NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Research and Innovation Matters

2023

2023 NUST RESEARCH REPORT

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Special Acknowledgment:

The Editors would like to acknowledge the assistance and support of all those who contributed to the Research Report.

NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Vice-Chancellor's Overview

Dr Erold Naomab

The year's theme was Toward Human-Centric Innovation and Sustainability, stemming from the University's drive to put human needs, well-being and societal impact at the core of technological advancements and the development processes. As such, this publication is people-centred, showcasing the innovation driven by our campus community, from early-career to established researchers.

One of the key outcomes of the year has been the evolution of a collaborative ecosystem that is driven by technology and innovation. This ecosystem fosters the development of future solutions in fields such as renewable energy, digital transformation, artificial intelligence, and sustainable development. Furthermore, the partnerships forged in 2023 have laid the foundation for long-term collaboration that goes beyond traditional interactions between universities and industries. These partnerships are now more strategic and focused on co-creating solutions, scaling up technological innovations, and driving commercialisation. Our industry partners are increasingly recognising NUST as a hub of talent, expertise, and innovation.

This publication is people-centred, showcasing the innovation driven by our campus community, from early-career to established researchers.


NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

Deputy Vice-Chancellor: Research, Innovation and Partnerships' Foreword

Dr Colin Stanley

As we reflect on the year, it is clear that significant progress has been made in positioning NUST as a research-driven institution. This year has been pivotal in placing the necessary building blocks for creating an environment that fosters research excellence and innovation. The approval of key policies related to Research, Innovation, and Technology has set a strong foundation for sustainable growth and transformation.

One of the cornerstone achievements of the year has been the approval of the **Researcher Development Framework (RDF)**. This framework is not just a policy document but a strategic tool that will guide the professional development of our researchers. It focuses on building their capacity, providing support mechanisms, and ensuring that NUST's researchers are well-equipped to lead in their respective fields. The RDF aligns with global best practices, offering a structured approach to nurturing the skills, knowledge, and competencies that are critical for achieving research excellence.

The RDF's importance cannot be overstated. It addresses key areas such as:

- **Research Skills and Techniques**: Enhancing the ability of researchers to conduct high-quality, impactful research.
- **Personal and Professional Effectiveness**: Developing leadership, collaboration, and communication skills that are essential for successful research careers.
- **Knowledge Transfer and Innovation**: Encouraging a mindset that focuses on translating research outputs into real-world applications through technology transfer, intellectual property management, and innovation practices.

By systematically developing our researchers, the RDF ensures that NUST is on a path toward becoming a research-led institution. This transformation is not only critical for the university's reputation but also for the broader national and regional development goals. A research-led university is one that contributes to the

knowledge economy, produces cutting-edge innovations, and drives socio-economic development through research.

Moving forward, there is a need to **implement these policies and frameworks effectively**, to ensure that they translate into tangible outcomes. This requires commitment from all stakeholders, including faculty, researchers, and administrators. With the building blocks in place, our focus in the coming years will be on the effective operationalisation of the RDF, coupled with continuous capacity building, technology transfer initiatives, and fostering a culture of research excellence.

Furthermore, this year, we made significant strides in creating a dynamic and technologically inspired ecosystem that fosters collaboration between academia and industry. These efforts are paving the way for innovations and solutions that will address future societal and industrial challenges.

Through various **initiatives and hackathons**, NUST has brought together students, researchers, industry experts, and entrepreneurs in a shared space of creativity and innovation. These activities have been instrumental in bridging the gap between theoretical research and practical, real-world applications. Hackathons, in particular, have served as platforms for addressing pressing challenges faced by industry, while also giving students the opportunity to apply their skills and knowledge to find innovative solutions. This hands-on approach has strengthened the bond between NUST and industry, creating a win-win environment where both parties benefit from shared knowledge and resources.

As NUST transitions into a **research-led forerunner**, we are well-positioned to not only enhance our research output but also to lead in innovation, making a meaningful impact on society.

> **One of the cornerstone achievements of the year has been the approval of the Researcher Development Framework (RDF). This framework is not just a policy document but a strategic tool that will guide the professional development of our researchers.**

Research in Numbers

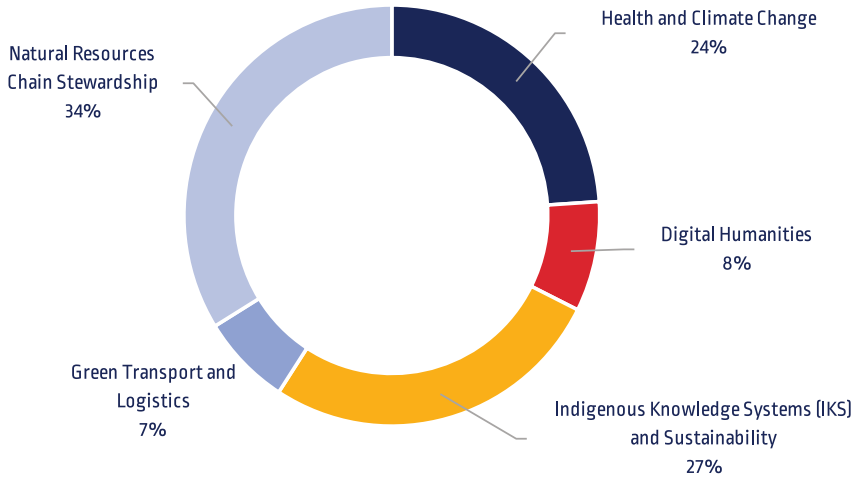
16,609 Total Students

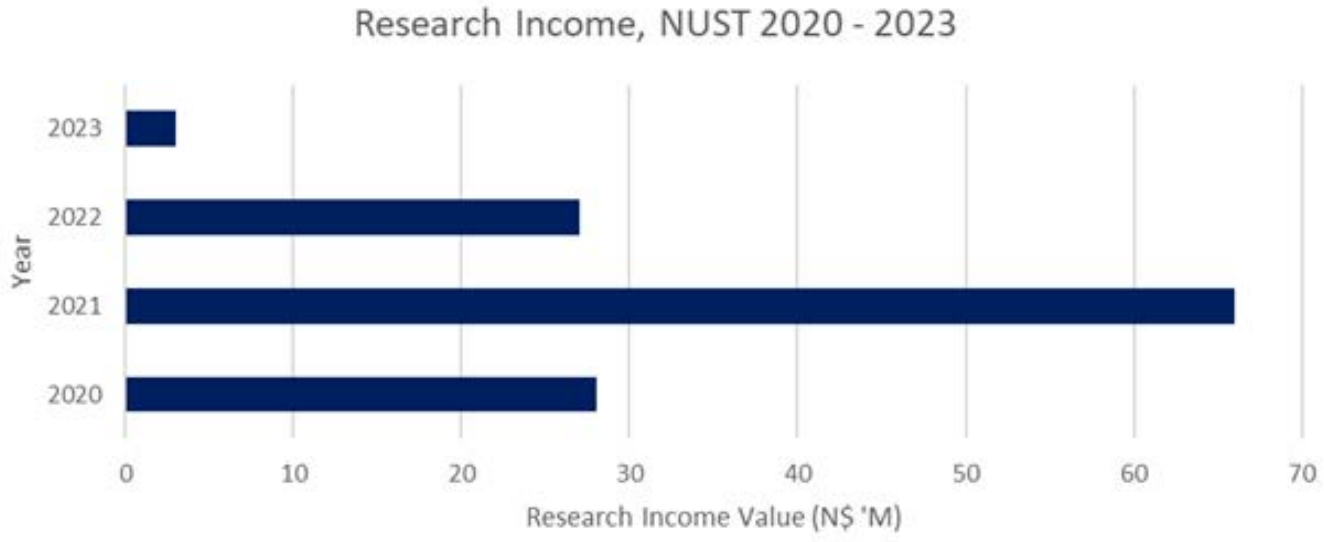
14,300
Undergraduate students

2,309
Postgraduate students

96
PhD Candidates

Externally Funded Research Grants Aligned to NUST Niche Areas





Professors across the Faculties

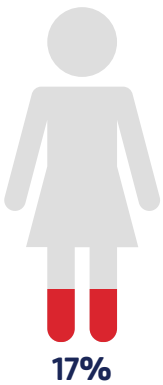
83%

FCI
0 VP | 2 FP | 4 AP

FEBE
3 VP | 7 FP | 5 AP

FHNRAS
4 VP | 7 FP | 6 AP

FCHE
2 VP | 1 FP | 11 AP



17%

FCI
0 VP | 2 FP | 2 AP

FEBE
0 VP | 0 FP | 0 AP

FHNRAS
3 VP | 2 FP | 0 AP

FCHE
0 VP | 0 FP | 2 AP

VP Visiting Professors
FP Full Professors
AP Associate Professors

Publications across the Faculties

Faculty/School/Centre	Articles		Scholarly	Conference papers	Technical reports (Opinion pieces)
	In Peer reviewed journals	Others (Book chapters)	Books		
Faculty of Computing and Informatics (FCI)	12	7	3	50	7
Faculty of Engineering and the Built Environment (FEBE)	42	13	0	2	8
Faculty of Health, Natural Resources and Applied Sciences (FHNRAS)	29	8	3	2	12
Faculty of Commerce, Human Sciences and Education (FCHE)	44	20	4	14	1
Total	**127**	**48**	**10**	**68**	**28**
2022 Statistics	*127*	*28*	*4*	*101*	*5*

Postgraduate student aggregation across the Faculties

	Qualifcation Type	Males	Females	PhD	Masters	Honours	Postgrad cert
FCHE	Honours Degree	272	457			729	
	Masters Degree	165	252		417		
	Postgraduate Cert/Dip	67	136				203
FCI	Doctoral Degree	18	10	28			
	Honours Degree	91	43			134	
	Masters Degree	90	86		176		
	Postgraduate Cert/Dip	10	14				24
FEBE	Doctoral Degree	8	13	21			
	Honours Degree	41	30			71	
	Masters Degree	116	85		201		
	Postgraduate Cert/Dip	0	0				0
FHNRAS	Doctoral Degree	19	28	47			
	Honours Degree	57	85			142	
	Masters Degree	38	78		116		
	Postgraduate Cert/Dip	0	0				0
	TOTAL	**992**	**1317**	**96**	**910**	**1076**	**227**
	GRAND TOTAL 4 618						

Global Recognition

NUST ranked 3 854 in the global 2024 rating, and scored in the top 50% across 11 research topics.

NUST appreciates rankings for their methodological rigor, global coverage, diverse metrics, focus on research impact, reputation surveys, transparency, and long-term track record. Therefore, it is a measure of internal relative strengths and weaknesses that will enable us to make informed decisions about our performance in the higher education and research landscape. In this way, a holistic view is taken, also taking into account factors such as programme offerings, location, and individual preferences.

NUST ranked 3 854 in the global 2024 rating, and scored in the top 50% across 11 research topics.

The NUST ranking is based on the following factors: Research Output and Impact; Academic Reputation; Industry Income and Innovation; Industry Collaboration; Teaching Environment; Student-to-Staff Ratio; International Outlook and Students; Student Outcomes and Employability; Sustainability and Social Impact; Digital and Technological Integration; and Funding and Financial Health.

BEST UNIVERSITIES EduRank 2024

#3 854 of 14 131
in the **World**

#107 of 1 104
in **Africa**

#129 of 352
for **Computer Science** (Africa)

#170 of 1 361
for **Forestry** (Africa)

#934 of 1 039
for **Management Information Systems** (Globally)

#4 865 of 7 738
for **Alumni Impact** (Globally)

#4 795 of 14 131
for **Non-academic Prominence** (Globally)

International Rankings

The Alper-Doger Scientific Index (AD Scientific Index) is a ranking and analysis system based on the scientific performance and the added value of the scientific productivity of individual scientists. Furthermore, it provides rankings of institutions based on the scientific characteristics of affiliated scientists. The Index analyses academic studies from countries, universities/institutions, and scientists, by using numerous criteria to present results to be used for the evaluation of productivity and efficiency by individuals and institutions.

www.adscientificindex.com

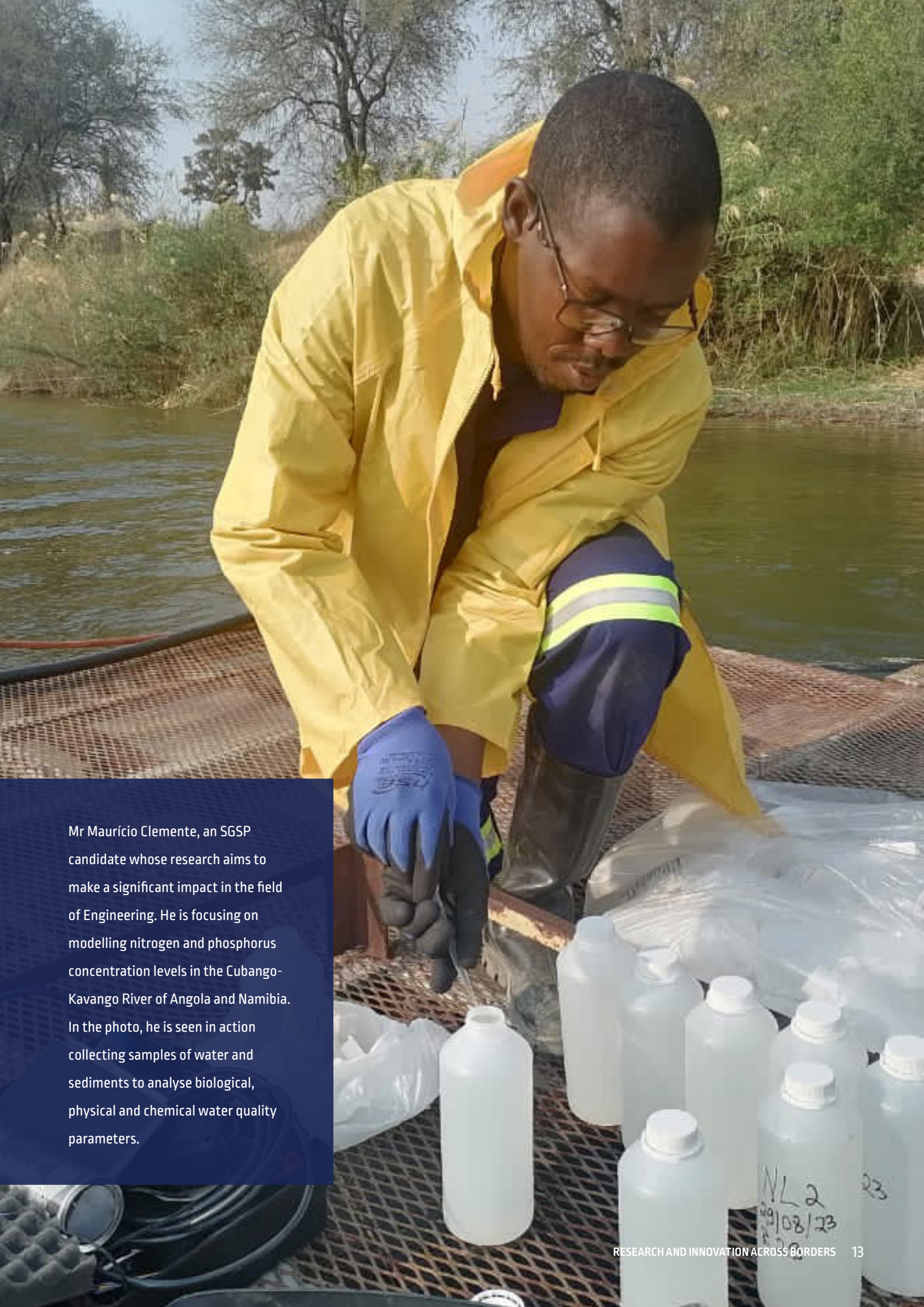
https://www.adscientificindex.com/?con=Africa&country_code=na

NUST Researchers Ranking (as of August 2023)

University Rank	Country Rank	Region Ranking	Name	Field	H Index
1	4	1,653	Michael Sony	Engineering & Technology / Chemical Engineering	35
2	7	2,916	Diptiranjan Sahu	Natural Sciences / Physics	30
3	8	3,737	Heike Theophilus	Engineering & Technology / Computer Science	27
4	9	4,027	Ben Mapani	Engineering & Technology / Earth Sciences	26
5	11	4,283	Edosa Omoregie	Agriculture & Forestry / Fisheries	26
6	12	4,786	Uchendu Eugene	Land management	24
7	14	5,452	Rakesh Kumar	Natural Sciences / Mathematical Sciences	23
9	21	7,343	Sulaiman Atiku	Business & Management / Human Resource Management	20
10	23	8,517	Percy Chimwamurombe	Medical and Health Sciences / Microbiology	19
11	27	9,408	Michael Mutingi	Business & Management / Strategic Management	18

Research and Innovation Across Borders

NUST firmly believes in the power of convening as a transformative force for driving collaboration, innovation, and collective action towards shared goals. By harnessing the power of convening, individuals, organisations, and institutions can mobilise stakeholders, build partnerships, catalyse change, and create lasting impact in their communities and beyond.



Mr Maurício Clemente, an SGSP candidate whose research aims to make a significant impact in the field of Engineering. He is focusing on modelling nitrogen and phosphorus concentration levels in the Cubango-Kavango River of Angola and Namibia. In the photo, he is seen in action collecting samples of water and sediments to analyse biological, physical and chemical water quality parameters.

Mr Petrus Tuhafeni Paulus (dressed in blue), an SGSP PhD student in Natural Resource Sciences focusing on microbial quality and physiochemical profiling of irrigation water used in Namibia, pictured collecting water samples for microbial quality assessment at the Okavango River and examining fresh produce from the small-scale farmers at the Shadikongoro Green Scheme Irrigation situated 180 kilometres east of Rundu.

Elevating Student Research through the SASSCAL Graduate Studies Programme: A New Era in Integrated Water Resources Management

The SASSCAL Graduate Studies Programme in Integrated Water Resources Management (SGSP-IWRM) is revolutionising the landscape of student research. With the support of the SGSP-IWRM Research Chair, students are now empowered to tackle critical water resource challenges with innovative solutions, blending academic rigor with real-world impact. This initiative is not just about education; it's about equipping the next generation of water-management leaders with the tools and knowledge to drive sustainable change. A Memorandum of Understanding between NUST and the Botswana University of Agriculture and Natural Resources (BUAN) was signed during the year. The collaborative agreement sets the stage for a partnership aimed at operationalising the **SASSCAL Research Chair in Water Resource Quantity and Availability.** The chairholder is Prof Ditiro Moalafhi from BUAN.

Prof Moalafhi notably participated in two (2) student colloquiums where students presented their proposal and research progress. The Chair also participated in the development of a PhD in IWRM consultative workshop as well as contributing towards shaping the mobility programme through two (2) consultative meetings. He also facilitated the application and acquisition of research permits for two (2) of the students with their study areas in Botswana.

To strengthen the SGSP-IWRM PhD students' academic writing capacity, the Research Chair hosted the first research publication clinic. The first publication clinic capacitated students on the importance of packaging and communicating their research through diversified public domains and implementing an efficient publication strategy for speedy and impactful publishing.

The SGSP-IWRM secretariat attended and presented papers and posters during the International Network of Research Management Societies (INORMS) conference that was held between the 30th of May and 2nd of June 2023 in Durban, South Africa. Dr Mabuku's (post-doctoral fellow) poster presentation titled "Doctoral student support: a SASSCAL graduate studies programme in IWRM model" won the most popular poster award.

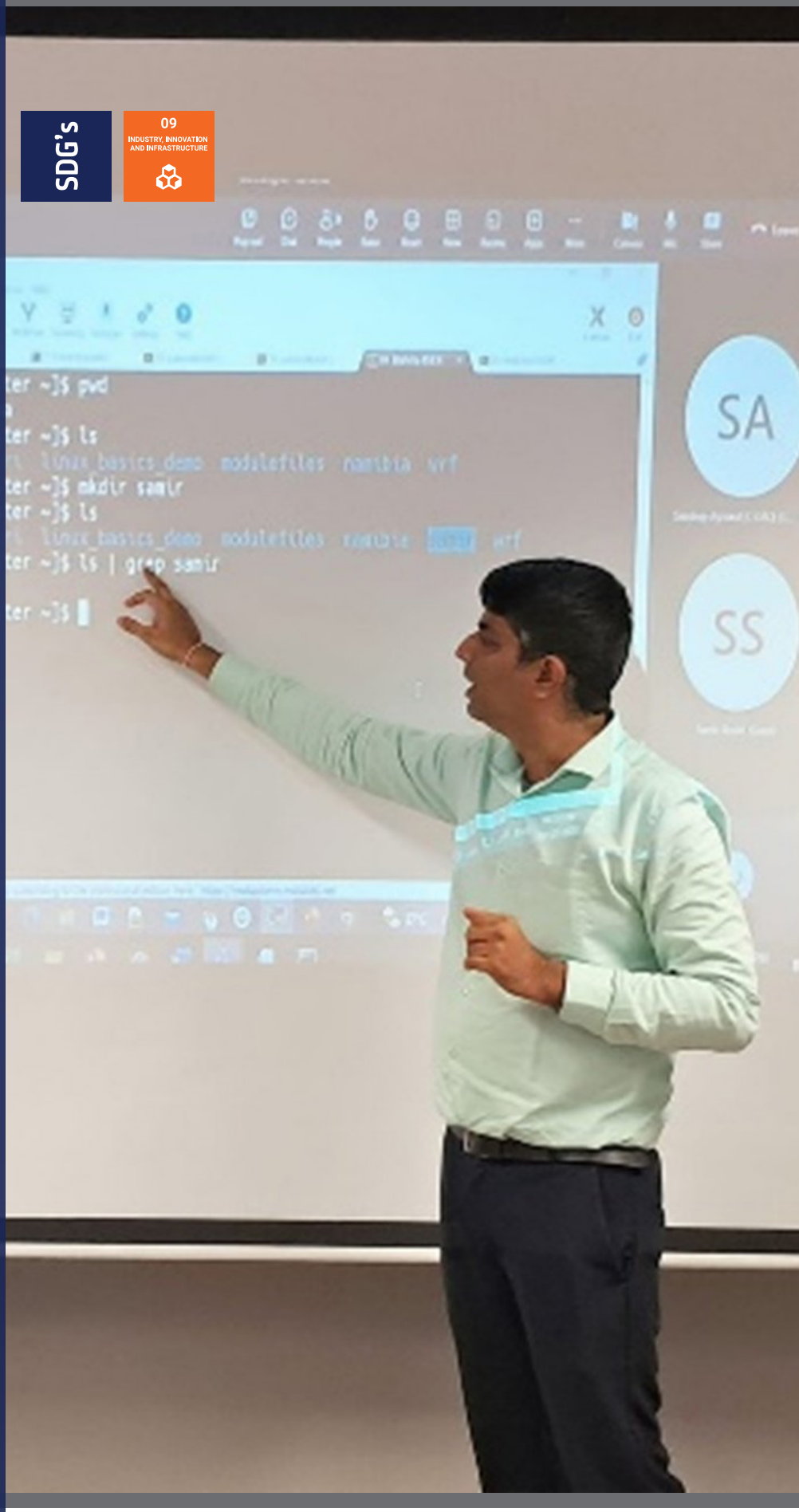
Spotlight on Emerging Trends in Networks and Computer Communications

SDG's

09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

The 2023 International Conference on Emerging Trends in Networks and Computer Communications (ETNCC) was organised by the UNESCO Chair on Secure High-performance Computing for Higher Education and Research, of the Faculty of Computing and Informatics. The conference was co-sponsored by the IEEE South Africa section and supported by IEEE Region 8. The 2023 ETNCC featured a high-quality technical programme across a wide range of research areas in a wired and wireless network, high-performance computing, emerging and intelligent computing, smart communication and networking, IoT automation and manufacturing, vehicle communication, signal, Artificial Intelligence, image processing, edge computing, blockchain and cyber security, etc. ETNCC received 129 papers, of which 48 were accepted to the main technical programme after a thorough, rigorous international peer-review process.

Notable experts in the specialised field of High-Performance Computing from the USA, South Africa, and India gathered for the IEEE Xplore and became part of the world's highest-quality body of technical literature in computing, informatics, science, engineering and technology.



IKD Cluster members at AfriCHI,2023 – East London, SA

Co-creation Research Awarded

SDG's 04 QUALITY EDUCATION

A team of 19 staff, students and community members under the Indigenous Knowledge in the Digital World Research Cluster, led by Prof Heike Winschiers-Theophilus, attended this year's AfriCHI Conference in South Africa. The team won three awards in the following categories: Best Full Paper; Best Demo; and Best Research Collaboration.

The community co-researchers from Otjisa and Donkerbos, were also in attendance to share their experience on university-community collaboration in technology co-design with African researchers from different countries.

The team presented findings from different research projects which were supported by MTC Namibia, Namibia National Commission for UNESCO, National Commission on Research, Science and Technology (NCRST), the European Union, and the Academy of Finland.

Promoting integrated Digital Technologies.

Prof Dharm Singh Jat - UNESCO Chair on Secure High-performance Computing for Higher Education and Research

The NUST-Centre for Development of Advance Computing (CDAC) - India research team, under the leadership of Prof Darm Singh Jat, focuses promoting an integrated System of research, training, information and documentation on digital technologies. It facilitates collaboration between high-level, internationally-recognised researchers and teaching staff from the University and other institutions in Namibia, as well as elsewhere in Africa, Europe and in other regions of the world.

Research in Focus

NUST Research Niche Areas

Niche research areas help define the university's identity and build its reputation in particular fields. It fosters the development of specialised expertise while promoting interdisciplinary research that broadens the reach, impact, and innovative potential of scholarly work, particularly within the university's niche areas.

Together, these efforts cultivate a dynamic and impactful research ecosystem tailored to address key regional and global challenges. These areas include:

01. **Water-energy-food nexus;**
02. **Health and climate change;**
03. **Natural resources and value-chain stewardship;**
04. **Transport and logistics;**
05. **Digital humanities; and**
06. **Indigenous knowledge systems and sustainability.**

01. Water-Energy-Food Nexus

WaterSIDE (Water and Sanitation in Arid Regions)

Research collaboration with the Swedish University of Agricultural Sciences has received its second round of funding, totalling SEK50 000 (N$86 275). The initiative aims to establish a Living Lab and build a network of international, transdisciplinary collaborations focused on advancing circular economies in sanitation technologies.

UNESCO Chair leads youth in water quality research

Dr Hilma Rantilla Amwele, the NUST-UNESCO Chair in Sustainable Water Research for Climate Adaptation in Arid Environments, is a senior lecturer in the Department of Agricultural Sciences and Agribusiness and the Associate Dean of the School of Agriculture and Natural Resource Sciences. Her research focuses primarily on water quality.

Dr Amwele has achieved significant milestones, including the successful implementation of the Accelerated Youth Participation in Water Security and Climate Change in Southern Africa Programme. This initiative led to the graduation of two Master's students in Natural Resources during the academic period. Additionally, she co-authored two book chapters as part of her research contributions. The project received funding of USD18 000 (N$342 000) for its implementation.

Biotechnology for sustainable crop production

The NCRST-funded project entitled Food Security and Nutrition Improvement by Fostering Protein-rich Legume using Low-cost Biotechnology in Namibia (FOODSECBIO) worth N$715 878 managed to address the challenge of poor soil fertility in sandy regions of Kavango East, namely the Mashare and Mayana areas. Consequently, this challenge unfortunately translates directly into reduced nutritional and food security in the areas affected by climate change. In this project, five (5) bioinoculants were developed and tested in these areas. The results increased the yield in Bambara ground nuts, cowpeas and pearl millet when compared to negative controls. These bioinoculants will be processed further for sale as biofertilisers. The project targeted to develop biofertilisers using climate-adapted bacteria from Kavango soils. In addition, the project utilised indigenous crops namely cowpeas, Marama beans and Bambara ground nuts. This approach immediately translates to environments with sustainable production for small-holder farming communities.

SDG's

07 AFFORDABLE AND CLEAN ENERGY

NUST Management Team visiting sites. Listen to NUST's Green Hydrogen Strategy here: https://www.youtube.com/watch?v=k9Ju5p_6VcQ

Accelerating Green Vision 2023

The NUST Green Hydrogen Research Cluster (NGHC) comprises over 20 researchers from NUST and several German universities. They are researching over 30 exciting topics that cover technical, logistical, and socio-economic aspects. Some of these include the efficiency of high-pressure membrane electrolysis, synthesis of Proton exchange membrane (PEM) catalyst coated membrane (CCM) with alternative materials, design of a hydrogen microgrid and wastewater treatment system for deployment in schools, analysis of the impact of green hydrogen on development, and techno-economic analysis of hydrogen transportation infrastructure. In subsequent reports, more details on some of these topics will be provided.

The NGHC is better equipped to support research, development, and innovation of various green economic activities especially developing the NUST Lüderitz Technovation Park to support all their green hydrogen research activities in collaboration with the industry.

Green Hydrogen Mission to Germany

During a five-day visit to Germany, the NUST management team underscored their dedication to strengthening partnerships with German organisations. The team visited several key partners, including the Fraunhofer IWU, known for its work in prototyping fuel cells. A highlight of the trip was the visit to Honda (Research and Development) R&D Europe's office and facilities, where they received a warm welcome and enjoyed an exclusive tour of the hydrogen production plant, refuelling stations, and a prototype fuel-cell car that is not yet available to the public. Additionally, the team had meetings with the president of Hochschule RheinMain and the managing director of Power-to-X applications at VDMA, an organisation that collaborates with NUST.

02. Health and Climate Change

Development of a new economic sector for the utilisation of bush biomass

The Federal Ministry for Economic Cooperation and Development (BMZ)/ Bavarian Ministry of Economic Affairs, Rural Development and Energy (StMWi)/GIZ invested approximately N$797 000 in the strengthening of research and production capacities in the health sector in Namibia and development of a new economic sector for the utilisation of bush biomass project. The project targets postgraduate students (Master's and Doctoral) and academic staff that are active in research.

Towards integrated urban and sustainable design

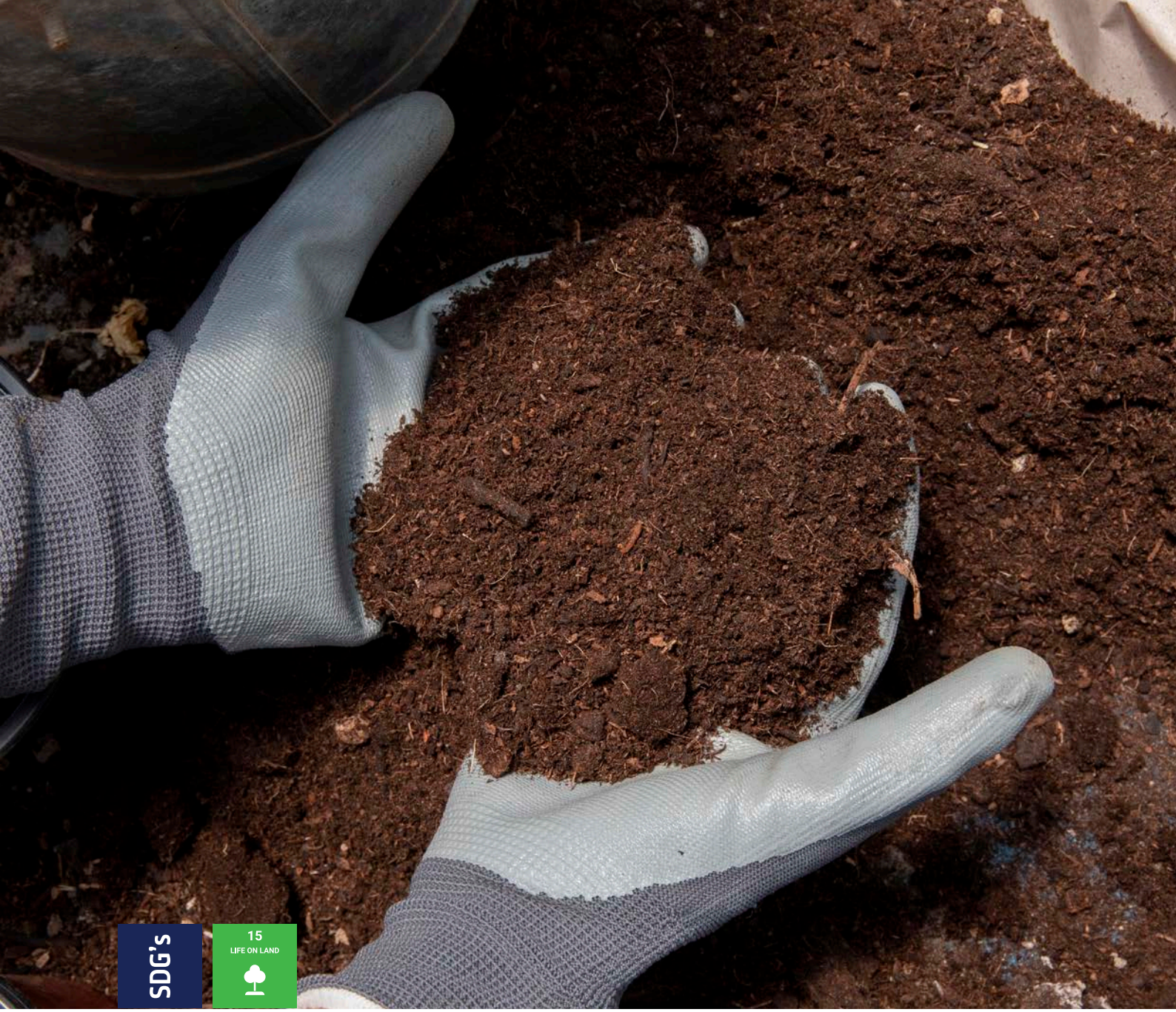
SDG GoGlocal, 2023-2026 is funded by DAAD and is conducted in collaboration with University of Stuttgart, Germany and Ain Shams University, Egypt; as well as the Namibia Housing Action Group/Shack Dwellers Federation as a local partner, with the ultimate aim to develop Master's degrees in Integrated Urban and Sustainable Design qualification to lead research in that area. The project coordinator is Ms Gaby Hansen with support from Ms Jennilee Kohima, Dr Madelein Stoffberg, Mr Gert van der Merwe and Ms Sophia van Greunen Department: Architecture, Planning and Construction (DAPC), and is aimed at developing indicator metrics for SDGs at the local level.

Accessibility of housing for the less privileged

After many years of public consultation and policy refinement, cabinet has approved the Revised National Housing Policy and Implementation Action Plan. This initiative was a collaboration between DAPC and Institute for Land, Livelihoods and Housing (ILLH) under the leadership of Dr Lühl, Dr Delgado and Prof Chiramba, along with the Ministry of Urban and Rural Development, the Ministry of Finance and Public Enterprises, the National Planning Commission, the National Housing Enterprise and the Namibia Housing Action Group/Shack Dwellers Federation of Namibia. The revised policy is poised to significantly enhance access to affordable housing for vulnerable populations, serving as a landmark step toward building a more inclusive and equitable society. By addressing housing needs in the context of climate resilience and public health, it also seeks to improve living conditions within the informal sector, fostering healthier, more sustainable communities that can better withstand the impacts of climate change.

Grow Green Africa (Gr2A)

The School of Commerce and Management Sciences is actively involved in the project "Building Climate Change Resilience through Smart Green Technologies". This project, funded by the European Education and Culture Executive Agency (EACEA), has received a grant amounting to EUR284 580. The initiative focuses on leveraging smart green technologies to address climate change challenges and promote sustainable business practices.



03. Natural Resources and Value Chain Stewardship

Mitigating Human-Wildlife Conflict Through Cutting-Edge Conservation Research

A major challenge the Namibian wildlife sector faces is human-wildlife conflict. Together with students and partners, Prof Morgan Hauptfleisch captured, and satellite collared three elephants, three lions and many antelope species to understand the drivers of wildlife movements and linkages to human-wildlife conflict. His team continues to monitor the movements of around 60 other animals as part of four Master's and three PhD studies and assists the Ministry of Environment Forestry and Tourism in conservation efforts. Within this cluster, research is further undertaken on the continental conservation status of African buffalo.

Soils4Africa

The Soils4Africa Project is a European Union, Horizon2020-funded programme headed by Ms Marina Coetzee (DAPC) as the country supervisor for Namibia. The project is in collaboration with Stellenbosch University as the regional coordinator and reports to the International Soil Reference and Information Centre (ISRIC) situated in Nigeria as the continental coordinating body. The research consists of a Soil Sampling Field Campaign, Stakeholder Workshops and a forum for sharing soil data and expertise. Additionally, it strengthens Ms Coetzee's other research project of producing and updating a Soil Map for Namibia.

04. Transport and logistics

The Namibian-German Institute for Logistics has been advancing green logistics and sustainable transport solutions through robust research collaborations. Working with international partners Flensburg University of Applied Sciences (Germany) and the Japan International Cooperation Agency (JICA), alongside national partners such as the Ministry of Works and Transport, Walvis Bay Corridor Group, and STADIO, the institute has been driving forward impactful initiatives under the leadership of one of NUST's youngest professors, Prof. Asa Romeo Asa. Research outcomes, presented at a major international conference, outlined critical steps toward establishing the Namibia Logistics Hub, an initiative set to position Namibia as a leader in sustainable logistics, with a strong focus on enhancing infrastructure resilience, and supporting economic growth across Southern Africa.

SDG's

04 QUALITY EDUCATION

Dr Colin Stanley (far left), Principal Investigator, pictured with researchers and OvaHimba community members.

05. Digital humanities

Digitally and Truly Representing our Culture

Many digital artefacts have been collected over the years about the rich and intriguing OvaHimba culture. However, many times, these artefacts are not validated by the OvaHimba communities themselves, and the exclusion of their input results in inaccurate representations of their culture.

Thus, this project aimed to preserve the culture of the OvaHimba communities by co-creating a digital multi-lingual, multi-media cultural heritage collection endorsed by the OvaHimba community, and therefore representing their perspectives.

Raw digital artefacts, dating back to over a decade were presented to the OvaHimba community from Otjisa and Epupa villages. Thereafter, a co-designed web-based digital repository was developed based on the OvaHimba-validated content dedicated to preserving the cultural heritage.

Some of the unique outcomes are that the co-designed web application was initiated by the OvaHimba communities and categorised in an interesting grouping of Ovandu (human beings), Ovinamuinyo (livestock), and Okuti (forest) with audio narrative in the Otjiherero language.

SDG's

02 ZERO HUNGER

Watch this video for more information

https://www.youtube.com/watch?v=mf3MvdBWbZA

06. Indigenous knowledge systems and sustainability

Increasing Efficiency in Rangeland-based Livestock Value Chains

The Namibian InfoRange consortium consisting of researchers from NUST and the Namibia Nature Foundation (NNF), discovered that there is a great need to appreciate community demands and room for co-creation on integrated grazing governance and community structural frameworks, and sustainable livestock marketing with community members. The project brings together partners from Namibia, Germany, and Kenya to collaborate on an initiative that aims to enhance rangeland use and governance, as well as resource-use and production efficiency in rangeland-based livestock production. Funded by the German government, the InfoRange consortium includes NUST, the Namibia Nature Foundation (NNF), the German Institute for Tropical and Subtropical Agriculture (DITSL), the University of Kassel (UK), Germany, the Kenyan-based Centre for Research and Development in Drylands (CRDD) and the University of Nairobi, Kenya.

Focus group discussion participants from the Muduva Nyangana Conservancy, Kavango East, pictured with NUST InfoRange researchers. Seated: Dr Colin Stanley (far right); Gereon Koch-Kapuire (far left); PhD Student, Steven Tjiraso (second from left) and Dr Hilma Amwele (standing, far left).

Namibia Nature Foundation (NNF) researchers: Mareike Aufderheide-Voigts (centre) and Belinda Thanises (seated on Mareike's right), discussing multi-stakeholder processes with communities from Muduva Nyangana Conservancy, Kavango East.

Celebrating Excellence

The Professorial Inauguration Ceremony highlights the university's commitment to academic excellence and its dedication to fostering a distinguished faculty. It honours newly appointed professors, recognising their contributions to their fields of expertise and their advancement to the rank of professor.

It remains an inspirational event for both students and faculty, showcasing the achievements of leading scholars and setting a standard for academic and professional excellence. The following faculties were inaugurated accordingly:

Professor José Ghislain Quenum

Faculty of Computing and Informatics

His research contributions focused on coordination issues in multi-agent systems, where he developed static and dynamic solutions. In the static version, agents analyse the protocols at their disposal and decide which one to use for a complex task. In the dynamic approach, less information is disclosed. Agents then have to make decisions independently and adjust or correct them based on the sequence of messages exchanged. The growth of electronic commerce propelled service-oriented computing as an area of interest, focusing on service selection and composition. He re-adapted the approaches developed earlier to design and deploy protocols and introduced protocol composition.

Professor Fungai Bhunu Shava

Faculty of Computing and Informatics

She is currently the Acting Executive Dean, a Professor in Cybersecurity and the leader of the Digital Forensics and Information Security Research Cluster. Prof Fungai Bhunu Shava's fields of specialisation are Human Computer Interaction, User Experience, Network Security, and Information Security in under-serviced communities. Her work focuses on the secure use of ICTs as enabling tools for socio-economic development in developing economies and societies including Child Online Protection

Professor Edosa Omoregie

Faculty of Health, Natural Resources and Applied Sciences

He leads the research team on Marine Biology and has contributed over 150 scholarly works, including more than 70 peer-reviewed research papers. With an h-index of 25, i10-index of 37, and over 1 300 citations, he is among Namibia's top 10 rated scientists and the number-one Namibian scientist in Agriculture and Fisheries, based on the AD Scientific Index, 2023 university rankings.

Professor Dipti Ranjan Sahu

Faculty of Health, Natural Resources and Applied Sciences

Prof Sahu is a fellow of the International Association of Advanced Materials (IAAW) in recognition of exceptional contributions to the field of science, engineering and technology, particularly in the realm of materials for multi-inter-transdisciplinary applications. His research focus is on multifunctional materials including nanomaterials, ceramics, composites, spintronics, magnetic materials and application of functional materials in devices. He has made several significant innovative and original research contributions to advance applied physics/ materials science in a broad interdisciplinary area.. He has research groups and collaborations with researchers in the USA, Germany, South Africa, Taiwan and India. Prof Sahu has made over 220 scholarly contributions, including 90 peer-reviewed journal research papers, four books, six book chapters and more than 120 in conference proceedings and meetings (h-index = 26 (Scopus); i10-index = 56; citations: 3 179 as of October 2023). He is cited as the number-one researcher at the Namibia University of Science and Technology for the years 2022 and 2023 according to AD World Scientific Index.

The Best of the Best

It is with great pleasure and pride that NUST recognises and celebrates the exceptional achievements of our esteemed researchers of the year. In the world of academia and research, excellence is not just a goal, it is a standard that we strive to uphold and surpass. Therefore, recognising and acknowledging those individuals who have exemplified this standard through their outstanding contributions to their respective fields of study, are celebrated on an annual basis.

Prof Rakesh Kumar

Faculty of Health, Natural Resources and Applied Sciences

2023 Best Established Faculty Researcher

Mr George Waliomuzibu Mukisa

Faculty of Health, Natural Resources and Applied Sciences

2023 Best Emerging Faculty Researcher

Dr Ambrose Azetta

Faculty of Computing and Informatics

- **2023 Best Institutional Emerging RoY**
- **2023 Best Emerging Faculty Researcher**

Prof Haileleul Zeleke Woldemariam

Faculty of Commerce, Human Sciences and Education,

- **2023 Best Institutional Established Researcher of the Year (RoY)**
- **2023 Best Established Faculty Researcher**

During this award period, Prof Woldemariam published five research articles in peer-reviewed and reputable journals and delivered four conference presentations, supervised seven Master's students and two PhD students. He is the Chief Editor of NAWA Journal of Language and Communication. During this period, the Journal has become the first NUST online journal (Refer: http://journals.nust.na/index.php/njlc/index).

Researcher Development in Motion

Promoting early-career researchers is essential for fostering innovation, driving research excellence, and ensuring a sustainable talent pipeline for the future. The NUST Council has approved a Researcher Development Framework (RDF), which introduces a new approach to researcher development by reclassifying workload based on reverse workload principles: 60% Research, 30% Teaching and Learning, and 10% Community Service.

This framework aims to enhance the institution's capacity to build a strong workforce, develop world-class researchers, and strengthen its research base. The RDF serves as a professional development tool that supports the personal, professional, and career growth of researchers in higher education. It outlines the knowledge, behaviours, and attributes of successful researchers and encourages them to realise their full potential.

By implementing these strategies, the institution is committed to creating a supportive and nurturing environment that empowers early career researchers to thrive, succeed, and make meaningful contributions to their fields.

Celebrating Researcher Empowerment

At NUST, an "early-career researcher" is typically defined as an individual who is in the initial stages of their research career, usually within the first five to 10 years of obtaining their doctoral degree or equivalent qualification. This period often involves developing their research profile, establishing a track record of publications, securing research funding, and gaining experience in leading research projects.

Early-career researchers at NUST will be supported through various initiatives, including the Researcher Development Framework (RDF), which provides tailored support for their professional growth and helps them build a solid foundation for their future research careers.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Dr Larai Aku-Akai

Senior Lecturer: Environmental Health Sciences, Department of Preventative Health Sciences, in the Faculty of Health Natural Resources and Applied Sciences at NUST. Her research focuses on public health with special interests in disease prevention, reproductive health, and one health. Recent Master's graduates supervised worked on the assessment of nutritional status and nutritional risk profile of hospitalised children at public hospitals in Windhoek. Similar research showed that maternal health knowledge and access to maternal health information among mothers in Windhoek and menstrual hygiene has critical impacts on school attendance among adolescent school girls in Rundu in particular.

Dr Tinoapei Dhliwayo

From the Quantity Surveying section was awarded a PhD from the University of Johannesburg. His thesis was titled "A framework for catalysing development and sustainability of Small and Medium-sized Contractors: A case of Namibia". This thesis was prompted by the dearth of comprehensive and contextualised solutions to combat challenges bedevilling Small and Medium-sized Contractors (SMCs) in most developing countries. Literature revealed that Eurocentric models that most developing countries adopted in the recent past in the quest to develop SMCs, are incongruent with local conditions of most of these developing countries. Hence, contextualised solutions are cardinal since there is no universal framework/model that can be employed arbitrarily to all contexts. The gap is even more evident within the Namibian context where little is known.

Ms Celina Awala

A staff member and PhD candidate in the Department of Land and Spatial Sciences is focusing on exploring and the examination of the influence of organisations' characteristics on spatial data and sharing behaviour in land administration organisations in Namibia. The research is envisioned to act as a knowledge foundation for future theoretical orientation to ongoing public service administration reform initiatives.

Mr Simon Pombili Kashihalwa

Distinguished as the nominated best emerging researcher in the school for the 2023 academic year. He is a biostatistics researcher and holds a lecturer position in the Department of Mathematics, Statistics and Actuarial Science. His specialised focus lies in biostatistics, with a particular emphasis on understanding HIV progression.

In 2023, Mr Kashihalwa's research achievements have been exceptional. Notably, he has contributed significantly to the field with two publications in the reputable Asian Journal of Probability and Statistics. His research articles delve into the Sojourn Time and Transition between Clinical States of HIV Patients under ART, providing valuable insights into the statistical nuances of HIV progression. Furthermore, Mr Kashihalwa's commitment to academic mentorship is evident through his supervision of an Honours project in Applied Statistics, showcasing his dedication to nurturing the next generation of researchers. In addition to his journal publications, he has enriched the academic landscape by contributing a book chapter to the book titled "Research and Applications Towards Mathematics and Computer Science," further solidifying his reputation as an emerging leader in biostatistics.

Dr Gereon-Koch Kapuire

Dr Kapuire's PhD work was titled "An Ubuntu Lens to Co-Design: Towards A Rural Community Engagement Framework". The research aimed to understand the problems encountered when academic researchers engage with rural communities to co-design culturally appropriate technologies in Namibia. There are no existing engagement frameworks to guide co-design with rural communities in Namibia. The methods comprised a literature review, a narrative analysis of several co-design case studies with rural communities, and the collaborative development of an engagement framework with communities through a co-design process, guided by applying an Ubuntu lens. The study contributes practical recommendations, expressed in an engagement framework to guide the community-based co-design of technology and services in Namibia.

Ms Shapopi Kamanja

Is a laboratory technician in the Department of Biology, Chemistry and Physics She was awarded a six-month fellowship (September 2022 – February 2023) in the CIBIO/BIOPOLIS Research Centre in Biodiversity and Genetic Resources in Vairão, Portugal. She was working under the supervision of Dr Manuel Lopes Lima, Associate Researcher Applied Ecology Group CIBIO/InBIO - University of Porto, Portugal. Her research aimed to detect the biodiversity in the different water systems in northern Namibia using eDNA. Ms Kamanja is now in the process of thesis write-up and is scheduled to graduate in 2024.

Dr Simon Muchinenyika

Focuses on newer functionalities realised on mobile platforms through mobile applications. In particular he is looking at research that employs energy-efficient techniques on software to prevent high battery drainage from induced energy consumption when controlling hardware. This work developed a framework by identifying and analysing mobile-platform energy hotspots before testing techniques to mitigate high battery drainage. Applying the framework on mobile applications saved on open repositories like GitHub and F-droid showed that a lot of work must be done to conscientise and train software developers on energy efficiency.

Ms Linda Ratjama

Is a laboratory technician and an MSc student in the Department of Biology, Chemistry and Physics. She was awarded a WE-STAR Fellowship for her MSc research scientific activity in the International Center for Genetic Engineering and Biotechnology (ICGEB) Tumour Virology Group at ICGEB Trieste (Italy), for a period of three months (October 2023 – January 2024). She was working under the supervision of Dr Lawrence Banks at the ICGEB Trieste in the Tumour Virology Group, Trieste, Italy. She was working on identifying the molecular role of human papillomavirus in head and neck cancers in Namibia, at the Tumour Virology laboratory, and worked on two objectives: Comparative proteomic analysis of E6 and E7 interactions in cells derived from skin, cervix, and tonsil; infection assays with PsVs on the same cells but exposed to different irritants. The WE-STAR Fellowship scheme is a programme to promote early-career women scientists from the African continent, supported by the Italian Ministry of Foreign Affairs and International Cooperation (MAECI) and the International Centre for Genetic Engineering and Biotechnology (ICGEB).

Mr Gabriel Nhinda

His research is founded upon Human Computer Intersection and Cybersecurity (HCISec). His research project is formed by the rural underserved communities in northern Namibia (Engela constituency). Specifically, "we co-design various interventions from community engagement protocols that guide the ethics of research within these communities". This research also gives an overview of the technology adoption and appropriation practices within these communities. Additionally, the current cybersecurity practices of rural underserved communities are elucidated. The main aim is to co-design a cybersecurity best practices framework that is guided by an Afrocentric lens.

Ms Katazo Amukente

Is in her third year of her PhD in Information Systems at the University of Cape Town. Her PhD study centres around the field of knowledge management. Although studies have looked at knowledge-sharing challenges within software development project teams in the private sector, there is limited knowledge of these challenges from e-government projects. Effective knowledge sharing depends on a focus that takes technology, processes, and people into consideration. Knowledge-sharing challenges within e-government project teams are further evaluated through designing a socio-technical framework to guide necessary action that can assist with improving knowledge sharing among the project teams.

Mr Herman Kandjimi

Is a second-year PhD Fellow at University of Cape Town's (UCT) Hasso-Plattner Institute HPI Research School, focusing on computer science education and machine learning. His research, titled "Modelling Students' Source Code Evolutions for Personalised Guidance in Introductory Programming Courses", aims to create a Personalised guidance tool based on Markov models (learning management systems). This tool will offer targeted and high-level guidance to students throughout their practical programming tasks. "By applying Markov Models, I aim to enhance the overall learning experience in introductory programming courses, making them more engaging and effective."

Ms Maria Nelago Kanyama

A NUST PhD student in Informatics, won the L'Oréal-UNESCO Young Talent Women in Science 2023 Sub-Sahara Africa winner. She was one of 30 female achievers in science in Sub-Saharan Africa. The event was hosted in Botswana where the President of Botswana, H.E. Mokgweetsi Masisi, conferred the honours. Her research focuses on ' Harnessing artificial intelligence to fight water scarcity.' The awards give recognition and visibility to Women in Science for their outstanding contributions.

Dr Bianca Tjizumaue

Recently completed her postdoctoral research through the prestigious Fulbright Scholarship at the University of New Mexico, USA. Fulbright is renowned for providing individuals with the opportunity to immerse themselves in different cultures while advancing their academic and teaching careers abroad. During her tenure, Dr Tjizumaue engaged in both teaching and research, specialising in Marketing Research, Marketing Management, and Professional Selling. A key highlight of her experience was the ability to link theoretical course concepts to real-world applications, which significantly enhanced student engagement and promoted practical learning outcomes. Her research also delved into analysing the buyer-seller relationship in the services sector at the bottom of the pyramid, utilising the Commitment-Trust Theory as a framework.

Dr Oluibukun Ajayi

Senior Lecturer from the Faculty of Engineering and the Built Environment, Department of Land and Spatial Sciences was awarded the prestigious Volvo Research and Education Funds Study Visit Grant. Hosted at the Centre for Transportation Studies at the University of Pretoria, Dr Ajayi actively engaged in research and teaching activities during his visit. The grant also facilitated benchmarking and knowledge exchange opportunities with the geomatic divisions at the University of Cape Town (UCT) and Cape Peninsula University of Technology (CPUT). These interactions were instrumental in fostering inter-departmental collaborations and expanding the scope of research and educational initiatives.

RETURN ON IMPACT (ROI):
Celebrating Research Service Excellence within DRIP

The true measure of research excellence lies in its ability to generate meaningful, lasting impact. Through these awards, DRIP shines a light on those who have not only advanced scientific knowledge but have also translated their work into tangible benefits for society. By fostering collaboration, upholding values of excellence and integrity, and providing world-class research support, these individuals and teams exemplify what it means to generate a "Return on Impact."

As we celebrate these achievements, we are reminded that research is a collective effort, driven by shared values, partnerships, and a commitment to pushing the boundaries of innovation. The Research Service Excellence Awards not only recognise these contributions but also inspire the next generation of researchers and innovators to continue striving for impact that reaches far beyond the academic world.

The Directorate of Research, Innovation, and Partnerships (DRIP) has long recognised the need to celebrate those who exemplify these qualities, and the **Research Service Excellence Awards** stand as a testament to this vision. The awards, which span across several categories, focus on highlighting individuals who have made a significant *return on impact* within the research ecosystem at the Namibia University of Science and Technology (NUST). These awards recognise efforts that go beyond the standard, bringing transformative change and contributing to the broader socio-economic development goals.

Excellence in Collaborative Efforts

Collaboration lies at the heart of groundbreaking research, and this category celebrates those who have effectively brought together multidisciplinary teams to solve complex challenges. Recipients of the **Excellence in Collaborative Efforts** award have demonstrated outstanding leadership in fostering cross-sector partnerships, both within academia and with external stakeholders such as industry, government, and international institutions. By leveraging collective expertise, these awardees have shown how teamwork can accelerate research outcomes and drive innovation that has real-world impact.

Ms Rennie Munyayi (Projects Coordinator) received this award in 2022 and Ms Kuda Brandt (Science and Innovation Communication Specialist) received the award in 2023.

DRIP Values Awards

At the core of DRIP's mission are its values of integrity, excellence, innovation, and inclusivity. The DRIP Values Award celebrates individuals who demonstrate administrative tenacity and excellence in providing efficient research services support. These awardees are the unsung heroes behind the scenes, ensuring that the administrative backbone of research operations runs smoothly and efficiently. Their dedication to delivering top-tier support—from managing complex research grants to navigating intricate compliance requirements—enables researchers to focus on their work, confident that they have a reliable and proactive support system in place.

Ms Mercelyne Maletzky (Research and Innovation Administrator) received the award in 2022 and Ms Nadia Jansen (Research and Innovation Compliance Coordinator) received in in 2023.

Ms Victoria Shipanga (Projects Analyst) received this award in 2022 and Ms Rennie Munyayi (Projects Coordinator) received it in 2023.

Research Innovation Services Excellence (RISE) Awards

The **Research Innovation Services Excellence (RISE) Awards** recognise individuals and teams within DRIP who have gone above and beyond in providing exceptional support services to the research community. From streamlining grant management processes to ensuring seamless technology transfer and intellectual property protection, RISE awardees are the backbone of the research ecosystem. Their dedication to operational excellence enables researchers to focus on their work, knowing they have a strong foundation of support to rely on.

SCHOLARSHIPS FOR THE CRÈME OF THE CROP

NUST recognised top-performing students in various disciplines through its full-time Prestigious Research Excellence Scholarships (PRES), valued at over N$2million. This is the first time the University is availing funds of this nature, as part of the initiatives funded through the Institutional Research Publications Committee (IRPC) budget.

One of the conditions is that the students will be groomed into the academic pipeline for exposure to various higher degrees-related functions such as teaching, assessing and leading research teams.

NUST IRPC scholarship recipients:

Digitally and Truly Representing our Culture

Recipients from L -R: Mr. H. Mangundu: Master of Applied Econometrics; Ms Charlize Rix: Master's in Biotechnology; Ms. Kauly Peter, Master of Computer Science in Software Development; Ag. DVC- RIP, Dr Colin Stanley in the middle, Ms. Laurica Celeste Afrikaner: PhD in Natural Resources (Hydrogeology); Mr Ericky Iipumbu: Master of Computer Science in Cyber Security.

Back row: Ms Kuda Brandt, Prof Lameck Mwapagha, Ms Rennie Munyayi, Prof Omotayo Awofolu, and the Exec. Dir. DRIP, Dr Anna Matros-Goreses

In absentia: Ms. M Hausiku, Master of Logistics & Supply Chain Management; Ruusa Shoowa: Master of Sustainable Energy Systems; Ms Vivian !Nou-/Gawaseb, Master of Spatial Sciences

Mr. Gerard Vries, Deputy Executive Director of Lifelong Learning, Arts and Culture, experiencing the VR of hunting with the San Community.

PROMOTING SCIENCE THROUGH COMMUNICATION

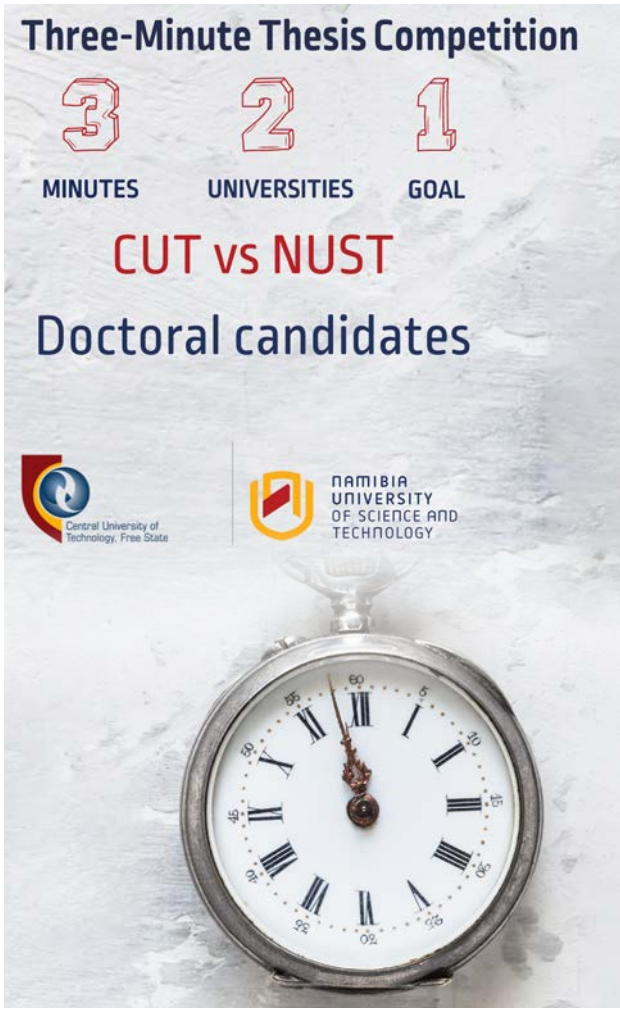
Science communication plays a vital role in enabling the masses to comprehend and apply scientific knowledge, thus bridging the divide between scientists and the general public. A workshop was held by NUST, in collaboration with the University of Namibia. The main aim of the engagement was to provide guidance to scientists on effectively presenting their research findings in a manner that is easily understandable and relatable to journalists, in addition to empowering science journalists with skills to effectively and factually communicate complex scientific concepts.

The workshop was attended by journalists, researchers, representatives from research institutes and non-governmental organisations.

Participants of the Science Communication Workshop

Follow this link to watch one of the presentations by Prof Morgan Hauptfleish: https://www.youtube.com/watch?v=k_xB0OEaUHU

ONE THESIS, TWO INSTITUTIONS AND THREE MINUTES



The Central University of Technology (CUT) Doctoral Summer School concluded on Day 2 with an institutional Three-Minute Thesis (3MT) Competition, collaborating with the Namibia University of Science and Technology (NUST) to promote research competencies among doctoral students. Six doctoral students from both Institutions put their academic prowess to the test in their respective fields of study. They presented on research topics such as a project to conserve water by identifying and addressing leaks in underground pipes; the need for a standardised user authorisation model for public cloud storage platforms; a communication architecture for improving production efficiency in smart manufacturing; microbial infection in the brewing industry; potential impacts of cyberattacks on healthcare systems, and developing a deep learning model to educate parents on cybersecurity.

After thorough deliberations, the panel of judges announced the results with great anticipation. The overall competition resulted in a tie between Chikuruwo Mary Nyaradzai Hughslar from NUST's Faculty of Engineering and the Built Environment; and Gareth Gericke from CUT's Faculty of Engineering, Built Environment, and IT. The first runner-up position was secured by Lerato Mogotsi (CUT - Faculty of Health and Environmental Sciences). The second runner-up spot was claimed by Stanford Musarurwa (NUST -Faculty of Computing and Informatics).

RESEARCH AND INNOVATION MATTERS ON NUST FM

To promote research and innovation, on and beyond campus, in a manner that can be digested by both expert and lay audiences, a podcast series was created. The show allows for 'easy on the ear' conversations with academics, that centre on their chosen career paths, their passion for their work, and essentially why their "research matters".

Watch the podcasts here: https://www.youtube.com/watch?v=bHnkvYrPtPI&list=PLrwOkWpfB_g-pLBTtnED7QSH0X0MU6MWq

Research Matters Podcast
Season 1

1. Dr Anna Matros-Goreses, Executive Director: DRIP **Episode: Research Matters (the prologue)**
2. Dr Guillermo Delgado, the Acting Director of NUST's Institute for Land, Livelihoods and Housing (ILLH) **Episode: Land, Livelihoods and Housing**
3. Ms Marsela Rita a master's Candidate in the Faculty of Computing and Informatics **Episode: Child Online Protection**
4. Dr David Iiyambo the HoD for Mathematics, Statistics and Actuarial Science, as well as a Senior Lecturer in Mathematics **Episode: Mathematics**
5. Ms Helvi Wheeler a Lecturer in the department of Technical and Vocational Education and Training [TVET] **Episode: Vocational Education and Training**
6. Prof Benjamin Mapani, Department: Civil, Mining and Process Engineering **Episode: Geodynamics**
7. Ms. Tekla Amutenya, Secretary: Department of Economics, Accounting and Finance **Episode: Secretary by day, Doctoral candidate by night.**
8. Prof Eugene Chigbu, Associate Professor: Land Administration Department: Land and Spatial Sciences **Episode: Digging into Land Research**
9. Prof. Morgan Hauptfleisch, Department of Natural Resources Sciences **Episode: Taking Research by the Horns**
10. Ms Judy Grobler, Director; NUST Library **Episode: Publish or Perish**
11. Mr Rian Uusizi, Lab Technician: Civil, Mining and Process Engineering **Episode: Paving the Road to Success**
12. Prof Vera De Cauwer, Associate Professor in the Department of Natural Resource Science **Episode: Sowing Seeds of Research**

NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

www.nustfm.na NUST FM REINVENTING SOUND

Distinct Research Entities' Achievements

INDIA – NAMIBIA CENTRE OF EXCELLENCE IN INFORMATION TECHNOLOGY (INCEIT)

The centre was jointly inaugurated by Hon. Dr S Jaishankar, Minister of External Affairs, India, Hon. Netumbo Nandi-Ndaitwah, Deputy Prime Minister and Minister of International Relations and Cooperations, Hon. Dr. Itah Kandjii-Murangi, Minister of Higher Education, Technology and Innovation on 5 June 2023. On this occasion, a tree was planted by dignitaries as a symbol of growth and sustainability.

Glimpse of inaugural function INCEIT

INCEIT is currently in operation with three programmes namely (1) Certificate in Ethical Hacking and Information Security, (2) Certificate in Big Data Technologies and (3) Certificate in Advanced Web Technologies and boasts with 238 students from industry, government organisations, and Ministries trained to date. Python programming is offered as a short skills development programme. New programmes such as Postgraduate Diploma programmes in Artificial Intelligence and Machine Learning, Big Data Analytics using HPC, and Network Security are pending.

INCEIT is promoting research in High Performance Computing in-country, and as a result workshops are conducted in both Namibia and India.

Participants attending the HPC Workshop at INCEIT

Institutional Research Week (IRW)

The Institutional Research Week brings together emerging, mid-career, and established researchers from various disciplines to showcase cutting-edge research at the Institution. Highlights of the 2023 event included presentations from keynote speakers such as Prof Chibale and Prof Mzyece.

Prof Kelly Chibale is a full Professor of Organic Chemistry at the University of Cape Town (UCT) where he holds the Neville Isdell Chair in African-centric Drug Discovery and Development. His presentation was centred on his research interests of infectious disease drug discovery and the development of preclinical discovery tools and models to contribute to improving treatment outcomes in people of African heritage.

Prof Mjumo Mzyece is a full Professor of Management in the Department of Business and Economics at Northwestern College in Orange City, Iowa, USA. His presentation was pivoted on his research interests in innovation management, digital operations, and operations in high-tech startups.

VC handing over the 2022 Research Matters Report to Deputy Minister of Higher Education, Technology and Innovation (MHETI), Hon. Nathalia /Goagoses.

Innovation is in Our DNA

Protect your Ideas – Protect your Intellectual Property

The Technology and Innovation Support Centre (TISC), in collaboration with the Business and Intellectual Property Authority of Namibia (BIPA), was officially inaugurated at the High-Tech Transfer Plaza Select (HTTPS). The Centre is the result of a collaboration between NUST, BIPA and the World Intellectual Property Organisation (WIPO). There are two centres of this kind at the University, with the other located at the NUST Library. By promoting innovation, the NUST TISC provides a platform to access WIPO database of IP-related tools and information. It further encourages the development of new ideas, technologies, and products, playing a crucial role in fostering an entrepreneurial culture among students, faculty, and the broader community.

Strengthening Capacity in Tech Transfer

Ms Nadia Jansen, a staff member from the Directorate of Research, Innovation and Partnerships (DRIP), is one of ten candidates that was selected to attend an eight week on-the-job training programme at The University of the Western Cape Technology Transfer Office. The training programme is set to provide the participants with a holistic understanding on processes and procedures pertaining to a Technology Transfer Office (TTO). The main function of a TTO is to translate new and innovative research into commercially viable products or services.

This opportunity is part of a project partnership between the World Intellectual Property Organisation (WIPO), and Southern African Research and Innovation Management Association (SARIMA). The project, called "Reinforcing the Technology Innovation Support Centres (TISCs/ Technology Transfer Offices in Southern Africa", is supported by the Japan Patent Office (JPO).

Business Idea Competition

Sparking public interest is the twin concept of innovation and entrepreneurship. It is also about motivating individuals to develop and pursue business ideas. As such, a total of eight students took part in a Business Idea Competition during the Institutional Research Week and the top three were given awards.

First (1) place **N$5000**
Mr Daniel Hammond, H&B,
E-Buy- an online global retail

Second (2) place **N$3000**
Mr Michael Links
Seedling Community Bank

Third (3) place N$2500
Mr Toivo Makuti
BioTech Technology

Southern Africa Innovation Collectives – Annual Boost-up Event

Boost-up events via the Southern Africa Innovation Collective (SAIC) facilitate improved networks between innovation actors within Southern Africa as executed by both Connected Hubs and focal points such as the National Commission on Research, Science and Technology (NCRST) from a Namibian perspective. The purpose of Connected Hubs such as NBII, GEM Namibia and Basecamp is to build a community and facilitate knowledge exchange by connecting innovation ecosystem actors for a joint cause: Enhanced entrepreneurship support and regional connectivity. The Connected Hubs network aims to share best practices in innovation support and further build a networked community of innovation actors in the Southern Africa Development Community (SADC). NBII in this initiative provides Business Modelling and Market Research Training to selected enterprises.

Inspire to Start-Up

This accelerator programme is designed to inform, spark, and capacitate potential individuals to create sustainable ventures. The initiative is implemented from two main activities, namely:

- Building capacities in areas of: Ideation (Idea Creation, Innovate Your Idea and Idea Assessment), Market Research, Business Modelling and Pitch & Pitch Clinic.
- Assessing the high potential startup ideas for incubation purposes.

In 2023, a total of 24 NUST students from various fields, received training.

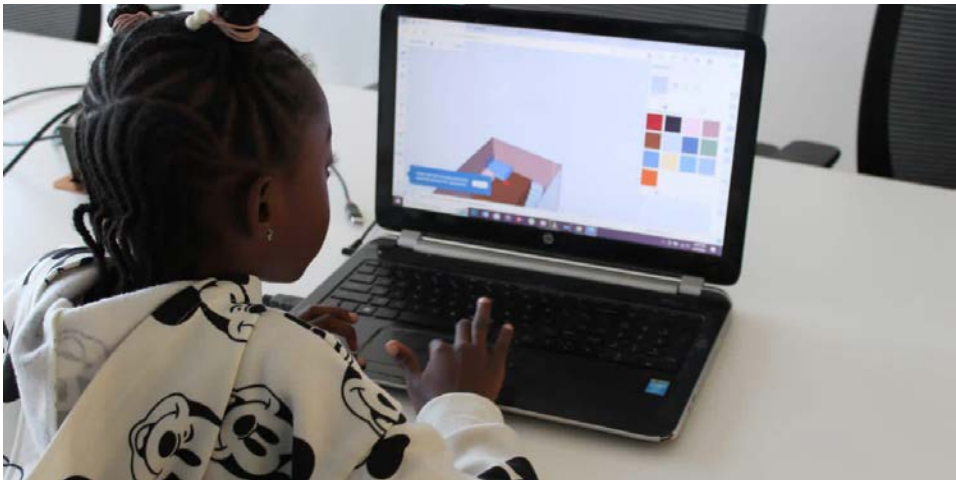
Out-of-the-box thinking

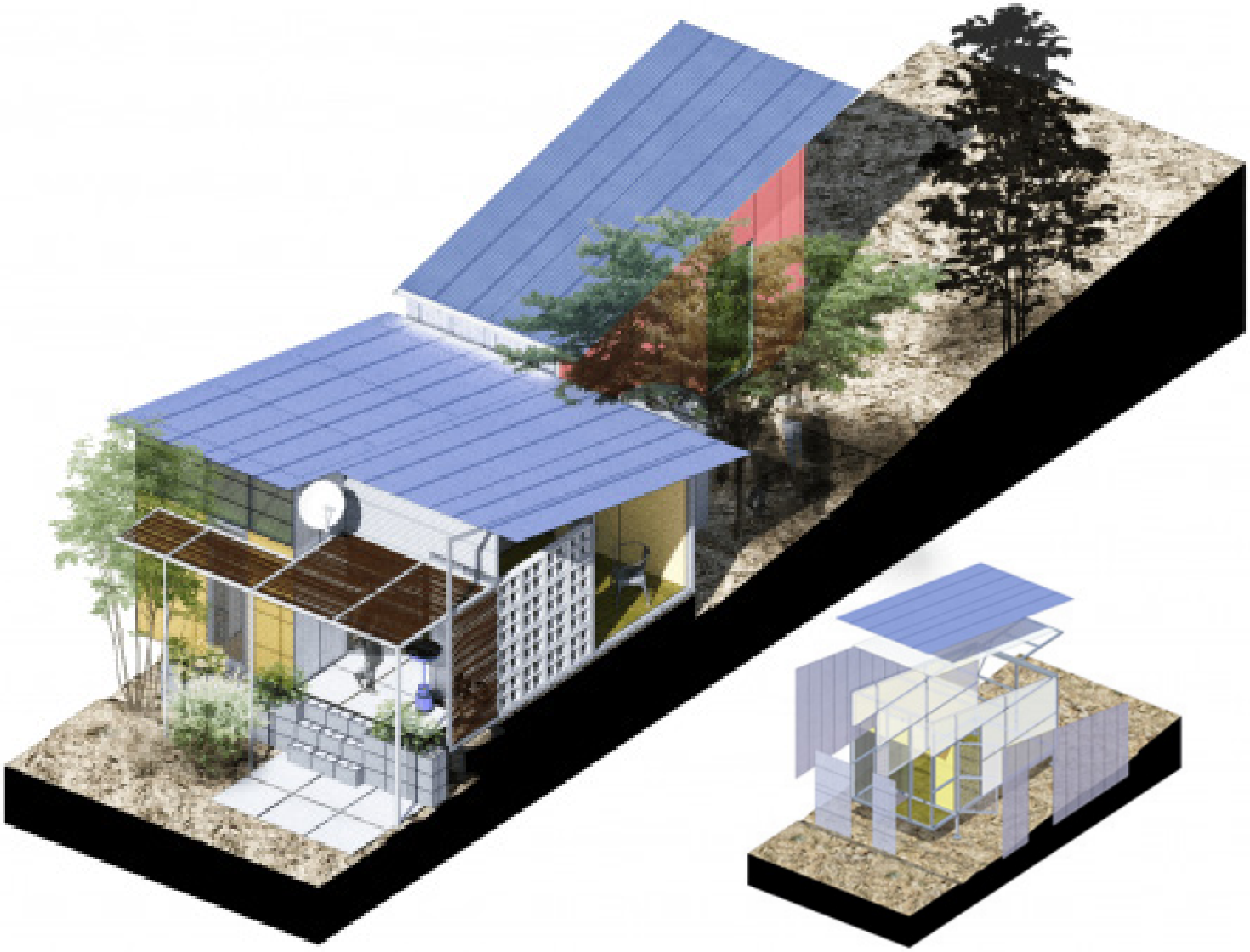
NUST partnered with Finland's Demola Hub to increase industry-academia collaboration and international connectiveness in the innovation ecosystem in Namibia. The hub connects local students and companies to global innovation activities, with the intention of contributing and utilising the global knowledge base of insights about the futures. This has a significant impact on the vitality of the Namibian innovation ecosystem. More than 50 students were enrolled in the programme during the year under review.

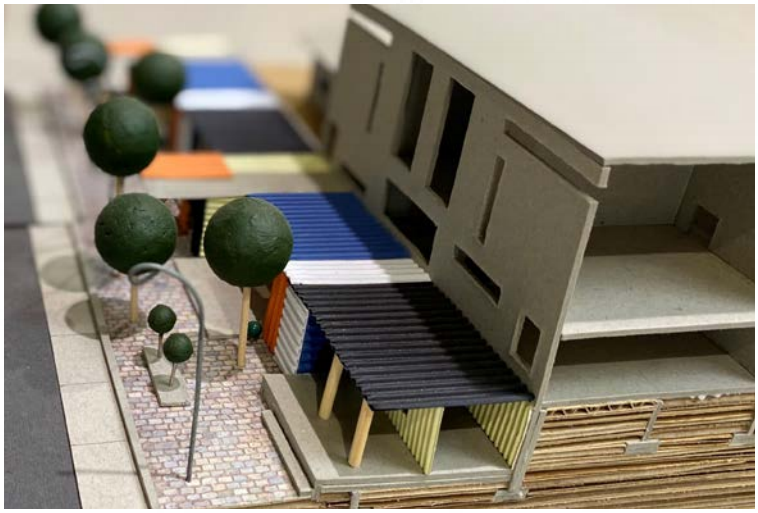
Tech gurus in the making

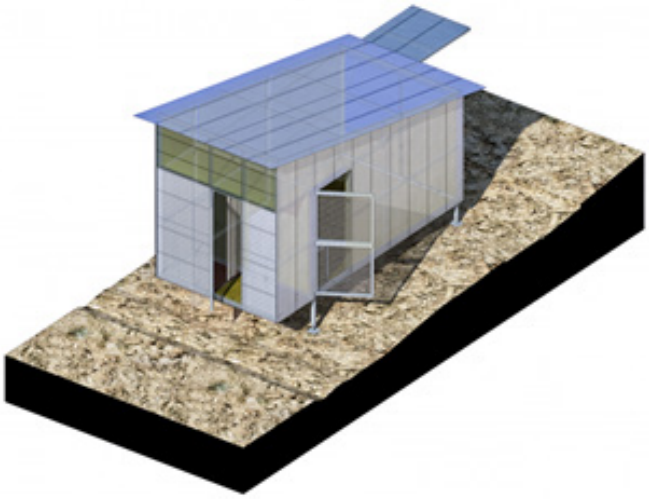
Throughout the year, groups of young learners showcased their skills in game design, development and programming, at the HTTPS, after being trained by Edu-Game Namibia, a game development company. Edu-Game partnered with MTC Namibia and in the process with NUST, to support innovative start-ups in the country through the MTC Innovation Centre at the HTTPS.

Impressed by the young curious minds, Dr Colin Stanley, the Acting Deputy Vice-Chancellor for Research, Innovation and Partnerships, said: "If you want to solve complex problems, you sometimes have to think like a child."









Incremental Adequate House - First Prototype

In parallel with the *Revised National Housing Policy & Implementation Action Plan*, the *Department of Architecture, Planning and Construction* has been developing an Incremental Adequate House for several years. The purpose is to use readily available materials that can be assembled easily and is modular, which would not only allow communities to construct it themselves, but the design complies with municipal bylaws and building regulations. In 2023 the first prototype was constructed by architecture students on the NUST campus under the guidance of Mr Derhano Kloppers, Ms Waseela Parbhoo and Ms Sophia van Greunen. The purpose was to test the ease and speed of construction, affordability and the ability to accommodate various building materials and serves as a technical development running in parallel with the *National Housing Policy*.

Epilogue

Dr Anna Matros-Goreses, Executive Director: DRIP

As I reflect on the progress made in the past year, I am both proud and optimistic about the research status and capacity development at the University. Our commitment to advancing research and technology transfer has been evident in the strides we have taken, despite a challenging environment marked by limited resources.

One of our major focuses has been the management and strategic use of intellectual property (IP) assets. We recognise that our research outputs are more than just academic achievements; they represent innovations that have the potential to create real-world impact. To this end, we have been developing systems and structures to not only protect, but also to effectively transfer these assets to the marketplace, ensuring they contribute to socio-economic growth. IP management is now firmly embedded within our institutional framework, laying the foundation for a robust innovation ecosystem that benefits both the university and the broader community.

Looking forward, the future of research management at NUST lies in embracing digital transformation. We are actively exploring and implementing digital tools and systems to streamline research processes, improve data management, and enhance communication across projects. This digitalisation of the research management landscape is essential as we adapt to changing global trends and the increasing complexity of interdisciplinary research. However, this shift requires a comprehensive change management approach, ensuring that our dedicated, albeit limited, staff are equipped to navigate and lead in this new era.

Our staff, though small in number, have shown immense dedication and adaptability. Their commitment has been the backbone of our achievements. Moving forward, we will continue to focus on building their capacity, equipping them with the skills and tools necessary to thrive in a rapidly evolving research environment.

NUST's leadership in research and innovation management is reinforced by my prestigious appointment of being the SARIMA President-Elect. The role enables NUST to deepen its collaborations within the Southern African Development Community (SADC) and beyond. It provides direct access to networks that include leading research institutions, funding bodies, and industry stakeholders, enhancing opportunities for strategic partnerships.

As we embark on this journey of transformation, I am confident that our emphasis on technology transfer, intellectual property management, entrepreneurship promotion and digitalisation will position NUST as a leader in research and innovation. We remain committed to fostering an environment where research excellence translates into tangible societal benefits, guided by a vision of sustainability and growth.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PUBLICATIONS

Faculty of Computing and Informatics

Conference Papers

Adewale, M. D., Ebem, D. U., Awodele, O., Azeta, A., Aggrey, E. M., Okechalu, E. A., Olayanju, K. A., Owolabi, A. F., Oju, J., Ubadike, O. C., Otu, G. A., Muhammed, U. I., & Oluyide, O. P. (2024). Comparative performance evaluation of random forest, extreme gradient boosting and linear regression algorithms using nigeria's gross domestic products. *International Conference on Innovations and Interdisciplinary Solutions for Underserved Areas*, (pp. 131–15). https://doi.org/https://doi.org/10.1007/978-3-031-51849-2_9

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