

# Millicent Ayako

College Park, Maryland  
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Curriculum Vitae as of June 26, 2023

[mmayako.github.io](https://mmayako.github.io)  
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## EDUCATION

- PhD in Electrical Engineering - Electrophysics Focus**, *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

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## RESEARCH EXPERIENCE

- Quantum node time synchronization using the White Rabbit protocol** **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:** Developed time synchronization models for optical quantum communication in conjunction with DC-QNet 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.

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## 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](https://doi.org/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

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### Course Tutor

Department of Physics and Astronomy at the University of Delaware  
Instructor: [Dr. David Seckel](#)

February 2023 – May 2023

Newark, DE

- PHYS202: Introductory Physics II (Algebra Based)

### Laboratory Teaching Assistant

Department of Physics and Astronomy at the University of Delaware  
Lab Manager: [Dr. John Shaw](#)

August 2020 – Present

Newark, DE

- 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

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### Member, Climate, Diversity, Equity, & Inclusivity Committee (CDEIC)

Department of Physics and Astronomy at the University of Delaware

July 2020 – June 2023

Newark, DE

### Attendee, American Institute of Physics (AIP) TEAM-UP Implementation Workshops

Department of Physics and Astronomy at the University of Delaware

January 2021 & July 2021

Newark, DE

### President, Society of Physics Students (SPS), University of Delaware Chapter

Department of Physics and Astronomy at the University of Delaware

July 2020 – May 2022

Newark, DE

### Grant Awardee, 100,000 Strong Educational Exchange

Delaware Summer Chinese Language Initiative for Communicating STEM Program

Sept 2016 – August 2017

Beijing, Hangzhou, and Shanghai, China

## AWARDS

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- 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

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- Society of Physics Students Fall 2018 – Spring 2022  
*UD Chapter President, Fall 2020 - Spring 2021*  
*UD Chapter President, Fall 2021 - Spring 2022*
- National Society of Black Engineers Fall 2018 – Spring 2022
- National Society of Black Physicists Fall 2018 – Present

## REFERENCES

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Provided upon request.