

MAXWELL NAKOS

Curriculum Vitae

EDUCATION

Physics Ph.D.

Years: June 2022 - Present

University of Wisconsin-Madison

Bachelor of Science, Double Major in Physics and Electrical Engineering

Years: August 2018 - May 2022

University of Texas at Austin

CONFERENCE PROCEEDINGS

[1] L. Lu *et al.* [IceCube-Gen2], "Shower angular resolution in IceCube-Gen2 and implications on diffuse science," PoS **ICRC2023**, 1188 (2023) doi:10.22323/1.444.1188

[2] S. Ning *et al.*, "A Point-of-care Biosensor with Subwavelength Grating Waveguide-based Micro-ring Resonator for Detection of COVID-19," 2022 Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, USA, 2022, pp. 1-2.S

RESEARCH EXPERIENCE

Graduate Research Assistant

June 2022 - Present

University of Wisconsin at Madison

Advisor: Lu Lu

- Designed and produced event viewer for neutrino telescopes in arbitrary mediums with realtime modifiable detector geometries
- Developed parameterization for photon yields with photon directional information for fast simulation to give insight into future detectors
- Working on physics analyses in the IceCube Collaboration to identify extremely high energy (EHE) neutrinos and do ultra-high energy (UHE) multi-messenger astronomy
- Utilizing a Graph Neural Network to differentiate between neutrinos and muon bundles from cosmic ray showers to reduce the background event rate for the IceCube Neutrino Observatory

Senior Design Project

September 2021 - May 2022

Project Title: Integrated Photonics Based Sensor for COVID-19 Spike Protein Detection

University of Texas at Austin

Advisor: Dr. Ray Chen

- Designed experiment testing power transmission between fiber-optic cables which identified problem with the testing setup for the diffraction grating design in silicon chip waveguide
- Aligned fiber optic cables with silicon waveguide to test chips for functionality
- Coauthored reports documenting work of the senior design team and planning project activities to make improvements to a photonic biosensor

Texas Experimental Geometry Lab

January 2021 - May 2021

Project Title: Convex Domains in Projective Geometry

University of Texas at Austin

Advisor: Professor Jeffery Danciger

- Created an interactive visual showcasing a projective linear transformation using Mathematica
- Codeveloped an algorithm to optimize the parameters the transformation matrix for a projective linear transform to maximize the roundness of the resulting transformation

AWARDS AND HONORS

McMinn Endowed Presidential Scholarship in Physics

Year: 2021

University of Texas at Austin

Texas Instruments Scholarship

Year: 2020

University of Texas at Austin

CONFERENCE PRESENTATIONS

Parameterization of Photon Yields In Idealized Ice for Pixelated Reconstruction

Date: April 3, 2024

APS April Meeting 2024

COLLABORATION PRESENTATIONS

Updates on GlobalFit EHE Analysis

Date: March 20, 2024

IceCube Spring 2024 Collaboration Meeting

Transient Ultra-High Energy Source Searches with Data from the IceCube and Pierre Auger Observatories

Date: March 18, 2024

IceCube Spring 2024 Collaboration Meeting

Idealized IceCube-Gen2 Cascade Reconstructions with Multi-Pixel Information

Date: October 22, 2023

IceCube Fall 2023 Collaboration Meeting

Enhancing Bundle Rejection for the EHE Neutrino Search and Future Prospects in Globalfit

Date: October 19, 2023

IceCube Fall 2023 Collaboration Meeting

Angular Resolution for DNN Cascades

Date: March 15, 2023

IceCube Spring 2023 Collaboration Meeting

Single Emission Direction Photon PDF for Multi-Pixel Sensor Reconstruction

Date: March 14, 2023

IceCube Spring 2023 Collaboration Meeting

TEACHING EXPERIENCE

Teaching Assistant, General Physics

Fall 2022

Physics Department

University of Wisconsin-Madison

Teaching assistant for non-calculus based introductory mechanics physics course. Ran discussion sections, which involved helping students work on solving physics problems and learn course material. Additionally, ran laboratory sessions, where students would perform experiments and collect data.

MENTORING EXPERIENCE

Mentor for Carter Shulick, Undergraduate Student

Spring 2024-Present

University of Wisconsin-Madison

Actively supervising him on a research project

SKILLS

- Mathematical Computing and Data Analysis in Python, Mathematica, and MATLAB
- Experience with Programming in Java, C, and C++
- Experience using Laboratory equipment including Multimeters, Oscilloscopes, Scintillation Detectors, Lasers, and Optical Equipment

PROFESSIONAL MEMBERSHIPS

American Physical Society