

Evan Norris

Ph.D. Student

Computational Microscopy and A.I.

- ▶ Ottawa, Ontario, Canada
- ▶ Houston, Texas, United States
- ▶ English

Skills

Scientific Computing



Data Visualization



High Performance Computing



Numerical Optimization



Machine Learning



Programming Languages

Julia



Matlab / Octave



Python



CUDA



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Biography

Evan Norris is a Ph.D. student in the Department of Physics at the University of Ottawa. His research primarily focuses on the solution of inverse problems using computational physics. His current work includes the development of deep learning techniques for the inverse design of plasmonic nanoparticles and techniques for computational second harmonic imaging microscopy using novel ptychography algorithms. In the future his primary research directions include the application of deep learning algorithms for the solution of inverse problems and the further development of computational microscopy systems.

Work Experience

Graduate Research Assistant | Ph.D. student

09/2021 - today

Department of Physics (Prof. Lora Ramunno)
University of Ottawa

Projects involving the development of surrogate computational models using deep learning to accelerate the exploration of parameter space for plasmonic inverse design, research into novel computational microscopy techniques for second harmonic imaging particularly using ptychography algorithms, and support on various projects involved with machine learning for optimization and applying second harmonic orientation imaging with ptychography.

Graduate Research Assistant | M.Sci student

09/2019 - 08/2021

Department of Physics (Prof. Lora Ramunno)
University of Ottawa

Research in the field of computational microscopy. Development of numerical algorithms for orientation reconstruction microscopy with nonlinear optical modalities.

Undergraduate Research Assistant | B.Sci student

08/2018 - 05/2019

Department of Physics (Prof. Pedro Derosa)
Louisiana Tech University

Research in atmospheric optics. Further development of optical scattering forward simulations with the objective of optical characterization.

Undergraduate Research Fellow | B.Sci student

06/2018 - 08/2018

Department of Physics (Prof. George Marcus)
State University of New York at Geneseo

Research in atmospheric optics. Development of forward simulation for optical scattering coefficients based on Mie Theory within a GPGPU programming framework.

Undergraduate Research Assistant | B.Sci student

06/2017 - 05/2018

Department of Physics (Prof. Pedro Derosa)
Louisiana Tech University

Assisted in the optimization of computer software designed to place carbon nano tubes in a sample and perform simulations to determine the conductivity of the sample.

Education

09/2021 - Present

Physics (Ph.D.)

University of Ottawa

Imaging ■ Nanophotonics ■ A.I.
Numerical Optimization and Machine Learning for nanophotonics and imaging.

09/2019 - 09/2021

Physics (M.Sc.)

University of Ottawa

Imaging ■ Numerical Optimization
Master's thesis: „Ptychography For Nonlinear Optical Microscopy: Retrieving Phase without Interferometry“.

09/2015 - 05/2019

Physics (B.Sc.)

Louisiana Tech University

Optics ■ Computational Materials
Bachelor's thesis: „The Efficient Simulation of Light Transmission Through Liquid Suspensions and Aerosols“.

Hobbies

- ▶ Photography
- ▶ Improv
- ▶ Hiking

Contact

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Houston, Texas

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👤 egnorris.github.io/

Teaching Experience

Teaching Assistant | PHY 3320

Electromagnetic Theory (Prof. Ravi Bhardwaj)
University of Ottawa

Winter 2023

Marking of assigned materials and exams, provided support to students, development of solutions for assigned materials

Teaching Assistant | PHY 1321

First Year Physics Lab | University of Ottawa

Fall 2023

Recitation of lectures on physical concepts and procedures related to the laboratory, hands on assistance with laboratory procedures, and marking lab reports

Teaching Assistant | PHY 4141 / PHY 5341

Computational Physics II (Prof. Lora Ramunno)
University of Ottawa

Fall 2022

Led lab section when needed, marking of assigned materials and exams, provided support to students

Research Projects

Tensorial Ptychography

University of Ottawa

Microscopy

Development of Tensorial Ptychography framework for the imaging of protein orientation using second harmonic generation microscopy without interferometry.

Prediction of Multipoles with Deep Learning

University of Ottawa

Nanoplasmonics

Development of convolution neural network model for the rapid prediction of nanoplasmonic particle scattering behaviour.

Efficient Calculation of
Mie Scattering Coefficients

State University of New York at Geneseo

Atmospheric Physics

Development of General Purpose GPU system for the efficient calculation of Mie scattering coefficients with the goal of effective categorization of atmospheric aerosol particles

Conductivity of Carbon Nanotube Composites

Louisiana Tech University

Material Science

Supporting role in the development of computational framework for the study of agglomeration in composite materials. Utilized High Performance Computing tools to determine optimal configuration for a Monte Carlo hopping algorithm.

