### 4. PAPERS

- (1) “Cardinality of the Set of Bounded Subsets of a Cardinal”. In preparation.
- (2) “The Size of a Set from the Size of Its Countable Power Set”. In preparation.
- (3) “Coding and Anticoding of a Cardinal by Bounded Subsets of the Cardinal”. In preparation.
- (4) “Boldface GCH Below the First Uncountable Limit Cardinal”. With Stephen Jackson and Nam Trang. Submitted.
- (5) “Size of Pieces in Decompositions into the First Uncountable Cardinal Many Pieces”. With Stephen Jackson and Nam Trang. Submitted.
- (6) “ $\infty$ -Borel Codes in Natural Models of  $\text{AD}^+$ ”. With Stephen Jackson and Nam Trang. Submitted.
- (7) “Almost Disjoint Families under Determinacy”. With Stephen Jackson and Nam Trang. *Advances in Mathematics*, 347 (2024).
- (8) “Definable Combinatorics of Strong Partition Cardinals”. In preparation.
- (9) “Almost Everywhere Behavior of Functions According to Partition Measures”. With Stephen Jackson and Nam Trang. *Forum of Mathematics, Sigma*, 12 (2024): e16, 1-36.
- (10) “Countable Length Everywhere Club Uniformization”. With Stephen Jackson and Nam Trang. *Journal of Symbolic Logic*, 88 (2023), no. 4, 1556-1572.
- (11) “The Size of the Class of Countable Sequences of Ordinals”. With Stephen Jackson and Nam Trang. *Transactions of the American Mathematical Society*, 375 3 (2022), 1725-1743.
- (12) “A Lipschitz Determinacy Principle Equivalent to Weak König Lemma”. *Annals of Pure and Applied Logic*, 174 (2023), no 3.
- (13) “Equivalence of Codes for Countable Sets of Reals”. *Canadian Mathematical Bulletin*, 64, no. 3 (2021), 580-590.
- (14) “More Definable Combinatorics around the First and Second Uncountable Cardinal”. With Stephen Jackson and Nam Trang. *Journal of Mathematical Logic*, 23 (2023), No. 3.

- (15) “Definable Combinatorics at the First Uncountable Cardinal”. With Stephen Jackson. *Transactions of the American Mathematical Society*, 374 3 (2021), 2035-2056.
- (16) “Applications of Infinity-Borel Codes to Definability and Definable Cardinals”. With Stephen Jackson. *Fundamenta Mathematicae*, 265 (2024), 215-258.
- (17) “Bounds on Continuous Scott Rank”. With Ruiyuan Chen. *Proceedings of the American Mathematical Society*, 148 8 (2020), 3591-3605.
- (18) “Bounds on Scott Ranks of Some Polish Metric Spaces”. *Journal of Mathematical Logic*, 21 (2021), no 1.
- (19) “An Introduction to Combinatorics of Determinacy”. *Trends in Set Theory, Contemporary Mathematics*, 752 (2020), 21-75.
- (20) “The Destruction of the Axiom of Determinacy by Forcing on  $\mathbb{R}$  when  $\Theta$  is Regular”. With Stephen Jackson. *Israel Journal of Mathematics*, 241 (2021), 119-138.
- (21) “Cardinality of Wellordered Disjoint Unions of Quotients of Smooth Equivalence Relations”. With Stephen Jackson. *Annals of Pure and Applied Logic*, 172 (2021), no 8.
- (22) “ $L(\mathbb{R})$  with Determinacy Satisfies the Suslin Hypothesis”. With Stephen Jackson. *Advances in Mathematics*, 346 (2019), 305-328.
- (23) “Ordinal Definability and Combinatorics of Equivalence Relations”. *Journal of Mathematical Logic*, 19 (2019), no 2.
- (24) “Definable Combinatorics of Some Borel Equivalence Relations”. With Connor Meehan. Submitted.
- (25) “When an Equivalence Relation with All Borel Classes will be Borel Somewhere?”. With Menachem Magidor. *Proceedings of the American Mathematical Society*, 150 2 (2022), 833-847.
- (26) “The Countable Admissible Ordinal Equivalence Relation”. *Annals of Pure and Applied Logic*, 168 (2017), 1224-1246.
- (27) “Equivalence Relations Which Are Borel Somewhere”. *Journal of Symbolic Logic*, 82 (2017), no. 3, 893-930.

## 5. TALKS

- Berkeley Conference on Inner Model Theory. University of California Berkeley. Berkeley, California. 2025.
- Set Theory Seminar. University of Vienna. Vienna, Austria. 2025.
- Cornell Logic Seminar. Cornell University. Ithaca, New York. 2025.
- Caltech Logic Seminar. California Institute of Technology. Pasadena, California. 2025.
- Rutgers Logic Seminar. Rutgers University. New Brunswick, New Jersey. 2025
- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2025.
- Logic Colloquium. Kurt Gödel Research Center, University of Vienna. Vienna, Austria. 2024.
- Generalized Computability Theory. Centro Internacional de Encuentros Matemáticos. Castro Urdiales, Cantabria, Spain. 2024.
- Determinacy, Inner Models, and Forcing Axioms. Erwin Schrödinger Institute. Vienna, Austria. 2024.
- Irvine Conference on Inner Model Theory. University of California at Irvine. Irvine, California. 2023.
- Mini Workshop in Set Theory. TU Wien, Vienna, Austria. 2023.
- Young Set Theory Workshop. University of Münster. Münster, Germany. 2023.
- 2023 BLAST Conference. University of North Carolina, Charlotte. Charlotte, North Carolina. 2023.
- Caltech Logic Seminar. California Institute of Technology. Pasadena, California. 2023.
- Set Theory Special Session. ASL North America Meeting. Irvine, California. 2023
- Nankai Logic Colloquium. Nankai University. Tianjin, China. 2022.
- Set Theory Workshop. Erwin Schrödinger International Institute. Vienna, Austria. 2022.
- Münster Conference on Inner Model Theory. University of Münster. Münster, Germany. 2022.
- Barcelona Set Theory Seminar. University of Barcelona. Barcelona, Spain. 2022.
- Set Theory Seminar. CUNY Graduate Center. New York City, New York. 2022.

- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2022.
- Logic and Its Applications. Canadian Mathematical Society Winter Meeting. Montreal, Quebec, Canada. 2020.
- Caltech Logic Seminar. California Institute of Technology. Pasadena, California. 2020.
- University of Chicago Logic Seminar. University of Chicago. Chicago, Illinois. 2020.
- University of Wisconsin-Madison Colloquium. University of Wisconsin-Madison. Madison, Wisconsin. 2020.
- University of Wisconsin-Madison Logic Seminar. University of Wisconsin-Madison. Madison, Wisconsin. 2020.
- Choiceless Set Theory and Related Areas. Joint Mathematics Meeting. Denver, Colorado. 2020.
- UIUC Logic Seminar. University of Illinois Urbana-Champaign. Champaign, Illinois. 2019.
- Caltech-UCLA Logic Seminar. University of California Los Angeles. Los Angeles, California. 2019.
- Berkeley Conference on Inner Model Theory. University of California at Berkeley. Berkeley, California. 2019.
- Boise Extravaganza in Set Theory. Annual Meeting of AAAS Pacific Division. Southern Oregon University. Ashland, Oregon. 2019.
- The Core Model Induction and Other Inner Model Theoretic Tools. Rutgers University, New Brunswick, New Jersey. 2019.
- Mid-Atlantic Mathematical Logic Seminar (MAMLS 2018). Rutgers University. New Brunswick, New Jersey, 2018.
- First Girona Conference on Inner Model Theory. University of Girona. Girona, Catalonia. 2018.
- Set Theory Research Seminar. University of Münster. Münster, Germany. 2018.
- Set Theory Special Session. ASL North America Meeting. University of Western Illinois. Macomb, Illinois. 2018.
- South Eastern Logic Symposium. University of Florida. Gainesville, Florida. 2018.
- Rutgers Logic Seminar. Rutgers University. New Brunswick, New Jersey. 2018.
- South Eastern Logic Symposium. University of Florida. Gainesville, Florida. 2017.
- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2017.
- Descriptive Inner Model Theory and HOD Mice. University of California at Irvine. Irvine, California. 2016.
- Boise Extravaganza in Set Theory. Annual Meeting of AAAS Pacific Division. University of San Diego. San Diego, California. 2016.
- Descriptive Set Theory and its Applications. AMS Spring Western Sectional Meeting. University of Utah. Salt Lake City, Utah. 2016.
- South Eastern Logic Symposium. University of Florida. Gainesville, Florida. 2016.
- Logic in Southern California. University of California at Irvine. Irvine, California. 2015.

## 6. RESEARCH VISITS AND WORKSHOPS

- Reverse Mathematics. Erwin Schrödinger Institute. Vienna, Austria. 2025.
- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2025.
- Vienna Inner Model Theory 2024. Technical University of Vienna. Vienna, Austria. 2024
- Determinacy, Inner Models, and Forcing Axioms. Erwin Schrödinger Institute. Vienna, Austria. 2024.
- Irvine Conference on Inner Model Theory. University of California at Irvine. Irvine, California. 2023.
- Young Set Theory Workshop. University of Münster. Münster, Germany. 2023.
- Invariant Descriptive Computability Theory Workshop. American Institute of Mathematics. San Jose, California. 2022.
- Set Theory Workshop. Erwin Schrödinger International Institute. Vienna, Austria. 2022
- Münster Conference on Inner Model Theory. University of Münster. Münster, Germany. 2022.

- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2022.
- Münster Conference on Inner Model Theory. University of Münster. Münster, Germany. 2021. (Cancelled)
- Münster Conference on Inner Model Theory. University of Münster. Münster, Germany. 2020. (Cancelled.)
- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2020. (Cancelled.)
- Berkeley Conference on Inner Model Theory. University of California at Berkeley. Berkeley, California. 2019.
- The Core Model Induction and Other Inner Model Theoretic Tools. Rutgers University, New Brunswick, New Jersey. 2019.
- First Girona Conference on Inner Model Theory. University of Girona. Girona, Catalonia. 2018.
- University of Münster. Münster, Germany. 2018.
- Semester on Descriptive Set Theory and Polish Groups. Descriptive Set Theory Conference. Bernoulli Center. Lausanne, Switzerland. 2018.
- Set Theory Workshop. Mathematisches Forschungsinstitut Oberwolfach. Oberwolfach, Germany. 2017.
- Descriptive Inner Model Theory and HOD Mice. University of California at Irvine. Irvine, California. 2016.

## 7. SUPERVISION

- Julie Thompson, Master's, Mathematics, University of North Texas, 2023.

## 8. TEACHING

- 104.690 Axiom of Determinacy. Spring 2025. TU Wien.
- 104.649 Determinacy. Fall 2023. TU Wien.
- MATH 3510 Abstract Algebra I. Spring 2023. University of North Texas.
- MATH 2730 Multivariable Calculus. Fall 2022. University of North Texas.
- 21-400 Intermediate Logic. Spring 2022. Carnegie Mellon University.
- 21-112 Calculus II. Fall 2021. Carnegie Mellon University.
- 21-259 Calculus in Three Dimensions. Spring 2021. Carnegie Mellon University.
- 21-373 Algebraic Structures. Fall 2020. Carnegie Mellon University.
- MATH 4500/5600 Introduction to Topology. Spring 2019. University of North Texas.
- MATH 6010. Topics in Logic and Foundations. Fall 2018. University of North Texas.

## 9. AWARDS

- Fang Family Postdoctoral Fellowship. Carnegie Mellon University. 2020.
- University of North Texas Postdoctoral Research Award. University of North Texas. 2018.
- Scott Russell Johnson Graduate Dissertation Prize. California Institute of Technology. 2017.
- Scott Russell Johnson Prize for Excellence in Graduate Research. California Institute of Technology. 2016.
- Scott Russell Johnson Prize for Excellence in First Year Graduate Studies. California Institute of Technology. 2013.
- NSF RTG Graduate Fellowship. California Institute of Technology. 2012-2014.

## 10. SERVICE

Conference, meeting, and seminar organization.

- Descriptive Set Theory, Borel Dynamics, and Borel Combinatorics. Banff International Research Station. Institute for Advanced Study in Mathematics. Hangzhou, China. 2026.
- Young Set Theory 2025. TU Wien. Vienna, Austria. 2025. (local organizer)
- Vienna Inner Model Theory 2024. TU Wien. Vienna, Austria. 2024. (local organizer)