

## Session Program

6–10 Jul 2026



## SAIP2026

### *Physics of Condensed Matter and Materials*

University of the Western Cape

## Tuesday 7 July

09:30

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Prof. J.J. Terblans

09:30–09:50

#### Investigating the Use of Complex Mechanics in Copper-Cobalt extraction and enviromental sustainability

Speaker

Dr Alain Daniel Shekomba

09:50–10:10

#### Interfacial Energetics and Charge-driven Adsorption in Polyethersulfone (PES)Functionalized Polyaniline ( PANI) Nanocomposites

Speaker

Nobathembu Faleni

10:10–10:30

#### Multifunctional Rare-Earth Doped Spinel Ferrites: From Structural, Magnetic Tuning, and Functional Application

Speaker

Nkanyiso Linda Ndlovu

10:30

11:00

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Cebo Ndlangamandla

11:00–11:20

#### Ni Substituted Mg–Ferrite Nanoparticles: Structure, Coating Effects, and Plant Growth Response

Speaker

Mr Sifiso Nxumalo

11:20–11:40

#### Preparation and study on the spectral properties of garnet type $\text{Ca}_2\text{YZr}_2\text{Al}_3\text{O}_{12}:\text{Dy}^{3+}$ warm white-emitting phosphors

Speaker

Ms Thandi Mazibuko

11:40–12:00

#### Effects of $\text{Ag}^+$ ion induced defects on structural, morphological and optical properties of thin $\text{VO}_2$ films

Speaker

Mr Matome Maloba

12:00–12:20

#### Cluster Expansion and First-Principles Study of Ti–V–Mn Alloys: Selection of $\text{Ti}_8\text{V}_8\text{Mn}_8$ for Hydrogen Storage Applications

Speaker

Vukosi Chauke

12:20–12:40

#### Predicting Crystal Symmetry in Sodium-Ion Battery Materials Using Ensemble Machine Learning Models

12:40

**Speaker**  
Keletso Monareng

14:40

## Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Richard Harris

**14:40–15:00** Effect of Operating Temperature on Rare-Earth Doped Hematite Gas Sensors

**Speaker**  
NTOKOZO CEBEKHULU

**15:00–15:20** Synthesis of SrVO<sub>3</sub> thin films using pulsed laser deposition.

**Speaker**  
Edward Lee

**15:20–15:40**

**Thermal and Structural Analysis of Li<sub>2</sub>MnO<sub>3</sub>-Li<sub>0.69</sub>MnO<sub>2</sub> Core-Shell Systems using Molecular Dynamics Simulations**

**Speaker**  
Precious Makhubela

**15:40–16:00**

**CuO/Fe<sub>2</sub>O<sub>3</sub> p-n heterostructures with Ag-functionalization for improved p-xylene and toluene sensing performance**

**Speaker**  
Vuyani Sifunda

16:00

## Wednesday 8 July

09:30

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Christopher Arendse

09:30–09:50

#### Fabrication and Characterization of Gd-doped $\text{ZnO}$ thin film- As a 365 nm-UV photodetector

Speaker

Dr Dr. Kumar Haunsbhavi

09:50–10:10

#### First principles study of the structural, electronic, and magnetic properties of the CeCuGe intermetallic compound

Speaker

Prof. Buyisiwe Sondezi

10:10–10:30

#### Room temperature trace Acetone detection using $\text{W}_{18}\text{O}_{49}$ - $\text{WO}_3$ nanostructures

Speaker

Jodinio Lemena

10:30

11:00

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Motlalepula Rebecca Mhlongo

11:00–11:20

#### Effect of the absorber layer thickness and defect density on the performance of $\text{KGeCl}_3$ perovskite solar cells

Speaker

Ms Bridgette Kabekwa

11:20–11:40

#### Investigation of Phonon Emission Modes in a Channel-Gated GaAs/AlGaAs Finger-Gate Electron Pump

Speaker

Ethan Luyt

11:40–12:00

#### Microfabrication of gratings and spot-pattern arrays using proton beam writing for applications in advanced MEMS

Speaker

Mr Kamogelo Mashiloane

12:00–12:20

#### Synthesis and characterization of Mo doped $\text{CeMgO}_3$ perovskite materials for potential supercapacitor applications.

Speaker

Dolamo Eunice

12:20–12:40

#### Augmenting the mechanical properties of $\text{LiTi}_2(\text{PO}_4)_3$ solid electrolyte through sulfur doping for better electrode-electrolyte contact

12:40

**Speaker**  
MOLATELO MATLEKE

14:50

## Physics of Condensed Matter and Materials

**Session** | **Location:** University of the Western Cape, Lecture Hall GH1 | **Convener:** Setumo Motloun

14:50–15:10

**The design of NiO-Co<sub>3</sub>O<sub>4</sub> heterostructures loaded with Er and Pr rare earth ions for the detection of hazardous air pollutants.**

**Speaker**  
Joy Mothiba

15:10–15:30

**Influence of Ca<sup>2+</sup> ions doping on the structural and electron spin resonance properties of ZnFe<sub>2</sub>O<sub>4</sub> nanoparticles**

**Speaker**  
Mr sinegugu Shezi

15:30–15:50

**The VEC effect on the electronic and lattice dynamic stability of B<sub>2</sub> Ti<sub>50</sub>Ru<sub>50-x</sub>Ni<sub>x</sub>: A supercell approach**

**Speaker**  
Bongani Ngobe

15:50–16:10

**CH<sub>4</sub> detection capabilities of Co<sub>3</sub>O<sub>4</sub> - ZnO nanofibers: synergistic effects of p-n junction**

**Speaker**  
Ms Khanyisile Nkuna

16:10

## Thursday 9 July

09:30

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Moise Bertin Tchoula Tchokonte

09:30–09:50

**First-Principles Investigation of Structural, Mechanical, Thermodynamic and Electronic Properties of High-Entropy Alloys for High-Temperature Applications.**

Speaker

Ramalebana Moeti

09:50–10:10

**First principles study of the structural, electronic, magnetic, thermodynamic, and electrical transport properties of PrCuGe<sub>3</sub>, ternary intermetallic compound**

Speaker

Dr Mubarak Yagoub

10:10–10:30

**Lanthanide-Doped Ca<sub>5</sub>Mg<sub>4</sub>(VO<sub>4</sub>)<sub>6</sub> Phosphors for NIR-to-Visible Latent Fingerprint Visualization**

Speaker

Hope Ramolahloane

10:30

11:00

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Prof. Lynndle Square

11:00–11:20

**Structural, magnetic and critical behavior properties of Ce<sub>2</sub>Al<sub>3</sub>Ge<sub>4</sub>**

Speaker

Ms Zandile Mpupa

11:20–11:40

**Optimized composition of the In<sub>2</sub>O<sub>3</sub>-Co<sub>3</sub>O<sub>4</sub>-ZnO nanostructure loaded with Ru for ethanol detection**

Speaker

Katlego Morulane

11:40–12:00

**Influence of Nickel (Ni) on the structural and optical properties of LiZnBO<sub>3</sub> and on the photocatalytic degradation efficiency of LiZnBO<sub>3</sub> on potassium ethyl xanthate under UV-Vis irradiation.**

Speaker

Mr Emmanuel Diutlwetse Magasi

12:00–12:20

**Optimization of Nitrogen in Transition Metal Oxynitrides for Fuel Cell Applications**

Speaker

Nicholas Onkoba

12:20–12:40

**The Synthesis and Characterization of  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub> Nanoparticles**

Speaker

Aphile Chithwayo

12:40

14:40

## Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Hasani Chauke

14:40–15:00

**Effect of CuO doping on the structural properties of CeO<sub>2</sub> nanofibers for selective detection of CH<sub>4</sub> and ppb-level NO gas**

Speaker

MAPHIA GIFT PHOLOANA

15:00–15:20

**Influence of sol-gel, combustion, and solid-state synthesis methods on the structural and photoluminescence properties of Zn<sub>4</sub>B<sub>6</sub>O<sub>13</sub> : xEu<sup>3+</sup> phosphor materials for LEDs applications.**

Speaker

Athenkosi Siyalo

15:20–15:40

**Non-linear Evolution of Wettability in ABPBI/CNT Composites Under UV–Ozone Exposure: A Machine Learning Approach**

Speaker

Siaybulela Andile Nkosi

15:40–16:00

**Establishing a Reproducible CVD Platform for CsPbBr<sub>3</sub> Thin Films and Future Routes to Plasma- and Temperature-Driven Heterostructure Optimization**

Speakers

Christopher Arendse, James Mercuur

16:00

16:30

## Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Kingsley Onyebuchi Obodo

16:30–16:50

**Atomistic Insights into Hydrogen Adsorption on TiAlCr-Based Alloys via DFT and HEAPs Calculations**

Speaker

David Tshwane

16:50–17:30

**Division AGM (Physics of Condensed Matter and Materials)**

17:30

## Friday 10 July

09:30

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: David Motaung

09:30–09:50

#### Density Functional Theory Study of the Electronic Properties of Group V Dopants in 2D Monolayer SiC for High-Power Electronic Application

Speaker

Emmanuel Igumbor

09:50–10:10

#### Mitigation of Helium-Induced Surface Damage in SiC Using Thin Carbon Layers

Speaker

Hesham Abdelbagi

10:10–10:30

#### Evaluation of poly(2,5-benzimidazole) against vacuum ultraviolet radiation for space applications.

Speaker

Ernst Ellis

10:30

11:00

### Physics of Condensed Matter and Materials

Session | Location: University of the Western Cape, Lecture Hall GH1 | Convener: Hendrik Swart

11:00–11:20

#### Photoactive Hybrid Nanodevices for Neuromorphic Systems and Collective Coulomb Blockade Architectures

Speaker

Prof. Richard Harris

11:20–11:40

#### Analysis of biomass-based GO for application in lithium-ion batteries for sustainable energy storage.

Speaker

Thokozane Mlotshwa

11:40–12:00

#### Tailoring SnO<sub>2</sub> Nanoparticles via pH-Controlled Hydrothermal Synthesis for Enhanced Gas Sensing Performance

Speakers

Mr Philani Mngomezulu, Charles Thulani Thethwayo

12:00–12:20

#### Theoretical Investigations of the phase stability and ductility of FeCo-Nb alloys

Speaker

Dr Ramogohlo Diale-Boshielo

12:20–12:40

#### Swift Heavy Ion Irradiation as a Post-Fabrication Tool for Tuning Schottky Barrier Characteristics in PolyanilineGraphene Nanocomposite Diodes



12:40

**Speaker**

Dr Daniel Chilukusha