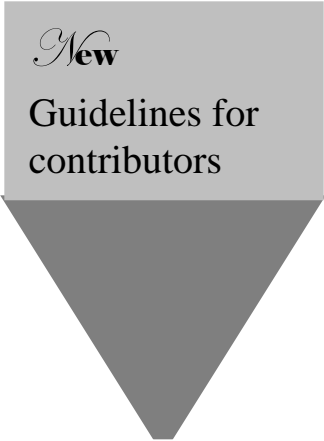


# JOURNAL OF THE NIGERIAN ASSOCIATION OF MATHEMATICAL PHYSICS

[TNAMP]



*New*  
Guidelines for  
contributors

*Manuscripts* should be submitted in triplicate copies along with a non-refundable fee of **₦2,000.00** (Two thousand naira only) in bank draft written in favour of Professor J.O.A. Idiodi, whose address appears below. Manuscripts can also be submitted via e-mail to the Editor-in-chief (see the e-mail address below) **Currently issues of the Journal appear every year in the months of January, March, May, July, September and November.** Articles are entertained all the year round but authors wishing their manuscript to be published in any of the journal issues should endeavor to submit their manuscripts at least two months earlier than the month of the Journal issue.

The submission of a paper implies *it has not been* published elsewhere, and it is not under consideration for publication with other journals. Once a paper is accepted, it is assumed that the author has ceded the copyright to the Nigerian Association of Mathematical Physics.

Manuscripts must be in English Language, should be typed in double spacing and should not exceed 20 typed A4 paper in length. Authors are urged to pay careful attention to symbols, which should be typed neatly and unambiguously, *using equation editor (NOT SYMBOLS) and separating equation number from the equation file and each equation statement should NOT BE GROUPED and should be properly aligned to distinguish subscripts and superscripts. Any paper with mathematical equations, typed without using equation editor would not be accepted and equations should not be grouped as objects. All tables, figures and references must be cited in the body of the paper. Tables, figures and references should be numbered in the order in which they are cited in the text. All graphs and figures should be neatly drawn or plotted and bold enough in case of enlargement.*

The Standard International (SI) system of units should be used in all manuscripts. Unusual symbols, abbreviations or notations should be defined when first mentioned in the text.

*Authors should also submit CD (Compact disc, not diskette) containing their manuscripts done in Microsoft word 2003 and NOT in PDF. Authors should be sure that their soft copy is VIRUS-FREE, otherwise the paper would be rejected and any paper not on CD would also be rejected.*

Manuscripts should contain the following headings, where appropriate: **Title** (followed by the author's name, address, e-mail and phone number); **Abstract** (that is, a brief summary of the contents and conclusion of the paper, not exceeding 200 words); **Introduction, Theoretical analysis, Experimental work, Results and Discussion, Conclusion, Acknowledgement and References.** The numbering of the headings and subheadings and references should be as in the Journal of NAMP.

All papers will be acknowledged and refereed and papers once received will not be returned to authors Contributors of an accepted paper will be expected to pay a publication charge. As a result of the highly unstable economic climate, publication charges are subject to frequent review. Contributors of articles are therefore expected to liaise with the Editor-in-chief to obtain the most recent information on the charges they are to pay.

*Professor J.O.A. Idiodi,  
Editor-in-chief,  
e-mail address:jidiodi@hotmail.com,  
Department of Physics,  
University of Benin, Benin City,  
Nigeria.*

# Contents



|   |            |
|---|------------|
| A Comparison Of The Variational Iteration Method And Adomian Decomposition Methods In Solving The Problem Of Squeezing Flow Between Two Circular Disks<br><i>Mustapha Adewale Rilwan and Moses Adebowale Akanbi</i> | <b>91</b>  |
| Sensitivity Indices Of A Generic Infectious Disease Epidemic For Disease Spread And Elimination<br><i>S.T. Tonga, L.P. Kenda, D. Andeyangde and D.S. Joro</i>   | <b>99</b>  |
| A Queue Model To Analyze The Probability Distributions Of Vehicles' Inter-Arrival And Service Times In A Traffic Intersection<br><i>S. A. Ogumeyo and J. O. Emunefe</i>   | <b>105</b> |
| Comparative Analysis Of Conpro And Servqual Models<br><i>Usiobaifo A.R., Amadin F.I. and Egwali A.O.</i>  | <b>111</b> |
| Mathematical Modeling Of The Effect Of Ivermectin and Cattle Availability On Malaria Control<br><i>Ochigbo J.E. and Adamu A.K.</i>  | <b>127</b> |
| Measurement Of Performance Of Thermal Power Plant Using Physics Techniques And It's Impact On Environment In Energy Physics<br><i>HAYATU Abba Ibrahim</i>   | <b>139</b> |
| Evaluation Of Outage Management And Reliability Indices Of Ugbowo 2X15 MVA, 33/11 KV Distribution Network<br><i>France O. Akpojedje and Oluwafemi O. Osho</i>   | <b>145</b> |
| Design And Construction Of A Mini Oven With Different Heating Modes<br><i>LOUIS C. ENYI</i>   | <b>157</b> |
| Measurement And Analysis Of Customer Satisfaction Using Six Sigma In Nigerian Banking Industry<br><i>Eboigbe C.I. and Ikpoza E.</i>   | <b>165</b> |
| Evaluation Of Mechanical Properties Of Composite Material Produced From Short Bamboo Fibre With Carbonized Bone Particles In An Epoxy Matrix<br><i>Ikpoza E. and Edokpia R.O.</i>                                   | <b>171</b> |

# JOURNAL

*of the*

**NIGERIAN ASSOCIATION OF MATHEMATICAL PHYSICS**

**Vol. 64**



## **Contents: = = = = = = = = = = = = = = =**

|   |           |
|---|-----------|
| Bound State Solutions To The Schrödinger Equation For Selected Diatomic Molecules<br><i>E.P. Inyang, E .S.William, E.A.Ibanga, J.E. Ntibi and O.O.Akintola</i>  | <b>1</b>  |
| Entropy of Metals Based On The Theory Of Free Electron Approximation<br>Using Thermodynamic Potentials<br><i>G.E. Adesakin, O.G. Edema, O.D. Afe<sup>1</sup>, M.A. Adekoya, O.A. Fasiku, O.A. Adegoke and T.H. Akanbi</i>                     | <b>13</b> |
| Solar Photovoltaic Array – Storage Combination Optimization For Stand-Alone Systems<br><i>N.E. Erusiafe, O. O. Oyebola and O. K. Onanuga</i>  | <b>19</b> |
| Investigation Of Technical Performance Targets For A Hybrid<br>Photovoltaic / Photo-Thermal System<br><i>N.E. Erusiafe, O. P. Shomotun and R. Adegbite</i>  | <b>27</b> |
| The Dielectric Study and Refractive Index of Niobium Pentoxide<br>(Nb <sub>2</sub> O <sub>5</sub> ) Under Alternative Current Conditions<br><i>Hemba E.C., Ikyumbur T.J. and Amon P.S.</i>  | <b>33</b> |
| Aquifer Characterization Analysis Using Geoelectrical Parameters:<br>A Case Study Of Olabisi Onabanjo University, Southwestern Nigeria<br><i>Adenuga O. A, Oladunjoye H. T. and Adekoya S.A.</i>  | <b>39</b> |
| Evaluation Of Soil Corrosivity At Ungwan-Maigero, Chikun Local<br>Government Area Of Kaduna State<br><i>Adeka P., Afuwai C. G and Dogara, M. D.</i>   | <b>45</b> |
| Extended Mono-Implicit Runge-Kutta Methods For Stiff Odes<br><i>I.B. Aihie and R.I. Okuonghae</i>   | <b>53</b> |
| Calculation Of Fluid Flow And Heat Transfer Over A Non-Isothermal Horizontal<br>Circular Cylinder In Cross Flow Using The Modified Merk Series Of Chao And Fagbenle<br><i>Falana A.</i>   | <b>59</b> |
| An Order Seven Bernstein Induced Hybrid Two-Step Method For<br>Direct Solution Of Second-Order Initial Problems<br><i>Ojo E. O., Adoghe L. O. and Okoro F.</i>  | <b>65</b> |
| Non-Uniform Heat Source And Melting Heat Effect On Casson Nanofluid<br>Flow Over A Riga Plate In The Presence Of Nonlinear Thermal Radiation<br><i>Akaje, T. W, Olajuwon, B. I and Raji, M. T.</i>  | <b>75</b> |
| Application Of Adomian Decomposition Methods In Solving Some<br>Selected Non Linear Partial Differential Equations<br><i>Ojimadu U.H, Usman M.A, Olasupo A.O, Olubanwo O.O, Oyewole O, Ayo F.E, Ayodele M.A, Sulaiman M.A. and Ajani A.S.</i> | <b>83</b> |
| A Study On Fuzzy Logic Control Of Washing Machine<br><i>Balogun F., Bolaji K. and Gyegwe J.</i>   | <b>87</b> |