

# Matthew Weidner

 [www.mattweidner.com](http://www.mattweidner.com)

---

## Education

- 2018-2019 **MPhil in Advanced Computer Science**, *University of Cambridge*, Cambridge, UK.
- 2014-2018 **B.S. in Mathematics (with Computer Science Minor)**, *California Institute of Technology*, Pasadena, CA.

---

## Research

- [1] A. K. Narayanan and M. Weidner. Subquadratic time encodable codes beating the Gilbert-Varshamov bound. In preparation.
- [2] M. Weidner. Pseudocharacters of Classical Groups. In preparation.
- [3] M. Weidner. On Conjectural Rank Parities of Quartic and Sextic Twists of Elliptic Curves. Submitted for publication.
- [4] M. Hadian and M. Weidner. On Selmer rank parity of twists. *Journal of the Australian Mathematical Society*, 102(3):316-330, June 2017.

---

## Teaching

- 6/2018-  
8/2018 **Computer Science Teaching Assistant/Counselor**, *Pennsylvania Governor's School for the Sciences*, Pittsburgh, PA.  
Assisted with lecture, lab, and team project courses in computer science and served as a live-in counselor for high school science summer program.
- 9/2017-  
12/2017 **Ma5a (Introduction to Abstract Algebra) Teaching Assistant**, *Caltech*, Pasadena, CA.  
Gave office hours and graded problem sets and exams for undergraduate course on group theory.
- 1/2016-  
3/2016; **CS21 (Decidability and Tractability) Teaching Assistant**, *Caltech*, Pasadena, CA.  
1/2017-  
3/2017 Gave office hours and graded problem sets and exams for undergraduate course on theory of computation and computational complexity.

---

## Talks Given

- 4/2018 **Subquadratic Time Encodable Codes Beating the Gilbert-Varshamov Bound**, *Caltech CS Theory Group Meeting*.
- 11/2017 **Algebraic Geometry Error-Correcting Codes**, *Caltech Undergraduate Math Club*.
- 4/2017 **2-Selmer Rank Parities and Quadratic Twists of Elliptic Curves**, *Caltech Langlands Program Learning Seminar*.

- 11/2015 **Mordell-Weil Groups of Elliptic Curves**, *Caltech Undergraduate Math Club*.
- 10/2015 **2-Selmer Ranks of Quadratic Twists of (Hyper)elliptic Curves**, *Caltech Number Theory Seminar*.

## Awards

- 2018-2019 **Churchill Scholarship**, *Winston Churchill Foundation of the USA*, MPhil in Advanced CS.  
 “[P]rovides funding to American students for a year of Master’s study in science, mathematics, and engineering at the University of Cambridge, based at Churchill College.”
- 2018 **George W. Housner Prize for Academic Excellence and Original Research**, *Caltech Undergraduate Academic Standards and Honors Committee*.  
 “[G]iven annually to a senior in the upper 20 percent of his or her class who has demonstrated excellence in scholarship and in the preparation of an outstanding piece of original scientific research.” *Also awarded to Samuel Yee.*
- 2017 **Eric Temple Bell Undergraduate Mathematics Research Prize**, *Caltech Math Department*.  
 “[A]warded for the best original mathematics paper written by a Caltech junior or senior.” *Also awarded to the team of William Ballinger, Chloe Hsu, and Tynan Ochse.*
- 2017 **Honorable Mention**, *2016 William Lowell Putnam Mathematical Competition*.
- 2016 **H. J. Ryser Scholarship**, *Caltech Math Department*.  
 “[A]warded to undergraduate students for academic excellence.”
- 2016 **Honorable Mention**, *2015 William Lowell Putnam Mathematical Competition*.

## Selected Coursework

- Caltech **Complexity Theory**.  
 CS151 Time and space complexity, nondeterminism, circuit complexity, randomness & derandomization, alternation, and interaction.
- Caltech **Analysis and Design of Algorithms**.  
 CMS/CS139 Approximation algorithms, randomized algorithms, online algorithms, streaming algorithms, and research topics.
- Caltech **Probability and Algorithms**.  
 CS150 Probabilistic method and randomized algorithms.
- Caltech **Quantum Computation**.  
 Ph/CS219ab Two terms covering quantum entanglement, quantum circuits, and quantum algorithms; quantum error-correction and fault-tolerant quantum computing.
- Caltech **Algebraic Geometry**.  
 Ma130ab Two terms covering basic properties of sheaves, schemes, and modules over a scheme; derived categories and cohomology of coherent sheaves.
- Caltech **Abstract Algebra**.  
 Ma120abc Three terms covering commutative algebra; Galois theory and Galois cohomology; noncommutative algebra and representation theory.

## Activities

- 2014-2018 Caltech-Occidental Concert Band. Band Manager, 2017-2018.

2015-2018 Caltech Deans' Office Peer Tutor for abstract algebra and algorithms courses.

2016-2018 Student Waiter for dinners in Dabney House (my undergraduate residence). Co-Head Waiter, 2017-2018.

Winter 2017 Pit Band, Caltech Theater Group production of "Company".