Lucas J. Myers

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Education

Lawrence University Appleton, WI 2015-2019
B.A. in Physics, Mathematics (*summa cum laude)*

Research Experience

University of Twente Enschede, NL 2018
Undergraduate Student Researcher
research advisor: Dr. Rebecca Saive

Creation of ray optical simulation to study the visual appearance of solar windows coated with Effectively Transparent Contacts (ETCs).

Small scale optical investigation of ETC-coated glass slides to experimentally verify results of simulation.

Exploration of visual properties of various ETCs to optimize size and aspect ratio using house-made ray optical program.

Lawrence University Appleton, WI 2018
Undergraduate Student Researcher
research advisor: Dr. Annemarie L. Exarhos

Adaptation and refinement of program to extract optical dipole orientation of single-photon emitters in two-dimensional hexagonal boron nitride (h-BN) from noisy image data.

Development of protocol and user interface with which others may use the analysis program.

Further statistical analysis of dipole orientation of single-photon emitters in 2D h-BN to characterize types of emitter defects.

Lawrence University Appleton, WI 2015-2017
Undergraduate Student Researcher
research advisor: Dr. Douglas S. Martin

Construction of automated translation stage which controls angle of incidence of microscope laser on sample – allows transition between total internal reflection (TIRF) microscopy and epifluorescence microscopy.

Design and programming of computer vision application in MATLAB to automatically track microtubules in high resolution microscope images.

Implementation of random forest machine learning algorithm to further optimize tracking program.

Integration of tracking program with CCD Camera/automated translation stage apparatus for use in real time during live experiments.

Course Projects

Lawrence University Appleton, WI 2018
Senior Thesis Project
Instructor: Dr. Jeffrey A. Collett

Investigation of quantum computational techniques for simulation quantum mechanical chemistry systems.

Design of library for quantum computation algorithms using Rigetti Forest API.

Implementation of quantum fourier transform and quantum phase estimation algorithm to simulate ground state H_2 molecule.

Lawrence University Appleton, WI 2018
Advanced Laboratory Experiment Extension Project
Instructor: Dr. Douglas S. Martin

Automation of Mach-Zehnder interferometer and interference data analysis for single photon experiment.

Lawrence University Appleton, WI 2017
Computational Mechanics Final Project
Instructor: Dr. Jeffrey A. Collett

Computational simulation of the orbit of the planets in the solar system.

Investigation and analysis of the classical and general relativistic precession of Mercury's orbit.

Presented the Sir Isaac Newton award for this project.

Skills and Techniques

Quantum computing library design with Rigetti Forest API and Python.

Design of ray optical simulations using MATLAB.

Parallel computing using CUDA and C/C++.

Scikit-learn package with Python to train and implement machine learning algorithms.

Preparing biological samples (microtubules, quantum dots) for high resolution microscopy experiments (TIRF, epifluorescence).

Design and automation of microscopy experiments using stepper motors, translation and rotation stages, and EMCCD cameras controlled by LabVIEW, Matlab, and Arduino.

Adobe Photoshop and MS Office products to prepare figures.

Mentorship and Pre-Faculty Teaching

Graduate Teaching Assistant: Taught introductory mechanics and electricity and magnetism laboratory/discussion sections for first year undergraduates. University of Minnesota 2019-Present

Lawrence University (undergraduate): Tutor: tutored undergraduate students in introductory classical and modern physics at Lawrence University. January-March 2005

Awards

Andrew C. Berry-James C. Stewart Prize in Mathematics, 2019
Lawrence University, Appleton, WI

Lawrence University Physics Research Award, 2019
Lawrence University, Appleton, WI

J. Bruce Brackenridge Prize in Physics, 2018
Lawrence University, Appleton, WI

Sir Isaac Newton Award, 2017
Lawrence University, Appleton, WI

Publications and Preprints

Visual appearance of microcontacts for solar windows, **Lucas J. Myers**, Harry A. Atwater, and Rebecca Saive, *Journal of Photonics for Energy*, 2019, **9 (2)**, pp 027001.

Contributed Talks

Method for Tracking Microtubules in Gliding Assays, 2017
Pew Midstates Science and Mathematics Consortium, Chicago, IL

Computationally Tracking Microtubules in Gliding Assays, 2016
Pew Midstates Science and Mathematics Consortium, Saint Louis, MO

Poster Presentations

Visual Appearance of Effectively Transparent Contacts for Solar Windows 2018
Lawrence University Annual Research Symposium, Appleton, WI

Optical Analysis of Effectively Transparent Contacts (ETCs) for Windows 2018
University of Twente COPS Ad Lagendijk Symposium, Enschede, NL

Method for Tracking Microtubules in Gliding Assays 2017
Lawrence University Annual Research Symposium, Appleton, WI

Computationally Tracking Microtubules in Gliding Assays 2016
Lawrence University Annual Research Symposium, Appleton, WI

Professional Organization Membership

Phi Beta Kappa Honor Society	2019-present
Sigma Pi Sigma National Physics Honors Society	2017-present
American Physical Society	2015-present
American Association of Physics Teachers	2015-present
Biophysical Society	2015-present