Cody L. Petrie - Curriculum Vitae

Arizona State University
Department of Physics
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Education

- B.S. Physics, Brigham Young University, Aug 2014.

- TALENT Summer School on Nuclear Quantum Monte Carlo Methods, July 2016

Research Experience

Quantum Monte Carlo for Nuclear Systems: August 2014 - Present

- I am currently using quantum Monte Carlo methods to solve many-body problems in nuclear physics. I have added quadratic spin-isospin dependent correlations to the trial wave function which improves statistics and energy estimates. These additional correlations have the greatest effect on systems of many nucleons.

Coupling of Nano Systems with Electromagnetic Fields: January 2015 - April 2015

- I used the Finite Difference Time Domain method to calculate the interaction coupling between nano particles such as Ag islands or spheres with surface plasmons on a Si substrate.

HIV Incidence Estimation: May 2012 - July 2012

- I computationally estimated HIV incidence based on serological data of diagnosed cases. I used a combination of survey and Bayesian statistics. This research was part of a summer Science Undergraduate Laboratory Internship (SULI) through the DOE during the summer of 2013.

Experimental/Computational Extreme Ultraviolet (EUV) Optics: March 2011 - August 2014

- I used geometrical optics, physical optics and direct calculations using Maxwell's equations to calculated reflection from thin film surfaces. These calculations were compared to reflection measurements that I took of EUV light from thin film surfaces of varying roughness. Comparing the calculated reflectances from surfaces with various roughnesses to the measured reflectances I was able to estimate the roughness of the thin films.

Grants & Awards

- Summer University Graduate Fellowship at ASU, Summer 2015.

- Department of Physics Graduate Fellowship at ASU, Fall 2014.

- Office of Research and Creative Activities Grant at BYU, Academic year of 2013-2014.

Computational Experience

Languages

Fortran
Python
C++
Matlab
Mathematica
R

Operating Systems

Linux
Mac
Windows

Teaching Experience

Teaching Assistant: University Physics Laboratory 1 (calculus based, **online format**), January 2017-Present, ASU.

Teaching Assistant: General Physics Laboratory 1 (calculus based, **online format**), January 2017-March 2017, ASU.

Teaching Assistant: Introduction to Physics (non-calculus based), August 2017-December 2017, ASU.

Teaching Assistant: General Physics Laboratory 2 (non-calculus based), January 2016-April 2016, ASU.

Teaching Assistant: University Physics Laboratory 2 (calculus based), August 2015-December 2015, ASU.

Teaching Assistant: University Physics Laboratory 1 (calculus based), August 2014-April 2015, ASU.

Physics Tutor: Tutor for both calculous and non-calculous based classes on waves, optics, thermodynamics, special relativity, and electricity and magnetism, Jan-Apr 2014, BYU.

Teaching Assistant: Introduction to Analog and Digital Circuits, Sep-Dec 2013, BYU.

Teaching Assistant: Classical Mechanics, Sep-Dec 2013, BYU.

Teaching Assistant: Introduction to Waves, Optics, and Thermodymanics (Physics Major Section), Jan-Apr 2013, BYU.

Teaching Assistant: Introduction to Electricity and Magnetism, Sep-Dec 2012, BYU.

Publications

1. Ethan Obie Romero-Severson, **Cody L. Petrie**, Edward Ionides, Jan Albert, Thomas Leitner. Trends of HIV-1 incidence with credible intervals in Sweden 2002-09 reconstructed using a dynamic model of within-patiend IgG growth. Int. J. Epidemiol., 2015, Vol. 0, No. 0.

2. **Cody L. Petrie**, Joshua Marx, David Squires, R. Steven Turley. Determining thin-film roughness with extreme ultraviolet reflection. J. Utah Acad. Sci. Arts Letts., 92, 239-255 (2015).

3. **Cody L. Petrie**, Determining thin film roughness with EUV reflection, Brigham Young University (2014), Senior Thesis.

4. Quintin Nethercott, **Cody L. Petrie**, R. Steven Turley. Non-specular reflection in the extreme ultraviolet. J. Utah Acad. Sci. Arts Letts., 89, 181-193 (2012).

Talks and Posters

1. "Determining Thin Film Roughness with Extreme Ultraviolet Refletion," **Cody L. Petrie**, R. Steven Turley. Utah Academy of Sciences, Arts and Letters, St. George Utah, April 11, 2014.

2. "Determining Thin Film Roughness with Extreme Ultraviolet Reflection," **Cody L. Petrie**. BYU Student Research Conference, Provo Utah, March 15, 2014

3. "Using EUV Reflection to Understand Thin Film Surfaces," **Cody L. Petrie**, R. Steven Turley. Utah Academy of Sciences, Arts and Letters, Orem Utah, April 12, 2013.

4. "Using EUV Reflection to Understand Thin Film Surfaces," **Cody L. Petrie**. BYU Student Research Conference, Provo Utah, March 9, 2013

5. "Determining Thin Film Roughness with Extreme Ultraviolet Light," **Cody L. Petrie**, R. Steven Turley. Annual Meeting of the Four Corners Section of the APS, Socorro New Mexico, October 26, 2012.

6. "Nonspecular reflectance in the extreme ultraviolet," Quintin Nethercott, **Cody L. Petrie**, R. Steven Turley. Utah Academy of Sciences, Arts and Letters, Logan Utah, April 13, 2012.

7. "Improving thin film thickness uniformity," Jordan Bell, **Cody L. Petrie**. BYU Student Research Conference, Provo Utah, March 12, 2012