

Kamphol (Best) Akkaravarawong

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AWARDS

Gold medal

42nd International Physics Olympiad

Bronze medal

12nd Asian Physics Olympiad

Leo Felicov fellowship

UC Berkeley's Department of Physics fellowship

Department scholarship

Awarded to 4 first-year

Berkeley's physics graduate students

PUBLICATION

4 first-authored papers

See more at kakkarav.com

SKILLS

Data analysis, Data visualization, Markov Chain Monte Carlo (MCMC), High-performance computing, containerization and virtualization

Programming Languages

Python • Julia • JavaScript

C • HTML/CSS • \LaTeX

Unix commands • shell scripts

Tools/Packages

numpy, scipy, pandas, scikit-learn

Jupyter, PySpark

Git • SQL

Docker • Proxmox • Git

Mathematica • MATLAB

AWS: S3, EC2

COURSEWORK

Data structures & algorithms

Statistics/Probability

Machine learning

Linear algebra

Quantum Information

Quantum field theory

Multivariable calculus

Differential equations

Statistical mechanics

LANGUAGES

English (fluent), Thai (native),

Mandarin Chinese (beginner)

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY | 2016 - 2023

Ph.D. in Physics, Theoretical AMO & Condensed Matter physics

Advisor: Professor Norman Yao (Currently a Full professor at Harvard University)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY | 2012 - 2016

B.S. in Physics

GPA: 5.0/5.0

EXPERIENCE

POSTDOC RESEARCHER

Lawrence National Berkeley Lab & UC Berkeley | Jun 2023 - Present

GRADUATE STUDENT RESEARCHER

UC Berkeley, CA | Aug 2016 - Jun 2023

Modeling [Superconductor, Quantum field theory]: I predicted the exotic effective interaction between magnetic atoms on a thin-film superconductor.

- Performed complex calculations to obtain an analytic solution and estimated the error bound for the interaction strength.
- Developed a novel measurement technique using microwave spectroscopy.
- Collaborated with experimentalists to devise a realistic experimental scheme for constructing a quantum simulator using Josephson junctions.

Numerical Simulation [Python, Julia]: I utilized the Monte Carlo technique to explore the effect of random potential on quantum materials.

- Developed an end-to-end Monte Carlo engine and data pipeline from scratch.
- Deployed parallel MCMC simulations on Slurm clusters to simulate quantum system with 30k lattice sites.
- Developed a Monte Carlo update that decreased the simulation time by $\sim 300\%$.
- Analyzed $\sim 1.3\text{M}$ clean data points of floats to classify phases of matter, leading to discovery of a new quantum matter.

GRADUATE STUDENT INSTRUCTOR

UC Berkeley, CA | Aug 2016 - Jun 2023

- Taught 2 advanced *graduate* courses (Advanced AMO and Condensed Matter Physics) and 3 introductory *undergraduate* courses.
- Mentored 4 undergraduate students and 2 junior graduate students.

SIDE PROJECTS

Self-Hosting [Python, Docker, Cronjobs, FOSS]

- Designed and set up personal Linux servers for hosting private and secure cloud services, such as cloud storage, a VPN server, and a media streaming server.
- Designed and implemented an encrypted backup solution, and automated the maintenance routine with a logging and notification system.

Network engineering

- Designed, set up, and maintained a local wireless network, IoT devices, NAS and printers for an office with 20 employees.