

Matthew Weidner

 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. Submitted for publication. arXiv:1712.10052
- [2] A. Chiesa, L. Chua, and M. Weidner. On cycles of pairing-friendly elliptic curves. *SIAM Journal on Applied Algebra and Geometry*, 3(2):175–192, 2019.
- [3] M. Weidner. Pseudocharacters of Classical Groups. In preparation. arXiv:1809.03644
- [4] M. Weidner. On Conjectural Rank Parities of Quartic and Sextic Twists of Elliptic Curves. To appear in *International Journal of Number Theory*. arXiv:1809.04244
- [5] 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.” *One of two recipients in 2018.*
- 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.” *One of two recipients in 2017.*
- 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

- Cambridge **Network Architectures.**
 ACS R02 Paper reading on current and alternative network architectures for: core IP layer, mobile networks, network topologies, transport services, data centers, IoT, and IPv6.
- Cambridge **Advanced Topics in Computer Systems.**
 ACS R01 Paper reading on current and historical topics in computer systems.
- Cambridge **Topics in Concurrency.**
 ACS L301 Models and logics for concurrent processes, model checking, cryptographic protocols, and strategies as concurrent processes.
- Cambridge **Machine Learning.**
 ACS L42 Support vector machines, spectral clustering, experts algorithms, decision trees, and neural networks.
- 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 **Quantum Computation.**
Ph/CS219ab Two terms covering quantum entanglement, quantum circuits, and quantum algorithms;
quantum error-correction and fault-tolerant quantum computing.

Activities

- 2018–2019 Cambridge University Recorder Ensemble.
- 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".