

KELLY ANN PAWLAK

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

✉ kapawlak@ucsb.edu ☎ (732) 763-6002 📍 CA, USA
🧗 Rock Climber — 🐶 Dog Lover — 🍰 Amateur Baker



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-to-day 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, spin-liquid 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 Superconductivity

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

😊 **Undergraduate Awards**
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 Epsilon 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" → Details
Collaborative & Interdiscp. Workflows

Physics Ecology Organic Chem.
Adv. Mathematics Adv. Statistics
Python WebDev Golang C 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

📅 Jan 2010 – Jun 2014 📍 FSU

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, Colloquium.
- – (2014). *Emergence of Superconductivity 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

 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