

Christian Pratt

Physics Ph.D. Candidate
University of California, Davis

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Education

- 2021 – Ph.D. *Physics*, University of California, Davis
Advisor: Prof. James P. Crutchfield
– Expected graduation date: Spring 2026
- 2022 M.Sc. *Physics*, University of California, Davis
- 2021 B.Sc. *Physics*, University of California, Davis
- 2019 A.A. *Mathematics*, San Diego Community College District

Research positions

- 2022 – Graduate student researcher
[Complexity Sciences Center](#) and Department of Physics and Astronomy
University of California, Davis
Advisor: Prof. James P. Crutchfield

Investigating the fundamental physics of computing by combining dynamical-systems theory, stochastic thermodynamics, and superconducting circuit theory.
Applications include developing energy-efficient superconducting computers.

Software skills: Python, SPICE/JoSIM, C++, JAX, Pytorch
- 2019 - 2021 Undergraduate student researcher
Experimental high energy physics
University of California, Davis
Advisor: Prof. Michael Mulhearn

Re-purposed smartphone camera sensors for detecting cosmic ray muons in table top experiments.

Publications

Peer reviewed

- 2025 **C. Z. Pratt**, K. J. Ray, and J. P. Crutchfield. Controlled erasure as a building block for universal thermodynamically-robust superconducting computing. *Chaos*. [10.1063/5.0227130](https://doi.org/10.1063/5.0227130)
- 2025 **C. Z. Pratt**, K. J. Ray, and J. P. Crutchfield. Extracting equations of motion from superconducting circuits. *Physical Review Research*. [10.1103/PhysRevResearch.7.013014](https://doi.org/10.1103/PhysRevResearch.7.013014)

Under review

- 2026 **C. Z. Pratt**, K. J. Ray, and J. P. Crutchfield. Metastable Dynamical Computing with Energy Landscapes: A Primer. [arXiv:2602.11390](https://arxiv.org/abs/2602.11390)

In prep

- C. Z. Pratt**, K. J. Ray and J. P. Crutchfield. Comparing Langevin and SPICE Simulations of Dynamical Energy Landscape Computations in Superconducting Circuits.

Presentations

Comparing Langevin and SPICE Simulations of Dynamical Landscape Computations in Superconducting Circuits

- 2026 **Invited postdoc job talk**. National University of Singapore.
- 2025 Information Engines at the Frontiers of Nanoscale Thermodynamics workshop. Telluride, Colorado.

Controlled Erasure as a Building Block for Universal Thermodynamically-Robust Superconducting Computing

- 2025 Society for Industrial and Applied Mathematics (SIAM) Conference on Applications of Dynamical Systems (DS25). Denver, Colorado.
- 2025 **Invited technical seminar**. Molecular Foundry, Lawrence Berkeley National Laboratory.
- 2025 APS March Meeting 2025. Anaheim, California.

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| 2025 | Invited poster. Interdisciplinary Graduate Research Exhibition. University of California, Davis. |
| 2024 | Recorded technical seminar. Complexity Sciences Center, University of California, Davis. <i>Universal Dynamical Computing on the Nanoscale</i> |
| 2024 | Dynamic Days 2024 conference. Davis, California. |
| 2023 | Information Engines at the Frontiers of Nanoscale Thermodynamics workshop. Telluride, Colorado. |
| 2023 | Army Research Office on-site visit. Complexity Sciences Center, University of California, Davis. |

Teaching

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| 2026 | 9A: Classical mechanics |
| 2025 | 256A: Physics of Information 256B: Physics of Computation |
| 2021 - 2022 | 7B: Fluid mechanics, electrical circuits, Newtonian mechanics 7C: Modern physics, waves, optics 9A: Classical mechanics |

Awards & Honors

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| 2025 | Ryan Couch Memorial Travel Award Department of Physics and Astronomy University of California, Davis |
| Fall 2025, Winter 2025, Spring 2024, Spring 2023 | Graduate Student Researcher Fellowship Department of Physics and Astronomy University of California, Davis |
| 2018 | NASA Community College Aerospace Scholar |
| 2016 - 2019 | Dean's Honors List San Diego Community College District |

Service and Outreach

- 2025 Workshop Volunteer Organizer. *Physics of Agency*. Beyond Institute for Theoretical Science (BITS). Pioneer, California.
- 2025 Session Chair for CS28: Electronic, Optical, and Condensed Matter Systems. *Society for Industrial and Applied Mathematics (SIAM) Conference on Applications of Dynamical Systems (DS25)*. Denver, Colorado.
- 2020 - 2021 Mentor, Support Encourage and Develop For Children (SendForC)
- 2018 Volunteer, New Story Charity
- 2017 - 2018 Volunteer, San Diego Rescue Mission
- 2016 - 2018 Volunteer, San Diego Air and Space Museum

Last updated: February 16, 2026