# T. Preston Hinkle

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## 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

## RELEVANT SKILLS

*Languages & Software:*

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

*Data Science:*

- Experience competing in data science competitions 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