

DANIEL POLIN

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EDUCATION

University of California Davis

Master of Science in Physics

June 2017 - Present

December 2018

New York University

Bachelor of Arts in Physics with Minors in Astronomy and Mathematics

August 2013 - May 2017

RESEARCH AND PROJECTS

Rubin Observatory LSST Camera Vera C. Rubin Observatory, UC Davis, SLAC -
Advisor J. Anthony Tyson

The LSST camera is the largest digital camera yet constructed and is planned for use in a ten year survey of the entire southern sky. In my role as an instrumentalist I worked on construction and mitigation of contamination in the camera focal plane. I was involved in the design and implementation of corrective camera raft hardware to meet operational specifications.

Characterization of photometric and astrometric distortions of the Rubin LSST camera's CCD detectors. Using the UC Davis optical beam simulator that mimics the LSST camera beam of Rubin Observatory, I worked on various CCD systematics including tearing, crosstalk, and other various response effects due to satellite constellation streaks. This includes an ongoing device physics investigation into non-linear crosstalk that is likely due to on-chip effects.

Dark Radio Experiment UC Davis - Advisor J. Anthony Tyson

A direct detection search for dark photon dark matter in the nano- to milli-eV mass range. We use novel spectrum analysis methods using a bicon antenna in an EM shielded chamber to scan for the unique spectral and temporal signature of dark photons from 30-300MHz.

CMB Measurement Lab UC Davis - 122 Lab

Construction of a cosmic microwave background detection experiment for use in the UC Davis 122 advanced physics lab. The experiment mimics the original detection of the CMB by Penzias and Wilson using a directional horn antenna, a microwave low noise amplifier, a heterodyne down-converter, and a chain of amplifiers followed by a square-law detector and an integrating voltmeter. Using this setup students measure the CMB temperature. More information here: <http://122.physics.ucdavis.edu/?q=node/35>

UC Davis Astronomy Observatory UC Davis

Managing the UC Davis Observatory on Hutchison Hall, upgrading control system and camera as needed for use in Physics 157 Advanced Astronomy Lab. The dome houses a 14in telescope with a professional mount and science grade CCD camera. More information here: <http://157.physics.ucdavis.edu/node/18>

PAPERS AND PRESENTATIONS

Papers

- Godfrey, B, et. al., "Search for Dark Photon Dark Matter: Dark E-Field Radio Pilot Experiment," In preparation.

- Tyson, J.A., et. al., “Mitigation of LEO Satellite Brightness and Trail Effects on the Rubin Observatory LSST,” 2020. Published in the *Astronomical Journal* and available on the arXiv at <https://arxiv.org/abs/2006.12417>.
- Drlica-Wagner, A, et. al., “Probing the Fundamental Nature of Dark Matter with the Large Synoptic Survey Telescope,” 2019. Available at the arXiv at <https://arxiv.org/abs/1902.01055>.

Presentations

- Oral Technical Presentation, 2016 APS March Meeting, Baltimore, MD, *Ab-initio Density Functional Theory Studies of Electronic, Transport, and Bulk Properties of Sodium Oxide (Na₂O)*

SKILLS

Programming	Python, Labview, MATLAB, Mathematica, HTML
Software	Adobe Photoshop, Audacity, SolidWorks
Platforms	Linux (Ubuntu), Windows, Mac
Typesetting	L ^A T _E X
Manufacturing	Machining, Welding, Woodworking, Soldering, Circuit Design

TEACHING EXPERIENCE

University of California, Davis *Graduate Student Instructor*

Physics 122 - Advanced Lab	<i>Winter 2019, Spring 2019, 2021, 2022</i>
Physics 105A - Upper Level Mechanics	<i>Fall 2018</i>
Physics 157 - Advanced Astronomy Lab	<i>Spring 2018</i>
Physics 7C (Waves, Optics, and Quantum Mechanics)	<i>Fall 2017</i>
Lathe Techniques (Woodworking)	<i>Fall 2019, Winter 2020, Spring 2022</i>

New York University *Adjunct Recitation Instructor*

General Physics I (Mechanics)	<i>Fall 2014, 2015, 2016</i>
General Physics II (Electricity & Magnetism)	<i>Spring 2015, 2016, 2017</i>

ORGANIZATIONS AND AWARDS

UC Davis Graduate Organization of Physics Students	<i>Co-Founder/Council Member 2018 - 2022</i>
UC Davis Graduate Physics Curriculum Committee	<i>Committee Member 2019 - 2020</i>
UC Davis Graduate Travel Grant Committee	<i>Committee Member 2019 - 2020</i>
UC Davis Diversity and Inclusion in Physics	<i>Member 2017 - Present</i>
Ray and Constance Chandler Fellow	<i>2017</i>
Davis Friends of the Library	<i>Member/Volunteer 2020-Present</i>
California Raptor Center	<i>Raptor Rehabilitation Volunteer 2021-Present</i>