

ACADEMIC CURRICULUM VITAE

H. Odhiambo Oyoko
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EDUCATION

Ph.D., Theoretical Condensed Matter Physics, 1991
University of Maine, Orono, Maine, USA.

M.S. Physics, 1987
Fairleigh Dickinson University, New Jersey, USA

B.S. Physics and Geology, 1975
University of Nairobi, Kenya.

EMPLOYMENT HISTORY

1. Professor, Department of Physics, Pwani University, Kenya.
2. Chair, School of Pure and Applied Sciences Academic Board.
3. Member, Pwani University Senate.
4. Served as Chairman, Department of Mathematics and Physical Sciences at Pwani University (2009 to 2016).
5. Served as Vice-Chairman of the Pwani University
6. Appointment and Promotion Appraisal Committee
7. Served as a member of the University Automation Policy Committee, in charge of developing the Automation Policy for Pwani University.
8. Served as Chairman, Pwani University Green Energy Committee
9. Military Service (Major), 1975-1983

Courses taught at Pwani University

1. SMA B104 Calculus I (B Undergraduate courses)
2. SMA B200 Calculus II
3. SPH B200 Mechanics II
4. SPH B202 Modern Physics
5. SPH B203 Thermal Physics II

6. SPH B301 Quantum Mechanics I
7. SPH B302 Structure and Properties of Matter
8. SMA B305/405 Complex Analysis I/II
9. SPH 315/401 Classical Electrodynamics I/II
10. SPH B305 Relativistic Mechanics
11. SMA B230 Vector Analysis
12. SPH B408 Statistical Mechanics
13. SPH B 410 Quantum Mechanics III
14. SPH B 406 Solid State Physics II
15. SPH G 804/807 Quantum Mechanics I/II (G Graduate courses)
16. SPH G 806 Classical Electrodynamics II
17. SPH G808 Statistical Mechanics
18. SPH G809/810 Solid State Physics I/II
19. SPH G 805 Mathematical Physics
20. SPH G 802 Classical Mechanics

These are at the level of standard American university courses.

2. University of Durban-Westville/University of KwaZulu-Natal (2003-2005/2005-2008), South Africa.

Senior Lecturer in Physics (2003-2008), member of University Senate (2003-2005), member of University of KwaZulu-Natal that participated in the founding of the South African National Institute for Theoretical Physics(NiTheP). This is a South African Government Institute that that conducts research in Theoretical Physics and is modeled along the lines of Perimeter Institute(Canada) and Kavli Institute for Theoretical Physics.

Courses taught:

1. PHYS 411T Mathematical Methods of Physics: Honors.
2. PHYS 303T Electromagnetic Theory.
3. PHYS 302 T Quantum Mechanics.
4. PHYS 202 W2 Vibrations and Waves.
5. PHYS 162 W2-Oscillations, Waves, Atomic and Nuclear Physics.
6. SEN 121 S Physics for engineering students.
7. PHYS 131 and PHYS 132 Physics for Health Science and Agriculture Students.
8. PHYS 162 Chemical Engineering Physics.
9. PHYS 332 High Energy Particle Physics.
10. **PHYS 195 Augmented Physics designed for students who are under prepared for University-level studies.**

3. University of Swaziland (1998-2003), Kingdom of Swaziland.

Senior Lecturer in Physics

Courses taught:

1. P331 Third Year Electromagnetic Theory I.
2. P342 Third Year Quantum Mechanics I.
3. P421 Fourth Year Solid State Physics I.
4. P422 Fourth Year Solid State Physics II.
5. P472 Fourth Year Electromagnetic Theory II.

4. University of Zululand, 1997-1998.

On sabbatical leave.

5. University of Nairobi (1991-1997)

Senior Lecturer in Physics

Courses taught:

1. Quantum Mechanics at B.S., Graduate levels.
2. Classical Mechanics at B.S., Graduate levels.
3. Classical Electrodynamics at B.S., Graduate levels.
4. Statistical Mechanics at B.S., Graduate levels.
5. Mathematical Physics at B.S., Graduate levels.
6. Solid State Physics at B.S., Graduate levels.
7. Many-Body Theory at Graduate level.
8. Introduction to Quantum Field Theory at Graduate level.
9. Laser Physics at B.S. level
10. First Year Physics Laboratory.

Adjunct faculty at United States International University-Africa, Nairobi, 1992-1997

Courses taught:

1. Pre-University Mathematics. This served as remedial course for students with deficient mathematics background to enable them meet university admission requirements.
2. Third Year Probability and Statistics.

Graduate Teaching Assistant, 1988-1991

University of Maine at Orono, Maine, graduate student and teaching assistant.

Graduate Teaching Assistant, 1985-1986
Fairleigh Dickinson University, New Jersey.

Professional Membership:

1. American Physical Society (APS) (Lapsed)
2. South African Institute of Physics
2. Sigma Xi (Scientific Research Society) (Lapsed)
3. Sigma Pi Sigma Honor society

LIST OF PUBLICATION:

1. Leonard Machuka, Hannington Odhiambo Oyoko, George Amolo, "The effect of Hermanson's spatial dielectric function on the density of impurity states in a GaAs quantum dot of rectangular cross-section", *Int. J. Appl. Maths and Theoretical Physics* 2018; 4(3):73-77.
2. Winnie Otieno, Hannington Oyoko, George Amolo, 'Variation of the photoionization cross-section with position and incident photon frequency of a hydrogenic donor impurity in a GaAs quantum dot of square cross-section', *American J. Optics and Photonics*, 2018; 6(3):25-30
3. F. Omboga, H. Oyoko and G. Amolo, 'A study of the effect of Hermanson's spatial dielectric function on the photoionization cross-section of a hydrogenic and a non-hydrogenic donor impurity in a GaAs quantum dot of cylindrical geometry in the regions of finite and infinite barrier potential', *J. Korean Phys. Soc.*, Vol.73, No. 7, 928-933 (Oct. 2018).
4. H. Odhiambo Oyoko, N. Porrás-Montenegro, S. Y. Lopez, and C. A. Duque, Comparative study of hydrostatic pressure and temperature effects on impurity-related optical properties in single and double $GaAs - Ga_{1-x}Al_xAs$ quantum wells, *Phys. Stat. Sol. (c)* **4**, No. 2, 298-300 (2007).
5. H. Odhiambo Oyoko, C.A. Duque and N. Porrás-Montenegro, Theoretical study of the effect of applied stress on the binding energy of a donor impurity in GaAs quantum well dot within an infinite potential barrier, *Ind. J. Pure & App. Phys.* **42**, 908-911 (2004).

6. H. Odhiambo Oyoko, 'Effect of Uniaxial Stress on the Density of Shallow Donor Impurities in GaAs Quantum Wells', *Physica Scripta*. Vol. **66**, 94-96, (2002).
7. C. A. Duque, N. Porrás-Montenegro and H. O. Oyoko, 'Shallow donor impurities in *GaAs – GaAlAs* Quantum Dots: The Uniaxial Stress and Temperature Dependence.', *Revista Colombiana di Fisica*, 34, No.1, 17-20 (2002).
8. H. O. Oyoko, C.A. Duque, N. Porrás-Montenegro, 'Uniaxial stress dependence of the binding energy of shallow donor impurities in GaAs-(Ga,Al)As quantum dots.', *J. Appl. Phys.* **90**, 819-823 (2001).
9. H. Odhiambo Oyoko, 'Theoretical study of effect of spatial dielectric function on binding energy of donor impurity located on varying positions along the z-axis of a GaAs quantum well dot of circular x-section', *Ind. J. Pure & Appl. Phys.* **39**, 467-470 (2001).
10. H. Odhiambo Oyoko, 'Effect of Hermanson's spatial dielectric function on donor impurity binding energy in a cylindrical cross-section GaAs/GaAlAs quantum well wire of finite length.', *Ind. J. Pure & Appl. Phys.* **38**, 512 (2000).
11. H. Odhiambo Oyoko, 'Binding energy of the first excited state non-hydrogenic donor impurity in a *GaAs/Ga_{1-x}Al_xAs* quantum well wire of circular x-section and infinite length.', *Proc. Ind. Nat. Sci. Acad.* **63**, A. No. 6, 489-493, (1997).
12. H. Odhiambo Oyoko, *Proc. Joint KPS/ANSTI Conf.* Sept. 1994.
13. P. Csavinszky and H. O. Oyoko, Binding energies of on-axis hydrogenic and non-hydrogenic donors in *GaAs/Ga_{1-x}Al_xAs*, *J. Math. Chem.* **9**, 197-206 (1992).
14. P. Csavinszky and H. O. Oyoko, Binding energy of on-axis hydrogenic and non-hydrogenic donors in *GaAs/Ga_{1-x}Al_xAs* quantum well wires of circular cross-section, *Phys. Rev. B* **43**, 9262 (1991).

CURRENT RESEARCH

1. Density of Impurity States of shallow donors in GaAs/Ga_{1-x}Al_xAs: A theoretical computation of the effect of uniaxial stress and temperature gradient.
2. Computation of the photoionization cross section of a donor impurity in its first excited state in a GaAs quantum well of square cross section. We plan to include applied stress and Hermanson's spatial dielectric function in our calculations.

CONFERENCE ABSTRACTS:

1. H. O. Oyoko, Bulletin of the APS **36**, F13, 2040 (1991).
2. H. O. Oyoko, Bulletin of the APS **36**, F 1 2, 2040 (1991).
3. H. O. Oyoko, Bulletin of the APS **35**, 1546 (1990).

LIST OF CONFERENCE PRESENTATIONS:

1. 48th South African Institute of Physics Annual Conf., Stellenbosch, SA, 2003, "Theoretical study of the effect of uniaxial stress on the binding energy of shallow monovalent donor impurity in GaAs quantum well dot of square cross-section".
2. International KPS/Ansti Conference, September 1994, Nairobi, Kenya, " Theoretical study of the binding energy of a hydrogenic donor impurity in a GaAs/GaAlAs quantum well wire of cylindrical cross-section."
3. H. O. Oyoko, Third Atlantic Chemistry Symposium, Umaine, Orono, May 1990

LATEST SEMINARS:

1. "Theoretical study of the effect of uniaxial stress on the density of impurity states (DOS) in a GaAs quantum well dot (QWD)". June 5, 2005, UDW, Physics Department.
2. "Effect of Uniaxial Stress and Temperature on the donor Impurity Binding Energy and Density of Impurity States in GaAs/GaAlAs QW", UKZN, Westville Campus, November 2007.

VISITS TO RESEARCH INSTITUTES:

1. 9/1996-12/1996: Regular Research Associate, International Center for Theoretical Physics, Trieste, Italy.
2. 6/1999-8/1999: Regular Research Associate, Abdus Salam International Center for Theoretical Physics.

SUPERVISION OF RESEARCH STUDENTS:

1. I am currently supervising two M.Sc. students in their thesis research (They have completed all the requirements for graduation) and one Ph.D. student who has published one paper in J. Koraen Physical Society and submitted a second paper to Physica Scripta.
2. I was an independent examiner of the Ph.D. dissertation of Mr. (now Dr.) Mosomi in the School of Physics at University of KwaZulu-Natal.
3. I was also an external examiner for M.Sc. Theses for Department of Physics, University of Zululand for the years 2006/2008.
4. I have been an external M.Sc. thesis examiner for Egerton University.
5. I was an external examiner for the School of Pure and Applied Sciences at Technical University of Mombasa during the period 2015/2016 academic year.

OTHER ACTIVITIES:

I am currently doing some reading on Loop Quantum Gravity (Carlo Rovelli, and Thomas Thiemann's books), String/M Theory and other issues in Mathematical Physics. Other interests include String Theory and Quantum Cosmology. I also love Lingala and Luo music. I am currently trying to polish my Kiswahili to Tanzanian standard. I enjoy their version of the spoken Kiswahili.

REFERENCES:

1. Dr. Thomas Baluku,
Chairman, Physics Department,
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