

# MANSUR MOHAMMED BALA

Kaduna North, Kaduna State, Nigeria



: +2349021965664 | : [mbbala36@gmail.com](mailto:mbbala36@gmail.com) | linkedin.com/in/mansur-bala-b17093179

## PROFILE SUMMARY

Analytical and versatile Physics graduate with experience in collecting, organizing, interpreting, and presenting statistical data. Skilled in field data collection, analysis, and technical report writing. Proficient in designing strategies to enhance learner engagement, academic achievement, and cognitive development. Strong communicator with excellent interpersonal and relationship management abilities

## EDUCATION

- **M.Sc. Physics (Nuclear & Radiation)** Mar 2019 – Sept 2024  
Nigerian Defence Academy Postgraduate School, Kaduna  
GPA: 4.33/5.00  
Relevant Coursework: Mathematical Methods in Physics, Electromagnetic Theory, Quantum Mechanics, Nuclear Structure & Reactions, Statistical Physics, Applications of Nuclear Physics, Radiation Detection & Measurements, Solid State Physics, and Solar Energy Physics
  
- **B.Sc. Physics** Mar 2013 – Jan 2017  
Bayero University, Kano  
GPA: 2.91/5.00 (Second Class Lower)  
Relevant Coursework: Classical Mechanics, Electricity & Magnetism, Probability & Statistics, Complex Analysis, Waves & Optics, Quantum Physics, Quantum Mechanics, Analytical Mechanics, Geophysics, Electric Circuits & Electronics, Thermal Physics, Vectors & Tensors, Energy & Environment, Practical Physics, Electromagnetic Waves, Differential Equations, Mathematical Methods in Physics and Computational Physics

## WORK EXPERIENCE

- Sao Paulo State University, Brazil (UNESP)** August 2025 – Present  
*Doctoral Researcher*
- Run numerical simulations for orbital and asteroid dynamics.
  - Analyze mean motion resonances and long-term orbital behavior.
  - Build and test computational models for research tasks.
  - Prepare data for meetings and discuss results with my supervisor.
  - Work with the research group on shared projects and scientific goals.
  - Review scientific papers to guide my research direction.
- Nigerian Defence Academy, Kaduna** September 2023 – present  
*Assistant Lecturer*
- Develop lecturing materials, such as lab exercises or problem sets, and provide input on course curriculum and instruction methods
  - Analyse experimental data using statistical and computational methods to extract meaningful insights and draw conclusions
  - Engage in professional development opportunities such as seminars and workshops to enhance my skills and knowledge in physics education and research

- Government Secondary School Dan Masara, Dutse, Jigawa, Nigeria** July 2017 – May 2018  
*National Youth Service Corps (NYSC)*
- Designed and developed appropriate lesson plan that align with school curriculum standard
  - Evaluated student progress through tests, quizzes and lab work

- Guided Students through experiments by applying theoretical concepts in a practical setting

## RESEARCH INTERESTS

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- Nuclear Energy and Reactor Physics
- Radiation Effects of Spacecraft and Instrumentation
- Orbital Dynamics and Astrodynamics
- Computational Physics Applications in Space Dynamics

## SKILLS HIGHLIGHT

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- Strong foundation in applying mathematical methods such as differential equations, linear algebra, and statistics, to describe and analyze physical systems, particularly in dynamic and complex environments.
- Proficient in the use of simulation software (e.g., PCTRAN) for modelling physical systems, including nuclear reactors, with transferable experience in applying similar tools to other domains such as spacecraft dynamics.
- Skilled in collecting, analyzing, and interpreting data from simulations and experiments, with visualization experience using tools like Origin Pro and Microsoft Excel to extract insights and present findings clearly.
- Deep understanding of reactor physics (neutron transport, reactivity, fuel cycles) with demonstrated ability to contribute to interdisciplinary projects, and a growing interest in applying these principles to space systems and orbital mechanics.
- Working knowledge of programming languages such as Python and C++ for data processing, analysis, and algorithm development in physics and engineering contexts.

## EXTRACURRICULAR

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- Physical Fitness
- Watching Films and Documentaries

## COMMUNITY SERVICE

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- Volunteer at “Essence International School, Kaduna, Nigeria” my alma mater which initiated and focused on providing clothing, food and essential resources to support underprivileged families and orphans

## WORKSHOP AND TRAINING

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- Boot camp on Effective Grant Application Writing For Researchers, Centre For Research in Science and Technology (CRISAT), Nigerian Defence Academy, Kaduna, July 23-24, 2020

## RESEARCH EXPERIENCE

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### **Analysis of Some Safety Features of An Advanced Boiling Water Reactor Using PCTRAN Simulator (MSc. Project)**

- Performed a comprehensive safety and transient analysis of an Advanced Boiling Water Reactor using PCTRAN simulator, focusing on both normal and transient scenarios
- Conducted statistical and comparative analyses to highlight the reactor's performance and safety features during critical events
- Identified key areas for improving reactor safety protocols and operational efficiency of nuclear power plants

### **Effects of Atmospheric Conditions of Radio Wave Transmission (Undergraduate Project)**

- Aimed to study how different weather conditions affect radio signal propagation

- Provided valued insights into how changes in atmospheric temperature can alter refractive index, affecting the curvature of radio waves and leading to multipath propagation.