

CURRICULUM VITAE

PERSONAL DATA :

Family name: Kuacgor Mathiang
First name: Karlo
Middle name: Ayuel
Date of birth: 1/1/1959
Place of birth: Abyei
Nationality: South Sudanese
Marital status: Married
Languages: Arabic and English (fluent)

MAILING ADDRESS

Kingdom of Saudi Arabia,
Ministry of Higher Education,
Al-Baha University,
Faculty of Sciences,
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AWARDS

Award of: Minister of Higher Education and Scientific Research-Sudan,
Sudan Institute for Natural Sciences in the years 2004-2005 for
distinguished contribution in theoretical Physics.

EMPLOYMENT EXPERIENCE

PROFESSOR from 08/2013 till now:
Department of Physics, Faculty of Science, Al- Baha University.
PROFESSOR, PRINCIPAL from 12/ 2010 to 06/2013:
University of Northern Bahr El Ghazal, South Sudan.
LECTURER from 01/ 2005 to 12/2010:
University of Juba, South Sudan.
LECTURER 02/2002:
Al-Neelain University, Sudan.
DEAN from 09/2003 to 12/2011:
Comboni College for Computer Science Khartoum Sudan.
ASSISTANT DEAN from 09/2003 to 12/2003:
Comboni College for Computer Science.

ASSOCIATE PROFESSOR, PHYSICS HEAD

DEPARTMENT from 08/2000 to 10/2008:

ASSISTANT PROFESSOR from 01/2000 to 07/2000:

Kordofan University, Sudan.

RESEARCH ASSOCIATES from 10/1996 to 01/2000:

University of Amsterdam.

LECTURER from 10/1992 to 01/200:

Kordofan University , Sudan.

TEACHING ASSISTANT from 04/1991 to 04/1992

Kordofan University, Sudan.

TEACHING PHYSICS 06/1982 to 04/1991:

High secondary schools, Ministry of Education Sudan.

EDUCATION

HIGHER DIPLOMA IN COMPUTER SCIENCES 06/2005:

with distinction University of Gezira (Sudan).

DR. (PH.D) DEGREE IN PHYSICS 01/2000:

Thesis on: Atomic current densities and magnetism, Department of physics and astronomy, Amsterdam University (Netherlands-Holland).

M.SC. PHYSICS 10/1992:

Thesis on: "X-RAY DIFFRACTION AND MÖSBAUER STRUCTURAL STUDIES ON THE SYSTEM $Bi_{2-x}Pb_xSr_2Bi_{n-2}Fe_nO_x$, ($x = 1, n = 2,3$)", University of Khartoum-Sudan.

B.SC. PHYSICS AND EDUCATION 05/1982:

with merit , University of Khartoum, Sudan.

Skills

LECTURING SKILLS:

- **Taught the following undergraduate physics courses:** Computational Physics, Quantum Mechanics Classical Mechanics, Electrodynamics, Thermodynamic, Statistical Mechanics, Atomic Physics, Nuclear Physics, Practical Physics, General Relativity and Solid State Physics, Nuclear Physics, and Particle Physics.
- **Taught the following undergraduate computer sciences courses:** Concepts of C++ programming, Logical design, Computer Architecture, Microprocessors, Computer Graphics, Simulation and Modeling, and Numerical Methods.
- **Taught the following postgraduate courses in physics:** Advance statistical mechanics; Computational physics, Advance solid state Physics, and Electronic Structure calculation.

COMPUTATIONAL SKILLS:

- **Considerable knowledge of two operating systems:** MS DOS and Windows and Linux operating systems.
- **Good experience with programming languages such as:** C/C++, Java Pascal, Fortran 77/90, Computer Graphics, Simulation and Modeling, and Numerical Methods.
- **Mastering computer algebra package Maple.**
- **Considerable knowledge of digital techniques,** computer organization, hardware, software, device driver libraries and interrupts.

SUPERVISION SKILLS:

Had supervised several M.Sc and Ph.D Physics thesis' as specified in Table (1).

OTHER SKILLS:

- **Participated in the development of Science-Based Colleges Curricula,** University of Juba, 2007-2009.
- **Participated in the development of curricula** of Faculty of Sciences, Dalanj University-Sudan March 2007,
- **Contributed in establishing of Kordofan University** and Physics department, faculty of sciences and humanities studies ,April 1991-Oct. 2008.

Table 1 :M.Sc and Ph.D Supersied students

No	Student Name	Degree Awarded	Title of the thesis	Year	University
1	Mohamed Mohamed Ahmed Ismaeil	M.Sc	Electronic structure and magnetic properties studies of CeAs, CeP, CeBi, CeSb using quantum Espresso	2019	AL Neelain (Sudan)
2	Gamar Alanbia Bilal Mansor	Ph.D	Calculation of Structural, Electronic and Optical Properties of Alkaline Earth Halides CaF ₂ , BaF ₂ and SrF ₂ Using Quantum Espresso and Yambo Codes	2019	AL Neelain (Sudan)
3	Nahid Mohamed Osman Ata Almanan	Ph.D	Electronic Structure, Optical and Thermal Properties of some Alkaline Earth: CaF ₂ , BaF ₂ , SrF ₂ and SrCl ₂	2013	Alzaiem Alazhari University (Sudan)
4	Maaly Ghariballah	M.Sc	Hole Doping Mott Insulators: Effect on Electronic and Magnetic Structure (DFT+U Study)	2013	AL Neelain (Sudan)
5	Ahmed Osman Mohammed Khair Osman	M.Sc	Electronic and Magnetic Properties of Some Sr-Based Single Pervoskite Oxide Using Spin Density Approximation	2011	AL Neelain (Sudan)
6	Amani Salah Mohammed	Ph.D	The influence of Crystal Field and Induce Magnetic Moments on Current and Magnetization Densities.	2010	AL Neelain (Sudan)
7	Bilquis Ibrahim Adham Babiker	M.Sc	The Effect of Cation Size Disorder on the Curie Temperature (TC) of Some Manganite Materials.	2010	AL Neelain (Sudan)
8	Modammed Ishag Mustafa	M.Sc	Crystal Field Effects on the 3-d-Band Structure Using Tight-Binding Model.	2010	AL Neelain (Sudan)
9	GalalAldeen Albokhary	M.Sc	Scattering of Charged Particles by Infinite Charged Wire.	2009	Sudan University of Science and Technology
10	Leila Yagoub Safielnour Abdallah	M.Sc	Thermal Properties of Gum Arabic.	2009	AL Neelain (Sudan)

11	Mohammed Mustafa Modammed	M.Sc	Simulation of Photoelectrons Counting.	2008	AL Neelain
12	Ahamed F. A	Ph.D	The Effect of Cubic Crystal Field on Charge, Spin and Current Densities in Rare Element	2007	Sudan University of Science and Technology
13	Rihab Omer Mohammed Eltahir	M.Sc	The Effects of Crystal Field on d Orbitals.	2007	AL Neelain (Sudan)
14	Faisal Ahmad Al-Tweit	Ph.D	The Modified Semi-Relativistic Hamiltonian & its Applications to Quantum Nuclear Physics.	2006	Sudan University of Science and Technology
15	Ter Garkek Kerjiok Guandong	M.Sc	Generating Energy Eigenfunctions of Hydrogen Atom by Means of Ladder Operator.	2005	AL Neelain (Sudan)
16	Kamal Aldin Abdalla Ibrahim	M.Sc	Simulating Compton Effects Experiment Using Monte Carlo Method.	2005	Sudan University of Science and Technology

RESEARCH AND

PUBLICATIONS

Research interests: Condensed Matter, Atomic current densities, magnetism and magnetic materials, electronic structure calculations, optical properties.

Publications:

- (1) Signal polariton switch achieved by controlling the phases of excitation fields”, A.S.Abdalla, SulimanAlameen, K.Ayuel, Muhammad SherazKhan, *Physica E Low-dimensional Systems and Nanostructures*(2022)115330
<https://doi.org/10.1016/j.physe.2022.115330>
- (2) “Quantum correlations of exciton–polaritons induced by magnetic field”, A. S. Abdalla, Suliman Alameen, K. Ayuel, Ahmed Mohamed Dafalla, and Nooreldin Fadol, *Journal of Applied Physics* **132**, 024401 (2022);
<https://doi.org/10.1063/5.0094645>
- (3) “Charge densities of transition-metal compounds”, K. Ayuel and Ahmed Zakaria, *JMMM* (2022)169315,
doi.org/10.1016/j.jmmm.2022.169315
- (4) ”Theoretical investigations of optical properties of FeF₂”,Karlo Kuacgor, Ahmed Mohammed, and Emmanuel Longa, *accepted for publication in Journal of the Optical Society of America A* (2022), [DOI 10.1364/JOSAA.425795](https://doi.org/10.1364/JOSAA.425795).
- (5) “Topological spin textures of exciton-polaritons manipulating by spin-orbit coupling”, Adam Sulieman IbrahimAbdalla, Suliman Alameen Abdelmajid and Karlo Ayuel Kuacgor, *Results in Optics* , Vol.3, (2021),100064,
<https://doi.org/10.1016/j.rio.2021.100064>
- (6) “FIRST PRINCIPLES STUDY OF ELECTRONIC AND OPTICAL

- (6) “FIRST PRINCIPLES STUDY OF ELECTRONIC AND OPTICAL PROPERTIES OF BaF_2 ”, NAHID OSMAN, GAMAR. MANSOUR , N.O. KHALIFA, K. AYUEL, **International Journal of Grid and Distributed Computing Vol. 13, No. 1, (2020), pp. 802.**
- (7) “Magnetic Properties of CeAs: LDA+U Studies “ , Mohamed. M. A. Ismaeil, K. Ayuel, and Siddig T. Kafi, **Rep Opinion 2019;11(10):1-5.** [doi: 10.7537/marsroj111019.01.](https://doi.org/10.7537/marsroj111019.01)
- (8) “Theory of polarized neutron form factors of cerium monopnictide CeP ”, K. Ayuel, Amani Salah, Ahmed Zakaria, **Physica B, 552 (2019) 236.** [doi: 10.1016/j.physb.2018.10.013](https://doi.org/10.1016/j.physb.2018.10.013)
- (9) “Orbital and spin contributions to magnetic hyperfine fields of the 3d transition metal ions”, K. Ayuel, Ahmed Zakaria, **JMMM 457 (2018) 42.**[doi: 10.1016/j.jmmm.2018.02.044](https://doi.org/10.1016/j.jmmm.2018.02.044)
- (10) “ First Principles Study of Structural and Optical Properties of Alkaline Earth Halide SrF_2 in its Cubic Phase”, Gamar Alanbia Bilal Mansour, Nahid Osman, Karlo Ayuel, Mohamed A. Siddig; Conference: **2015 International Conference on Computing, Control, Networking, Electronics and Embedded Systems Engineering (ICCNEEE)**
[DOI: 10.1109/ICCNEEE.2015.7381354](https://doi.org/10.1109/ICCNEEE.2015.7381354)
- (11) “Orbital and spin contributions to magnetic hyperfine fields of tri-positive rare earth ions”, K. Ayuel, P.F. Chatel and A.El Hag, **Physica B,457 (2015) 250**
[doi: 10.1016/j.physb.2014.10.017](https://doi.org/10.1016/j.physb.2014.10.017)
- (12) “Ab initio method study of ionic conductor CaF_2 , Osman, N.; Bilal, G.A. ; Osman, N.; Ayuel, K.; Adllan, A., Computing, Electrical and Electronics Engineering (ICCEEE). **2013 International Conference on:**[doi: 10.1109/ICCEEE.2013.6633978](https://doi.org/10.1109/ICCEEE.2013.6633978)
- (13) “Determination of Probability of Photoelectrons Ejection and Surface Efficiency by Using Simulation Techniques”, Mustafa M. and Ayuel K., **Sudan University Journal of science and Technology J.Sc. Tec . 12 (1) 2011.**
- (14) “The influence of crystal field on Magnetization densities for some rare earth ions”, Salah Amani, and K. Ayuel, **Post Graduate Conference August 2010 , AL Neelain University (Sudan).**
- (15) “Multipole expansions: Magnetic and electric fields generated by electrons bound in spin-orbit eigenstates” K. Ayuel, P.F.de Chatel, **Physica B, 404 (2009) 1209-1217:doi : 10.1016/j.physb.2008.11.202**
- (16) Problems Militating Against Physics Education In Sudan K. Ayuel, **2005,**[http://www.wcpsd.org/posters/education/Ayuel.pdf.](http://www.wcpsd.org/posters/education/Ayuel.pdf)
- (17) “Probability and spin densities of rare earth tri-positive ions” K. Ayuel, P.F.de Chatel, **JMMM 277(2004) 43-59. Doi: 10.1016/j.jmmm.2003.10.010**

- (18) "Dirac delta function and probability density of an electron bound in angular momentum eigenstates" **Sudan University Journal of science and Technology**, 5(2004) 15-24.
- (19) "Canted ferromagnetic structure of UniGe in high magnetic fields" K. Prokes, P.F. de Châtel, E. Brück, F.R. de Boer, K. Ayuel, H. Nakotte and V. Sechovský., **Phys.Rev B**, 65 (2002) 144429 doi: [10.1103/PhysRevB.65.144429](https://doi.org/10.1103/PhysRevB.65.144429)
- (20) "Charge, current and spin densities of a two – electron system in Russell – Saunders spins – orbit coupled eigenstates". K. Ayuel, P.F. De Chatel, Salah Amani, **Physica B** 315 (2002) 29 – 37. Doi: [10.1016/S0921-4526\(01\)01461-2](https://doi.org/10.1016/S0921-4526(01)01461-2)
- (21) "Charge, current and spin densities of a two – electron system in Russell – Saunders spins – orbit coupled eigenstates". K. Ayuel, P.F. De Chatel, Salah Amani, **Physica B** 315 (2002) 29 – 37. Doi: [10.1016/S0921-4526\(01\)01461-2](https://doi.org/10.1016/S0921-4526(01)01461-2)
- (22) " Spin and orbital contributions to magnetic scattering of neutrons". K. Ayuel and P.F. de Chatel, **Phys. Rev. B Vol. 61, no. 22, (2000) 15213**.doi: [10.1103/PhysRevB.61.15213](https://doi.org/10.1103/PhysRevB.61.15213)
- (23) "The ambiguity of atomic magnetization". P.F. de Chatel, K. Ayuel, **Physica B** 266 (1999) 256 – 266. doi: [10.1016/S0921-4526\(99\)00044-7](https://doi.org/10.1016/S0921-4526(99)00044-7)
- (24) "The ambiguity of atomic magnetization". P.F. de Chatel, K. Ayuel, **Physica B** 266 (1999) 256 – 266. doi: [10.1016/S0921-4526\(99\)00044-7](https://doi.org/10.1016/S0921-4526(99)00044-7)
- (25) "The magnetic field generated by an electron bond in angular–momentum eigenstates". K. Ayuel and P.F. de Chatel, **Eur. J. Phys** 20 (1999) 5-58. DOI: [10.1088/0143-0807/20/1/017](https://doi.org/10.1088/0143-0807/20/1/017).
- (26) "Quenched orbital moments and neutron form factors "Karlo Ayuel, Peter F, de Chatel, **abstract submitted for the6MAR00 meeting of the American Physics Society**.

PUBLISHED BOOKS

(1) كارلو ايويل كوجفور | مدخل الفيزياء الاحصائية والحرارية

فهرست المكتبة – السودان 536.2 ك.م

الخرطوم : شركة مطابع السودان للعملة، 2008

ردمك: 879-24999-998-8-1

(2) Concepts of C++ Programming Part 1, Karlo Ayuel, Sudan Currency Printing Press, 2010

CONFERENCES:

- The fourth symposium on " Magnetics". Yarmouk University 6-8 November 2000.
- JOINT INFM – THE ABDUS SALAM ICTP SCHOOL ON:
- "MAGNETIC PROPERTIES OF CONDENSED MATTER INVESTIGATED BY NEUTRON SCATTERING AND SYNCHROTRON RADIATION TECHNIQUES" (Trieste, Italy, 1-11 February 2000).
- Forth International workshop on "Physics and Modern applications of Lasers" University of Khartoum 6-12 January 1996.
- The Forth Nile Winter College on Material Sciences, Khartoum University (19992).
- 2nd ICTP-INFN Spring School on:
"Magnetic Properties of Condensed Matter Investigated by Neutron Scattering and Synchrotron Radiation", 19-28 May 2003, Trieste, Italy.
- Summer College and conference on Physics and Chemistry of RARE-EARTH MAGNETICES 1-18 June 2003.

Referees:

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