





RESEARCH &
INNOVATION REPORT
2022/2023



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01

INTRODUCTION





NWU Principal & Vice-Chancellor
PROF BISMARK TYOBEKA

FOREWORD BY THE PRINCIPAL & VICE-CHANCELLOR

Prof Bismark Tyobeka

The North-West University (NWU) is at the forefront of Research and Innovation (R&I) in the South African higher education sector. We participate in research that is relevant and innovative, life-transforming and that creates powerful partnerships, both at national and international levels.

I am delighted to launch this inaugural Research and Innovation Report 2022/2023, which has four main goals. First, the report showcases the diversity of our R&I activities, from young and emerging to seasoned researchers, and from start-up research entities to centres of excellence. Second, it highlights selected R&I initiatives and notable achievements. Third, the report profiles some of our research programmes advancing scholarly and societal impact. Finally, the report covers extensive national and international networks and partnerships currently enjoyed by our institution.

The NWU has earned a reputation for its strong culture of innovation leading to IP creation and commercialisation. In line with our mission of striving to benefit society through the provision of knowledge, excelling in innovative teaching, cutting-edge research and focused engagement with the community, our research entities produce research that is relevant both locally and globally, addressing the needs of the country and the United Nation's Sustainable Development Goals (UN-SDGs). The SDGs remain key drivers of our R&I programmes. It is in this regard that we remain committed to intensifying our efforts to foster sustainable partnerships, both locally and internationally. Our objective is to ensure that our academics and postgraduates conduct research that is globally relevant and provide impactful solutions.

The NWU boasts recognition at both national and international levels and enjoys an extensive and visible profile in this regard.

The 2023 QS World Universal Rankings (QSWUR) ranked the NWU among the top 4,4% globally, the top 10 in Africa, and the top seven in the Republic of South Africa. Among 20 966 universities worldwide, the 2024 Global 2000 list, published by the CWUR, places the NWU among the top 4,2% of the world's best universities.

As we continue to strive for excellence, I recognise the need for the NWU to strengthen and improve our capacity, as well as to expand and bolster R&I beyond its current stature, as articulated in the NWU Strategic Plan 2024 and beyond. Furthermore, we continuously introduce strategies to nurture excellence and to motivate and retain our committed and talented staff in the highly competitive National System of Innovation ecosystem.

We recognise and reward scholars for their sterling achievements and extraordinary contributions in R&I, as well as in Teaching-Learning and Community Engagement, through the Vice-Chancellor's Excellence Awards. The Awards have proven to promote and sustain a passion among academics for continuous learning, professional development in their career, and innovation.

I am confident that you will find this inaugural Research and Innovation Report to be a thoroughly engaging and insightful exploration, showcasing our continuous commitment to the development of groundbreaking research.



SUMMARY BY THE DEPUTY VICE-CHANCELLOR: *RESEARCH & INNOVATION*

Research is thriving at the NWU, and emphasis is placed on balancing quantity with quality in research outputs. The R&I activities are conducted predominantly, but not exclusively, through the 61 research entities, comprising: five centres of excellence, eight hosted entities, 12 research units, 17 research focus areas, 10 research niche areas, one commercial unit and eight research chairs.

In the last two years, we introduced initiatives to bolster the quantity and quality of research outputs. These include but are not limited to, the establishment of a research integrity office with concomitant high-quality training sessions across the university, introducing external peer-reviews of Research Entities in addition to the long-standing internal review process conducted by our Research Entities Evaluation Committee.

The primary goal of R&I is to conduct research and innovation with a strategic focus on global impact, as encapsulated in and beyond the NWU Strategic Plan 2024.

In keeping with our strategic objective of **generating new knowledge through high-quality publications and scientific leadership**, our academics conduct research aiming to advance and impact the economy, social responsiveness, policy and practice, peace and prosperity, and provide sustainable solutions to our country and the SDGs.

Deputy Vice-Chancellor
PROF JEFFREY MPHAHLELE

In our quest to balance the quantity and quality of R&I outputs, FIVE STRATEGIC OBJECTIVES were identified to meet the R&I goal in and beyond the NWU Strategic Plan 2024.

THE R&I GOAL:

- **Conduct research and innovation with a strategic focus on global impact.**

THE FIVE DRIVING STRATEGIC OBJECTIVES:

- Generate new knowledge through high-quality publications and scientific leadership.
- Inspire and nurture the next generation of researchers.
- Improve international stature and visibility of scholars and research outputs.
- Intensify research through international partnerships and collaborations.
- Support and sustain an ecosystem for the conducive creation of IP and commercialisation.

For the first time, the subsidy units linked to DHET-recognised publications surpassed the per-capita output of 1.00 unit in 2022. We are closely monitoring research output per staff category, especially for professoriate and senior-level lecturers. Earning global scientific leadership in generating new knowledge is highly valued and encouraged. The journal publications where the senior or first author is affiliated with the NWU were at 63% in 2023 (against the annual target of 53%). This is an impressive improvement compared to previous years (49% in 2022, 50% in 2021, 50.3% in 2020 and 53.4% in 2019).

The NWU is committed to **inspiring and nurturing the next generation of researchers** by growing the pipeline of researchers through a myriad of initiatives. These include postgraduate students, Postdoctoral Research Fellows (PDRFs) and Early-Career Academics who obtained doctoral degrees in the last five years.

The completion rate of master's and doctoral students is continuously under the spotlight to ensure that the majority of students graduate as per university rules. Since 2022, incremental changes have been introduced to improve the number and stipends of PDRFs over the next five years. The academic staff without doctoral degrees are highly encouraged to take up opportunities internally (and externally) to upgrade their qualifications. In 2023, a total of 57% of NWU academic staff had doctoral qualifications. Equally important is the transformation of our researcher cohort, especially women and black academics.

Strategic interventions are underway to **improve the international stature and visibility of scholars and research outputs**. A number of our scholars have distinguished themselves in the relevant scholarly domains, through their exceptional, meritorious and impactful scholarly outputs.

They are actively involved in national and international panels, advisory groups and working groups in their fields of expertise and are worthy recipients of prestigious awards and scholarly achievements, both nationally and internationally.

The cohort of NRF-rated researchers grows annually. Currently, the university boasts over 320 NRF-rated researchers, of which 35 are B-rated. The institution implemented a five-year strategic investment to grow and nurture the pool of B-rated researchers. Our vision is to propel this cohort to improve scholarly stature by attaining an NRF A rating in the shortest time possible, without compromising on quality. In addition, co-publication with international collaborators and partners is commendable.

In our quest to **intensify research through international partnerships and collaborations**, the R&I portfolio concluded over 20 new or renewed international institutional academic agreements in 2023 alone. The agreements aim to facilitate academic exchanges or mobility of scholars and postgraduate students, joint academic activities, and appointments of international honorary and extraordinary academics. In 2023, the NWU Council approved the Internationalisation Strategy, which is crucial to advance internationalisation on all fronts.

The need to **support and sustain an ecosystem for the conducive creation of IP and commercialisation** has become highly competitive in the higher education sector. Based on the second survey of Intellectual Property and Technology Transfer conducted by the National Intellectual Property Management Office (NIPMO), the NWU ranked among the top three revenue earners among Higher Education Institutions for 2016 and 2017, and among the top five revenue earners for 2018. This recognition affirmed NWU's cutting-edge R&I capacity.

The recent years have witnessed an increase in the number of disclosures emanating from faculties with historically low IP inventions, as well as filed and granted patents. The promotion of entrepreneurship activities targeting students is commendable, with entrepreneurship boot camps held both for undergraduate and postgraduate students.

Our long-term vision is to create a platform where academic staff and students can conduct entrepreneurial activities and creative outputs and submit IP disclosures.

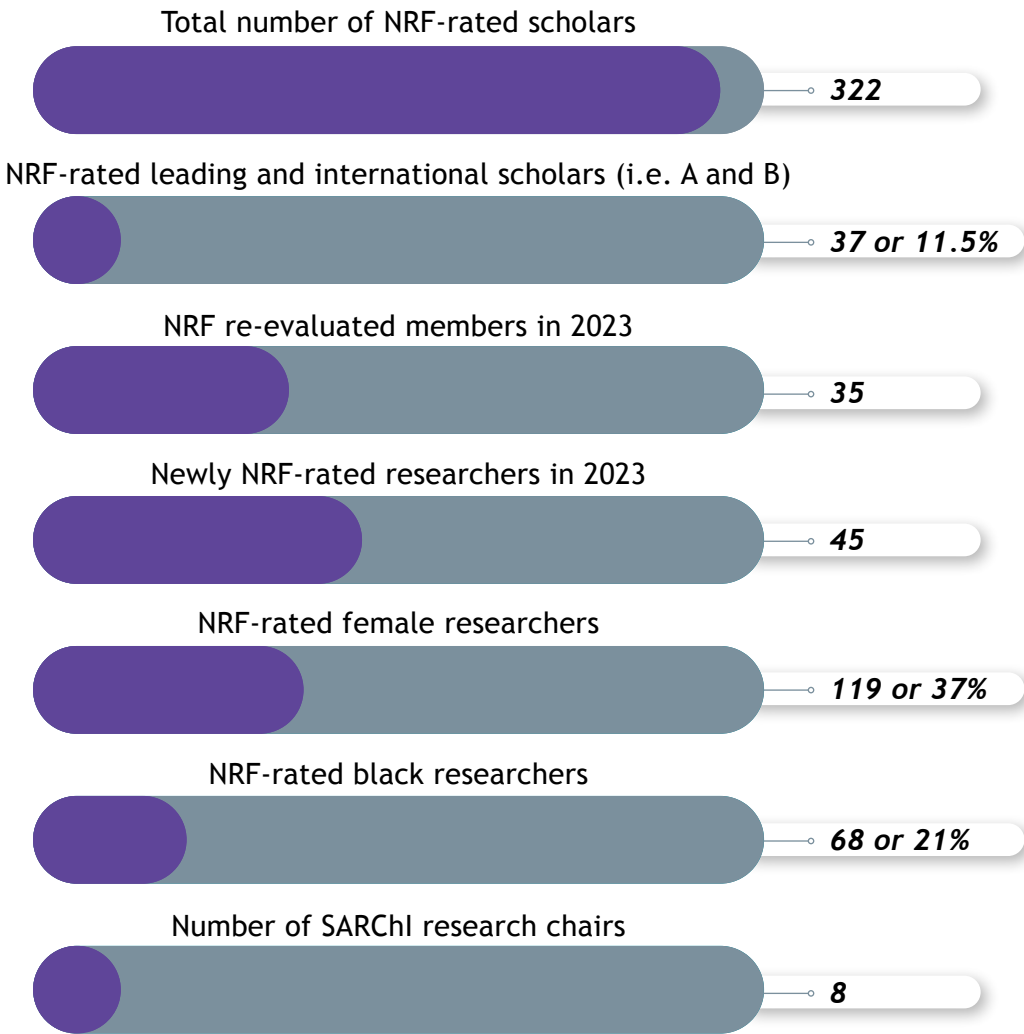
Finally, we recognise the need to continuously strive for improvement by ensuring that our structure is coherent, fit for purpose, resilient, agile and geared towards improving efficiency. The Library and Information Service is exemplary in this regard. Not only does it strengthen R&I activities through cutting-edge resources, but it also provides access to services vital to fulfilling Teaching-Learning and Community Engagement.

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**RESEARCH & INNOVATION
AT A GLANCE**

Research and Innovation at a Glance

NRF-RATED SCHOLARS AS AT 2023



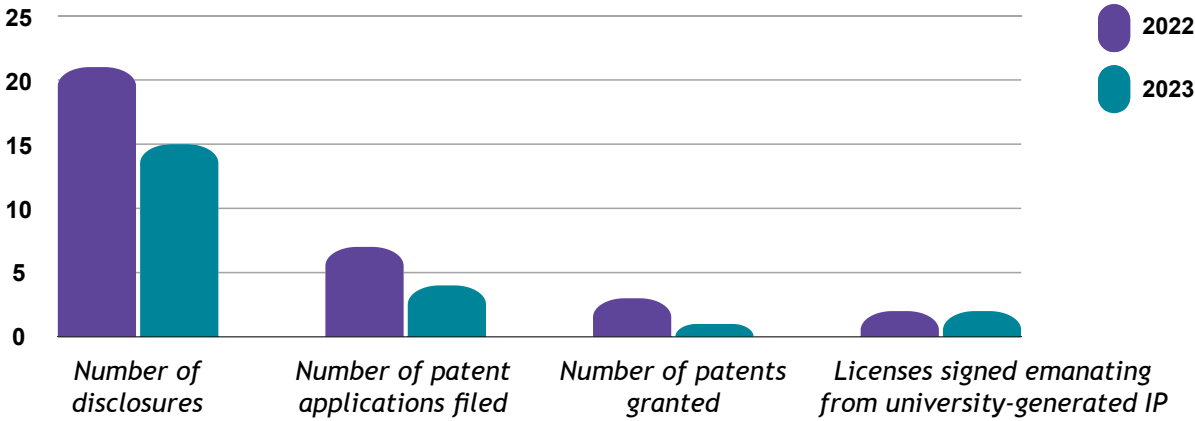
SUMMARY OF NRF-RATED RESEARCHERS

NRF-rated researchers by category over five years

NRF	2019	2020	2021	2022	2023
A	0	0	1	1	0
B	27	26	32	36	36
C	161	181	188	196	218
P	2	1	1	2	1
Y	58	55	58	63	67
TOTAL	248	263	280	298	322

A – Leading international scholars B – Internationally recognised researchers C – Established researchers
P – Young researchers (typically under 35) Y – Young researchers (40 years or younger)

STATS ON INNOVATION AND CREATIVE OUTPUTS



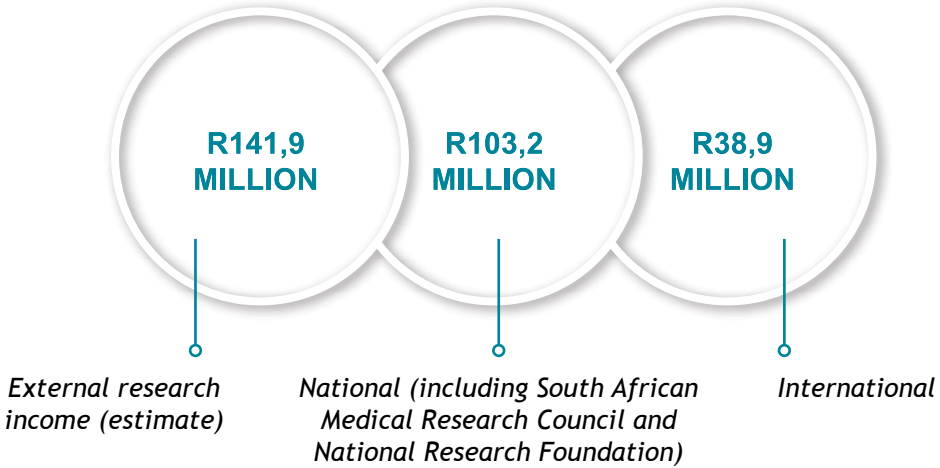
STATISTICS ON DHET-APPROVED RESEARCH SUBSIDY UNITS (2020 - 2022)

	2020	2021	2022
Journal articles	1 264.32	1 366.3	1342.11
Conference proceedings	38.84	66.9	91.63
Books and chapters	233.43	222.90	272.62
Total article equivalents published	1 536.59	1 656.10	1706.36
Master's degrees conferred	722	698	695
Research master's	521.61	509.96	519.08
Research master's weighted	521.61	509.96	519.08
Doctoral degrees conferred	251	264	213
Doctoral degrees weighted	753	792	639
Total weighted research output	2 811.19	2 958.06	2 864.30
Publication units per permanent academic staff	0.93	0.99	1.02
Staff with PhD qualifications	53%	56%	56%

POSTDOCTORAL RESEARCH FELLOWS



STATS ON GRANTSMANSHIP



NWU GLOBAL RANKINGS AND INTERNATIONAL PARTNERSHIPS

Number of active international agreements and partnerships on Research and Innovation

143 in over 55 countries

Ranking Scheme	GLOBAL RANKING 2023	GLOBAL RANKING 2022	POSITION IN SOUTH AFRICA	POSITION IN AFRICA
ARWU Academic Ranking of World Universities (Shanghai Ranking)	501-600	880	7	9
THE Times Higher Education	601-800	601-800	7	-
QS World University Rankings (Quacquarelli Symonds)	801-850	801-1000	7	10
QS Sustainability Rankings	458	-	6	8
CWUR Centre for World University Ranking	887 (top 4.4%)	924	7	-



03

*DVC RESEARCH AND
INNOVATION STRUCTURE*

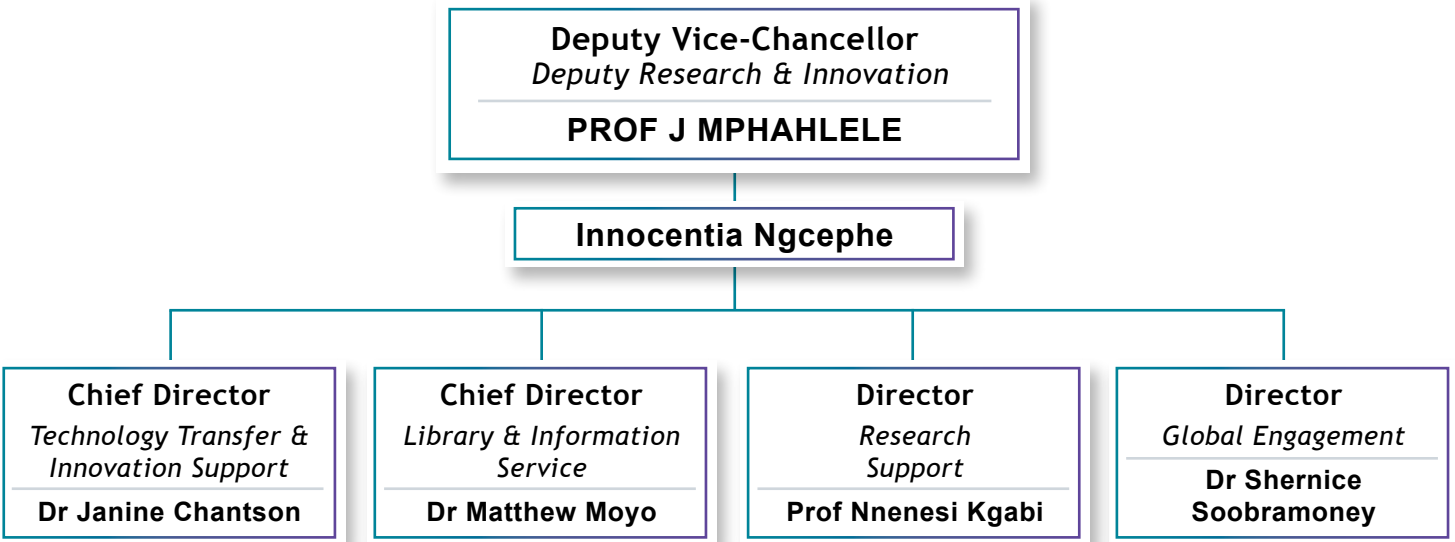
DVC Research and Innovation Structure



The Office of the DVC: R&I is the administrative and management hub of the R&I goal of the NWU Strategic Plan, with a plethora of activities ranging from management of research funds (statutory and non-statutory) to supporting postgraduates, researchers and innovators, internationalisation activities, etc.

Four departments enable and support the R&I activities across the institution: Research Support Department, Technology Transfer and Innovation Support, Global Engagement Office, and Library and Information Service.

KEY DEPARTMENTS SUPPORTING AND ENABLING R&I



Research Integrity Officer
Prof Minrie Greef

The NWU prides itself on having been able to roll out the newly developed Integrated Research Integrity Management System (IRIMS) in June 2022 to all faculties. This system is used for the management and maintenance of the Responsible Conduct of Research by faculty management, research managers, researchers and postgraduate students.

A powerful and effective tool, the system provides management of the full spectrum of research activities within faculties by focusing on fostering a climate for responsible conduct of research and managing breaches and transgressions in research integrity that is transparent and just. An effective website is available for both internal and external users.

The introduction of IRIMS was led by Prof Minrie Greef, a former NRF B-rated researcher within the Faculty of Health Science and expert in research, research ethics, and research integrity.



Research Support
Director: Prof Nnenesi Kgabi

The Research Support includes management of research output information, research development and capacity building, management of research funds and financial support, and streamlining and standardisation of research processes for all students and researchers, thus maximising research excellence and maintaining the quality of research, ethics and integrity in the institution.

The department also organises a Biennial Research and Innovation Week and other research events in collaboration with faculties.

Technology Transfer and Innovation Support (TTIS)

Chief Director: Dr Janine Chantson

TTIS is a key strategic office that focuses on supporting and sustaining an innovation-orientated culture and an environment conducive to the creation, transfer and commercialisation of intellectual property.

It provides value-added services to researchers and departments in translating their research from the laboratory towards innovative products and services which address real-world problems and market needs. The office engages in various outreach and capacity-building efforts to encourage and support faculty involvement in innovation.

In 2023, new incentives were implemented through the NWU Innovation Fellowship Programme and the Patent Incentive Scheme. These incentives were aimed at encouraging researchers to devote time to patenting and commercialisation activities. The NWU Innovation Fellowship Programme was piloted in 2023 with grant funding from the Department of Science and Innovation (DSI)/National Intellectual Property Management Office (NIPMO). Dr Frans Smit, from the NWU School of Physical and Chemical Sciences, was enrolled as the inaugural fellow to develop a commercialisation pathway for novel surfactants.

The Patent Incentive Programme, with funding from the office of the DVC: R&I, rewards researchers for their involvement in the prosecution and examination of their patent applications.

A vibrant community of innovators is critical to growing the NWU's pipeline of innovations, as measured by the number and quality of disclosures made to the TTIS office. Forging new connections and building TTIS faculty relationships is crucial to uncovering innovative ideas early on.

This is done through regular meet-and-greet events with newly appointed researchers and what is referred to as Coffie-Proffie sessions. Other networking events held include a celebration of the achievements of NWU innovators in November 2022, and a World Intellectual Property Day breakfast with Sasol and the NWU Business School in April 2023.

TTIS contributes to national and regional capacity development within the wider innovation ecosystem through various initiatives, including participation in SARIMA programmes, Regional Technology Transfer forums, and hosting conferences and events with government departments and agencies.

- In 2022, the office hosted a delegation from Malawi to discuss technology transfer, aiding in the establishment of Malawi's first Office of Technology Transfer.



Chief Director: Dr Janine Chantson

- As part of the World Intellectual Property Office (WIPO), Japanese Patent Office (JPO), and Southern African Research and Innovation Management (SARIMA) On-The-Job training programme, the NWU hosted two emerging technology transfer practitioners, Tharusha Naidoo-Maistry (Sol Plaatje University) and Mohlatlego Sebola (Sefako Makgatho Health Sciences University), for an eight-week on-the-job training programme in September and October 2024.

TTIS is actively involved in Regional Technology Transfer Forums. On 12 May 2023, TTIS hosted directors from several Gauteng-based technology transfer offices (University of Pretoria, University of Johannesburg, University of South Africa, Tshwane University of Technology) for a round-table discussion to address common issues and share experiences.

This event proved valuable for all participants, and forums for continued engagement and collaboration will be scheduled throughout 2024.

Intellectual Property and Technology Commercialisation Colloquium

The Department of Trade, Industry, and Competition's (DTIC) Intellectual Property and Technology Commercialisation Colloquium, held in partnership with the Companies and Intellectual Property Commission (CIPC), the Department of Science and Innovation (DSI) through the National Intellectual Property Management Office (NIPMO), and the NWU through the TTIS office, took place at the NWU Mahikeng campus on 28 and 29 March 2023. The event was themed Advancing Innovation through IP Commercialisation for Full-scale Industrialisation.

The colloquium provided marketing opportunities by showcasing NWU technologies at the exhibition stall during the DTIC Colloquium, as well as through campus radio broadcasts and NWU Corporate Communications YouTube videos.



Global Engagement Office

Director: Dr Shernice Soobramoney

Global Engagement supports and facilitates internationalisation activities at the NWU while demonstrating excellence, equity and innovation in the pursuit of internationalisation. It promotes a culture of global awareness and appreciation for international perspectives and cultural diversity at the NWU. **A broad overview includes:**

- A. international students;
- B. international partnerships and collaborations; and
- C. other internationalisation activities.

The Office also offers guidance throughout the partnership and collaboration process between international stakeholders and NWU Legal Services. This supports the advancement of university research and innovation, exchange programmes and other internationalisation services.



Director: Dr Shernice Soobramoney

“Global Engagement achieves success through the lens of internationalisation by focusing on the macroscopic and the microscopic.”



Statistics of International Students and Postdoctoral Fellows at the NWU

TABLE 1:
Number of international honours, master’s and doctoral students at the NWU in 2023

Mahikeng Campus	203
Potchefstroom Campus	979
Vanderbijlpark Campus	105
Total number of international students	1287
Percentage of international students	2.30%

TABLE 2:
Number of undergraduate and postgraduate international students at the North-West University in 2023

Undergraduate international students	630
Postgraduate international students	657
- Internatioinal honours students	116
- International master’s students	184
- International doctoral students	357
Total international students	1 287

TABLE 3:
Top six countries with the highest number of international postdoctoral students at the NWU

Nigeria	56
Zimbabwe	31
India	9
Cameroon	8
Lesotho	4
Russian Federation	4

Institutional Partnerships and Collaborations at International Level

The current number of international partnerships and agreements stands at 143, spanning over 55 countries. Europe leads as the topmost partner, followed by Africa.

Other Internationalisation Activities

There are several other internationalisation activities aimed at increasing our global standing and visibility.

In addition to bilateral partnerships, the NWU is part of quite a few strategic interinstitutional collaborations, such as the Southern African Regional Universities Association (SARUA), which has a memorandum of understanding with the OBREAL Global Observatory.

The NWU is also a member of the Southern African-Nordic Centre (SANORD), which advances strategic, multilateral academic collaboration between institutions in the Southern African and Nordic regions. Furthermore, the NWU is an active partner in research collaborations within the Brazil, Russia, India, China and South Africa (BRICS) bloc, and has knowledge and skills-sharing agreements with several BRICS universities.

Finally, the Global Engagement Office is actively involved in assisting both inbound and outbound staff/student exchange programmes. Recent exchanges were linked with seed funding from the SASUF/NRF Award involving 19 students and staff members who successfully applied for the Erasmus International Credit Mobility funding at three institutions: Tilburg University (Netherlands), Vytautas University (Lithuania) and University of Applied Sciences (Austria).

Library and Information Service (LIS)

Chief Director: Dr Matthew Moyo

The LIS is a vital entity within the university, tasked with the significant responsibility of enhancing the dissemination and access of research and innovation outputs for societal benefit and impact. It also provides comprehensive research support services, leveraging Information Communication Technologies (ICTs) to increase the visibility of NWU research outputs.

In December 2022, the LIS reported a major milestone by successfully transitioning from the legacy Sierra Library Management System to the cloud-based, fourth-generation WorldShare Library Management System (LMS), enhancing integration with other university systems and offering an easy-to-use user interface.

“Science literacy is the artery through which the solutions to tomorrow’s problems flow.”
Neil deGrasse Tyson



OPEN ACCESS ADVOCACY

Open Access Advocacy actively promoted open-access initiatives, such as spearheading the development of the Open Access Policy in 2022 and contributing to the global scholarly community by disseminating knowledge freely.

This included fostering collaboration through open-access publications and repositories, and marketing and advocacy of signed transformative agreements with large publishers through the South African Library and Information Consortium (SANLiC) in support of open-access publishing. In 2023, 302 papers were published under transformative agreements, resulting in the university saving over USD 230,000 in article processing charges.

An important highlight to note was the hosting of the International Open Access Week Colloquium 2023, which brought together notable scholars, researchers, and open access advocates from around the world, with the theme Community over Commercialisation which emphasised the need for researchers and the publishing landscape to prioritise community benefits ahead of financial gains. More information on this event can be accessed here: <https://nwulibraries.wordpress.com/2023/11/14/reflecting-on-the-impact-international-open-access-week-colloquium-2023-north-west-university/>

DIGITISATION OF SCHOLARLY OUTPUTS

The LIS continues to support the creation of digital sets by mining online resources or digitising paper materials and to grow expertise in research methods and practices using technologies. The aim is to provide academic staff, researchers, and students with easy access and preservation for those interested in incorporating digital methods into their teaching and research.

Currently, digitisation activities have been focused on theses and dissertations, giving students, researchers, and the public expanded access to knowledge. Easy access to high-quality content is both a public good and a key necessity for good research.

The LIS digitisation efforts will be enhanced through the Digital Scholarship Centre (DSC), which was established in 2023 and is currently in the process of being operationalised. More information on what the DSC will offer can be accessed here: <https://library.nwu.ac.za/digital-scholarship-centre>



The LIS Digital Scholarship Centre

The LIS also offers science literacy to researchers and postgraduate students at all levels, providing support for research, understanding open research practices and policies, navigating the publishing landscape, and mastering research data management.

04

RESEARCH ENTITIES AT THE NWU



RESEARCH ENTITIES AT THE NWU


Research and Innovation activities are predominantly conducted within 61 research entities. These include eight research chairs, eight hosted research entities (including a centre of competence), five centres of excellence, 12 research units, one commercial research unit, 17 research focus areas, and 10 research niche areas. As in the past, researchers and research programmes outside these entities have also received support. The image below serves as an overview of the aforementioned research entities.

- 5** *Centres of Excellence*
- 12** *Research Units*
- 17** *Research Focus Areas*
- 10** *Research Niche Areas*
- 8** *Research Hosted Entities*
- 1** *Commercial Research Units*
- 8** *Research/SARChI Chairs*

Overview of Centres of Excellence at the NWU

Faculty of Engineering

- CARBON-BASED FUELS

 <https://engineering.nwu.ac.za/research/centre-excellence-carbon-based-fuels>

Faculty of Natural and Agricultural Sciences

- SPACE RESEARCH

 <https://natural-sciences.nwu.ac.za/space-research>

Faculty of Health Sciences


- NUTRITION

 <https://health-sciences.nwu.ac.za/cen>

- PHARMACEUTICAL SCIENCES

 <https://health-sciences.nwu.ac.za/pharmacn>

- HYPERTENSION IN AFRICA

 <https://health-sciences.nwu.ac.za/hart>

Research Chairs

 **Economic and Management Sciences**
World Trade Organisation (WTO)

 **Education**
ETDP SETA ECD CHAIR
Multimodal Learning and OER (Open Educational Resources)

 **Engineering**
*Coal Research
Biofuels and Other Clean Alternative Fuels
Emission Control*

 **Health Sciences**
*The SANOPSys SARChI-Albertina
Sisulu Chair in Nursing Science*

 **Law**
Cities, Law and Environmental Sustainability

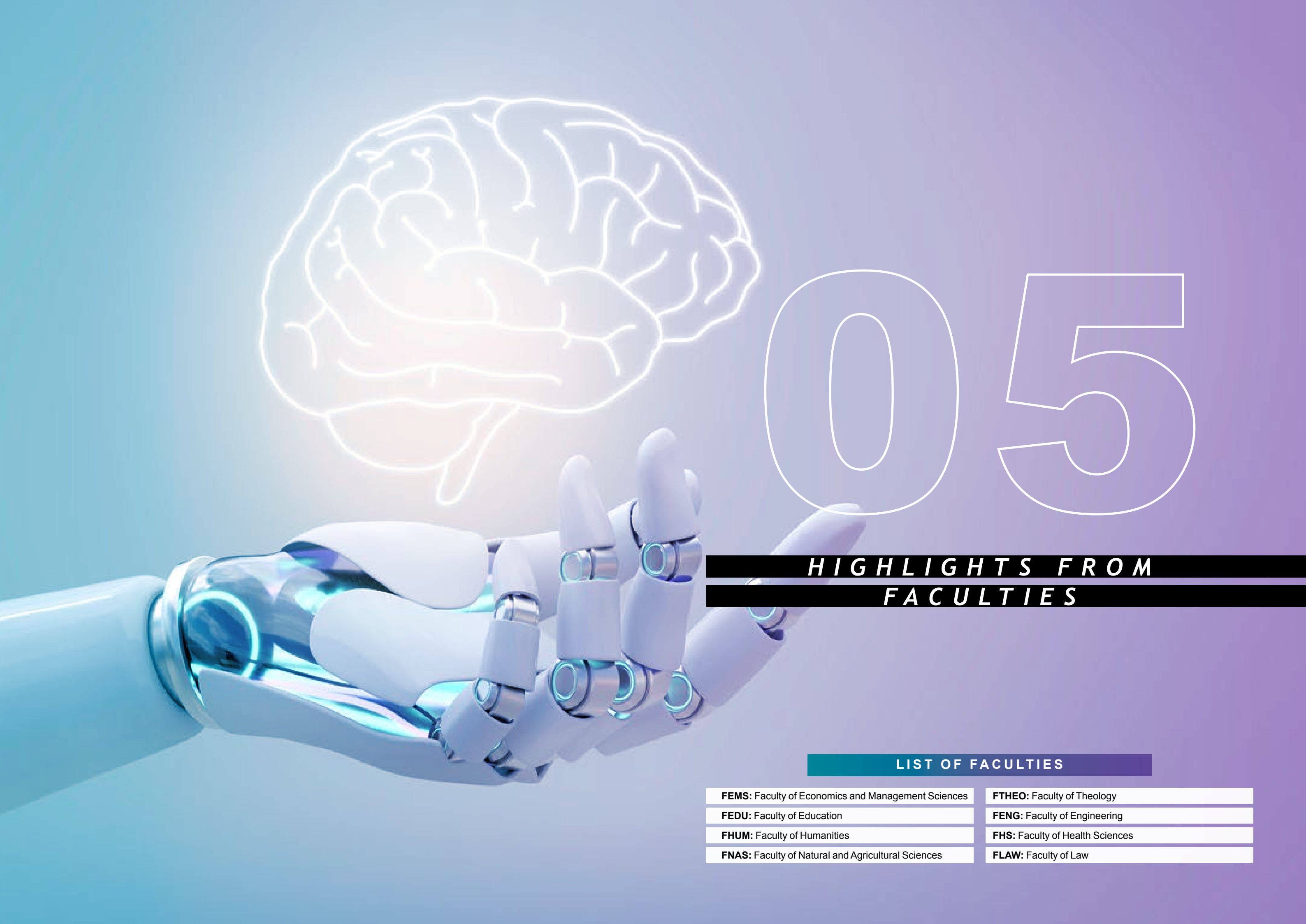
Hosted Research Entities

 **Engineering**
*Advanced Manufacturing
Competence in hydrogen production, storage,
reticulation and safety codes and standards*

 **Health Sciences**
Hypertension and Cardiovascular Disease

 **Humanities**
*South African Centre for Digital Language Resources (SADiLaR)
Text Technology*

 **Natural and Agricultural Sciences**
*Indigenous Knowledge Systems
Human Metabolomics*



*HIGHLIGHTS FROM
FACULTIES*

LIST OF FACULTIES

FEMS: Faculty of Economics and Management Sciences
FEDU: Faculty of Education
FHUM: Faculty of Humanities
FNAS: Faculty of Natural and Agricultural Sciences

FTHEO: Faculty of Theology
FENG: Faculty of Engineering
FHS: Faculty of Health Sciences
FLAW: Faculty of Law

Faculty of Economic and Management Sciences (FEMS)

Deputy Dean's Report

Prof Verona Leendertz - Deputy Dean: Research and Innovation

Over the past two years, FEMS has shown exponential growth in all key performance areas of research and innovation. In 2022, the faculty contributed 158.12 article equivalents (AE), which increased to 326.18 AE in 2023, a significant increase of 48%. This is a testament to the strong focus on improving research productivity and the number of publications, of which at least 86% were authored by faculty staff members.

To increase postgraduate numbers and access for students, the faculty, in addition to the university postgraduate bursaries, awarded an additional R1.7 million for bursaries.



Prof Verona Leendertz

In 2023, more than 31% of the successful NRF bursaries awarded at the NWU were from the faculty. In total, more than R5.3 million (excluding NRF) in bursaries were awarded to students. For the 2023 academic year, the faculty (including the Business School) graduated 691 postgraduate students.

In 2022, five staff members received NRF ratings; in 2023, an additional eight staff members received their ratings, amounting to 26 NRF-rated researchers. Since 2014, the faculty has hosted the World Trade Organisation Chair, which is significant to the development of research in trade and development. To intensify international research, the faculty embarked on various exchange and mobility programmes, including Erasmus Staff and Student Exchange Programmes, and visiting scholars to internationally recognised universities such as Cambridge University, Chandigarh University, Shanghai Open University, and Tilburg University, among others.

In 2023, the faculty had 47 active MoUs with partners in Africa and beyond. In September 2023, the faculty signed an agreement with the University of Malawi to offer PhDs to staff and students. Additionally, the faculty has a cotuelle agreement with the University of Turku. All these initiatives ensure an increase in the international postgraduate footprint in the future.

To support these initiatives, the faculty has six research entities. Three of these entities are featured in this publication.

Trade and Development (TRADE)

Director: Prof Zandri Dickason



TRADE was established in 2012 as a niche area to extend the scope of the export promotion research group's work and to make a more substantial contribution to South Africa's export and economic development efforts.

In 2016, the entity was upgraded to a research focus area, broadening its research scope to include additional areas. Following an external evaluation in 2022, the entity is currently revisiting its strategic plan to regain focus.



Director: Prof Zandri Dickason

The **core functions** of the focus area are to achieve international recognition and to provide opportunities for the sharing of ideas and collaboration in joint research projects on an interdisciplinary and inter-campus basis.

Among its **major contributions and achievements** are the WTO Chair and collaboration both internally with members of other entities and faculties and externally in terms of commercialisation projects, collaborative research papers, and book chapters.

TRADE has established significant national and **international collaborations** and partnerships. Internationally, it collaborates with the London School of Economics and Political Science, University of Chandigarh, Czestochowa University of Technology, University of Malawi, Namibia University of Science and Technology, University of Helsinki, Namibian Meat Board, and the World Trade Organisation (WTO).

Nationally, it partners with organisations such as Sanlam, Business Unity South Africa (BUSA), Agbiz, University of KwaZulu-Natal, and Raisins South Africa.

Technology Enhanced Learning and Innovative Training and Education in South Africa (TELIT-SA)



Director: Prof Liandi van den Berg

TELIT-SA, established in 2016, is a research entity dedicated to advancing education and training through innovative teaching and learning technologies. The unique research focus of TELIT-SA allows it to comprehensively explore the dynamic relationship between technology and education across faculties.

In response to the exponential rise of technology and digital disruption in higher education, TELIT-SA's research projects are strategically aligned with national and NWU's strategic goals to address digital transformation, inform technology-enhanced teaching practices, and train lecturers and students for the technology-infused workforce skills needed.

TELIT-SA operates on three core pillars: research-informed teaching and learning, artefact development, and training and development for effective integration of technology into teaching and learning. These integral research pillars distinguish TELIT-SA from other entities, with each pillar playing a crucial role in shaping the landscape of contemporary education research. The pillar of artefact development signifies TELIT-SA's dedication to creating tangible tools and resources that enhance students' educational experiences.

The pillar of training and development highlights TELIT-SA's proactive approach to empowering lecturers and students. The research outputs of TELIT-SA hold practical application value for NWU lecturers who incorporate innovative technology into their teaching and learning.

TELIT-SA has made **significant contributions**, including the development and implementation of an Open Educational Resource (OER). This project, led by a TELIT-SA researcher, produced the NWU's first OER, supporting the global drive for access to knowledge through technologies and addressing national equality goals.

Another notable contribution is the development of the board game Liike, a unique educational tool with commercial potential, which was nominated for an international award at the European Conference on Games-Based Learning in Denmark. Additionally, TELIT-SA has produced two Y-rated NRF researchers.

In terms of **international collaborations**, TELIT-SA renewed its Memorandum of Understanding (MoU) with the University of Eastern Finland (UEF) in Joensuu in June 2022. This agreement enables NWU students and staff to enrol and complete a PhD with UEF in technology-enhanced teaching and learning practices and artefact development. Prof Susan McKenny from the University of Twente, Netherlands, serves as an extraordinary professor at TELIT-SA. Her collaboration aids the development of entity members' research skills through her design research workshops, university campus visits, research on technology knowledge transfer, and numerous research outputs.



Director: Prof Liandi van den Berg

Tourism Research in Economics, Environs and Society (TREES)



Director: Prof E Slabbert

Established in 2015, TREES is a multi-disciplinary unit focused on advancing the industry's sustainability and enhancing scholarly insights through tourism research. Its origins trace back to the early 1980s with the formation of the Institute for Leisure Studies.

This entity grew significantly, leading to the establishment of research entities funded by the NRF in the 2000s. This gave rise to the first tourism niche research entity, SEIT (Socio-Economic Impact of Tourism), which was later renamed TREES (Tourism Research in Economics, Environs and Society). In 2015, TREES became an independent research unit, aspiring to be a Centre of Excellence in Tourism Research.

In terms of **core functions**, TREES is dedicated to conducting innovative research on the economic, environmental, and social impacts of tourism that are relevant to society and academia. The unit aims to contribute to the development of the tourism sector through quality research that informs planning, policy, and development. It also focuses on developing skilled researchers who are globally recognised and equipping postgraduate students with the necessary research skills and knowledge to contribute to the field of tourism research and practice. Additionally, TREES actively contributes to academic discourse through conference presentations, publications in top-tier journals, and participation in research projects.

TREES has **achieved significant milestones** in its core functions. It conducts research for the Department of Tourism, directly contributing to the development of South Africa's tourism sector through innovative projects such as the tourism grading system and the development of a resilience model for the country as a tourism destination. TREES boasts nine rated researchers, the highest number in tourism research.

In 2023, two postgraduate students and three staff members won best paper awards at international conferences, showcasing the unit's quality and international standing. TREES members maintain a high presence in the media, providing insights on critical issues related to sector resilience and wildlife tourism dilemmas. The unit's extensive networks with industry and academia have led to numerous projects, keynotes, and other opportunities, while the high quality of their publications contributes significantly to international discourse.

In terms of national and international collaborations, TREES has established **excellent relationships with several national organisations**, including Arts Festivals (Aardklop, Innibos, Suidooster, Woordfees), the National Department of Tourism and CATHSETA (Culture, Arts, Tourism, Hospitality and Sports Sector Education and Authority), wildlife associations such as PHASA (Professional Hunters Association of South Africa) and SuCO, and the West-Coast District Municipality. On an international level, TREES collaborates with the University of Angers (France), Westküste University (Germany), and the University of South-Eastern Norway (Norway).



Director: Prof E Slabbert

Faculty of Education (FEDU)

Joint Report by Deputy Deans

Prof Martha Matashu and Prof Johan Botha
- Acting Deputy Deans: Research and Innovation

FEDU's Research and Innovation landscape is underscored by the NWU Research and Innovation Goals. It focuses on conducting research and innovation with a strategic aim for global impact:

A series of scholarly articles have been published in internationally recognised and prestigious ISI journals by members of the **Education and Human Rights in Diversity Research Unit (Edu-HRight)** (Dr Nicholas Mollo and Profs Charl Wolhuter and Hannes van der Walt) during 2023 on their groundbreaking empirical research in Africa on learner discipline and parental involvement.

Profs Ferdinand Potgieter and Charl Wolhuter engaged in pioneering work on the use of posthumanism as an onto-epistemological lens through which discipline may be studied and retheorised, as well as their work (together with Prof Hannes van der Walt) to research the theoretical linkages between lawlessness, discipline, and morality. Prof Shan Simmonds, a member of the Citizenship sub-area group in Edu-HRight, was one of the guest editors for a special issue on decolonisation and posthumanism.



Prof Johan Botha



Prof Martha Matashu

This special issue appeared in the South African Journal of Higher Education (SAJHE) in 2023 and is titled Posthumanist Curriculum Studies and Post-Schooling: Contemplations from the South. Prof Shan Simmonds has been acknowledged as one of the top three researchers in the humanities and social sciences at the South African Women in Science Awards (SAWiSA) in 2023. This prestigious accolade was awarded for outstanding contributions in advancing science and building knowledge in specific areas of research.

Prof Ferdinand Potgieter was invited (as a visiting professor) by the Pieter Gillis Centre for Philosophy at the University of Antwerp in Belgium in 2022/2023 to work alongside Leni Franken and Peter Loobuyck on the Belgian citizenship education component of LEF (i.e., Afr. Lewens-en wêreldbeskouing, Etiek en Filosofie; Eng. life-and worldview, Ethics and Philosophy). Prof EK Niemczyk, a member of the Comparative International Perspectives sub-area group in Edu-HRight, has established an Erasmus+ mobility grant (postgraduate students and mentors) in alignment with the Higher Education for Sustainable Development project between the University of Ljubljana, Slovenia.

The sub-area group Blended Learning to support Self-Directed Learning in the Research Unit Self-Directed Learning (SDL) has several noteworthy projects and collaborations underway in the realm of education and technology.

One such research project is the GREAT (Games Realising Effective & Affective Transformation) initiative, which involves collaboration with colleagues from various institutions, including the DIPF Leibniz Institute for Research and Information in Education in Germany and the International University of La Rioja (UNIR) in Spain.

Funded by the European Union, this project aims to implement a case study in South Africa, exploring the transformative potential of educational games. An SDL project application was approved by the NRF in the Switzerland/SA (SNSF/NRF) Lead Agency Programme on the affordances of SDL skills and attitudes through machine-based adaptive attention guidance.

The project is under the leadership of Prof Elsa Mentz (NWU) and Prof Per Bergamin from Fernfachhochschule Schweiz (FFHS) (Switzerland). Researchers from three other South African universities also participate in this NWU-led project.

The Language, Literacy, and Literature (L3) Initiative for Empowerment in Communities sub-area group in the Community-based Educational Research Focus Area (COMBER), under the leadership of Prof Carisma Nel, is actively engaged in the British Council Project and has secured funding exceeding a million rand from the Oppenheimer Memorial Trust for the period 2024-2027.

Three FEDU Research Entities are profiled next.

Education and Human Rights in Diversity Research Unit (Edu-HRight)



Director: Prof Johan Botha

The Edu-HRight Unit was established in 2013/2014 under the directorship of Prof CD Roux (2013–2015); Prof JP Rossouw (2015–2018); Prof E de Waal (acting director 2019), and Prof AJ Botha since 2019. The vision of the Unit is to strive to be an internationally recognised leader in socially relevant social justice and human rights-related research, as well as education for South Africa and Africa.

Our mission is to create and sustain a research and education environment grounded in the values of social justice and human rights in diversity. We, the members of Edu-HRight, believe that our community of scholars must be founded on the pursuit of knowledge through research, teaching and learning, and community engagement, with membership acquired based on intellectual merit, ability, and the potential for outstanding, rigorous scholarship. We also believe that differing perspectives, arising from diverse backgrounds and histories that define the identities of our sub-areas, deepen scholarly inquiry and enrich academic debate.

The Unit members treasure academic freedom, creative and innovative thought, ethical standards and integrity, accountability, and unity in diversity, and our staff and postgraduate candidates, who constitute Edu-HRight's core asset. We foster an inquiry-led and evidence-based approach to creating knowledge and academic citizenship, whereby we commit ourselves to harnessing our intellectual abilities in the interest of our nation and humanity.

The Unit members also recognise that in a resource-constrained world where vast disparities remain, Edu-HRight cultivates – on a regular and sustained basis – researchers (established, novice, fellows, and postgraduate candidates) who appreciate the importance of engaging communities, entrepreneurial endeavours, and innovative actions in advancing scholarly knowledge, education, employment, and development in our local contexts.



Director: Prof Johan Botha

Edu-HRight RU's core business focuses on research about human rights and social justice in and for education about:

Bio-Psychosocial Perspectives; Citizenship; Comparative International Perspectives; Discipline; Diverse Contexts; and Legal Perspectives, Governance, and Democracy (six sub-area groupings). The RU's core activities are underpinned by a Community of Practice (CoP) approach that strengthens national and international collaborations and partnerships with institutions such as Vrije Universiteit, Amsterdam, Netherlands; Crete University, Greece; Westminster Law School Research Centre, London; University of Antwerp, Belgium; Catholic University in Leuven, Belgium; and Driestar Educatief (University for Teacher Training) in Gouda, Netherlands. Prof Shan Simmonds, a researcher at Edu-HRight, has been acknowledged as one of the top three researchers in the humanities and social sciences at the recent South African Women in Science Awards (SAWiSA).

Partnerships have been fostered between the NWU and Vrije University (Amsterdam), established through a University Capacity Development Programme mobility grant awarded to Prof Shan Simmonds to visit Vrije University (Amsterdam) in September 2023. Prof EK Niemczyk established an Erasmus+ mobility grant (postgraduate students and mentors) in alignment with the Higher Education for Sustainable Development project between the University of Ljubljana, Slovenia.



Research Unit Self-Directed Learning (SDL)

Director: Prof Elsa Mentz



Director: Prof Elsa Mentz

The journey of the SDL Unit commenced in 2014 under the leadership of Prof Elsa Mentz, progressing from a Research Focus Area to a research unit in 2020. Our vision is to promote self-directed learning (SDL) as a gateway to lifelong learning in all education sectors through excellent research.

We aim to contribute to the advancement of the scholarship of teaching and learning, in South Africa and beyond, through theory building in primary, secondary, and higher education, as well as informal learning. We aspire to enhance SDL abilities and dispositions in all learners and students from diverse contexts.

Distinguished as the only research unit of its kind in Africa, and proudly boasting the largest group of SDL researchers globally, we have established a substantial national and international footprint. This can be attributed to the relevance of our research on SDL as a critical competency for the twenty-first century and essential for navigating the 4IR. The output of our Unit is evidenced by numerous publications in internationally accredited journals and open-access book publications.

Scholars worldwide request to engage with our researchers and their work, which is a testament to the significance and impact of what we do.

Our strength lies in our vibrant community of practice comprising 70 researchers. Through our unique mentorship programme, we are committed to nurturing talent and building capacity, which resulted in two new NRF-rated researchers in 2022 and five new NRF-rated researchers in 2023. In 2023, Prof Dorothy Laubscher, a researcher in SDL, was appointed as the new chairholder of the UNESCO chair on Multimodal Learning and Open Educational Resources. As part of the Unit, the Chair aims to promote an integrated system of research, training, information, and documentation sharing on self-directed multimodal learning and open educational resources.

A further accolade in 2022 includes the Education Association of South Africa Postgraduate Doctoral Medal awarded to two of our PhD students and staff members in the Unit, Dr Anita Lubbe and Dr Marisa Verster. This underscores the calibre of scholarship within our ranks. Through strategic partnerships with esteemed international institutions such as the Swiss Distance University of Applied Sciences and the Universidad Internacional de La Rioja, we have established collaborative research projects and secured Memorandums of Understanding.

The Commonwealth of Learning has enlisted the expertise of the SDL Unit to collaborate in the development of their Massive Open Online Course on SDL, thereby amplifying our impact on a global scale.



Community-based Educational Research (COMBER)

Acting Director: Prof Mariette Koen



Acting Director: Prof Mariette Koen

Prof Lesley Wood assumed the role of Director in the COMBER niche area in June 2018. Since then, COMBER has experienced significant growth in its membership and has solidified its presence as a Focus Area within the Faculty of Education.

The unit aims to foster a nurturing research environment for members specialising in community-based educational research. At COMBER, researchers are viewed as catalysts for social change, aligning their work with educational, political, and emancipatory objectives, which complements NWU's commitment to increased social responsiveness and engagement.

COMBER's central focus is to facilitate learning and development across diverse contexts, from early childhood to adult communities, through research conducted across six strands:

Early Childhood Development in Communities; Environmental Education for Sustainable Development in Communities; Inclusive Education and Support Services in Communities; the Language, Literacy and Literature (L3) Initiative for Empowerment in Communities; Holistic Wellbeing in Communities; and Lifelong Learning and Development in Communities. Researchers in these strands aim not only to theorise but also to implement tangible changes on personal, institutional, and community levels, using community-based research to enhance the social responsibility of higher education.

Under the guidance of the leaders of these strands, COMBER has nurtured future leaders and expanded its international collaborations.

Notable achievements include international collaborations such as the partnership between the ECD strand and CREC UK, along with the appointment of the Early Childhood ETDP SETA chair.

COMBER members frequently share their expertise on various ECD topics through radio platforms, with contributions from distinguished individuals like Dr Wessels, Ms Nkwe, Dr Taylor, and Dr Schoonen.

The L3 initiative is actively engaged in the British Council Project and has secured over a million rand in funding from the Oppenheimer Memorial Trust for the 2024-2027 period. Under Dr Hay's leadership, the EE for Sustainable Development in Communities strand is spearheading an Erasmus+Proposal Application. Additionally, the Inclusive Education strand has published three AOSIS books since 2021, the *Director: Prof Lesley Wood* collaborates with international scholars to advance living educational theory, and the Holistic Wellbeing strand partners with Tampere University for Applied Sciences and the Eduhealth 2.0 project with Sweden.

COMBER's research recognises the complexity of social systems and advocates for change from within communities rather than through external imposition. The unit aims to raise awareness of social complexities and encourage innovative, locally informed solutions. This focus has led to increased project development funding and enhanced leadership capacity within the entity.

COMBER remains dedicated to impactful, community-driven research that fosters both individual and societal growth through education and empowerment.



Faculty of Humanities (FHUM)

Deputy Dean's Report

Prof Mirna Nel - Deputy Dean: Research and Innovation

The integral and key principles guiding the Faculty of Humanities' research and innovation are centred on contributing to the social, economic, and cultural transformation of local, national, and international communities. This is achieved by leveraging the humanities' expertise and knowledge to address the major challenges of the 21st century.

Our research is hosted in nine research entities, including Indigenous Language Media in Africa (ILMA) and Population and Health (P&H) on the Mahikeng campus; Social Transformation, Languages and Literature in the South African Context; Musical Arts in South Africa: Resources and Applications (MASARA); and Visual Narratives and Creative Outputs through Interdisciplinary and Practice-Led Research (ViNCO) on the Potchefstroom Campus; and Understanding and Processing Language in Complex Settings (UPSET), Afrocentric Governance of Public Affairs (AGoPA), and OPTENTIA on the Vanderbijlpark campus.



Prof Mirna Nel

Additionally, the South African Centre for Digital Language Resources (SADiLaR), a national entity supported by the Department of Science and Innovation (DSI), is hosted within the Faculty.

Although the research entities are situated on specific campuses, membership is spread across all three campuses and in many instances membership in one entity are from different schools and even across faculties. An important feature of these research entities is the encouragement of inter- and multidisciplinary input and perspectives during research proposal reviews and project execution.

As all staff members belong to a research entity, more focused and in-depth research is progressively conducted. Mentorship and capacity building are crucial strategies for enabling our higher-degree students and researchers to conduct quality and rigorous research. Consequently, all research entities provide numerous training opportunities, seminars, webinars, and expert lectures throughout the year, utilising both local and international specialists.

This approach significantly increases both the quantity and quality of the faculty's research and creative outputs each year. Additionally, NRF ratings are improving in both numbers and levels. Internationalisation is a priority, and as such, all entities have several international partners, including esteemed extraordinary professors and researchers. Notable highlights include Optentia developing two unique mentorship short courses for mentors and mentees, focusing on building academic careers and thriving in an academic environment.

The faculty is also in the process of establishing a digital humanities centre, which will be only the second of its kind in Africa. Two young researchers have received National Institute of Human and Social Sciences (NIHSS) grants of just over a million rand each. AGoPA has been awarded a R1.2 million grant by the Gauteng Department of Economic Development and Policy to participate in the Gauteng Innovation Observatory Project. *Four of the FHUM Research Entities are profiled next.*



The South African Centre for Digital Language Resources (SADiLaR)



Director: Prof Langa Khumalo



Director: Prof Langa Khumalo

The South African Centre for Digital Language Resources (SADiLaR) was established in 2017 as part of the South African Research Infrastructure Roadmap. The Centre aims to secure a digital future for the country's 12 official languages, in alignment with the Constitution of the Republic of South Africa and the Use of Official Languages Act. SADiLaR's hub is based at the North-West University (NWU), with a network of nodes distributed across various universities and entities throughout South Africa.

The **core functions** of SADiLaR include creating, managing, and distributing digital language resources and relevant software for all South African official languages. This is a key component of its digitisation programme, which lays the groundwork for developing representative technologies and tools such as translation systems.

Additionally, SADiLaR supports computational research and development in the humanities and social sciences through its digital humanities programme. It also plays a crucial role in implementing the New Language Policy Framework for Public Higher Education Institutions, focusing on language policy planning, development, and support.

SADiLaR's **major contributions and achievements** include the completion of a comprehensive language resources audit for the public higher education sector, which was presented at the Vice-Chancellor's Colloquium in December 2024. The Centre has been recognised as a key partner in developing a shared infrastructure in line with the new Language Policy Framework.

Internationally, SADiLaR was accepted as a formal member of the Common Language Resources and Technology Infrastructure (CLARIN ERIC) in December, marking a significant milestone in its quest to establish a world-class research infrastructure. The Centre has also been pivotal in driving and enabling Digital Humanities, hosting over 300 events and conferences that have reached thousands of participants.

In terms of **collaborations and partnerships**, SADiLaR has engaged with a broad range of stakeholders in the human language technology, digital humanities, and language planning sectors. This includes links with the Department of Science and Innovation, the Department of Sports, Arts, and Culture, Universities South Africa, and various higher education institutions and research councils in South Africa. Internationally, SADiLaR is connected with the CLARIN ERIC network, the Alliance of Digital Humanities Organisations, and numerous universities and individuals who contribute to these fields.

Optentia Research Unit



Prof Sebastiaan (Ian) Rothmann

Optentia was established as a faculty-supported focus area in 2011 and was upgraded to an NWU-supported focus area in June 2012. In 2021, it was awarded "research unit" status. The unit operates within the Faculty of Humanities and employs a multidisciplinary approach, incorporating social justice and strengths-based perspectives.

It addresses complex problems across various levels, including individual, familial, generational, organisational, and societal, focusing on transforming precarity into capabilities throughout the life course.

The **core functions** of Optentia involve conducting innovative multidisciplinary research on human potential and capabilities across different levels and domains. The unit translates evidence-based research findings into actionable policy and practice outcomes, contributing to public knowledge production and dissemination. Optentia is also committed to creating enabling environments through capacity building for staff, students, and the public, and it fosters collaborations with national and international partners to enhance the impact and reach of its research. Optentia has **achieved several significant milestones.**

It has produced a substantial body of research that enhances understanding of how individuals and communities can optimise their potential, earning recognition as an international reference point for organisational research and ageing in Africa.

The unit has successfully translated research into practical interventions that have improved well-being and productivity in local communities, schools, and workplaces. Notably, Optentia researchers contributed to the African Union's Strategy and Policy on Ageing (2022), which was endorsed by 53 member states. Additionally, Optentia has developed robust training programmes in research methodology and career development, supporting postgraduate students and researchers in establishing successful careers.

Optentia engages in extensive **National and international collaborations.** It maintains formal partnerships with a range of international universities, including KU Leuven, Utrecht University, Oxford University, Bristol University, Colorado State University, Erasmus University, University of Alberta, Texas Tech University, National Taiwan University of Science and Technology, Tilburg University, and Twente University. The unit also hosts the International Longevity Centre – South Africa in collaboration with the University of Cape Town. Domestically, Optentia collaborates with the National Department of Social Development, the National Department of Health, the Gauteng Premier's Office, the Gauteng Department of Economic Development, and the Department of Public Service and Administration.



Prof Sebastiaan (Ian) Rothmann

Musical Arts in South Africa: Resources and Applications (MASARA)

Director: Prof Chris van Rhyn



Director: Prof Chris van Rhyn

MASARA was established as a Research Niche Area in November 2008 and approved as a research focus area in 2024. Initially, its focus was on selected musical arts of South Africa, specifically concerning Setswana and other local music cultures of the North West Province. Over time, the entity's focus evolved from the conservation and use of indigenous music to encompass Music and Wellbeing, incorporating South African music and musical practices while retaining its initial interests.

This broad research focus is reflected in the entity's various programmes, including Music Education and Instrumental and Vocal Pedagogy, Community Music, Music Theory, Composition and Aural Training, Creative Practice and Artistic Research, Musicology (including African Musics), and Music Psychology. MASARA achieved Focus Area status in 2024.

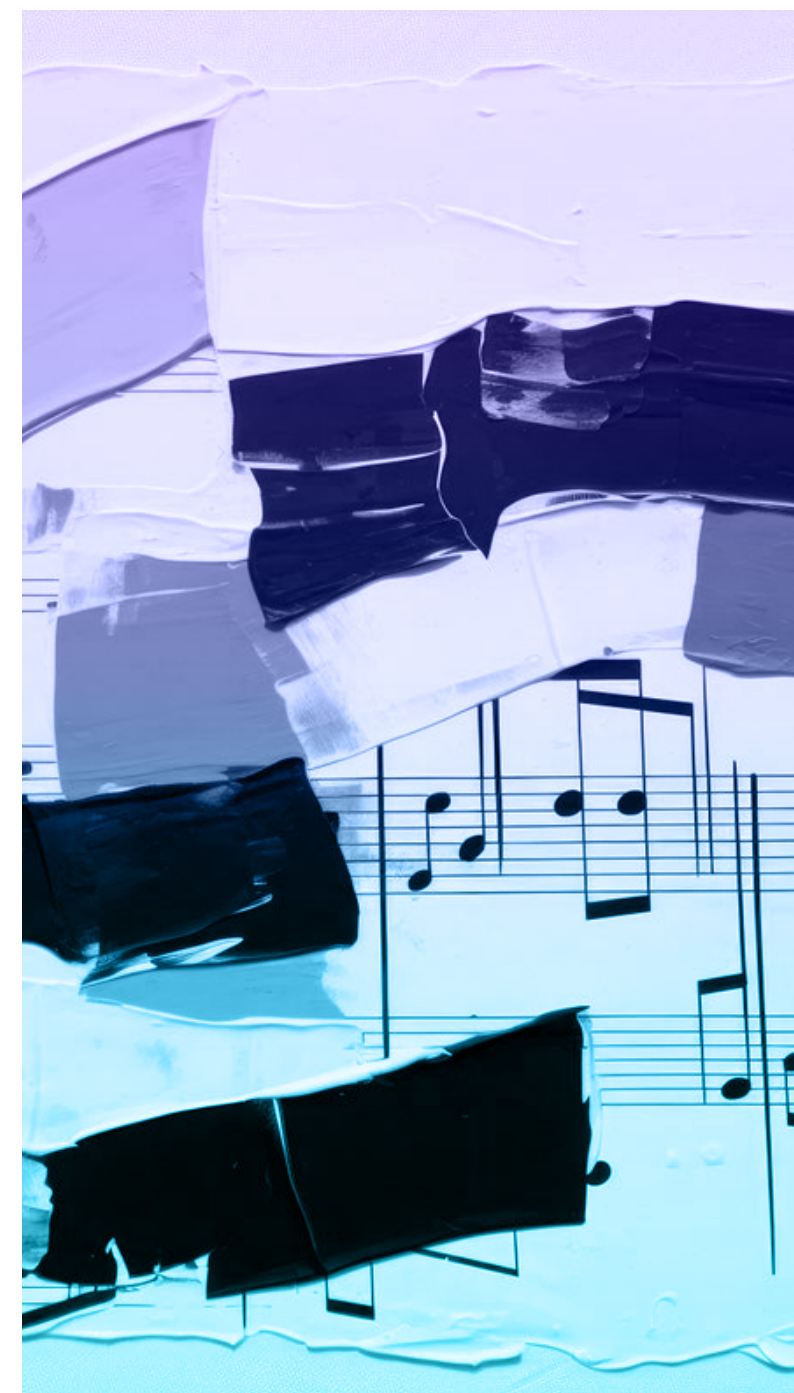
The core functions of MASARA include conducting research and innovation, producing creative outputs such as music performances and compositions, and offering a range of postgraduate programmes. These programmes include the MMus in Musicology (full dissertation), the MMus in Applied Music Studies (a modular degree with Community Music studies), the MMus in Music Performance, and the MMus in Music Composition. At the doctoral level, MASARA offers the PhD in Visual and Performing Arts with Music (full dissertation) and the practice-led or -based Doctor of Music (DMus) degree, which integrates creative work into an artistic research product.

MASARA has made several significant contributions and achievements. Prof Tinus Botha's exceptional performances, including at the World Piano Conference in Serbia, earned him the most DHET-accredited creative outputs at the NWU in 2022 and led to a record deal with Odradek Records. Ms Thembinkosi Magagula, appointed at the NWU in 2023, received acclaim for her role in the opera *Aufstieg und Fall der Stadt Mahagonny* at the Dutch National Opera in Amsterdam.

The MASARA Oral Arts Project (MOAP), initiated by Prof Jaco Kruger, focuses on researching, archiving, and sharing oral art forms from southern Africa, and has made significant strides in areas such as language acquisition, indigenous knowledge, and cultural tourism (see <https://humanities.nwu.ac.za/masara-oral-arts-project>).

Additionally, Prof Liesl van der Merwe and Dr Ewie Erasmus edited a special issue of the *International Journal of Education and the Arts* titled *Positive Psychology and Music Education* in 2023, featuring contributions from eleven MASARA members.

MASARA has developed formal partnerships with institutions such as the University of Malawi's Department of Music and Dance and the Guildhall School of Music and Drama in London. It is also in the process of renewing its cooperation agreement with the Royal Northern College of Music and is negotiating a new agreement with the School of Design at the University of Lincoln in collaboration with the VINCO research entity. The entity's Prof of Practice, Kamal Khan, is a renowned conductor and pianist, while the extraordinary professor, Rev Prof June Boyce-Tillman MBE, is an esteemed academic in Music, Spirituality, and Wellbeing.



Indigenous Language Media in Africa (ILMA)

Director: Prof Abiodun Salawu



The research entity ILMA was officially established in July 2016. Its formation aimed to delve into indigenous language media and traditional communication systems in Africa, examining their nature, content, styles, and organisational management, as well as their applications in democracy, development, and corporate communication. The establishment of ILMA marked a significant step towards understanding and enhancing the role of these media systems in contemporary African contexts.

ILMA's core functions encompass several key areas. The entity is dedicated to providing postgraduate training, supporting the development of new scholars in the field. It also focuses on research and publications, contributing to the academic discourse on indigenous language media and traditional communication systems. Scholarly engagements and community outreach are integral parts of ILMA's mission, promoting the dissemination of knowledge and fostering collaborations with various stakeholders.

The entity has made notable contributions and achievements in its core areas. ILMA stands out as the only research entity of its kind on the continent, establishing itself as a pivotal reference point in the field. Researchers from ILMA are frequently invited to deliver keynote addresses at conferences and to examine theses and dissertations, reflecting the entity's growing influence. The research output has been substantial, with 16 journal articles and 14 book chapters published in 2022, followed by 12 journal articles and 21 book chapters in 2023, along with six edited volumes. Additionally, ILMA has successfully nurtured emerging scholars through its master's and PhD programmes and significantly contributed to the intellectual vibrancy of its Mahikeng campus through a series of seminars and public lectures.

ILMA's national and international collaborations underscore its broad impact. Locally, it partners with the South African National Editors Forum to train journalists and publishers in the indigenous language media sector.

Internationally, ILMA collaborates with the Institute of Cultural Studies at Obafemi Awolowo University in Nigeria and is an active participant in the International Association for Minority Language Media Research. These collaborations enhance ILMA's research capabilities and extend its influence across global platforms. Building on the above achievements, significant scholarly work by Prof Abiodun Salawu has further highlighted ILMA's impact. Among these notable contributions are his two influential book chapters published in 2022.



Director: Prof Abiodun Salawu



The first, Frank Okwu Ugboajah, Oramedia and the Ethical Paradigm of Development, appears in The Handbook of Global Interventions in Communication Theory. This chapter, which was a result of an invitation from the editors based on previous related work, provides a critical contribution to Communication Theory from an African perspective.

The second chapter, Indigenous Languages, African Language Media and Development, featured in the UNESCO publication State of the Art of Indigenous Languages in Research: A Collection of Selected Research Papers, was selected from a competitive call to mark the International Year of Indigenous Languages. It underscores the crucial role of indigenous languages in development communication.

In the same year, Prof Salawu co-edited two seminal volumes on Indigenous African Popular Music with postdoctoral fellow IA Fadipe. Indigenous African Popular Music, Volume 1: Prophets and Philosophers and Indigenous African Popular Music, Volume 2: Social Crusades and the Future, both published by Palgrave Macmillan, are pioneering works on a relatively rare subject. These volumes have set a new benchmark in the study of African popular music and its cultural implications.

In 2023, Prof Salawu, in collaboration with colleagues from the global South, edited two additional significant volumes. Indigenous Language for Social Change Communication in the Global South and Indigenous

Language for Development Communication in the Global South, published by Lexington Books, represent the first comprehensive scholarly projects addressing indigenous language communication beyond Africa. These works cover regions including Africa, Asia, and South America, highlighting the global relevance of the research.

These scholarly achievements not only reflect the profound impact of ILMA's research but also underscore its role in advancing knowledge across diverse fields and regions.

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Faculty of Natural and Agricultural Sciences (FNAS)



Deputy Dean's Report

Prof Francois Van Der Westhuizen - Deputy Dean: Research and Innovation

The FNAS prides itself on its longstanding, dynamic, and diverse research profile. It encompasses 13 research entities across three campuses, covering biological, basic, business, computer and agricultural sciences, as well as an entity dedicated to indigenous knowledge. These entities also include centres focused on applied science, industry and service delivery.

FNAS boasts notable national and international expertise, as evidenced by the rapidly growing number of NRF-rated scientists, who represent approximately 60% of NWU's B-rated scientists and include the sole A-rated scientist at the NWU. This reflects the calibre of scientists within FNAS and its national and international reach.



Prof Francois Van Der Westhuizen

Encouragingly, most of these leading researchers fall within the age bracket of 40–55, and they were duly recognised during the inaugural biennial Research Excellence Awards ceremony in September 2023.

Regarding productivity, FNAS contributed around 30% of the NWU's weighted research outputs in the reporting period, with its publications consistently increasing by an average of 18% annually over the past five years. In this regard, the faculty is achieving its goals and performing above expectations. However, similar to the general trend at the NWU, the improvement of postgraduate studies delivery has remained relatively stable compared to previous years and is being addressed through various initiatives.

FNAS has specific overarching objectives, including the continuous improvement of its article equivalents. There is now a greater emphasis on enhancing and measuring research quality, better aligning resources to address shortcomings across all three campuses, and improving postgraduate student support. With the impending registration of NWU Enterprises in 2024, concerted efforts have been made to identify pilot projects for commercialisation that can be incubated within this new entity.

Looking ahead, strategic developments identified for the coming years, in line with the NWU's strategic plans, include nuclear sciences, water sciences and mining, agriculture and veterinary sciences, radio astronomy and space biology, and cybersecurity.

The Centre for Business Mathematics and Informatics (CBMI)

Director Prof: Helgard Raubenheimer

The CBMI was founded in 1998 as a joint initiative between the NWU and Absa. The vision of CBMI was to become a centre of excellence in risk management, with the mission of conducting professional training and research in financial risk. Over the past two decades, CBMI has successfully established itself as a globally recognised institute for training and research in risk management.

Its focus has since expanded to include financial mathematics, actuarial science, data science, and business analytics.

A significant factor in CBMI's success is its integrated approach, where master's students conduct research projects within the financial industry.

These projects address real-life business problems at banks or other companies and are completed under the joint supervision of a client project officer and an academic supervisor appointed by CBMI. The frequent interaction between academic supervisors, students, and their clients in industry facilitates continuous learning for all parties involved and ensures that CBMI remains at the forefront of developments and needs within the financial sector. This approach also allows CBMI to continually revise its training and research programmes to better meet industry demands.

Throughout its 26 years of operation, CBMI has forged valuable long-term partnerships with major banks, including Absa and FirstRand, as well as with the well-known international technology company SAS. Additionally, CBMI has engaged with several universities, such as Albstadt-Sigmaringen University in Germany, The Economics University in Vietnam, The University of Namibia, and the University of the Western Cape, through Memoranda of Agreement that provide access to its unique course and teaching methods.



Director Prof: Helgard Raubenheimer



The Unit for Environmental Sciences and Management (UESM)

Director: Prof Carlos Bezuidenhout

The UESM was founded in 2008 following the upgrade of the Focus Area of Environmental Sciences and Management to a research unit. It comprises two Schools – Geo and Spatial Sciences, and Biological Sciences – which together include seven subject groups participating in the UESM. Research is organised into ten focused subprogrammes and spans across all 17 UN Sustainable Development Goals (SDGs).

The vision is to be a nationally and internationally recognised scientific research entity in Environmental Sciences and Management in Africa. International partnerships and funding include collaborations with the International Atomic Energy Agency (IAEA), NASA, NORCE (USA), various EU and Canadian funding bodies, and the African Union. Eight permanent and three extraordinary staff members are NRF-B rated, internationally recognised by their peers. Over the past five years, article equivalents have consistently exceeded 2.0, primarily published in Quintile 1 journals.



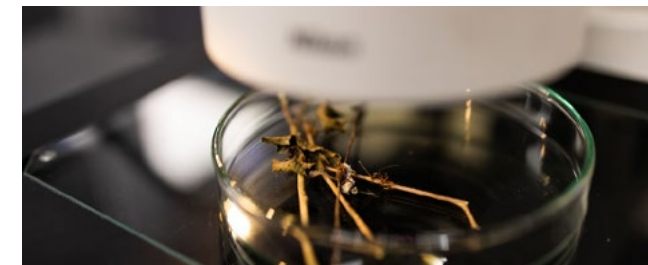
Research within the UESM covers all fields of Environmental Sciences and Management. At least nine researchers have received lifetime awards from national and international academic agencies. Recently, approximately fifteen UESM staff members had newly discovered species named after them, including a new bullfrog species from Namibia – the first in 100 years – and two new plant species from Limpopo discovered in 2023. The Centre also has an extensive list of invertebrate species discovered and described by its staff.



Director: Prof Carlos Bezuidenhout



Researchers in Climate Change, Air Quality, and Disaster Risk Studies are contributing significantly to understanding air pollution, its impact on climate change, and imminent disasters, sharing their findings with South African and SADC agencies. Additionally, the UESM has access to its own RADAR, making it one of the few universities in the Southern Hemisphere with such facilities. State-of-the-art sequencing facilities support its active contribution to the African BioGenome Project. The UESM also hosts several national collections on behalf of SANBI and SAIAB. These contributions have led to a recent academic ranking among the top 1 000 world universities, with Atmospheric Sciences rated in the top 300 and Ecology in the top 500.



In addition to its academic achievements, several staff members are regularly interviewed by various radio and television stations for their expert opinions. The UESM maintains an annual plan for community outreach and engagement, with activities spread throughout the year.



Space Research Centre of Excellence

Director: Prof Amare Abebe



The Centre for Space Research (CSR), although formally reorganised under its current name in 2010, has been in existence since the early 1950s, making it probably the oldest research entity with a long history of research excellence at the NWU.

The mission is to be a world-class research centre with excellent staff, students, post-doctoral fellows, and support personnel, conducting innovative, leading-edge research in specialised fields such as heliospheric physics, gamma-ray astronomy, pulsar astrophysics, stellar astronomy, gravity and cosmology, optical and radio astronomy, and materials modelling for space applications.

Recent key research contributions include providing key theoretical input for a paper published in *Science* (impact factor 47.73) on the H.E.S.S. detection of the Vela pulsar, and lead-author contribution to a paper in *Nature* (impact factor 49.96) on bent jets of a radio galaxy in Abell3376. The Centre has also participated in the first-ever observational evidence of spiral arm structures in accretion discs around forming protostars and has conducted continuous observations of cosmic rays of galactic, heliospheric, and solar origin using a network of neutron monitors.

CSR researchers are involved in multi-national experiments such as the High Energy Stereoscopic System (H.E.S.S.) and Cherenkov Telescope Array (CTA), Voyager, Payload for Antimatter Matter Exploration and Light-nuclei Astrophysics (PAMELA), Fermi Large Area Telescope (LAT), the KM3NeT Neutrino Observatory, and the Square Kilometre Array (SKA) and its pathfinder, MeerKAT.



Director: Prof Amare Abebe

The Centre also maintains decade-long collaborations with NASA theoreticians and local partnerships with the South African Radio Astronomical Observatory (SARAO), the South African Astronomical Observatory (SAAO), and the Centre for High Performance Computing (CHPC).

CSR hosts the South African Gamma-ray Astronomy Programme (SA-GAMMA) consortium, as well as the northern nodes of the National Astrophysics and Space Science Programme (NASSP) and the National Institute for Theoretical and Computational Sciences (NITheCS). It is likely the largest entity of its kind in the country, having reached a critical mass that enables a focus on high-impact research in its field. The Centre is also engaged in community outreach programmes, including the use of the solar telescope in Potchefstroom, the radio and optical telescopes at Nootgedacht, and the optical telescope in Mahikeng.

The Centre for Human Metabolomics (CHM)

Director: Prof Chris Vorster / Dr Ilse du Preez



The CHM was established in 2006 and was restructured in 2012 to form the Research Focus Area for Human Metabolomics and CHM. The purpose of the CHM is to operate as a commercial, third-stream income entity, providing metabolomics services to the broader South African healthcare sector.

Its core offerings include the diagnosis of inborn metabolic disorders and newborn screening. As part of the South African Technology Innovation Agency's initiative to democratise OMICS technology, the CHM was designated to host the National Metabolomics Platform. This partnership led to the expansion of contract research services and the establishment of the first rare disease biobank on the African continent at the CHM.



Dr Ilse du Preez

The acquisition of advanced robotic sample handlers, a custom laboratory information system, and cutting-edge analytical instruments has elevated the laboratory to international standards. The CHM currently analyses samples for approximately 3 500 diagnostic patients, 5 000 newborn screens, 400 functional medicine tests, and 1 600 contract research samples per year, with over 1 000 rare disease patients enrolled in the biobank.

Collaborations with organisations such as DIPLOMICS and Metabolomics SA (MSA) underscore the commitment to advancing national initiatives. Industry partnerships with Takeda, Sanofi, FYMCA Medical, and Pfizer facilitate knowledge transfer to medical practitioners and researchers, while support for patient advocacy is provided through close work with Rare Diseases South Africa.



Director: Prof Chris Vorster

The CHM collaborates with world-renowned experts, including the Mayo Clinic (top-ranked hospital in the USA), Metabolon (global leader in metabolomics services), and UMC Utrecht Metabolism Diagnostic Laboratory in the Netherlands. The staff demonstrates significant leadership, including roles as HPCSA committee members, ISBER Director-at-large for Europe, the Middle East, and Africa, MBirSA Chair, DIPLOMICS coordinator, MSA committee members, and the Director of Nngwe.

The Nngwe Project, a pioneering initiative by DIPLOMICS, addresses the challenges faced by rare disease patients, particularly those with undiagnosed conditions in South Africa and Africa. Although the CHM is a commercial entity, the staff actively engages in academic activities, resulting in numerous research publications, conference presentations, and successful postgraduate student supervisions.



Material Science, Innovation and Modelling (MaSIM)

Director: Prof Ashmore Mawire

The MaSIM research focus area was established in 2012 to become a leading centre for research and development in materials and applications, nanotechnology, renewable energy, mathematical modelling, and general innovation initiatives aimed at addressing societal and industry-related problems on regional, provincial, national, and international levels.

From 2012 to 2020, the strategic aim of MaSIM was to create an enabling environment for achieving the South African government's strategic objectives by supporting long-term research in advanced materials, nanoscience, nanotechnology, renewable energy, and modelling, thereby developing human capital and supporting infrastructure in the North-West province.



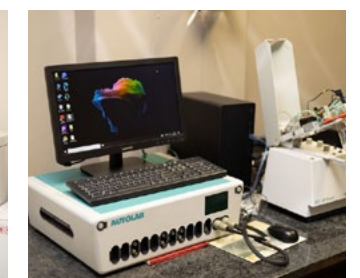
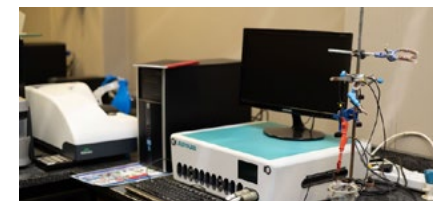
Director: Prof Ashmore Mawire



Since 2021, MaSIM's focus has aligned with several of the UN Sustainable Development Goals aimed at addressing global societal challenges, including water (6), food and hunger (2), poverty (1), energy (7), climate change (13), innovation (9), and health (3). The research scope has broadened to incorporate computational sciences innovation in response to the 4th Industrial Revolution (4IR).

While maintaining the three core research themes of Material Science, Innovation, and Modelling, the research areas now include advanced materials, nanoscience and nanotechnology, renewable energy, general systems modelling, and innovation related to physical, mathematical, and computational sciences.

In recent years, MaSIM has graduated over 40 MSc and 25 PhD students from 2019 to 2023. The entity has produced over 110 accredited high-quality journal articles annually during this period and secured approximately R5 million in funding from internal and external sources between 2019 and 2022. Currently, MaSIM is engaged in over 10 active community engagement projects. Researchers at MaSIM are involved in collaborations with national, regional, and international universities and research organisations, including highly ranked institutions such as the University of Nottingham in the United Kingdom and KU Leuven in Belgium. An external evaluation of MaSIM in February 2024 confirmed its potential to become a leading national research entity.





Faculty of Theology (FTHEO)

Deputy Dean's Report

Prof Ferdi Kruger and Prof Risimati Hobyane

The FTHEO consists of only two research entities which this report is based on. These are the Unit for Reformational Theology and the Development of the South African Society (URT), directed by Prof Ferdi Kruger, and the Focus Area of Ancient Texts (Text, Context and Reception), under the leadership of Prof Risimati Hobyane.



Prof Ferdi Kruger

Working in harmony, the two research entities have made significant strides during 2023. This collective dedication and hard work are a testament to our shared commitment. Together, we published 180 articles and chapters in books and authored six monographs. The FTHEO is proud of the publication of nine monographs during 2022 and 2023, as well as numerous book projects in which researchers have contributed chapters.

The FTHEO has proven productive regarding research equivalents, with 63 postgraduate students graduating between 2022 and 2023. The year 2023 alone saw the graduation of 40 master's and doctoral students, reflecting our commitment to nurturing the next generation of scholars. We have numerous international students and are proud of the students and supervisors who have worked to enhance our throughput rate, which has increased by 18% since 2018.

The URT completed an external review, which was highly encouraging and provided valuable insights for future vision.

The RFA has submitted all required documents for its external evaluation, which will be released later in 2024. The faculty, as a united front, hosted numerous workshops. In March 2024, Profs Theo Pleizier (PTHU) and Kobus Schoeman (UFS) facilitated our M&D workshop, focusing on the grounded theory approach and theological-empirical research within the context of challenges faced by Faculties of Theology both nationally and internationally.

The faculty has recently renewed its MOUs with several esteemed institutions, including the Theologische Universiteit Apeldoorn (TUA), Theological University of Kampen (TUK), Free University of Amsterdam (VU), Evangelische Theologische Fakulteit Leuven (ETF), and the Reformed Theological Seminary (Sarospatak). These partnerships are not merely symbolic; we are actively planning to exchange guest lecturers and collaborate on research projects.

We are also excited about our first grant proposal, which will be submitted to multiple institutions with the support of senior management and marketing experts.



Prof Risimati Hobyane

Ancient Texts: Text, Context, and Reception Focus Area



Prof Risimati Hobyane and Research Entity Members

This research entity was established in 2015 by combining the fields of Ancient Languages and Ancient Cultures, which were previously distributed across the Potchefstroom and Vanderbijlpark campuses. Researchers investigating Latin, Greek, and Semitic languages came together in this process.

The research entity comprises three subprogrammes: Textual Studies, Contextual Studies, and Reception Studies.

Due to capacity constraints, the current Director of RFA, Prof Hobyane, also chairs the three subprogrammes. The research entity operates in a very scarce and highly specialised field. In our strategic plan, we aim to increase and enhance studies in ancient languages in light of developments across faculties of Theology in South Africa. The RFA is grateful to have such a dynamic team with their specialised skills and abilities. The research entity boasts six NRF-rated scholars, including one with a B3 rating.



Prof Risimati Hobyane

The Unit for Reformational Theology and the Development of the South African Society (URT)



Prof Ferdi Kruger and Research Entity Members

The Unit's research activities are distributed among eight subprogrammes: African Spiritualities and Leadership; Bibliological Perspectives; Ecclesiological Perspectives; Ecumenical Perspectives; Missiological Perspectives; Moral Renewal of Society; Practical-Theological Perspectives; Public Practical Theology and Civil Society. The Unit boasts that 40% of its permanent researchers hold NRF ratings, and we are purposefully working to enhance researchers' profiles to achieve two immediate goals: increasing the number of researchers receiving ratings and improving current ratings.

While the Unit is exceptionally proud of being a productive research entity, we are also aware of the challenge of increasing our impact in the academic environment and within South African society. We commend the researchers who have published in accredited journals and engaged in research projects, resulting in collected volumes and book chapters. Over the past two to three years, six monographs have been published annually. The aforementioned subprogrammes are also involved in managing the flow of postgraduate students, aiming to further improve student throughput. Most of our postgraduate students are part-time, balancing their studies with careers as missionaries, ministers and counsellors.



Prof Ferdi Kruger



Faculty of Engineering (FENG)

Faculty Report

Prof Hein Neomagus - Faculty Research Director

The FENG strives to change the world for the better by addressing the current and future challenges faced by our industries and communities through a strong culture of research and innovation.

We are particularly proud of the significant continuation of research and innovation activities carried out by the Centre of Excellence in Carbon-Based Fuels in the field of Just Energy Transition and the DSI National Centre of Competence: HySA Infrastructure CoC, focusing on green hydrogen technologies (electrolytic production, storage, delivery) to support the Hydrogen Society Road Map for South Africa.

This includes related human capital development, securing intellectual property rights for locally developed technologies, and commercialisation.



Prof Hein Neomagus

Our new initiatives are aligned with the NWU Strategy 2024 and beyond, striving for relevance, sustainability, and impact:

Agrisystems aims to solve real-world problems with agri-companies, improving production schedules, facility layouts, and driving innovative advancements in the industry.

Assistive Medical Devices: A team qualified to compete in the international Cybathlon competition in Zurich, Switzerland.

New Research Chair: A new research chair is being conceptualised within the context of the new Centre for Sustainable Mining.

These highlights reflect our commitment to fostering research and innovation that address pressing global and local challenges and pave the way for future advancements.

Additionally, we would like to highlight several noteworthy research and innovation activities:

EMISSION CONTROL GROUP AWARD:

The emission control group received the NWU Excellence in Community Engagement award on behalf of the project team. The award recognised intra-faculty collaborative research efforts to improve the quality of life in low-income communities by reducing household air pollution through low-emission, semi-continuous coal stoves.

HYDROGEN REFUELER TEST:

In collaboration with Toyota, HySA Infrastructure conducted a successful test of their in-house developed hydrogen refueler, filling a Toyota Mirai with hydrogen up to 325 bars. This achievement marks a significant step forward in advancing hydrogen fuelling technology and its application in vehicles.

DEEP LEARNING RESEARCH IN SPACE WEATHER SYSTEMS:

Jacques Beukes from the MUST Deep Learning research group received the VC medal for his research on deep learning in space weather systems. His work demonstrated that models can be made more transparent without compromising performance, marking a significant advancement in the field.

NALEDI 2.0 SOLAR CAR:

NWU's solar car, Naledi 2.0, won the Structural Design Award presented by Euro Steel during the 2022 competition, showcasing our excellence in engineering design and sustainable technology.

NRF SARCHI CHAIR IN COAL RESEARCH:

The chair has been extended for five more years and elevated to the prestigious Tier 1 status.



Hydrogen Infrastructure (HySA Infrastructure): Department of Science and Innovation National Centre of Competence



Director: Prof Dmitri Bessarabov

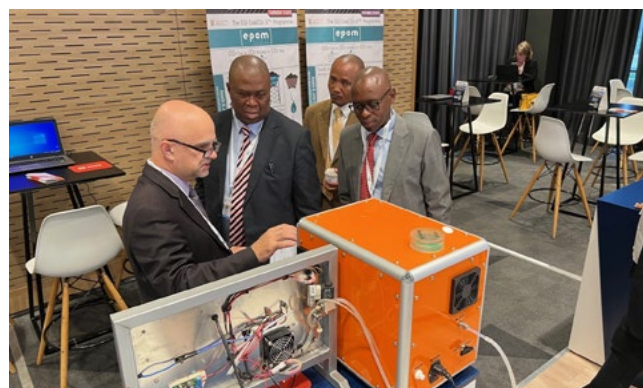
The Department of Science and Technology (now the Department of Science and Innovation) of South Africa developed the National Hydrogen and Fuel Cell Technologies Research, Development and Innovation Strategy in May 2017.

The National Strategy was branded Hydrogen South Africa (HySA). It is a national flagship programme aimed at developing intellectual property, knowledge, human resources, products, components, and processes to support the country's participation in the nascent, yet rapidly developing international platforms in hydrogen technologies and the related value chain.

The HySA Infrastructure Centre of Competence (CoC) at the NWU was formally launched in May 2013 by Minister Derek Hanekom. The CoC is co-hosted by CSIR, with the NWU hosting the headquarters. The HySA Infrastructure CoC at the NWU is mandated by DSI to develop technologies along the value chain of hydrogen production, storage, delivery, and safety, with a focus on water electrolysis and liquid organic carriers for hydrogen storage.



Director: Prof Dmitri Bessarabov



The HySA Infrastructure CoC at the NWU was instrumental in organising the International Conference on Electrolysis (ICE) held at Sun City in August 2023 (www.ICE2023.net). More than 200 delegates from around the world attended the conference.

The HySA Infrastructure CoC was invited to exhibit at Infrastructure South Africa (ISA), which hosted the inaugural South Africa Green Hydrogen Summit (SAGHS) in Cape Town in October 2023. The SAGHS showcased the country's potential as an early-stage, large-scale, low-cost, world-class green hydrogen production hub. The HySA Infrastructure CoC played an integral role in designing the booth and presented various working demonstrators alongside other entities.

The HySA Infrastructure CoC successfully hosted a SATREPS meeting in South Africa for its flagship collaboration project Green Ammonia and Hydrogen with Japan and delivered a progress report. Two students from the NWU visited Japan for training under SATREPS funding (https://www.jst.go.jp/global/english/kadai/r0304_southafrica.html).

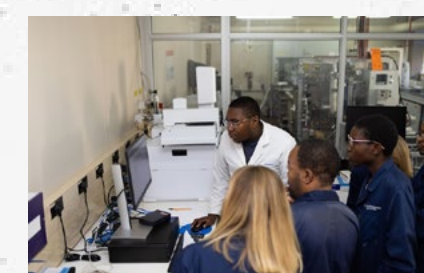
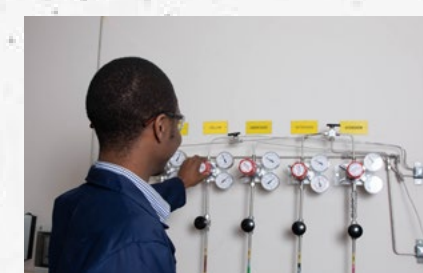
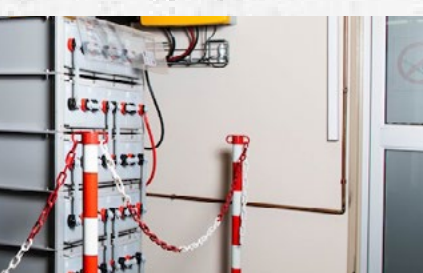
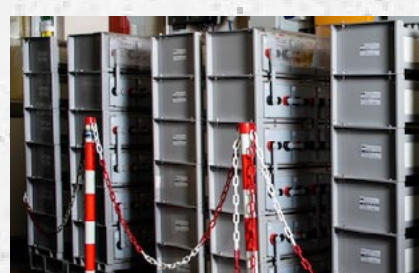
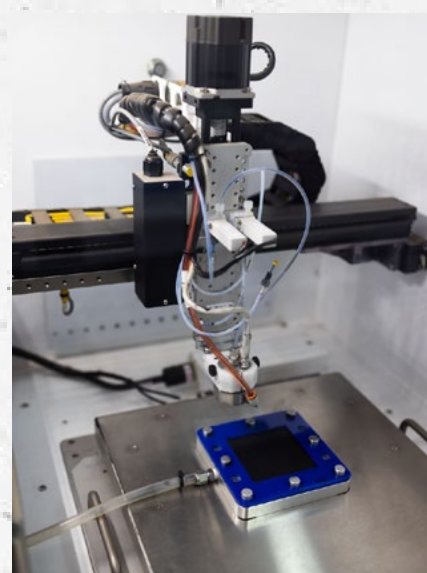
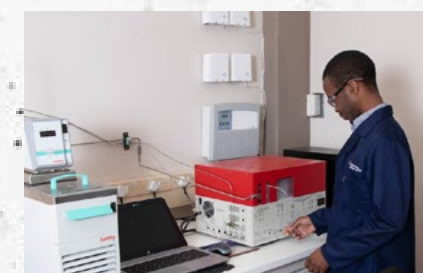
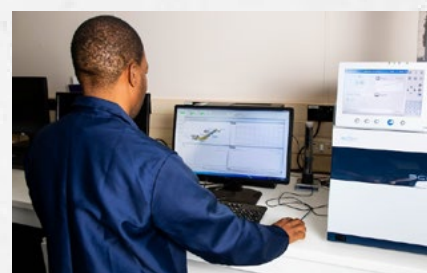
The HySA Infrastructure CoC at the NWU signed a groundbreaking contract with Toyota South Africa to develop a hydrogen refuelling system. In 2023, an EU-funded project to develop innovative hydrogen storage technologies was approved, and HySA CoC at the NWU was invited to participate. Partners include HERAEUS, HYGear, FRAMATOME, the University of Bilbao (Spain), CEA, CNRS-Lyon, and North-West University of South Africa to develop a scalable prototype system at TRL 5 (<https://unlocked.cnrs.fr/>).



Figure 5.3: The HySA Infrastructure Centre of Competence at the NWU



Figure 5.4: LEGEND



The Centre for Carbon-Based Fuels

Director: Prof Hein Neomagus



The Centre of Excellence in Carbon-based Fuels (CoE-CbF) was established in 2018. The CoE-CbF aims to enhance the NWU's position as a leading research institution focused on renewable energy solutions within South Africa's transitioning energy sector.

By developing economically viable, environmentally friendly, and socially acceptable alternatives to conventional coal-dominated energy supply, the Centre contributes to sustainable development and societal impact.



Director: Prof Hein Neomagus

The core functions of the CoE-CbF include conducting advanced research in clean coal technologies and coal waste valorisation, quantifying coal-related emissions and developing emissions abatement technologies, exploring coal, biomass, and plastic waste co-feeding and related product developments, and benefiting critical minerals associated with coal and biomass energy production.

The CoE-CbF has made several major contributions and achievements in its core functions. Firstly, the DST/SARChI Chair in Coal Research has been instrumental in advancing research in clean coal technologies and alternative fuels, recently receiving a Tier 1 status upgrade by the NRF for the next five years. Secondly, significant progress has been made in developing coal and biomass co-feeding technologies, integrating these feedstocks to reduce carbon emissions.

Thirdly, the Centre has successfully implemented advanced techniques to monitor and mitigate emissions from coal power generation, contributing to improved environmental controls. Lastly, the Centre has designed a high-efficiency, low-emissions coal stove, which has been tested in low-income rural communities. The tests demonstrated that these stoves could significantly improve local air quality and enhance the quality of life. As a result, a further rollout of approximately 5 000 stoves is planned for another community.

The CoE-CbF boasts several significant national and international collaborations and partnerships, including inter-university multidisciplinary collaborations with the Climatology Research Group and the Chemical Resource Beneficiation Group. The Centre also collaborates closely with local industrial partners such as Eskom and Sasol.

Further interuniversity collaborations exist with the Vaal University of Technology, the University of Venda (national), and many international institutions, including the Institute of Mechanics of Fluids of Toulouse, Université de Toulouse, IMT Mines Albi (France), Penn State University (USA), University of Queensland (Australia), and Colorado School of Mines (USA).



Faculty of Health Sciences (FHS)

Deputy Dean's Report

Prof Jeanetta Du Plessis - Deputy Dean: Research and Innovation

HEALTH SCIENCES: AN INTEGRATED APPROACH

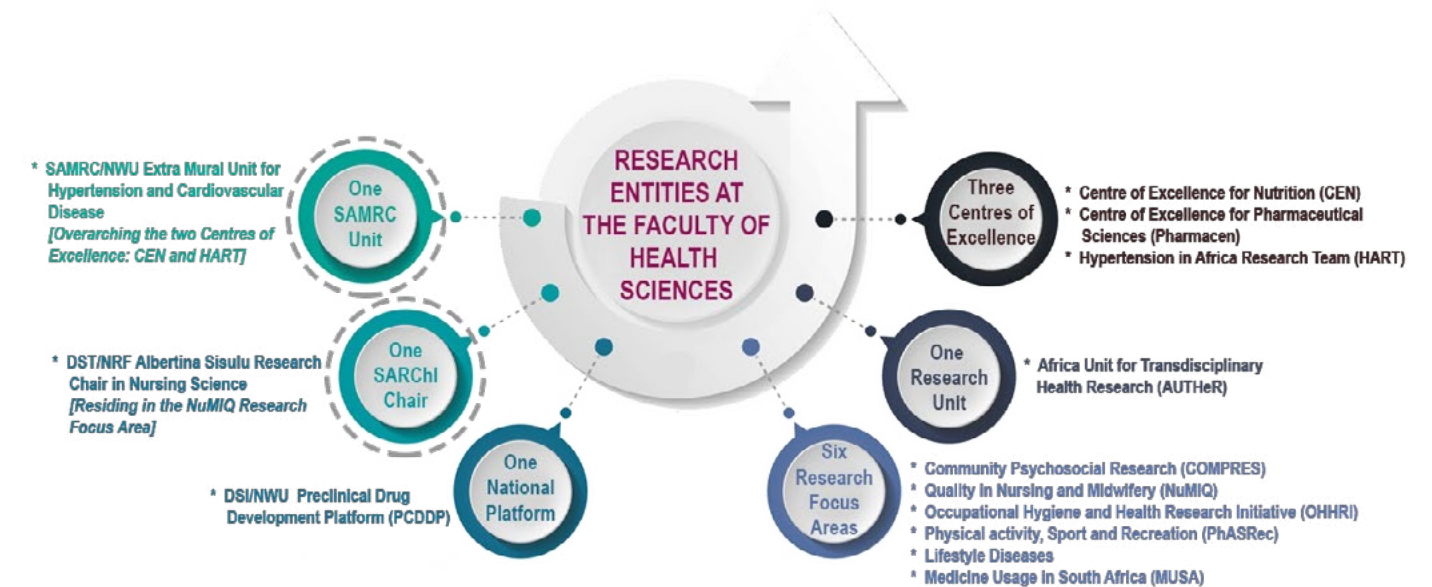
In the FHS, we focus our research on holistic health. *“Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease.”* This statement, from the preamble to the World Health Organisation's constitution, adopted in 1946, remains true today and is practised by our faculty. Holistic health is an approach to wellness that addresses the physical, mental, emotional, social, and even environmental aspects of health.

Our focus encompasses the body, mind, people, culture, and the environment. We have ten research entities, including three centres of excellence, one research unit, and six focus areas. These entities include both humanities research as well as more clinical and natural sciences research - a truly transdisciplinary approach. We are focusing on embracing wellbeing in diverse African contexts. In addition to enhancing context-sensitive theory and practice on the African continent, we also contribute to the global discourse on holistic health.

Our research brings together work from African scholars, featuring studies on theoretical perspectives on wellbeing in Africa, the measurement of wellbeing, its manifestations and dynamics, and the promotion of wellbeing across the continent.



Prof Jeanetta Du Plessis



It emphasises the interconnectedness and situatedness of human functioning and wellbeing, contributing to a more balanced perspective on wellbeing from an international viewpoint. Our studies examine how the characteristics of countries (e.g., policy and economic environment) influence community characteristics (e.g., built environment, nutrition environment, and sociocultural factors) and household factors (e.g., family structure, income, and housing).

These, in turn, affect individual lifestyle behaviours (such as physical activity, diet, and psychosocial behaviour), which are modified by individual attitudes, culture, and awareness of healthy behaviours. Adverse changes in these health behaviours can lead to the development of biological risk factors (e.g., blood pressure, diabetes, obesity) and, ultimately, to cardiovascular diseases.

Basic research in the pharmaceutical domain involves generating new knowledge to establish general principles, such as drug effects and mechanisms, while applied research encompasses the developmental phases of drug products. The application of this knowledge aims to optimise the therapeutic effectiveness of drug products. New therapies for the rational use of medicines can influence current healthcare strategies and policies.

Our research is committed to pursuing knowledge through relevant and high-quality research and innovation, with the goal of delivering new products, novel treatment modalities, and insights across various disciplines of pharmaceutical sciences. This research aims to drive changes in policy and ultimately promote and restore the physical health of individuals, families, communities, and populations

“Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease.”

The Hypertension in Africa Research Team (HART) Centre of Excellence



Director: Prof Carina Mels

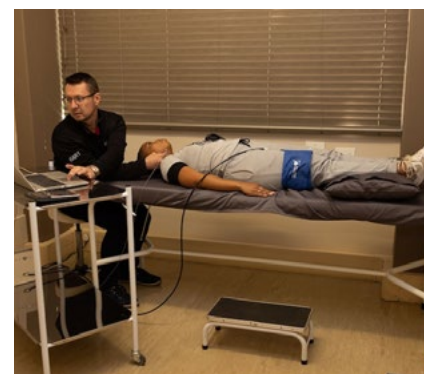
HART was established in 2008 as a niche area, initially consisting of a small group of cardiovascular physiologists. Through the expansion of existing research, the launch of novel research endeavours, the cultivation of existing collaborations, the establishment of new ones, and the continuous improvement of our facilities and infrastructure, HART steadily progressed and achieved NWU Centre of Excellence status in 2017.

We aspire to gain national and international recognition by fostering research excellence across the spectrum of generating, translating, and implementing scientific knowledge to influence preventive and treatment strategies for hypertension through community and stakeholder engagement.

Distinguished as the sole unit in South Africa with a robust emphasis on preventive cardiovascular research, HART adopts a life course approach to comprehensively grasp the origins and progression of hypertension and cardiovascular disease within the South African context. Anchored by our core themes of Discovery Science, Translational and Implementation Science, and Epidemiology and Preventive Science, we aim to follow a bench-to-bedside approach, aligning with national priorities while also contributing globally to reduce non-communicable diseases (NCDs) through prevention, treatment, and promotion of wellbeing.



Director: Prof Carina Mels



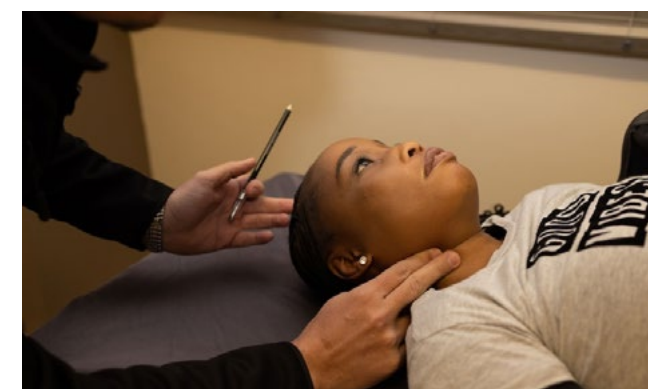
In Epidemiology and Preventive Science, our contributions include insights from the ExAMIN Youth SA study, conducted in collaboration with Prof Henner Hanssen from the University of Basel, which revealed alarmingly high rates of overweight/obesity and elevated blood pressure among youth.

In response, we initiated the Captain Heart initiative, focusing on hypertension education and healthy lifestyle promotion among children. Concurrently, we launched a nationwide blood pressure screening project to establish normative values.

Within Translational and Implementation Science, we recognised the pivotal role of social determinants of health and the need for tailored hypertension management in low- and middle-income countries. This led to the inception of a multi-component, community-based approach to hypertension management in South Africa, aimed at improving contextualised hypertension management within local communities, in collaboration with experts from the Julius Centre & University Medical Centre Utrecht.

In Discovery Science, our partnership with Prof Christian Delles at the University of Glasgow facilitated groundbreaking research in identifying novel cardiovascular risk biomarkers using cutting-edge methodologies such as 'omics'. This paves the way for further experimental research to identify precise intervention targets.

HART is committed to furthering its impact through strategic partnerships, innovative research, and community engagement. We invite collaboration and support to advance our mission of mitigating the burden of hypertension and cardiovascular diseases in Africa and beyond.





The Centre of Excellence for Pharmaceutical Sciences (Pharmacem™)

Director: Prof Lesetja Legoabe

Pharmacem, established as a Focus Area in 1999, was elevated to a research unit in 2006 and then to a Centre of Excellence in 2012. Over the years, Pharmacem has consistently strived for excellence in research, pushing the boundaries of knowledge in pharmaceutical sciences.

PHARMACEM IS ORGANISED INTO THREE INTERCONNECTED SUBPROGRAMMES:

1. Drug Delivery (Pharmaceutics):

This includes Solid-state Pharmaceutical Innovation and Nanotechnology (SPIN), Cosmeceutical Research (CR), and Biopharmaceutics and Drug Delivery Systems (BDDS) subprogrammes, which focus on advancing drug delivery technologies and systems.

2. Drug Discovery (Pharmaceutical Chemistry):

This subprogramme is dedicated to the design, synthesis, and characterisation of chemical compounds with potential therapeutic value.

3. Translational Neuroscience and Neurotherapeutics (Pharmacology):

This area involves pre-clinical and translational experimental work in behavioural neuroscience and pharmacology.



Director: Prof Lesetja Legoabe



Pharmacem contributes significantly to the South African pharmaceutical research sector by offering postgraduate training at both PhD and MSc levels, thereby building capacity in the field. The Centre has published over 40 articles in quartile 1 journals on various globally relevant topics, including antiparasitic, antibacterial, and antitubercular agents. Internationally, Pharmacem collaborates with leading experts to co-publish research, enhancing its global reach.

A notable achievement includes Prof Chrisna Gouws leading the largest cluster of ClinoStar units on the continent (the second largest globally), used specifically for culturing mini-tumour models in cancer research. Additionally, Pharmacem successfully hosted the second Society for Advanced Cell Culture Modelling for Africa Conference from 9 to 11 October 2023 in Potchefstroom.

INTERNATIONAL COLLABORATIONS INCLUDE:

Prof Caffrey Conor from the University of California, San Diego, United States

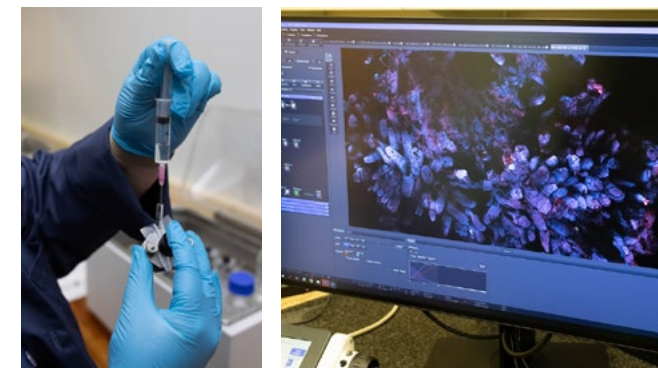
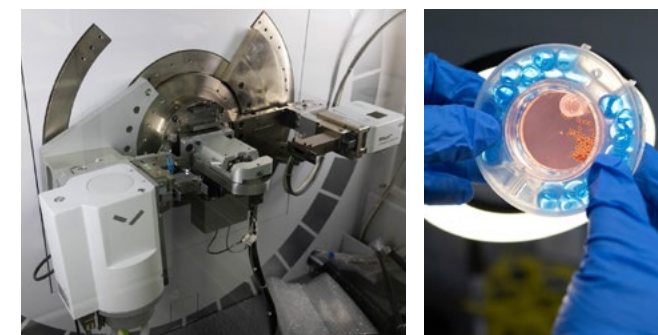
Prof Guy Caljion from the University of Antwerp, Belgium

Prof Joseph Stone Dogett from Oregon Health and Science University, United States

Prof Ken Walder and Prof Michael Berg from Deakin University, Australia

CelVivo ApS (3D drive unit supplier in Denmark), serving as an official training site and collaborator

Pharmacem remains committed to advancing pharmaceutical research through excellence, international collaboration, and impactful contributions to the field.





The Centre of Excellence for Nutrition [CEN]

Director: Prof Marius Smuts

The Centre for Nutrition (CEN) was established in January 2009, with Prof HH Vorster serving as its first Director. Since its inception, CEN has emerged as a leading nutrition research institute in South Africa and has gained international recognition. The Centre's mission is to provide evidence-based solutions to nutritional problems to improve the nutritional status of individuals, households, communities and populations. Additionally, CEN supports this mission through leadership development programmes.

CEN's core focus is shaped by the prevailing nutritional issues in South Africa, Africa, and globally, operating under the overarching research theme of Nutrition for Health and Development.



Director: Prof Marius Smuts



The Centre employs a research approach termed from molecules to society, which enables the exploration of underlying molecular mechanisms and their translation into public health outcomes.

Research at CEN is structured within four sub-programmes, as outlined below, with each addressing specific nutritional problems from molecular to societal levels, integrating epidemiological, clinical, and mechanistic studies.			
Non-communicable Disease Sub-programme:	Nutrition in Early Childhood Development Sub-programme:	Leading Change in Nutrition Sub-programme:	Therapeutic Nutrition Sub-programme:
This programme contributes to developing African-specific guidelines addressing lifestyle, genetic, and environmental factors to counter the rising incidence of non-communicable diseases (NCDs) in Africa.	Focuses on improving early childhood development and achieving optimal health during the "First 1000 Days" of life, with particular attention to the role of nutrition in brain development and immune system functioning.	Aims to develop leaders capable of driving the transformational change needed to address malnutrition in all its forms across the African continent.	Advances medical nutrition therapy by investigating the impact of immunonutrition on inflammation and conducting research on premature infants and severe acute malnutrition (SAM) across multiple African countries.

CEN is engaged in various notable national and international collaborations and partnerships, including:

- The International Food Policy Research Institute (IFPRI)
- The USAID Advancing Nutrition programme
- The Bill and Melinda Gates Foundation, which assists in developing leadership capabilities among nutritionists in Nigeria
- The Supporting Nutrition Research and Education in Africa (SuNREA) initiative, aimed at establishing and strengthening nutrition research capacity in Africa
- The Atomic Energy Agency (IAEA) project titled Building Capacity to Use Stable Isotope Techniques to Improve Micronutrient Status Among Children
- Wageningen University & Research (Netherlands), for collaborative and joint research projects
- ETH Zurich (Switzerland), for collaborative research efforts
- The University of Ghana, involved in joint research projects, staff exchanges, and capacity-building
- The Improving Early Nutrition and Health in South Africa (ImpENSA) project, a multi-country initiative co-funded by the Erasmus+ Programme of the European Union

CEN continues to advance its impact through strategic collaborations and innovative research, addressing critical nutritional issues and contributing to global health improvements.

The Quality in Nursing and Midwifery (NuMIQ)

Director: Prof Welma Lubbe



NuMIQ, established on 1 January 2013 and operational from 1 April 2013, is dedicated to enhancing the quality of nursing and midwifery services. Its overarching purpose is to leverage research evidence to improve patient and nurse outcomes while influencing healthcare policy at both local and national levels.

The core functions of NuMIQ include education and training for postgraduate students and healthcare professionals, conducting high-quality and relevant research, fostering career and capacity development among its researchers, and engaging with communities in socially responsive ways.

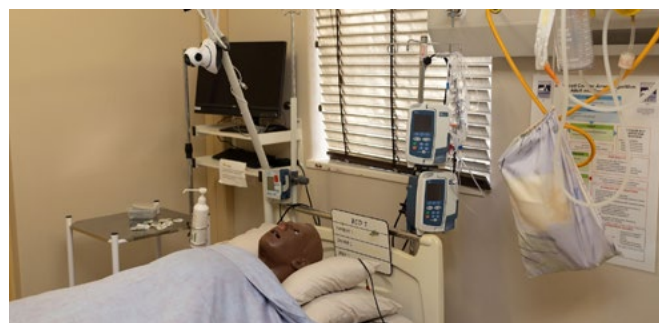
Over the years, NuMIQ has made significant contributions through its core functions. Prof Siedine Coetzee holds the NRF (SARChI) Albertina Sisulu Chair in Nursing Science, hosting the SANOPYs research programme aimed at improving various outcomes in nursing.

The entity also hosts four NRF-rated scientists:

Prof Siedine Coetzee (C2), Prof Tinda Rabie (C2), Prof Emmerentia du Plessis (C2), and Prof Welma Lubbe (C1). Between 2018 and 2022, NuMIQ experienced notable annual growth of 41.6% in its local and international research outputs, with a threefold increase in article equivalence. In 2022, the entity introduced a pre-doctoral workshop series, now a registered Short Learning Programme available to all students within the Faculty of Health Sciences.



Director: Prof Welma Lubbe



NuMIQ has established significant collaborations and partnerships at both national and international levels. These include working with the NRF SARChI on the Ubuntu Community Model of Nursing, collaborating with Prof Mavis Mulaudzi from the University of Pretoria, and forming memoranda of understanding (MOUs) with international institutions such as Tampere University of Applied Sciences and Turku University in Finland for research projects and staff exchange programmes.

Additionally, in 2018, NuMIQ co-hosted a public lecture with the Optentia research unit, featuring international speaker Prof Andries Baart from the University of Utrecht in the Netherlands.



Community Psychosocial Research (COMPRES)

Director: Prof Retha Bloem



COMPRES, home to 47 researchers, is dedicated to fostering positive change in South Africa’s psycho-social landscape. With 250 postgraduate students enrolled across nine different programmes, COMPRES integrates research with professional training in clinical and counselling psychology, forensic practice, and child protection social work.

The Focus area maintains constructive partnerships with statutory bodies such as the South African Council for Social Service Professionals (SACSSP) and the Health Professions Council of South Africa (HPCSA). It is uniquely positioned as the only South African university offering master’s degrees in forensic practice and child protection training.

Through collaboration with government agencies, NGOs, and NPOs, COMPRES engages in research projects aligned with South Africa’s national development plan, as well as international agendas such as the Sustainable Development Goals (SDGs) and WHO initiatives.



Director: Prof Retha Bloem

Despite the challenges inherent in the social services sector, COMPRES remains committed to engaged research that benefits the most disadvantaged and marginalised communities. Research initiatives include mentorship programmes in Gauteng to empower disadvantaged youth, life skills workshops in the Eastern Cape to foster resilience among adolescents, and health promotion research in the Western Cape focusing on child protection, sexual abuse prevention, and mental health awareness.

COMPRES also conducts community-based research, including environmental health studies in Mpumalanga and culturally sensitive mental health services in Limpopo. Advocacy efforts in the Northern Cape aim to enhance paternal involvement in farming communities, while collaborations with legal processes address high-conflict families affected by Parental Alienation Syndrome.

The Focus area’s commitment extends to capacity-building and skills development, offering training workshops in conflict resolution and support programmes for children in homes with chronically ill family members. COMPRES is also active in crisis response and disaster relief, establishing community resilience programmes and disaster preparedness training based on evidence-based scientific research.

NOTABLE RESEARCH HIGHLIGHTS INCLUDE:

- the establishment of the Global Footprint initiative, enhancing international collaboration and mobility;
- the creation of a simulation lab, marking a significant advancement in research innovation in African psychology;
- a notable increase in research output quality, with a focus on articles published in high-impact international journals; and
- the development of a children’s laboratory and a psychometric lab, underscoring COMPRES’ commitment to advancing research methodologies.

COMPRES’ publication output has steadily increased, with a focus on international journals. The Focus area’s leadership is recognised by statutory bodies, contributing to the profession’s development. Looking ahead, COMPRES aims to achieve financial sustainability and further improve research output, postgraduate graduation rates, and mentorship programmes.

In conclusion, COMPRES exemplifies a commitment to research excellence and community engagement, aligning with global research priorities and fostering both national and international collaborations.

National collaborators	International collaborators
South African Council for Social Service Professions (SACSSP)	Universities and research institutions in Europe (e.g., Belgium, Netherlands, Germany, UK)
Health Professions Council of South Africa (HPCSA)	Universities and research institutions in Sub-Saharan Africa (e.g., Ethiopia, Nigeria)
Government agencies across various sectors (e.g., Department of Health, Department of Social Development)	Universities and research institutions in the United Arab Emirates (UAE)
Non-governmental organisations (NGOs) in psychology, social work, and community development	Universities and research institutions in New Zealand
Non-profit organisations (NPOs) involved in social justice advocacy and community empowerment	International non-profit organisations (INGOs) specialising in global health and development
Community-based organisations (CBOs) representing diverse South African communities	International funding agencies supporting research and capacity-building initiatives
Local universities and research institutions engaged in collaborative research projects	Intergovernmental organisations (IGOs) such as the World Health Organization (WHO)
Legal aid organisations and advocacy groups focusing on human rights and social justice	International professional associations and networks in psychology and social work
Community health centres and clinics serving underserved populations	International conferences and symposiums fostering collaboration and knowledge exchange
Vocational training centres and skills development programmes for youth and unemployed individuals	Global initiatives and partnerships addressing social justice, human rights, and public health challenges

Physical Activity, Sport and Recreation (PhASRec)

Director: Prof Andries Monyeki



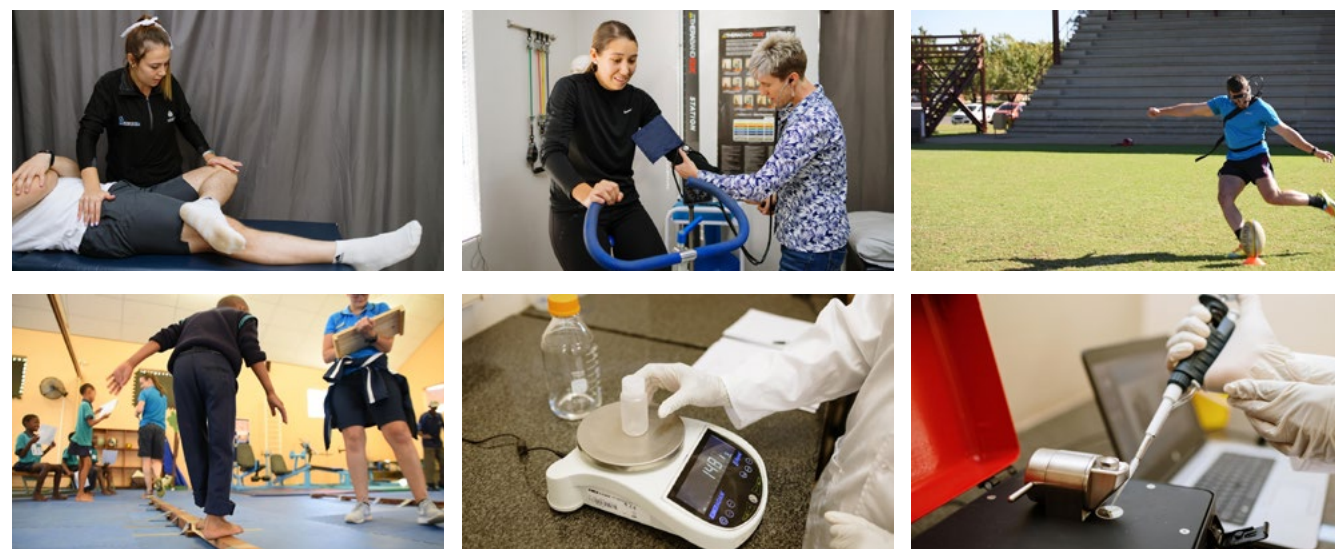
PhASRec began as a niche area in 2009, following the restructuring of the African Unit for Transdisciplinary Health Research (AUTHER) (Focus Area 9) within the Faculty of Health Sciences. The entity achieved Focus Area status after a review in 2010.

PhASRec is distinguished by its focus on researching human movement, specifically physical activity, sport, and recreation, to optimise individual performance throughout life. This includes motor development, health promotion, and disease prevention. PhASRec offers training and capacity-building through postgraduate programmes at the master's and PhD levels.

The research outcomes are applied to the teaching and learning of human movement specialists, including biokineticists, kinderkineticists, sports scientists, and managers of recreational programmes. Additionally, PhASRec contributes to understanding the importance of physical activity for overall wellbeing. It is recognised as the second leading research entity in South Africa, following the University of Cape Town.

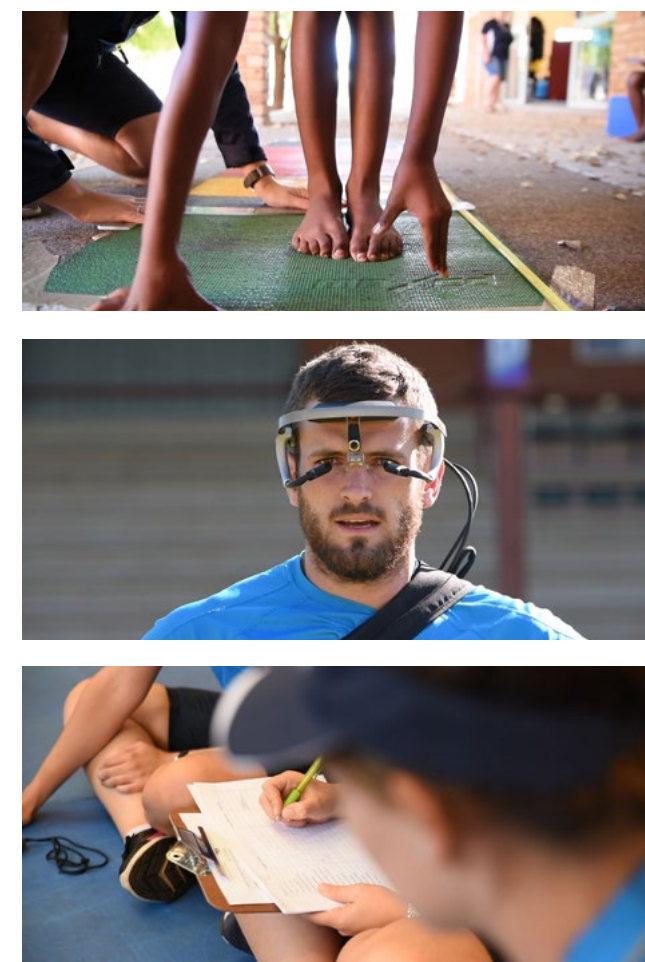


Director: Prof Andries Monyeki



PhASRec experts collaborate with national government departments and various universities to advance scientific knowledge. Their involvement includes developing the South African Healthy Kids (HAKSA) Report Card, the National Department of Health's strategy for preventing obesity, the National Sport and Recreation Plan (NSRP), and a national project on body composition (obesity and malnutrition) using nuclear techniques with the Department of Mineral and Energy. Internationally, PhASRec contributes to the UN Sustainable Development Goal 3 – Improving Health and Wellbeing – and aligns with the World Health Organisation's strategic goals.

The Focus area also partners with the International Atomic Energy Agency (IAEA) on national projects involving stable isotope nuclear technology for health sciences, particularly body composition. PhASRec participates in the Erasmus+ mobility exchange programme in collaboration with the University of Zagreb, focusing on EU education, training, youth, and sports programmes. Additionally, it maintains partnerships with universities such as the University of Strathclyde, the University of London, and the University of Southern Queensland in Australia.



Faculty of Law (FLAW)

Deputy Dean's Report

Prof Mitzi Wiese - Faculty Research Director

The FLAW Research Report is based on the Faculty Research Unit (RU) of Law, Justice, and Sustainability, which evolved from a pre-merger focus area, Development in the South African Constitutional State.



Prof Mitzi Wiese

Over time, this focus area transitioned into a research unit. After an external evaluation in 2013, the RU underwent a pivotal rebranding, adopting the name Law, Justice, and Sustainability, aligning its identity with its evolving research agenda and streamlining its projects. All faculty members became part of the RU.

In 2018, the NRF SARChI Chair Cities, Law and Environmental Sustainability (CLES) was incorporated into the RU, enriching its research endeavours and enhancing its stature.

The RU conducts interdisciplinary research at the intersection of law, justice, and sustainability, exploring juridical science and sustainability issues in social, environmental, and economic contexts. Aligned with the NDP and SDGs, it addresses developmental and legal challenges, seeking innovative solutions for advancing justice and sustainability.

In 2018, CLES was established as one of the NRF's SARChI Initiative research chairs. Based on its outputs and achievements, it was renewed for another five-year cycle in 2023. It was also upgraded from a Tier 2 to a Tier 1 Chair, signifying its substantial impact and contribution to the field both nationally and internationally.

Profs Chitimira, Soyapi, and Viljoen received NRF ratings in 2022/2023. Profs Fuo and Soyapi were awarded the prestigious Von Humboldt: Georg Forster Research Fellowship (2023–2024). This fellowship enhances international collaboration, enriching the unit's global engagement and scholarly pursuits and aligning with the NWU Internationalisation Strategy. The NRF-NWO-funded WEF Nexus Project was established in 2020. Prof Willemien du Plessis is the chief investigator, supported by Prof Viljoen. The project delves into the intricate interplay of water, energy, and food systems.

Through fieldwork and workshops (2022/2023), the researchers addressed sustainability challenges in the Eastern and Northern Cape regions, showcasing the RU's proactive approach to addressing real-world issues.

The NWU FLAW journal, PER/PELJ, has witnessed substantial growth and influence in 2022/2023, reflected by its rising impact factor and Scimago h-index. This prominence solidifies its position as a leading platform in legal scholarship, both nationally and internationally. The RU collaborates internationally with esteemed universities in Europe, Africa, and India, and domestically with organisations such as the Black Lawyers Association, SA Company's Tribunal, and Northwest Provincial Legislature. These partnerships highlight the RU's dedication to interdisciplinary research, transcending geographical and disciplinary boundaries.

The background of the image is a dark stage. Several bright blue spotlights shine down from the top, creating a dramatic atmosphere. The floor is a dark grid pattern that recedes into the distance. In the center of the stage, there is a bright, glowing area where the spotlights converge.

006

UNDER THE SPOTLIGHT



UNESCO Chair on Multimodal Learning and Open Educational Resources, Faculty of Education

Prof Dorothy Loubser



Prof Dorothy Loubser

- UNESCO Chair on Multimodal Learning and Open Educational Resources since 2023
- Research fellow of the UNESCO Chair for Personalised and Adaptive Distance Education, Switzerland (2018)

The UNESCO Chair on Multimodal Learning and Open Educational Resources (OER), housed within the Self-Directed Learning (SDL) research entity, has advanced several initiatives in 2022 and 2023, demonstrating significant progress in open education.

The Digital Humanities OER Champions initiative in 2022 was a vital capacity-building effort within South African universities, aimed at equipping scholars with the tools and resources necessary for embracing open educational practices. Similarly, the NWU OER Fellowship Programme was launched to support scholars actively engaged in OER development and utilisation at the NWU, fostering a network of OER advocates and supporting ongoing and new research endeavours. The project culminated in the publication of an AOSIS book, consolidating the experiences of OER practitioners.

Throughout 2022 and 2023, the Chair participated in various impactful projects, workshops, and presentations, enhancing its influence within the academic community. Notably, during Open Education Week 2022, the Chair hosted a colloquium where esteemed researchers in open education from the NWU and Notre Dame University, Lebanon, convened to exchange insights and promote interdisciplinary dialogue.

Additionally, a pivotal webinar titled OER for Microlearning was arranged in the Kingdom of Saudi Arabia as part of Open Education Week, featuring presentations by distinguished academics.



Presentations at the 2023 Open Access Week at the NWU on Renewable Assessment as an Open Educational Resource and a workshop on Establishing an OER Fellowship Programme at Higher Education Institutions within the Siyaphumelela network further solidified the Chair's leadership in open education.

Partnerships with other UNESCO Chairs nationally and internationally, such as the UNESCO Chair on eLearning in Spain, UNESCO Chair in Teacher Education for Diversity and Development in South Africa, UNESCO Chair in Open Education and Social Justice in South Africa, and UNESCO Chair on Personalised and Adaptive Distance Education in Switzerland, facilitate knowledge exchange and collaborative research efforts. Academic publications arising from these partnerships are a testament to the Chair's commitment to advancing discourse on self-directed multimodal learning and OER.



Empowering Transitions: A Journey from Research to Impact

Dr Marietha Malan - Member of
COMBER, Faculty of Education

When I embarked on my journey towards obtaining a PhD in 2019, my primary goal was to effect meaningful change through my research. I deliberately chose a topic close to my heart; one that directly reflected my passion as both a mother of a child with special needs and a dedicated teacher: promoting family-school-community partnerships to foster learner-centred transitions into adult life for youth with severe intellectual disabilities. After completing my doctoral studies in 2022, I took proactive steps to disseminate my research findings. This included arranging presentations at the Department of Basic Education (DBE) Head Office-Inclusion and Special Needs, as well as participating in a radio interview to further share insights from my work.

“I deliberately chose a topic close to my heart; one that directly reflected my passion as both a mother of a child with special needs and a dedicated teacher: promoting family-school-community partnerships to foster learner-centred transitions into adult life for youth with severe intellectual disabilities.”

At my school, where my principal was an integral part of my Participatory Action Learning and Action Research (PALAR) team, I was entrusted with the responsibility of managing the school's exit plans. Currently, I am engaged in teaching transition-related life skills to students aged 16 to 18. For those learners nearing the end of their schooling journey, I begin by administering a career interest questionnaire that I developed during my doctoral studies to identify their strengths and interests. Subsequently, I establish robust partnerships with parents and caregivers, conducting individual interviews with each and arranging regular parent support meetings.

To facilitate practical experience, I arrange placements for students in workplaces near their homes, providing them with the necessary support from job coaches whom I recruit and train. Over time, I have forged partnerships with various centres and small businesses to expand opportunities for our learners.

Recently, we organised the Career Expo with a Difference, where all exhibitors offered opportunities specifically tailored for young people with severe intellectual disabilities. The event drew participants from approximately 40 schools, and the enthusiasm for discovering meaningful opportunities for our learners was palpable.

The above findings suggest that my efforts are making a tangible difference in the lives of learners with severe intellectual disabilities, providing them with the support, opportunities, and resources they need to succeed in the workforce and beyond.



Involvement at a community centre, where we got the army to rescue their vegetable garden for Mandela Day

Second Runner-up at South African Women in Science Awards in 2023

Prof Shan Simmonds - Member of Edu-HRight, Faculty of Education



Prof Shan Simmonds

- NRF Y-rated

- Recipient of Women in Science Award 2023 & second runner-up in the Distinguished Young Woman Researchers Humanities and Social Sciences category

- Editor for the DHET accredited journal, Transformation in Higher Education

- Vice-President for the South African Education Research association (SAERA)

- South African representative of the Women in Higher Education Management (WHEM) network

Prof Shan joined the NWU as a lecturer in 2011 and, in 2013, completed her PhD jointly between the NWU, Stellenbosch University and the Vrije University of Amsterdam, as part of the South Africa Vrije University Strategic Alliance international scholarship. ***She specialises in curriculum studies and is a sub-leader of the Edu-HRight Unit. As a young aspiring science researcher, she is one of the top three researchers in the faculty. Her notable achievements include:***

- Recognition by the South African Women in Sciences (SAWiSA): Hosted by the Department of Science and Technology, she was recognised for her excellent scholarly activism. She was nominated as the second runner-up in the young researchers under forty category and received the South African Distinguished Young Women Science Award for her outstanding contributions in advancing science and building knowledge in specific research areas. ***Read more here:*** <https://news.nwu.ac.za/young-researcher-shines-south-african-women-science-awards>
- She is the editor and one of the founding members of the accredited journal Transformation in Higher Education, which is listed on indexes such as Scopus, ProQuest, ERIC, EBSCO Host, and DOAJ.
- She received a grant funded by the Swedish Research Council (Vetenskapsrådet) as well as the Research Capacity Initiative (RCI) SANPAD (South Africa-Netherlands Research Programme on Alternatives in Development) Bursary.
- As a representative of the South African Representative for Women in Higher Education Management (WHEM) Network, she is part of an international feminist research consortium. She and her WHEM colleagues convened Stream 10 of the 2023 Gender, Work, and Organisation international conference. They also have a book publication project in progress.
- She serves on the executive committee of the International Association for the Advancement of Curriculum Studies (IAACS).
- Prof Shan has held various leadership positions, including serving on the executive committee of the South African Education Research Association (SAERA) since 2019, and is currently the Vice-President of SAERA.



***Biodiversity and
Conservation Ecology,
Unit for Environmental
Sciences and Management,
Faculty of Natural and
Agricultural Sciences***

Prof Louis du Preez



Prof Louis du Preez

- NRF B2-rated

- Recipient of the Elston Dew Medal (2023) from the Parasitological Association of Southern Africa for a lifetime achievement in Parasitology

- Authored 10 books and 173 peer reviewed papers

In 2021, we were invited by Dr Francois Jacobs of the Namibian Ministry of Fisheries and Marine Resources to conduct a frog and reptile survey in the Khaudum-Nyae Nyae ecosystem. This was to provide baseline information needed to have this area proclaimed a Ramsar site. In this survey, we also involved Dr Ed Netherlands (Free State University), Dr Francois Becker (National Museum of Namibia), and some of our students. The survey was funded by the Kwando Carnivore Project of Namibia.

During this survey, I noticed a brightly coloured bullfrog that I recalled seeing once before with a former student in the Okavango, more than 10 years ago. We were able to collect a few specimens, and based on morphometrics, call structure, and DNA, it was confirmed to be a previously undescribed species.

Globally, this is the largest frog discovered in 104 years, and the discovery is of evolutionary significance. This is only the fourth bullfrog species known from southern Africa. The frog has a striking pattern of blue blotches on a yellow-olive background. It has been named the Beytell's bullfrog (*Pyxicephalus beytelli*) in honour of the late Ben Beytell, one of Namibia's foremost conservationists.

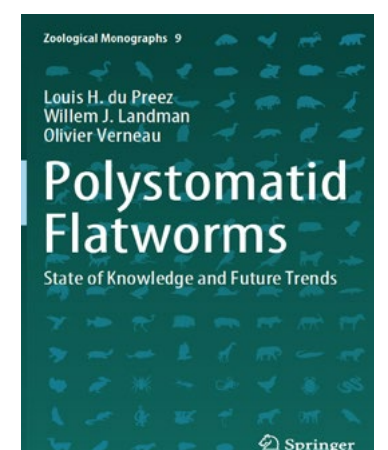
A new bullfrog species - the largest bullfrog discovered in 104 years

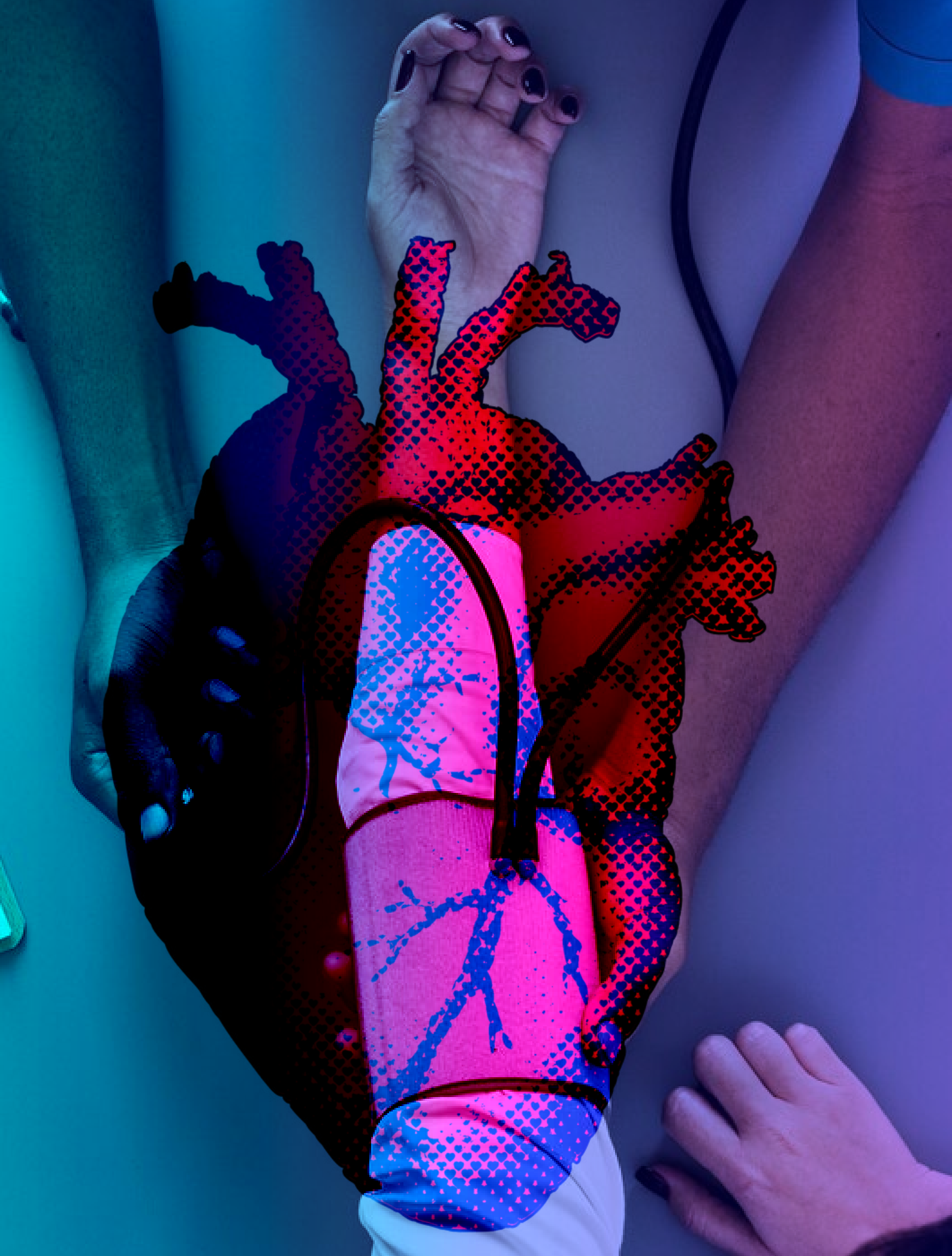


SPRINGER BOOK ON POLYSTOMES OF THE WORLD

Polystomatid flatworms predominantly parasitise amphibians and freshwater turtles, but also the African hippopotamus and the Australian lungfish. This group of parasites is evolutionarily very old and speciated, radiating with their amphibious hosts and now being found on all hospitable continents and larger islands.

Published information on this group was scattered in the literature, with no comprehensive sourcebook available. After 26 years of research on this group of parasites, describing several new genera and many new species, we published a comprehensive 645-page book with Springer in 2023. This book will hopefully inspire parasitologists around the globe to focus on polystomes.





The Heart of the Matter: Tackling Hypertension in Africa

Associate Prof Lebo Gafane-Matemane - Member of the Hypertension in Africa Research Team, Faculty of Health Sciences

Associate Prof Lebo Gafane-Matemane is a physiologist and community engagement champion with a passion for translating basic science into solutions for the growing burden of hypertension in the region. Her scholarly work, published in top-tier journals in hypertension research, was inspired by the need to elucidate the link between the so-called low-renin phenotype and cardiovascular health in populations of African ancestry to improve hypertension treatment.

Her quest to advance the understanding of the kidney's role in hypertension phenotypes in Africans has led her to focus more on tangible solutions for hypertension as the sub-theme leader (since 2023) for Translational and Implementation Science at HART, Faculty of Health Sciences.

She is currently collaborating with researchers in Southern Africa, Eastern and Western Africa to investigate the implications of the low-renin phenotype on therapeutic interventions for hypertension and cardiovascular disease, particularly personalised medicine. She has received funding through the South African Medical Research Council (SAMRC), the National Research Foundation, and the Department of Higher Education and Training Future Professors Programme. The latter provided an opportunity for a collaborative research visit to Australia in 2023, including visits to the University of Western Australia, the University of Melbourne, and the University of New South Wales (The George Institute of Global Health).

Her contribution to improving cardiovascular health was recognised with the SAMRC Scientific Merit Award (Bronze) and the Japan Society for the Promotion of Science HOPE Fellow certificate in 2023. She is one of the three and the youngest Fellow of the International Society of Hypertension in South Africa, a recognition of excellence and impact in hypertension research.



Associate Prof Lebo Gafane-Matemane

From Studying Stress Disorders in Humans to Related Stress Conditions in Wildlife

Prof Brian Harvey - Member of Pharmacoen, Faculty of Health Sciences



Prof Brian Harvey

- NRF B1-rated scholar
- Recipient of FARMOVS prize for Pharmacology and Drug Development from the Suid Afrikaanse Akademie vir Wetenskap en Kuns in 2012
- Finalist for the National Science and Technology Forum's NSTF-South32 Lifetime Achievement Award 2018
- Member of the Academy of Science of South Africa (ASSAf) since 2015
- Fellow of the Collegium Internationale Neuropsychopharmacologicum (CINP)
- Counsellor for the International Society for Serotonin Research (ISSR)
- Associate Editor - Frontiers in Psychiatry (Molecular Psychiatry section)
- Editorial Board - Metabolic Brain Disease, Human Psychopharmacology: Clinical and Experimental & Acta Neuropsychiatrica

After a career focused on understanding risk and resilience in human mental disorders using translational rodent and zebrafish models, Prof Harvey and his postgraduate students have turned their attention to studying stress and its mitigation in wildlife.

Stress is an inherent facet of life, having both beneficial and detrimental effects on the survival of species. It is essential to understand species-specific stress responses to better prevent and treat the harmful effects of stress.

The white rhinoceros is heavily poached for its horn, while its natural range is reduced by human encroachment. Conservationists rely on translocation, dehorning, collection of biological samples, tracking devices, and veterinary medical interventions to ensure its survival. However, these actions require capture via chemical immobilisation. Wild animals are variably susceptible to the toxic effects of immobilisation drugs, often leading to fatalities.

In collaboration with veterinary colleagues at the University of Pretoria, Prof Harvey and his team have been studying the effects of capture drugs, alone and in various combinations, in white rhinoceros, observing their effects on an array of stress biomarkers at various time points during immobilisation. This study will highlight how different capture drugs and combinations, depending on their mode of action, can adversely affect critical physiological parameters in these animals. Despite their status as apex predators, stress in crocodiles has not been thoroughly investigated from a neurological, behavioural, and pharmacological perspective.

It is especially during their capture and housing at crocodile farms where these animals are most at risk, having financial and ethical implications for farm owners. Prof Harvey's group is studying the association between acute and late stress biomarkers in the Nile crocodile following an acute stressor, looking specifically at rapid and delayed behavioural and biological stress markers, and how these may be prevented by herbal calmers.

This study may be useful in developing a stress biomarker panel to inform on the overall stress status of the animal and herald a novel intervention strategy.

Finally, Prof Harvey's group, together with the above veterinary colleagues and Wildlife Pharma, have developed a rodent model of capture stress-induced myopathy, a common and potentially fatal condition of wildlife capture. This model may serve as a platform to better understand the pathology and physiology of this condition and aid in developing novel capture drugs.



One of the enclosures at the crocodile farm where the crocodile stress study was undertaken.



Veterinarian Prof Jan Myburgh collecting blood samples for analysis at the NWU division of Pharmacology.



Postgraduate student André Swanepoel processing the collected blood samples for analysis, while Prof Myburgh collects urine from a young crocodile with assistance from the farm capture team.



Full veterinary team and members of South African National Parks working on a rhino following darting using one of a series of capture drug cocktails under investigation



Prof Harvey and veterinarian Prof Emma Hooiberg collecting blood samples from a darted rhino for analysis at the NWU Centre of Excellence for Pharmaceutical Sciences' sub-programme Translational Neuroscience and Neurotherapeutics



The field theatre in the Kruger National Park, in preparation for the nighttime lion capture.



Prof Harvey and veterinarian Prof Leith Meyer preparing a captured lion for blood collection

Exemplary in Human Capital Development and Mentorship of the Postgraduate Legal Professionals

Prof Howard Chitimira - Member of the Unit for Law, Justice and Sustainability, Faculty of Law



Prof Howard Chitimira

- NRF C2-rated scholar
- Advocate of the High Court of South Africa
- Editor of the Potchefstroom Electronic Law Journal and editorial board member for several journals
- President of the Society for Law Teachers of Southern Africa (SLTSA), January 2024
- Nominated as the Society for Law Teachers of Southern Africa (SLTSA) co-representative to the Takeover Regulation Panel, July 2015
- Recipient of several research grants and academic awards.
- Founder of the Annual International Corporate and Financial Markets Law Conference
- Founder of the Annual International Banking, Competition and Corporate Law Conference

Howard Chitimira is a Professor of Securities and Financial Markets Law as well as a Research Professor at the NWU. Since 1 May 2024, he has been the Research Director of the Faculty of Law. Prof Chitimira has supervised at least four postgraduate students per year since 2021.

For instance, in 2022, he supervised four LLD students and two LLM students. In 2023, Dr Sharon Munedzi graduated, and in 2024, three LLD students and one LLM student (Ms Jessica Khakhathiba) graduated.

He has successfully hosted at least one postdoc per year since 2018. He hosted the Companies Tribunal seminar for the Mafikeng community as part of community engagement on 9 March 2023 and academic book launches in 2021 and 2022, where two books were launched each year, and in 2023, where three books were launched. He has pioneered and hosted the BCCL and CFML conferences since 2019.

These conferences have consistently produced special editions where high-quality papers, especially from emerging scholars, are published as part of capacity development. Howard has published at least ten journal articles per year since 2018. In 2022, Howard received an NRF grant for research and has been frequently invited to deliver keynote addresses at various conferences at Cambridge, Harvard, the University of British Columbia, Cornell University, and the University of Manitoba.

He was recently invited to deliver research seminars at the University of Limpopo and the University of the Free State. He was also invited for long-term research visits at La Trobe University and Deakin University in 2024. He is currently a Research Professor and Research Director at the Faculty of Law, NWU.

Rare Breed in the Interplay between Law, Languages and Social Identity

Dr Natasha Ravyse - Member of the Unit for Law, Justice and Sustainability, Faculty of Law



Dr Natasha Ravyse

- Recipient of Research Excellence Award (NWU Vice Chancellor's Medal 2014)
- ASSAF Humanities Book Award nominee 2022
- Recipient of Teaching Excellence Award 2020 and UTEA nominee 2023
- Member of the national and international editorial boards
- Featured as an Inspirational Woman in Research for Women's Month 2022 NWU

Dr Natasha Ravyse is a language specialist, teaching Law and Language to law students. Her expertise includes language and social identity, language vitality, sub-cultural language vitality, Fanagalo, and sub-cultural languages.

Dr Ravyse is the author of “Natasha E Ravyse Revisiting Ethnolinguistic Vitality: Language and Subcultural Repertoires” (2021, Routledge).

This groundbreaking book delves into the intricate realm of subcultural languages, challenging traditional theories of linguistic vitality. Through meticulous analysis, the author unveils the limitations of conventional approaches to assessing linguistic vitality and proposes a novel method for gauging the vitality of subcultural languages.

Drawing on themes such as the interplay between language and culture, ethnicity within sociolinguistics, and the coined concept of ideolinguistic vitality, the book navigates through the complex landscape of subcultural linguistic dynamics. It underscores the significance of understanding the nature and principles of subcultural languages, shedding light on the superdiverse linguistic mosaic of our world.

Central to the book's contribution is the development of a unique measuring instrument tailored for assessing the vitality of subcultural languages. This innovative approach transcends the confines of subcultural linguistics, offering a valuable tool applicable to broader sociolinguistic inquiries.

In addition to its scholarly significance, the book addresses the practical challenges inherent in studying subcultural languages. It confronts issues of access to subcultural communities and provides insights into the methodological intricacies of conducting research in this domain.

This ambitious endeavour showcases the author's dedication to advancing our understanding of subcultural languages. With meticulous attention to detail and scholarly rigour, the author has crafted a seminal work that promises to shape the discourse on linguistic vitality for years to come.

An indispensable resource for scholars and researchers across disciplines, this book stands as a testament to the importance of studying and preserving the linguistic diversity inherent in subcultural communities. It paves the way for continued theoretical development and empirical exploration in the dynamic field of subcultural linguistic vitality.



Trailblazer in Urban Climate Change Mitigation and Adaptation

Prof Oliver Fou - Interim NRF SARCHi Chair in Law and Environmental Sustainability (CLeS)

Throughout the stages of his academic development, Prof Oliver Fou has made several novel contributions to law as a sole author and co-author. In a co-authored publication in 2022 (Fuo O, Zengerling C, and Sotto D 'A Comparative Legal Analysis of Urban Climate Change Mitigation and Adaptation in the Building Sector in Brazil, Germany and South Africa' 2022 (12) Climate Law 32-97), they analysed the climate-related mitigation and adaptation efforts in the building sector of three cities: Cape Town (South Africa), Hamburg (Germany), and São Paulo (Brazil).



Prof Oliver Fou

- NRF C2-rated

- Recipient of several awards including Georg Forster Research Fellowship for Experienced Researchers from the Alexander Von Humboldt Fellowship

- Assistant Editor of Potchefstroom Electronic Law Journal

- Member of several law associations for academics and practitioners

They examined national, state, and local laws and policies with a focus on building-related energy, water, and green infrastructure and revealed similarities and differences in multilevel building-related laws and policies that partly enhance and partly limit cities' climate mitigation and adaptation efforts.

The study carved out synergies, conflicts, and key challenges and made suggestions on how to overcome identified shortcomings. Two reviewers confirmed that the article makes an original contribution to climate change law, and one indicated that:

“This paper might also trigger more publications in legal scholarship on climate action of various cities in various legal areas.”



Determined to Change the Landscape of Philosophy Discipline in South Africa

Dr Yolandi Coetser - Social Transformation on Environmental Philosophy, Faculty of Humanities



Dr Yolandi Coetser

- Awarded Catalytic Research Programme Grant from the National Institute for the Humanities and Social Sciences (NIHSS)
- Received an R1 million grant for the project titled South African Society for Environmental Philosophy
- Best Master's Coursework Graduate in ICT in Education in 2022 (UJ)
- Studying MEnv Man in Conservation Leadership (NWU)

I applied for a National Institute for Humanities and Social Science Catalytic Research Programme Grant at the end of 2022. I was honoured to be awarded R1 million for my project, which broadly aimed to advance the field of environmental philosophy in Southern Africa.

The grant, running from April 2023 to September 2024, has the following objectives:

- 1 Establishment of a Southern African Society of Environmental Philosophy (SASEP)
- 2 Development and hosting of the SASEP website with NIHSS acknowledgement
- 3 Convening/hosting the inaugural academic conference for SASEP with NIHSS acknowledgement.
- 4 Capacity building: Supporting one MA student, one PhD student, and two honours students
- 5 Conference sponsorship for five postgraduate students
- 6 Writing workshop for ten scholars (including five postgraduate students)
- 7 Production of one journal special issue with NIHSS acknowledgement

Much of 2023 was dedicated to planning the conference, which successfully took place in March 2024. Thus far, funding in 2023 supported one master's student and two honours students.

It is quite unusual, at least to my knowledge, for philosophy in South Africa to receive such extensive funding. Additionally, this new society is the first of its kind in Southern Africa, despite numerous similar academic societies existing in other parts of the world. The website is available at SASEP. What was particularly significant about this award was its emphasis on postgraduate development. Although the plan was to sponsor at least five students for the inaugural conference, I was able to sponsor 12 students to attend.



Bridging Traditional Knowledge with Contemporary Science

Prof Oladapo Aremu - Indigenous Knowledge Systems Centre, Faculty of Natural and Agricultural Sciences

Prof Aremu is a prominent figure in ethnobotany and indigenous knowledge. As the President of the South African Association of Botanists (SAAB) and an active member of the Society for Ethnobotany (SEB) and the International Society for Ethnopharmacology (ISE), his influence extends both nationally and internationally.

He serves on the Standing Committee on Biosafety and Biosecurity for the Academy of Science of South Africa and the NRF Specialist Panel on Plant Science Ratings. His role as a member of the Global Young Academy highlights his leadership among 200 distinguished researchers from 101 countries, showcasing his excellence in research and dedication to advancing societal impact through his research.

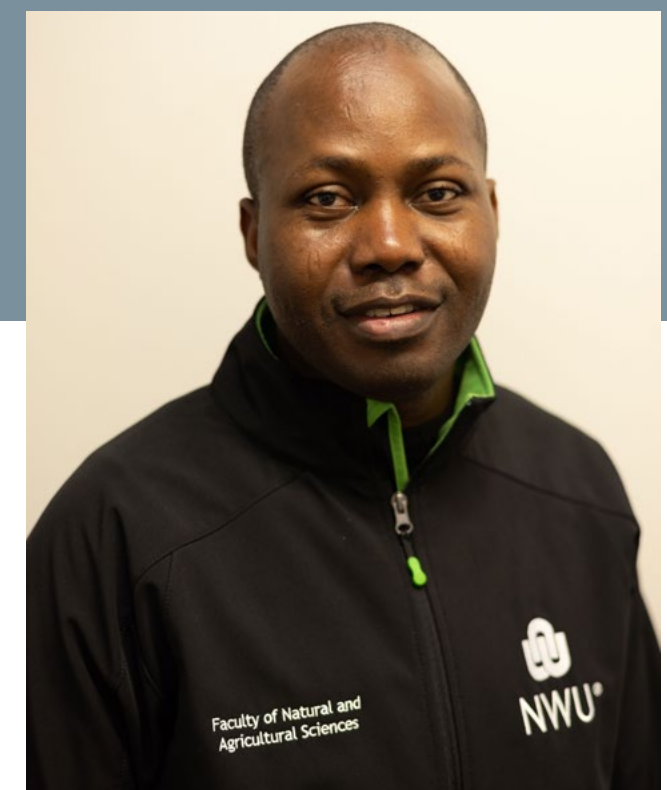
Prof Aremu spearheads efforts to promote Indigenous Knowledge Systems and Ethnobotany. His research group has documented over 300 medicinal plants used by the Batswana in southern Africa for both human and livestock health.

This invaluable work significantly contributes to the South African Indigenous Knowledge Systems (IKS) Act 6 of 2019 and global initiatives (UN SDGs) to conserve biodiversity and preserve indigenous knowledge.

His international acclaim is further underscored by the Society for Ethnobotany's Mid-Career Excellence Award/Economic Botany Excellence Award (EBEA), which he received in Atlanta, USA, in 2023. This prestigious award recognises individuals who have substantially advanced economic botany or ethnobotany through teaching, publishing, and practical application.

As a testament to his leadership, Prof Aremu played a pivotal role in the success of the inaugural Global Indigenous Youth Summit on Climate Change (GIYSCC) in 2023 hosted by the United Nations Institute for Training and Research (UNITAR) based in Geneva, Switzerland. The summit, held on the International Day of the World's Indigenous Peoples, engaged over 1 300 registrants from six continents (112 nations) across 88 languages in a 24-hour global dialogue. This groundbreaking event led to the co-authorship of a commentary in *Nature* (Sogbanmu et al., 2023), advocating that Indigenous Youth must be at the forefront of climate diplomacy and foster a global partnership of Indigenous Youth.

His work exemplifies his commitment to bridging traditional knowledge with contemporary science, ensuring the preservation and advancement of Indigenous knowledge for current and future generations.



Prof Oladapo Aremu

- NRF C1 rated
- President of the South African Association of Botanists (SAAB)
- Society for Ethnobotany's Mid-Career Excellence Award/Economic Botany Excellence award
- Global Young Academy: recognition as one of 200 early and mid-career global leaders
- Associate Editor, South African Journal of Botany

Young Scientist Unravelling HIV-1 Subtypes in Southern Africa to Improve Prevention and Management

Prof Monray Williams - Faculty of Natural and Agricultural Sciences



Prof Monray Williams

- Appointed to the Next Generation of Academics (nGAP) Programme in Biochemistry in 2020
- Published 17 research and review papers since PhD graduation in 2021
- Awarded the NWU Faculty of Natural and Agricultural Sciences' Most Promising Next Generation Researcher Award in 2023
- Generated R780,000 as a principal investigator to date from various sources, including the NRF, Poliomyelitis Research Foundation and biological psychiatry as an early career academic

KEY DISCOVERIES IN THE SOUTHERN AFRICAN CONTEXT:

Vpr Protein:

Diversity in Vpr amino acid sequences significantly influences blood inflammation (<https://pubmed.ncbi.nlm.nih.gov/38524224/>) and metabolism levels (<https://pubmed.ncbi.nlm.nih.gov/38395987/>). This suggests that variations in Vpr can modulate host immune responses and metabolic processes, potentially affecting disease progression.

Tat Protein:

Variations in the amino acid sequences of Tat influence viral transcription (<https://pubmed.ncbi.nlm.nih.gov/35464972/>) and blood inflammation (<https://pubmed.ncbi.nlm.nih.gov/35285039/>). This highlights the role of Tat in regulating viral replication and its impact on the host's inflammatory response.

Vif Protein:

Amino acid diversity in Vif affects its binding to APOBEC3G, a protein that can restrict viral replication (<https://pubmed.ncbi.nlm.nih.gov/38072879/>). This interaction is crucial for understanding how Vif-mediated evasion mechanisms influence viral fitness and persistence in the host.

HIV-1's genetic diversity leads to various geographically distributed subtypes. Subtype B is prevalent in the USA and Europe, while Subtype C predominates in Sub-Saharan Africa (SSA).

Evidence suggests that these subtype variations affect the severity of clinical outcomes in people living with HIV, driven by differences in amino acid sequences of viral proteins. However, most insights come from Subtype B studies, leaving a gap in understanding Subtype C's impact in SSA, where HIV incidence is high. Our group has made strides in addressing this within the SSA context.

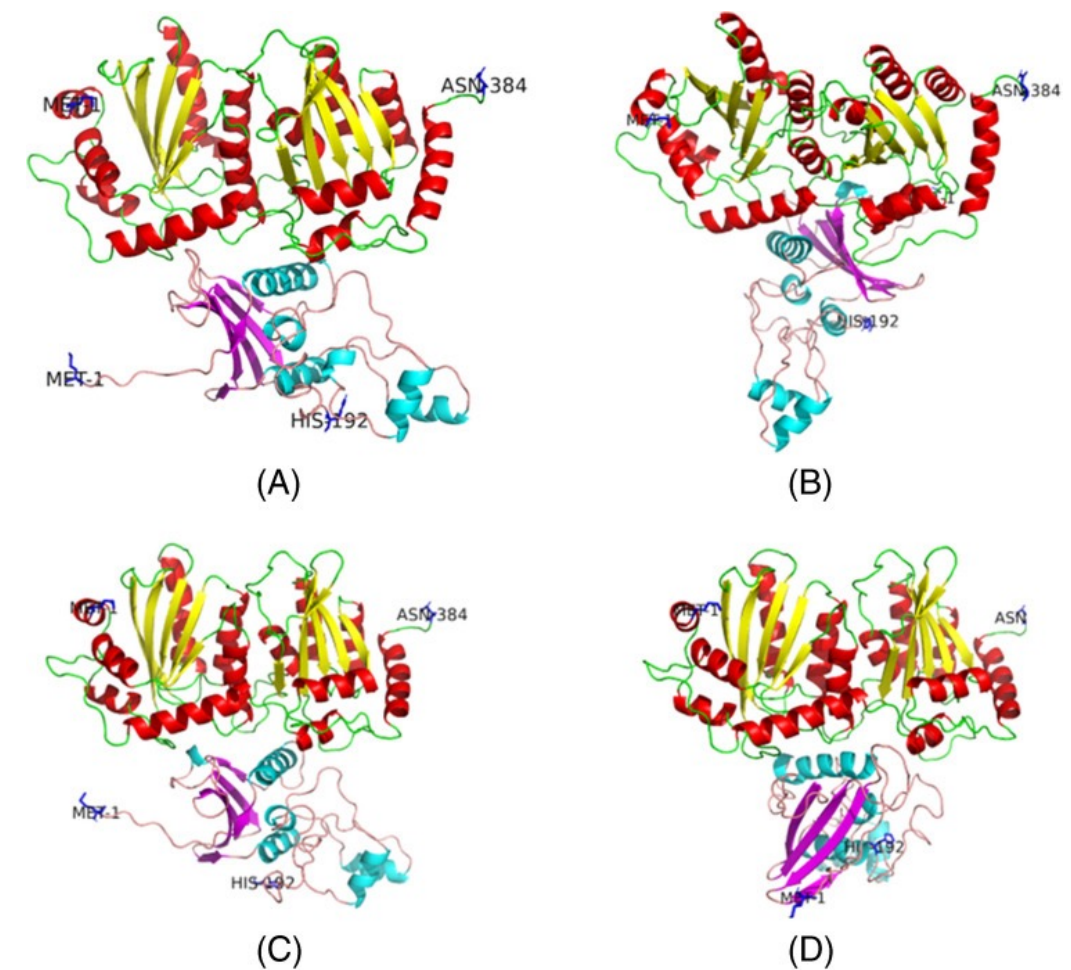


Figure: Top predicted binding poses for APOBEC3G docked to Vif variants from different geographical regions (A and B: SSA, C: Uganda, D: India).

The findings highlight the importance of considering subtype-specific amino acid variations in HIV-1 pathogenesis. This could lead to targeted therapeutics that inhibit these viral proteins, reducing HIV-1's impact. Understanding these unique mechanisms in Southern Africa is crucial for effective interventions and better clinical outcomes for those living with HIV-1 in the region.

A Christian Bioethical Perspective on Pre-Implantation Genetic Diagnosis (PGD) and Human Genetic Manipulation (GM)

Prof Manitza Kotze - Unit for Reformed Theology and the Development of the South African Society, Faculty of Theology



Prof Manitza Kotze

- NRF C2-rated scholar
- Research fellow, Centre of Theological Inquiry, Princeton (2020)
- Published 14 single-authored peer-reviewed articles and 10 single-authored peer-reviewed book chapters

Prof Manitza's doctoral studies set the scene for her dreams and research interests. Her research focuses on the interplay between doctrine and bioethics, particularly questions raised by biotechnology, including assisted reproductive technologies and human biotechnological enhancement.

Her doctoral dissertation titled *A Christian Bioethical Perspective on Pre-Implantation Genetic Diagnosis (PGD) and Human Genetic Manipulation (GM)* was completed in 2013. The study examined the challenges that emerging biotechnology, such as Pre-Implantation Genetic Diagnosis and Human Genetic Manipulation, raises for Christian bioethics, especially regarding the impact this could have on the larger populace, particularly the local population in South Africa, where only a small percentage would be able to access and afford these possible treatments.

Arguing that the primary theological responses to PGD and GM draw from the doctrine of creation, the Christian bioethical challenges were addressed using Jurgen Moltmann's trinitarian doctrine of creation.

THE PUBLICATIONS BELOW ARE ALL LINKED TO HER MAIN RESEARCH INTERESTS, NAMELY:

- The river of the water of life: Water as a theological symbol in Christian eschatology*
- The theological ethics of human enhancement: genetic engineering, robotics, and nanotechnology*
- A Christian Bioethical perspective on pre-implantation genetic diagnosis (PGD) and genetic manipulation (GM)*
- A Christian doctrine of sin and transhumanism in the public sphere: The Promethean concern of pride*



The Quality of life & “Human-hood”

Prof Vhumani Magezi - Unit for Reformed Theology and the Development of the South African Society, Faculty of Theology

“While faith and faith-based organisations are valuable in developing and improving people’s quality of life, it is essential to note that theology is not economics, engineering, or any other discipline. Hence, theology’s contribution to human development and quality of life—which are elements of quality ‘human-hood’—should be carefully considered and understood.”

Prof Vhumani is a visiting research fellow at Oxford University’s Institute of Population and Ageing in the UK, with a research focus on churches and youth sexual reproductive health.

His research interests include public pastoral care positioned at the nexus of practical and public theology, and pastoral care to foster quality of life denoted by the term “human-hood.” His understanding of public pastoral care spells out the presuppositions underlying the notion of public pastoral care.

Explaining the concept of “human-hood” during his inaugural address lecture, Prof Magezi indicated that the idea was built upon principles and values that placed people and the planet at the centre, submitting that civil society and faith-based formations – including churches – could contribute to quality “human-hood” and development.

He further noted that theology has risks, challenges, and limitations in engaging in efforts to foster “human-hood.” He used the current challenges in South Africa as an example, including racial tensions, xenophobic attacks, inequality, unemployment, the floods in KwaZulu-Natal, and disillusionment with the state of the country, among other things. He has authored articles, book chapters, books, and technical reports on HIV, church, civil society, developmental issues, and pastoral care. Prof Magezi is a member of several international academic bodies.



Prof Vhumani Magezi

- NRF C2-rated scholar
- Leading researcher in public pastoral care from the nexus of the interplay of Christian religion, spirituality, and public health
- Research Fellow Research Fellow of the University of Oxford Institute of Population and Ageing
- Current President of the International Council on Pastoral Care and Counselling (ICPCC)
- President of the African Association for Pastoral Studies and Counselling

Ancient Texts, Contexts & Reception

Prof Jaco Gericke, Faculty of Theology

Prof Jaco obtained an NRF B3 rating based on his dedication to his research focus and established international networks. Typical aspects recognised in his outputs on ancient languages, especially the Old Testament, are the wisdom literature and his engagement with the philosophy of religion. **The following monographs and chapters in books with an excellent impact were published:**



Prof Jaco Gericke

i Gericke, J., 2022, *Trauma and the Origin of Idolatry in Wisdom 14:15 Within the Broader Religious-Philosophical Context*, pp. 51-78 in N. Allen & J.T. Doedens (eds.) *Turmoil, Trauma, and Tenacity in Early Judaism* (Berlin: De Gruyter).

ii Gericke, J., *Whistling in the Library of Babel: Meta-Principles and Second-Order Religious Language About Divine Revelation in TPOJ*, in *The European Journal of Philosophy of Religion*, *European Journal for Philosophy of Religion* 14 (4) (2022): 343–359.

iii Gericke, J., *The Hebrew Bible and Philosophy of Religion - An Update in Recent Related Research (2012-2022)*, *Interdisciplinary Journal for Religion and Transformation in Contemporary Society* (2024) 1–25 brill.com/jrat. On invitation from Prof Esther Heinrich-Ramharter from Philosophy at the University of Vienna after presenting an online public lecture in October 2022, hosted by the University of Vienna on the same topic given my research focus and the initial publication anniversary of the 2012 monograph, J.W. Gericke, *The Hebrew Bible and Philosophy of Religion* (Atlanta, Society of Biblical Literature 2012). In addition, the impact of the related research since 2012 was noted as a leading influential landmark in a recent overview by Keefer, A. (2022). *Philosophical Engagement with the Hebrew Bible/ Old Testament: Some Methodological Reflections*. *Currents in Biblical Research*, 21(1), 89-114. <https://doi.org/10.1177/1476993X221124950>, in response to a 2019 comment in Konrad Schmid's *Historical Theology of the Old Testament* about the earlier lack of a clearly defined and well-represented research profile for the new philosophical perspectives (since 2012 up to 2018).

iv Gericke, J., *Job's First-Person Knowledge Claims; and the Epistemology of Religious Disagreement*, in *Hebrew Bible and Ancient Israel (HeBAI; Mohr Siebeck)*, Volume 12 (2023) / Issue 3, pp. 251-265. (co-editor of the volume *Epistemology and the Book of Job*, Eds. Jan Dietrich, Jaco Gericke (following a consortium on Job and Epistemology held from 3-7 February 2020; part of the HB and epistemology research network and part of the more extensive network on Second Order Thinking in the Ancient Fertile Crescent (2017-2024)).

v Gericke, J., *The Meaning(s) of the Question of the Origin of the Concept of God in Szatkowski, Mirosław. Ontology of Divinity*, Berlin, Boston: De Gruyter, 2024. <https://doi.org/10.1515/9783111332536>. Invited by Prof Mirosław Szatkowski (misza@gmx.de) as suggested to the editor by Prof Graham Oppy based on interdisciplinary expertise. The publication is mainly in *Philosophy of Religion*, and I was an Old Testament scholar whose contribution was required in the preliminary historical chapter.

vi Gericke, J. *Come let us reason together (Isa 1:18) - Belief justification in the Hebrew Bible's Religious Language and the Comparative-Philosophical Question of Epistemological Commensurability*, eds Thomas Wagner, Jan Dietrich, Annette Schellenberg, in *Orientalische Religion der Antike*, Mohr Siebeck. Final proofs of the accepted article have been sent to the publisher for publication in time for the SBL November 2024 San Diego Exhibition.

A conceptual image featuring a hand placing a pin on a wireframe globe. The globe is composed of interconnected lines forming a hexagonal grid. A hand is shown in the process of placing a pin into one of the grid's vertices. The background is a blurred image of a person's face, and the overall color scheme is a mix of teal and purple. A large, white-outlined number '07' is positioned on the right side of the image.

07

*INNOVATION AND
ENTREPRENEURSHIP*

INNOVATION BY UNIVERSITY ACADEMICS



Innovation in Renewable Hydrogen Energy

*Prof Dimitri Bessarabov and Dr Faan Du Plessis,
Faculty of Engineering*



Prof Dimitri Bessarabov



Dr Faan Du Plessis

Prof Bessarabov has created a portfolio of intellectual property consisting of a family of patents, design registrations, and trademarks over many years. This culminated in an International Collaboration Research agreement between the NWU and Koshen University (Japan).

This collaboration is supported by DSI and the Japanese government and is still ongoing in the field of creating green hydrogen. This led to the NWU Vice-Chancellor's Innovation Impact Award being awarded to Prof Bessarabov in 2022. In the period leading up to June 2023, Prof Bessarabov and Dr du Preez made two disclosures of new inventions and one of designs. A further patent was also granted on "*Activation Compounds for Hydrogen*". Prof Bessarabov and Dr du Preez received the NWU Vice-Chancellor's Top Inventor Award for this invention in 2023.



Innovation for Improving Pre-Primary and Primary School Learners’ Maths Achievement

Prof Petro Erasmus, Faculty of Health Sciences



Prof Petro Erasmus

Dr Erasmus, an educational psychologist, received the NWU Vice-Chancellor’s Innovation Impact award in 2023 for her development of a learning maths board game system that enables children to overcome their fear of mathematics.

She commercialised it under license from the NWU under the trade and style of Let’s Really Play Maths and PENPlay, for which she was selected to be part of the Femintech 2022 programme, the 2020 Africa for Africa Women Conference in Zanzibar (invited by SEDA) and the Gitex 2022 Expo in Dubai (invited by SEDA).

She was also awarded international research funding for the project from the British Council in 2020 and the Royal Society of Engineering in 2022 (in conjunction with Loughborough University in the UK).

Innovation in Health Technologies

Prof Leenta Grobler, NWU Business School, and Prof Henry-Jean Marais, Faculty of Engineering



Prof Leenta Grobler

Prof Grobler and Prof Marais shared the NWU Top Inventor award in 2022 for their participation in the development of four inventions.

They are both electronic and computer engineers. First, they devised a system to interpret a PCR machine’s test results remotely, paving the way for quicker and more efficient testing for COVID-19, TB and other diseases in remote clinics across the country. Second, they developed a system to remotely monitor ventilated patients, including patients on a series of different brands and models of ventilators, on a single remote device, which would enable fewer specialist clinicians to monitor more patients who are geographically widely spread.

Third, they developed and implemented a practical and simple-to-use mobile app for health screening at schools and workplaces during the COVID-19 compulsory monitoring period, screening more than 20,000 individuals per day at peak. They also developed an immersive sound environment orchestration system which can be of great assistance for speech and hearing therapists.



Prof Henry-Jean Marais

A Card Game to Promote the UN's SDGs in Learners and Grassroots Communities

Prof Byron Bunt and Dr Lance Bunt, Faculty of Education

Named the “Dogs of War” game, this innovation was designed by two brothers, Prof Byron Bunt and Dr Lance Bunt, from the Self-Directed Learning (SDL) Research Unit. The “Dogs of War” card game is set during World War II and allows players to interact with historical events, characters, and themes.

It incorporates strategic decision-making and resource management features, making it both enjoyable and instructive. Moreover, it can foster a more profound comprehension of historical themes and motivate players to take responsibility for their own learning experiences. This educational strategy is particularly valuable as it encourages learners to take initiative, make decisions, and manage their learning processes independently.

By integrating historical content with gameplay, the game provides a dynamic environment where players actively engage with and reflect on historical events, enhancing their ability to initiate further learning and research autonomously. As players navigate through the game's complexities and strategic demands, they develop essential skills for independent learning and critical thinking. These skills are transferable to other academic and real-world scenarios, making SDL an integral part of the educational value provided by the “Dogs of War” game.

Further emphasising the game's impact, its commercialisation through the NWU's Technology Transfer and Innovation Support office and its marketing abroad not only expand its educational reach but also demonstrate its viability as a tool that resonates across different cultural contexts. This enhances global historical education and fosters self-directed learning worldwide.



Prof Byron Bunt



Dr Lance Bunt

For information on the story, visit: <https://www.dst.gov.za/index.php/media-room/latest-news/4285-new-card-game-encourages-youngsters-to-look-for-solutions-to-global-issues>

COMMUNITY ENTREPRENEURSHIP:

Impact of NWU Innovation Highway (Pty) Ltd

The NWU TTIS office helps innovators and entrepreneurs outside of academia to realise their dreams. Two such examples are the development of Moonshine Reflective Paint and La Tumai cosmetic products.

MOONSHINE REFLECTIVE PAINT

A reflective animal spray was developed to curb road fatalities due to stray domesticated animals, particularly donkeys. More on this story here: <https://news.nwu.ac.za/nwu-assists-invention-reflective-livestock-spray-paint>



LA TUMAI COSMETIC PRODUCTS

Cosmetic skin and hair products were developed, commercialised and showcased at the NWU-DTIC Multi-Stakeholder Event in March 2023.

More on this story here: <https://news.nwu.ac.za/ideation-commercialisation-impactful-nwu-research>



Irene Nompini Tsele (centre), an entrepreneur and NWU final-year student, with Thandi Maretlane and Hannes Malan, both from the NWU's Technology Transfer and Innovation Support office.



The Technology Transfer and Innovation Support (TTIS) office at the NWU is helping innovators and entrepreneurs to realise their dreams.

Student Entrepreneurship Bootcamps and Leopards Lair® Finals

The Leopards Lair® is a student entrepreneurship competition that offers NWU students a valuable learning journey into the real world of entrepreneurship and start-up businesses, providing an exciting avenue for those eager to explore new venture creation as an alternative to traditional employment or to gain practical business development experience.

Throughout 2023, aspiring entrepreneurs had the opportunity to participate in entrepreneurial boot camps across all three campuses, earning their chance to compete in this exciting contest. At the final event, contestants had the daunting task of presenting their ideation stage business ideas and pitch decks within a tight five-minute timeframe, followed by some challenging questions from a panel of judges.

The Leopards Lair® 2023 finals were hosted by the TTIS and received support from the Faculty of Economic and Management Sciences, the NWU Business School, the Small Business Advisory Bureau, and the Bhive Enterprise Development Centre, with funding from DSI/NIPMO, the IDC and the Bongani Foundation.

At the event, the winner of the Leopards Lair® postgraduate category and recipient of the inaugural Bongani Foundation Prize for sustainability, Fleather, presented their plans for an alternative leather company using mushroom roots as feedstock.

The FLeather team includes Madelein de Jager, Le Roux Bernard and PJ Prinsloo, all of whom are honours students in business management sciences.

More on this story here: <https://news.nwu.ac.za/student-entrepreneurs-compete-tomorrows-success>

Zander van der Watt, an engineering student who won the undergraduate category with his Positech Vending Machine, has revolutionised traditional vending machines, which have remained largely unchanged since the 1980s. He has undertaken a complete redesign, incorporating cutting-edge technologies to enhance reliability and aesthetics. He has manufactured his first three prototype machines, which are currently performing exceptionally well in field trials.

More on this story here: <https://news.nwu.ac.za/students-speak-out-importance-innovation-and-entrepreneurship>

The Leopards Lair® continues to be a launchpad for young innovators, providing them with a platform to turn their bold ideas into reality.



From the left PJ Prinsloo, Madelein de Jager and Le Roux Barnard – Postgraduate winners.




Zander van der Watt – Undergraduate winner.



FLeather, winner in the postgraduate category of the Leopards Lair® competition.



The Positech vending machine, winner in the Leopards Lair® competition's undergraduate category.



08

A C C O L A D E S

The 2023 NWU Vice Chancellor's Excellence Awards:

Research and Innovation Category

The NWU Vice-Chancellor's prestigious event, held on 23 November 2023, honoured academics for their exceptional achievements in research and innovation.

Awards were presented across various categories, including National and International Recognition and Memberships, Acknowledgement of New and Upgraded NRF Ratings, Research Chair Acknowledgements, Most Productive Senior Researcher Award, Most Productive Emerging Researcher Award, Creative Outputs Award, Top Inventor Award, Innovation Impact Award, S2A3 Award for the Best Master's Dissertation, and the Vice-Chancellor's Award (refer to Table 8.1 on the next page).

Table 8.1 Academics Acknowledged with Research and Innovation Excellence Awards

CATEGORY	TITLE	NAME	SURNAME	FACULTY
National and International Membership Recognition	Prof	Francois	Van der Merwe	FNAS
	Prof	Adayemi O.	Aremu	FNAS
Internationally Acclaimed Researchers	Prof	Johan	Zaaiman	FHUM
	Prof	Sarel	Cilliers	FNAS
	Prof	Riaan	De Jangh	FNAS
	Prof	Stefan	Ferreira	FNAS
	Prof	Brian	Harvey	FHS
	Prof	Mark	Maboeta	FNAS
	Prof	Nico	Smit	FNAS
	Prof	Gerhard	Hyssteen	FHUM
Research Chairs	Prof	Dorothy	Lauscher	UNESCO Chair, FEDU
	Prof	Anel	Du Plessis	SARChI Chair, FLAW
Most Productive Senior Researcher	Prof	Ruan	Kruger	FHS
Most Productive Emerging Researcher	Prof	Marko	Van DeVenter	FEMS
Creative Output Award	Mr	Lesego	Motlhankane	FHUM
Top Inventor Award	Prof	Dimitri	Bessarabov	FENG
Top Inventor Award	Dr	Faan	Du Plessis	FENG
Innovation Impact Award	Prof	Petro	Erasmus	FHS
Most Outstanding Master's Students	Mr	Andrew J	Oosthuizen	FHS
	Miss	Marelize	Van Ree	FENG
	Miss	Jamey	Davis	FNAS

Forty-eight researchers were celebrated for receiving and upgrading their NRF ratings.
(See the full list here.)



SARIMA Excellence Awards



Dr Janine Chantson was awarded the SARIMA Award for Distinguished Contribution to the Innovation Management Profession at the SARIMA Conference in August 2022.

For more information on the story, follow this link: <https://news.nwu.ac.za/technology-transfer-and-innovation-support-office-leads-way-empowering-innovation>

The NWU TTIS office was awarded the prestigious DSI/SARIMA Organisation Excellence in Innovation Management (2022) at the SARIMA Special “3C” (Connect, Celebrate and Collaborate) event in Johannesburg in October 2023.

Follow this link for more on the story: <https://news.nwu.ac.za/technology-transfer-and-innovation-support-receives-prestigious-dsi-sarima-award>

LIST OF KEY ABBREVIATIONS

AGOPA: Afrocentric Governance of Public Affairs

ARWU: Academic Ranking of World Universities

BRICS: Brazil, Russia, India, China South Africa

CoC: Centre of Competence

CoE: Centre of Excellence

CWUR: Centre for World University Rankings

DSI: Department of Science and Innovation

DTIC: Department of Trade Industry and Competition

DVC-R and I: Deputy Vice-Chancellor -Research and Innovation

HPCSA: Health Professional Council of South Africa

HySA: Hydrogen-South Africa Infrastructure

IAEA: International Atomic Energy Agency

IFPRI: International Food Policy Research Institute

IGO: International Governmental Organisation.

IKS: Indigenous Knowledge Systems

IP: Intellectual Property

IRIMS: Integrated Research Integrity Management Systems

JST: Japan Science and Technology Agency

NIHSS: National Institute of Human and Social Sciences

NDP: National Development Plan

NIPMO: National Intellectual Property Management Office

NRF: National Research Foundation

NWU: North-West University.

RE: Research Entities

R&I: Research and Innovation

ROI: Research Integrity Office

SACSSP: South African Council for Social Services Professionals

SADiLaR: South African Centre for Digital Language Resources

SANLIC: South African National Library Information Consortium

SANORD: Southern African Nordic Centre

SARChi: South African Research Chair

SARIMA: Southern African Research and Innovation Association

SARUA: Southern African Regional Universities Association

SASUF: The South African Sweden University Forum

SATREPS: Science and Technology Research Partnership for Sustainable Development

SAWISA: South African in Science Awards

SDGs: Sustainable Development Goals

TIA: Technology Innovation Agency

THE: Times Higher Education Rankings

TTIS: Technology Transfer and Innovation Support

URT: Unit for Reformation Theology and Development of the South African Society

WHO: World Health Organisation.

WTO: World Trade Organisation

ACKNOWLEDGEMENTS

The DVC Research and Innovation Office wishes to acknowledge Professor Thami Sithebe for sterling assistance with the collection and compilation of information towards the working document of this inaugural report. The DVC R&I is equally grateful for an exceptional commitment, the hard work and contribution from the faculties, researchers, and Tian du Preez.

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