

FOSSE

Newsletter

2023





"Success is a
Science. If you have
the conditions, you get
the Results"

- Oscar Wilde

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Welcome to the fifth edition of the Faculty of Science and Engineering (FOSE) Newsletter, an annual publication that serves as a conduit for us to share our progress, achievements, and future aspirations. The past year of 2022 was filled with opportunities and challenges, but the indomitable spirit of the FOSE family has once again seen us through.

We start the year by welcoming new staff members Miss Zamekile Bhembe, Dr. Machawe Maphalala, and Dr. Meshack Nkosinathi Dlodlu to the Department of Biological Sciences, and Mr. Sandile Masango to the Department of Electrical and Electronic Engineering. Each of these individuals brings a wealth of knowledge and experience that we are certain will enrich the FOSE community.

I am delighted to congratulate the FOSE staff members who have been appointed as executive committee or board members of various national and international organizations. This recognition of our staff's expertise and leadership reinforces our commitment to influence and advance the field of Science and Engineering, both within Eswatini and beyond.

The year 2022 was remarkable for FOSE in terms of accolades. Many members of our faculty were honoured with awards in recognition of their excellence and outstanding contributions to Science. It fills me with pride to see our faculty's diligence and expertise being recognized at such a high level. Congratulations to all award recipients – you have indeed placed the University of Eswatini on the global map!

A testament to our commitment to developing young talent was the participation of FOSE students in national and international hackathon competitions. Our students demonstrated exceptional coding and problem-solving skills, and we are immensely proud that some were among the winners at these events, including the India-Africa hackathon in New Delhi. Their achievements affirm the quality of our teaching and learning practices.

2022 also saw the launch of the Climate Change and Sustainability Research (C3SR), our latest Centre of Excellence. Coordinated by the “Scientist of the Year” award recipient, Dr. Wisdom Dlamini, the C3SR aims to be the country's think tank on climate change and sustainability issues. We have high hopes for the influence and impact the Centre will have in the years to come.

Amidst a challenging funding environment, FOSE was able to host several training workshops and conferences, thanks to the generous support of non-governmental organizations, collaborating partner universities, and international organizations. Our faculty members attended numerous international conferences to disseminate their research findings, demonstrating our commitment to knowledge exchange and collaborative learning. This past year saw our faculty publishing over 60 journal articles, along with several conference proceedings and book chapters. I applaud our faculty's dedication and tenacity in maintaining an active research profile.

I invite you to explore this edition of the FOSE Newsletter to delve deeper into our journey in 2022. From research highlights to faculty achievements and student successes, we have a lot to share and celebrate. As we anticipate the coming year, we are optimistic and prepared to embrace new opportunities and surmount whatever challenges may come our way.

Enjoy the read, and I wish you all a fruitful and successful 2023.

- Prof. Sandile S. Matsa



Miss Zamekile Bhembe

Miss Zamekile Bhembe is an ecologist whose primary research interests are in bird ecology and conservation. She holds a B.Sc. degree majoring in biology and chemistry and a Master's degree in conservation ecology, both from the University of Eswatini. Miss Bhembe joined the University of Eswatini in August 2022 as a lecturer and Ph.D. student in the department of biological sciences. The Ph.D. is focused on the effects of malaria parasites on birds, occurring along an elevation gradient. She is a professional birder, possessing a working knowledge of southern African birds, but she has also worked with other animal species such as rodents and ticks. She is also involved in the Eswatini WILDLife Laboratory Project (EWILD), as a project manager; the project is led by the All-Out Africa Foundation in partnership with the UNESWA Biological Sciences and funded by USAID and is aimed at establishing a wildlife forensic laboratory in the country.



Dr. Machawe Maphalala

Dr. Machawe Maphalala joined the Department of Biological Sciences as a lecturer in February 2022. He graduated with a BSc majoring in Biology and Chemistry in 2013 at the University of Eswatini, after which he studied towards His MSc in Environmental Resource Management at the same university. His MSc. research focussed on vulture ecology, specifically the Critically Endangered White-backed Vulture. After graduating with an MSc. degree, he was offered an internship at Hawk Mountain Sanctuary in the USA, a non-governmental organisation that is dedicated to the study of raptor ecology and their conservation.

After completing his internship, he began his PhD research at the University of KwaZulu-Natal, co-funded by the National Research Foundation of South Africa and Hawk Mountain Sanctuary. His PhD thesis investigated the adaptation of raptors to human modified landscapes with emphasis on the movement ecology of Long-crested Eagles as a model species. Dr. Maphalala research interests include raptor ecology, land use change and its effects on biodiversity and occupancy modelling. He has served as a reviewer for journals such as Ostrich Journal of African Ornithology, African Journal of Ecology and Global Ecology and Conservation. As an Ecologist he has been trained through local and international workshops and field schools. He has presented his research findings at international conferences. In April 2022 he joined the Ostrich Journal of African Ornithology editorial board where he is currently serving as an Associate Editor.



Dr. Meshack Nkosinathi Dlodlu

Dr. Meshack Nkosinathi Dlodlu joined the Department of Biological Sciences, as lecturer in Botany, in January 2022. He holds a PhD in Botany, from the University of Cape Town (UCT), South Africa. His career with the University of Eswatini, began in 2006, when he was appointed as Research Assistant in the Eswatini Institute for Research in Traditional Medicine, Medicinal and Indigenous Food Plants (EIRMIP). At that time, he had just graduated (October, 2005) with a Bachelor of Science Degree from UNISWA, in which he majored in Biological Sciences and Chemistry. In 2011, Dr. Dlodlu was appointed as Research Fellow at EIRMIP, following his graduation with a Master of Science in Botany from UCT. In that same year, Dr. Dlodlu won the Abdou-Salam Ouédraogo Fellowship, for research on conservation and use of forest genetic resources in Sub-Saharan Africa. This is a highly competitive fellowship, offered by Bioversity International, and is awarded to one candidate from Sub-Saharan Africa each year. Through the fellowship, he uncovered the distribution and population Biology of the endangered *Warburgia salutaris* plant species in Eswatini.

Dr. Dlodlu's research interests include biodiversity conservation, ecology, ethnobotany and plant systematics. His research employs diverse techniques from several fields, such as biogeography, bioinformatics, ecology, microbiology, molecular phylogenetics, soil chemistry and traditional taxonomy. Thus far, he has published 14 research

articles in peer reviewed journals and presented several papers in international conferences. Two articles are presently in press, while three are under preparation. These outputs are products of collaboration with colleagues from the University of Cape Town in South Africa, University of Hamburg in Germany, Umaru Musa Yar'adua University in Nigeria, and Gothenburg University in Sweden.

Thus far, graduates who were supervised by Dr Dlodlu include two at Master's Degree level and three at Undergraduate Degree level. Current supervised students include three at Master' Degree level and three at Undergraduate Degree level.



Dr. Meshack Nkosinathi Dlodlu

Mr. Sandile Masango joined the Department of Electrical and Electronic Engineering at UNESWA as a Technologist in January 2022. He has previously worked at the Eswatini Electricity Company. He graduated with a B. Eng. in Electrical and Electronic Engineering from UNESWA in 2018.

New Bat Species Described by UNESWA Biologists

A team led by Profs. Peter Taylor and Ara Monadjem recently described a new bat species to science. This bat goes by the scientific name of *Neoromicia hlandzeni*, which refers to the fact that it is closely associated with the lowveld of Eswatini and neighbouring regions of South Africa and Mozambique. This is the first mammal (and quite possibly vertebrate) that has ever been given a SiSwati name as part of its scientific name. Two other members of staff of the Department of Biological Sciences were also involved in this study and are co-authors on the paper: Mr. Mnqobi Mamba and Ms. Siphesihle Magagula.



Mr. Mamba, one of the UNESWA biologists who described the new bat species giving an interview for the national television.

Dr. Wisdom Dlamini Appointed Coordinator of the Centre for Climate Change and Sustainability Research



Dr. Dlamini appointed coordinator of the Centre for Climate Change and Sustainability Research, UNESWA.

Dr. Wisdom M. Dlamini was appointed Coordinator of the newly established Centre for Climate Change and Sustainability Research (CCCSR) of the University of Eswatini in May 2022. This appointment of Dr. Dlamini by the Vice Chancellor on the recommendation of the Faculty, is for a three-year period. The Centre is envisaged to be the country's think tank on climate change and sustainability issues. Its establishment came as a request from the Climate Change Unit and the Department of Meteorological Services in the Ministry of Tourism and Environmental Affairs.

Dr. Sandile Simelane and Dr. Thabile Ndlovu Elected to Serve in the National Laboratory Association of Eswatini (NLAE) Executive Committee

Dr. Sandile B. Simelane and Dr. Thabile Ndlovu were elected to serve in the National Laboratory Association of Eswatini (NLAE) executive committee. Dr. Ndlovu acts as deputy chairperson while Dr. Simelane acts as an executive member.



Dr. Simelane and Dr. Ndlovu posing with other members of the NLAE-EXCO.

Ms. Nothando Thwala Honoured by the U.S. Embassy in Eswatini for Women History Month

The U.S. Embassy in Eswatini on March 2022, celebrated Ms. Nothando Thwala as part of their Women History Month campaign where they celebrate Eswatini women's contributions to history, culture, and society. Women's History Month is an annual internationally declared month that highlights the contributions of women to events in history and contemporary society during the month of March. Ms. Thwala was celebrated with six other Eswatini women doing meaningful work in different fields.



The campaign photo of Ms. Thwala courtesy of the U.S. Embassy Eswatini.

Dr. Wisdom Dlamini awarded Inaugural Kingdom of Eswatini Academy of Science (KEAS)



Dr. Dlamini receiving his award during the awarding ceremony.

Dr. Wisdom Dlamini was awarded the inaugural Kingdom of Eswatini Academy of Science (KEAS) achievement award by KEAS on the 12th October 2022. The award was given to Dr. Dlamini during the inaugural KEAS Research Conference held under the theme 'Fostering collaboration between Scientists in Eswatini' organized in conjunction with the Ministry of Information, Communication and Technology (ICT), which was held at Royal Villas, Ezulwini. The award was a recognition of Dr Dlamini's contribution to science and the application of science to addressing societal issues in Eswatini.



The team with Minister of Education Hon. Lady Howard Mabuza and Director of Education Dr Dlamini in India after the closing ceremony.

The Faculty of Science and Engineering sent 11 participants and one lecturer to the UNESCO INDIA – AFRICA Hackathon 2022. The event was held physically in India from the 22nd November to the 24th November 2022. This was a 36-hour event that brought together students, educators and the research community of India and its African partners to tackle the common challenges faced by their countries and also served as a facilitator for cultural amalgamation. The event was meant to provide a suitable platform allowing young innovators to come together and find solutions for social, environmental, and technical problems faced by the collaborating nations. It served as the foundation for creating potential start-ups with the potential to transform the world. It allowed the participating students to unleash their creativity and explore new technologies to solve real-world problems under the guidance of experts - thus, spearheading business innovation in the modern world.

The event had 603 student participants from 22 African countries and India. The students were divided into 100 teams and each team was allocated a problem drawn from 20 problem statements. Each team comprised of students from different countries. The problem statements came from 5 thematic areas namely education, drinking water and sanitation, energy, agriculture and health and hygiene. Collaboration of the student teams working together to solve shared problems opens the doors to cultural assimilation by introducing students and their mentors to methods, values and manners different from their own. The Hackathon served as a symbol of the close relation cherished

by India and its African counterparts and embodies the spirit of collaboration - bringing them together to solve problems for the betterment of humankind.

Prior to going to India, the students were given their problem statements around October 2022. Each group was assigned a mentor working in one of the leading technological companies in India including Samsung. The groups started working with their mentors on the projects and were also given online tutorials over a period of 4 weeks on problem solving skills using Artificial Intelligence and other techniques.

In India, the teams had a 36 hours non-stop round table session, where they put together their solutions and were evaluated by a team of evaluators from India's leading technological companies. The 20 problem statements were evaluated separately and eventually the hackathon had 20 winning teams. The University of Eswatini had 3 students in 3 different winning teams. The winners were Neliswa Bhembe, Tibutsile Dlamini and Saheed Faremi. Congratulations to these students. The faculty would like to thank all those who made it possible for the students to attend the event. The Government of India who sponsored students with flight tickets, accommodation and food, the Centre for Energy and Sustainable Development for sponsoring the students with pocket money, an Indian businessman and his wife who also sponsored students with pocket money and t-shirts and finally the University for sponsoring the accompanying lecturer. Technical Support to Increase Transparency Capacity and Set-up of Sectoral MRV Systems in Eswatini



The team on arrival at KMIH International Airport from India.



The Eswatini team posing for the lenses in India.



A group composed of UNESWA administration, professionals and participants posing for a photo after the awarding ceremony.

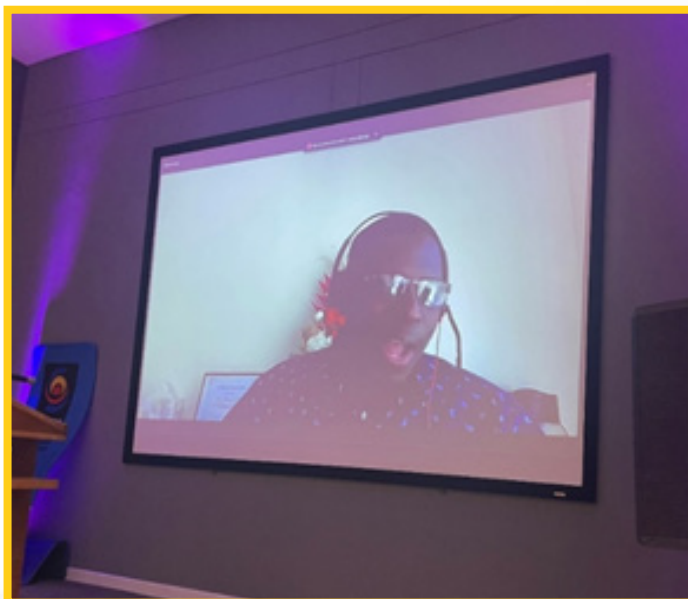
The University of Eswatini and its partners hosted the fourth edition of IndabaX Eswatini at **ROYAL SCIENCE TECHNOLOGY PARK (RSTP) NOKWANE**, from 29th – 30th September, under the theme Machine learning for Telecommunications networks. The event was sponsored by various partners including the Central Bank of Eswatini, ESCCOM, Centre for Financial Inclusion, FSRA, and Zindi. The **poster presentation winner**, Ms. Shabangu Zandile, presented a topic titled detecting Cyberbullying using Machine Learning & Deep Learning Models. **Hackathon winners are as follows; first prize of E15000, won by Mr. Mayibongwe Mahlalela; second prize of E10000, won by Mr. Kwanele Tsabedze, and the third prize of E5000 was won by Mr. Saheed Faremi and Ms. Tifeziwe Dlamini.** The poster presentation winner of this contest will get funding, from the Deep Learning Indaba, to attend the main Deep Learning Indaba event that will be held in Accra, Ghana in August 2023.



A participant posing a question to one of the presenters on Day 1 of IndabaX.



Ms. Pamela Nhlengetfwa (CBE) presenting on the impact of Machine Learning on Fintech for mobile platforms.



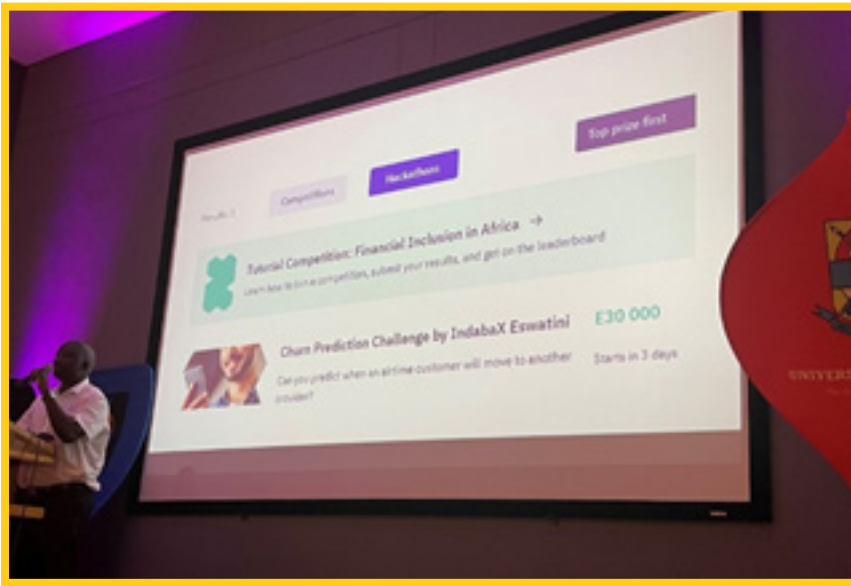
Dr. Nickson Karie (Edith Cowan University, Australia) presenting online on deep learning models for cyber security on telecommunication networks.



Ms. Zandile Shabangu making her poster presentation about detecting cyberbullying using Machine Learning & deep learning models.



An audience comprised of students, lecturers and other professionals during a practical session led by Mr. Jeremiah Olamijuwon, a Data Scientist from Etihuku in South Africa.



Mr. Elliot Mbunge (UNESWA) introducing the Zindi Hackathon competition problem, giving the participants all details about the competition.



A group photo of attendees captured at the Royal Science and Technology Park (RSTP), Matsapha.



Ms. Zandile Shabangu receiving her certificate for being the winner in poster presentation category during the IndabaX awarding ceremony.



Ms. Tifeziwe Dlamini and Mr Saheed Faremi receiving a cheque after winning the third prize (E5, 000.00) of the Hackathon Competition.



Mr. Kwanele Tsabedze receiving his cheque after winning the second prize (E10, 000.00) of the Hackathon competition.



Mr. Mayibongwe Mahlalela making his speech as the winner for the first prize (E15, 000.00) of the Hackathon competition.



The graduates posing for the group photo with the VC of UNESWA and the MD of EPTC.

For the year 2022, the UNESWA CISCO Networking Academy (CNA), was able to conduct its operations smoothly. We had a total of two intakes in the year, one on the 21st of February 2022 and the other on the 6th of August 2022. The academy was also able to successfully host its third graduation ceremony

on the 19th of May 2022, at EPTC Training Centre. The ceremony was graced by both the University management, as well as the EPTC management, where the UNESWA Vice Chancellor, Prof Justice M. Tfwala and the EPTC Managing Director, Mr Themba Khumalo both made their remarks.



The VC, Prof. Thwala making his remarks during the graduation ceremony.



The MD of EPTC, Mr. Khumalo, making his remarks during the graduation ceremony.

UNESWA CISCO ACADEMY



BLENDED SESSIONS

- ☺ Online sessions
- ☺ Face 2 face sessions

COURSE OUTLINE

- CCNA1 Introduction to Networks
- CCNA2 Switching, Routing & Wireless Essential
- CCNA3 Enterprise Networking, Security & Automation

E6 000.00
per module

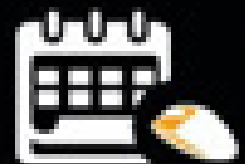
2023

COURSE DURATION

12 Weeks Per Module

COURSE STARTING

04 March 2023



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Technical Support to Increase Transparency Capacity and Set-up of Sectoral MRV Systems in Eswatini

The Centre for Sustainable Energy Research (CSER) in the Faculty of Science and Engineering at the University of Eswatini (UNESWA) recently conducted a project on technical support to increase the overall transparency capacity and set-up of sectoral Measurement, Reporting and Verification (MRV) systems in the Kingdom of Eswatini.

The project was funded by the Initiative for Climate Action Transparency (ICAT), a partnership between the United Nations Framework Convention on Climate Change (UNFCCC) and the World Bank. The project aimed to build the capacity of technicians at Eswatini's Ministry of Tourism and Environmental Affairs, line departments and national experts and institutions, including UNESWA, to develop robust sustainable data collection processes, including institutional arrangements, and improved Tier 2 data for future inventory compilation.

The project also aimed to undertake a renewable energy policy assessment in order to model the climate, economic and social impacts of various scenarios on emissions and the community and the economy as a whole, particularly in the agriculture and LULUCF sectors. The project was successfully completed in June 2022. The key outcomes of the project include:

- The development of a framework for monitoring and tracking adaptation actions in the health and water sectors to meet Eswatini's NDC targets.
- The strengthening of capacities to construct frameworks for other sectors.
- The contribution towards ongoing efforts to build a national transparency framework that meets international standards but is tailored for domestic needs.
- The contribution towards ongoing efforts to improve the availability, collection and quality of data required for estimating emissions in the energy and AFOLU sectors.

- Conduct a renewable energy policy assessment and scenario impact modelling to explore concrete approaches that could significantly assist Eswatini to meet its NDC renewable energy target.

The project has made a significant contribution to Eswatini's efforts to increase its transparency capacity and set-up of sectoral MRV systems. The project has also helped to build the capacity of national experts and institutions to develop and implement MRV systems. This will be essential for Eswatini to meet its climate change commitments and to access climate finance.

The CSER is grateful to the ICAT for funding this important project. It is also grateful to the Ministry of Tourism and Environmental Affairs, line departments and national experts and institutions, including UNESWA, for their cooperation and support. It is committed to continuing its work on MRV and climate change, and working with partners to support Eswatini's efforts to build a more sustainable future.

Training Eswatini Water Services Employees on Organizational Greenhouse Gas Accounting

The Centre for Sustainable Energy Research (CSER) of the Faculty of Science and Engineering at the University of Eswatini recently provided introductory climate change training to employees of Eswatini Water Services Corporation (EWSC). The training, which was held at the Emtfonjeni Building in Ezulwini from September 12 to 16, 2022, focused on organizational greenhouse gas (GHG) accounting.

Nine EWSC employees participated in the training, which was led by the Manager of the Environmental Health and Safety Department (EHS). The main objective of the training was to provide employees with the skills and knowledge necessary for EWSC to account for its carbon footprint. The Executive Director of the Eswatini Environmental Authority was also in attendance to provide insights into the business case for GHG accounting.

The topics covered in the training included:

- Climate change as a result of GHG emissions
- The greenhouse effect and GHG gases, their emission factors, and global warming potentials
- The business case for GHG accounting
- ISO 14062-1 standards
- Intergovernmental Panel on Climate Change (IPCC) guidelines and sectorial GHG accounting
- The Greenhouse Gas Protocol: Scopes 1, 2, and 3
- Live GHG inventory worksheet exercise
- Methodologies for GHG inventories

- Organizational GHG inventory examples
- Potential GHG source categories for EWSC
- Setting GHG targets for EWSC (opportunities)
- Preparing a GHG inventory report
- Verification of carbon footprint: ISO 14064-3 and case study on verification of carbon footprint.

The training was well-received by the participants, who expressed their appreciation for the opportunity to learn more about GHG accounting and its importance for EWSC. The training is expected to play a significant role in helping EWSC to reduce its carbon footprint and contribute to the fight against climate change.

In response to the climate change urgency and the Kingdom of Eswatini's need to adapt to and mitigate the impacts of climate change, the University of Eswatini (UNESWA) Senate in its meeting on the 31st of May 2022 approved the establishment of the Centre for Climate Change and Sustainability Research (C3SR). This is a national centre of excellence for climate and sustainability research and training housed under the Department of Geography, Environmental Science and Planning within the Faculty of Science and Engineering. The Centre's mission is to provide world-class innovative and interdisciplinary research and training towards Eswatini's sustainable and climate-resilient development. Subsequently, a Centre Coordinator, Dr. Wisdom M.D. Dlamini was appointed.



Vision and Mission

The Centre's founding vision is a climate resilient, climate just and climate neutral Eswatini whilst the mission is to be a centre of excellence providing world-class innovative and interdisciplinary research and training towards Eswatini's sustainable and climate-resilient development.

The broad mandate of the C3SR include:

- Producing credible, salient and legitimate science that informs nature-based climate strategies and actions in Eswatini and beyond.

- Providing facilities for offering postgraduate, seminar, symposium, training and short courses to help develop professional skills in climate change and environment-related areas.
- Providing advanced climate change and environmental research training and capacity building for researchers and professionals across disciplines and fields of study.
- Securing funding for conducting research addressing climate change and environmental issues.
- Facilitating the exchange of ideas between scientists, policy makers and practitioners regarding climate change and sustainable development issues across Eswatini and the world.
- Building collaborative research networks between interested parties both within (e.g., research institutes) and outside Eswatini (e.g. external universities and research centres),
- Establishing a resource and documentation centre on environment and climate studies that draws on comparative and relevant research and theory,
- Sharing the knowledge of climate change and sustainability issues with decision makers, think tanks and civil society through scientific publications and engagements.

Research Areas

The Centre is an inter- and transdisciplinary research and training institute that brings academics and researchers from UNESWA and other higher education and research institutions together with business, civil society and government actors to co-produce and test new insights, evidence and innovations that will help to solve Eswatini's climate and environmental challenges. Researchers at the Centre apply fundamental scientific principles to pressing questions on environmental change, climate dynamics, climate variability, global climate change, and extremes of weather and climate. The Centre will also provide science-based evidence for how climate change impacts all aspects of life, and ideas for urgent actions to address these challenges.

The standard minimum set of objectives for research and innovation funding for the Centre will include the promotion of internationalisation, career advancement, career renewal, capacity building, strategic priorities, collaboration with industry and commercialisation of academic research.

Activities

The newly appointed Co-ordinator had preliminary meetings with the Commonwealth Climate Finance Advisor Dr. Samson Samuel Ogallah who was embedded in the Ministry of Tourism and Environmental Affairs and the Climate Change Coordinator, Ms. Khetsiwe Khumalo. The preliminary discussions centred on the development of a financing plan for the Centre as well as developing financeable programmes.

The Co-ordinator also attended a workshop organized by the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) from the 7-10th November 2022 in Gaborone, Botswana. The aim of the workshop was to validate a Regional Report on Mapping of Climate-Relevant Satellite Data Sources and the launch of the “Information for Agriculture and Food Security” Project.

The Co-ordinator also attended the following meetings/workshops:

- United Nation Convention to Combat Desertification (UNCCD) Working Session to prepare the UNCCD National Report, 14 - 16 September 2022, Sibane Sami Hotel, Ezulwini. The Co-ordinator assisted with geospatial data sets on the following:

- Land cover change
- Land use change
- Soil organic Carbon

- Launch of the Eswatini Agriculture Climate Change Sector Project, 29 September 2022, Happy Valley Hotel, Ezulwini
- National Disaster Management Agency (NDMA) / United Nations Office for Disaster Risk Reduction (UNDRR) National Workshop on Systemic Risk Assessment in Eswatini, 10 – 13 October 2022, Royal Villas, Ezulwini.
- Consultative Workshop on Gaps, Constraints and Needs for Reporting under the United Nations Framework Convention on Climate Change (UNFCCC), 17 October 2022, Mountain View Hotel, Mbabane.
- Climate Technology Needs Assessment and Systems of Innovation Stakeholder Consultation Workshop, 17 October 2022, Mountain View Hotel, Mbabane.
- Great Green Wall Initiative (GGWI) National Action Plan (NAP) Validation Workshop, 19 October 2022, Esibayeni Lodge, Matsapha.
- Stakeholder Validation Workshop on the Guidelines for integrating Climate Change in the National Development Process, 25 October 2022, Mountain View Hotel, Mbabane.
- The United Nation Convention to Combat Desertification (UNCCD) Country Report Validation Workshop, 26 October 2022, The George Hotel, Manzini
- Waste Indaba 2022 under the theme “Transitioning to a Circular Economy: Addressing the Waste Management Nexus in Eswatini”, 27 October 2022, Sibane Sami Hotel, Ezulwini. The Co-ordinator presented on “The circular economy in waste management: challenges and opportunities for Eswatini”.

Biological Sciences Department

Long Term Surveys

Prof. Ara Monadjem and Dr. Machawe I. Maphalala conducted another instalment of the long term-surveys on Red Data List species, namely:

- a) Southern Bald Ibis at Mahamba and Mantenga on the 31st of October 2022.

This survey involves counting the number of active nests early in the breeding season and later counting the total number of fledglings. The data collected every year are shared with Birdlife South Africa.

- b)Vulture surveys in Mlawula Nature Reserve on the 23rd of October 2022.

This survey also involves the recording the number of active nests and the total number of chicks that eventually fledge out of the active nests. Where possible chicks are tagged with unique ID numbers as a means to monitor dispersal.



One of the rings fitted to the vulture chicks. The rings have a number that is unique to each individual bird.



Dr. Maphalala taking measurements of a White-backed Vulture chick that is almost ready to fledge.

Terrestrial Vertebrate Laboratory

The following staff members of the Department of Biological Sciences have pooled their experience and resources to form the Terrestrial Vertebrate lab: Prof. Ara Monadjem, Prof. Themb'alilahlwa Mahlaba, Dr. Sara Padidar, Dr. Machawe Maphalala, and Mr. Mnqobi Mamba. The vision for this lab is to conduct pure and applied research on the role of vertebrate animals in terrestrial landscapes, including ecosystem services, conservation, and snakebite and pest management. We envisage that by forming this lab, our MSc and PhD students will be exposed to more ideas and skills than if we were working alone.



Some of the members of the Terrestrial Vertebrate lab during a meeting.

Mount Mabu Expedition

Prof. Ara Monadjem and Mr. Mnqobi Mamba were invited to participate in a small mammal survey of Mt Mabu in northern Mozambique. This is one of the most remote areas in our region, yet it is home to the largest tropical rainforest in southern Africa. Specifically, the survey focussed on bats, rodents and shrews. A small collection of voucher specimens was made, which was shared between the National Museum of Maputo and the Eswatini National Museum of Natural History. Included in this collection, was a specimen of Mt Mabu horseshoe bat (*Rhinolophus mabuensis*), which was described a decade ago by Profs. Peter Taylor and Monadjem together with a few other colleagues. The specimens are in the process of being examined, which may lead to new insights into how small mammal communities are organised in isolated forest patches.

History, UNESWA, Kwaluseni campus. Prof. Themb'alilahlwa Mahlaba, Mr. Mnqobi Mamba, and Miss Siphesihle Magagula visited the Maputo Natural History Museum to foster collaboration and sharing of specimens and information between the two museums.



From left to right Prof. Themb'alilahlwa Mahlaba, Mr. Mnqobi Mamba, Ms. Erika Tovela, and Ms. Siphesihle Magagula during their visit to the Maputo Natural History Museum.



Mr. Mamba (first from left) and Prof. Monadjem (third from left) during the Mount Mabu expedition.

Eswatini National Museum of Natural History

Prof. Ara Monadjem and Mr. Mnqobi Mamba were invited to participate in a small mammal survey of Mount Mabu in northern Mozambique. They collected some voucher specimens during this expedition, which were shared between the Maputo Natural History Museum and the Eswatini National Museum of Natural History. The specimens are in the process of being examined and are currently kept in the Eswatini National Museum of Natural

UNESCO Man and Biosphere (MAB) Programme

On the 3rd of November 2022, the Kingdom of Eswatini joined the world in celebrating the first international day for biosphere reserves and also celebrated the kingdom's very first biosphere reserve, the Lubombo Biosphere Reserve which was designated by the Man and Biosphere International Coordination Council (MAB ICC) in June 2019. This historic day was celebrated at the University of Eswatini, Kwaluseni Campus.

Monitoring of Breeding Vultures at Mlawula Nature Reserve

Dr. Machawe Maphalala surveyed breeding vultures at Mlawula Nature Reserve. This is part of the annual monitoring of the Critically Endangered White-backed Vulture in the country. This is an important exercise for the conservation of this highly threatened bird, whose populations are declining across Africa at an alarming rate.



Dr. Maphalala holding one of the White-backed Vulture chicks at Mlawula Nature Reserve.

also touched on the challenges women and girls face in accessing careers in STEM and the work she does at Women in Engineering (WomEng) Eswatini, where they have different programs targeted at getting more girls and women to take up careers in STEM.

The International Day of Women and Girls in Science was declared by the United Nations General Assembly on 11 February 2015, and has since been celebrated annually on this day, to further efforts of achieving gender equality and the empowerment of women and girls globally.



Ms. N. Thwala during the live interview at Kusile Breakfast Show.

Electrical and Electronics Engineering Department

EEE Participates in International Day of Women and Girls in Science celebration on Eswatini TV

On the 11th of February 2022, the Department of Electrical and Electronic Engineering in celebration of the United Nation's International Day of Women and Girls in Science, gave a live interview on the Kusile Breakfast show on Eswatini TV. Ms. Nothando Thwala represented the department where she highlighted on the role and need for the full and equal access and participation of women and girls in science, the significant gender gap that has existed throughout the years at all levels of science, technology, engineering, and mathematics (STEM) disciplines all over the world and on the role, society must play to eliminate this underrepresentation. She



Ms. N. Thwala and the Kusile Breakfast Show presenter during the interview.

HUAWEI Visits the EEE Department to Mobilize for the Huawei ICT Competition 2022-2023

On the 2nd of September 2022 the EEE Department hosted a representative from Huawei Eswatini to talk about the launch of the Huawei ICT Competition 2022-2023 to our students. The Huawei ICT Competition is a competitive ICT talent exchange event developed by Huawei for college and university students globally. To promote the healthy development of the ICT talent ecosystem and support the integration of industry and education. Mr. Mfanukhona Gama, the Account Manager at Huawei Technologies Eswatini and alumnus of the EEE Department made the presentation and highlighted on how this is a great opportunity to boost our students' ICT skills and win valuable prizes in the process.

As part of the programme, Mr. Senzo Mngometulu, the Spectrum monitoring officer at Eswatini Communications Commission (ESCCOM) also gave a talk on how students can align their future career plans with the fast-changing technological advances. Which skills they need to succeed in this new digital era and how to handle challenges along the way.

Network performance monitoring engineer at Eswatini Mobile, Thandolwenkhosi Tsabedze also gave a talk on the work he does at Eswatini Mobile. He also highlighted on some key principles that made him be successful in his journey. These are some of the points he touched on during his presentation:

- Continuously seeking out knowledge & opportunities
- The value of hard work
- Benefits of teamwork & collaboration
- The need for Tech Entrepreneurs in Eswatini



Mr. Mfanukhona Gama, Account Manager at Huawei Eswatini making his presentation on the ICT competition.



Mr. Thandolwenkhosi Tsabedze, engineer at Eswatini Mobile giving his remarks during the launch.



Mr. Senzo Mngometulu, Spectrum monitoring officer at ESCCOM giving his remarks during the launch.



The Honourable Minister of Tourism and Environmental Affairs, Moses Vilakati planting a tree in the donga under rehabilitation at Ngcayini during his official visit.

Geography, Environmental Science and Planning Department

Official Visit by Minister of Tourism and Environmental Affairs to Departmental Community Projects Undertaken Under Eswatini Environment Fund

In October 2022, the Honourable Minister of Tourism and Environmental Affairs (MTEA), Moses Vilakati, toured two community land rehabilitation projects that were implemented in Ngcayini and Nkonjwa communities under the guidance and support of the GEP Department, respectively. In both ministerial tours, the GEP Department was afforded an opportunity to exchange with the Minister, delegates and the community on the rehabilitation process, status of the work, and work that was still to be achieved. In addition, the Minister and the delegates took time to plant trees aimed at enhancing the rehabilitation process in both sites, which contributed to the national drive to plant 10 million trees by 2025.



The Minister and delegates preparing to tour the donga that was being rehabilitated in Ngcayini community.



On behalf of the Department of Geography, Environmental Science & Planning, Mr. Masilela present the project report to the Minister of Tourism & Environmental Affairs, Moses Vilakati.



Delegates joined the Honourable Minister during the tour in planting trees as part of the rehabilitation of the donga at Ngcayini.



Honourable Minister Vilakati poses for a photograph with officials and the community at Ngcayini.



Dr. Mamba explaining the gully rehabilitation process to the Honourable Minister of Tourism and Environmental Affairs, Moses Vilakati, delegates and the community.



Dr. Mamba explaining the gully rehabilitation process to the Honourable Minister of Tourism and Environmental Affairs, Moses Vilakati, delegates and the community.



The Honourable Minister touring the site with delegates, including Prof. Mkhonta, a member of the EEF Board and Dr. Mabaso, and the community, assessing the work that had been done on the site.



The donga that is under rehabilitation at Nkonjwa before works were done, also showing that some people had started using it to dump their waste.





The Honourable Minister, Mr. Moses Vilakati, The Dean of Faculty, the Chairperson of EEA, the Chairperson of EEF, the Acting ED of EEA, posing with members of FOSE, the MSc student and other recipients from the Fund in 2020.

GEP MSc Student Successfully Complete Research Funded by Eswatini Environment Fund, and Reports Back to the Fund

As it had been reported that on the 13th of November 2020, the Department of Geography, Environmental Science and Planning in Faculty of Science and Engineering received a research grant award to the tune of E50,000.00 towards MSc student research at Nkonjwa are under the Eswatini Environment Fund (EEF). The handing over of the award was made by the Minister of Tourism and Environmental Affairs, Honourable Minister Moses Vilakati. The funding was in line with the EEF, assists with providing financial support for activities aimed at the enhancement, protection and conservation of the environment and the sustainable management of natural resources and supporting community participation in these activities.

Ms. Masuku Sphiwe's MSc research focused on assessing the soil erosion risk potential of Nkonjwa area under Sithobela Inkhundla in the Lubombo Region, where also a donga rehabilitation project was undertaken by the EEF. The key research findings revealed severe soil loss rates on bare land areas and areas where high livestock stocking rates



The Dean of FOSE, Prof. Motsa and Ms. Masuku receiving a replica cheque of the funding from the Honourable Minister, Mr. Moses Vilakati, while the Chairpersons of EEA and EEF look on.

were prevalent. Recommendations included that the areas having very high to extreme erosion should be prioritized by conservation planners during interventions for soil conservation.

During the Ministerial tour of the rehabilitated donga at Nkonjwa on the 19th of October 2022, which brought together major stakeholders such as the Ministry of Tourism and Environmental Affairs, EEF Board of Trustees, EEA, UNESWA, World Vision, ESWADE, and Nkonjwa Community at large, an official handover of the research report was made by Ms. Masuku and Dr. Sizwe Mabaso, the Head of the

GEP Department. Ms. Masuku also had a chance to summarise her research work, the key conclusions and recommendations during the event.



Ms. Masuku reporting to the Honourable Minister and his delegates on the key findings and recommendations from the research.



Dr. Mabaso featured in an environmental programme that was aired by Eswatini TV on the work of the EEF and its partners.

GEP Department Hosts German Colleagues from Friedrich-Alexander University of Erlangen-Nuremberg (FAU)

The GEP Department, through the Sustainable Futures Global Network that GEP is part of, hosted two German colleagues from German partners, namely; Prof. Daniel Koehn and Mr. Daniel Hafermaas from Friedrich-Alexander University of Erlangen-Nuremberg (FAU), Germany. During the visit, which ran from the 11th to the 19th of October 2022, meetings between the GEP Department and the colleagues from FAU where further areas of cooperation were explored. The meetings also explored the potential of applying for a PhD funding under DAAD, where the candidate would undertake a split PhD between the two institutions. In addition, the meetings gave the chance to the FAU team to present to the GEP Department an online course that FAU, UNESWA, University of Glasgow, Makerere University, amongst other institutions had developed.

The GEP Department also took advantage of the expertise of Prof. Koehn, and undertook a field excursion to Gobholo Caves, a study area of one of the departmental staff, to get his views on the study area.

On a lighter note, the GEP Department took the FAU colleagues on a field excursion to Maguga, Nkomanzi and Nsangwini bushmen paintings. They were further given a feel of the sugarbelt of Eswatini and ecotourism activities in the Kingdom through a visit to Shewula Mountain Camp, amongst other areas explored.

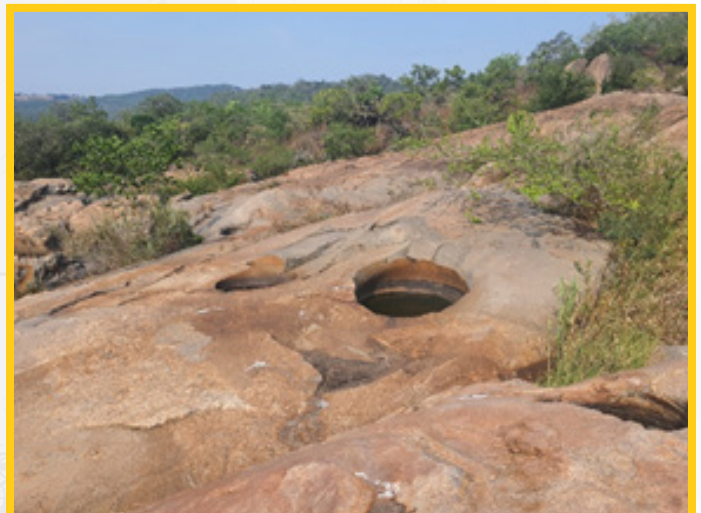
As the visit was being winded down, the two institutions further explored opportunities and other potential areas of collaborations.



Members of the GEP department during the excursion with the visiting German colleagues at Maguga.



Members of the GEP Department and the FAU colleagues at Nsangwini bushmen's paintings during their tour.



Members of the GEP Department and the German colleagues exploring the Nkomanzi geological formations.

GEP Department Conducts a Seasonal Livelihoods Programming (SLP) at Lomahasha Inkhundla in Partnership with WFP and DPMO

Dr. Sipho Mamba, Dr. Samkele Tfwala, Mr. Mpendulo Mkhonta, Mr. Sibusiso Malinga and Dr. Sizwe Mabaso represented the GEP Department in the implementation of the country's third Seasonal Livelihoods Programming (SLP) which took place in Lomahasha Constituency, in the Lubombo Region of the Kingdom. The SLP was undertaken from the 7th to the 11th of February 2022, and undertaken

in partnership with the Deputy Prime Minister's Office (DPMO) the World Food Programme (WFP) Eswatini. The aim and focus of this programme is to assist both rural and urban communities to develop strategies with tailored responses to respond to local needs and come up with an SLP framework that will inform their development activities.



Dr. Mamba training the participants on the equitable distribution of resources to community members.



Participants being taken through an exercise aimed at assisting them appreciate planning and teamwork in community development and resources sharing.



Dr. Mabaso leading one of the sessions of the workshop.



A member of the core team, Ms. Thabile Mamba from WFP, assisting a community member to report back after completing a groupwork session.



A community member reporting back to the meeting after group discussions, while Dr. Tfwala takes notes from the submissions.



Lomahasha Member of Parliament, Honourable Ndumiso Masimula marking his remarks during the workshop closing ceremony.



Indvuna of Lomahasha chieftdom making his remarks during the report presentation, while Dr. Tfwala takes notes of the meeting.

A week after completing the consultative workshop, the team went back to Lomahasha to present the findings of the consultations, and to share the finalised SLP report. The handover event was graced by the Senior Regional Officer, Mrs Nozizo Masuku, who was representing the Regional Secretary of the Lubombo Administrative Region, Mrs N. Masuku. During the event, she thanks the three institutions

for the commitment to undertaking the SLP exercise, and especially the diligence going into the report produced. Copies of the report were presented to the representative of the Regional Secretary by the Disaster Commodities Manager in the Disaster Management Department of the Deputy Prime Minister's Office, Ms. Nosizo Mthupha.



Ms. Nosizo Mthupha presenting the copies of the SLP report to the representative of the Regional Secretary, Mrs Masuku.

GEP Department Conducts a Community-Based Participatory Programming (CBPP) in Njelu Chiefdom in Partnership with WFP and DPMO

Dr. Sizwe Mabaso, Dr. Sipho Mamba, Mr. Mpendulo Mkhonta and Dr. Samkele Tfwala represented the GEP Department under the newly established Memorandum of Agreement with the World Food Programme (WFP) Eswatini and the Deputy Prime Minister's Office (DPMO) in the implementation

of a Community-Based Participatory Programming (CBPP) in Njelu Chiefdom, under Nhlambeni Inkhundla during the month of November 2022. The implementation of the CBPP in Njelu chiefdom was a follow-up activity to a Seasonal Livelihoods Programming (SLP) exercise that these institutions had undertaken in the year 2021 in the Inkhundla, which highlighted Njelu as the worst chiefdom of the four in terms of livelihoods, and thus had the highest needs for interventions aimed at enhancing the livelihoods of these communities. The exercise went very well and was successfully completed.



The GEP representatives together with members of the technical working group and members of the community during the CBPP exercise.



GEP Department representatives, Dr. Mamba and Mr. Mkhonta, together with members of Njelu community, members of the 3-PA technical team and Mr. Ashraful Amin from the WFP Head Office developing a community map.



Members of the community and the technical working group doing a transect walk during the CBPP development in Njelu community.



The technical team listening to the local people as they explain their needs in preparation for needs prioritization and targeting.



Members of the technical working group and community engaging in discussion during community plan development.

Sustainable Futures Project Under the GEP Department

New Hub Structure

Over the past years, it became apparent that the current trajectory in which the network was moving in was not sustainable in the long term. Additionally, since the SF network is now global, it was imperative that all hubs discussed how they envisioned the new network to look like - as well as plan a way forward for their hubs. Members of the Eswatini Hub had

discussions regarding a hybrid between a Research Centre (that would be based within the University) and a Non-Governmental Organisation (which would be an independent entity). The Hub has had to establish a new executive structure which led to the following appointments:

1. Dr. Sizwe Mabaso an SF Global Board member
2. Dr. Molefe Joseph - University co-lead



Dr. Mabaso (SF Global board member) and Dr. Joseph (Eswatini co-lead).

Whose Crisis Extension Project

Return visits to the Vuvulane and Kwaluseni communities were collectively planned and executed with the original community liaisons - Khulekani Msweli and Letsie Dlamini - bringing together a small selection of the original research participants for a lunch gathering, a short documentary screening, and an open discussion and focus group designed to facilitate a space of safe sharing and narrating based on the updated lived experiences of those in attendance. This was an opportunity for the communities to share honest stories, feedback, suggestions, and ideas - key takeaway points, comments, concerns, messages and requests were collected. In general, both communities

highlighted that they had hoped that the standard of living and quality of life would improve 'post-Covid' but the feeling is that it had actually worsened. People were also affected emotionally - a consequence of witnessing so many loved ones pass, one after the other. Children were left orphaned, and this also had a negative toll on their psychology. Access to education was also hindered because of the hasty switch to online learning - this led to most children being 'promoted' to the next grades, without them being examined on whether they knew the content for that grade or not. An alternate opinion was that one positive impact of pandemic was that it forced people to shift towards the virtual world and therefore meetings could be held anywhere, anytime, with anyone.



Members of the department, Dr. Seyama, Mr. Malinga and Mr. Mkhonta, with SF Network hub partner, Ms. Belusile Mhlanga from EEA, with community members during the community visit.



Kwaluseni community members in discussion with members of the SF Network during the visit led by Dr. Mabaso.

Schools Visit Programme to the Weather Station

With the Covid-19 effects lifting and restrictions being lifted, the GEP Department received Mshengu High School from Shiselweni Region, under the departmental schools visit programme. During the

visit, which comprised 15 Form 5 students, the GEP Departmental technologist, Mr. Sibusiso Malinga introduced the visitors to the weather station, then took them through the measurement procedures, and how to make readings from each of the different weather instruments in the weather station.



The students from Mshengu High School with Mr. Malinga at the weather station.

EWILD Laboratory Four Days Workshop on Collection and Analysis of Forensic Evidence for Wildlife

The Eswatini Wildlife laboratory Project (EWILD Project) is a project implemented by All Out Africa Foundation in Partnership with the University of Eswatini, supported by the USAID VukaNow Project. On June 22, as part of the EWILD Project, UNESWA held a national stakeholder meeting to discuss how best to reduce wildlife crime in Eswatini.

In addition, following a forensics training at SANBI, the EWILD lab in collaboration with the Eswatini National Museum of Natural History hosted a 4-day training workshop on collection and analysis of forensic evidence to fight wildlife crime. The participants of the workshop included representatives from the office of the Director of Public Prosecutions (DPP), Royal Eswatini Police Services (REPS), Big Game Parks (BGP), Mhlosinga Game Reserve, and Mbuluzi Game Reserve.



A group photo at the end of the EWILD Project stakeholder meeting.

Eswatini Electricity Company (EEC) Board Members and Executives visit to the department of Electrical & Electronic Engineering

On 17 November 2022, Board members and Executives from Eswatini Electricity Company (EEC) visited UNESWA, Kwaluseni Campus to view and appreciate equipment donated to the department of Electrical and Electronic Engineering.

In the month of September 2020, the department received a donation of SZL 500,000.00 worth of equipment for the Electrical and Electronics laboratories and teaching support. The equipment includes Teaching Support Equipment, Embedded Systems Laboratory Computer Upgrades, 'Store Away' Laboratory, Electronic Lab Equipment, Electrical and Industrial Control Equipment, and Communication Systems Equipment.

Dr. Mzabalazo Lupupa, Mr. John Mahlalela and Mr. Mhlaliseni Khumalo made presentations and demonstrations on some of the fascinating work that department has been able to do through the EEC support. This includes the creation of a remote model car, a smart home model, both which can be controlled with a smartphone. Turning the lights, geyser on and off, and some of the remote functions that are available on the smart home model. The team also demonstrated their constructed alarm sensor technology, and much more.



The Dean of the Faculty of Science and Engineering, Prof. Motsa making his opening remarks during the EWILD training for local stakeholders at UNESWA.



EWILD Project stakeholder meeting at the University of Eswatini.



The Dean of the faculty of Science and Engineering, Prof. Sandile S. Motsa expressed his heartfelt appreciation to the EEC Board members and Executives. The EEC Managing Director, Ernest Mkhonta said EEC is proud to support UNESWA,

especially in the specialty field of engineering. Mr. Mkhonta said the donated equipment would provide the much-required practical experimentation for students so that they are groomed to be the industry required graduates.



Dr. Lupupa giving his demonstration with EEC staff watching attentively during the visit.

EEC MD, Mr. Mkhonta making some remarks during the visit.



Mr. Khumalo making his presentation and demonstration during the visit.



Mr. Mahlalela making his presentation on the day.



EEE HoD, Mr. Nyembe making his remarks on the day.



A group photo of EEC board & Executives with UNESWA's VC, FOSE dean, EEE HOD and other EEE department staff members.

Members of the Chemistry Department Attend NLAE-AGM Workshop

Dr. Sandile Simelane, Dr. Thabile Ndlovu, Ms. Nothando Sithole and Ms. Nomcebo Ngwenya attended the NLAE-AGM workshop on the 9th December 2022 at the University of Eswatini,

Matsapha (Refectory New Wing). In this workshop, the National Laboratory Association of Eswatini (NLAE) elected a new executive committee. The outgoing executive's chairperson presented the institution's strategy and key focus areas to be inherited by the incoming executive committee. Worth mentioning is that Dr. Simelane and Dr. Ndlovu were elected to the new executive committee.

GEP Department Hosts the International Mires



Ms. Ngwenya addressing participants at the NLAE-AGM workshop.

Conservation Group Scientific Congress

The Department of Geography, Environmental Science and Planning successfully hosted the 2022 International Mires Conservation Group scientific congress at Kwaluseni Campus. The event was held at the IDE Conference room on the 22nd of March 2022. The opening ceremony was directed by the Dean of FOSE, Prof. Sandile Motsa. The Pro Vice Chancellor, Professor Henry Gadaga opened the conference on behalf of the Vice Chancellor, Prof. Justice Thwala, and welcomed all delegates to UNESWA and the Kingdom. Other notable dignitaries who attended the meeting and made comments during the opening ceremony included, the Chief Executive Officer of the Eswatini National Trust Commission, Ms. Hlobisile Sikhosana and the representative of the Executive Director of Eswatini Environment Authority, Ms.

Mhlanga. In addition, there was the Secretary General of the IMCG, Prof. Hans Joosten, the Chair of the Southern African Wetland Society, Dr. van Rooyen, and the Chair of WetRest, Jacolette Adam. Delegates included scientists from the region and



The Dean, Prof. Motsa making his opening remarks during the symposium.



The CEO of ENTC and the representative of the ED of EEA making their remarks during the opening ceremony.



The PVC, Prof. Gadaga making his opening remarks at the IMCG scientific congress on behalf of the VC.

A section of the participants listening to the PVC as he made his remarks at the IMCG scientific congress at the IDE Lecture Theatre, Kwaluseni Campus.



from abroad, especially from European countries. The opening ceremony was closed off through keynote that was given by Mr. Sandile Gumedze, from ENTC, titled 'The Conservation Status of Mires and Wetlands in Eswatini'. After the opening ceremony, two sessions were held, with different speakers sharing their research work, including questions and answers sessions. By the close of business, the representative of the Pro Vice Chancellor, Dr. Sizwe Mabaso made the closing remarks for the conference.

Department of Biological Sciences Host a Snake Identification and Handling Workshop

The Department of Biological Sciences hosted a snake identification and handling workshop on the 14th of January 2022, at the IDE Lecture Theatre, University of Eswatini. The training was provided by Eswatini Antivenom Foundation. It first focused on



Mrs. Thea Litschka-Koen, founder of Eswatini Antivenom Foundation presenting during the snake identification and handling workshop.

general snake information, snake ID and first aid for snakebites, with the second session focussing on the handling of venomous snakes.



Participants from the faculty of Science and Engineering during the snake handling workshop.

Department of Electrical and Electronic Engineering Seminar Titled Continued Career Development

On 08th September 2022, the University of Eswatini Engineering Society with the support of the Department of Electrical and Electronic Engineering hosted a seminar under the theme, “Continued Career Development”. This was held at the Science In-Service Conference Room at the Kwaluseni Campus. The invited guest was Ms. Zamancele Mavuso from Education USA, US Embassy in Eswatini.

These are some of the points that the speaker touched on during her presentation:

- Accessing scholarships and fellowships offered by US Embassy.
- Duration of these scholarships.
- Application requirements.
- Benefits of applying for these scholarships.
- Study spaces/ material that students can access at the US Embassy.



Ms. Mavuso delivering her talk.



Students listening attentively to the talk.



Students with the guest speaker and some staff members from the Department of Electrical and Electronic Engineering.

EWILD Training Workshop at South African National Biodiversity Institute (SANBI)

Dr. Sara Padidar, Mr. Mngqobi Mamba, Miss Zamekile Bhembe, Prof. Themb'alilahlwa A.M. Mahlaba and Miss Siphehile Magagula went on a forensics training course in Pretoria. The training was done in preparation for the Eswatini Wildlife Project (EWILD) which will be a forensics Laboratory located at UNESWA Kwaluseni campus, to fight wildlife crime in Eswatini. The forensics training was done at the genetics services unit (GSU) of the South African National Biodiversity Institute (SANBI) in Pretoria, South Africa.

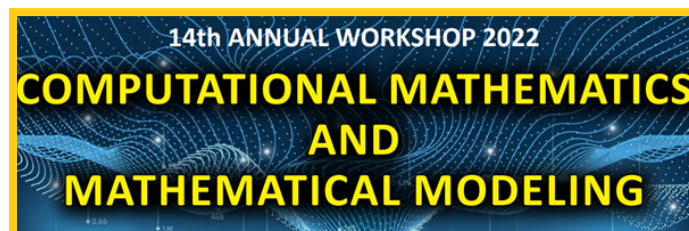


The EWILD team learning how to use a genetic sequencer at the genetic services unit, SANBI, in Pretoria.



Dr. Padidar (on the right) during the training at the genetic services unit in SANBI, in Pretoria, South Africa.

Prof. S.S. Motsa and Dr. V. Magagula participate in the 14th Annual Workshop/Conference at UKZN, South Africa



Prof. Sandile Motsa and Dr. Vusi Magagula were among the organizers and facilitators of the 14th Annual Workshop and Conference on Computational Mathematics and Mathematics. The annual event, which attracts over 60 post-graduate students and early career Mathematicians from over a dozen universities, was hosted by the School of Mathematics, Statistics, and Computer Science (MSCS) at the University of KwaZulu-Pietermaritzburg Natal's Campus from June 29 to July 8, 2022. Dr. Magagula was the primary resource person for the Pre-workshop sessions, which introduced participants to spectral methods for solving differential equations. Prof. Motsa gave lectures on block hybrid methods for solving dynamical systems during the main workshop, which took place from July 4th to July 6th, 2022. The Workshop was followed by a two-day conference on July 7th and 8th, 2022.



Prof. Motsa, Dr. Magagula, Fezile Khumalo (UNESWA MSc student) and Zweli Mkhonta (Southern Africa Nazarene University lecturer).



Dr. Magagula with some of the postgraduate students that participated in the workshop.

First-ever Man and Biosphere (MAB) Youth Forum in Southern Africa

Miss Zamekile Bhembe attended the first-ever MAB Youth Forum in Southern Africa, which was held in Cape Town, South Africa, from December 4–9, 2022, and was organized by the UNESCO regional office

for Southern Africa and took place in Cape Town, South Africa. Young people from various Southern African nations gathered to talk about the roles that young people, especially those who live in biosphere reserves, may play in protecting the natural world around them.



Ms. Bhembe with other members of the UNESCO Man and Biosphere Programme received t-shirts to commemorate the first international day for biosphere reserves.



Ms. Bhembe (in the middle) participating in the MAB Youth Forum held in Cape Town, South Africa.

Information & Records Management Indaba

The Department of Computer Science hosted an information and records management (IRM) indaba, on the 13 May 2022 at Royal Science Technology Park (RSTP). This event interrogated and explored the different ways of managing information and records in order to improve service delivery of organisations in the digital era.

Access to information is increasingly regarded as a human right issue which calls for systems and procedures to manage records in such a way that information is continuously made available when it is needed. This is important for good governance, transparency and accountability which in turn contributes to productivity and effective service delivery.



The primary audience for this IRM indaba were both private and public sector that wish to develop and improve the management of their organizational records or other sources of documentary evidence. This was a one-day indaba where there were different speakers from South Africa Prof. Mpho Ngoepe (UNISA) who provided some insights on how to manage information and records in the 4th industrial revolution. Other speakers were from Eswatini standard Authority (SWASA) who presented on ISO-15489: 2016 Information & Documentation Standard. The Eswatini National Archives through their Director Mr. Nqoba Msibi presented the Records Management Service Bill 2020 which has come as a relief to the records management professional in the country. The Bill repeals the Archives Act No. 5 of 1971 archival

legislation which has been found to be weak in so far as providing guidance to electronic records in the country. The Eswatini Revenue Services (ERS) also shared their journey to successful implementation of Information & Records Management and why it matters. The theme for 2022 'Information and Records Management: The heart of an organisation in ensuring effective business processes that meet the demands of the changing world'.

According to Dr Andile Metfula, "There could not be ready recipes or magic formulas on most effective initiatives for managing information as a department we believe that open and serious discussion could be a step forward in finding the best answers to organizations challenges". Therefore, the department will continue host the event yearly and invite organisations to come deliberate on best strategies and share experience on managing information in ensuring effective business processes that meet the demands of the changing world.

Prof. Motsa Participates in the NAISSMA Research School in Windhoek, Namibia

Prof. Sandile Motsa attended the Namibian International Spring School in Mathematics (NAISSMA) from October 23 to 29, 2022. The research school was co-organized by the University of Namibia (UNAM) and the Namibia University of Science and Technology (NUST) and was held at UNAM's main campus in Windhoek. Prof. Motsa

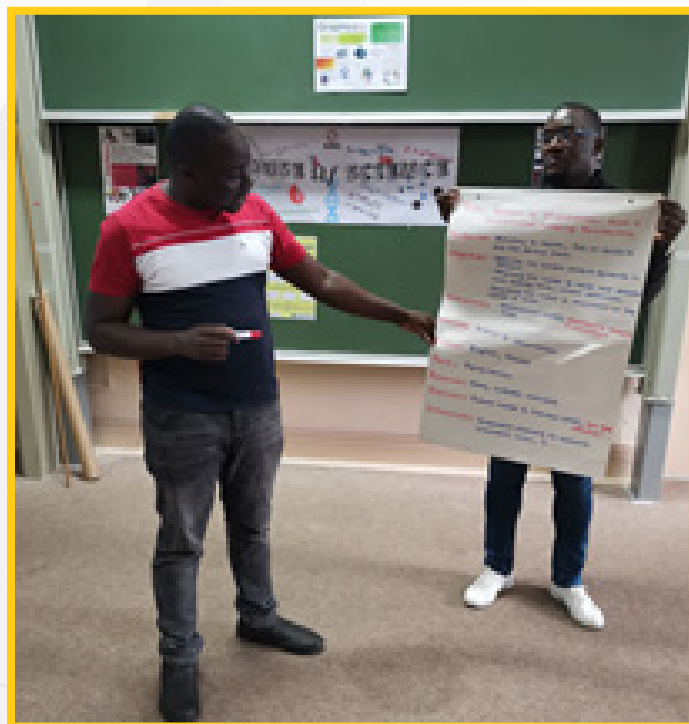


Prof. Motsa delivering one of his lectures at the NAISSMA research school in Windhoek, Namibia.



delivered a series of lectures on the topic: Block hybrid methods for solving dynamical systems during the research school. The summer research school was supported by the London Mathematical Society (LMS), the African Mathematics Millennium Science Initiative (AMMSI), and the International Mathematical Union (IMU) as part of the Mentoring African Research in Mathematics (MARM) program. Through professional mentoring partnerships, the MARM program connects African academics with their counterparts in the United Kingdom and Europe. MARM thus provides African mathematicians with the means and opportunities to develop international working relationships while also improving the quality of academic provision at their home institution.

Dr. Joseph Malinzi Attends the CIMPA Research School and Mini Conference: Mathematical and Statistical Methods for Data Science



Dr. Malinzi giving a presentation during the house of science session.



Prof. Motsa with some of the delegates of the NAISSMA 2022 Research School.

Dr. Joseph Malinzi participated in the CIMPA Research School and Mini Conference: Mathematical and Statistical Methods for Data Science, held at the

African Institute for Mathematical Sciences (AIMS, Cape Town), 18-29 July, 2022. The school mainly covered statistical and mathematical methods used in data sciences. The courses that were covered included spatial statistics, numerical algebra, modern graphical methods, deep generative models and high dimensional statistics. The courses were taught by highly rated researchers from around the globe. During the school, there were two sessions on scientific communication and community engagement in which Dr. Malinzi participated. The main idea of these sessions was to educate the participants on the importance of communicating one's own research to the world and impacting the community. Participants were each tasked with conceptualizing a project that they would carry out using mathematics and then present it in two minutes to the others on how they would engage the community with their research.



Dr. Malinzi with the other Data Science School participants enjoying a light moment at the Muizenberg Beach.

UNESWA Signs a Memorandum of Agreement with World Food Programme Eswatini and the Deputy Prime Minister's Office

The University of Eswatini successfully signed a memorandum of agreement with the World Food Programme (WFP) Eswatini and the Deputy Prime Minister's Office (DPMO) on the 08th of September 2022. The signing ceremony was held at the DPMO Conference room in Mbabane. Representing the Deputy Prime Minister was the Principal Secretary to the DPMO, Mr. Melusi Masuku, and representing the WFP Head of Country Office (Mr, Deepak Shah) was the Mr. Melusi Kunene. The Vice Chancellor, Professor Justice Thwala represented the University, and was accompanied by the Registrar, Dr. Salebona Simelane, The Dean of the Faculty of Science and



The VC, Prof. Thwala, together with the PS, Mr. Masuku and the acting HOO, Mr. Kunene signing the MOA while the Assistant Registrar, Corporate Affairs, Mrs. Matse looks on.

Engineering, Prof. Sandile Motsa and the Head of the GEP Department, Dr. Sizwe Mabaso, Assistant Registrar, Corporate Affairs, Mrs. Qinisile Matse, among other university members.

It was noted that the MOA aimed at enhancing work and investment in resilience building for the vulnerable population of the Kingdom. The main objective of the initiative is to build and to strengthen the resilience of the society to ensure that when disaster strikes, communities are able to withstand the impact.

Speaking on behalf of the DPM, the Principal Secretary, Mr. Masuku noted that the DPM's Office had been working with the two institutions in the past on a number of initiatives with the aim of improving the livelihood of EmaSwati. Some of the initiatives include vulnerability assessment, technical support



The Registrar of UNESWA, Dr. Simelane, signing as a witness the MOA documents.



in analysing cross-cutting issues and assisting Government in challenges relating to food security. In his speech, the Vice Chancellor, Prof. Thwala acknowledged the partnership among the three institutions and the contributions of UNESWA which mostly focused “in improving the livelihoods of our communities through research and community-based projects and interventions.” In the partnership, the University has continued to provide technical support through the GEP Department through seminars and workshops on research and technology relating to food security analysis and monitoring, vulnerability assessment analysis and the integrated food security phase classification, as well as the planning and implementation of the Seasonal Livelihood Programming initiative, among others.

The Acting Head of Office (HOO) at WFP, Mr. Kunene mentioned that the signing of the MOA was confirmation that WFP was still willing to partner with His Majesty’s Government. He further mentioned that, currently, WFP was working with Government in providing food to Neighbourhood Care Points (NCPs) and the intention is to make NCPs a production hub. WFP is currently feeding 55 000 orphaned and vulnerable children through 1500 NCPs. Mr. Kunene further reported that WFP had completed the NCP strategy, and was working with the Government on vulnerability assessment. The acting HOO further welcomed the University’s proposition to provide tailor-made programmes on disaster management, and that as WFP, they looked forward to working with students on internship. A Memorandum of Agreement was then signed among the three institutions.



The VC, Prof. Thwala, the PS, Mr. Masuku and the acting HOO, Mr. Kunene holding the signed MOA documents after the signing.

Workshop on Trends in Modelling and Analysis in Life Sciences



Dr. Malinzi with other participants of MALs 2022.

Dr. Joseph Malinzi participated in the Workshop on research trends in mathematical modelling and analysis in life sciences (MALs 2022). This was the third edition in the MALs series of workshops and it was organised by the Department of Mathematics and Applied Mathematics, University of Pretoria and the SARChi Chair M3B2 and CoE-Mass. The workshop took place on 20-23 November 2022 at Tshikwalo Game Lodge, Dinokeng Game Reserve. This workshop aims to provide a forum for students, emerging and established researchers to explore new trends in mathematical modelling and analysis in life sciences. This Workshop features top researchers in the field. During the workshop, Joseph gave a talk titled ‘Dynamical survival analysis: from population to individual-based epidemic models’.

Dr. Godwin Ugwunadi at a Functional Analysis and Operator Theory Workshop South Africa

Dr. Godwin Ugwunadi attended the first ever South Africa’s Functional Analysis and Operator Theory Workshop 2022 (FAOTSA2022), which was held in the conference center at Berg-en-Dal Camp in the Kruger National Park. It was a workshop that aimed to bring together the South African functional analysis community and a few international experts in order to foster discussions and collaboration, and ran from the 30th September to the 3rd October 2022. Young academics were given special consideration. A number of parallel and plenary discussions took place.



Dr. Godwin Ugwunadi at the Functional Analysis and Operator Theory Workshop South Africa.

Mr. Mthobisi Masilela Visits the Institute of Geology at the University of Coruña, Spain

Mr. Mthobisi Masilela on invitation, visited the Institute of Geology of the University of Coruña, Galicia, Spain. The visit was from the 17th to the 28th of September 2022. The visit involved a tour of and demonstrations at the analytical laboratories at the institute of geology, as well as field visits in Coruña and the Galicia Region. The Institute of Geology at the University of Coruña boasts of vast research in granitic landscapes and granite caves in north-western Spain. This aligns well with Masilela's the research interests in granite geomorphology and granitic landscapes in the kingdom of Eswatini. Masilela's current research investigates the genesis and dynamics of the granite cave system located in the Gobhola Valley of the Mbabane Granite Pluton in north-western Eswatini. While in Spain, Masilela exchanged with academics and researchers who have experience working in granite environments, and also had the opportunity for exposure to granite geology and geomorphology of coastal environments in the western coast of the Iberian Peninsula.



Mr. Masilela with the Spanish hosts in one of the granite caves in La Coruña, north-western Spain.



Mr. Masilela and a professor of Geology at the University of Coruña, studying granite tafoni in the coast of north-western Spain.



Prof. Monadjem explaining the history and purpose of the Eswatini Biodiversity Research Conference.

Eswatini Biodiversity Research Conference

Members of the Department of Biological Sciences attended the 4th Eswatini Biodiversity Research Conference (EBRC) held on the 14th of July 2022, at the Simunye Club. The goal of the EBRC was to present new scientific research on Eswatini's biodiversity. Members of Faculty that attended the conference included Prof. Ara Monadjem, Prof. Themb'alilahlwa Mahlaba, Dr. Sara Padidar, Mr. Mnqobi Mamba, Dr Meshack Dlodlu, Dr Gugu Sibandze and Dr Wisdom Dlamini.



Group photo at the end of the Eswatini Biodiversity Research Conference.



Mr. Mamba presenting at the Eswatini Research Biodiversity Conference.

DAAD Online Course Development Workshop in Erlangen, Germany

Dr. Sizwe Mabaso attended an online course development workshop in May 2022, which aimed at developing a course titled 'Transdisciplinary online course - Resources & Sustainability'. This is a course the GEP Department worked on together with Friedrich Alexander (FAU) University Erlangen/Nuremberg (Germany), the University of Glasgow (United Kingdom) and Makerere University (Uganda). Out of the partnership and this effort, the team managed to jointly develop trans-disciplinary, interconnected learning modules for a postgraduate course based on virtual collaboration during design, implementation and within the actual course.

The course aims to enhance digital and inter-cultural skills including geological knowledge about the countries' resources under the aspect of sustainability across the cultures of tutors and students, with a truly global virtual perspective and to develop a best-practice case for the wider community.

Dr. Ndlovu Attends the 18th Persistent Organic Pollutants Review Committee (POPRC) Meeting in the FAO HQ in Rome, Italy

Dr. Thabile Ndlovu attended the 18th Persistent Organic Pollutants Review Committee (POPRC) meeting held at the headquarters of the Food and Agricultural Organization of the United Nations, Viale delle Terme di Caracalla, Rome, from 26 to 30 September 2022. She is on her second term as a member of POPRC which is a technical committee responsible for reviewing scientific data on the listing of Persistent Organic Pollutants (POPs) that need to be added to the Stockholm Convention and advises the Conference of Parties (COP). In this meeting, the Committee established a contact group, chaired by Dr. Ndlovu, which was tasked to revise the draft risk profile for long-chain perfluorocarboxylic acids, their salts and related compounds and to prepare a draft decision based on initial text to be prepared by the Secretariat. She is still chair for the intersectional work on the same compound until the next POPRC meeting to be held in October 2023.



Dr. Mabaso working through the course modules with colleagues from FAU, University of Glasgow and Makerere University during the physical meeting in Erlangen, Germany.



Dr. Ndlovu with other members of the POPRC committee who attended the meeting in Rome.



Dr. Ndlovu making submissions during the POPRC committee meeting.



South African Snakebite Symposium

Dr. Sara Padidar presented at the South African Snakebite Symposium held on the 22nd of July 2022, in Nelspruit. The titles for her talks were ‘Snakebite mitigation, working and failing options’ and ‘Epidemiology of snakebites in Eswatini’.



Dr. Padidar presenting at the South African Snakebite Symposium.

Stakeholder Validation Workshop on the Guidelines for integrating Climate Change

Dr. Wisdom M. Dlamini participated in the Stakeholder Validation Workshop on the Guidelines for integrating Climate Change in the National Development Process organized by the Ministry of Tourism and Environmental Affairs 25 October 2022, Mountain View Hotel, Mbabane. The purpose of the workshop was for stakeholders to validate the ‘Guidelines for mainstreaming climate change adaptation into key sector policies, strategies and plans’.



Dr. Dlamini making a presentation during the workshop.



Prof. Motsa with the One-Health 2022 symposium delegates in Maputo.

Prof. Sandile Motsa Attended the 2022 One-Health Symposium in Maputo, Mozambique

Prof. Sandile Motsa attended the One-Health Symposium, which was held at Eduardo Mondlane University in Maputo, Mozambique, on Monday, November 21, 2022. This international research symposium marked the tenth anniversary of the US-Africa Collaborative Research Network in Mathematical Sciences, which was established by the US National Science Foundation. The symposium centered on the relationship between human, animal, and environmental health. It highlighted the network's previous work as well as future collaborative research areas and knowledge transfer work. It is hoped that by utilizing mathematical and statistical tools, research teams from various disciplines and geographical areas, as well as policymakers and practitioners, we will be able to inform policy and practices that will improve the health of all.

Prof. Ara Monadjem Attends the International Bat Research Conference (IBRC) in the United States of America

Prof. Ara Monadjem presented at the 19th IBRC held on 7 – 12 August 2022 in Austin Texas. In the conference, Prof. Monadjem made a presentation, and his talk was titled 'Functional Diversity of African Bats is Influenced by Elevation'.



Prof. Monadjem presenting at the International Bat Research Conference.

Dr. Wisdom Dlamini participated in the National Workshop on Systemic Risk Assessment in Eswatini

Dr. Wisdom M. Dlamini participated in the National Workshop on Systemic Risk Assessment in Eswatini organized by National Disaster Management Agency (NDMA)/United Nations Office for Disaster Risk Reduction (UNDRR) on the 10 – 13 October 2022 at Royal Villas, Ezulwini. The purpose of the workshop was to bring together key government, UN agencies, private and civil society sector stakeholders to start the process of systemic risk assessment in Eswatini as well as to provide an opportunity to share knowledge and experience on the current state of risk understanding and action in the Eswatini and highlight current policy and sectoral capacities and opportunities for enhancement.



Dr. Dlamini in a group photo during the workshop.

Prof. Motsa Participates in the 40th Annual SAMSA Conference in Maputo, Mozambique

Prof. Sandile Motsa attended the Southern African Mathematical Sciences Association (SAMSA) conference in Maputo, Mozambique. Eduardo Mondlane University (UEM) hosted the conference from November 22nd to 25th, 2022.

The SAMSA 2022 conference had the primary goal of establishing a platform for networking, interaction, and learning among mathematicians in the region, as

well as bringing together scientists working in various areas of mathematics and all fields of science that use mathematics to share new trends in mathematics applications. Prof. Motsa gave a talk titled ‘A new overlapping grid approach for the solution of first order IVPs using hybrid block methods’. This work is part of his most recent research, which is aimed at developing efficient methods for solving mathematical equations that model real-life phenomena.



Prof. Motsa with the Vice Chancellor of UEM and the SAMSA 2022 LOC Chair during the conference.



Prof. Motsa with SAMS 2022 conference delegates at Eduardo Mondlane University

10th International Conference of the International Association of Geomorphologists, Coimbra Portugal

Prof. Heinz Beckedahl, Mr. Mthobisi Masilela, and Miss Thandeka Ndlela participated in the 10th International Conference of the International Association of Geomorphologists. The conference took place in Coimbra, Portugal between the 12th – 16th of September 2022, and it covered a wide range of topics on Geomorphology and Global Change. There were twenty-five thematic sessions in the conference, and these covered a wide range of subjects from experimental geomorphology to wildfires and soil erosion, to geoarchaeology to planetary geomorphology. The conference also involved a one-day mid-conference fieldtrip that was split into different themes of geomorphology depending on the interest of the participant. Mr. Masilela presented on the preliminary finding of his PhD research into the Gobholo granite cave system in Eswatini.



Mr. Masilela making his presentation at the 10th International Conference on Geomorphology in Coimbra.



Mr. Masilela, Prof. Beckedahl, and Ms. Ndlela with colleagues from the University of Pretoria pose for a picture at the conclusion of the 10th International Conference on Geomorphology.



Ms. Nothando Thwala participates in Waterford Kamhlaba United World College of Southern Africa (WK UWCSA)'s inaugural Symposium on Education

Ms. Nothando Thwala participated as a panelist in the Waterford Kamhlaba United World College of Southern Africa (WK UWCSA)'s inaugural Symposium on Education under the theme 'Changing Course, Transforming Education'. The symposium was held on the Waterford Kamhlaba campus on Saturday, 26 March 2022. Ms. Thwala was part of the discussions on how Eswatini working together with all stakeholders, can move towards an education system that responds to the times to realise the fundamental right to education for everyone.

She referred to her work and experiences, as an educator at UNESWA and a co-director of Women in Engineering (WomEng) Eswatini promoting for more girls to enter fields of Science Technology Engineering and Mathematics (STEM). The panel discussion was moderated by the Principal of Waterford Kamhlaba UWCSA, Ms. Patricia Angoy and the symposium had

over 100 participants who included dignitaries from government, private sector, primary and secondary schools, as well as the broader Waterford Kamhlaba community including students, teachers, and others.



Ms. Nothando Thwala making some remarks during the panel discussion pictured with Patricia Angoy, Principal of Waterford Kamhlaba UWCSA.



Ms. Nothando Thwala with Ms. Patricia Angoy, Principal of Waterford Kamhlaba UWCSA and Mr. Wakhile Mkhonza, Operations Officer at World Bank Eswatini during the symposium.

Sustainable Futures Global Mini Hybrid Symposium

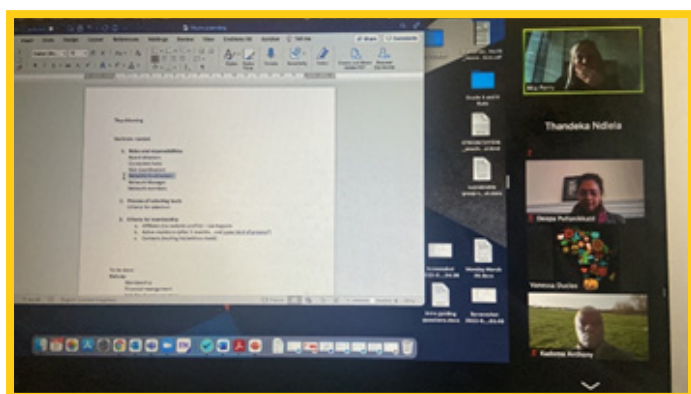
The Eswatini Hub joined other hubs at the 2022 Sustainable Futures Global Mini Hybrid Symposium (SFGMHs) which was held virtually between the 28th and 30th of March 2022. The SFGMHs was aimed at forging new partnerships, strengthening existing partnerships, making strategic decisions, and increasing visibility and productivity of the different hubs. Some of the major highlights of the symposium included the first network-wide gathering with structured updates from the team in Glasgow and from each hub; the Edinburgh Scottish International Development Alliance event; Strategic visioning,

community building, and an announcement of new action plans; as well as a celebration of early career writers and network outputs from the recent past. The network also took some time to decide on a cohesive approach to roles and responsibilities of board, leaders, coordinators, and members; process and criteria for selection; and terms of engagement between hubs and SF Global.

Members of UNESWA that participated in the symposium included Dr. Samuel Seyama, Dr. Sizwe Mabaso, Dr. Joseph Molefe, Dr. Sipho Mamba, Ms. Thandeka Ndlela, the Whose Crisis Project research administrator and Mr. Dane Armstrong, the Whose Crisis Project research assistant.



Dr. Dlamini making a presentation during the waste indaba conference at Sibane Sami Hotel.



A screenshot showing the co-directors of the Network, Prof. Mia Perry and Dr. Deepa Pullanikkatil during one of the sessions.

Dr. Wisdom Dlamini Presented at the Waste Indaba Themed 'Transitioning to a Circular Economy'

Dr. Wisdom M. Dlamini participated in the Waste Indaba 2022 under the theme "Transitioning to a Circular Economy" which was held at Sibane Sami Hotel, Ezulwini on the 27th of October 2022. Dr. Dlamini was addressing the Waste Management Nexus in Eswatini, which was hosted by the Eswatini Environment Authority in partnership with Women Unlimited, United Nations Development Programme and the Institute of Waste Management in Eswatini. Dr. Dlamini presented on 'The circular economy in waste management: challenges and opportunities for Eswatini'. The workshop aimed at discussing waste management issues in Eswatini as well as possible solutions.

67th Annual Conference on Magnetism and Magnetic Materials (MMM2022)

Dr. Blessed Muchono attended and presented a poster at the 67th Annual Conference on Magnetism and Magnetic Materials (MMM2022), from the 31st of October to the 4th of November 2022. This was a hybrid conference which was attended by participants both in person and online. The main focus of the conference was to bring together scientist and engineers to present their research work on recent developments in fundamental and applied magnetism. In addition to the above, Dr. Muchono also attended and presented a poster at the annual Conference of the South African Institute of Physics (SAIP2022) held online from the 4th to 8th of July 2022. In March (7–11) 2022 he also attended (online) a Second African Conference on Fundamental and Applied Physics (ACP2021).

GEP Department Represent UNESWA at the Integrated Geospatial Information Framework (IGIF) Launch Meeting

Dr. Sizwe Mabaso and Mr. Mthobisi Masilela participated at the Integrated Geospatial Information Framework (IGIF) stakeholder workshop that was hosted by the Surveyor General's Office of the Government of the Kingdom of Eswatini. The



The Principal Secretary at the Ministry of Natural Resources, Ms. Dorcas Dlamini, Minister Jabulani Mabuza, and Dr. Mabaso following the proceedings of the IGIF stakeholder workshop.

workshop was held at the Mountain Inn Hotel on the 12th of August 2022. The Integrated Geospatial Information Framework is a United Nations endorsed Framework that was developed in collaboration between the United Nations and the World Bank, originally to provide a basis and guide for lower to middle income countries to reference when developing and strengthening their national and sub-national arrangements in geospatial information management and related infrastructures.



Dr. Mabaso delivering the keynote address during the official opening of the IGIF stakeholders workshop.

The Kingdom of Eswatini is in a process of adopting this framework for managing geospatial information in the country, and UNESWA through the Department of Geography, Environmental Science & Planning, sits in the committee for the implementation of this project. Key dignitaries that attended the Framework launch included the Acting Honourable Minister of Natural Resources and Energy, Mr. Jabulani Mabuza, the Principal Secretary to the MNRE, Ms. Dorcas Dlamini and the Principal Secretary to the Ministry of Agriculture, who is also the former Surveyor General, Mr. Sydney Simelane. In this workshop, Dr. Mabaso delivered the keynote address entitled ‘The need to strengthen integrated geospatial information management’ through which he echoed the challenges posed by the lack of the Framework in the Kingdom, and the opportunities availed by the adoption of the Framework. Mr. Masilela facilitated the discussions of the vision, mission, and goals of the framework proposed for adoption by the Kingdom of Eswatini.



Participants following the proceedings during the IGIF stakeholder workshop.

7th African School of Physics (ASP) at the Nelson Mandela University

The following undergraduate students from the Department of Physics attended the 7th African School of Physics (ASP) at the Nelson Mandela University in Gqeberha, South Africa from November 28 - December 9, 2022. These are Linda Dlamini, Welile Mthethwa, Pholile Mtsetfwa and Bongiwe Dlamini. It was a hybrid event covering lectures, tutorials and workshops on the following main topics:

1. Nuclear and Particle Physics
2. Astrophysics and Cosmology
3. Accelerators, Radiation and Medical Physics
4. Materials Physics, Nanoscience
5. Biophysics, Fluid and Plasma Physics, Atomic & Molecular Physics
6. Light Sources and Neutron Sources
7. Earth Science, Optics & Photonics
8. Physics Education, the Internet of things, Quantum Information
9. Renewable Energies and Energy Efficient
10. Statistical Analysis, Heavy Ion Physics

paper sessions of the meeting were held. The trip then continued to northern Gauteng Province, and from there ended at the Johannesburg International Airport on the 30th March. The transport support given to this meeting by UNESWA was greatly appreciated.



Physics undergraduate students' attendance of the 7th African School of Physics (ASP) at the Nelson Mandela University in Gqeberha, South Africa.



Prof. Beckedahl leading the discussion in the field adjacent to one of the peatlands in Mpumalanga Province, South Africa.

International Mires Conservation Group (IMCG) Field Excursion

Prof. Heinz Beckedahl was involved in the planning and the execution of the International Mires Conservation Group (IMCG) field workshop. The field workshop started in Kempton Park, South Africa, on the 13th March, 2022. The group then travelled to the Northern Province of South Africa; then through Mpumalanga to the Kruger National Park, where Prof Beckedahl again met up with the group, to lead them to Eswatini. Post the scientific congress that was hosted by UNESWA at Kwaluseni Campus, the field study continued to Chrissiesmeer, where the academic



Discussion of the geomorphology of the Mfayeni Hot Spring Mire, led by Dr Piet-Louis Grundling and Prof Heinz Beckedahl in the Kruger National Park, South Africa.

Africa Food Safety Workshop, Johannesburg, South Africa

After participating on the SADC MET training virtual course for strengthening Chemical Metrology for Food Safety in the SADC region where she was nominated by SWASA, Dr. Ndlovu was invited to attend the Africa Food Safety Workshop 2022, which took place at Emperors Palace Conference Centre, Johannesburg, South Africa. The workshop ran from the 26th of June to the 1st of July 2022, where she was also expected to attend the AFRIMETS TCQM meeting which took place on Friday the 1st of July 2022.



Dr. Ndlovu at the Africa Food Safety Workshop 2022 in Johannesburg, South Africa.

Dr. Wisdom M. Dlamini Participated in the United Nation Convention to Combat Desertification Preparatory Working Session

Dr. Wisdom M. Dlamini participated in the United Nation Convention to Combat Desertification (UNCCD) Working Session to prepare the UNCCD National Report organized by the Ministry of Agriculture. The preparatory meeting ran from the 14th to the 16th of September 2022 at Sibane Sami Hotel, Ezulwini. The purpose of the working session was to prepare the UNCCD National Report to the United Nation Convention to Combat Desertification (UNCCD). Dr Dlamini assisted with geospatial data sets on land cover change and soil organic carbon.

1. **Prof. A. Monadjem, Prof. T.A.M. Mahlaba, Dr. S. Padidar, Ms. Z.B. Bhembe** attended the 2022 Oppenheimer Research Conference 04th October 2022 to 08th October 2022. In this conference the findings from research funded by Oppenheimer Generations are presented. Two of our MSc. graduates who were sponsored by Oppenheimer Generations, Miss. Zamekile Bhembe and Mr. Monday Mdluli, presented the findings of their research projects.
2. **S.S. Motsa**, Overlapping hybrid block methods: Preliminary results in IVPs, SAMSA2022 Conference, Hosted by the Eduardo Mondlane University, November 22-25, 2022, Maputo, Mozambique.
3. **Masilela, M., Beckedahl, H., and Dlamini, W.** 'Understanding the geomorphology of the Gobholo granite cave system in Eswatini' in the 10th International Conference of the International Association of Geomorphologists, Coimbra, Portugal, 12 – 17 September 2022.
4. **S.S. Motsa**, Block hybrid methods for solving dynamical systems, Namibian International Spring School in Mathematics, University of Namibia, Windhoek, October 23-28, 2022.
5. **S.S. Motsa**, Hybrid block methods for solving IVPs using Mathematica, 14th Annual Workshop On Computational Applied Mathematics And Mathematical Modeling, 29 June - 8 July 2022, University of KwaZulu-Natal, Pietermaritzburg, South Africa.
6. **B.A. Akinnuwesi, S.G. Fashoto, A.S. Metfula, E. Mbunge, S.A. Sanni**, J. Mahlalela, M. Lupupa, N. Hadebe, J. Manyatsi, P. Mnisi, N. Nkambule, F.M.E. Uzoka and D. Nkantah (2022) *Re-Engineering Financial Inclusiveness in the Kingdom of Eswatini using Machine Learning Engineering (MLE) Algorithms*, Deep Learning Indaba 2022, SUP'COM, Tunis, Tunisia 21-26 August, 2022.
7. Faith-Michael Uzoka, Mugisha Gift, Kingsley Attai, **Boluwaji A. Akinnuwesi**, Samali V. Mlay, Peter Zeh, Arnold Kiirya, Christine Muhumuza, Justine N. Bukenya, **Stephen Fashoto**, Daniel Asuquo, Christie Akwaowo, Oryina Kingsley Akputu, Mercy E. Edoho, Ifiok Udo, Lucy Amaniyo, Andile S. Metfula, Gorretti Kyeyune (2022) *Tackling Occupational and Nosocomial Infection using Vitex-Medical Assistant Tool*, IST-Africa 2022 Conference Proceedings, Miriam Cunningham and Paul Cunningham (Eds), organized by IST-Africa Institute and IIMC (16-20 May).
8. **B. Muchono**, C.J. Sheppard and A.R.E. Prinsloo (2022). Hall coefficient of (Cr100-xAlx)95Mo5 alloy system, 67th Annual Conference on Magnetism and Magnetic Materials (MMM2022), 31 October to 04 November 2022.
9. **S.K. Mkhonta**. Pattern formation, Universality and Computational Physics, at the Kingdom of eSwatini Academy of Science Annual Conference, eZulwini, eSwatini (13 Oct, 2022).
10. **S.K. Mkhonta**. Speed and road safety: A case for regulation enforcement of speed limits, Launch of Road Safety Month, Road Safety Council, 24 November, 2022.
11. **S.K. Mkhonta**. Physics and the bigger picture, ICTP-eSwatini Science Week, St Mary's High School (15 Dec 2022).
12. **Joseph Malinzi**. Introduction to mathematical epidemiology 3MC course and conference, North-west University, Potchefstroom, South Africa. 4-7, April 2022. Presentation title: On COVID-19 number of waves and impact of vaccination: From a mathematical modelling perspective.
13. **Joseph Malinzi**. SAMSA-Masamu CRN Virtual Colloquia Series, September 20, 2022. Presentation title: A reaction-telegraph model for oncolytic virus spread.
14. **Joseph Malinzi**. Workshop on research trends in mathematical modelling and analysis in life sciences (MALs 2022), held at Dinokeng Game Reserve, organised by University of Pretoria, South Africa, 20-23 November 2022. Presentation title: Dynamical survival analysis: from population to individual-based epidemic models.

15. **Joseph Malinzi.** ‘The future of cancer treatments: insights from mathematical modelling’, presented at the College of Natural Sciences, Department of Mathematics, Makerere University on the 12th January, 2022.
16. **Beckedahl, H.R.** (2022). IMCG Workshop on Southern African Wetlands. The sensitivity and general potential for rehabilitation of wetlands in the North-eastern region of Southern Africa. Paper presented in the Kruger National Park, South Africa at the Mfayeni Hot Spring Mire.
17. **Beckedahl, H.R.** IMCG Field visit to Malolotja Nature Reserve. The environmental and geological setting of Eswatini. Paper presented at Sibebe Rock, Eswatini.
18. **Beckedahl, H.R.** IMCG Field visit to Malolotja Nature Reserve: The geomorphology of the main Malolotja peatland. Paper presented at Malolotja main camp.
19. **Ndlela, T., and Beckedahl, H.R.** IMCG Field visit to Malolotja Nature Reserve. The hydrological flux within the main Malolotja peatland, Eswatini.
20. **Ndlela, T., Beckedahl, H.R.,** Grundling, A.T., and Grundling, P.L. IMCG Field Assembly at Chrisiesmeer (dual mode presentation). Peatland hydrological processes in Malolotja Nature Reserve, Eswatini.
21. **Ndlela, T., Beckedahl, H.R.,** Grundling, A.T. and Grundling, P-L.: The ecological and hydrological characteristics of the main Malolotja peatland, Eswatini
22. Grundling, R.E, **Beckedahl, H.R.,** and Loubser, M.: Anthro-geomorphological wetlands.
23. Grundling, R.E, Beckedahl, H.R., and Loubser, M.: Urban Anthro-geomorphological Wetlands – South African Case Studies.
24. Swart, N., **Beckedahl, H.R.,** and Loubser, M.: Assessment of gully erosion along major armoured roads in Emakhazeni, Mpumalanga Province, South Africa.
25. **Joseph Malinzi.** ‘Mathematical models of combination cancer therapy, virtually presented at the International virtual FDP-Innovative mathematical techniques in research’, organised by the Department of Mathematics, Sathyabama Institute of Science and Technology, Chennai, India, 1-6 August, 2022.
26. **Joseph Malinzi.** A reaction-telegraph model for oncolytic virus spread, virtually presented at the International virtual FDP-Frontiers in Mathematics on 26 May, organised by the SRM Institute of Science and Technology, Ramapuram, India and 1 Decembrie 1918 University of Alba Iulia, Romania 19 May – 02 June, 2022.

1. Gustavo, Nuno, **Elliot Mbunge**, Miguel Belo, **Stephen Gbenga Fashoto**, João Miguel Pronto, **Andile Simphiwe Metfula**, Luísa Cagica Carvalho, **Boluwaji Ade Akinnuwesi**, and Tonderai Robson Chiremba. (2022). “Emphasizing the Digital Shift of Hospitality Towards Hyper-Personalization: Application of Machine Learning Clustering Algorithms to Analyze Travelers.” Chapter 1 in Optimizing Digital Solutions for Hyper-Personalization in Tourism and Hospitality, pp. 1-19. DOI: 10.4018/978-1-7998-8306-7.ch001. [Published by IGI Global].
2. Faith-Michael Uzoka, Mugisha Gift, Kingsley Attai, **Boluwaji A. Akinnuwesi**, Samali V. Mlay, Peter Zeh, Arnold Kiirya, Christine Muhumuza, Justine N. Bukenya, **Stephen Fashoto**, Daniel Asuquo, Christie Akwaowo, Oryina Kingsley Akputu, Mercy E. Edoho, Ifio Udo, Lucy Amaniyo, **Andile S. Metfula**, Gorretti Kyeyune (2022). “Tackling Occupational and Nosocomial Infection using Vitex-Medical Assistant Tool”. In IST-Africa 2022 Conference Proceedings, Miriam Cunningham and Paul Cunningham (Eds), IST-Africa Institute and IIMC, 2022, Pp 1-9. ISBN: 978-1-905824-68-7. [Published by IST-Africa Institute and IIMC].
3. **Elliot Mbunge, John Batani**, Racheal Mafumbate, Caroline Gurajena, **Stephen Fashoto**, Talent Rugube, **Boluwaji Akinnuwesi & Andile Metfula (2022)**. “Predicting Student Dropout in Massive Open Online Courses Using Deep Learning Models - A Systematic Review”. In: Silhavy, R. (eds) Cybernetics Perspectives in Systems. CSOC 2022. Lecture Notes in Networks and Systems, Vol 503, Pp 212-231. DOI: https://doi.org/10.1007/978-3-031-09073-8_20. [Published by Springer Nature, Cham].

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