Millicent Ayako

College Park, Maryland
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Curriculum Vitae as of August 1, 2024

mmayako.github.io
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Education

PhD in Electrical Engineering - Electrophysics Concentration, *University of Maryland, College Park* **2023 – Present**
Clark Doctoral Fellow
Advisor: Dr. Yanne K. Chembo

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

Research Experience

White rabbit time synchronization **June 2023 – July 2023**
University of Maryland Institute for Advanced Computer Studies (UMIACS) *College Park, MD*
Co-Advisors: Dr. Gerald Baumgartner, Laboratory of Telecommunication Sciences & Dr. Yanne K. Chembo, Chembo Lab

- **Computation:** Collected and analyzed time synchronization data in collaboration with NIST partners.

Nitrogen vacancy center based quantum sensors **January 2021 – January 2022**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*
Advisor: Dr. Mark Ku *Quantum Materials & Engineering Group @ UD*

- **Experiment:** Constructed quantum sensor based on a nitrogen vacancy (NV) centers in diamonds to study quantum materials.

Modeled the lifetime behavior of cancerous and non-cancerous colorectal tissue **June 2020 — August 2020**
Department of Mathematical Sciences at the University of Delaware *Newark, DE*
Advisor: Dr. Gilberto Schleiniger & Dr. Bruce Boman

- **Theory:** It has been phenomenologically demonstrated that high levels of retonoic acid can suppress various common cancers.
- **Computation:** Developed a MATLAB script to model cancerous and non-cancerous colorectal tissue organization using a Lotka-McKendrick system of equations.

Investigated electron confinement in SiGe quantum dot arrays **June 2019 — August 2019**
Energy Research Institute at the University of Delaware *Newark, DE*
Advisor: Dr. Zubaer Hossain *The Laboratory of Mechanics and Physics of Heterogeneous Materials*

- **Theory:** Investigated how the dimensional, geometric, and spatial characteristics of individual quantum dots can affect the overall confinement of quantum dot arrays.
- **Computation:** Utilized the finite element method of solving PDEs to compute solutions to the time-independent Schrodinger equation using COMSOL Multiphysics and MATLAB software.

Investigated heterogeneity in alloyed quantum dots **Sept 2018 — May 2020**
Department of Mechanical Engineering at the University of Delaware *Newark, DE*
Advisor: Dr. Zubaer Hossain *The Laboratory of Mechanics and Physics of Heterogeneous Materials*

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

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
- **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

Instructor **Summer 2024**
High School STEM Summer Camp in IREAP (The Institute for Research in Electronics and Applied Physics) *College Park, MD*
Program Director: Dr. Yanne K. Chembo

- Assisted in teaching an intensive two-week curriculum covering introductory linear algebra, chemistry, and physics.
- Provided individualized support and feedback to students, helping to boost their confidence and academic readiness for college.

Private Tutor **Fall 2014 – Present**
Freelance *Newark, DE & Washington D.C. Metro Area*

- Tailored one-on-one instruction to high school and college students in math and physics, ensuring comprehension and mastery of complex concepts. *Common courses covered include algebra 1, pre-calculus, calculus, kinetics, and electromagnetism.*
- Provided personalized guidance and support to students applying to undergraduate and graduate STEM programs, including assistance with application essays, resumes, recommendation letters, and interview preparation.

Course Tutor **February 2023 – May 2023**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*
Instructor: Dr. David Seckel

- PHYS202: Introductory Physics II (Algebra Based)

Laboratory Teaching Assistant **August 2020 – August 2022**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*
Lab Manager: Dr. John Shaw

- PHYS202: Introductory Physics II (Algebra Based) – 3 Sections
- PHYS208: Introductory Physics II (Calculus Based) – 4 Sections
- PHYS245: Electricity and Electronics for Engineers – 5 Sections

Professional Service, Outreach, and Mentorship Experience

Web Manager, Physicists of Underrepresented Genders (PUGs) **June 2024 – June 2025**
Department of Physics at the University of Maryland *College Park, MD*

Mentor, Physicists of Underrepresented Genders (PUGs) **October 2023 – May 2024**
Department of Physics at the University of Maryland *College Park, MD*

Member, Climate, Diversity, Equity, & Inclusivity Committee (CDEIC) **July 2020 – June 2023**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*

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

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*

Other Relevant Experience

Front Desk Administrative Assistant **August 2022 – May 2023**
Department of Physics and Astronomy at the University of Delaware *Newark, DE*
Supervisor: Dawn Butler
As the first point of contact, I provided a high level of service to internal and external constituencies and provided support to DPA staff, faculty, and students. Typical duties included:

- Providing general information about the department, its programs, events, and policies to students, staff, and the community.
- Assisted in the planning and coordination of various program events and meeting logistics (virtual and in-person) such as faculty visits, hiring committee meetings, student events, and graduation events.

Awards

- UMD Clark Doctoral Fellowship 2023-2027
- UD Department of Physics and Astronomy Climate and Inclusion Service Award 2023
- UD Department of Physics and Astronomy Student Leadership Award 2022
- UD Department of Physics and Astronomy Climate and Inclusion Service Award 2022
- UD Department of Physics and Astronomy Student Leadership Award 2021
- UD Presidential Scholarship 2018 — 2022
- DuPont de Nemours Inc. Women in STEM Scholarship 2018 — 2022

Activities and Memberships

- Physicists of Underrepresented Genders — 2023 — Present
- National Society of Black Physicists — 2018 — Present
- Society of Physics Students — 2018 — 2022
  UD Chapter Treasurer (2019 — 2020), *UD Chapter President (2020 — 2022)*
- National Society of Black Engineers — 2018 — 2022
- Delaware African Students Association — 2018 — 2022

References

Provided upon request.