



# PRIS

2024

POSTGRADUATE RESEARCH & INNOVATION SYMPOSIUM



DATE:  
**29 & 30**  
October 2024  
(Tuesday and  
Wednesday)

VENUE:  
**Coastlands  
Hotel,**  
Musgrave Durban

THEME:  
**ENERGY  
SUSTAINABILITY**

[pris.ukzn.ac.za](http://pris.ukzn.ac.za)

*The College of Agriculture, Engineering and Science  
would like to express its appreciation to the following external partners who have supported  
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Dr Mervlyn Moodley, Quantum Research Group, School of Chemistry and Physics

Professor Mohamed Mostafa, KZNDoT Chair in Sustainable Transportation- Sustainable Transportation Research group (STRg)

Professor Samson Mukaratirwa, School of Life Sciences

Professor Onisimo Mutanga, South African Research Chair in Land Use Planning and Management, School of Agricultural, Earth and Environmental Sciences

Professor Vincent Nyamori, NanoChemistry Research Group, School of Chemistry and Physics

Professor Ademola Olufolahan Olaniran, School of Life Sciences (Dean and Head of School)

Professor Bernard Omondi Owaga, Structural Chemistry Research Group, School of Chemistry and Physics

Professor Francesco Petruccione, National Institute for Theoretical and Computational Sciences (NITheCS), School of Chemistry and Physics

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Professor Parvesh Singh, Organic Synthesis and Medicinal Chemistry, School of Chemistry and Physics

Professor Rob Slotow, Centre for Functional Biodiversity and Oppenheimer Fellow in Functional Biodiversity, School of Life Sciences

Professor Jeff Smithers, uMngeni-uThukela Water Chair of Water Resources Research and Innovation, School of Engineering

Professor Viran Jay Srivastava, School of Engineering

Professor Anne Stark, South African Research Chair in Sugarcane Biorefining, School of Engineering

Professor Andrew Swanson, Centre for Power and Energy Systems, School of Engineering

Professor Serestina Viriri, Computer Vision and Machine Learning Research Lab, School of Mathematics, Statistics and Computer Science (Dean and Head of School)

***The College of Agriculture, Engineering and Science would like to express its appreciation to the following Exhibitors at the 2024 College Postgraduate Research and Innovation Symposium:***

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*The College of Agriculture, Engineering and Science would like to express its appreciation to the following Chairs, Assistant Chairs, Moodle Co-ordinators and Judges of the 2024 Postgraduate Research and Innovation Symposium:*

### **SCHOOL OF AGRICULTURAL, EARTH AND ENVIRONMENTAL SCIENCES**

#### **ORAL PRESENTATIONS**

Chair: Professor Molla Demlie

Assistant Chair: Dr Lelethu Mdoda

Moodle Co-ordinator: Dr Hloniphile Sithole Mthethwa

Judges:

Dr Raesetse Baloyi

Prof Maqsooda Mahomed

Dr Mthembeni Mngadi

Dr Karen Caister

Prof Asanda Mditshwa

Dr Simphiwe Mngomezulu-Dube

Dr NkosiNomusa Dube

Dr Ntuthuko Mkhize

#### **FLASH PRESENTATIONS**

Chair: Professor Trevor Hill

Assistant Chair: Prof Seifu Kebede Gurmessa

Moodle Co-ordinator: Dr Hloniphile Sithole Mthethwa

Judges:

Dr Raesetse Baloyi

Dr Lelethu Mdoda

Dr Simphiwe Mngomezulu-Dube

Dr NkosiNomusa Dube

Dr Saumitra Misra

Dr Lerato Phali

Prof Asanda Mditshwa

Dr Ntuthuko Mkhize

### **SCHOOL OF CHEMISTRY AND PHYSICS**

#### **ORAL PRESENTATIONS**

Chair: Professor Werner van Zyl

Assistant Chair: Professor Parvesh Singh

Moodle Co-ordinator: Dr Vino Paideya

Judges:

Prof Matthew Akerman

Dr Vineet Jeena

Dr Colani Masina

Dr Ilya Sinayskiy

Dr Ukpong Aniekan

Dr Sam Mahomed

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Dr Mervlyn Moodley

## FLASH PRESENTATIONS

Chair: Professor Bice Martincigh  
Assistant Chair: Professor Parvesh Singh  
Moodle Co-ordinator: Dr Tshephiso Papo

### Judges:

Prof Matthew Akerman  
Dr Vineet Jeena  
Dr Mervlyn Moodley  
Dr Mashawe Tukulula

Dr Ukpong Aniekan  
Dr Sam Mahomed  
Dr Sibusiso Hector Mthembu

Dr Patricia Govender  
Dr Colani Masina  
Prof Ilya Sinayskiy

## SCHOOL OF ENGINEERING

## ORAL PRESENTATIONS

Chair: Professor Kuveneshan Moodley  
Assistant Chair: Professor Nishani Harinarin  
Moodle Co-ordinator: Mrs Rosanne Els

### Judges:

Dr Joy Adu  
Prof Pradeep Kumar  
Mr Siqiniseko Richmond

Dr Simbarashe Fashu  
Dr Malusi Mkhize  
Prof Tilahun Seyoum Workneh

Dr Mohamed Fayaz Khan  
Prof Wayne Nelson  
Prof Anne Stark

## SCHOOL OF LIFE SCIENCES

## ORAL PRESENTATIONS

Chair: Prof Raymond Hewer  
Assistant Chair: Dr Meenu Ghai  
Moodle Co-ordinator: Dr Sizwe Zamisa

### Judges:

Dr Lorika Beukes  
Dr Nontuthuko E Maningi  
Dr Lethukuthuka Melusi Ngobese

Dr Sifiso Thuthukani Gumbi  
Dr Tshoanelo Miya  
Dr Ofentse Jacob Pooe

Dr Zabentungwa Hlongwane  
Dr Karen Muthusamy

## FLASH PRESENTATIONS

Chair: Professor Matthew Adeleke  
Assistant Chair: Dr Pamela Gumbi  
Moodle Co-ordinator: Dr Sizwe Zamisa

### Judges:

Dr Sifiso Thuthukani Gumbi  
Dr Karabelo Macmillan Moloantoa  
Dr Ofentse Jacob Pooe

Dr Nontokozo Dephney Matume  
Dr Lethukuthuka Melusi Ngobese  
Dr Shakira Shaik

Dr Tshoanelo Miya  
Dr Sindiso Nkuna

## **SCHOOL OF MATHEMATICS, STATISTICS AND COMPUTER SCIENCE**

### **ORAL PRESENTATIONS**

Chair: Professor Rituparno Goswami

Assistant Chair: Professor Sergey Shindin

Moodle Co-ordinator: Dr Simo Sisize Mthwethwa

Judges:

Prof Knowledge Chinhamu  
Dr Zekhaya Benard Shozi

Dr Jean Vincent Fonou-Dombeu  
Prof Jules-Raymond Tapamo

Prof Paul Kogeda

## **SCHOOL OF ENGINEERING AND MATHEMATICS, STATISTICS AND COMPUTER SCIENCE**

### **FLASH PRESENTATIONS**

Chair: Professor Rituparno Goswami

Chair: Professor Nishani Harinarain

Assistant Chair: Professor Sergey Shindin

Assistant Chair: Dr Joy Adu

Moodle Co-ordinator: Mrs Rosanne Els

Judges:

Prof Knowledge Chinhamu  
Dr Jean Vincent Fonou-Dombeu  
Dr Malusi Mkhize  
Prof Tilahun Seyoum Workneh

Dr Simbarashe Fashu  
Prof Paul Kogeda  
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### MESSAGES OF SUPPORT



Welcome to PRIS 2024 – the fourteenth College of Agriculture, Engineering and Science Postgraduate Research and Innovation Symposium. We are striving to ensure that the research carried out by our postgraduate students is relevant to society and contributes to the wellbeing of South Africans. This event highlights the cutting-edge research conducted by our postgraduate students and provides them with an opportunity to present their work to peers, academic staff and research partners. I would like to thank and congratulate the large number of postgraduate students who have shown the courage and enthusiasm to present their work today. The standard of proceedings is very similar to what students can expect at national and international conferences. Many students have used occasions such as this to hone their presentation skills and have gone on to win awards at international conferences. Behind every postgraduate student is a supervisor or supervisory team, who challenges, encourages and today will be sharing in your success – we owe you a debt of gratitude. Finally, we are grateful to all the sponsors whose generous contributions made this day possible, and we continue actively to seek ongoing collaboration and partnerships with industry and with all relevant role players.

**Professor Nana Poku, Vice-Chancellor and Principal, UKZN**



The research community from the College of Agriculture, Engineering and Science continues to set the pace in terms of research outputs produced across the university. An important part of UKZN's Strategy is the emphasis it places on growing the impact of the research that is produced at UKZN. Impact can be measured in terms of the influence our research has on the community in which we function, the manner in which it impacts the policy environment but also the citations our published research attracts from the broader research community. This requires a focus on high-impact journals and increasing the international collaborations we engage with. These two factors alone will significantly strengthen the research profile of UKZN. Please use the opportunity afforded by this event to encourage all our students and academics to build their research profiles and to focus on the quality of the research produced to ensure that UKZN becomes well-known for the transformative character of its research.

**Professor Neil Koorbanally, Acting Dean of Research, UKZN**



*One of the most influential scientists of modern times, Albert Einstein, stated, "If we knew what it was we were doing, it would not be called research, would it?" Given the pace at which our world is changing, it is no wonder that the human race is under increasing pressure to become "experts" – to know more and more about less and less. The big challenge for us is rapidly to discover, inform and implement our small and big discoveries to make real changes. We have economic, environmental, health and cultural questions to respond to, for the benefit of the present and future generations. The mission of UKZN is to be relevant to our local communities, South Africa and the world. Our postgraduate students have made it possible for UKZN to deliver on its mission. The College Postgraduate Research and Innovation Symposium is a significant moment for UKZN to highlight the efforts and successes of our students and their supervisors. Every presentation over these two days is valuable and I encourage that you should start working on publishing your work. We are thankful to all the students who took time to share their knowledge with us. We also thank their supervisors who guided them to the point of being able to share their research with us. Without the support of our funders, partners and collaborators in research, we would not be celebrating the global recognition we currently enjoy and showcase through this special symposium.*

**Professor Fhatuwani Mudau, Acting Deputy Vice-Chancellor & Head of College: Agriculture, Engineering & Science, UKZN**



*Welcome to the fourteenth College of Agriculture, Engineering and Science Postgraduate Research and Innovation Symposium. This year, the School of Engineering is the proud host of this flagship College event and the two days we have lined up are aimed at showcasing our master's and PhD research across the College, under the banner: "Energy Sustainability". Of particular importance is communicating this research to a wider audience, demonstrating the impact it has on communities and industry. It is my hope that the event will be the catalyst for future collaborative projects with community, government and industry stakeholders.*

*Part of conducting scientific research is to improve the lives of mankind. These two days will provide a platform for our postgraduate students to demonstrate this to their peers, professors and to the public. I applaud all presenters who have come forward to present their research. Hosting an in-person symposium at one of our premier hotels in Durban allows students to get the full experience of attending a conference similar to a national or international format. This is an experience every postgraduate student should have. The symposium will take place in two formats, the conventional oral presentations, and flash presentations, which are a shorter, more concise version of the oral presentation. This is something that is also being practised in international conferences on various continents. As such, our students will be exposed to this way of presenting their research that will allow them to make an impact to a large audience.*

*Finally, I would also like to take this opportunity to thank and congratulate the supervisors and supervisory team. To both the presenters and their supervisors, well done. I look forward to an interesting two days*

**Professor Glen Bright, Dean and Head of the School of Engineering, UKZN**

## PROGRAMME

Tuesday, 29 October and Wednesday, 30 October 2024

### **DAY ONE: Tuesday 29 October**

09:00 – 09:15	<b>Introduction</b> – Professor Neil Koorbanally: College Dean of Research <b>Official Welcome</b> – Professor Nana Poku: Vice-Chancellor of the University of KwaZulu-Natal
09:15 – 09:45	<b>Introduction of the guest speaker</b> – Professor Glen Bright, Dean and Head of the School of Engineering  <b>Keynote Lecture – Dr Mteto Nyati</b> , Chairman of Eskom  “The Eskom Turnaround Story”
09:45 – 9:50	<b>Programme overview - Professor Neil Koorbanally</b>

### **10:00 – 11:20 Session 1 – ORAL PRESENTATIONS**

Timeslot	SAEES	SCP	SE	SLS	SMSCS
10:00 – 10:20	SAEES-O-1-Buthelezi-Gugu	SCP-O-1-Adu-Peter	SE-O-1-Ayingeneye-Josiane	SLS-O-1-Alabi-Mercy	SMSCS-O-1-Gaddam-Sindhu
10:20 – 10:40	SAEES-O-2-Khumalo-Sinikiwe	SCP-O-2-Ayo-Ojo-Oluwatumininu	SE-O-2-Byamungu-Jonathan	SLS-O-2-Govender-Suveena	SMSCS-O-2-Ibrahim-Amna
10:40 – 11:00	SAEES-O-3-Lake-Simon	SCP-O-3-Bauchoo-Yastheer	SE-O-3-Jajbhay-Omaira	SLS-O-3-Jagaran-Keelan	SMSCS-O-3-Ssengonzi-Charles
11:00 – 11:20	SAEES-O-4-Mbava-Nozibuso	SCP-O-4-Chithwayo-Aphile	SE-O-4-Naidoo-Durante	SLS-O-4-Kunene-Caroline	SMSCS-O-4-Motaung-Thato

### **11:20 – 11:40 Tea**

### **11:40 – 13:00 Session 2 – ORAL PRESENTATIONS**

Timeslot	SAEES	SCP	SE	SLS	SMSCS
11:40 – 12:00	SAEES-O-5-Mncube-Zandile	SCP-O-5-David-Ian	SE-O-5-Nsele-Sishosonke	SLS-O-5-Maduna-Thandiswa	SMSCS-O-5-Mthembu-Banele
12:00 – 12:20	SAEES-O-6-Muchaonyerwa-Knowledge	SCP-O-6-Dralle-Lesley	SE-O-6-Pather-Yashlen	SLS-O-6-Magwaza-S'thandiwe	SMSCS-O-6-Pillay-Shivani

12:20 – 12:40	SAEES-O-7- Nyawo-Bongizenzo	SCP-O-7- Folkard-Aaron	SE-O-7- Phumusa-Mouline	SLS-O-7- Mbambo-Phila	SMSCS-O-7- Ruvinda-Caroline
12:40 – 13:00	SAEES-O-8- Omarjee-Zahra	SCP-O-8-Juma-David	SE-O-8- Rameshwarnath-Semyn	SLS-O-8- Mthembu-Sandile	SMSCS-O-8- Sambo-Sydney

13:00 – 14:00 **Lunch**

14:00 – 15:20 **Session 3 – ORAL PRESENTATIONS**

Timeslot	SAEES	SCP	SE	SLS	SMSCS
14:00 – 14:20	SAEES-O-9- Oyebamiji-Emmanuel	SCP-O-9- Chikowe-Ibrahim	SE-O-9-Samuwi-Laston	SLS-O-9- Ndlovu-Nduduzo	SMSCS-O-9- Saruchera-Bester
14:20 – 14:40	SAEES-O-10- Phungula-Nokuzola	SCP-O-10- Mapapiro-Tariro	SE-O-10-Sithole-Bokang	SLS-O-10- Ngcongco-Khanyisile	SMSCS-O-10- Singh-Shridhar
14:40 – 15:00	SAEES-O-11- Shelembe-Sihle	SCP-O-11- Mbatha-Thandeka	SE-O-11-Mothiba-Koena	SLS-O-11- Reddy-Viloshanie	SMSCS-O-11- Tshibase-Slungile
15:00 – 15:20	SAEES-O-12- Sithole-Nkonzo	SCP-O-12- Ngcobo-Nondumiso	SE-O-12-Zakwe-Siboniso	SLS-O-12- Thekiso-Keneilwe	SMSCS-O-12- Zuma-Ntuthuko

16:00 – 17:30 **Guest Lecture: Dr Ntsapokazi Deppa**, Executive: Scientific Services, uMngeni-uThukela Water (UUW)

**“Green Initiatives and Skills in the Water Sector: uMngeni-uThukela Water (UUW)’s Perspective”**

18:00 – 22:00 **Gala Dinner**

Master of Ceremonies: Professor Alan Mathews

18:00 Welcome: Professor Neil Koorbanally

18:10 Entertainment

18:15 **Keynote Speaker: Professor Andrew Swanson**, Associate Professor, School of Engineering, University of KwaZulu-Natal

18:30 Entertainment

18:35 Acknowledgement of uMngeni-uThukela Water (UUW): Mr Sandile Mkhize

18:55 Acknowledgement of PRIS companies

19:05 Closing Remarks: Professor Fhatuwani Mudau, Acting Deputy Vice-Chancellor and Head: College of Agriculture, Engineering and Science

19:10 Entertainment

## DAY TWO: Wednesday, 30 October

### FLASH PRESENTATIONS

Timeslot	SAEES	SCP	SMSCSENG	SLS
09:00 – 13:00	SAEES-F-1-Bala-Abdulbasit	SCP-F-2-Amirthapandian-Bala	SMSCSENG-F-2-Buthelezi-Sbonile	SLS-F-1-Chabalala-Vunene
	SAEES-F-2-Chetty-Evania	SCP-F-4-Dlangalala-Celiwe	SMSCSENG-F-3-Corcos-Shimon	SLS-F-2-Dayanand-Shreya
	SAEES-F-3-Chifurira-Cornelia	SCP-F-5-Hajee-Mariam	SMSCSENG-F-5-Dlamini-Nqobile	SLS-F-3-Dlamini-Anele
	SAEES-F-4-Dlamini-Celuxolo	SCP-F-6-Hlongwane-Senzo	SMSCSENG-F-6-Gumede-Mkhululi	SLS-F-4-Doolabh-Kareshma
	SAEES-F-5-Dlamini-Siyabonga	SCP-F-7-Jili-Ncedo	SMSCSENG-F-7-Haroon-Ali	SLS-F-5-Gobey-Caitlyn
	SAEES-F-6-Ebrahim-Nazneen	SCP-F-8-Jimoh-Saheed	SMSCSENG-F-9-Joseph-Elijah	SLS-F-7-Hadebe-Asande
	SAEES-F-7-Jilajila-Senelisiwe	SCP-F-9-Madaree-Adela	SMSCSENG-F-10-Khumalo-Mandlenkosi	SLS-F-8-Hlongwane-Notando
	SAEES-F-8-Kanonge-Grace	SCP-F-10-Madonsela-Nomaswazi	SMSCSENG-F-11-Lawton-Sahil	SLS-F-9-Idris-Almahi
	SAEES-F-11-Mkhize-Nkosikhona	SCP-F-11-Maharaj-Shamik	SMSCSENG-F-12-Malope-Ben	SLS-F-11-Ismail-Huda
	SAEES-F-12-Mkhwenkwana-Anela	SCP-F-12-Majozi-Siphesihle	SMSCSENG-F-13-Manyama-Mashako	SLS-F-12-Khwela-Sikhanyiso
	SAEES-F-13-Mncwabe-Ntuthuko	SCP-F-13-Maphalala-Aphiwe	SMSCSENG-F-14-Manyathi-Snothile	SLS-F-13-Lauchande-Vanessa
	SAEES-F-14-Moipolai-Reabetswe	SCP-F-14-Mathenjwa-Mandisa	SMSCSENG-F-16-Mngadi-Siyamthanda	SLS-F-14-Maphosa-Khethiwe
	SAEES-F-15-Mthethwa-Melusi	SCP-F-15-MedieFah-Helarie	SMSCSENG-F-17-Mnisi-Siyamthanda	SLS-F-15-Mbonambi-Sithabile
	SAEES-F-16-Mthiyane-Sfundu	SCP-F-16-Migwi-Francis	SMSCSENG-F-18-Mohammed-Anas	SLS-F-16-Moodley-Eden
	SAEES-F-18-Ndlovu-Snethemba	SCP-F-17-Moodley-Danica	SMSCSENG-F-21-Mphahlele-Ipoteng	SLS-F-17-Motaung-Mncedisi
	SAEES-F-19-Ndlovu-Samukelisiwe	SCP-F-18-Msane-Sbonelo	SMSCSENG-F-22-Mtshali-Bongiwe	SLS-F-18-Motiwalat-Tehrim
	SAEES-F-21-Nkomo-Nqobile	SCP-F-19-Msomi-Mhleli	SMSCSENG-F-24-Ncama-Samkelo	SLS-F-19-Msele-Kwanele
	SAEES-F-22-Ntonta-Sipho	SCP-F-20-Mthethwa-Lindokuhle	SMSCSENG-F-25-Ntombela-Onesipho	SLS-F-20-Ndlangamandla-Valencia
	SAEES-F-23-Nxumalo-Nzuko	SCP-F-21-Mthimkhulu-Sakhile	SMSCSENG-F-26-Ntuli-Simiso	SLS-F-21-Nkala-Mandlenkosi
	SAEES-F-24-Nwosu-Obinnaya	SCP-F-22-Mthiyane-Wakhiwe	SMSCSENG-F-27-Ogutu-Sarah	SLS-F-22-Parusnath-Myuri
	SAEES-F-25-Oboh-Michael	SCP-F-23-Mvelase-Sabathile	SMSCSENG-F-28-Okem-Eche	SLS-F-23-Ramaloko-Winnie
	SAEES-F-27-Sebopela-Dimpfo	SCP-F-24-Ndabankulu-Vuyolwethu	SMSCSENG-F-29-Omer-Salaheldin	SLS-F-25-Sappor-Raelene

SAEES-F-28-Sigigaba-Masithembe	SCP-F-25-Ndlovu-Nkanyiso	SMSCSENG-F-31-Reddy-Emerald	SLS-F-26-Singh-Savarna
SAEES-F-29-Sokoko-Sesethu	SCP-F-26-Ngubane-Ntombenhle	SMSCSENG-F-33-Sumbu-Kitenge	SLS-F-27-Singh-Nishthi
SAEES-F-30-Thema-Mamonene	SCP-F-27-Nkosi-Ndumiso	SMSCSENG-F-34-Uzor-Victor	SLS-F-28-Tokota-Dineo
SAEES-F-31-Tshikororo-Mutondi	SCP-F-28-Nompume-Emihle	SMSCSENG-F-35-Xulu-Ntandoyenkosi	SLS-F-29-Zondo-Sindiswa
SAEES-F-32-Tshivhundo-Zwivhuya	SCP-F-29-Nosenga-Sive	SMSCSENG-F-36-Yakubu-Saidu	
SAEES-F-33-Yacoob-Ameera	SCP-F-30-Nxumalo-Sifiso	SMSCSENG-F-37-Zondi-Mthobisi	
SCP-F-32-Nzama-Hlobisile SCP-F-33-Omogunloye-Olusegun SCP-F-34-Permaul-Tanita SCP-F-35-Pillay-Keleish SCP-F-36-Pillay-Vishalan SCP-F-37-Rajkumar-Nerissa SCP-F-38-Rotimi-Sheyi SCP-F-39-Saroj-Shruti SCP-F-40-Seboletswe-Pule SCP-F-41-Shabalala-Lizwi SCP-F-42-Sikakane-Berlinda SCP-F-43-Simelane-Nontobeko SCP-F-44-Singh-Nijal SCP-F-45-Somaru-Saniksha SCP-F-46-Thethwayo-Sinenhlahla			

11:20 – 11:40 **Tea**

13:00 – 14:00 **Lunch**

14:30 – 16:00 **Networking Session: Tea and Coffee**

16:00 – 17:00 **Closing, Prize-Giving, and Lucky Draws**

**Professor Neil Koorbanally**, College Dean of Research

**Professor Fhatuwani Mudau**, Acting Deputy Vice-Chancellor and Head of College: Agriculture, Engineering and Science

**Dr Sally Frost**, Public Relations Manager, College of Agriculture, Engineering and Science

## INDUSTRY SESSION

**Wednesday, 30 October**

### **uMngeni-uThukela Water Chair in Water Resources Research and Innovation**

*(Accredited with the Engineering Council of South Africa for one CPD point)*

Time*	Name	Title
08:30 - 09:00	<i>Arrival tea and coffee</i>	
09:00 - 09:05	Prof Jeff Smithers	<b>Welcome:</b> uMngeni-uThukela Research Chair
09:05 - 09:20	Dr Ntsapokazi Deppa	<b>Keynote:</b> Advancing and Inspiring Industrial Research and Innovation Through “Research and Innovation Chairs
<b>Flood Studies and Water Supply</b>		
09:20 - 09:40	Sandile Dladla*** PhD 215035978  <i>Supervised by:</i> Prof J.C. Smithers Prof O.J. Gericke Dr T.R. Kjeldsen Dr U. Maharaj	Enhancing Flood Risk Assessment Through Multivariate Frequency Analysis: A South African Perspective
09:40 - 10:00	Demian Mukansi PhDEng 215064982  <i>Supervised by:</i> Prof. J.C. Smithers Dr. T.R. Kjeldsen Dr. K. Johnson <i>UUW Industry Leader:</i> Mr Kevin Meier	Detecting Trends in Rainfall and Flood Extremes and Non-Stationary Design Flood Estimation in KwaZulu-Natal
10:00 - 10:20	Khanyisile Mnguni MScEng 216009423  <i>Supervised by:</i> Prof M. Kumarasamy Prof J.C. Smithers <i>UUW Industry Leader:</i> Mr Kevin Meier Mr Mark Scott	Modelling, Assessment and Optimisation of Rules for Selected Umgeni Water Distribution Systems
10:20 - 10:40	Glen Phumlane Ntfonga Mkhonta MSc 219091736  <i>Supervised by:</i> Dr D. Kibirige Dr S. Gokool	Evolution of the Coupling of Hydrologic and Hydraulic Modelling to Enhance the Predictive Accuracy of Flood Forecasting in Umgeni River, South Africa

	<i>UUW Industry Leader:</i> Ms Futhi Vilakazi	
10:40 - 10:50	<i>Tea and leg stretch</i>	
10:50 - 11:10	Thobani Ngwazi MSc 217043646  <i>Supervised by:</i> Prof S.K. Gurmessa <i>UUW Industry Leader:</i> Ms Futhi Vilakazi	An Assessment of Radon (222Rn) Level in Aquifers Along the Umgeni Catchment: Health and Geohydrological Significance
<b>Water Governance and Citizen Science</b>		
11:10 - 11:30	Prof. T. Hill <i>on behalf of</i> Carla Higgs PhD 962079479  <i>Supervised by:</i> Prof T. Hill Prof R. Meissner <i>UUW Industry Leader:</i> Mr Kevin Meier	Developing an Indicator System to Assess Water Equity in South Africa: A Delphi Consensus
11:30 - 11:50	Tanisha Curtis MSc 217007840  <i>Supervised by:</i> Dr M. Graham Dr S. Ngcobo Dr J. Taylor <i>UUW Industry Leader:</i> Ms Futhi Vilakazi	An Evaluation of the State of Citizen Science for Water Quality Monitoring
11:50 - 12:10	Susan Risko*** PhD 217081425  <i>Supervised by:</i> Dr. C. Sutherland Dr. S. Stuart-Hill	Water Governance in uMsunduzi Catchment: Politics and Construction of Socio-Economic and Environmental Values
12:10 - 12:50	<i>Lunch and leg stretch</i>	
<b>Water, Effluent, and Sludge Treatment</b>		
12:50 - 13:10	Nkosinathi Madlala PhD 212518283  <i>Supervised by:</i> Prof D. Lokhat <i>UUW Industry Leader:</i> Ms Megan Schalkwyk Mr Peter Thomson Ms Limakatso Biyela	Validation of Velocity Settling Model Against Experimental Measured Settling Velocity Quantified Using Post-Image Analysis of CCD Camera Toolbox
13:10 - 13:30	Numeerah Ally PhD 218033284  <i>Supervised by:</i> Dr B. Gumbi Dr S.T. Getahun	Standardised Methods for Analysing Emerging Contaminants in Wastewater to Enhance Water Quality Management

13:30 - 13:50	<p>Oyeladun Rhoda Adegoke** PhD 220082237</p> <p><i>Supervised by:</i> Prof B. Martincigh Prof V. Nyamori <i>UUW Industry Leader:</i> Ms Megan Schalkwyk Mr Peter Thomson Ms Limakatso Biyela</p>	Removal of sulfamethoxazole from aqueous solutions by adsorption onto biochar/graphene oxide composites
13:50 - 14:10	<p>Relebogile Morake** MScEng 216005246</p> <p><i>Supervised by:</i> Dr S.S. Stringel Prof D. Lokhat Prof B. Martincigh <i>UUW Industry Leader:</i> Ms Megan Schalkwyk Mr Peter Thomson Ms Limakatso Biyela</p>	Evaluation of Biochar and Activated Carbon Produced from Different Feedstock for Use as an Adsorbent
14:10 - 14:30	<p>Akhil Ramlucken MScEng 217007409</p> <p><i>Supervised by:</i> Dr S.S. Stringel <i>UUW Industry Leader:</i> Ms Megan Schalkwyk Mr Peter Thomson Ms Limakatso Biyela</p>	Development of Solar Thermal Drying Technologies for the Treatment of Faecal Sludge from On-site Sanitation Facilities and Sewage Sludge from Wastewater Treatment Plant
14:30 - 14:50	<p>Dr J. Pocock <i>on behalf of</i> Kirthi Rampersad MScEng 217016379</p> <p><i>Supervised by:</i> Dr S.S. Stringel Dr J. Pocock <i>UUW Industry Leader:</i> Ms Megan Schalkwyk</p>	Development of a Urine Evaporator for Innovative Non-Sewered Sanitation Systems
14:50 - 15:10	<p>Yashlen Pather MScEng 216041338</p> <p><i>Supervised by:</i> Dr. J. Pocock Dr. S.S. Stringel Dr. R. Seodigeng <i>UUW Industry Leader:</i> Ms Megan Schalkwyk</p>	Disrupting Bound Water in Faecal Sludge to Improve Water Removal Processes
15:10 - 15:30	<i>Tea and leg stretch</i>	
15:30 - 16:30	<b><i>Facilitate discussions and closing statements</i></b>	

\* Approximate times

\*\* Pre-recorded presentation due to schedule conflict

\*\*\* Online presentation

## Keynote Lecture

### **“The Eskom Turnaround Story”**

*by*

**DR MTETO NYATI**

Chairman of Eskom

South Africa has been experiencing loadshedding due to the energy crisis for over a decade. This energy crisis has negatively impacted the economy in particular small and micro businesses. A permanent solution to the problem has eluded many leaders who have attempted to solve the problem. Andre de Ruyter is the most recent Group Chief Executive of Eskom who failed dismally and declared that Eskom was a dead horse that could not be fixed. South Africa experienced a loadshedding free winter. Eskom’s new Group Chief Executive Dan Marokane is forecasting a summer without loadshedding. Is this a miracle? Was the dead horse resurrected? What lessons can South Africa learn from the Eskom turnaround story?

## Guest Lecture

### **“Green Initiatives and Skills in the Water Sector: uMngeni-uThukela Water (UUW)’s Perspective”**

*by*

**DR NTSAPOKAZI DEPPA**

Executive: Scientific Services, uMngeni-uThukela Water (UUW)

How is uMngeni-uThukela Water (UUW) gearing up towards the achievement of the National Development Plan-2030 for a green economy?

The South African National Development Plan, NDP-2030, states that by 2030, South Africa’s transition to an environmentally sustainable, climate-change resilient, low-carbon economy and just society must be well underway. There are appeals for environmental assets and natural resources to be preserved, enhanced and protected, in gearing up for a well-managed, just transition to an environmentally sustainable economy. Aligned to this, the next wave of innovation is predicted to include technology that improves and preserves the environment and reduces environmental degradation. This, in turn, requires a Skilled and Capable Workforce.

## **Gala Dinner Keynote Address**

### **“Moving Energy in Space and Time”**

*by*

**PROF ANDREW SWANSON**

Associate Professor, Electrical Engineering, UKZN

There are a number of challenges present in the field of electrical energy. At the Centre for Power and Energy Systems, we have responded to these challenges and have made a contribution to the field. Some of the current and upcoming projects at the Centre are presented from integration of renewable energy to improving the efficiency of the moving energy and ensuring that it can be done reliably. This will encourage postgraduate students to see that you can contribute to the larger challenges no matter how small the contribution.

### ***DR MTETO NYATI***

#### **Biography:**



Dr Mteto Nyati is the chairman of Eskom. Previously he was the Group Chief Executive of Altron and Chief Executive Officer of MTN South Africa

Mteto is also the executive chairman of BSG, a homegrown consulting and technology company that specialises in strategy execution. In BSG he holds a 40% shareholding through his investment vehicle, Wazo Investments.

Mteto is author of the number one bestseller, *Betting on a Darkie*, a book about his life as a shopkeeper's son, family man and business leader at local and multinational corporates.

He mentors and coaches senior executives including CEOs as well as up and coming business professionals.

In 2021, the University of Johannesburg's College of Business and Economics awarded Mteto an honorary doctorate in IT Management. He is a Yale University

World Fellow.

He holds a BSc in Mechanical Engineering from the University of KwaZulu Natal.

### ***DR NTSAPOKAZI DEPPA***

#### **Biography:**



Dr Ntsapokazi Deppa is the Executive: Scientific Services for uMngeni-uThukela Water (UUW) and holds a PhD in Chemistry from the University of Cape Town, focusing on research in medicinal, physical and analytical chemistry. She graduated with her MBA *cum laude* from the University of KwaZulu-Natal and began her career as a contract chemistry lecturer at the Vaal University of Technology. She proceeded to work as a chemist and later as an Analytical Manager at Tongaat Hulett for nine years. She joined UUW as the Laboratory Manager in 2016.

In her role at UUW, she provides strategic leadership in:

- Ensuring compliance with water and wastewater quality standards and regulations, which includes appropriate planning, sampling, monitoring, analysis, auditing, and treatment process rectification functions throughout the water management cycle.
- The organisation's environmental sustainability initiatives include the development and implementation of appropriate sustainability plans and ensuring that all the organisation's operations function per its environmental values.
- Research and innovation programs of the organisation that are in line with the organisation's strategic direction

## ***PROFESSOR ANDREW SWANSON***

### **Biography:**



Prof Andrew Swanson is Associate Professor at the University of KwaZulu-Natal and a professionally registered engineer. He is responsible for research and testing in the field of high voltage engineering and has tested overhead line equipment with voltages up to 350 kV AC, 650 kV impulse and 350 kV DC according to the required high voltage standards.

He is more recently interested in renewable energy use, supply to the grid and storage including the various standards applicable for the connection to the grid and the impact on the quality of the power when connecting to the grid. He has worked in industry as an engineering consultant on railways including 3 kV DC and 25 kV AC traction power systems, earthing and bonding of railways systems, compliance with power quality standards, and low voltage systems for stations and line side equipment. He has several industrial collaborations. He has graduated a number of postgraduates and

published in numerous journals, and international and local conference papers.

# PRIS 2024

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