T. Preston Hinkle

8807 Palo Verde Rd.
Irvine, CA 92617
tphinkle@gmail.com
github.com/tphinkle
614-208-4506

EDUCATION

Ph.D. Physics, University of California, Irvine — 2017 (anticipated)
Advisor: Professor Zuzanna Siwy

B.S. Physics and Astronomy, The Ohio State University — 2011
Advisor: Professor Yen Lee Loh

COMPUTING SKILLS

Languages & Software:

- Proficient in
  - C++
  - Python
  - Git
  - Qt framework
  - Mathematica
  - LaTeX

Data Science

- Experience competing in data science competitions (digit recognition, search query relevance) both independently and as part of a team.
- Wrote C++/Qt program to automatically detect and analyze transients in large time-series data sets.
- Experience with machine learning algorithms, including linear and logistic regression, and neural networks.

RESEARCH EXPERIENCE

Solid-state nanopore research — Fall 2013–Present
Ph.D. Advisor: Professor Zuzanna Siwy

- Designed experiments to study the transport properties of solid-state nanopores, including carbon nanotubes, silicon nitride pores, and polymer pores.
- Responsible for nanofabrication of silicon nitride nanopores with scanning transmission electron microscopy, low pressure evaporation systems, and chemical modification.
- Wrote C++/Qt GUI programs for remote device control, automated data acquisition, and detection of transients in nanopore current time-series data.
- Performed finite element analysis simulations of nanopores using COMSOL multiphysics package.

Quantum spin system research — 2009–2013
Advisors: Professors Yen Lee Loh and Clare Yu

- Wrote Mathematica programs to simulate and visualize quantum spin systems.
- Simulated magnetic flux noise in SQUIDs via Monte Carlo simulations written in C++, with applications in quantum computing.

PUBLICATIONS

Preston Hinkle*, Yinghua Qiu*, Crystal Yang. Pores with longitudinal irregularities distinguish particles by shape. *ACS Nano* **2015**, *9*, 4390-4397.

Yinghua Qiu, Ivan Vlassiouk, Preston Hinkle. *Role of Particle Focusing in Resistive-Pulse Technique: Direction-Dependent Velocity in Micropores. ACS Nano* **2016**.

Yinghua Qiu, Crystal Yang, Preston Hinkle. Anomalous Mobility of Highly Charged Particles in Pores. *Anal. Chem.*, **2015**, *87* (16), 8517-8523.

*Equal contributors to work.

TALKS & POSTERS

Talks

Ion and particle transport in solid-state nanopores
Advancement to Ph.D. candidacy talk

A new method for measuring nanoparticle length using the resistive pulse technique
2015 Annual Meeting of the Far West Section of the APS

Physics research at the graduate level
GRE bootcamp for APS BRIDGE students

Posters

A new procedure for measuring particle length using the resistive pulse technique with irregular single micropores
Biophysical Society 2016 Meeting

Pores with longitudinal irregularities distinguish particles by shape
Biophysical Society 2015 Meeting

Estimation of mean square flux noise in SQUIDs from Monte Carlo simulations of the classical 2D XY model
American Physical Society 2014 March Meeting

TEACHING EXPERIENCE

Graduate teaching assistant 2012–2014
Department of Physics and Astronomy, University of California, Irvine

Temporary lecturer 2011–2012
Department of Physics, The Ohio State University

Private tutor 2011–

OUTREACH

Mentor for incoming graduate students

Teaching assistant for Cal State Long Beach Physics GRE study bootcamp for underrepresented groups

Volunteer for UCI Department of Physics outreach progams: LEAPS and Astronomy outreach program