ISAAC B. OGUNNIRANYE

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Address: Department of Physics, University of Ibadan, Nigeria

Research Interest:

- Computational Materials Physics, Nanophysics, Computational Materials Design, Functional Materials, Energy Materials, Photovoltaic, Renewable Energy, Sustainable Energy, Novel Materials Modeling

Education:

- Postgraduate:
  - Ph.D. (Physics) - Baylor University, Texas, USA. In view
  - M.Sc. (Physics) - University of Ibadan, Ibadan. 2016
- Undergraduate:
  - B.Sc. (Edu.) (Physics) - Obafemi Awolowo University 2012

Professional Affiliations:

- Graduate Member, American Physical Society (APS)
- Member, Institute of Electrical and Electronics Engineers (IEEE)

Professional Experience:

- Lecturer, Department of Physics, University of Ibadan, Nigeria. 2019 – To Date

Publications:

Regmi, B., Cocconcelli, M., Miertschin, D., Salinas, D.P., Panchal, G., Kandel, P., Pandey, K., **Ogunniranye, I.**, Mueller, R., Yao, L. and Valvidares, M., (2024). Epitaxial growth and magnetic characterization of orthorhombic $Ho(Ni_{0.2}Co_{0.2}Fe_{0.2}Mn_{0.2}Cr_{0.2})O_3$ high-entropy oxide perovskite thin films. Journal of Magnetism and Magnetic Materials. Vol. 613: 172673.

Ogunniranye, I. B., Atsue, T., and Oyewande, O. E. (2021). Structural and optoelectronic behavior of the copper-doped double perovskite: A density functional theory investigation. *Physical Review B*. Vol. 103(2): 024102.

Atsue, T., **Ogunniranye, I. B.**, and Oyewande, O. E. (2021). Investigation of material properties of halide mixed lead-free double perovskite for optoelectronic applications using first-principles study. *Materials Science in Semiconductor Processing*. Vol. 133: 105963.

Ogunniranye, I. B., Oyewande, O. E., Atsue, T., and Usikalu, M. (2021). Influence of Transition Metal Doping on the Structural and Electronic Behaviour of Quaternary Double Perovskite, Cs2AgInCl6, using First-Principles Calculations. *IOP Conf. Ser.: Earth Environ. Sci.* Vol. 655: 012046.

Oyewande, O. E., Atsue, T., **Ogunniranye, I. B.**, and Usikalu, M. (2021). Prediction of Lattice Constants of some Transition Metal Nitrides using Different Functionals and Pseudopotentials. *IOP Conf. Ser.: Earth Environ. Sci.* Vol. 655: 012045.

Atsue, T., Oyewande, O. E., **Ogunniranye, I. B.**, and Aizebeokhai, A. P. (2021). Density Functional Theory Approach to the Study of the Structural Stability of Nitrides of Iron and Nickel. *IOP Conf. Ser.: Earth Environ. Sci.* Vol. 655: 012055.

Atsue, T., **Ogunniranye, I. B.**, and Oyewande, O. E. (2020). A Study of the Structural and Magnetic Properties of Nitrides of Iron and Nickel (XN; X=Fe,Ni) Using Density Functional Theory Approach. *Electron. Struct.* Vol. 2(4): 045002.

Atsue, T., Oyewande, O. E., and **Ogunniranye, I. B.** (2019). Review of Recent Progress in Fine-tuning the Physical Properties of Perovskite Materials. Proceedings of the 4th International Conference on Scientific Research in Nigeria, 20 – 23 May 2019. 41 – 52pp.

Presentations:

- Influence of transition metal doping on the structural and electronic behavior of quaternary double perovskite, $Cs_2AgInCl_6$, using first-principles calculations. Paper presentation at the 4th International Conference on Science and Sustainable Development (ICSSD 2020 Virtual) organized by Covenant University, Ota, Ogun State, Nigeria, from 3 – 5 August 2020.

Current Research:

- Exploring high-entropy oxide perovskite (HEOP) thin films, utilizing entropy-driven stability to develop multifunctional materials.
- A novel synthesis approach for plasmonic nanoparticles (NPs) and characterization of their particle-size-dependent properties, including localized surface plasmon resonance (LSPR) characteristics.
- Optimization of transmission optical spectroscopy to measure the optical resonance of various nanoparticles and structures, characterizing their absorption and transmission properties.

Skills:

- *Computational skills:* Proficiency in DFT calculations, material property simulations, and relevant software (e.g., Quantum Espresso).
- *Data Analysis and Programming:* Proficiency in MATLAB, Mathematica, OriginPro, LaTeX, Python, Fortran.
- *Experimental techniques:* Optical spectroscopy, electron microscopy - SEM with EDX, Pulsed Laser Deposition (PLD)

Selected Workshop/Courses/Conferences Attended:

- *Selected Participant*, AiiDA Virtual Tutorial, Ecole Polytechnique Federale De Lausaane, Switzerland, *July 2021*.
- *Selected Participant*, Virtual School on Electronic Excitations, Centre Européen de Calcul Atomique et Moléculaire (CECAM)-HQ and MAX CoE, *April 2021.*
- *Selected Participant*, International Workshop on Computational Physics and Materials Science, ICTP, Italy [*Virtual*], *February 2021.*
- *Selected Participant*, Workshop on Excited Charge Dynamics in Semiconductors, ICTP, Italy [*Virtual*], *September 2020.*
- *Attendee*, International Conference on Science and Sustainable Development (ICSSD 2020), Covenant University, Ota, Ogun State, Nigeria, *August 2020.*

Research Supervision Experience:

- Undergraduate physics students' project at the University of Ibadan, Nigeria (2019 – 2022)

Teaching Experience:

- Undergraduate: Experimental Physics I, Introductory Waves, Optics and Modern Physics, and Elementary Physics for Students of Agriculture, Forestry and Veterinary Medicine (2019 – 2022), at the University of Ibadan, Nigeria**.**

Collaborators/References:

- Excellent references available upon request.