

DR. ISAAC OWINO OKOTH

PERSONAL INFORMATION

Address: School of Mathematics, Statistics and Actuarial Science,
Maseno University,
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EDUCATION

- PhD in Mathematics, University of Stellenbosch (South Africa), 2012-2015
Thesis title: Combinatorics of oriented trees and tree-like structures
Advisor: Prof. Stephan Wagner
- PGD in Mathematical Sciences, University of the Western Cape (South Africa), 2010-2011
Awarded in association with African Institute for Mathematical Sciences (AIMS - SA)
Essay title: Finite fields, p -Adic fields and their extensions
Supervisor: Dr. Mark Berman (University of Cape Town)
- MSc in Pure Mathematics, Maseno University, 2008-2010
Thesis title: Block quivers and their mutations
Supervisors: Dr. David Stern and Prof. John Agure
- BEd (Science), Maseno University, 2003-2007
Final Grading: First Class Honours
- Kenya Certificate of Secondary Education, Masaba High School, Keroka, 1998-2001
Mean Grade: B+(plus)
- Kenya Certificate of Primary Education, Ojwando Primary School, Oyugis, 1990-1997
Marks: 474/700

WORK EXPERIENCE

- July 2025 - Date: Senior Lecturer in Mathematics, Maseno University
- March 2015 – June 2025: Lecturer in Mathematics, Maseno University
- December 2010 - February 2015: Tutorial Fellow, Maseno University
- April 2008 - December 2010: Graduate Assistant, Maseno University

HONORS AND AWARDS

- February 2015: Awarded a PhD Incentive bursary by Faculty of Science, Stellenbosch University, for having finished my PhD in less than three years.
- 31 October 2013: Awarded a Second Prize in the "Best talk by a PhD student" category at the Annual Congress of South African Mathematical Society in Pietermaritzburg, University of KwaZulu Natal.
- July 2012 - June 2015: Awarded a scholarship by German Academic Exchange Service (DAAD) to undertake a PhD at Stellenbosch University, South Africa.
- December 2010 - March 2015: Awarded Tutorial Fellowship at Maseno University.

- August 2010 - June 2011: Awarded a scholarship by AIMS to undertake a postgraduate diploma in Mathematical Sciences, Cape Town, South Africa.
- April 2008 - December 2010: Awarded Graduate Assistantship at Maseno University.
- November 2007: Awarded a First Class Honours Degree at Maseno University.

LEADERSHIP EXPERIENCE

Academic Leadership

- August 2022 – Date: Dean, School of Mathematics, Statistics and Actuarial Science, Maseno University
- May 2019 – August 2022: Chairman, Department of Pure and Applied Mathematics, Maseno University
- September 2016 - May 2019: Chairman, School Postgraduate Studies Committee, Maseno University

Community Service

- February 2019 – May 2025: Vice Chairman, Board of Management, St. Anne's Secondary School – Ojwando, Oyugis
- February 2016 - February 2019: Member, Board of Management, St. Anne's Secondary School – Ojwando, Oyugis

RESEARCH EXPERIENCE

My research interests are in the broad areas of combinatorics, graph theory, number theory and mathematics education.

Theses Supervision:

1. Christopher Amolo Onyango, MSc in Pure Mathematics, Maseno University, Graduated, 2024.
Thesis title: *Enumeration of plane and d -ary tree-like structures*
2. Sylvester Arthur Abayo, MSc in Pure Mathematics, Maseno University, Graduated, 2024.
Thesis title: *Reachability in labelled complete m -ary trees*
3. Albert Oloo Nyariaro, MSc in Pure Mathematics, Maseno University, Graduated 2021
Thesis title: *Enumeration of trees by degree sequences and reachability of vertices*
4. Donnie Munyai Kasyoki, PhD in Pure Mathematics, Maseno University, Graduated 2021
Thesis title: *Regular prime graphs of selected classes of nonabelian finite groups*
5. Fidel Ochieng Oduol, MSc in Pure Mathematics, Maseno University, Graduated 2021
Thesis title: *On shifted Fibonacci numbers and their polynomials*
6. Meshack Ochieng Agwang, MSc in Pure Mathematics, Maseno University, Graduated 2019
Thesis title: *Groups of composition operators on Dirichlet spaces of the upper half plane*
7. Omondi Eric Gori, MSc in Pure Mathematics, Maseno University, Graduated 2019
Thesis title: *Duality properties of non-reflexive Bergman space of the upper half-plane*
8. Mose Samuel Bagasa, MSc in Pure Mathematics, Maseno University, Graduated 2019
Thesis title: *Spectral properties of semigroups of weighted composition operators on the Bloch space*
9. Andrew Odwali, MSc in Pure Mathematics, Maseno University, Ongoing
10. Kenneth Lumumba, MSc in Pure Mathematics, Maseno University, Ongoing

11. Vitalice Wamnyolo, MSc in Pure Mathematics, Maseno University, Ongoing
12. Sylvester Arthur Abayo, PhD in Pure Mathematics, Maseno University, Ongoing
13. Felgona Tana, PhD in Applied Statistics, Maseno University, Ongoing
14. Yvonne Kariuki, PhD in Pure Mathematics, Moi University, Ongoing
15. Fidel Oduol, PhD in Pure Mathematics, Moi University, Ongoing
16. Albert Nyariaro, PhD in Pure Mathematics, Moi University, Ongoing

PUBLICATIONS

1. **I. O. Okoth** and D. M. Kasyoki, *Generalized plane trees*, Bull. Inst. Combin. Appl., 2025.
2. A. O. Nyariaro, **I. O. Okoth** and F. O. Nyamwala, *Generalized k -plane trees*, J. Discrete Math. Appl., 2025.
3. F. O. Oduol, **I. O. Okoth** and F. O. Nyamwala, *Generalization of a variant of k -plane trees*, Math. Syst. Sci., 2025.
4. F. O. Oduol, **I. O. Okoth** and F. O. Nyamwala, *On a variant of k -plane trees*, J. Alg. Combin. Discret. Struc. & Appl., 2025.
5. K. O. Lumumba, **I. O. Okoth** and D. M. Kasyoki, *Refined enumeration of 2-plane trees*, Europ. J. Math. Appl., 2025.
6. V. O. Wamnyolo, M. O. Oyengo and **I. O. Okoth**, *Properties of pseudo-orthogonal Chebyshev-like polynomials*, Europ. J. Math. Appl., 2025.
7. **I. O. Okoth** and S. Wagner, *Refined enumeration of k -plane and k -noncrossing trees*, Annals Combin., 2024.
8. Y. W. Kariuki, **I. O. Okoth** and F. O. Nyamwala, *On non-decreasing 2-plane trees*, Commun. Combin. Crypt. & Comp. Sci., 2024.
9. A. O. Nyariaro and **I. O. Okoth**, *Bijections for a class of trees*, Trans. Combin., 2024.
10. A. O. Nyariaro and **I. O. Okoth**, *Enumeration of k -plane trees and forests*, Commun. Combin. Crypt. Comp. Sci., 2024.
11. Y. W. Kariuki, **I. O. Okoth** and F. O. Nyamwala, *Counting formulas and bijections of nondecreasing 2-noncrossing trees*, Electron. J. Math., 2024.
12. F. O. Oduol and **I. O. Okoth**, *Counting vertices among all noncrossing trees by levels and degrees*, Commun. Combin. Crypt. & Comp. Sci., 2024.
13. C. A. Onyango, **I. O. Okoth** and D. M. Kasyoki, *Enumeration of plane and d -ary tree-like structures*, Annals Math. & Comp. Sci., 2023.
14. Y. W. Kariuki and **I. O. Okoth**, *Bijections of plane Husimi graphs and certain combinatorial structures*, Europ. J. Math. Appl., 2023.
15. S. A. Abayo, **I. O. Okoth** and D. M. Kasyoki, *Reachability in complete t -ary trees*, Annals Math. Comp. Sci., 2023.
16. **I. O. Okoth**, *Bijections of k -plane trees*, Open J. Discret. Appl. Math., 2022.
17. **I. O. Okoth**, *Enumeration of k -noncrossing trees and forests*, Commun. Combin. Optim., 2022.
18. Z. O. Juma, **I. O. Okoth** and M. O. Oyengo, *Delivery of Integral Calculus at Maseno University: Is STACK really playing an integral part?*, International Journal of Emerging Technologies and Learning, 2022.
19. A. O. Nyariaro and **I. O. Okoth**, *Reachability results in plane trees*, Commun. Adv. Math. Sci., 2021.
20. **I. O. Okoth**, *On noncrossing and plane tree-like structures*, Commun. Adv. Math. Sci., 2021.
21. **I. O. Okoth**, *Refined enumeration of 2-noncrossing trees*, Notes in Number Theory and Discret. Math., 2021.
22. **I. O. Okoth** and A. O. Nyariaro, *Reachability results in labelled t -ary trees*, Open J. Math. Sci., 2021.
23. **I. O. Okoth**, *On 2-noncrossing increasing trees*, Open J. Discret. Appl. Math., 2021.
24. F. O. Oduol and **I. O. Okoth**, *On Generalized Fibonacci Sequences*, Commun. Adv. Math. Sci., 2020.
25. **I. O. Okoth** and S. Wagner, *Locally oriented noncrossing trees*, Electron. J. Combin., 2015.

26. **I. O. Okoth** and D. A. Stern, *Block mutation of block quivers*, International J. Algebra, 2010.
27. **I. O. Okoth** and F. O. Oduol, *On Shifted Fibonacci Polynomials*, Accepted for publication in J. Math. Study, 2025.
28. S. A. Abayo, **I. O. Okoth** and D. M. Kasyoki, *Counting formulas for weakly labelled plane tree-like structures*, Accepted for publication in J. Discrete Math. Appl., 2025.
29. **I. O. Okoth**, *Enumeration of a family of set partitions and tree-like structures*, Under Review.
30. Y. W. Kariuki and **I. O. Okoth**, *Enumeration and bijections of a class of labelled plane trees and related structures*, Under Review.
31. F. O. Oduol, **I. O. Okoth** and F. O. Nyamwala, *Enumeration of a variant of k -noncrossing trees*, Under Review.
32. S. A. Abayo, **I. O. Okoth** and D. M. Kasyoki, *Generalization of tree-like structures*, Under Review.
33. A. O. Nyariaro, **I. O. Okoth** and F. O. Nyamwala, *Marked noncrossing trees*, Under Review.
34. A. O. Nyariaro, **I. O. Okoth** and F. O. Nyamwala, *Generalization for a formula of marked plane trees*, Under Review.
35. Y. W. Kariuki and **I. O. Okoth**, *On a class of skew Dyck paths*, Under Review.
36. F. O. Oduol, **I. O. Okoth** and C. M. Kaneba, *Counting vertices among all d -dimensional plane trees*, Under Review.
37. A. O. Nyariaro and **I. O. Okoth**, *Counting k -plane trees by levels*, Under Preparation.
38. **I. O. Okoth**, *Refinement for leaves in d -dimensional plane trees*, Under Preparation.
39. **I. O. Okoth**, *Locally oriented d -dimensional plane trees*, Under Preparation.
40. **I. O. Okoth**, *Noncrossing trees with degree restrictions*, Under Preparation.
41. **I. O. Okoth**, *Rooted forests vs locally oriented Cayley trees: A bijection*, Under Preparation.
42. A. O. Odwali, **I. O. Okoth** and D. M. Kasyoki, *Forests of tree-like structures*, Under Preparation.

CONFERENCES AND WORKSHOPS

- July 2022: Presented a paper virtually at African Mathematics Seminar, University of Nairobi, Kenya.
- June 2022: Presented a paper virtually at Combinatorial Research Studio Seminars.
- March 2022: Attended DIES-DAAD Training of Heads of Departments on Management in Post-COVID 19 Era, Moi University, Eldoret, Kenya.
- July 2021: Presented a paper at Strathmore International Mathematics Conference, Strathmore University, Nairobi, Kenya.
- August 2019: Presented a paper at Strathmore International Mathematics Conference, Strathmore University, Nairobi, Kenya.
- 13-17 August 2018: Presented two papers at the MARMS workshop "Around Algebra, Combinatorics and Number Theory" at the University of Malawi, Chancellor College, Zomba, Malawi.
- August 2015: Presented a paper at Strathmore International Mathematics Conference, Strathmore University, Nairobi, Kenya.
- July 2015: Conducted an Experimental Pure Mathematics Workshop at Makerere University, Kampala, Uganda.
- October 2013: Presented a paper at the Annual Congress of South African Mathematical Society in Pietermaritzburg, University of KwaZulu Natal, South Africa.
- October 2012: Presented a paper at the Annual Congress of South African Mathematical Society in Matieland, University of Stellenbosch, South Africa.

- August 2011: Presented a paper at Strathmore International Mathematics Conference, Strathmore University, Nairobi, Kenya.

REFEREES

1. Prof. John Ogonji Agure,
Ag. Deputy Vice-Chancellor (Planning, Research and Innovations),
Maseno University,
Maseno, Kenya.
Email: johnagure@maseno.ac.ke
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2. Prof. Maurice Owino Oduor,
Deputy Vice-Chancellor (Planning, Research and Development),
University of Kabianga,
Kericho, Kenya.
Email: moduor@kabianga.ac.ke
Phone: +254 721 753991
3. Prof. Stephan Wagner,
Professor of Mathematics,
Institute of Discrete Mathematics,
Technical University of Graz,
Graz, Austria.
Email: stephan.wagner@math.uu.se