Cody L. Petrie - Curriculum Vitae

Arizona State University
Department of Physics
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Education

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

Research Experience

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

- I am working on a physical optics calculation that will calculate reflection from thin film surfaces. These calculations will be compared to reflection measurements I have taken. I am using this comparison to determine the roughness of the thin films.

Computational Plasma: September 2013 - August 2014

- I am learning how to use DSMC methods to model particle collisions. This experience will be expanded to be able to model a helium plasma that is being used as an EUV light source. The goal is to be able to increase the intensity of the EUV light that arrives at a reflecting sample.

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.

Quantum Monte Carlo for Nuclear Systems: August 2014 - Present

- I have learned how to use methods such as Variational and Diffusion Monte Carlo to solve simple problems such as the quantum harmonic oscillator. I am also learning how to the the Auxiliary Field Diffusion Monte Carlo method to solve nuclear physics problems with spin and isospin degrees of freedom.

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

- I have used to 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.

Grants & Awards

- Office of Research and Creative Activities Grant at BYU, Academic year of 2013-2014.
- Department of Physics Graduate Fellowship at ASU, Fall 2014.

Computational Experience

Languages

Fortran
Python
C++
Matlab
Mathematica
R

Operating Systems

Linux
Windows
Mac

Teaching Experience

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: Classical Mechanics, Sep-Dec 2013, BYU.

Teaching Assistant: Introduction to Analog and Digital Circuits, 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.

Teaching Assistant: University Physics Laboratory 1, August 2014-Present, ASU.

Publications

1. Ethan Obie Romero-Severson, **Cody L. Petrie**, Edward Ionides, Jan Albert, Thomas Leitner. Bayesian estimation of HIV-1 incidence in Sweden 2003-2009 using a dynamic model of IgG growth. Epidemiology. Submitted for publication.
2. Quintin Nethercott, **Cody L. Petrie**, R. Steven Turley. Non-specular reflection in the extreme ultraviolet. The Journal of the Utah Academy of Sciences, Arts, & Letters. 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