KELLY ANN PAWLAK

Condensed Matter Physics, Ph. D. (2020) Applied and Computational Mathematics B.S.

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CA. USA



EXPERIENCE

Academic Coordinator Faculty at UCSB Physics University of California, Santa Barbara

June 2020 - Ongoing

Santa Barbara, CA

- After graduating during the pandemic, I offered to stay at UCSB to help them with their online course transition.
- I am responsible for the creation, execution and maintenance of all undergraduate laboratory courses at UCSB's Physics department. I create, test and update manuals and interface with students, graduate students and faculty members about course content.
- I manage, coach and train 20-40 Graduate Students across 4-10 laboratory courses each quarter. I also manage and coordinate the day-today of other staff members to ensure that courses are polished and ready. I coach and train
- I developed an entire live-parsed online manual website with virtual simulations, remote control of experiments, and free laboratory manuals for the pandemic with no prior experience in web design or micro-controller function. This website is now replacing all paper manuals at UCSB Physics and will be adopted by other departments.

Graduate Researcher in Quantum Materials University of California, Santa Barbara

Sept 2014 - June 2020

Santa Barbara, CA

- Using a wide range of mathematical and computational techniques, I work - both independently and in a collaborative environment – to understand the properties of technologically interesting materials.
- My focus is charting the phase diagrams of novel 2D materials exhibiting exotic behaviors, such as superconductivity, spinliquid states and quantum hall phases.
- Much of my work has been pragmatic connecting models to available empirical data, thus providing plausible theories that not only explain for observed physical phenomena, but also provide testable predictions for collaborating experimental groups.

Research Assistant in Unconventional Superconduc-

National High Magnetic Field Laboratory

Jun 2013 - Sep 2014

▼ Tallahassee, FL

- I worked under senior supervision while investigating a novel realization of High-Temperature superconductivity.
- I extended a previous technique which demonstrated that exotic quantum phases can naturally emerge from multi-scale complex electronic systems - to an extremely general and analytically tractable model.

AWARDS

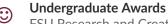
UCSB Graduate Fellowship \$24K/yr - 1 year - 2018



NSF Graduate Research Fellowship \$34K/yr - 3 years - 2014



UCSB P.Broida Fellowship \$3K/yr - 1 year - 2014



FSU Research and Creative Activity (\$4k); 1st Place Lanunutti Physics Research Award (\$750); FSU Honors Thesis Award (\$600): NSF Travel (\$ 500):

Organizations (Undergraduate) Pi Mu Eplsion Mathematics Society

(Historian, President), Sigma Pi Sigma Physics Society (President), Phi Beta Kappa Honors Society

STRENGTHS

Self Management

Self Education

Communication

Peer Management

Team Management

Creativity

Data literacy

"Big Picture" \rightarrow Details

Collaborative & Interdscp. Workflows

Physics

Ecology

Organic Chem.

Adv. Mathematics

Adv. Statistics

Python

WebDev

Golang

Julia

EDUCATION

Ph.D. Condensed Matter Physics

₩ Sept 2014 - 2020

UCSB

Advisor: Cenke Xu

MA awarded 2017 Thesis: New Directions in Strongly Correlated

Materials

B.Sc. Physics, Applied Mathematics

Advisor: Ziad Musslimani

Hon. Thesis: Self-Dual Nonlinear Schrodinger

Equation

• I demonstrated that simple solid state materials, such as a 2D copper-oxide plane, has an extremely rich phase diagram. My paper provided a proof of a new result: that there is always a doping regime such that superconductivity can be realized in a clean sample.

PUBLICATIONS

Journal Articles

- Wu, Xiao-Chuan, Anna Keselman, Chao-Ming Jian, Kelly Ann Pawlak, and Cenke Xu (2019). "Ferromagnetism and spin-valley liquid states in moiré correlated insulators". In: *Physical Review B* 100.2, p. 024421.
- Wu, Xiao-Chuan, Kelly Ann Pawlak, Chao-Ming Jian, and Cenke Xu (2018). "Emergent Superconductivity in the weak Mott insulator phase of bilayer Graphene Moiré Superlattice". In: arXiv preprint arXiv:1805.06906.
- Bi, Zhen, Chao-Ming Jian, Yi-Zhuang You, Kelly Ann Pawlak, and Cenke Xu (2017). "Instability of the non-Fermi-liquid state of the Sachdev-Ye-Kitaev model". In: *Physical Review B* 95.20, p. 205105.
- Pawlak, Kelly Ann, James M Murray, and Oskar Vafek (2015).
 "Emergence of superconductivity in a doped single-valley quadratic band crossing system of spin-1/2 fermions". In: *Physical Review B* 91.13, p. 134509.

Conference Proceedings

Murray, James, Kelly Pawlak, and Oskar Vafek (2015). "Interaction-driven phase instabilities in two-dimensional quadratic band touching systems". In: APS Meeting Abstracts.

✓ Presentations

- Pawlak, Kelly (2017). The Sachdev-Ye-Kitev Model: Overview and New Results. University of Geneva, CH, Colloquiumm.
- - (2014). Emergence of Supercondutivity in Doped Quadratic Band Touching Systems. University of Colorado, Boulder, CO, Poster.
- (2013). Stability of Bose-Einstein Condensates in a Random Potential. IMACS, Contributed Talk.

ADDITIONAL TRAINING

The Ecology and Evolution of Microbial Communities

Kavli Institute of Theoretical Physics

2021

Santa Barbara, CA

FTPI Summer School
Fine Theoretical Physics Institute

₩ 2016

Q U. Minnesota

NHMFL Theory Winter School National High Magnetic field Laboratory

2015

♥ Tallahassee, FL

Boulder School in Materials Physics Department of Physics, U. Colorado, Boulder

2014

♀ Boulder, CO

Laboratory Research Assistant (Photochemistry)

Supervisor: Jack Saltiel

2010-2012

♀ FSU