

CURRICULUM VITAE

Personal Information

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Summary of Qualification

I obtained my bachelor's degree B.Ed. (Physics/Mathematics) in 2011 at the Kenyatta University, in Kenya. I obtained the degree B.Sc. Hons (Physics) in 2015, the degree M.Sc. (Physics) in 2017 and my PhD (physics) in 2020 at the University of the Free State, South Africa. I had served the Teachers Service Commission of Kenya as a teacher of Physics and Mathematics at Moyale Boys Secondary School from May 2012 to May 2014. At the University of the Free State I served as Laboratory and Research Assistant. Currently, I am a Physics lecturer at Murang'a University of Technology since January 2021.

Education Background

YEAR	INSTITUTION	ACTIVITY	OVERALL GRADE
2018-2020	UNIVERSITY OF THE FREE STATE, SA	PhD (PHYSICS)	PASS
2016-2017	UNIVERSITY OF THE FREE STATE, SA	MSc (PHYSICS)	PASS WITH CUM LAUDE (88%)
2014-2015	UNIVERSITY OF THE FREE STATE, SA	B.Sc. (HONS. PHYSICS)	PASS (66%)
2007-2011	KENYATTA UNIVERSITY, KENYA	B.Ed (Sc.) PHYSICS & MATHEMATICS	SECOND-CLASS HONS. (61)
2002-2005	SACHO HIGH SCHOOL, KENYA	K.C.S.E	A- (75/84)
1994-2001	A.I.C VISA OSHWAL PRIMARY SCHOOL, KENYA	K.C.P.E	A- (386/500)

Employment History

- ✓ **Murang'a University of Technology January 2021 up to date:** Lecturer (Physics)
Responsibility: Lecturing, research and any other responsibilities assigned by the supervisor.
- ✓ Part-time Lecturer, **University of Embu** (December 2020- December 2021)

- ✓ **University of the Free State (July 2014 to December 2019):** Laboratory Assistant
Responsibility: Helping the undergraduate classes in Practical Sessions and Tutorials
- ✓ **Moyale Boys Secondary School, Moyale Kenya (May 2012 to May 2014):** Teachers service commission employed teacher
Responsibility: Teaching and other support services delegated by the Principal.
- ✓ **Macci Mixed Mission Secondary School, Kenya (1st July 2011 to 31st April 2012):** Employed Teacher.
Responsibility: Teaching, Guidance/Counseling and other activities delegated by Principal.

Administrative Responsibilities at Murang'a University of Technology

- ✓ Chairman of department of Physical and Biological Sciences (2021 - date).
- ✓ Academic advisor (PhD Physics) 2024 - date
- ✓ Programme coordinator (MSc. Physics and PhD. Physics) 2021 - date.
- ✓ Academic advisor (BSc. Industrial Chemistry) 2021- 2023
- ✓ Postgraduate coordinator (School of Pure Applied and Health Sciences) 2021- date

POSTGRDUATE SUPERVISION

<u>DOCTORATE</u>			
	Student name	Institution	Status
1.	Irungu Kahura Moses	MUT	Thesis writing
2.	Atambo O. Vincent	MUT	Thesis writing
<u>MASTERS</u>			
1.	Waweru Simon Gakuru	MUT	Completed, Graduated August 2024
2.	Kiprotich Cornelius	MUT	Completed, Graduated August 2024
3.	Samuel Ndungu Waithira	UoE	Completed, Graduated September 2024
4.	Victor Kadenge	UoE	Completed, Graduated September 2024
5.	Joan Jepng'etich	MUT	Thesis writing
6.	Boniface Gachanja	MUT	Thesis writing
7.	Bethwel Toroitich	MUT	Proposal Development
8.	Nimrod Gitonga	MUT	Proposal Development

THESES EXAMINATION

I have examined the following thesis both internally and externally;

- ✓ MSc Thesis “Impact of energy Management in a Solar PV Micro-grid” (MUT, Kenya)
- ✓ PhD Thesis “Improvement of Titanium dioxide properties by metal doping for visible light photocatalytic water purification application” (UFS, South Africa)

RESEARCH GRANTS

- ✓ Data Science Africa (DSA) - African AI Research Award 2022. February 2023 – March 2024 (USD 12,500.00 = Kshs. 1,500,000.00).
- ✓ The World Academy of Science (TWAS)- “Seed Grant For New African Principal Investigators” (Sg-Napi)” Jan 2024 – January 2026 (USD 62,000.00 = Kshs. 9,900,000.00)
- ✓ Seeding Labs Equipment- instrumental Access Award 2023 (Kshs. 60,000,000.00)

RESEARCH PROJECTS

- ✓ Preparation and investigation of multifunctional materials based on transparent conducting oxides for possible solar cell application funded by **Data Science Africa - DSA & DEEP LEARNING INDABA through African AI Research February 2023 – March 2024.**
- ✓ Synthesis and characterization of multifunctional nano-materials based on transparent conducting oxides And non oxides for possible solar cell application FUNDED BY UNESCO-TWAS through “**Seed Grant For New African Principal Investigators” (Sg-Napi)” Jan 2024 – January 2026**

COMMUNITY SERVICE

- ✓ Contribution towards the Covid-19 emergency fund.
- ✓ MUT- MUWASCO project in biogas production from municipality waste.
- ✓ Mentoring of high school students

OTHER SKILLS, WORKSHOPS AND TRAININGS

- ✓ Auditors’ Training on the 17025:2017 Laboratory ISO Standards on 4th - 6th September 2024.
- ✓ Workshop Training on Building Capacity for Competency Based Education (CBE) at Dedan Kimathi University of Technology Thursday, May 30th and Friday, May 31st 2024
- ✓ MRS-K Virtual Workshop on Cambridge Structural Database Thursday 25th July, 2024, Materials Research Society of Kenya Nairobi, Kenya
- ✓ Cybersecurity and Emerging Technologies Awareness Training. Conducted by the ICT Authority, Kenya in collaboration with Soft Tech Solutions on July 5, 2024
- ✓ Implementation Training on the 17025:2017 Laboratory ISO Standards on 17th-21st June 2024
- ✓ Annual MUT Pedagogy training June 2023
- ✓ Capacity Building for Universities on Implementation of Guidelines for Mainstreaming of Global Citizenship Education and Education for Sustainable Development in Universities 9th to 10th March 2023 at AICAD Juja, Kenya.
- ✓ Fundamentals of X-ray Diffraction Virtual Workshop, 18th - 20th July, 2023
- ✓ Competence Based Curriculum Training 12th -14th January, 2022
- ✓ Curriculum development and review of programmes as per the CUE guidelines.
- ✓ Operating system: WINDOWS, Programming language: C++ (basic), MATLAB (working knowledge), and Java: Visual Basic windows operating system

- ✓ Trained and developed expertise in operating various instruments/systems like, XRD. PL, UV spectrophotometer, SEM, FTIR etc. for research at University of Free State

PROFESSIONAL MEMBERSHIP

- ✓ Materials Research Society (MRS), 2014 - date
- ✓ Materials Research Society Kenya (MRSK), 2024 - date
- ✓ African Materials Research Society (AMRS), 2023 – date
- ✓ Physical Society of Kenya (PSK), 2023 - date
- ✓ South African Institute of Physics (SAIP) 2014 - date

RESEARCH INTERESTS

- ✓ Experimental Condensed Matter Physics
- ✓ Material sciences and technologies
- ✓ Experimental spectroscopy
- ✓ Fabrication and Characterization of Organic electronic devices
- ✓ Charge transport phenomena across semiconductor interfaces
- ✓ Semiconductor characterizations
- ✓ Nanomaterial science and nanotechnology

LIST OF PUBLICATIONS

YEAR 2022 - TO DATE

1. Waithira, S., **Kiprotich, S.**, Wako, A. H., & Nyamoto, G. S. (2024). Effects of pH on the Structural and Optical Properties of $\text{CaAl}_2\text{O}_4: \text{Eu}^{2+}, \text{Dy}^{3+}$ Nanoparticles. *Trends in Sciences*, 21, Manuscript. <https://doi.org/10.48048/tis.2024.8432> June 2024
2. Kadenge, V., **Kiprotich, S.**, Kawira, M., & Wako, A. (2024). Effect of Dy^{3+} Concentrations on the Structural and Optical Properties of $\text{SrAl}_2\text{O}_4: \text{Eu}^{2+}, \text{Dy}^{3+}$ NPs. *Trends in Sciences*, 21(9), 8308-8308. <https://doi.org/10.48048/tis.2024.8308> June 2024
3. Bett, Kiprotich, and **Sharon Kiprotich**, “Effects of Stirring Speed of Precursor Solution on the Structural, Optical and Morphological Properties of ZnO:Al:Ga Co-Doped Nanoparticles Synthesized via a Facile Sol-Gel Technique” *American Journal of Condensed Matter Physics* 2024, 13(1): 9-20. DOI: 10.5923/j.ajcmp.20241301.02. June 2024
4. Waweru, Gakuru Simon, **Sharon Kiprotich**, and Peter Waithaka, “Structural and Optical Properties of Fe Doped TiO_2 Nanoparticles: Investigation of Effects of Different Doping Concentration”. *Advances in Materials* 2024, Vol. 13, No. 2, pp. 20-30 <https://doi.org/10.11648/j.am.20241302.11>. May 2024
5. Waweru, Gakuru Simon, **Sharon Kiprotich**, and Peter Waithaka, “Effects of Growth Temperature on the Structural and Optical Properties of Synthesized Titanium Dioxide Nanoparticles”. *American Journal of Materials Science* 2024, 14(1): 12-20 DOI: 10.5923/j.materials.20241401.02. March 2024.
6. Kiprotich Bett, **Sharon Kiprotich**, Jatani Ungula and Warren Andayi, “Structural and Optical Properties of ZnO:Al:Ga Co-Doped Nanoparticles: Investigation on the Effects of pH of the Precursor Solution via a Simple Sol-Gel Route” *American Journal of Materials Science* 2024, 14(2): 21-30 DOI: 10.5923/j.materials.20241402.01. May 2024
7. Waweru, Gakuru Simon, **Sharon Kiprotich**, and Peter Waithaka, “Effects of Different Zn Doping Concentration on the Optical and Structural Properties of TiO_2 Nanoparticles”.

Nanoscience and Nanotechnology 2024, 13(1): 1-9 DOI: 10.5923/j.nn.20241301.01 May 2024

8. J. Ungula, **S. Kiprotich**, and H. C. Swart. "Effect of Deposition Time on Material Properties of ZnO Nanorods Grown on GZO Seed Layer by CBD." *Journal of Nanosciences Research & Reports*. SRC/JNSRR-170. DOI: [doi.org/10.47363/JNSRR/2024\(6\)156](https://doi.org/10.47363/JNSRR/2024(6)156) (2024): 2-6.
9. **S. Kiprotich**, "Synthesis and Characterization of Zinc Telluride Quantum Dots: Studies on the Structural and Optical Properties" *Journal of Nanosciences Research & Reports* 2024. SRC/JNSRR-159. DOI: [doi.org/10.47363/JNSRR/2023\(5\)154](https://doi.org/10.47363/JNSRR/2023(5)154). September 2023
10. Nkaule, Anati N., **Sharon Kiprotich**, Leandre B. Brandt, Thomas Gerber, Abram M. Madiehe, Nandipha L. Botha, and Martin O. Onani. "Effects of Reaction Temperature and Cadmium Source on the Optical, Morphological and Cytotoxic Properties of CdSe/ZnSe Quantum Dots." *ChemistrySelect* 8, no. 47 (2023): e202301962.
11. Ungula, Jatani, **Sharon Kiprotich**, Hendrick C. Swart, and Birhanu F. Dejene. "Investigation on the material properties of ZnO nanorods deposited on Ga-doped ZnO seeded glass substrate: Effects of CBD precursor concentration." *Surface and Interface Analysis* 54, no. 10 (2022): 1023-1031.
12. **Kiprotich, Sharon**, F. B. Dejene, and Martin O. Onani. "Effects of growth time on the material properties of CdTe/CdSe core/shell nanoparticles prepared by a facile wet chemical route." *Materials Research Express* 9, no. 2 (2022): 025008.

YEAR 2016-2019

13. **Kiprotich, Sharon**, Francis B. Dejene, and Martin O. Onani. "Capping Ligand Influence on the Structural, Optical and Luminescence Properties of CdTe Nanoparticles Prepared by a Simple Wet Chemical Process." *ChemistrySelect* 4, no. 11 (2019): 3096-3104. <https://doi.org/10.1002/slct.201803974>
14. **Kiprotich, Sharon**, Francis B. Dejene, and Martin O. Onani. "Effects of selenium concentration in the precursor solution on the material properties of cadmium selenide flower-like nanoparticles." *Applied Physics A* 125 (2019): 1-12. <https://doi.org/10.1007/s00339-018-2303-0>
15. **Kiprotich, Sharon**, Francis B. Dejene, and Martin O. Onani. "Structural and optical properties of novel CdSe nanoparticles produced via a facile synthetic route: Studies on the effects of cadmium sources." *Surface and Interface Analysis* 51, no. 7 (2019): 722-732. <https://doi.org/10.1002/sia.6643>
16. **Kiprotich, Sharon**, B. F. Dejene, and M. O. Onani. "Structural, optical and luminescence properties of CdTe quantum dots: Investigation on the effect of capping ligand ratio." *Materials Research Express* 5, no. 6 (2018): 065028. <https://doi.org/10.1088/2053-1591/aac938>
17. **Kiprotich, Sharon**, B. F. Dejene, and M. O. Onani. "Effects of precursor pH on structural and optical properties of CdTe quantum dots by wet chemical route." *Journal of Materials Science: Materials in Electronics* 29 (2018): 16101-16110. <https://doi.org/10.1007/s10854-018-9699-3>
18. **Kiprotich, Sharon**, Martin O. Onani, and Francis B. Dejene. "Effect of growth temperature on the structural, optical and luminescence properties of cadmium telluride nanoparticles." *Journal of Materials Science: Materials in Electronics* 29 (2018): 6004-6011. <https://doi.org/10.1007/s10854-018-8574-6>

19. **Kiprotich S**, Onani MO, Ndwandwe MO, Dejene FB (2018) Effect of Tellurium Concentration of the Solution on the Structural, Optical and Luminescence Properties of Cadmium Telluride Nanoparticles. *J Nanomater Mol Nanotechnol* 7:2. <https://doi.org/10.4172/2324-8777.1000245>
20. **Kiprotich, Sharon**, Martin O. Onani, and Francis B. Dejene. "A comparison investigation of optical, structural and luminescence properties of CdO_xTe_{1-x} and CdTe_xSe_{1-x} nanoparticles prepared by a simple one pot method." *Physica B: Condensed Matter* 535 (2018): 72-78. <https://doi.org/10.1016/j.physb.2017.06.057>
21. **Kiprotich, Sharon**, Martin O. Onani, and Francis B. Dejene. "High luminescent L-cysteine capped CdTe quantum dots prepared at different reaction times." *Physica B: Condensed Matter* 535 (2018): 202-210. <https://doi.org/10.1016/j.physb.2017.07.037>
22. **Kiprotich, Sharon**, Francis B. Dejene, Jatani Ungula, and Martin O. Onani. "The influence of reaction times on structural, optical and luminescence properties of cadmium telluride nanoparticles prepared by wet-chemical process." *Physica B: Condensed Matter* 480 (2016): 125-130. <https://doi.org/10.1016/j.physb.2015.08.062>

SUBMITTED ARTICLES, AUGUST 2024

1. Effects of Synthesis Temperature on the Structural and Optical Properties of CaAl₂O₄: Eu²⁺, Dy³⁺ Nanoparticles submitted to Scientific African.
2. Effects of annealing temperature on the material properties of ZnO:Al:Ga co-doped nanoparticles for solar cell applications submitted to journal of nanostructures
3. Structural and Optical Properties of SrAl₂O₄:Eu²⁺, Dy³⁺ Nanoparticles: Influence of Growth Temperature" submitted to Luminescence journal

THESES AND DISSERTATIONS

PhD thesis

Sharon, Kiprotich. "Growth and characterization of tunable CdTe and CdSe nanoparticles by facile synthetic route for use in biological applications. "PhD diss., University of the Free State (Qwaqwa Campus), 2020.

MSc thesis

Sharon, Kiprotich. "Synthesis and characterization of CdY (Y= Te/O/Se) nanoparticles by wet chemical process." MSc diss., University of the Free State (Qwaqwa Campus), 2017. <http://hdl.handle.net/11660/9178>

PRESENTATIONS AT CONFERENCES

- ✓ DSA Nyeri 2024 Workshop, Dedan Kimathi University of Technology, Kenya 6th- 7th June 2024. Comparison Investigation on the Material Properties of TiO₂ and CdO And ZnO:Al:Ga Co-Doped Nanoparticles for Possible Solar Cell Applications by **Sharon Kiprotich**.
- ✓ 7th Kirinyaga University, Kenya Annual International conference 2024 under the sub theme Natural & Physical sciences, March 27th, 2024: Effects of Zn and Fe concentrations on the optical and structural properties of titanium dioxide nanoparticles by Gakuru Simon Waweru, **Sharon Kiprotich** and Peter Waithaka.

- ✓ 5th Annual International Conference : Machakos University, Kenya Theme: Leveraging Research, Innovation and Technology for Socioeconomic Development 14th - 16th June 2023 “Effects of deposition time on material properties of ZnO nanorods grown on GZO seed layer by Chemical Bath Deposition Method” by Jatani Ungula, **Sharon Kiprotich** and Hendrick Swart
- ✓ 1st International Conference on Innovation and Technology for sustainable development Murang’a University of Technology, Kenya 3rd – 5th November 2021. Structural, optical and luminescence properties of CdTe NPs: Effects of Te concentration. **Kiprotich S.**, Dejene B.F., Ungula J. and Onani M.O
- ✓ 6th South African Conference of Photonic Materials (SACPM) Mabula (RSA) 3rd - 8th May 2015, The influence of reaction times on structural, optical and luminescence properties of cadmium telluride nanoparticles prepared by wet-chemical process; **Kiprotich S.**, Dejene B.F., Ungula J. and Onani M.O.
- ✓ 61st Annual conference of the South African institute of Physics (SAIP) University of capetown (UCT), Capetown (RSA) 4th - 8th July 2016, Effect of refluxing growth time on optical, structural and luminescent properties of ZnTe quantum dots, **Kiprotich S.**, Dejene B.F. and Onani M.O.
- ✓ 7th South African Conference of Photonic Materials (SACPM) Amanzi (RSA) 27th - 31st March 2017, A comparison investigation of optical, structural and luminescence properties of CdOxTe1-x and CdTexSe1-x nanoparticles prepared by a simple one pot; **Kiprotich S.**, Dejene B.F. and Onani M.O.
- ✓ 7th South African Conference of Photonic Materials (SACPM) Amanzi (RSA) 27th - 31st March 2017, High luminescent L-cysteine capped CdTe quantum dots prepared at different reaction times; **Kiprotich S.**, Dejene B.F. and Onani M.O.

REFEREES

- Prof. F. B. Dejene
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