

# DR. DUNCAN KIBOI BOIYO, PhD

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**Name:** Dr. Duncan Kiboi Boiyo

**Sex:** Male

**Marital Status:** Married

**Current Address:** Department of Maths, Physics and Computing, Moi University, P.O. Box 3900-30100, Eldoret, Kenya

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**Nationality:** Kenyan

**Religion:** Christian

**Language:** English, Kiswahili

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## **CAREER OBJECTIVE**

Be competent, ambitious, industrious and looking forward to induce the knowledge acquired in organizational, institutional sectors and in the world of physics and technology to realize their Missions and Visions.

## **PERSONAL PROFILE**

Self-motivated, creative, responsible, God fearing and can work with minimum supervision.

## **ACQUIRED SKILLS**

1. Laser optics and applications in Telecommunication Systems.
2. Solar PV Technologies
3. Terrestrial and Marine Optical Fibre Links
4. Experimental skills in optical fibre communication and applications; deployment, error-detection and diagnostics using OTDR, splicing, connections and cabling.
5. Concepts of basic Networking, Network intelligence and management.
6. Computation, programming and simulation: MatLab, Mathcad, Mathematica, LabView, VPI, Optisystem, OptiBPM and Origin.
7. Research, methodology, analysis, dissemination and presentation.

**Teaching Areas:** Semiconductor physics, Physics for Engineers, Physics for Public Health, Physics for Environmental Science, Analogue and Digital Electronics, Measurement and Instrumentation, Linear and non-linear Optics, Fibre Optics, Transmission Lines, Physical optics, Mechanics, Electronics, Electricity and magnetism, Quantum Mechanics, Thermo-electrodynamics, Renewable Energy Technologies, Solar PV Systems, and Medical Optics.

## **EDUCATION**

- 1) Feb, 2017 to Sep 2017: Nelson Mandela University, South Africa  
*Postdoctoral Researcher*- Physics Department
- 2) 2014-2017: Nelson Mandela University, South Africa  
*Doctor of Philosophy (PhD)* in Physics  
Research Thesis/Project Title: **Optimization of Flexible Spectrum in Optical Transport Networks**
- 3) 2009 to 2013: University of Eldoret, Eldoret, Kenya.  
*Master of Science (MSc) in Physics (Laser Optics)*  
**Experimental research** in Port Elizabeth, South Africa.
- 4) 2005 to 2009: Moi University- Eldoret, Kenya  
*Bachelor of Science (BSc. Hons)- Physics*  
Award: **2<sup>nd</sup> Class Honours Upper Division**
- 5) 2000 to 2003: Lenana School-Nairobi  
*Kenya Certificate of Secondary Education (KCSE)*

- 6) 1991 to 1999: Namorio Primary School, Mt. Elgon District  
*Kenya Certificate of Primary education (KCPE)*

### **OTHER TRAINING**

1. 23<sup>rd</sup> Sep- 2020- Virtual Intellectual Property Training- Machakos University
2. 17<sup>th</sup>- 19<sup>th</sup> Oct 2018-Resource Mobilization and Grant Writing Course, Machakos  
*By Training Centre in Communication Africa, Nairobi*  
Award: Certificate
3. 2014: Laser Applications and Safety, CSIR, South Africa  
Award: **Certificate**

### **WORK EXPERIENCE**

Period	Institution	Role	Activities
Feb 2023- date	Moi University	<ul style="list-style-type: none"> <li>• Lecturer</li> <li>• Researcher</li> </ul>	<ol style="list-style-type: none"> <li>1. Lecturing</li> <li>2. Supervision of under- and Postgraduate students</li> <li>3. Research</li> <li>4. Curriculum development</li> </ol>
Feb- September 2020	Machakos University	<ul style="list-style-type: none"> <li>• Acting Director, Centre for Renewable Energy (CREN)</li> </ul>	<ol style="list-style-type: none"> <li>1. Administration of Centre</li> <li>2. Coordination of Activities</li> <li>3. Grant Application</li> <li>4. Development of Projects</li> <li>5. Community Service</li> </ol>
Sep 2017-December 2022	Machakos University- Physical Sciences Department	<ul style="list-style-type: none"> <li>• Lecturer</li> <li>• Departmental Examinations and Timetable Coordinator (Sep 2017- Jan 2020)</li> </ul>	<ol style="list-style-type: none"> <li>1. Lecturing</li> <li>2. Supervision of undergraduate students</li> <li>3. Research</li> <li>4. Administrative responsibilities</li> <li>5. Curriculum development and leadership</li> </ol>
January- September 2017	Nelson Mandela University- Physics Department	Postdoc Researcher	<ol style="list-style-type: none"> <li>1. Research</li> <li>2. Lecturing</li> <li>3. Supervision of postgraduate students</li> <li>4. Mentorship</li> <li>5. Research</li> </ol>
2014-2016	Nelson Mandela University- Physics Department	Graduate/Tutorial/Lab Assistant	<ol style="list-style-type: none"> <li>1. Conducting tutorials to undergraduates</li> <li>2. Setting up experiments</li> </ol>
2019-2013	University of Eldoret- Physics Department	<ul style="list-style-type: none"> <li>• Part-time Lecturer,</li> <li>• Tutorial and Lab demonstrator</li> </ul>	<ol style="list-style-type: none"> <li>1. Lecturing undergraduate courses</li> <li>2. Settings up experiments</li> <li>3. Assessment</li> </ol>
2010	Mt. Kenya University	Part-time Lecturer	Lecturing and assessment of undergraduate courses

### **SEMINARS, EXHIBITIONS, CONFERENCES & WORKSHOPS**

- a) Attended the **Optica Foundation**, *Subsea Optical Fibre Communications School*, Backafallsbyn, Sweden, **10<sup>th</sup>-16<sup>th</sup> July 2022**
- b) Attended the **Virtual Google and OSA Foundation Mini-Dive**, *Subsea Optical Fibre Communications International Summer School* **6<sup>th</sup>-8<sup>th</sup> August 2020**.
- c) Attended the **Google and OSA Foundation**, *Subsea Optical Fibre Communications International Summer School*, **Polvijärvi, Finland, 4<sup>th</sup>-10<sup>th</sup> August 2019**.

- d) *Duncan Kiboi Boiyo, E.K. Rotich Kipnoo, T.B. Gibbon, "Bragg Trans-reflectance OADM based VCSEL Optical Fibre Access Networks within the 1550nm Transmission Window", 2<sup>nd</sup> Annual International Machakos University Conference, 24<sup>th</sup>-26<sup>th</sup> April 2019.*
- e) **D. Kiboi Boiyo**, "Green VCSEL Technology: Powering Fibre to the Village (FTTV) Access Networks for Kenyan Villages", *SEKU-UMMA university International Conference, 21st- 23rd Nov 2018.*
- f) 28<sup>th</sup> Nov- 2<sup>nd</sup> December, 2016- **Cape Town, South Africa**: Presented PhD Research Report at the SKA Postgraduate Conference.
- g) 23<sup>rd</sup> to 28<sup>th</sup> Nov, 2016- **STIAS Wallenburg, Cape Town, South Africa**, attended and presented Research Progress at the **ALC Annual Workshop 2016.**
- h) 28<sup>th</sup> to 1<sup>st</sup> Dec, 2016- **Stellenbosch University, Cape Town, South Africa**, attended **ALC Laser Imaging Workshop 2016.**
- i) 11<sup>th</sup>-15<sup>th</sup> Sep, 2016, **Skukuza, Kruger Park, South Africa**, Presented a research at the 4<sup>th</sup> SMEOS Conference.
- j) 4<sup>th</sup>-7<sup>th</sup> Sep, 2016- **Fancourt, George, South Africa**. Presented a paper at the South African telecommunication networks and applications conference (SATNAC) 2016.
- k) 31<sup>st</sup> June-9<sup>th</sup> July, 2016: Presented a poster paper at the South African institute of physics conference (SAIP), **University of Cape Town (UCT), Cape Town.**
- l) 2<sup>nd</sup>-4<sup>th</sup> Dec- **Zevenwacht, Stellenbosch, South Africa**, attended and presented Research Progress at the **ALC Annual Workshop 2015.**
- m) 30<sup>th</sup> Nov- 4<sup>th</sup> December, 2015- **Cape Town, South Africa**: Presented Research Progress at the SKA Postgraduate Conference.
- n) 6<sup>th</sup> – 9<sup>th</sup> Sept 2015- **Arabella, Hermanus, Western Cape, South Africa**. Presented a paper at the South African telecommunication networks and applications conference (SATNAC) 2015.
- o) 29<sup>th</sup> June – 3rd July 2015, **Port Elizabeth, South Africa**- Presented a paper at the South African institute of physics conference (SAIP).
- p) 4<sup>th</sup>- 8<sup>th</sup> December, 2014, **Cape Town, South Africa**: Presented Research Progress at the SKA Postgraduate Conference.
- q) 3<sup>th</sup>-5<sup>th</sup> November, 2014, **Rabat, Morocco**: Attended and presented at the **ALC Annual Workshop 2014.**
- r) 31<sup>st</sup> Aug – 3<sup>rd</sup> Sept, 2014, **Port Elizabeth, South Africa**: Presented a paper at SATNAC 2014 Conference.
- s) 7<sup>th</sup> – 11<sup>th</sup> July, 2014, **Johannesburg, South Africa**: Presented a paper at SAIP 2014 Conference.
- t) 4<sup>th</sup>-8<sup>th</sup> Sep 2012, **Eldoret, Kenya**: presented a paper at *Moi University Inter. Conference.*
- u) 3<sup>rd</sup>-4<sup>th</sup> May 2012, **JKUAT, Nairobi, Kenya**: Presented a paper at the Mechanical Engineering Annual SRI Conference.
- v) 23<sup>rd</sup> March-14<sup>th</sup> June, 2012, **NMMU, and Port Elizabeth, South Africa**: participated in discussions and research regarding Optical Fibre Technologies at **Nelson-Nelson Mandela University-South Africa** through African Laser Centre (ALC) funding.

## **PUBLICATIONS: Journals, Conference Proceedings and Book of Abstracts**

### **JOURNALS**

1. S. Wassin, GM Isoe and D Kiboi Boiyo, (2022). The Square Kilometre Array: The Notion of Timing and Synchronization, JKUAT Sustainable Research and Innovation, pp 52-55
2. SO Kuja, EK Kipnoo and D K Boiyo, (2022). Interaction between the Linear and Nonlinear Polarization in Optical fibre, JKUAT Sustainable Research and Innovation, pp 176-179
3. Henry Chepkoiwo Cherutoi, Kennedy Mwaura Muguro, David Wafula Waswa, Enoch Rotich Kipnoo, **Duncan Kiboi Boiyo**, George Mosoti Isoe, Andrew Leitch, Timothy Gibbon, Performance of 1550 nm VCSEL at 10 Gb/s in G.655 and G.652 SSMF, International Journal of Sustainability Management and Information Technologies. Vol. 6, No. 1, 2020, pp. 13-17. doi: [10.11648/j.ijsmi.20200601.12](https://doi.org/10.11648/j.ijsmi.20200601.12)
4. **D. Kiboi Boiyo**, G. M. Isoe, E. K. Kipnoo & T. B. Gibbon (2019) Bidirectional and wavelength unrestricted conversion for long-haul and data centre VCSEL optical fibre interconnects, Journal of Modern Optics, DOI: [10.1080/09500340.2019.1686185](https://doi.org/10.1080/09500340.2019.1686185)

5. G. M. Isoe, **D. Kiboi Boiyo**, E. K. Rotich, D. M. Osiemo & T. B. Gibbon (2019) Integrated extended reach VCSEL interconnect with 8.5 Gbps data modulated forward Raman pump signals, *Journal of Modern Optics*, 66:19, 1913-1919, DOI: 10.1080/09500340.2019.1683632
6. E. K. Rotich Kipnoo, G.M. Isoe, D.K. Boiyo, S. Kuja, D. Waswa, T.B. Gibbon, & A.W.R. Leitch (2019). All Optical Polarization-Based and DSP-Assisted Distributed Fiber Sensor for Earth Mass Movements Caused by Environmental Factors. *Optik*, 163691.  
<https://doi.org/10.1016/j.ijleo.2019.163691>
7. G. M. Isoe, **D. Kiboi Boiyo**, E. K. Rotich & T. B. Gibbon (2019), Ultra-fast optical switch with reconfigurable wavelength reuse functionality for dynamic flexible spectrum networks, *Journal of Modern Optics*, DOI: 10.1080/09500340.2019.1686184
8. G. M. Isoe, **D. K. Boiyo** & T. B. Gibbon (2019) Dynamic O-band to C-band wideband wavelength converter for integrated VCSEL-based optical interconnects, *Journal of Modern Optics*, ISSN: 1362-3044, DOI: [10.1080/09500340.2019.1654626](https://doi.org/10.1080/09500340.2019.1654626)
9. P. P. Dlamini, G. M. Isoe, **D. Kiboi Boiyo**, A. W. R. Leitch, and T. B. Gibbon (2019), "All-Optical VCSEL-to-VCSEL Injection Based on Cross Gain Modulation for Routing in Multinode Flexible Spectrum Optimization in Optical Fibre Transmission Links," *International Journal of Optics*, vol. 2019, Article ID 2987652, 11 pages, 2019. ISSN: 1687-9392 <https://doi.org/10.1155/2019/2987652>.
10. G. M. Isoe, E. K. Rotich, **D. K. Boiyo**, S. Wassan, A. W. R. Leitch & T. B. Gibbon (2019) All-optical wavelength reuse with simultaneous upstream data and PPS timing signal transfer for flexible optical access networks, *Journal of Modern Optics*, ISSN: 1362-3044, DOI: [10.1080/09500340.2019.1615565](https://doi.org/10.1080/09500340.2019.1615565)
11. **D. Kiboi Boiyo**, E.K. Rotich Kipnoo, T.B. Gibbon, "An integrated OADM based on Bragg trans-reflectance in 1550 nm VCSEL optical fibre access networks", *Optik- Int. J. Light Electron Opt*, Volume 178, 2019, Pages 478-482, ISSN 0030-4026, <https://doi.org/10.1016/j.ijleo.2018.09.153>.
12. **D. Kiboi Boiyo**, T.B. Gibbon, E.K. Rotich Kipnoo, A VCSEL-based backbone extended-reach optical fibre network: Supporting up to 10 Gbps flexible access networks for Africa, *Optical Fiber Technology*, Volume 43, 2018, Pages 126-130, ISSN 1068-5200, <https://doi.org/10.1016/j.yofte.2018.04.013>.
13. **D. Kiboi Boiyo**, E.K. Rotich Kipnoo, R.R.G. Gamatham, A.W.R. Leitch, T.B. Gibbon, A Signal Impairment-Aware Scheme for Next-Gen Flexible Spectrum in 10 Gb/s VCSEL Metro-Access Optical Fibre Networks, *Optical Switching and Networking*, Volume 25, 18 March 2017, Pages 57-62, ISSN **1573-4277**, <http://dx.doi.org/10.1016/j.osn.2017.03.002>.
14. E.K. Rotich Kipnoo, **D. Kiboi Boiyo**, G.M. Isoe, T.V. Chabata, R.R.G. Gamatham, A.W.R. Leitch, T.B. Gibbon, Demonstration of Raman-based, dispersion-managed VCSEL technology for fibre-to-the-hut application, *Optical Fiber Technology*, Volume 34, March 2017, Pages 1-5, ISSN **1068-5200**, <http://dx.doi.org/10.1016/j.yofte.2016.12.001>.
15. **Duncan Kiboi Boiyo**, T.V. Chabata, E.K. Rotich Kipnoo, R.R.G. Gamatham, A.W.R. Leitch, T.B. Gibbon, Reconfigurable high-speed optical fibre networks: Optical wavelength conversion and switching using VCSELs to eliminate channel collisions, *Optical Fiber Technology*, Volume 33, January 2017, Pages 30-35, ISSN **1068-5200**. <http://dx.doi.org/10.1016/j.yofte.2016.11.001>.
16. T. V. Chabata, **D. Kiboi Boiyo**, E. K. R. Kipnoo, R. R. G. Gamatham, A. W. R. Leitch, and T. B. Gibbon, Signal monitoring and performance stability evaluation tool in a high speed optical communication network, *Opt. - Int. J. Light Electron Opt.*, vol. 127, no. 20, pp. 9001–9007, 2016. ISSN: **0030-4026**.  
<http://dx.doi.org/10.1016/j.ijleo.2016.06.085>.
17. D. Kiboi Boiyo, S. Kuja, D. Waswa, G. Amolo, R. R. G. Gamatham, E. K. Rotich Kipnoo, T. B. Gibbon, A.W.R. Leitch, "Effects of polarization mode dispersion (PMD) on Raman gain and PMD measurement using an optical fibre Raman amplifier," 2013 Africon, Pointe-Aux-Piments, 2013, pp. 1-5.

#### **CONFERENCE PROCEEDINGS AND BOOKS OF ABSTRACTS**

1. Puhmla, P., G. M. Isoe, **Duncan Kiboi Boiyo**, A.W. R. Leitch and T. B. Gibbon, "Cascaded VCSEL-to-VCSEL all-optical injection for spectral defragmentation and switching using optical transmitter cross gain modulation", Proceedings Volume 10946, Metro and Data Center Optical Networks and Short-Reach Links II; 109460P (2019), *SPIE OPTO, 2019, San Francisco, California, United States*, DOI: 10.1117/12.2509981

2. **Duncan Kiboi Boiyo**, E.K. Rotich Kipnoo, T.B. Gibbon, "Bragg Trans-reflectance OADM based VCSEL Optical Fibre Access Networks within the 1550nm Transmission Window", *2<sup>nd</sup> Annual International Machakos University Conference, 24<sup>th</sup>-26<sup>th</sup> April 2019*.
3. **D. Kiboi Boiyo**, "Green VCSEL Technology: Powering Fibre to the Village (FTTV) Access Networks for Kenyan Villages", *SEKU-UMMA university International Conference, 21st- 23rd Nov 2018*.
4. **D. Kiboi Boiyo** and Tim Gibbon, "Flexible Spectrum for High Speed Optical Fibre Networks", SKA SA-HCD 2016 Postgraduate Bursary Conference, *Fire and Ice Hotel, Cape Town*, 28<sup>th</sup> Nov-2<sup>nd</sup> Dec 2016).
5. **D. Kiboi Boiyo**, Tim Gibbon and Andrew Leitch, "An all optical VCSEL-to-VCSEL 1550 nm wavelength conversion for high-speed fibre transmission", *9<sup>th</sup> African Laser Centre Student Workshop STIAS, Stellenbosch*, South Africa (23rd- 28<sup>th</sup> Nov 2016).
6. **D. Kiboi Boiyo**, G. M. Isoe, A.W.R. Leitch, R.R.G. Gamatham, T.B. Gibbon, "A 1550 nm All Optical VCSEL to VCSEL Wavelength Conversion of a 8.5 Gb/s Data Signal and Transmission over a 24.7 km Fibre", *Proc. SPIE*, Skukuza, South Africa (11-15<sup>th</sup> Sept 2016), **vol. 10036. SPIE, p. 100360X-1-100360X-6, 2017**.
7. **D. Kiboi Boiyo**, G. M. Isoe, E. K. Rotich Kipnoo, R. R. G. Gamatham, A.W. R. Leitch and T. B. Gibbon, "Utilization of Flexible Spectrum to Optimize a 24.7 km Fibre TDM Passive Optical Network", Proceedings of the SATNAC Conference 2016, Fancourt, George, South Africa (4th – 7th Sept 2016), p.p. 8-12. ISBN: **978-0-620-72418-0**.
8. G. M. Isoe, **D. Kiboi Boiyo**, S. Wassin, E. K. Rotich Kipnoo, R. R. G. Gamatham, A.W. R. Leitch and T. B. Gibbon, "Effect of 10 Gbps Data Transmission on 1.712 GHz 1309.97 nm VCSEL Based Radio Frequency Distribution over a Single Optical Fibre for the Telescope Array", Proceedings of the SATNAC Conference 2016, Fancourt, George, South Africa (4th – 7<sup>th</sup> Sept 2016), p.p. 156-159. ISBN: **978-0-620-72418-0**.
9. Shukree Wassin, George M. Isoe, **D. Kiboi Boiyo**, Romeo R. G. Gamatham, Andrew W. R. Leitch and Tim B. Gibbon, "Component Power Budget Analysis and VCSEL Characterization for the Square Kilometre Array Signal and Data Transport Network", Proceedings of the SATNAC Conference 2016, Fancourt, George, South Africa (4th – 7th Sept 2016), p.p. 160-164. ISBN: **978-0-620-72418-0**.
10. K.J. Leburu, G.M. Isoe, S. Wassin, **D. Kiboi Boiyo**, R.R.G. Gamatham, A.W.R. Leitch and T. B. Gibbon, "Transmission of Pulse per Second Clock Tone Signals in Optical Communication Systems over Optical Fibre and Free Space" Proceedings of the SATNAC Conference 2016, Fancourt, George, South Africa (4th – 7th Sept 2016), p.p. 21-24. ISBN: **978-0-620-72418-0**.
11. **D. Kiboi Boiyo**, G. M. Isoe, E. K. Rotich Kipnoo, R. R. G. Gamatham, A.W. R. Leitch and T. B. Gibbon, "Characterization and Compensation of Fibre Link Dispersion in a 10 Gb/s Flexible Network", 61st SAIP Conference 2016, 4-8th July 2016, Kramer Law building, University of Cape Town, Cape Town, South Africa-Poster.
12. G. M. Isoe, **D. Kiboi Boiyo**, S. Wassin, P. P. Dlamini, E. K. Rotich Kipnoo, R. R. G. Gamatham, A.W. R. Leitch and T. B. Gibbon," Effect of 1.712 GHz RF-Clock Signal Distribution on 10 Gbps 1550.89 nm VCSEL Based Transmission over Single Optical Fibre for Square Kilometre Telescope Array", Proceedings of 61st SAIP Conference 2016, 4-8th July 2016, Kramer Law building, University of Cape Town, Cape Town, South Africa.
13. S. Wassin, G. M. Isoe, **D. Kiboi Boiyo**, E. K. Kipnoo Rotich, R. R. G. Gamatham, A.W.R Leitch and T. B. Gibbon, "Power Budget Analysis of Passive Components along an Optical Fibre Link of a Frequency Dissemination System within the MeerKAT Telescope Array", Proceedings of 61st SAIP Conference 2016, 4-8th July 2016, Kramer Law building, University of Cape Town, Cape Town, South Africa.
14. K.J. Leburu, **D. Kiboi Boiyo**, G.M. Isoe, S. Wassin, R.R.G. Gamatham, A.W.R. Leitch and T. B. Gibbon, "Advantages of Free Space Optics over Optical Fibre for Clock Tone Distribution in a 2.5 GHz Transmission Link", Proceedings of 61st SAIP Conference 2016, 4-8<sup>th</sup> July 2016, Kramer Law building, University of Cape Town, Cape Town, South Africa-Poster.

15. P.P. Dlamini, **D. Kiboi Boiyo**, T. B. Gibbon, R.R.G. Gamatham, A.W.R. Leitch, "Laser Effect on the RF Signal Stability for Clock Signal Distribution over Optical Fibre", Proceedings of 61st SAIP Conference 2016, 4-8<sup>th</sup> July 2016, Kramer Law building, University of Cape Town, Cape Town, South Africa.
16. **D. Kiboi Boiyo**, G. M. Isoe, S. Wasson, E. K. Rotich Kipnoo, R. R. G. Gamatham, A.W. R. Leitch and T. B. Gibbon, "An all Optical VCSEL Wavelength Conversion for Optical Fibre Access Networks", Proceedings of the 2016 Annual Conference on Sustainable Research and Innovation, 4-6<sup>th</sup> May 2016, JKUAT, Nairobi-Kenya, p.p. 17-20. ISSN: **2079-6226**.
17. S. Wasson, G. M. Isoe, **D. Kiboi Boiyo**, E. K. Kipnoo Rotich, R. R. G. Gamatham, A. W. R Leitch and T. B. Gibbon, "The Square Kilometre Array: The Notion of Timing and Synchronization", Proceedings of the 2016 Annual Conference on Sustainable Research and Innovation, 4-6<sup>th</sup> May 2016, JKUAT, Nairobi-Kenya, p.p. 52-55. ISSN: **2079-6226**.
18. I. M. Matere, D.W. Waswa, J. Tonui, **D. Kiboi Boiyo**, "Modeling of ring resonators as optical Filters using MEEP", Proceedings of the 2016 Annual Conference on Sustainable Research and Innovation, 4-6<sup>th</sup> May 2016, JKUAT, Nairobi- Kenya, p.p. 114-118. ISSN: **2079-6226**.
19. **D. Kiboi Boiyo** and Tim Gibbon, "Advanced Modulation Techniques in a 80 Gb/s Flexible Spectrum for SKA High Speed Data Transport", SKA SA-HCD 2015 Postgraduate Bursary Conference, Stellenbosch, Cape Town, 30th Nov-8th Dec 2015).  
Available at: [http://www.ska.ac.za/bursaryconference/2015presentations/download/2015\\_69.pdf](http://www.ska.ac.za/bursaryconference/2015presentations/download/2015_69.pdf)
20. **D. Kiboi Boiyo**, Tim Gibbon and Andrew Leitch, "Reconfigurable Optical Networks for Next Generation Optical Fibre Transmission", 8th African Laser Centre Student Workshop Zevenwacht, Stellenbosch, South Africa (2nd- 4th Dec 2015).
21. **D. Kiboi Boiyo**, T.V. Chabata, E.K. Rotich Kipnoo, R.R.G. Gamatham, A.W.R. Leitch and T.B. Gibbon, "Crosstalk Penalties in Optical Fibre Transport for Next-Generation Flexible Spectrum Networks", Proceedings of the SATNAC Conference 2015, Arabella, Hermanus, Western Cape, South Africa (6th – 9th Sept 2015), p.p. 21-24. ISBN: 978-0-620-67151-4.
22. T.V. Chabata, **D. Kiboi Boiyo**, E.K. Rotich Kipnoo, R.R.G. Gamatham, A.W.R. Leitch and T.B. Gibbon, "Directly Modulated 10.3 Gb/s Coherent Detection Scheme for Passive Optical Access Network in the Fibre-to-the-Hut Technology", Proceedings of the SATNAC Conference 2015, Arabella, Hermanus, Western Cape, South Africa (6-9<sup>th</sup> Sept 2015), p.p. 37-40. ISBN: **978-0-620-67151-4**.
23. **D. Kiboi Boiyo**, T.V. Chabata, Romeo Gamatham, A.W.R. Leitch and T.B. Gibbon, "Reconfigurable Wavelength Selective Switching for 10 Gbps Optical Fibre Ring Networks", 60<sup>th</sup> SAIP Conference 2015, Boardwalk, Port Elizabeth, South Africa (29th June – 3rd July 2015).
24. T.V. Chabata, **D. Kiboi Boiyo**, E.K. Rotich Kipnoo, R.R.G. Gamatham, A.W.R. Leitch and T.B. Gibbon, "Performance Comparison between the Traditional Intensity Modulation Direct Detection and Coherent Detection in a High Speed Optical Fibre Communication System", Proceedings of the 60th SAIP Conference 2015, Boardwalk, Port Elizabeth, South Africa (29th June – 3rd July 2015). ISSN: **978-0-620-70714-5**.
25. G.M Isoe, E.K Rotich, **D.K Boiyo**, R.R.G. Gamatham, A.W.R Leitch, T.B. Gibbon, K.M. Muguro and D.W. Waswa, "Noise figure and pump reflection power in SMF-reach optical fibre for Raman amplification," in AFRICON, 2015, Addis Ababa, Ethiopia, vol., no., pp.1-5, 14-17<sup>th</sup> Sept.2015.  
Available at: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7332036>
26. **D Kiboi Boiyo**, EK Kipnoo, R Gamatham, AWR Leitch, TB Gibbon, "Effects of Crosstalk on a 20 Gb/s Flexible Grid 12 km Optical Fibre Transmission", SKA SA-HCD 2014 Postgraduate Bursary Conference, Stellenbosch, Cape Town, South Africa, 4-8<sup>th</sup> Dec 2014.  
Available at: [ska.ac.za/bursaryconference/programme/programme.pdf](http://ska.ac.za/bursaryconference/programme/programme.pdf)
27. **D Kiboi Boiyo**, EK Kipnoo, R Gamatham, AWR Leitch, TB Gibbon "Evaluation of Efficient Guard Bands on Flexible Grids in an Optical Fibre Transmission", Proceedings of the ALC Annual Workshop 2014, p.p. 30, Rabat, Morocco (3-5 November 2014).  
Available at: <https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbXhxbGNtZG5uM3xneDoxMDkxNmRiYjk1M2EyNDFj>

28. **D Kiboi Boiyo**, EK Rotich Kipnoo, RRG Gamatham, AWR. Leitch, TB Gibbon, "Towards Investigating Transmission Penalties in a Flexible Spectrum Optical Network". Proceedings of the SATNAC Conference 2014, the Boardwalk, Port Elizabeth, Eastern Cape, South Africa, (31<sup>st</sup> Aug – 3 Sept 2014), p.p. 459-460. (WIP Paper). ISBN: **978-0-620-61965-3**.  
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29. **D Kiboi Boiyo**, EK Rotich Kipnoo, AWR Leitch, TB Gibbon, "Flexible Spectrum and the Effects of Crosstalk on a 20 Gbps Signal over 12 km Optical Fibre". Proceedings of the 59th SAIP Conference 2014, Johannesburg, South Africa (7 – 11 July 2014).  
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30. G. M. Isoe, K. M. Muguro, D. W. Waswa, D. Osiemo, E. Kirui, H. Cherutoi, **D. K. Boiyo**, E. Rotich Kipnoo, "Forward Raman Amplification Characterization in Optical Networks", Proceedings of 2014 International Conference on Sustainable Research and Innovation, Volume 5, 7th-9th May 2014. ISSN **2079-6226**.  
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31. S. Kuja, **D. Boiyo**, D. Waswa, G. Amolo, E. Kipnoo, T. Gibbon, and A. Leitch, "Comparison of PMF and LEAF as Optical Fibre Stress and Temperature Sensing Elements," in *Advanced Photonics 2013*, H. Chang, V. Tolstikhin, T. Krauss, and M. Watts, eds., OSA Technical Digest (online) (Optical Society of America, 2013), paper JT3A.32.
32. **D. Kiboi Boiyo**, S. Kuja, D. Waswa, K. M. Muguro, G. Amolo, "Modelling of an optical Raman amplifier", Proceedings of the 2012 Mechanical Engineering Conference on Sustainable Research and Innovation, Volume 4, 3rd-4th May 2012. ISSN **2079-6226**.
33. S. Kuja, E.K. Rotich Kipnoo, **D. K. Boiyo**, D. Waswa, G. Amolo and K. M. Muguro, "Interaction between the Linear and Nonlinear Polarization in Optical Fibre", Proceedings of the 2012 Mechanical Engineering Conference on Sustainable Research and Innovation, Volume 4, 3rd-4th May 2012. ISSN **2079-6226**

#### **RESEARCH VISITS, ATTENDANCE AND PARTICIPATION**

- a) 1<sup>st</sup> June- 15<sup>th</sup> July 2024: *Research Visit*, Nelson Mandela University, Port Elizabeth, South Africa
- b) 4<sup>th</sup>-10<sup>th</sup> August 2019: **Google and OSA Foundation**, *Subsea Optical Fibre Communications International Summer School*, Polvijärvi, **Finland**
- c) 5<sup>th</sup> June- 1<sup>st</sup> August 2019: *Post-Doctoral Research Visit*, Nelson Mandela University, Port Elizabeth, South Africa
- d) Nov, 2018: SEKU-UMMA University and DAAD International Conference, Kitui/Kajiado, Kenya
- e) July, 2015: South African Institute of Physics (SAIP) Conference, Port Elizabeth
- f) July, 2015: South African Interuniversity Games (USSA-Volleyball), Port Elizabeth
- g) June-July, 2014: South African Interuniversity Games (USSA-Volleyball), Johannesburg

#### **SPECIAL AWARDS, RESEARCH GRANTS AND SCHOLARSHIPS**

1. 2018: \$220,000 Funding from UN/ China Corporation for the joint BARIDI SANA Project in collaboration with Sapienza University of Rome, Italy
2. 2014- 2016: Awarded the African Laser Centre (ALC), South Africa PhD Scholarship for studies at Nelson Mandela University.
3. 2014-2016: Awarded the Square Kilometre Array (SKA), South Africa- PhD Scholarship for studies at Nelson Mandela University.
4. 2014-2015: Awarded the Nelson Mandela University Postgraduate Research Scholarship (NMMU-PGRS).

#### **POSTGRADUATE SUPERVISION**

1. Titus Mwenda, *Investigation of the Effects of matter deposition on the Power efficiency of Mono- and Poly-crystalline solar panels and design of an automated cleaning device*- Moi University- Ongoing

2. Victor Chepkech Naibei, *High frequency Signal generation and analysis in Microwave Photonics using dual drive Mach-Zehnder modulator*- University of Eldoret. Status- Ongoing

### **THESIS EXAMINATION**

1. Kunga Gathage John- PhD Thesis, Machakos University, June 2021. Status; Graduated

### **COMMUNITY SERVICE**

1. Member, Board of Management, Chemweisus Secondary School, Mt. Elgon

### **LEADERSHIP AND RESPONSIBILITIES**

1. Programme Thematic Leader, BSc Applied Physics and Technology- Machakos University
2. February – September 2020: Acting Director, Centre for Renewable Energy, Machakos University
3. August-September 2019: Acting Chairman of Department (COD), Physical Sciences Department- Machakos University
4. March 2019-Dec 2022: Association of Commonwealth Universities (ACU)- Machakos University Champion  
Role: Contact person to ACU events, Coordinator of Commonwealth Activities, Opportunities, Grants and Fellowships
5. Aug 2018-Dec 2018: Chairman, Alcohol and Drug Abuse (ADA) Committee, Machakos University.  
Role: Student & staff counselling, rehabilitation and policy development
6. Sept 2017-February 2020: Examinations and Timetable Coordinator, Physical Sciences Dept, Machakos University.

### **MEMBERSHIP/CLUBS**

- a) 2014-Date: South African Institute of Physics (SAIP)
- b) 2014-Date: African Laser Centre (ALC) Student Chapter
- c) 2011-Date: Optical Society of America (OSA)
- d) 2010-Date: Society of Photo-Optical Instrumentation Engineers (SPIE)
- e) 2010-Date: Physics Society of Kenya (PSK)
- f) 2005-2009: Physics Society of Moi University (PSOMU)

### **INTERESTS AND HOBBIES**

1. Playing and Watching Volleyball and Soccer
2. Reading research journals
3. Listening to music

### **REFERENCES**

1. Prof. Fredrick Nyamwala: Head of Department,  
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