

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.

- 2025 **Invited poster.** Interdisciplinary Graduate Research Exhibition. University of California, Davis.
- 2024 [Recorded technical seminar.](#) Complexity Sciences Center, University of California, Davis.
- Universal Dynamical Computing on the Nanoscale*
- 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

- 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

- 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. <i>Physics of Agency</i> . Beyond Institute for Theoretical Science (BITS). Pioneer, California.
2025	Session Chair for CS28: Electronic, Optical, and Condensed Matter Systems. <i>Society for Industrial and Applied Mathematics (SIAM) Conference on Applications of Dynamical Systems (DS25)</i> . 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