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Goodfriend Maduforo Whyte

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Date of birth: 17/04/1986 **Nationality:** Nigerian (Nigeria)

WORK EXPERIENCE

Forschungszentrum Jülich GmbH

City: Jülich | **Country:** Germany

[01/02/2021 - 31/10/2025] **Scientific Researcher**

- Collected, processed, and analyzed outdoor photovoltaic (PV) module data.
- Conducted physical modeling and simulation of PV module performance.
- Developed robust machine learning models for data-driven analysis and prediction.
- Authored and published peer-reviewed research articles.
- Presented research findings at national and international conferences/workshops.
- Mentored and coached junior researchers and students.

University of Nigeria Nsukka (UNN) https://www.unn.edu.ng/

City: Nsukka | **Country:** Nigeria

[01/02/2016 - 31/12/2021] **University Physics Lecturer**

- Supervised undergraduate research projects, guiding students to successful completion of high-quality theses.
- Mentored junior researchers and undergraduate students in experimental methods and data analysis.
- Facilitated specialized tutorial sessions that strengthened student comprehension and problem-solving skills.
- Managed key laboratory instruments and contributed to experimental design, ensuring operational efficiency and robust data acquisition.
- Co-authored peer-reviewed publications, as a Research Assistant in Nano Research Group (UNN), contributing to the group's scientific output.

Living Fountain International Foundation School

City: Emene, Enugu State | **Country:** Nigeria

[01/11/2015 - 31/01/2016] **Computer Instructor**

- Taught computer fundamentals, software applications, and internet usage to students and staff.
- Developed and delivered lesson plans, practical exercises, and assessments.
- Provided hands-on training in Microsoft Office, basic programming, and digital literacy.
- Assisted in maintaining computer labs and ensuring proper functioning of IT equipment.

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Iketa Grammar School

City: Osi, Kwara State | **Country:** Nigeria

[05/08/2014 - 04/08/2015] **Science Teacher / Laboratory Demonstrator**

- Delivered engaging instruction in Physics and Mathematics to senior secondary students
- Conducted and supervised laboratory practicals, ensuring safety and effective learning outcomes
- Administered examinations, including invigilation, grading, and accurate record-keeping
- Collaborated in departmental meetings and contributed to academic planning and coordination

EDUCATION & TRAINING

[01/02/2021 - Current] **Doctorate**

RWTH Aachen University https://www.rwth-aachen.de/go/id/a/?lidx=1

City: Aachen | **Country:** Germany | **Field(s) of study:** Physics , Electricity and energy

[01/03/2016 - 10/09/2019] **Masters (Solid-state/Materials Science)**

University of Nigeria Nsukka https://www.unn.edu.ng/

Address: University Road, Nsukka, Enugu (Nigeria) | **Final grade:** 4.56/5

[31/10/2009 - 30/06/2013] **Bachelors (Physics)**

University of Nigeria Nsukka https://www.unn.edu.ng/

Address: University Road, Nsukka, Enugu (Nigeria) | **Final grade:** 4.43/5

LANGUAGE SKILLS

Mother tongue(s): Igbo

Other language(s):

English

LISTENING: C2 **READING:** C2 **WRITING:** C2

SPOKEN PRODUCTION: C2 **SPOKEN INTERACTION:** C2

German

LISTENING: A2 **READING:** A2 **WRITING:** A2

SPOKEN PRODUCTION: A2 **SPOKEN INTERACTION:** A2

SKILLS

Python (advanced – data analysis, machine learning, web apps) | R (intermediate – statistics and visualization) | MATLAB & Simulink (intermediate – modeling, data analysis & system simulation) | SQL (Basic) & Git | Data Collection, Processing, Analysis & Visualization | Command Line Scripting (Bash/Linux) | LaTeX (advanced – academic writing) | Research and scientific writing | Advanced IT skills (MS Office)

DIGITAL SKILLS TEST RESULTS

Information and data literacy	**ADVANCED**	Level 6/6

Communication and collaboration	**ADVANCED**	Level 6/6
Digital content creation	**ADVANCED**	Level 6/6
Safety	**ADVANCED**	Level 6/6
Problem solving	**ADVANCED**	Level 6/6

Results from a Self-assessment Based on The Digital Competence Framework 2.1.

PUBLICATIONS

[2026] **Anomaly detection, filtering and visualization for Outdoor photovoltaic data**

Reference: Whyte, G. M., Gerber, A., Rau, U., & Pieters, B. E., 2026, Solar Energy, 114351

- UMAP–HDBSCAN enables unsupervised classification of outdoor PV data.
- Identified data classes have clear physical interpretations.
- LOF filtering supports flexible, application-specific data filtering.
- Method corrects Isc to STC and uses its standard deviation as noise metric.
- LOF + cluster removal outperforms thresholding, reducing noise with less data loss.

Authors: Whyte, G. M., Gerber, A., Rau, U., Pieters, B. E. | **Journal Name:** Solar Energy | **Volume, Issue and Pages:** 307, 114351 | **Publisher:** Elsevier

[2024] **Development and improvement of a transient temperature model of PV modules: Conceptof trailing data**

Reference: Whyte Goodfriend, E. Bart Pieters, Merdzhanova Tsvetelina, Agbo Solomon, Fabian Ezema, Uwe Rau, 2024, PIP, 399-405

- A transient temperature model for photovoltaic (PV) modules is developed as an extension of the conventional Faiman thermal model.
- The model incorporates a thermal mass term, enabling it to capture transient effects and better represent real module behavior.
- A dynamic parametrization approach is proposed to accurately estimate model parameters under non-steady-state conditions.
- Validation with a 1-year outdoor dataset (5-minute resolution) shows a significant improvement in temperature prediction compared to the steady-state model.

Authors: Whyte Goodfriend, E. Bart Pieters, Merdzhanova Tsvetelina, Agbo Solomon, Fabian Ezema, Uwe Rau | **Journal Name:** Progress in Photovoltaics: Research and Applications | **Volume, Issue and Pages:** 32, 6, 399-405 | **Publisher:** Wiley

[2023] **Temperature-modulated nanostructures of ytterbium-doped Cobalt Selenide (Yb-CoSe)for photovoltaic applications**

Reference: I.L. Ikhioya, G.M. Whyte, A.C. Nkele, 2023, JICS, 100848

- Successful doping of CoSe with ytterbium via electrodeposition method
- Polycrystalline peaks with spherical nano-clustered morphology
- Good absorbance and low band gap energy values (E_g = 1.7 eV)
- Potential application to solar cells and optical devices

Authors: Imosobomeh L. Ikhioya, Goodfriend M. Whyte, Agnes C. Nkele | **Journal Name:** Journal of the Indian Chemical Society | **Volume, Issue and Pages:** 100, 1, 100848 | **Publisher:** Elsevier

[2022] **The effects of doping and temperature on properties of electrochemically depositedEr3+ doped ZnSe thin films**

Reference: Obitte, B. C. N., Ikhioya, I. L., Whyte, G. M., et al. (2022). OM, 124, 111979

- successful doping of crystalline chalcogenide thin films via chemical path
- doping is used for band gap tuning
- films deposited at room temperature has wider band gap (2.9 eV–2.61 eV)
- films find application as solar cell buffer layers and absorbers

Authors: B.C.N. Obitte, I.L. Ikhioya, G.M. Whyte, U.K. Chime, B.A. Ezekoye, A.B.C. Ekwealor, M. Maaza, Fabian I. Ezema | **Journal Name:** Optical Materials | **Volume, Issue and Pages:** 124, 111979 | **Publisher:** Elsevier

[2021] **Experimental and theoretical studies of the solid-state performance of electrodepositedYb2O3/As2Se3 nanocomposite films**

Reference: Whyte, G. M. et al (2021). JAC, 855, 157324

- wet chemical synthesis of crystalline chalcogenide thin films via low-cost electrodeposition technique
- polycrystalline thin films find application as phase change materials and solar cell application
- doping leads to reduction in band gap energy, due to lone pair p-states of Se
- electronic behaviour of films were investigated via DFT calculations

Authors: G.M. Whyte, C. Awada, P.O. Offor, F.U. Whyte, M.B. Kanoun, S. Goumri-Said, A. Alshoaibi, A.B.C. Ekwealor, M. Maaza, Fabian I. Ezema | **Journal Name:** Journal of Alloys and Compounds | **Volume, Issue and Pages:** 855, Part 1, 157324 | **Publisher:** Elsevier

[2020] **Synthesis and studies of electro-deposited yttrium arsenic selenide nanofilms for opto-electronicapplications**

Reference: Awada, C., Whyte, G. M., et al (2020). Nanomaterials, 10(8), 1557

- Nanocomposite films of Y/As_2Se_3 were successfully grown via the solution-phase electro-deposition technique
- lowering of the bandgap energy with increasing Yttrium content, and high red-shifted non-linear refractive index of pristine and composite films are reported
- DFT calculations were performed to investigate the electronic behaviour of the films

Authors: Chawki Awada, Goodfriend M. Whyte, Peter O. Offor, Mohammed Benali Kanoun, Souraya Goumri-Said, Adil Alshoaibi, Azubike B. C. Ekwealor, Malik Maaza, Fabian I. Ezema | **Journal Name:** Nanomaterials | **Volume, Issue and Pages:** 10, 8, 1557 | **Publisher:** MDPI

[2019] **Structural, morphological and optical properties of spray-formed silver-doped zinc sulphidethin films**

Reference: Offor, P. O., Whyte, G. M., et al (2019). Optik, 185, 519-528

- Silver-doped and undoped ZnS thin films were formed with 0%, 1%, 3% and 5% silver concentrations by CSP.
- X-ray diffraction data showed the cubic structure, and scanning electron microscopy showed the presence of agglomerates of nanoparticles and pores in the film.
- The film crystallite sizes were found to increase as the Ag concentration increased from 0% to 5%. FTIR showed the chemical bonds in the 1% silver concentration film.
- At 550 nm, the transmittance of the films varied between 42.35 and 81.86%

Authors: P.O. Offor, G.M. Whyte, V.A. Ezekoye, A.D. Omah, S.N. Ude, C. Ocheri, N.

Ezukwoke, I.C. Ezema, I.G. Madiba, B.A. Okorie, Malik Maaza, Fabian I. Ezema | **Journal Name:** Optik | **Volume, Issue and Pages:** 185, 519-528 | **Publisher:** Elsevier

VOLUNTEERING

[01/03/2021 - Current] **Diaspora Narrative Initiative e.V** Schwalbach am Taunus 60385 Frankfurt, Germany

- Fostering engagements in African communities through creating support-group networks for diaspora and home country
- active in Integration support, counselling, especially in the focus areas of participation and empowerment
- participation in projects and offers under the Sustainable Development Goals (SDGs) of the United Nations

HOBBIES AND INTERESTS

Chess playing

Programming and web design

Academic journal editing, peer review coordination, and publication management

Indoor Games

CONFERENCES & SEMINARS

[22/09/2024 - 27/09/2024] **41st European Photovoltaic Solar Energy Conference and Exhibition (EUPVSEC 2024)** Vienna, Austria

[18/09/2023 - 22/09/2023] **40th European Photovoltaic Solar Energy Conference and Exhibition (EUPVSEC 2023)** Lisbon, Portugal

[19/07/2021 - 23/07/2021] **4th African Nano Conference/Workshop on Application of Nanotechnology to Energy, Environment, Agriculture and Health** University of Nigeria Nsukka, 410001 Nsukka

[18/11/2019 - 22/11/2019] **42nd Annual National Conference of the Nigerian Institute of Physics (NIP)** Federal University of Technology (FUTO), Imo State, Nigeria

[16/07/2018 - 21/07/2018] **3rd International African Conference/Workshop on the Applications of Nanotechnology to Energy, Environment, Health and Agriculture** University of Nigeria Nsukka, 410001 Nsukka

[08/10/2018 - 12/10/2018] **41st Annual National Conference of the Nigerian Institute of Physics (NIP)** Federal University Lafia (FULAFIA), Nasarawa State, Nigeria

[04/07/2016 - 07/07/2016] **2nd International African Conference/Workshop on the Applications of Nanotechnology to Energy, Environment, Health and Agriculture** University of Nigeria Nsukka, 410001 Nsukka

NETWORKS AND MEMBERSHIPS

[08/10/2018 - Current]

Nigerian Institute of Physics (NIP) Department of Physics, Kaduna State University, Kaduna, Nigeria

[05/09/2023 - Current] **Horizon Resource Network** Germany

RECOMMENDATIONS

Name: Uwe Rau Professor of Physics/Supervisor

He has been my PhD supervisor for four years, demonstrating exceptional skill in teaching, supervision, experimental work, and theoretical analysis. I strongly and wholeheartedly recommend him.

Phone number: +49 2461611554 | **Email:** u.rau@fz-juelich.de

Name: Bart E. Pieters Co-supervisor

He serves as my PhD co-supervisor, advisor, and mentor. His expertise in teaching, research, experimental work, and theoretical analysis is truly outstanding. I strongly and wholeheartedly recommend him.

Phone number: +49 2461612679 | **Email:** b.pieters@fz-juelich.de

Name: Fabian I. Ezema Professor of Physics

I have known him for several years and have found him to be outstanding in experimental physics and scientific research collaborations. I strongly recommend him.

Phone number: +234 8036239214 | **Email:** fabian.ezema@unn.edu.ng

Name: Solomon N. Agbo Project partner

I have known him for several years and have found him to be exceptional in scientific project management and academic advising/mentorship. I strongly recommend him.

Phone number: +49 15215809279 | **Email:** s.agbo@fz-juelich.de