Millicent Ayako

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Curriculum Vitae as of 1/23

Education

Bachelor of Science in Physics, *University of Delaware* **2018 – 2022**
Bachelor of Science in Applied Mathematics, *University of Delaware* **2018 – 2022**
Minor in Computer Science
UD Presidential Scholarship, University of Delaware 2018 — 2022
DuPont Women in STEM Scholarship, DuPont de Nemours, Inc. 2018 — 2022

Technical Skills

Domain of Experience	Electronic Structure Theory, Optical Physics, DEI in Physics
Quantitative Research	Optimization, Mathematical Modeling, Numerical Analysis, Data Visualization
Tools & Packages	Mathematica, MATLAB, Python (SciPy, NumPy), C/C++, COMSOL Multiphysics (Equation Based Modeling)
Practical Experience	Circuit Design, Standard Electronic Testing and Instrumentation Equipment

Research Experience

Undergraduate Research Assistant & Independent Research Student **January 2021 – January 2022**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*
Principle Investigator: Dr. Mark Ku

- Constructed quantum sensor based on a nitrogen vacancy (NV) centers in diamonds to study to a variety of quantum materials, including magnetic Fe_5GeTe_2 flakes.
- Utilized MATLAB to simulate the magnetic field generated by the NV laser system when observing samples and compared simulated and experimental results to assess the validity of my model.

Summer Research Scholar **June 2020 — August 2020**
Department of Mathematical Sciences at the University of Delaware *Newark, DE*
Principle Investigator: Dr. Gilberto Schleiniger & Dr. Bruce Boman

- Developed a MATLAB script which used a second order finite difference scheme to model tissue organization using age structured population dynamics. Project findings were presented at the University of Delaware's Undergraduate Research Symposium.

Energy Research Intern **June 2019 — August 2019**
Energy Research Institute at the University of Delaware *Newark, DE*
Principle Investigator: Dr. Zubaer Hossain

- Investigated how the dimensional, geometric, and spatial characteristics of individual quantum dots affect the overall confinement of SiGe quantum dot arrays using COMSOL Multiphysics and MATLAB software.
- Presented findings at the University of Delaware's Undergraduate Research Symposium and the APS April 2020 meeting.

Undergraduate Research Assistant & Summer Research Scholar **Sept 2018 — May 2020**
Department of Mechanical Engineering at the University of Delaware *Newark, DE*
Principle Investigator: Dr. Zubaer Hossain

- Investigated how deformational and compositional heterogeneity affects the localization of electronic states of alloy quantum dots in thermodynamic equilibrium using COMSOL Multiphysics and MATLAB software.
- Developed analytical functions to model heterogeneity in quantum dots.

Publications, Presentations, & Posters

- Chen, H. et al. Revealing room temperature ferromagnetism in exfoliated Fe_5GeTe_2 flakes with quantum magnetic imaging. 2D Mater. 9 025017 (2022). DOI: 10.1088/2053-1583/ac57a9
- Yang, H. Ayako, M. Sarpong, N. Hossain, Z. Electronic and mechanical properties of sub-nm diameter carbon nanotubes. (In Review)
- Ayako, M. Hossain, Z. Electronic Confinement in SiGe Quantum Dot Arrays. Contributed Poster at the American Physical Society April Meeting, Washington, D.C. April 18, 2020 D21.00010.

Teaching Experience

Laboratory Teaching Assistant **August 2020 – Present**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*
Lab Manager: Dr. John Shaw

- Instructed several electricity and magnetism lab courses developed for students ranging from algebra based physics to calculus based electrical engineering. 300 students total.
- Prepared lectures introducing physics concepts, graded lab reports and exams, and created grading rubrics. Also worked on the transition to online learning due to COVID-19.
  - PHYS202: Intro. Physics II (Alg. Based) – 2022 Winter, 2022 Spring
  - PHYS208: Intro. Physics II (Calc. Based) – 2021 Winter, 2021 Spring
  - PHYS245: Electricity and Electronics for Engineers – 2020 Fall, 2021 Fall

Professional Service, Outreach, and Mentorship

Member, Committee for Climate Diversity, Equity, & Inclusivity (CDEI) **July 2020 – Present**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*

- Created accessible channels for communication for all levels of the department such as climate surveys and supplying reporting resources.
- Took part in the departmental hiring process several times and provided CDEI considerations for candidates though personal CDEI interviews.
- Led the writing of memos and reports and presented these to departmental members, stakeholders, and external reviewers.
- Provided other departmental committees with quantitative CDEI consulting. Results include more diverse colloquium speakers, greater student involvement in SPS and the Physics and Astronomy Graduate Student Society, and more holistic interviews for candidates on all levels.

Attendee, American Institute of Physics TEAM-UP Implementation Workshops **January 2021 & July 2021**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*

- UD was selected as a core set of physics departments by the TEAM-UP project to participate in the workshops.
- Worked with the the AIP TEAM-UP Project through workshops and webinars to implement structural changes to improve the CDEI conditions of the DPA, especially towards Black students, faculty, and staff.

President, Society of Physics Students (SPS), University of Delaware Chapter **July 2020 – May 2022**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*

- Organized and led biweekly club meetings where students were presented with opportunities to get involved in physics.
- Meetings consisted of events such as research presentations from students and faculty, science presentations about various topics in physics and astronomy, and opportunities to connect with active researchers.

100,000 Strong Educational Exchange Grant Recipient **Sept 2016 – August 2017**
Delaware Summer Chinese Language Initiative for Communicating STEM Program *Beijing, Hangzhou, and Shanghai, China*

- Attended classes at the Wanxiang Polytechnic College pertaining to Chinese language and culture as well as STEM topics concerning renewable energy.
- Wrote a thesis on the future of green architecture through sustainable building materials in developing countries using recent Chinese cultural and scientific developments.
- I presented my findings at both the Wanxiang Polytechnic College in Hangzhou, China and the Delaware Department of Education in Dover, Delaware.

Awards

- Department of Physics and Astronomy Student Leadership Award 2022
- Department of Physics and Astronomy Climate and Inclusion Service Award 2022
- Department of Physics and Astronomy Student Leadership Award 2021

Activities

- UD Chapter of the Society of Physics Students — Fall 2018 — Spring 2022
  Chapter President, Fall 2020 - Spring 2021
  Chapter President, Fall 2021 - Spring 2022
- UD Chapter of the National Society of Black Engineers — Fall 2018 — Spring 2022
- Delaware African Students Association — Fall 2018 — Spring 2022
- National Society of Black Physicists — Fall 2018 — Present