NJAH, Abdulahi Ndzi

Degree: B.Sc., M. Sc., PhD.; PGD. Computer Sciences

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Department: Physics

Academic Rank: Senior Lecturer

Current position: Coordinator Pre-degree

Research Interest:

- Control and Synchronization of Chaos in physical system and their applications
- Chaos in driven and couple non-linear Oscillators.
- Classical and Quantum Transport in non-equilibrium system (the ratchet mechanism)
- Physics of Biological and complex system.
- Non-linear Dynamics in Plasma, Superconductivity in long and coupled Josephson junctions.
- Non-linear Optics, Optical Solitons and their applications in telecommunications
- Cryptography for information security.

ACADEMIC DEGREES WITH DATE

Ph.D. Theoretical Physics	-	2001
M.Sc. Theoretical Physics	-	1993
Post Graduate Diploma Computer Science	-	2002
B.Sc. (Hons.) Physics	-	1991

INSTITUTIONS ATTENDED WITH DATE

University of Agriculture, Abeokuta, Nigeria	-	2001 - 2002
University of Ibadan, Ibadan, Nigeria	-	1992 – 2001
University of Jos, Jos, Nigeria	-	1987 – 1991

MEMBERSHIP OF PROFESSIONAL BODIES

- ❖ 2001 - date **Member** of the Nigerian Association of Mathematics Physics
- ❖ 1998 - date **Member** of the Nigerian Institute of Physics
- ❖ 2009 - date **Member** of the Cameroonian Physics Society
- ❖ 1998 - date **Member** of the Nigerian Institute of Physics
- ❖ 2009 - date **Member** of the American Institute of Physics

PRIZES, HONOURS, NATIONAL AND INTERNATIONAL RECOGNITIONS.

- The Jos International Breweries prizes for the best graduating student in Physics, University of Jos, 1991.
- The Dr. Nwafor prize for the best graduating student in Physics, University of Jos

- Cameroon Government Scholarship, B.Sc. Physics 1989 – 1991.
- Cameroon Government Scholarship, M.Sc. Theoretical Physics, 1991 – 1993
- Cameroon Government Scholarship, Ph.D. Theoretical Physics, 1993 – 1997

COURSES TAUGHT

100 Level

PHS 101 - General Physics I

PHS 105 - General Physics I for Biological Sciences

PHS 102 - General Physics II

PHS 106 - General Physics II for Biological Sciences

PHS 191/192 - Physics Laboratory I/II

200 Level

PHS 211 - Classical Physics

PHS 222 - Thermal Physics

PHS 231 - Waves and Optics

PHS 242 - Electricity

PHS 251 - Introductory Modern Physics

PHS 291/292 - Physics Practicals

300 Level

PHS 311 - Analytical Mechanics I

PHS 312 - Analytical Mechanics II

PHS 341 - Electromagnetism

PHS 342 - Electromagnetic Waves and Optics

PHS 344 - Electronics

PHS 364 - Energy and Environment

400 Level

PHS 411 - Quantum Mechanics I

PHS 412 - Quantum Mechanics II

PHS 468 - Semiconductor Devices

PHS 471 - Method of Mathematical Physics I

PHS 472 - Method of Mathematical Physics II

Undergraduate Project Supervision: Supervised **33** student

Courses taught at Post graduate level:

PHS 701 - Quantum Mechanics

PHS 703 - Mathematical Physics

PHS 706 - Statistical Mechanics

CHM 744 – Quantum Chemistry and Symmetry (Department of Chemistry)

CST 713 - Introduction to Telecommunications (MICT Programme, Department of Computer Sciences).

Postgraduate Supervision:

Ph. D Supervision (Completed)

- **U. E. Vincent Ph.D**. Department of Physics (2001 – 2005) Dynamical behaviour and Synchronization of Chaos in coupled Nonlinear Oscillators June 2005 (Co-supervised)

- **B. A. Idowu, Ph.D.** Department of Physics (2003 – 2008): "Dynamics, Synchronization and Chaos Control of Parametrically excited oscillators" January, 2009 (Major Supervised)

- **O. i. Olusola, Ph.D.,** Department of Physics (2003 - 2010) Synchronization Dynamics and Stability Analysis of Coupled Time-varying Nonautonomous System " (Major Supervisor)

- **A. S. Onashoga, Ph. D.,** Department of Computer Science (2005 - 2010): "A Distributed Intrusion Detection Architecture using Multi-agent System " (Major Supervisor)

Ph. D Supervisor (in Progress)

- **A. A. Ajayi, Ph. D.,** Department of Physics (2003 – dates): " A Generalized van der pol-Duffing oscillator and its Analysis" (Major Supervisor)

- **S. O. Kareem, Ph. D.,** Department of Physics (2005 – date): "Dynamics and synochronization of coupled oscillators in extended potential " (Major Supervisor)

- **U. A. Marte, Ph. D.,** Department of Physics (2007- date): "Analysical and Numerical Approximations of Nonlinear Differential Equations with Ratchet Potential" (Major Supervisor)

- **A. O. Adelakan,** Department of Physics (2010 - date): "Design and Implementation of Nonlinear Chaotic " (Major Supervisor)

- **K. S. Ojo,** Department of Physics (2010 - date): "Nonlinear Dynamics and Chaosin in Josephson Junctions: Networks, Analysis, Control Synchronization and implementation" (Major Supervisor)

- **O. Ojoniyi,** Department of Physics (2010 – date): "Choatic Theory of Turbulent Flow" (Major Supervisor)

- **F. Ometan,** Department of Physics (2010 - date): "Quantum FChaos: The Non-linear Schrodinger Equation" (Major Supervisor)

- **A. I. Egunjobi,** Department of Physics (2010 - date): "Generalization of some Chaotic Circuits and their dynamical Analysis" (Major Supervisor)

- **O. P. Durojaye, Ph. D.,** Department of Mathematics (2006 - date): (Co-supervisor)

- **A. J. Ikuomola, Ph. D.,** Department of Computer Science (2009 - date): "Intrusion Response System" (Cosupervisor)

M. Sc. Supervisor (Completed)

- **K. S. Ojo M. Sc.,** Department of Physics (2005 – 2008): "Control and Synchronization via Backstepping Techniques of some ϕ^6 chaotic Oscillators and their Application to Secure Communication" January 2009 (Major Supervisor)

- **O. D. Sunday M. Sc.,** Department of Physics (2005 – 2008): "Synchronization and Control of some four-dimensional chaotic system with Application to Secure Communications" January 2009 (Major Supervisor)

- **E. O. Adegoke,** Department of Physics, 2006 – 2010: "Adaptive Tracking Control and Synchronization of some new Hyperchaotic System with Application to Secure Commnuications" (Major Supervisor)

- **B. Mathew, M. Sc.,** Department of Physics (2005 – 2010): "Dynamical Properties of Krypton and Xenon fluid from Molecular Dynamics Simulation" April 2009. (Major Supervisor)

- **M. K. Bamgbose,** Department of Physics (2005 – 2010): "Electronic properties and Infra-red Spectra of FeO (B1 Phase) at high Pressure from ab initio Calculations" (Co-supervisor)

- **T. G. Jaiyeola, M. Sc.,** Department of Mathematics (2003 – 2005): "An isotopic study of properties of central loops" 2005 (Co-supervisor)

- **T. E. Akinsola, M. Sc.,** Department of Mathematics (2004 – 2010): "On Hardy-type Inequalities" (Co-supervisor)

- **K. A. Ayanlowo M. Sc.,** Department of Computer Sciences (2004 – 2008): "An Improved Chaotic Encryption Scheme" August 2008 (Co-supervisor)

- **M. O. Agbaje, M. Sc.,** Department of Computer Sciences (2004 – 2008): "Effect of Block sizes on Watermarked digital images using Discrete Cosine Transform" August 2008 (Co-supervisor)

- **O. C. Akinola M. Sc.,** Department of Computer Sciences (2005 – 2008): "A Neural Network-based Intrusion Detection System" (Co-supervisor)

- **A. A. Dosunmu, M. Sc.,** Department of Computer Sciences (2004 – 2010): "A framework for interactive visualization of multidimentioned data" (Co-supervisor)

M. Sc. Supervision (in Progress)

- **O. S. Onama,** Department of Physics, 2008 – date: "Extended backstepping Technique and its Application in the Control and Synchronization of Hyperchaotic Systems" (Co-supervisor)

- **O. O. Sowunmi, M. Sc.,** Department of Mathematics, (2006-date): "On some Loop Theory (Co-supervisor)

- **A. A. Lasisi,** Department of Soil Science and Land Management (2008-date): "Soil Dynamics" (Co-supervisor)

- **O. C. Oke., M. Sc.,** Department of Forestry and Wildlife Management (2009-date): "Geophatic Stress Studies" (Co-supervisor)

Supervision of Postgraduate Diploma (PGD) in Computer Science and Master in Information & Computer Technology (MICT)

- Supervised **5 PGD** and **9 MICT** students in Computer Science
- Currently supervising **0 PGD** and **2 MICT** student in Computer Science

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RESEARCH CONDUCTED

PUBLICATIONS

1. **A. N. Njah** and R. Akin-Ojo : Classicalization of the Nonlinear Schrodinger Equation, Journal of the Nigerian Association of Mathematical Physics (Journal of NAMP). V 6 (2002) 19 – 30.

2. **A. N. Njah** and R. Akin-Ojo : Analysis of the Nonlinear Schrodinger in an infinite potential well, Journal of NAMP, bf 7 (2003) 39 – 46.

3. **A. N. Njah** and R. Akin-Ojo : Analysis of the Nonlinear Diffusion Equation associated with the Nonlinear Schrodinger, Journal of NAMP, bf 7 (2003) 47 – 52.

4. U. E. Vincent, **A. N. Njah**, O. Akinlade and A.R.T. Solarin: Phase Synchronization of coupled hyper-chaotic Duffing Oscillator, Journal of NAMP, 8 (2004) 203 – 210.

5. U. E. Vincent, **A. N. Njah**, O. Akinlade and A.R.T. Solarin: Phase Synchronization of Unidirectionally coupled Chaotic Rachets, CHAOS : An Interdisplinary J. Nonlinear Science 14 ("4) (2004) 1018 – 1025 ©American Institute of Physics (AIP).

6. U. E. Vincent, **A. N. Njah**, and O. Akinlade: Measure Synchronization in Hamitonian system associated with Nonlinear Schrodinger Equation, Modern Phys. Lett. B. 19 (15) (2005) 737 – 742 © World Scientific, Singapore.

7. U. E. Vincent, **A. N. Njah**, O. Akinlade and A.R.T. Solarin: Synchronization of cross-well chaos in coupled Duffing Oscillators, Int. J. Modern Phys. B. 19 (20) (2005) 3205 – 3216 © World Scientific, Singapore.

8. U. E. Vincent, A. Kenfack, **A. N. Njah**, and O. Akinlade : Bifurcation and chaos in coupled ratchets exhibiting synchronized dynamic, Physical Review E 72 (2006). © American Physical Society (APS).

9.   U. E. Vincent, **A. N. Njah**, O. Akinlade and A.R.T. Solarin: Phase synchronization in bi-directionally coupled chaotic ratchets, Physical A 360 (2006) 186 – 196. © Elsevier.

10.   U. E. Vincent, **A. N. Njah**, A. O. Obawole and M. T. Azeez: Measure synchronixation in a Coupled Hamiltonian associated with the Motion of particles in a Periodic Potential, Journal of NAMP, 10, 1 (2006) 127 – 136.

11.   **A. N. Njah** : Active Control versus Recursive Backstepping Control of a Chaotic system, Journal of NANP, 10, (1) (2006) 137 – 142.

12.   **A. N. Njah** : Synchronization of Forced Damped Pendulum via Active Control, (Journal of NAMP), 10, (2006) 143 – 148.

13.   **A. N. Njah**: Analysis of Nonlinear Schrodinger Potential barrier as an Electromagentic switch or limiter, Journal of Applied Science and Technology (JAST), 11, (1) (2006) 3 – 6 CSIR-INSS Ghana.

14.   U. E. Vincent, **A. N. Njah**, and O. Akinlade: Sychronization and basin bifurcations in mutually coupled oscillators, PRAMANA Journal of Physics, 68, (5) (2007) 749 – 756. © Springer-Verlag/ Idian Academy of Science.

15.   U. E. Vincent, **A. N. Njah**, and J.A. Laoye: Controlling chaos and deterministic directed transport in inertia ratchets using backstepping control, Physical D 231 (2007) 130 – 136 © Elsevier – Science Direct.

16.   B. A. Idowu, U. E. Vincent and **A. N. Njah** : Control and Synchronization of chaos in nonlinear dyros via backstepping design, Int. J. Non-linear Science 5 (1) (2008) 11 – 19. © World Academy Union.

17.   **A. N. Njah** and U. E. Vincent: Chaos Synchronization between Single and Double wells Duffing - Van der Pol. Oscillators using Active Control, Chaos, Solutions & Fractals 37 (5) (2008) 1356 – 1361. © Elsevier – Science Direct.

18.   **A. N. Njah**: Synchronization and Anti-synchronization of double-Hump doffing oscillators via active control – Nigerian Journal of Physics, 20(2), (2008) 206 – 211.

19.   **A. N. Njah** and U. E. Vincent: Theoretical formulation of chaos synchronization in the Duffing Oscillators using active control. Nigerian Journal of Physics, 20(2), (2008) 213 – 219.

20.   B. A. Idowu, U. E. Vincent and **A. N. Njah**: Synchronization of chaos in non-identical parametrically excited systems, Chaos, Solutions and Fractals 39 (2009) 2322-2331. © Elsevier – Science Direct.

21.   **A. N. Njah** and U. E. Vincent: Synchronization and anti-synchronization of chaos in an extended Bonhoffer-van der Pol oscillator using active control, Journal of Sound and Vibration 319 (2009) 41-49. © Elsevier – Science Direct.

22. **A. N. Njah** and K. S. Ojo: Synchronization via backstepping nonlinear control of externally excited ϕ^6 van der Pol and ϕ^6 Duffing oscillators, Far East Journal of Dynamical Systems 11 (2) (2009) 143 – 159. © Pushpa Publishing House.

23. B. A. Idowu, U. E. Vincent and **A. N. Njah** : Generalized adaptive back-stepping Synchronization for non-identical parametrically excited systems, Nonlinear Analysis: Modelling and Control 14 No. 2, (1)(2008) 165 – 176 .

24. **A. N. Njah** and O. D. Sunday: Generalization on the chaos control of 4-D chaotic systems using recursive back stepping nonlinear controller, Chaos, Solutions and Fractals 41 (2008),2371 – 2376 © Elsevier - Science Direct.

25. **A. N. Njah**, : Synchronization via active control of identical and non-identical ϕ^6 chaotic oscillators with external excitation – Journal of sound and vibration 327 (2009) 322 – 332 . © Elsevier - Science Direct.

26. **A. N. Njah**, O. D. Sunday : Synchronization of identical and non-identical 4-D chaotic Systems via Lyapunov direct method. – International Journal of Nonlinear Science Vol. 7 (1) (2009) pp. xxx,

27. O. I. Olusola, U. E. Vincent and **A. N. Njah:** Global chaos synchronization of coupled parametrically excited pendula, PRAMANA Journal of Physics, 73 (6) (2009) 1011 – 1022 © Spinger-Verlag/India Academy of Science.

28. **A. N. Njah** : Synchronization and anti-synchronization of double-hump Duffing - van der Pol oscillation via active control, Journal of Information and Computing science 4 (4) (2009) 234-250. © World Academic Press, World Academic Union. http://www.jic.org.uk/jicvol4no4paper01.pdf

29. O. I. Olusola, U. E. Vincent and **A. N. Njah:** Synchronization, Multistability and basin crisis in coupled pendula, Journal of Sound and Vibration, 329 (4) (2010) 443-456. © Elsevier – Science Direct. Doi:101016/j.jsv.2009.09.030

30. **A. N. Njah:** Tracking control and synchronization of the new hyperchaotic Liu systems via backstepping techniques, Nonlinear Dynamics, 61 (1) (2010) 1 – 9 (DOI 10.1007/s11071-009-9626-5). © Springer

31. O. I. Olusola, U. E. Vincent, **A. N. Njah** and J. A. Olowofela: Bistablility in coupled oscillators exhibiting synchronization dynamics, Communications in Theoretical Physics, 53 (5) (2010) 815-824. © Institute of Physic (IOP) Publishing.

32. **A. N. Njah,** K. S. Ojo, G. A. Adebayo and A. O. Obawole: Generalized control and synchronization of chaos in RCL-shunted Josephson junction using backstepping design, Physica C:

Superconductivity 470 (2010) 558-564 © Elservier – Sci-ence Direct. Doi:10.1016/j.physc.2010.05.009

33.   **A. N. Njah:** Synchronization via active control of parametrically and externally excited ϕ^6 Duffing oscillators and its application to secure communications, Journal of Vibration and Control, (2010) DOI:10.1177/1077546309357024 © Saga.

34.   M. O. Agbaje, A. T. Akinwale, O. Folorunso and **A. N. Njah:** The effect of block size on the attribute of a watermarked digit image, International Journal of Nonlinear Science 9 (2) (2010) (in Press). © World Academic Union.

Technical Paper:

35. G. A. Adebayo, B. C. Anusionwon, **A. N. Njah**, B. Mathew and Fabamise: Density Dependence of the Diffusion coefficient of Alkali metals, International Centre for Theoretical Physics (ICTP) Internal Reports (IC/IR/2004/2).

36. G. A. Adebayo, B. C. Anusionwu, **A. N. Njah,** O. J. Adeniran, B. Mathew and R. S. Sunmonu: Collision frequency of Lennard-jones fluid at high densities by equilibrium molecular dynamics simulation, The Abdus Salam International Central for Theoretical Physics (ICTP) Publication IC/2009/004: Available at: http:/publications.ictp.it.

37. **A. N. Njah:** Some Modifications of the active control techniques for tracking control and synchronization of chaotic dynamics. Proceedings of the Third international Conference on Dynamics, Vibrati9on and Control (ICDVC-2010), Hangzhou, China, 12 – 14th May 2010, pp 468.