Harrisonn R. Griffin

Contact Information

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Education

MSc, Physics, McGill University, Montreal, Qc, Canada **May 2020**

G.P.A.: **4.00**/4.00

Summa Cum Laude, with Honors in Physics

Thesis Topic: *Study of Single Electron Redox Reactions in Individual Ferrocene Molecules with Electrostatic Force Microscopy*

Thesis Advisor: Dr. Peter Grutter

BSc, Physics, Union College, Schenectady, NY, USA **June 2016**

G.P.A.: **3.84**/4.00

Summa Cum Laude, with Honors in Physics

Minor: Mathematics

Thesis Topic: *Heat of Fusion of Primary Alcohol Confined in Nanopores*

Thesis Advisor: Dr. Samuel Amanuel

Research Experience

Single Electron Spectroscoy in Ferrocene Molecules Feb 2018–Present
Grutter Research Group, McGill University, Montreal, QC, Canada

- Experiments run on home built low temperature atomic force microscope (AFM).
- Convert home build low temperature atomic force microscope (AFM) to fully open source instrumentation in both software and hardware, including scanner controller and DSPs.
- Implement optical excitation of AFM cantilever ("blue drive"), including design, electronics, and instrumentation.
- Synthesize samples with self assembled monlayers with functionalized ferrocene heads for experiments.
- Develop python model for simulating single electron charging events, for eventual forward modeling machine learning.
- Present results at NC-AFM 2018 and NC-AFM 2019.
- Manuscript *Optical excitation of atomic force microscopy cantilever for accurate spectroscopic measurements* under review.

Strain Engineering Graphene Transistors Aug 2016–Jan 2017
Champagne Research Group, Concordia University, Montreal, QC, Canada

- Build Mathematica model to simulate varying strain and
- Microfabrication of monolayer suspended graphene channels via photolithography,e–beam lithography, thermal evaporation, RIE, wet etching.
- Characterize devices via optical microscope, tilted SEM, Raman Spectroscopy.
- Wire bond and package devices for measurement in He-3 cryostat. magnetic field on suspended graphene devices.

Professional Experience

Darkfield Microscopy and SEM Defect Engineer April 2017–Jan 2018
GLOBALFOUNDRIES, Malta, NY, USA

- Train and manage machine learning algorithms and recipes for automatic defect mage-based classification.
- Formulate effective inline defect inspection techniques and recipes on darkfield microscopy and SEM tools.
- Work with Process Integration and Advance Module Engineering teams to improve capture rate of defects of interest.
- Improve speed and efficiency of existing recipes to increase throughput of wafers through the process line.

Undergraduate Research Experience

Phase Transitions of Nano-Confined 1-Decanol June 2015–June 2016
Department of Physics, Union College, Schenectady, NY, USA

- Prepare samples of silica nanopores filled with 1-Decanol.
- Precisely heat and cool sample via Differential Scanning Calorimeter to measure energy of phase transitions.
- Explore and understand the effects of nanoscale confinement and overnormalization of Heat of Fusion.
- Present results at American Physical Society March Meeting.

Fabrication of Self Ordering Alumin Oxide Nanopores Summer 2015
Department of Physics, Union College, Schenectady, NY, USA

- Prepare samples of pure aluminum via mechanical polishing, electroploshing, and thermal annealing.
- Anodize aluminum to create self-ordered array of AAO nanopores with diameters of 200-300 nm.
- Characterize pores via SEM and AFM.
- Present results at Union College Summer Research Series.

Developing Optical Tweezers Summer 2014
Department of Physics, Union College, Schenectady, NY, USA

- Machined aluminum parts and aligned optical components.
- Successfully trapped 0.5 and 1μm polystyrene beads.
- Created programs using MATLAB to control piezoelectric stage to move particles at precise velocities in different patterns.
- Present results at Union College Summer Research Series.

Teaching Experience

3D Printing Lab Manager, McGill University Fall 2016

Assemble and maintain printers, design space for lab, build and maintain website (p3dl.github.io), teach workshops for undergraduates, host weekly meetings.

Teaching Assistant, Concoridia University Fall 2016

PHYS 252, Optics

Teaching Assistant, Union College Fall 2013–Spring 2016

PHY 120, Matter in Motion

PHY 121, Principles of Electromagnetics

Scientific Techniques	**Characterization**—Atomic Force Microscopy, Kelvin Probe Microscopy, Electron Microscopy, Raman Spectroscopy, Cyclic Voltometry.
	Microfabrication—Photolithography, E-Beam Lithography, Reactive Ion Etching, Wet Bench, Wire Bonder, Thermal Evaporator.
	3D Printing—Fused Filament, Stereolithography, CAD.
Computer Skills	**Languages**—Proficient in Python, Bash. Experience in Julia, Javascript, HTML, CSS.
	Operating systems—Linux.
Honors	Sigma Pi Sigma (Physics Honor Society), Sigma Xi (Scientific Research Honor Society), Deans List, Eagle Scout, High School Valedictorian.
Languages	English–**Native**; French–**A1**; Norwegian–**A1**