Christopher Wang, B.A.

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https://chrisw47.github.io/

Education

2021 – 2025 **B.A. Physics, Mathematics, Pomona College.** GPA: 3.96

Physics thesis: *Developing and Characterizing a Maximum Entropy Model to Analyze Memory and Prediction in Cultured Cortical Neurons.*

Mathematics thesis: *A Mathematical Supplement for First-Year Physicists.*

2007 – 2021 **Hong Kong International School.**

Recipient of the Outstanding Achievement in Mathematics Award and National Orchestra Award (each awarded to one student in the senior class of ~200).

Experience

Sep '25 – **Research Assistant,** W. M. Keck Science Department.

- Applied Maximum Entropy models to neuronal networks—a type of categorical variable—and characterized performance with confusion matrices. Adopted weighted cross-entropy KL divergence loss function to account for class imbalance. Selected subsets of neuron population by contribution to predictive accuracy, helping circumvent the curse of dimensionality in calculating partition functions. Experimented with properties of time domain discretization and investigated subsequent trends in predictive accuracy.
- Co-drafted and revised a paper documenting aforementioned experiments and results, incorporated collaborator feedback over numerous iterations to paper. Manuscript submitted to PLoS ONE as first author, revising for resubmission.
- Currently in collaboration with UMD investigating mechanistic interpretability of reservoir computers and improving reservoir recipes for improved reservoir computing performance. All work has been done under the guidance of Professor Sarah Marzen.

Experience (continued)

Summer '23, '24 — **Student Researcher,** Pomona College.

- Received $5,000+ over eight weeks each summer as part of the Summer Undergraduate Research Program (SURP) through the Sontag Physics Grant to perform computational research in simulating gravitational waves (GWs) and their detection.
- Over two weeks of intense study (8+ hours daily), learned general relativity and tensor calculus to model gravitational wave generation of spinning binary systems. Used the Xojo programming language and Git Source Control to organize and refine a simulator program for the Laser Interferometer Space Antenna (LISA). Resolved theoretical problems in post-Newtonian GW polarization equations and addressed computing time reduction with extensive quantitative documentation in LaTeX.
- Cooperated with three other researchers in a team to advance different parts of the multi-pronged project. Great teamwork helped forge strong academic and social bonds.

Jan '22 – May '25 — **Student Mentor, Teaching Assistant,** Pomona College, Harvey Mudd College.

- Assisted students with lab equipment and conducting labs in the fall 2023 and 2024 Foundations of Modern Physics lab course. Addressed questions about theory behind labs, gave comprehensive feedback to lab notebooks weekly, graded student lab reports, and guided students on off-campus field trips. Served as a writing partner at Pomona College's Center for Speaking, Writing, and the Image (CSWIM) to aid students in writing formal lab reports.
- Organized weekly mentor sessions for introductory and upper-division Mechanics, Mathematical Methods of Physics, and Vector Calculus. Guided students through problem sets and prepared them for exams, dynamically adjusting my mentoring style to multimodally teach material depending on students' learning styles.
- Graded problem sets and provided specific feedback on student solutions for Mathematical Methods of Physics, Mechanics, Advanced Linear Algebra, and topics in quantum theory, a first-year graduate quantum mechanics course at Harvey Mudd College.
- Proofread Professor Stephen R. Garcia's textbook, Matrix Mathematics: A second course in Linear Algebra ISBN-13 978-1108837101. Provided comprehensive feedback on mathematical errors and general layout. I was selected for this task because of my strong course performance, passion towards math, and my attention to detail.

Research Publications

Journal Articles

1. **C. Wang** et al., "Analyzing an organism's sensors using maximum entropy models with bias, variance, and confusion matrices," Under review at PLoS ONE, Submitted 01/26.

Conference Talks and Poster Sessions

1. **C. Wang** et al., *Analyzing an organism's sensors using maximum entropy models with bias, variance, and confusion matrices*, APS March Meeting 2025, Anaheim, CA., 2025.

Skills

Languages	Bilingual fluency in English and Mandarin Chinese.
Coding	Python (`numpy`, `matplotlib`, `pandas`, `scipy`), LaTeX, Wolfram Mathematica.
Misc.	Academic research, teaching, grading, LaTeX typesetting.

Relevant Courses

Physics	Quantum, Classical, and Statistical Mechanics, Electromagnetism, General Relativity, Particle Physics.
Math	Real and Functional Analysis, Linear and Abstract Algebra, Vector Calculus, Differential Geometry, Point-set and Algebraic Topology, Dynamical Systems, Representation Theory.

Miscellaneous Experience

Awards and Achievements

2025	**Alfred Kwok Memorial Prize**, for outstanding leadership and service to the physics department at Pomona College.
2024, 2025	**Sigma Xi (associate member)**, Claremont Colleges Chapter. Elected to membership on the basis of outstanding aptitude in science as demonstrated by participation in research.
2023-2025	**Pomona College Scholars**, Pomona College. Awarded semesterly to the top quarter of students in each class based on semester GPA.
2023	**Tileston Physics Prize**, Pomona College. Awarded to outstanding underclassmen whose record is judged most promising by the physics department.

Hobbies

Cello, Piano, Photography, Amateur Chemistry, Cooking, Camping, Hiking, Running, Cycling, Badminton.

CV theme adapted from L. T. Lim on Overleaf.