

Programme

Research and Innovation Week

25 - 29 May 2026

Muckleneuk and Science Campuses

Date: 26 May 2026, Time: 8:00-16:00, Venue: TK AUDITORIUM, UNISA Science Campus

Time / Room	GJG, C-Block C03-093, 3 rd Floor Conference Venue 1	GJG, C-Block C04-097, 4 th Floor Conference Venue 2
08:00 – 08:30	REGISTRATION, TEA/COFFEE (TK AUDITORIUM)	
08:30 – 08:50	Welcome Address: Prof S Dube, Deputy Executive Dean CSET	
08:50 – 09:00	Safety and Security: Mr. O. Abdullah, Security Services	
09:00 – 09:05	Chair: Prof TT Nkambule, Head iNanoWS, Introduction of Invited Plenary Speaker 1	
09:05 – 09:55	Invited Plenary 1: Prof Paul Westerhoff, Arizona State University, USA	
09:55 – 10:00	Q&A	
10:00 – 10:05	Chair: Dr N Madzivha, Introduction of Plenary Speaker 2	
10:05 – 10:55	Plenary 2: Prof Patience Mthunzi-Kufa, Photonics Centre	
10:55 – 11:00	Q&A	
11:00 – 11:05	Chair: Dr N Madzivha, Introduction of Plenary Speaker 3	
11:05 – 11:55	Plenary 3: Prof Ilunga Kamika, Centre for Molecular Biology and Microbial Engineering	
11:55 – 12:00	Q&A	
12:00 – 12:20	TEA/COFFEE (TK AUDITORIUM)	
Parallel Session Chairs	Prof C Mbohwa	Prof S Dhlamini
12:30 – 12:50	Talk 1.1 Dr McArthur Fundira: The Fourth Industrial Revolution Technologies for Advancing Sustainability in the Banking and Financial Industries	Talk 2.1 Dr Rapelang Gloria Motsoeneng: Ultra-fast and ultra-Sensitive nanomaterial-based Gas Sensors: Selective Detection of CH ₄ , NH ₄ , H ₂ and VOCs for Aviation-aeronautic and food security application
12:50 – 13:00	Q&A	Q&A
13:00 – 13:20	Talk 1.2 Dr Dedy Christelle Sekadjie: The Fourth Industrial Revolution Technology Applications in financial services, Accounting and auditing	Talk 2.2 Dr Ismaila T. Bello: Design and Evaluation of Mixed-Phase Mn-Doped MoS ₂ Nanoflowers with Enhanced Electrochemical Performance for Supercapacitor
13:20 – 13:30	Q&A	Q&A
13:30 – 14:30	LUNCH (EXAM HALL)	
14:30 – 16:00	POSTER SESSION (EXAM HALL)	

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Prof Paul Westerhoff is a Fulton Chair of Environmental Engineering at the Arizona State University (ASU, USA) in the School of Sustainable Engineering and The Built Environment. He is the Deputy Director of a National Science Foundation Nanosystems Engineering Research Center for Nanotechnology Enabled Water Treatment (newtcenter.org), Co-Deputy Director, NSF Science and Technologies for Phosphorus Sustainability (STEPS) Center and the current Executive Editor, Environmental Science and Technology. He also serves as one of the twelve Advisory Board Members of iNanoWS. He has published over 500 journal publications and multiple patents on his research related to fate of nanomaterials in water, developing novel technologies for water and reuse treatment, and understanding reactions related to the fate of pollutants during treatment or in natural systems with a focus on oxo-anions, natural organic matter and micropollutants. He has a google h-index of 122 and has close to 70 000 citations. He was the Founding Director for the School of Sustainable Engineering and the Built Environment. Since then he has served as an Associate Dean of Research in Engineering, ASU Vice Provost for Academic Programming, and Vice Dean for Research and Innovation in Engineering. He is currently the Director of the ASU Global Center for Water Technology.

Prof Paul Westerhoff (ASU, USA)

Regents Professor,

School of Sustainable Engineering and the Built Environment

Water Institute

Central Arizona-Phoenix Long Term Ecological Research

Distinguished Global Futures Scientist, Global Futures Scientists and Scholars



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Prof Patience Mthunzi-Kufa (OMB) is a photonics expert with a PhD in Physics (2010) from the University of St. Andrews, Scotland, UK. She is currently a Distinguished Professor at the College of Science, Engineering, and Technology, where she leads the Center for Photonics. She is an internationally recognized, multi-award-winning scientist who previously founded and led the Council for Scientific and Industrial Research (CSIR) Biophotonics Research group, where lasers of various types were used to develop novel photonics-based point-of-care (POC) diagnostic devices. She secured over R150 million in research grants for projects performed by the Biophotonics group, including the establishment of the Biophotonics facility at the CSIR.

Prof Mthunzi-Kufa's work has led to multiple patents, published outputs, and technology demonstrators. Among her accolades are the Order of Mapungubwe in Bronze (2012) as the youngest recipient, and several others, such as the TechWomen Award (2014), TED Fellowship (2015), DSTI SAWISA award (2023), and the prestigious "Science Oscar" - TW Kambule - NSTF Award (2024). She holds leadership roles in various National Science and Innovation advisory committees and serves on key international photonics and science committees, advocating for innovation, scientific excellence, and diversity in STEM. Some of these include serving as the Deputy Chairperson of the new Advisory Council on National Orders, an appointment by President Cyril Ramaphosa; being the BRICS (Brazil, Russia, India, China, and South Africa) Photonics Working Group as the Nodal point, Society of Photo-Optical Instrumentation Engineers (SPIE - Committee Member and Student Chapter Advisor), member of the SPIE Membership and Communities Committee, L'Oréal Women in Science Awards, (Jury President), Chair for the IEEE Photonics Diversity Overseeing Committee as well as the Institute for the Preparedness and Prevention of Pandemics (IP3) Steering Committee member. Notably, Patience Mthunzi-Kufa has served as a judge for FameLab since 2013, including in 2026. In recognition of her outreach activities and contribution to the Sowetan community, the Department of Basic Education named the Block of Science within the Curtis Nkondo School of Specialisation after her. She has also supervised several postgraduate students, many of whom graduated *Cum Laude*.

Prof Patience Mthunzi-Kufa
Distinguished Professor,
CNA: Health Studies
Photonics Centre



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Prof Ilunga Kamika is a distinguished professor and researcher at the University of South Africa, where he is affiliated with the College of Science, Engineering and Technology (CSET). He is widely recognised for his work in environmental microbiology, water sustainability, biotechnology, and nanotechnology-driven solutions for water treatment and public health challenges. He holds advanced qualifications in Water Care and Life Sciences, including a Doctorate in Water Care from Tshwane University of Technology. His research focuses on microbial diversity, wastewater treatment, environmental biotechnology, genomic surveillance, and the application of advanced technologies such as nanobiotechnology and artificial intelligence in water and environmental systems. He is an NRF-rated researcher and has published extensively in high-impact international journals on topics such as antimicrobial resistance, wastewater microbiology, bacterial diversity, and environmental pollution monitoring. His work contributes significantly to developing sustainable strategies for improving water quality and safeguarding environmental and public health.

A major milestone in his career came when Unisa was awarded the prestigious DSTI-NRF SARChI Chair in Water and Environmental Biotechnology following a proposal he led. The chair focuses on innovative approaches to producing pollutant-free water streams through genomic surveillance, nanobiotechnology, bio-electrochemical systems, and AI-assisted environmental monitoring. Prof Kamika is also actively involved in international scientific collaborations and professional organisations, including the:

- International Water Association
- American Society for Microbiology
- South African Society for Microbiology

In addition to his research achievements, he is known for mentoring postgraduate students and contributing to capacity-building in science, sustainability, and biotechnology across Africa. His work continues to position Unisa as a significant contributor to water and environmental research on the continent.

Prof Ilunga Kamika
Distinguished Professor

CNA: Natural Sciences (Biotechnology Studies)
Centre for Molecular Biology and Microbial Engineering



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POSTER SESSION (EXAM HALL): 14:30 – 16:00

Dineo Molebatsi	Abdulrazak Zubairu	Ibrahim Anwar Sani	Hassan Adebayo Shittu	Maroof Alade Kareem
The gas-sensing properties of n-type and p-type metal fluorides on volatile organic compounds (VOCs) for agricultural management applications	Quasi-Hetero Sensing Units of MnO-Nanorods/CuO-Nanoplates in Single Crystal CuMnO ₂ for Rapid Detection of NO ₂	Ultrahigh Sensitive Long-range (ppm-ppb) NO ₂ Detection via Binary Crystal Engineering	Investigating Transition Metal (Co, Ni, Mn) doped 1T-MoS ₂ for Ultra sensitive NO ₂ sensing”	Synthesis and fabrication of polymer modified MXene-based Nano sensors for agricultural VOC management
Thomas Daniel	Tabitha Penina Alango	Ephantus Nyaga Njeru	Qiniso Nkomo	JK Lehutso
Combined Density Functional Theory and Experimental Approach for Lung Cancer Detection from Human Breathe Using Metal-Carbide-Based Nanosensors	Enhancing Photocatalytic Hydrogen Production Using Silver Nanoparticles	Synthesis And Characterization of Graphene-Platinum Nanocomposite Counter Electrode Combination for Dye-Sensitized Solar Cell Application	Influence of anatase, rutile, anatase-rutile crystalline phases of TiO ₂ on electrocatalytic hydrogen evolution reaction under acidic electrolyte	Influence of TiO, Morphology on Electrocatalytic Hydrogen Evolution: A Comparative Study of Spherical and Mesoporous Structures

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Busisiwe Petunia Mabuea

Heterojunction engineering of an n-n SnO₂-TiO₂ for accelerated charge transfer and an enhanced hydrogen evolution electrocatalysis

Dr Tarekegn Dolla

Hollow-structured high-entropy oxide-carbon anode for enhanced and durable sodium-ion storage

Tebogo M. L. Mokoto

Hydrophobic cavity-directed encapsulation of isopropylbenzene within the pharmaceutical framework of lopinavir

Nompumelelo Sibanyoni

Metabolomic insights into microbial cross-feeding and chemical communication among PGPR strains (Prestia megaterium pm and pseudomonas fluorescens no4) and the pathogen pseudomonas syringae PST

Dr Tatenda Talent Chingono

Optimizing Waste to Energy operations in Emerging Cities using 4IR, Machine learning, GIS and LCA techniques.

Dr Beauty Mugoniwa **Dr Nyasha Grace Gatawa**

The Fourth Industrial Revolution and Digitalization Applications in Education.

Advancing and harnessing sustainability and future technologies in the energy sector globally with particular focus on Southern Africa and particularly in Zimbabwe and South Africa

Dr Morakane Madiba **Ms Rabyatalhabesha Bilal Assefa**

Sustainable Energy Transitions for Inclusive Development: Policy, Public, Governance and Practice in African education, socio-ecological and technological systems

Green synthesis, characterization, and application of Fe-Mn-doped and nanoparticle-enhanced MOFs for multifunctional remediation of acid Mine Drainage