2ND AFRICAN-NORDIC CONFERENCE IN MATHEMATICS

COLLABORATIVE RESEARCH IN MATHEMATICS AND MATHEMATICS EDUCATION FOR SUSTAINABLE DEVELOPMENT

11-14 AUGUST 2026

DRAFT CONFERENCE PROGRAMME

DAY 1: Tuesday 11 August 2026

09:00-10:00	**Opening Ceremony**		
10:00-10:10	**Group Photo**		
10:10-10:50	**HEALTH BREAK**		
10:50-11:40	**Venue: Room 1** **Keynote Presentation** **Chair: Prof. Juma Kasozi** **Prof. Verdiana Grace Masanja:** Mathematics Beyond the Blackboard: Modelling Africa's Health, Water, Climate, and Environmental Systems for Sustainable Development		
	Session 1 **Venue: Room 1** ***Mathematical Biology & Health*** Chair: Dr. Theresia Marijani	**Session 2** **Venue: Room 2** ***Pure Mathematics*** Chair: Dr Marco Mpimbo	**Session 3** **Venue: Room 3** ***Applied Mathematics & Modelling*** Chair: Dr. Samuel Asefa Fufa
11:40-12:00	**Sirajo Abdulrahman** Modelling the Impacts of Fishing Nets, Cannibalism and Gamma-Hexachlorocyclohexane on Fisheries in Unreserved-Water Bodies	**Tilahun Abebaw** An Algorithm for the Number of Decomposition Factors of Certain D-Modules	**Samuel Asefa Fufa** Exploring the Convergence of Mathematics and Chemistry: Insights from Chemical Graph Theory and Linear Regression Models

12:00-12:20	**Banzi Wellars** Analysis of Disease Transmission and Competition Among Multiple Species Using an SIR Epidemic Model with Reaction-Diffusion in a Three-Dimensional Bounded Environment	**Gareth Amery** An Introduction to Local Isometric Embeddings	**Chacha Stephen Chacha** Advanced Krylov–Newton Iterative Solvers for the Yang–Baxter Matrix Equation
12:20-12:40	**Furaha Michael Chuma** Modeling and Global Sensitivity of Bacterial Meningitis Transmission Dynamics in the African Meningitis Belt	**Tadesse Bekeshie** Progress on Lomonosov-Type Approaches to the Invariant Subspace Problem	**Ayegbusi Florence Dami** Effects of Viscous Heating and Chemical Reactions on Heat and Mass Transfer in Casson Fluid Flow Through a Channel
12:40-14:00	**LUNCH**		
14:00-14:40	**Venue: Room 1** **Plenary Presentation** **Chair : Dr. Septimi Kitta** **Prof. Bettina Dahl Søndergaard:** Reimagining the Mathematics Lecture: Preserving Rigor While Engaging Students Actively		
	Session 4 **Venue: Room 1** ***Mathematical Biology & Health*** Chair: Dr. Yves Mangongo	**Session 5** **Venue: Room 2** ***Pure Mathematics*** Chair: Dr. Ismail Mirumbe	**Session 6** **Venue: Room 3** ***Mathematics Education & Sustainability*** Chair: Prof. Shun Sudo
14:40-15:00	**Bright Elisamehe** Modeling the Impact of Media Awareness and Farmer Behavioral Response on the Transmission Dynamics and Control of Early Blight Disease in Tomato Plants	**Kuldeep Singh Gehlot** Two Parameter Gamma Function and Its Properties	**Ema Boki** Effects of Digital Mathematics Instructional Materials on Secondary School Students' Conceptual Understanding and Procedural Fluency
15:00-15:20	**Augustino Isdory Msigwa** Fractional-Order Modelling and Optimal Control of HIV/AIDS and Cryptococcal Meningitis Co-	**Yvonne W Kariuki** On a Class of Skew Dyck Paths	**Ssali Celester** Integration of Ethnomathematics with Problem-Based Learning: Approaches and Issues

	Infection Using the Atangana-Baleanu-Caputo Operator		
15:20-15:40		**Silas Luliro Kito** The Toeplitz–Hausdorff and Spectral Inclusion Theorems for Linear Relations	**Gaanya Ismael** Mathematics Modelling Perspectives for Sustainability Learning in Ugandan Lower Secondary Schools A Transformational Approach
15:40-16:00	**Coffee Break**		
	Session 7 **Venue: Room 1** ***AI, Data Science & Statistics*** Chair: Prof. Farai Mhlanga	**Session 8** **Venue: Room 2** ***Pure Mathematics*** Chair: Dr. Damas Mgani	**Session 9** **Venue: Room 3** ***Mathematics Education & Sustainability*** Chair: Dr. Ssali Celester
16:00-16:20	**Aminat Obakhume Abdulsalaam** Development of a Hybrid Osprey–Bayesian Optimisation Framework for Enhancing Explainability in AI-Driven Distance Learning Systems	**C´elestin Kurujyibwami** Algebraic Method of Group Classification for Semi-Normalized Classes of Differential Equations	**Honorata Kihaga** Classroom Dialogue in Large Mathematics Classes: Integrating Participatory Lectures, Think–Pair–Share, and Whole-Class Discussion in a Secondary School Classroom in Tanzania
16:20-16:40	**Andongwisye John Mwakisisile** Modelling Meteorological Drought in Tanzania Using Machine Learning Models Integrated with the Standardized Precipitation Index	**Pendo Malaki** Solvability of Infinite Systems of Third-Order Differential Equations in the Sequence Space cUsing Meir-Keeler Condensing Operators	**Morwo Likinjiye** Clustering Students on Their Experience of Learning Undergraduate Mathematics in Tanzania
16:40-17:00	**Major Vincent Bulinda** Data Science and AI-Driven Models for Optimizing Renewable Energy Systems in Developing Economies	**Mesia Simbeye** Solvability of Infinite Systems of Integral Equations of Hammerstein Type in Three Variables in Tempering Sequence Spaces c_0^{β} and ℓ_0^{β}	**Zerihun Kinfe Birhanu** Building Sustainable Higher Education and Industrial Engagement in Applied Mathematics The Ethiopian-Norwegian Network in Computational Mathematics (ENNCoMat)

Day 2: Wednesday 12 August 2026

08:30-09:10	**Venue: Room 1** **Plenary Presentation** **Chair : Prof. Nyimvua Shaban** **Prof. Martin Singull:** Data-driven Model Selection for Bilinear Regression using Functional Principal Component Analysis		
	Session 10 Venue: Room 1 *Mathematical Biology & Health* Chair: Dr. Furaha Chuma	Session 11 Venue: Room 2 *AI, Data Science & Statistics* Chair: Dr. Aminat Obakhume Abdulsalaam	Session 12 Venue: Room 2 *Pure Mathematics* Chair: Dr. David Koloseni
09:10:09:30	**Adamu, Abdul Kareem** Effect of maternally-derived immunity on dengue-malaria co-infection dynamics	**Justine Eustace** Do Proxy Measures of Social Capital Align with Complex Network Properties? Insights from Systematic Review, Formal Derivation, and Empirical Validation	**Kasifa Namyalo** On the Construction of Group Divisible Designs of Block Size Five with Two Groups of Different Sizes for Specific Values of λ_1 and λ_2
09:30-09:50	**Pacifique Karekezi** High-Resolution Spatiotemporal Modeling of NO_2 and NO in Kigali, Rwanda	**Farai Julius Mhlanga** A Portfolio Choice Problem When Mortality Risk Is Age-Dependent	**Bosco Nyandwi** An Extension of Polya's Shire Theorem
09:50-10:10	**Leonce Leandry** Mathematical Modelling of Social Media Influences on Gambling Behaviour A Sensitivity Analysis	**Theresia Bonifasi Mkenda** Application of K-Means Clustering to Mental Health Profiles of University Students in Northern Tanzania	**Peter Masong Slaa** On Existence of Subspace Codiskcyclicity for C_0-Semigroups
10:10-10:30	**Joseph Malinzi** A Predictive Model for Optimized Oncolytic Virotherapy with Two Viruses	**Joseph Nzabanita** Generalized Growth Curve Model and Its Extensions From Estimation to Hypothesis Testing	**Coffee Break**
10:30-11:00	**HEALTH BREAK**		
	Session 13 Venue: Room 1	Session 14 Venue: Room 2	Session 15 Venue: Room 3

	Mathematical Biology & Health Chair: Dr. Paride Oresto	*Pure Mathematics* Chair: Dr. Isack Tembo	*AI, Data Science & Statistics* Chair: Dr. Andongwisye John Mwakisisile
11:00-11:20	**Yves Tinda Mangongo** A Mathematical Modeling Approach to Assess Pharmaceutical, Vaccination, and Environmental Clean-Up Interventions for Mpox Transmission Dynamics in the Democratic Republic of Congo	**Damas Karmel Mgani** A Categorical Perspective on Gluing	**Ronald Katende** Mathematics for Governable Early-Warning Systems Data-Efficient, Long-Memory and Risk-Aware Decision Models for East African Public Infrastructure
11:20-11:40	**Theresia Marijani** Modeling the Impact of Housing Structures and Insecticide-Treated Nets on Malaria Vector Control Strategies in Rufiji District, Tanzania	**Froduald Minani** Extension of Riesz's Representation Theorem to the Set of Interval-Valued Functions	**Sheila Masaku** Modelling of University Academic Progression Application of Multistate Markov Models
11:40-12:00	**Refilwe Matlou** Bridging the Treatment Gap Modelling the Impact of ART Access for Immigrants on HIV/AIDS Transmission in Botswana	**Mirumbe Ismail** On the Local Stability of a Certain Class of Polynomial Differential Systems	**Lemjini Masandawa** A Modelling Framework for Parameter Estimation and Optimal Control of STH–Malaria Co-infection Dynamics
12:00-12:20	**Goodluck Mlay** Pneumonia Modelling Dynamics with Sensitivity Analysis Using Normalized and PAWN Methods	**Solange MUKESHIMANA** Some More Sparse Bounds for Rough and Smooth Pseudodifferential Operators	**Filimon Abel Mgandu** Forecasting Water Level in Mtera Dam Using Machine Learning Techniques
12:20-12:40			**Nyanumba Walter Motanya** Derivation of a Risk Model that Incorporates Inhomogeneous Claim Counts and Financial Risks
12:40-14:00	**LUNCH**		
	Venue: Room 1 **Plenary Presentation** **Chair: Dr. Mervis Kikonko** **Prof. Montaz Ali:** Network-based Data Mining via Matrix Decomposition		

	Session 16 Venue: Room 1 *Mathematical Biology & Health* Chair: Dr. Refilwe Matlou	Session 17 Venue: Room 3 *AI, Data Science & Statistics* Chair: Dr. Ronald Katende	**CoRE-Math Meeting**
14:40-15:00	**Abdul-rahman Mumbu** A Mathematical Dynamics of Drug-Sensitive and Drug-Resistant Strains of Tuberculosis Disease Transmission with Parameter Uncertainties Analysis in Tanzania	**Daniel Mwanga** The Effect of Random Seed on Risk of Type I or II Error During Multiple Imputation of Binary Outcomes Missing at Random	
15:00-15:20	**Mussa Burhani Mvungi** A Caputo Fractional-Order Mathematical Model and Optimal Control Analysis of Lethal Yellowing Disease in Coconut Palms	**Edward Kanuti Ngailo** A hybrid multilevel and machine learning models for student dropout prediction	
15:20-15:40	**Elimercy Ntagalinda** Mathematical Modelling and Optimal Control of Antimicrobial-Resistant Typhoid Fever Incorporating Public Health Education	**Innocent Ngaruye** Misclassification Probabilities for Linear and Quadratic Classifiers in Repeated-Measures Data A Systematic Review	
	Session 18 Venue: Room 1 *Applied Mathematics & Modelling* Chair: Dr. Pitos Seleka	Session 19 Venue: Room 2 *Mathematics Education & Sustainability* Chair: Dr. Albert Tarmo	Session 20 Venue: Room 3 *AI, Data Science & Statistics* Chair: Dr. Edward Kanuti Ngailo
16:00-16:20	**Sicelo Goqo** A Rational Block Hybrid Method for Solving Third-Order Boundary Value Problems	**Shun Sudo** The Relationship Between Calculations Involving Negative Numbers and the Mental Number Line in Zambia	**Jean de Dieu Niyigena** Misclassification Probability Approximation for a Quadratic Classifier with Repeated Measurements

16:20-16-40	**Dietmar Homberg** Mathematical Study Groups with Industry in Ethiopia Experiences and Lessons from the ENNCoMat Network	**Morwo Likinjiye** Trends in Mathematics Education Research in Tanzania A Bibliometric Analysis	**Siboniso Nkosi** A One-Factor Short Rate Model Driven by Skew Diffusions
16:40-17:00		**Beryl Apondi Otieno** Reinforcement Learning for Personalized STEM Learning A Dynamic Adaptive Framework	**Bard Støve** From Global to Local Dependence: Recent Advances Beyond Pearson's Correlation
17:00-19:00	**Cocktail Party**		

Day 3: Thursday 13 August 2026

08:30-09:10	**Venue: Room 1** **Plenary Presentation** **Chair : Dr. Celestin Kurujyibwami** **Prof. Stanford Shateyi:** Entropy Generation Analysis of a Casson–Williamson Nanofluid Flow Through an Upright Microchannel in the Presence of Hall Effect and Viscous Dissipation		
	Session 21 Venue: Room 1 *Applied Mathematics & Modelling* Chair: Dr. Ali Raza	Session 22 Venue: Room 2 *Pure Mathematics* Chair: Dr. Elizabeth Mrema	Session 23 Venue: Room 3 *AI, Data Science & Statistics* Chair: Dr. Siboniso Nkosi
09:10-09:30	**Yusuf Dauda Jikantoro** Variable-Coefficient Hybrid Schemes for Third-Order Initial Value Problems	**Prisca Mogotu Omoke** Extended Spectrum of Shift–Diagonal Operators on ℓ^p Spaces	**Charline Uwilingiyimana** Estimation of Threshold Effect of Kenyan Shilling Exchange Rate on Rwandan Economy A Semiparametric Model Approach

09:30-09:50	**David Koloseni** A Novel Dynamic Differential Evolution Optimization Method for Weight Optimization in WASPAS	**Wistad Sanga** A Note on Dendrite and Terminal Decomposition	**Watson Levens** Triadic Closure and Self-Organised Growth in an Early National Twitter Network Evidence from Tanzania
09:50-10:10	**Felix Majeke** Adaptive Chaotic Optimization of Physics-Informed Extreme Learning Machines Conditioning, Stability, and Operator-Theoretic Error Bounds	**Mengistu Goa Sangago** Mann-type composite iterative method for a generalized equilibrium problem, constrained convex minimization problem and fixed point problem of a nonlinear mapping	**Justine Eustace** Reductions of the SPC Model to Classical Small-World and Scale-Free Network Models
10:10-10:30	**Beatrice Michael** A Nonlinear ODE Model for Financial System Stability and Debt Dynamics	**Yusto Daniel** An Efficient Miniball Approximation Approach for Estimating Simplicial Complexity in a Stable Bifiltrations	**Adeline Mtunya** A Stochastic Control Framework for Liquidity Crises in Investment Funds with Regime Switching and Jump Risks
10:30-11:00	**Health Break**		
	Session 24 Venue: Room 1 *Mathematical Biology & Health* Chair: Dr. Thadei Sagamiko	Session 25 Venue: Room 2 *Applied Mathematics & Modelling* Chair: Prof. Lazarus Rundora	
11:00-11:20	**Venuste Nyagahakwa** Mortality Attributable to Short-Term Exposure to Outdoor Air Pollution	**Uledi Ngulo** GIS-Based Extended Maximum Covering Location Model for Optimal Fire Hydrant Allocation under Spatial Uncertainty: A Case Study of Dar es Salaam, Tanzania	
11:20-11:40	**Paride Lolika Oresto** A Note on the Fractional-Order Model of Malaria Disease Transmission in Border Regions: A Case Study of South Africa and Mozambique	**Constantine Nkulu** Spatial-temporal Analysis of a Predator-Prey Model with Harvesting and Intraspecific Competition	

11:40-12:00	**Olopade, Isaac Adesola** Mathematical Analysis of Seasonal Malaria Transmission with Integrated Control Strategies	**Ineza Remy MUGENGA** Distributed Joint Chance-Constrained Optimization via Conditional-Independence Decomposition	
12:00-12:20		**Ngendahayo Jean Pierre** Solving an Inverse Heat Conduction Problem with Phase Transitions Using Tikhonov Regularization	
12:20-12:40		**Benito Gasper Mng'ong'o** Application of the COPRAS method in conjunction with the Entropy Weight approach	
12:40-14:00	**LUNCH**		
14:00-14:40	**Venue: Room 1** **Plenary Presentation** **Chair : Prof. Banzi Wellars** **Prof. Farai Nyabadza:** Digidemiology: An Epidemiological Framework for Modelling Digital Pathogens		
	Session 26 Venue: Room 1 *Mathematical Biology & Health* Chair: Dr. Leonce Leandry	Session 27 Venue: Room 3 *Applied Mathematics & Modelling* Chair: Dr. Ineza Remy Mugenga	
14:40-15:00	**Kelly Joelle Gatore Sinigirira** Mathematical Modelling of Malaria Integrating Temperature, Rainfall, and Vegetation Index	**Ali Raza** Lie Symmetry Analysis, Rogue Waves, Periodic Waves and Various Analytical Solutions of Non-linear Diffusion Equation with Applications	

15:00-15:20	**Oladimeji Samuel Sowole** Network Curvature Reveals Climate-Sensitive Transmission Pathways for Influenza Control in High School Contact Networks	**Lazarus Rundora** Comparative Lie Symmetry Analysis of Four Fundamental One-Dimensional Wave Equations	
15:20-15:40	**Innocent Sosoma** A predator-prey inspired model for corruption dynamics with feedback from law enforcement and community engagement	**Yolam Sakala** Modeling Multi-Stage Learning Dynamics Using Piecewise Fractional Differential Equations A Data-Driven Approach to Personalized Education	
15:00-16:00	**Coffee Break**		
	Session 28 Venue: Room 1 *Mathematical Biology & Health* Chair: Dr. Innocent Sosoma	Session 29 Venue: Room 2 *Applied Mathematics & Modelling* Chair: Dr. David Koloseni	**CoRE-Math Meeting**
16:00-16:20	**Siyamthanda Gift Mnisi** Southern African HIV/AIDS Dynamics Analysis Integrating Statistical and Mathematical Modelling	**Endrick Yohana** Modelling Delivery-Dependent Course Structures for Blended University Course Timetabling	
16:20-16-40	**Muhirwa Jean Pierre** Effect of Human Behavior and Fund Cut on the Transmission Dynamics of HIV/AIDS Through a Fractional-Order Mathematical Model	**Pitos Seleka Biganda** Personalized PageRank Analysis on Hybrid Graphs: A Line of Nodes Connected with Multiple Complete Graphs	

16:40-17:00			
19:00-21:00	**Conference Dinner**		

Day 4: Friday 14 August 2026

08:30-09:10	**Venue: Room 1** **Plenary Presentation** **Chair: Dr. Chacha Stephen Chacha** **Prof. Timothy Kamanu:** ENGAGE: Unlocking AI Talent for Cutting-Edge Transdisciplinary Research in Africa, from Africa
09:10-10:10	Closing Ceremony
10:10-10:40	Health Break
10:40-18:00	**Excursion & Departure**

Excursion Information

The Local Organising Committee has organised a one-day excursion to **Tarangire National Park**. Tarangire is one of Tanzania's premier wildlife conservation areas, renowned for its spectacular elephant herds, majestic baobab trees, and rich diversity of wildlife, including lions, giraffes, zebras, wildebeest, and over 500 bird species. Participants wishing to join the excursion are requested to register on the second day of the conference. Return transportation from the conference venue and light refreshments will be provided during the trip. Participants will be responsible for paying the applicable park entrance fees, as outlined below.

Park Entrance Fees

East African Community Citizens:

- Adults (16 years and above): **TZS 12,000**
- Children (5–15 years): **TZS 2,000**

Foreign Non-Residents/Residents

- Adults (16 years and above): **USD 60**
- Children (5–15 years): **USD 18**