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## **PERSONAL INFORMATION:**

Citizenship: US/UK

## **EDUCATION:**

**University of Chicago,** Chicago, IL Ph.D. in Mathematics (2012-2018) Advisor: Matthew Emerton Thesis: Taylor-Wiles-Kisin Patching and the mod-l Langlands Correspondence

<u>Coursework: Real Analysis; Functional Analysis (Brezis); Complex Analysis and</u> <u>Topics in Analysis; Algebraic Topology (Hatcher); Differential Topology;</u> <u>Differential Geometry; Representation Theory; Commutative Algebra and</u> <u>Algebraic Geometry; Topics in Algebra.</u>

**California Institute of Technology**, Pasadena, CA B.S. in Mathematics (2008-2012)

<u>Coursework:</u> Algebraic Geometry (Hartshore); Representation Theory (Representations of Finite and Compact Groups, Barry Simon); Elliptic Curves; Algebraic Number Theory; Algebraic Topology (Hatcher); Abstract Algebra: Undergraduate (Dummit and Foote), Graduate (Hungerford, Lang); Real Analysis (Carothers); Complex Analysis (Robert E. Greene); Differential Geometry (Do Carmo); Differential Topology; Discrete Mathematics (Norman Biggs); Error-Correcting Codes; Mathematical Logic; Probability and Statistics; Differential Equations.

### **EMPLOYMENT:**

**Imperial College London:** Research Associate in Number Theory (2022-2025) **Max Planck Institute for Mathematics:** Postdoctoral Fellow (2021-2022) **UCLA:** Hedrick Assistant Adjunct Professor (2018-2021)

### **RESEARCH EXPERIENCE:**

University of Minnesota, Duluth Mathematics REU: Summer 2011

Conducted research under Professor Joseph Gallian on the distinguishing chromatic numbers of graphs embedded in surfaces. Gave a presentation of research at the 2012 joint math meetings.

#### University of Minnesota, Duluth Mathematics REU: Summer 2010

Conducted research under Professor Joseph Gallian on the factorization properties of a class of block monoids. Wrote and submitted a paper for publication. Gave a presentation of research at the 2011 joint math meetings

#### **TEACHING EXPERIENCE:**

#### Instructor: 2014-2021

#### UCLA:

Math 110A: Abstract algebra (ring theory) (Fall 2018)
Math 11N: Gateway to Mathematics, Number theory (Winter 2019)
Math 115A: Linear algebra (Winter 2019)
Math 61: Introduction to Discrete Structures (Spring 2019)
Math 61: Introduction to Discrete Structures (Fall 2019)
Math 11N: Gateway to Mathematics, Number theory (Winter 2020)
Math 32A: Calculus of Several Variables (Winter 2020)
Math 115B: Linear Algebra (Spring 2020)
Math 215A: Commutative algebra (Fall 2020)
Math 110A: Abstract algebra (ring theory) (Winter 2021)
Math 110B: Abstract algebra (group theory) (Spring 2021)
Math 11N: Gateway to Mathematics, Number theory (Spring 2021)

### **University of Chicago:**

Calculus (Math 151,152,153) -'14-'15 academic year - Textbook: *Calculus: One variable* (Salas-Hille-Etgen) Math Methods in Social Science (Math 195) - Fall '15, Spring '16, Fall '16, Fall '17, Spring '18 - Textbook: *Multivariable Calculus* (Stewart) Linear Algebra (Math 196) - Winter '16, Winter '17, Winter '18 - Textbook: *Linear Algebra with Applications* (Bretscher)

### College Fellow: 2013-2014

University of Chicago

Honors Algebra (Math 257,258,259)

- Instructor: John Boller (Fall term); Anne Shiu (Winter and Spring terms).

- Textbook: *Abstract Algebra* (Dummit and Foote); *Linear Algebra* (Hoffman and Kunze)

#### Mathzoom Summer Camp: Summer 2009

Worked as a Camp counselor and teaching assistant. Helped teach middle and high school students problem solving for math competitions. Answered student questions and graded student solutions.

### Art of Problem Solving: Summer 2009

Worked primarily as proofreader for a Precalculus text book. Also wrote some math problems for an online teaching system, and preformed various other miscellaneous tasks.

## **Private Tutoring:**

During college, tutored a variety of high school and college students in math. Subjects taught included the standard high school curriculum, problem solving for math competitions and college level math (including calculus, linear algebra and differential equations).

## AWARDS, GRANTS AND HONORS:

American Institute of Mathematics SQuaRE grant: 2023-2025 (with Patrick Allen, Srikanth Iyengar and Chandrashekhar Khare) Lawrence and Josephine Graves Prize for excellence in undergraduate teaching (UChicago): 2016 Ryser scholarship (Caltech): 2011 (awarded to undergraduate students for academic excellence) Honorable Mention in Putnam Competition: 2009, 2010 Top 100 in Putnam Competition: 2008

# **PUBLICATIONS:**

Jeffrey Manning "*Mod l multiplicities in certain U(4) Shimura varieties*", preprint at <u>https://arxiv.org/abs/2410.08795</u>

Srikanth Iyengar, Chandrashekhar Khare, Jeffrey Manning and Eric Urban "*Congruence modules in higher codimension and zeta lines in Galois cohomology*", Proceedings of the National Academy of Sciences **121** (2024), no. 17, e2320608121

Srikanth Iyengar, Chandrashekhar Khare and Jeffrey Manning "Freeness of Hecke modules at non-minimal levels", Math. Res. Lett. to appear

Srikanth Iyengar, Chandrashekhar Khare and Jeffrey Manning "Congruence modules and the Wiles-Lenstra-Diamond numerical criterion in higher codimensions", Inventiones Mathematicae to appear

Gebhard Böckle, Chandrashekhar Khare and Jeffrey Manning "*Wiles defect of Hecke algebras via local-global arguments:* With an appendix by Najmuddin Fakhruddin and Chandrashekhar B. Khare", Journal of the Institute of Mathematics of Jussieu (2024), 1–81.

Gebhard Böckle, Chandrashekhar Khare and Jeffrey Manning "*Wiles defect for Hecke algebras that are not complete intersections*", Compositio Mathematica, 157(9), 2046-2088 (2021)

Jeffrey Manning and Jack Shotton "*Ihara's lemma for Shimura curves totally real fields via patching*", Math. Ann. 379, 187-234 (2021)

Jeffrey Manning "*Patching and multiplicity*  $2^k$  for Shimura curves", Algebra and Number Theory Vol. 15, No. 2, 387-434 (2021)

Jeffrey Manning, "*EZADS inputs which produce half-factorial block monoids*", Semigroup Forum Volume 90, Issue 3 (2015) Page 775-799

#### **PRESENTATIONS:**

"Congruence modules in higher codimension" New Advances in the Langlands Program: Geometry and Arithmetic, Clay research conference workshop (October 2024)

"The Wiles-Lenstra-Diamond numerical criterion over imaginary quadratic fields" Sheffield number theory seminar (November 2023)

"The Wiles-Lenstra-Diamond numerical criterion over imaginary quadratic fields" Oxford number theory seminar (February 2023)

"The Wiles-Lenstra-Diamond numerical criterion in the positive defect case" BIRS Workshop 23w5134 *Arithmetic Aspects of Deformation Theory* (January 2023)

"The Wiles-Lenstra-Diamond numerical criterion over imaginary quadratic fields" London number theory seminar (November 2022)

"The Wiles-Lenstra-Diamond numerical criterion over imaginary quadratic fields" MPIM Number Theory Lunch Seminar (September 2021)

"The Wiles-Lenstra-Diamond numerical criterion over imaginary quadratic fields" Essen Number Theory Seminar (July 2022)

"The Wiles-Lenstra-Diamond numerical criterion over imaginary quadratic fields" International Seminar on Automorphic Forms (June 2022)

"The Wiles defect for Hecke algebras that are not complete intersections" MPIM Number Theory Lunch Seminar (October 2021)

"The Wiles defect for Hecke algebras that are not complete intersections" Purdue Automorphic Forms and Representation Theory Seminar (October 2021)

"The Wiles defect for Hecke algebras that are not complete intersections" Quebec-Vermont Number Theory Seminar (February 2021)

"The Wiles defect for Hecke algebras that are not complete intersections" UCSB Number Theory Seminar (April 2020)

"The Wiles defect for Hecke algebras that are not complete intersections" UIUC Number Theory Seminar (April 2020)

"The Wiles defect for Hecke algebras that are not complete intersections" University of Utah Number Theory Seminar (April 2020)

"The Wiles defect for Hecke algebras that are not complete intersections" UCSD Number Theory Seminar (February 2020)

"The Wiles defect for Hecke algebras that are not complete intersections" UCLA Number Theory Seminar (February 2020)

"Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" Stanford Number Theory Seminar (November 2019) "Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" UC Irvine Number Theory Seminar (October 2019)

"Patching and self-duality" BIRS-CMO Workshop 19w5210 Modularity and Moduli Spaces (October 2019)

"Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" Caltech Number Theory Seminar (March 2019)

"Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" UCLA Number Theory Seminar (October 2018)

"Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" UC Berkeley Arithmetic Geometry and Number Theory Seminar (September 2018)

"Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" Johns Hopkins UniversityNumber Theory seminar (February 2018)

"Taylor-Wiles-Kisin patching and mod l multiplicities in Shimura curves" UMichigan Group, Lie and Number Theory seminar (January 2018)

"Multiplicities of Galois representations in the mod-l Cohomology of Shimura curves" (CTNT 2016 Research Conference Elliptic Curves, Modular Forms and Related Topics)

"Distinguishing chromatic numbers of planar maps" (Joint Math Meetings, 2012) "EZADS inputs which produce half-factorial block monoids" (Joint Math Meetings, 2011)

**<u>REFERENCES</u>**: Available upon request.