

# 2008 Annual Research Report

research

technology

innovation

# Vision

NMMU's vision as a values-driven university is to be the leader in optimising the potential of our communities towards sustainable development in Africa.

Having attained our vision we will be able to:

- ▶ Contribute to the transformation and development of our communities in terms of the full spectrum of their needs.
- ▶ Empower our institution, staff, graduates and communities to contribute and compete, both locally and internationally.
- ▶ Continue to make a major contribution to sustainable development in Africa.

# Mission

Nelson Mandela Metropolitan University is an engaged and people-centred university that serves the needs of its diverse communities by contributing to sustainable development through excellent academic programmes, research and service delivery.

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Dr Sepi Rouhani

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Ms Leonette Bower and faculties

Appreciation is expressed to the Deans and Faculty RTI Committee Chairpersons who provided faculty specific contributions.

## LAYOUT AND PUBLISHING

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NMMU 2008 Annual Research Report

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It gives me pleasure to invite you to read the 2008 Annual Research Report of NMMU. It provides a portrait of the most important research themes, activities and achievements for 2008, and our leading researchers and entities directing research at NMMU today.

The core NMMU research strategy is to systematically grow high-level research competence and innovation in a number of niche areas across the natural and social sciences domains, while raising the general floor of research output of the university as a whole.

In addition, NMMU seeks to use science and technology innovations to add value to the social and economic well-being of especially poorer communities, and more generally, by stimulating sustainable economic development in the Eastern Cape region and beyond. This strategy is supported by a number of institutional conditions including sustained levels of financial investment to stimulate research productivity and innovation; dedicated Council funding, mobilisation of private sector research investment and public funding agencies such as the National Research Foundation; the creation of a new generation of Research Chairs and entities anchored around our research niches detailed in this report; a new research incentives policy and institution-wide recognition of research achievements through a new system of NMMU Research Awards.

The 2008 Annual Research Report shows a trajectory of steady growth of NMMU research strategy in terms of growth in the number of NRF-rated scientists; published books and journals; attendance at key conferences and delivery of conference papers; appointment of some of our leading researchers onto both national and regional-based advisory and policy-making councils that influences public policy; the creation of a new generation of research chairs driving key research work (eg. the VWSA-DAAD and General Motors Chairs in Mechatronics); and influential work done by our scientists in areas such as biodiversity, restoration ecology, renewable energy, information and communications technologies, language and media studies, and biokinetics.

The 2008 Annual Research Report also shows a significant expansion in the number of strategic partnerships and links between our scientists and academics with industries, municipalities, provincial

governments, schools and development agencies as part of NMMU's commitment to strategic engagement. The report also reflects the extensive manner in which NMMU's research is supportive of many of South Africa's national development goals on economic development, job creation, poverty eradication, raising quality of school education and workplace training, and so forth. This role we play is especially important in the context of the current economic crisis in the world and South Africa, and efforts to revitalise the economy and communities under social stress.

Moreover, the NMMU research niches also reflect a much broader commitment to looking beyond the limitations of existing economic and social paradigms. It is now widely accepted that many aspects of the current economic development models that have driven industrialised countries - based on infinite varieties of mass production, consumption and resource extraction - have not only exacted irreparable damage to the natural environment but also proven its inherent non-sustainability.

The current crisis has begun to pose crucial questions about the future - what modes of economic development can provide well being for the majority while it also sustains our natural heritage? How can we harness and cheapen the production of "greener" technologies in important areas such as energy, transportation, housing and food production? What role can civil society and labour play in promoting more sustainable regimes of economic and social development? These questions are being explored by NMMU academics and researchers, and we hope to make a distinctive contribution in the search for meaningful alternatives. We hope you can be a partner in this regard.

Yours sincerely



**Derrick Swartz**  
**Vice-Chancellor**



# NMMU's Research, Technology and Innovation (RTI) Strategy



*Prof Thoko Mayekiso, newly appointed Deputy Vice-Chancellor: Research, Technology and Planning*

A formal NMMU Research, Technology and Innovation (RTI) strategy was developed in 2007 in consultation with the NMMU RTI Committee and the Faculty RTI committees. Senate and Council approved the strategy late in 2007 and full implementation commenced in 2008 with special emphasis on developing faculty research strategies and research and innovation themes that address national, regional and local imperatives underpinning the nine academic focus areas of NMMU.

The institutional strategy follows the vision of the university: to be the leader in optimising the potential of our communities towards sustainable development in Africa. It aims to achieve this vision by:

- ▶ Contributing to the transformation and development of our communities through research, technology and innovative solutions;
- ▶ Empowering our institution, staff, graduates and communities to contribute and compete, both locally and internationally, as researchers of note;
- ▶ Continuing to conduct research projects that relate to society's needs.

Our research strategy aims to create and sustain an environment that encourages, supports and nurtures a vibrant research, scholarship and innovation culture. It is based on four key principles:

- ▶ The development of a critical mass of academic and student researchers in a limited number of focus areas;
- ▶ The creation of an environment that encourages the development of a research culture and research ethos;
- ▶ The role of the university in promoting transformation and a diversity of experience in terms of race, gender and age to achieve social justice.
- ▶ The promotion of networking, collaboration, partnering, co-operation and clustering.

The strategy recognises the importance of critical inquiry, as well as the need to address societal challenges in terms of wealth creation and improving quality of life. The research and innovation agenda of the institution is formed by the following strategic objectives:

- ▶ To develop and sustain research and innovation capacity, thereby increasing research productivity.
- ▶ To promote and enhance research relevance and utility.
- ▶ To promote the commercialisation of research outcomes in the form of products, processes and services.
- ▶ To improve and enhance innovation capacity at the frontiers of science and technology.



*Prof Mohammed Jeenah, former Deputy Vice-Chancellor: Research, Technology and Planning*

# Selected Research Highlights

## Researcher of the Year: Challenging the status quo

Why does the “threat of terror” exist, and how can we make it redundant, particularly in our post 9/11 society? Where is the human face in the avalanche of technology, and what happens when people turn their backs on nature?

Bert Olivier, a professor of philosophy at NMMU, believes in asking the uncomfortable questions that challenge the status quo, but ultimately have the potential of improving life for all. For Olivier, philosophy does not belong to the confines of heavy textbooks and complicated concepts – it applies to all aspects of life, from music to cinema, and politics to nature. “People who practice ivory tower philosophy don’t demonstrate philosophy’s relevance to society at large,” he said.

Olivier has published widely in the philosophy of culture, art and architecture, cinema, music and literature, as well as the philosophy of science, epistemology (the theory of knowledge) and psychoanalytic, social, media and discourse theory.

His research has earned him a number of awards, most recently NMMU’s top researcher of the year award for 2008. He was also named the top researcher in NMMU’s Faculty of Arts for 2008, an award he previously received in 2006. And, at what was then the University of Port Elizabeth, he was named the top researcher for the period 1999 to 2004. In addition to his awards from the university, he received the Stals Prize for Philosophy from the South African Academy for Arts and Sciences in 2004.

Olivier discovered philosophy “by accident” as a filler subject in his teaching degree. While his heart lay in the philosophy of art, culture and cinema, he did not know of anyone in South Africa who could be his promoter, so he settled for epistemology – the branch of philosophy concerned with the nature and limitations of knowledge – taking it to doctoral level.

But it was a post-doctoral fellowship at Yale University, studying under Prof Karsten Harries, a leading thinker of the philosophy of art and architecture, that truly shaped Olivier’s journey in philosophy. Through Harries, he was introduced to the work of a number of renowned philosophers, including Martin Heidegger, who soon became one of his main influences.

“Heidegger was one of the first people who thought in poststructuralist terms”.

A new paradigm of philosophy, post-structuralism emerged in France in the 1960s, and is broadly understood as a body of distinct elaborations on structuralism, which attempted to explain the world as a neat system of inter-related structures.

“Structuralism was a manifestation of the culmination of modern thought, which turns the world into a series of mathematically articulated objects – essentially the pre-condition for technology. Heidegger rebelled at this attempt to control the earth through technology. Instead of setting upon nature in the form of an assault, Heidegger believed we must become like listeners to discover our place on this earth.” Without this view, Olivier believes our fight against global warming and other life-threatening natural phenomena is a lost cause.

“We make the mistake of thinking we are in control, but our control is very limited. We need to rediscover nature as that in which we are rooted. The active genetic difference between us and chimpanzees is a mere 0,4%. We are intimately related to nature. We are a form of nature.”



*Prof Bert Olivier (right), NMMU Researcher of the Year 2008, and Dr Pieter van Breda, Director, Department of Research Management*

But Olivier's philosophical research is not limited to nature. To him, life in all its forms is inter-related, a concept that goes back to ancient Greek philosophy.

"What appealed to me about Plato is that he would think about what the political implications were of something like music, for instance. He was not one to put things into little compartments. We can't isolate music, art, architecture from everything else, whether it is politics or ecology."

"Philosophy belongs everywhere and nowhere, which is where it should be. The moment it is compartmentalized, it will lose its political edge."

The opinions of this outspoken commentator on life are regularly published on Mail and Guardian Online's Thought Leader. He has published over 150 academic articles in journals and books, and dozens more in popular media.

## Solution-seekers: From state-of-the-art welding technology to the testing of biodiesel, NMMU is pioneering cutting-edge research.

### NMMU SCIENTIST FINALIST IN TOP AWARDS

Transferring research into real-life solutions is a challenge Prof Danie Hattingh embraces with much success.

Prof Hattingh, who heads up the Automotive Components Technology Station (ACTS) and Friction Stir Processing research team at the Institute of Advanced Manufacturing and Engineering Research (IAMER), is the first NMMU staff member to be selected as one of five finalists for the National Science and Technology Forum (NSTF) Awards.

He was nominated for contributions made as an individual through research and scientific outputs over the last five years in science, engineering, technology and innovation. However, Prof Hattingh is quick to point out that he has always been part of a "very good and competent team". His main achievements include the establishment of an internationally-recognised research group in Friction Stir processing.

He is also part of a team of international scientists working on the quantifying of residual stress magnitudes by synchrotron and neutron diffraction for engineering applications.

The Friction Stir Processing research team is currently involved in a multi-million rand research project in support of the local nuclear industry, which could result in reduced costs and increased reliability. "In a nutshell, we are developing specialised platforms for using Friction Stir Welding as a possible weld repair procedure. We are also involved with process optimisation."

The R7-million Friction Stir Welding system, recently acquired by IAMER, allows the research team to "stay competitive and relevant" and is also likely to draw more international postgraduate students.

Future research includes the joining of titanium for the aerospace industry. "We are currently finalising proposals with Boeing Phantom Works' Advanced Manufacturing Research and Development group in the USA."



*Prof Danie Hattingh was nominated for a top NSTF award in 2008. Prof Hattingh also serves on the Materials Science and Manufacturing panel for Metals and Metal Processes group at the Council for Scientific and Industrial Research (CSIR). This panel is responsible for evaluating CSIR research programmes and gives strategic direction to future projects.*



## FIGHTING GAS EMISSIONS



*Deputy Minister of Science and Technology Derek Hanekom (centre) and Nurunessa Molla of his office, visited NMMU's Institute for Chemical Technology, InnoVenton, where they met (from left) former Deputy Vice-Chancellor Prof Mohammed Jeenah and InnoVenton staff Dr Gary Dugmore, Prof Ben Zeelie and Dr Nawaz Mahomed, and discussed biodiesel testing.*

The fight against greenhouse gas emissions is being carried out at NMMU.

The university's Institute for Chemical Technology and its Downstream Chemicals Technology Station (InnoVenton) is upgrading its facilities to research and test biodiesel and associated products. The R7m upgrade – which includes funding of R1m from the Department of Science and Technology and R3m each from NMMU and industry – is expected to be completed next year.

In the first phase, a biodiesel analytical laboratory will be completed, where biodiesel will be analysed and certified to comply with SABS standards. The laboratory will be the first of its kind at a higher institution in South Africa. Major advantages of the institute's biodiesel process research and development work are its focus on cleaner, lower-cost processing, using a wide variety of plant and animal fat sources, and its applied research in the field of small production systems, which will enable small to medium enterprises to enter into and compete in chemical production activities.

InnoVenton also plans to extend the facility to include world-class test and research facilities, covering all the principal transport fuels, in the form of a Fuel Chemicals Centre (FCC). The FCC will include a fuels testing laboratory, which will provide expertise and facilities for the analysis and testing of biodiesel, bio-ethanol, diesel, aviation fuel and other synthetic or renewable fuel components. It will also include a product development laboratory.

The institute envisages the establishment of sectoral network innovation partnerships between industry, specialised research and development institutions and government, to bring together the necessary skills, knowledge and resources.

## GREEN WHEELS

The invention of an environmentally-friendly additive likely to revolutionise the tyre industry worldwide saw PhD Chemistry student Robert Bosch taking top honours – and a R300 000 prize – in the Innovation Fund's National Innovation Competition.

Through a series of experiments stemming from the analysis of nano zinc oxide – the initial focus of his PhD – Bosch discovered a safe alternative to the toxic zinc oxide component used in the formulation of rubber.

Termed the Rubber Nano Products Liquid Activation System, or RNPX, it's a "composite of various chemicals that replaces zinc oxide completely and is very safe environmentally". RNPX is undergoing trials at a major European tyre manufacturer.

"About 800 000 metric tons of zinc oxide are used in the rubber industry every year – 500 000 in the tyre industry alone. We want to replace it completely," says Robert.

For Bosch, the biggest reward is knowing that "some crazy little experiment can have a worldwide impact quite quickly".



*PhD Chemistry student Robert Bosch whose invention is set to make an impact worldwide.*

## GROUND-BREAKING INSECT REPELLENT

Ilse Asquith, a part-time lecturer at NMMU's Faculty of Science, discovered her insect repellent formulation, RepelloX, during her Chemistry Master's studies in Product and Process Development at NMMU.

RepelloX, the university's first intellectual property to be patented internationally, will be in the shops next year, following a commercialisation agreement between NMMU and investment partner Afrepell Manufacturing.

The success of RepelloX – which saw Ilse becoming one of 10 national finalists in the Innovation Fund's National Innovation Competition in 2004 – has been both exciting and rewarding.



*The team of inventors from InnoVenton, (back from left) Dr Gary Dugmore, Mr Batso Mpuhlu (DTech student), Prof Ben Zeelie, Dr Shawn Gouws, Dr Ilse Asquith and Mr Nico Rust (DTech student) join Prof Derrick Swartz (seated, left) and Advocate Eben Nel, Director, Afrepell Manufacturing after signing an agreement to commercialise RepelloX, an insect repellent.*

## DIABETES TREATMENT BREAKTHROUGH IN THE EASTERN CAPE

Diabetes is one of the top six killers in South Africa and it's on the rise. But recent breakthrough findings in diabetes treatment by NMMU researchers could mean a change in this statistic for the better.

A hardy Karoo plant, two biochemists and the will to make a difference, may be the recipe for success in the lives of thousands of diabetics. Scientific experiments undertaken over six years by the Department of Biochemistry and Microbiology at NMMU have found that the blood sugar

of diabetic rats stabilised to normal levels within a few days of being given an extract of an indigenous plant, *Sutherlandia frutescens*.



*Biochemist Dr Saartjie Roux (right) and members of her research team (from left) Dr Trevor Koekemoer, Dr Gill Dealtry, Janine McKenzie and Jacki Mugomba, are thrilled that their research may soon make a positive difference in the lives of diabetics.*

Dr Saartjie Roux, who conducted the research with Dr Maryna van de Venter and several other postdoctoral and postgraduate students, also found that sugar levels remained stable even if insulin was administered at the same time.

"It stayed within the normal range and did not go too low, as is often the case when diabetics accidentally inject too much insulin," says Dr Roux of their work to verify claims about the plant for diabetes treatment and to investigate the safety aspect of its usage.

The university has been assisted financially in this ongoing research by the Medical Research Council (MRC), the National Research Foundation (NRF) and natural health company Value Added Life.

Dr Roux said the university felt it would be unfair not to share such good news with South Africa's diabetes sufferers. "It has led us to the point where we feel it would be unethical of us not to inform the community at large about the positive effects of this drug on diabetes. This could be a safe and inexpensive anti-diabetic treatment for diabetics in South Africa."

# Research Governance and Administration

The Research, Technology and Innovation (RTI) portfolio is headed by the DVC: Research, Technology and Planning (RTP). Research at NMMU is governed by a committee of Senate, the Research, Technology and Innovation (RTI) Committee. The RTI Committee is chaired by the DVC and its membership comprises faculty representatives and heads of the relevant academic support services.

The NMMU RTI Committee has four operational sub-committees:

- ▶ Research Committee
- ▶ Research Ethics Committee: Animal
- ▶ Research Ethics Committee: Human
- ▶ Publications Committee

To allow for greater participation of academic staff members, faculty RTI committees were established to promote, manage and administer research within faculties. All faculty RTI committees report to the Faculty Board and raise issues of interest to the faculty and university at the NMMU RTI Committee. The Faculty RTI Committee is ultimately responsible to the dean and is chaired by the dean or by an experienced researcher. Faculties have a large degree of flexibility in managing their RTI activities, including faculty funding models.

Various policies are in place to give effect to the research strategy and to govern research activities at NMMU. Research incentives are of particular importance to encourage staff members to engage in research activities which enhances the NMMU's research strategy e.g. incentives to publish in DoE- subsidised publications, to graduate research master's and doctoral students and to obtain an NRF rating. There are also incentives for the best faculty researchers and staff researchers with exceptional outputs in the creative and performing arts.

Some of these policies, developed shortly after the merger between the former Port Elizabeth Technikon and the University of Port Elizabeth in 2005, were further developed and refined in 2008.

# Support for Researchers Research Office



*Dr Pieter van Breda, Director, Department of Research Management*

At the time of the establishment of NMMU, a Department of Research Management and Postgraduate Financial Support (RM & PFS) was created under the direction of the DVC: Research, Technology and Planning and a director. Soon it was acknowledged that research capacity development was of such a high priority that it required the establishment, in 2007, of a separate Department of Research Capacity Development (RCD) to look after the interests of emerging researchers and postgraduate students.



*Research Management Team (from left): Dr Sepi Rouhani, Mr Kevan Johnson, Mrs Carmen van Leeve, Ms Nicola Taylor and Mrs Visha Coopasamy.*



The RCD Department takes responsibility for most research development programmes, research development funding, bursaries and scholarships (M-level and higher), the research ethics committees, research associates and related policies. A particular focus is to assist the 25.6% of academic staff whose highest qualification is below the master's level, to improve their qualifications. It is also of concern that only 34.4% of academic staff members have a doctoral degree.

The existing RM & PFS department became the Department of Research Management (RM), which focuses mainly on the needs of established researchers and manages such matters as National Research Foundation (NRF) grants, Department of Education (DoE) publication funding, research entities, internal research incentives and the research information management system.



*Dr Shaleen Els, Director, Department of Research Capacity Development*

It also became clear that the management and commercialisation of intellectual property and the management of contract research and some external research grants needed to be handled by a dedicated office, which led, in 2007, to the formation of the Department for Innovation Support and Technology Transfer (IS&TT). IS & TT manages and commercialises the NMMU's Intellectual Property (IP). Typically, commercialised IP will be in the form of a patent, but all forms of IP, such as copyright, are also commercialised where possible by IS & TT.

The permanent staff complements were seven, five and three for RM, RCD and IS & TT respectively.



*RCD staff: L-R Front: Mrs Kirsten Longe and Mrs Delene Gerber. Back: Mrs Belinda du Plooy, Mrs Carla Venter and Dr Blanche Pretorius, newly appointed Director, Department of Research Capacity Development.*



*Innovation Support and Technology Transfer: Ms Jaci Barnett, Director, and Ms Elsa van Wyk (left).*

## Finance Department

In August 2007 the Department of Finance created a section with four staff members to focus on research-related financial matters. It remains a challenge to incorporate financial management support into a single research support unit which might also render human resources (HR) and contract management support to researchers.

## Unit for Statistical Consultation

The Unit for Statistical Consultation (USC) renders a free statistical consultation service to staff engaged in academic research and master's and doctoral students. In 2008 the Unit assisted 109 researchers. From the beginning of 2008 the USC operated as an independent entity within the Faculty of Science linked for budget and administrative purposes to the Department of Research Management.

## Ethics committees

The protection of both research subjects/participants and researchers has been identified as of core importance within the practice of research, and the NMMU Research Ethics Committees (Human and Animal) are tasked with ensuring that research conducted at NMMU falls within the guiding principles of national and international research ethics. In 2008, approximately 80 research proposals were dealt with by these committees.



## Research Information Management System

With the introduction in 2007 of InfoEd as a national Research Information Management System (RIMS) and the signing of a contract between NRF and DST for the NRF to manage the system, NMMU became a member of a consortium of South African universities and science councils implementing InfoEd. The national rollout started in 2008, but has been disappointingly slow. This impacted negatively on the rollout of InfoEd at NMMU. A RIMS administrator, Ms Marisa Kolver, was appointed at NMMU from funding secured from NRF.



*Ms Marisa Kolver, RIMS Administrator*

## Research websites

The departments of Research Management (RM), Research Capacity Development (RCD) and Innovation Support & Technology Transfer (IS & TT) have designed their own websites aimed at providing online access to information and services offered. Access the website at: [www.nmmu.ac.za](http://www.nmmu.ac.za)

## Directory of Experts

The NMMU online Directory of Experts, a combined project between the departments of Marketing and Corporate Relations and Research Management was launched in 2008 and can be viewed on the NMMU website: <http://www.nmmu.ac.za> under "community".

This directory, updated annually, is available to the media and public as a resource, and a printed version was distributed to the local and national media. Marketing and Corporate Relations use this resource as a tool for enhancing NMMU's media profile by providing journalists with sources of credible information and expert opinion for quoting in articles, interviews etc. This creates excellent opportunities for staff and departments to have their work publicised in the media. Research Management use the directory to direct queries from other institutions and to identify researchers for potential projects, funding, collaboration etc.

## Research leave and research sabbatical

NMMU has a research leave policy which allows all academics and certain categories of support staff to take a year's research sabbatical every six years. Financial constraints in the form of staff replacement costs have limited the uptake of sabbaticals and have been detrimental to the research effort of the individual and the university. Despite these constraints, the number of research sabbatical applications (for periods ranging from a term to as long as a year) approved by the Research Committee increased from 31 in 2007 to 50 in 2008.

## Institutional Audit

During 2008 the Higher Education Quality Committee (HEQC) of the Council for Higher Education (CHE) conducted as part of their mandate a quality assurance audit at NMMU. Central to the audit process was a self evaluation exercise which was extremely useful.

The research activities at NMMU, especially the research niche areas, were found to feed very well into the vision and mission of the university. Some concern was expressed about the examination process for master's and doctoral degrees, the fact that NMMU's postgraduate policy was unevenly implemented across faculties and that there was not a clear research ethics policy.

Concern was also expressed about the very few black rated-researchers. All these matters will receive attention in 2009.



*Prof Martin Oosthuizen, former Acting DVC: RTP led the NMMU team for the audit.*

## Fact File

	<b>BTech</b>	<b>Hons</b>	<b>Master's</b>	<b>Doctoral</b>
Enrolled in 2008	1209	1131	1335	338
Graduates (graduating in 2009)	449	463	279	47

NMMU had 22810 contact and off-campus students in 2008. African students accounted for 59,14% of total enrolments, white students 25,47%, coloured students 13,16% and Indian students 2,21%. The ratio of male to female students was 46:54 respectively.

## Postgraduate student enrolment

The 2804 students enrolled for honours, master's and doctoral degrees represented just over 12% of the total number of 22 810 students at NMMU. Full research master's registrations accounted for far less than half of registrations at this level.

Headcount enrolments at the master's and doctoral level have declined since the merger, from 1 732 in 2005 to 1 673 in 2008. However, while master's degree registrations declined over that period (from 1 473 to 1 335), doctoral registrations increased (259 to 338).



*Khwezikazi Mkentane (left) and Tutu Maseko, are two of the four women students completing the country's first BSc honours degree in Formulation Science.*

A possible cause for the growth in doctoral enrolments is that significantly larger NMMU scholarships have been made available for doctoral scholarships since 2005 (R30 000 per annum as opposed to R7 500); and that all doctoral students, including international students, became eligible for NMMU scholarships.

An office for Mature and Postgraduate Masters was established in 2007 and further developed in 2008. The office acts as an information access point from where prospective postgraduate students are able to retrieve general and specialist knowledge.

## International students

The university has set itself the goal of increasing the total international student enrolments from the current 8.76% of the student body to 15%. Almost 15% of the international students in 2008 were already on master's and doctoral level. Of these students, 30% were enrolled in the Faculty of Arts and 27% in the Faculty of Business and Economic Sciences.

## Research focus: Nine Institutional Academic Focus Areas

The prime reason for prioritising focus areas is to be excellent. Accordingly, nine academic focus areas were identified:

- ▶ Health and wellness
- ▶ Economic and business development with a focus on job creation and entrepreneurship
- ▶ Materials and process development for industry and manufacturing
- ▶ Emerging information and communications technology for development
- ▶ Environmental and natural resource management
- ▶ Culture, communication and language
- ▶ Leadership, governance, democracy and justice
- ▶ Educational development in support of excellence in teaching, learning and curriculum
- ▶ Infrastructure and human settlement development

## Research strengths

A number of clear strengths within the institution's nine institutional academic focus areas have been identified, including:

- ▶ The environment and ecology (including environmental law),
- ▶ Marine and estuary studies,
- ▶ Optic fibres and electron microscopy,
- ▶ Mathematics and science education,
- ▶ Nursing and community health,
- ▶ Architecture and the built environment,
- ▶ Engineering technology (including friction stir processing),
- ▶ Art and design,
- ▶ Chemical technology,
- ▶ IT programming and IT systems support,
- ▶ Academic development (especially for disadvantaged students).

## NRF Research Niche Areas

In 2008 the following three NRF supported Research Niche Areas (RNAs) at NMMU were allocated a budget of R2 146 333 by the NRF and NMMU which supported 13 staff members and their students:

- ▶ Innovative batch for downstream chemical products and processes: Mr Geoff Ritson (team leader)
- ▶ Business Information Risk and Security: Prof Rossouw von Solms (team leader)
- ▶ Manufacturing Technology: Prof Danie Hattingh (team leader)

A fourth and new niche area - building a biodiversity-based economy in the Eastern Cape - successfully applied in 2008 for 2009 funding. Prof Graham Kerley is the team leader.

## Faculty and cross-faculty research themes

In accordance with the university's strategic research plan, faculties identified and developed a limited number of research and innovation themes in 2008 to address national, regional and local imperatives underpinning the NMMU's academic focus areas. The themes proposed by the faculties will be consolidated to encourage multi-disciplinary collaboration across faculties. They will be used to focus resources and develop a critical mass of

experienced researchers. The ultimate goal is that each theme will be spearheaded by a research institute headed by NRF A- and B-rated researchers.

### CROSS-FACULTY RESEARCH THEMES

Co-ordinating faculty	Theme	Driver
Arts	Social Cohesion	Prof Thoko Mayekiso
Business and Economic Sciences	Regional economic development (including SMMEs and entrepreneurship)	Prof Piet Naudé
	Ethics, governance and leadership	Prof Elmarie Venter
Education	Curriculum development for all faculties	Prof Paul Webb
Engineering, the Built Environment and Information Technology	Injury On Duty (IOD) in motor vehicle industry	Prof Henk De Jager
Health Sciences	Health and disease management responsive to regional needs	Prof Ilse Truter and Prof Mark Watson
Science	Natural resource management and energy	Prof Andrew Leitch

Please refer to the faculty section of this report for faculty specific research themes.

## Research Entities

There are 22 registered research entities, classified into institutes at the highest level (three), centres (five), and units (14) at the lowest level. During 2008 the policy governing the establishment, operation and review of entities was further refined. The main objective of the new policy is to facilitate a process towards establishing centres of excellence based on NMMU's research and innovation themes. The policy encourages the formation of research networks and groups within the university, as well as inter-departmental and inter-faculty collaboration, which will enable the future development of the critical mass necessary for research excellence. Please refer to the faculty section of the report for more detailed information about the research entities.

## Technology Stations

NMMU has two Department of Science and Technology (DST) technology stations:

- ▶ Automotive Components Technology Station (ACTS) headed by Prof Danie Hattingh
- ▶ Downstream Chemical Technology Station (DCTS) headed by Mr Geoff Ritson

In 2008, the Tshumisano Trust, on behalf of DST, signed new three-year contracts with both stations to ensure continued financial support. The stations were identified in 2008 by Tshumisano Trust as the best of the 14 stations in South Africa.

## Research Chairs

The SA Research Chairs Initiative (SARChI) is a strategically-focused knowledge and human resource intervention sponsored by the DST and administered by the NRF. During 2008 the Tier 2 Chair in Nanophotonics allocated to Prof Reinhardt Botha of the Physics Department was further developed. NMMU also successfully submitted pre-proposals to NRF for a further four SARChI Chairs.



*Prof Igor Gorlach, GMSA  
Chair in Mechatronics*

A decision was taken to establish in-house a chair in HIV/AIDS Education, funded with R3m by the Faculty of Education. A sponsorship of R3.6m over a five-year period, by General Motors of South Africa, also saw the establishment of the GMSA Chair in Mechatronics, under the leadership of Prof Igor Gorlach, in the Faculty of Engineering, the Built Environment and Information Technology. This complements the existing VWSA-DAAD International Chair in Automotive Engineering in the same faculty, headed by Prof Hinrich Holdack-Janssen.



*Prof Hinrich Holdack-Janssen, VWSA DAAD International  
Chair in Automotive Engineering*

## NRF Evaluation and Rating of Researchers

NMMU recognises the rating of researchers as one important benchmark of research excellence in South Africa. The number of NRF-rated researchers increased from 55 in 2007 to 57 in 2008 ensuring that NMMU retained its place among the top 10 South African universities in terms of NRF ratings. Prof Richard Cowling became the first NMMU staff member to be placed in the A (1) category. It remains a concern however, that NMMU has only one A-rated and five B-rated researchers.

### 2008 NRF-rated researchers per faculty

Faculty	A	B	C	P	Y	L	Total
Arts			3			1	4
Business & Economic Sciences			1		2	3	6
Education			2			1	3
Engineering, the Built Environment and Information Technology		1	4				5
Health Sciences		1	2				3
Law			1		2		3
Science	1	3	21		2	4	31
Higher Education Access & Development Services			1				1
Sport Bureau			1				1
<b>Total at NMMU</b>	<b>1</b>	<b>5</b>	<b>36</b>		<b>6</b>	<b>9</b>	<b>57</b>

## Research Awards

In recognition of research outputs and excellence in research, awards were presented to established and emerging researchers in November 2008. Awards were made to eight Faculty Researchers of the Year, seven Emerging Researchers of the Year and three Performing and Creative Arts staff members. The winners were:

### NMMU Researcher of the Year

Prof Bert Olivier (Faculty of Arts)

### Faculty Researchers of the Year

Prof Bert Olivier (Faculty of Arts)

Prof Piet Naude (Faculty of Business & Economic Sciences)

Prof Tilla Olivier (Faculty of Education)

Prof John Smallwood (Faculty of Engineering, the Built Environment & Information Technology)



Prof Mark Watson (Faculty of Health Sciences)  
Prof Narnia Bohler-Muller (Faculty of Law)  
Prof Thomas Gerber (Faculty of Science)  
Dr Richard Stretch (Support services)

### Emerging Faculty Researchers of the Year

Mr Theodore Petrus (Faculty of Arts)  
Prof Eileen Mazibuko (Faculty of Business & Economic Sciences)  
Dr Lesley Wood (Faculty of Education)  
Dr Annelize Els-Botes (Faculty of Engineering, the Built Environment & Information Technology)  
Ms Ottilia Brown-Baatjies (Faculty of Health Sciences)  
Dr Deon Erasmus (Faculty of Law)  
Dr Maryna van de Venter (Faculty of Science)

### Performing and Creative Arts Awards

Prof Cleone Cull  
Ms Ethna Frankenfeld  
Ms Junita Lamprecht-Van Dijk

## Developing Research Capacity

NMMU qualified, based on 2006 research outputs, for a research development grant of R1.26m from the DoE for 2008. These funds, as well as other external and internal funding, were used to develop research capacity through a number of initiatives.

## Thuthuka programme

In 2008, the NRF Thuthuka Programme, which is aimed at advancing emerging researchers through its sub-programmes (Researchers in Training, Research Development Initiative for Black Academics and Women in Research), enhanced the research endeavours of 23 grant holders at NMMU. Of these, 11 were black and 13 were female. This support had the wider impact of the grantholder-linked student support of 17 postgraduate students. An amount of approximately R1.4m was awarded under this programme, including a contribution from NMMU of about R800 000.



*Ms Ethna Frankenfeld, winner of the Performing and Creative Arts Award for Printmaking.*



*Prof Cleone Cull, winner of the Performing and Creative Arts Award for Fine Arts.*



*Ms Junita Lamprecht-Van Dijk, winner of the Performing and Creative Arts Award for Choral Conducting.*



*The 2007-2009 Phuhlisa candidates are (from left) Noluntu Dyubhele, (Economics), Bianca Wright, (Journalism, Media and Philosophy), Inge Economou, (Applied Design), Ronel Nel, (Zoology), Zoleka Soji, (Social Development Professions), Jacques Ophoff, (ICT), Nandipha Mnonopi and Essa Suleman (Biochemistry and Microbiology), Nenekazi Mkuzangwe, (Statistics), Pragashni Padayachee, (Mathematics and Applied Mathematics) and Joleen Steyn-Kotze, (Political and Governmental Sciences). Absent: Riki Ferreira and Percy Hlangothi, (Chemistry), Ted Petrus, (Sociology and Anthropology), and William Rall, (Mechanical Engineering).*

## Phuhlisa Research Development Programme

Phuhlisa (meaning “to develop”) aims to develop the next generation of academic leaders. It was started in 2007 as a structured three-year programme, during which each participant receives the opportunity to develop teaching, research and personal skills by means of a series of workshops as well as through a close mentoring relationship with an experienced senior staff member at NMMU. It also provides funding support for research projects, where applicable, and is co-funded by the Ford Foundation of America and the NMMU Council and Trust. The first intake in 2007 had 15 participants and the second in 2008 had 31, consisting of both staff and postgraduate students completing their master’s or doctoral studies.

## Research Development Fund

The Research Development Fund (RDF) is an internal funding opportunity available to those NMMU emerging researchers who are conducting research but do not have access to external grant funding. It is intended largely as seed funding for staff members in the process of studying towards a further academic qualification and seed funding for researchers who have recently completed their doctoral qualification. Funding is awarded on an application basis in which the research proposal along with an associated budget is peer-reviewed by two research associates. Funding for 38 projects, amounting to R530 000, was granted in 2008.

## Research Capacity Development Workshops

In conjunction with the Phuhlisa programme several workshops aimed at empowering emerging researchers through the development of personal and research skills were made available to the NMMU research community in 2008.

A large number of postgraduate students and academic staff members participated in a series of 50 workshops hosted between February and October on a wide-ranging series of topics, encompassing career development, self-motivation, personal development, research skills and supervisory skills.

## Postdoctoral Scholarships

In 2008, NMMU granted nine postdoctoral scholarships to outstanding national and international scholars. These scholars were hosted in various faculties and departments across NMMU. A further eight postdoctoral scholarships were supported by external funders, including the NRF.

### 2008 Postdoctoral Fellows

	Total	International	South African
Funded from NMMU departmental or personal research accounts and managed by RCD	6	4	2
Funded by NMMU Council (RTP budget) and NMMU Trust	9	5	4
Funded by NRF	4	3	1
External funders	2	2	0
	21	14	7

## South Africa-Netherlands Research Programme (SANPAD)

SANPAD (South Africa-Netherlands Research Programme on Alternatives Development) finances collaborative research projects of a high quality that have a social development and policy-related content that may be multi-disciplinary and cross-thematic, with a special focus on poverty reduction. In 2007, Prof Vincent Kakembo was awarded a SANPAD grant of R480 150 for his research project entitled "Vegetation invasions: implications for hydrological and erosion response, land degradation and climate change." He received the first transfer of this funding in 2008. The SANPAD Research Capacity Initiative programme is a prestigious programme in research methodology, worth about R160 000 annually. The programme seeks to support the research capacity development of South African junior or emerging researchers and consists of approximately seven weeks of contact learning offered at doctoral level. Annually, a few places in the programme are awarded to doctoral students who are not part of a SANPAD-supported project but are particularly deserving. In 2008, Ms Zoleka Soji of the Department of Environmental Health and Social Development Professions at NMMU was selected as a participant.

## Research Associates

Through mentoring and the facilitation of workshops, research associates add immense value to the various research capacity development programmes. They also help NMMU in its review of funding proposals. The number of research associates at NMMU has grown from 20 in 2006 to 90 in 2008, with 40 of these appointed within the Science Faculty. Research associates are drawn from retired NMMU staff members, former NMMU staff members and students, as well as other individuals who conduct research in collaboration with NMMU staff or departments. The appointment of research associates is a mechanism through which the research expertise of retired or former academic staff members of NMMU may be retained as a tool in building the research capacity of young and emerging academic staff members.

## Research Funding

### DoE research output subsidy

The research output subsidy paid by the Department of Education (DoE) represents a crucial benchmark of research excellence as it is based on doctoral and research master's students who graduate, and subsidies generated through academic publications. The monetary value of the subsidy from this source increased from R39m in 2006 to more than R47m in 2007. The monetary value of the 2008 outputs will only be available in 2010. The 2007 weighted-research output of NMMU amounted to a delivery proportion of 89% of the expected weighted-research output according to the DoE norm. This places NMMU 9th among South African universities. In 2007, there was a slight decrease to 179.70 units for research publications compared to 187.73 units in 2006. This was mainly due to merger-related pressures and it seems as if this trend will continue for at least the next year. (Confirmed outputs and figures for 2008 were not available by the time of going to print.)

#### NMMU DoE research output units for period 2004 to 2007

Year	Journal	Books	Conference	Total
2004	132.80	7.30	12.90	153.00
2005	183.72	2.26	23.30	209.28
2006	172.20	1.71	13.82	187.73
2007	165.04	0.33	14.33	179.70
2008	*156.44	**	**	**

\*Audited submission to DoE

\*\* Available in February 2010

#### Incentive funding paid in 2008 to faculty RTI committees and individuals based on 2006 research outputs as measured by the DoE.

	Faculty RTI committee	Individuals in faculty	Number of individuals
Arts	R374 710	R848 310	21
Business & Economic Sciences	R213 688	R459 553	26
Education	R27 599	R88 798	7
EBEIT	R162 760	R532 279	18
George Campus	R27 608	R92 824	6
Health Sciences	R52 245	R190 734	14
Law	R270 963	R520 568	10
Science	R611 520	R1 680 592	64
HEADS	R30 220	R1 02 661	3
Other	R29 590	R88 770	4
<b>TOTAL</b>	<b>R1 800 903</b>	<b>R4 605 089</b>	<b>173</b>

The above table indicates that only 34% of academic staff published a research publication subsidised by the DoE or promoted a research master's or doctoral student who graduated.



## Internal Research Funding

The RTI Committee's budget (excluding student bursaries) increased by 8% in 2008 to R11 789 500. A large proportion of these funds is allocated to research incentives – rewarding researchers who publish articles in DoE-subsidised journals. In 2008, only for the second time, was R80 000 reserved for staff producing creative outputs not subsidised by the DoE and their faculty RTI committees.

Towards the end of 2008 the management of NMMU approved in principle more than R20m for the erection of a building to house a R81.5m High Resolution Electron Microscope which will be jointly funded by NRF/DST and industrial partners Sasol and the Pebble Bed Modular Reactor.

## Master's and doctoral bursaries and scholarships

With a budget of R7.9m, the NMMU Postgraduate Research Scholarship provided funding to approximately 385 students in 2008. 104 doctoral students were funded, with full-time doctoral students receiving R30 000 for the year, and 281 master's students were awarded scholarships with values ranging from R8 000 to R20 000 per annum for full-time study. The budget for NMMU financially needy bursaries was R500 000, and 59 bursaries of up to R10 000 each were awarded.



*NMMU postgraduate student Obediant Tshabalala, a Mandela Rhodes Scholar, had the privilege of meeting Former President Nelson Mandela during 2008.*

## External Support for Research

An indicator of research quality and activity levels at a university is the extent to which external funding has been granted for research. In 2008, the most significant source of external research funding was the National Research Foundation (NRF) which awarded R35 064 966 (R22.7 million in 2007) in grant funding to NMMU. This enabled 61 staff members with a total of 118 grants and 200 students (including post-doctoral students) to participate in 28 NRF programmes and sub-programmes. This included NRF grant holder-linked bursaries of R2.45m and 30 successful applications in the category "NRF International Travel Block Grant" which was administered internally by the Research Committee.

### NRF grants to NMMU in 2008

Programme	Total
Ad hoc grants - ICD	83 977
African coelecanth ecosystem programme	430 000
Conservation and management of ecosystems and biodiversity	1 317 938.03
Distinct South African research opportunities	32 000.00
Economic growth and international competitiveness	674 110.65
Incentive funding for rated researchers	759 000.00
Indigenous knowledge systems	612 857.11
Information and communication technology	420 801.17
Innovation fund grants	1 960 583.45
Institutional research development programme	1 710 653.32
International liaison	115 888.81
International science and technology agreements	1 121 520.49
Knowledge interchange and collaboration	345 000.00
MCM provincial funding	371 888.00
Nanotechnology flagship programme	1 103 000.00
National equipment	4 111 000.00
National nanotechnology grant	5 000 000.00
Rediba (Thuthuka)	113 500.00
Research equipment programme	240 000.00
Research infrastructure support programme	217 000.00
Researchers in training (Thuthuka)	601 751.19
SA research chairs - open	1 464 040.00
Scholarships & fellowships programme	3 431 073.49
Sustainable livelihoods: the eradication of poverty	158 000.00
Technikon research development programme	540 955.00
Technology and human resources for industry programme (THRIP)	7 748 567.00
Unlocking the future	174 452.31
Women in research (Thuthuka)	205 409.94
<b>Total</b>	<b>R35 064 966.96</b>

Prof Jan Neethling of the Physics Department were allocated R4 680 000 for the period 2008 – 2010 to conduct research on the development of nanomaterials under NRF's National Nanotechnology Flagship Programme.



Included in the NRF allocation is R7 648 437 (adjusted amount) granted under the Technology and Human Resources for Industry Programme (THRIP) which represents a substantial increase compared to 2007. Industry contributed a further R10 366 913 towards THRIP projects.

### 2008 Technology and Human Resources for Industry Programme (THRIP) Awards

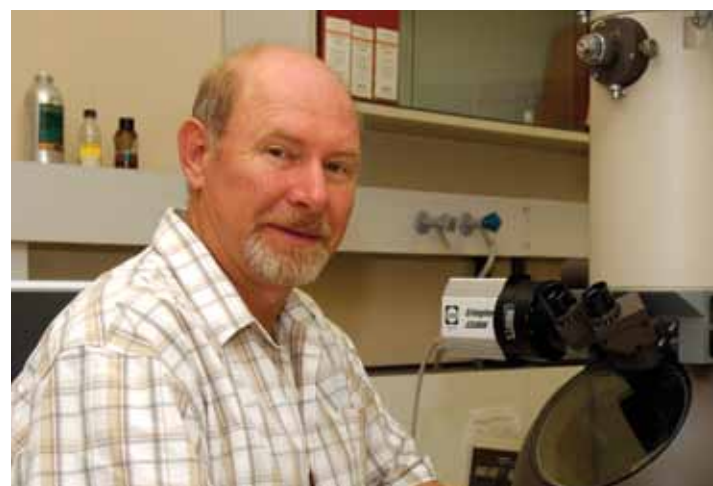
Project Leader	THRIP amount	Industry amount
Prof D Hattingh	614 603	1 293 900
Prof A Leitch	140 000	140 000
Prof A Leitch	345,800	728 000
Prof JH Neethling	5 277 796	5 555 575
Prof E van Dyk	57 146	171 438
Prof E van Dyk	166 667	500 000
Prof J Wesson	249 375	525 000
Dr D Winter	213 750	225 000
Prof B Zeelie	583 300	1 228 000
<b>Total Awarded by THRIP</b>	<b>7 648 437</b>	<b>10 366 913</b>

Other statutory funding agencies contributed smaller amounts: Medical Research Council (MRC) – R258 000; African Laser Centre (ALC) – R347 031; National Laser Centre (NLC) – R945 299; Water Research Council (WRC) – R799 932. Prof Janine Adams of NMMU was appointed as chairperson of the WRC's Council.



*Prof Janine Adams, a professor in NMMU's Department of Botany, was appointed Chairperson of South Africa's Water Research Commission (WRC) by the minister of Water Affairs and Forestry, Lindiwe Hendricks. The WRC is tasked with leading and coordinating all aspects of water-related research in South Africa.*

The biggest external support for research in 2008 was the decision to establish at NMMU a High Resolution Transmission Electron Microscope (HRTEM) Centre under the leadership of Professor Jan Neethling. Following on from several discussions regarding a fund raising strategy, the NRF in partnership with the Department of Science and Technology (DST) agreed to take the responsibility for securing the funds for the purchase of the suite of instruments required for the Centre. This cost is estimated at R81.5m and will include the initial human resource development costs. The 50% down-payment, required by the suppliers to place an order for the HRTEM before the end of 2008/09 financial year, was secured. The project is supported by industry partners (Sasol – R6m and PBMR – R5m).



*Prof Jan Neethling, Department of Physics*

Numerous other external ad hoc grants for research were made in 2008. For example, NMMU obtained a grant of some \$60 000 (USD) from the Critical Ecosystem Partnership Fund (CEPF) for a project to develop a biodiversity based, off-the-beaten-track, tourism route in the Gouritz Corridor in the Southern Cape. Another example was the Oslo Celebration Grants which is jointly administered by the DoE and the Norwegian Ministry of Education through its embassy in SA. The only two successful South African applicants are from NMMU's Faculty of Education: Dr Laetitia Greyling and Ms Pam Austin, who were each granted R100 000.

In addition to external grant funding, contract research projects were externally funded in 2008 to the value of R46.5m. Other third-stream income, from short courses, non-diploma courses and summer / winter schools, was approximately R20m. Income in the form of an institutional levy on third-stream income was however disappointingly low.

# Intellectual Property and the Commercialisation of Research

The ownership of intellectual property falls under an IP policy. NMMU claims ownership of all intellectual property developed by staff in the course and scope of their employment, as well as that of supervised students. Any income arising from the commercialisation of Intellectual Property (IP) is distributed among the inventors, relevant departments and NMMU.

Commercialisation of intellectual property generally involves a partnership with an external party. Previously this process had been fairly ad hoc, but is now being handled by the Department of Innovation Support & Technology Transfer (IS & TT) which ensures that there is no conflict of interest and will, with the researcher(s), approach external parties to commercialise the research.

<b>NMMU IP Score Card</b>	<b>2008</b>	<b>2007</b>
Disclosures	10	7
Patents provisionally filed	6	0
SA patents granted	1	0
PCT filed	0	2
National granted	1	0
National filed	0	12
Licences / assignments (sale of IP)	7	0
Spin-out companies in which NMMU holds equity	4	0

In 2008 NMMU received R236 000 from the Innovation Fund's Patent Support Fund. The purpose of the fund is to refund institutions with up to 50% of patent costs.

Four commercialisation deals were struck in 2008 and NMMU was in the process of being issued shares in four spin-off/start-up companies. These commercialisation deals are:

## REPLACEMENT OF ZINC OXIDE IN RUBBER COMPOUNDS

Zinc oxide is an environmental hazard and efforts are being undertaken to eliminate it from rubber compounds, particularly vehicle tyres. Two patents in this field were filed by NMMU and have been assigned to a start-up company called Rubber Nano Products (Pty) Ltd (RNP)

that owned a complimentary patent which could solve the zinc oxide problem. Trials at German tyre companies have been successfully completed and RNP is in the process of signing an agreement with a German manufacturer to license the technology. Due to European chemical regulations, manufacture cannot be undertaken in South Africa; however, on-going research funds will be provided to NMMU by RNP to continue research in this and related fields. NMMU owns shares in RNP. (See story on p.7)

## INSECT REPELLENT TECHNOLOGY

In 2008, NMMU and Afrepell Manufacturing started a company called Afrepell Technologies (Pty) Ltd for the commercialisation of two patents owned by NMMU. The patents are a novel formulation for an insect repellent (patented internationally during 2008) and a production method for one of the active ingredients (filed as a provisional patent during 2008). South African sales of the insect repellent will begin in 2009; the insect repellent is also currently being trialled in the United States. Manufacturing of the active and, where appropriate, of the insect repellent mixture, will be done in South Africa. NMMU owns shares in Afrepell Technologies. (See story on p.8)



## UKUBAMBA STUDENT COUNSELLING SOFTWARE

NMMU has developed software for capturing and reporting on student counselling data at universities, allowing the impact of interventions to be tracked and assessed. This was licensed to UNISA in 2008 and more

universities have expressed an interest in licensing the software.

## ROSE PRESERVATION TECHNOLOGY



A provisional patent on the preservation of roses was filed in 2008. A business plan was submitted to the Industrial Development Corporation (IDC) and R5m in Venture Capital funding was provided by the IDC to African Everose, the start-up company created for the commercialisation of the technology. NMMU assigned its patent to AEIP (Pty) Ltd, the IP holding company which will license the technology to African Everose. The company will provide a number of semi-skilled jobs and an impetus for the struggling flower industry. NMMU owns shares in both African Everose and AEIP.

## National Innovation Competition (NIC)

The NIC takes the form of two competitions, the first is the Student Business Plan Competition, which was run in 2007 and will be run again in 2009. This particular competition aims to encourage student entrepreneurs to develop innovative products and services and take the first steps towards commercialisation.

The competition takes place in two stages: the first is at an institutional level, where NMMU students compete against each other; the second takes place nationally, where the top students from each institution compete.

The winner of the 2008 NMMU institutional phase was Robert Bosch who went on to win the national competition in February 2008. His invention and research is featured on page 7 in this report.

The second form of the competition is between all South African higher education institutions which compete for the title of "The most innovative HEI in South Africa". A written submission provides information on the innovation strategy of the institution, the way innovation and entrepreneurial activities are managed at the institution, as well as data on patents, research outputs and commercialisation. In 2008, NMMU won the title of "Most Improved HEI" in terms of technological innovation for activities up to the end of 2007. The R200 000 prize money is to be used to promote innovation at NMMU.









# Faculty of Arts

*Creating tomorrow*

The Faculty of Arts continues to maintain an excellent research and scholarly record in terms of DoE-accredited journal articles, books, book chapters, creative outputs, refereed conference proceedings, national and international research collaborations, presentation of papers at national and international conferences, and prestigious editorships.

The faculty's research agenda is informed by its strategic goal of creating an environment that is conducive to the development and maintenance of high quality research.

Various initiatives, such as teaching replacements, supervision workshops, postgraduate seminars, writing retreats and research methodology workshops, are aimed at achieving the following research objectives:

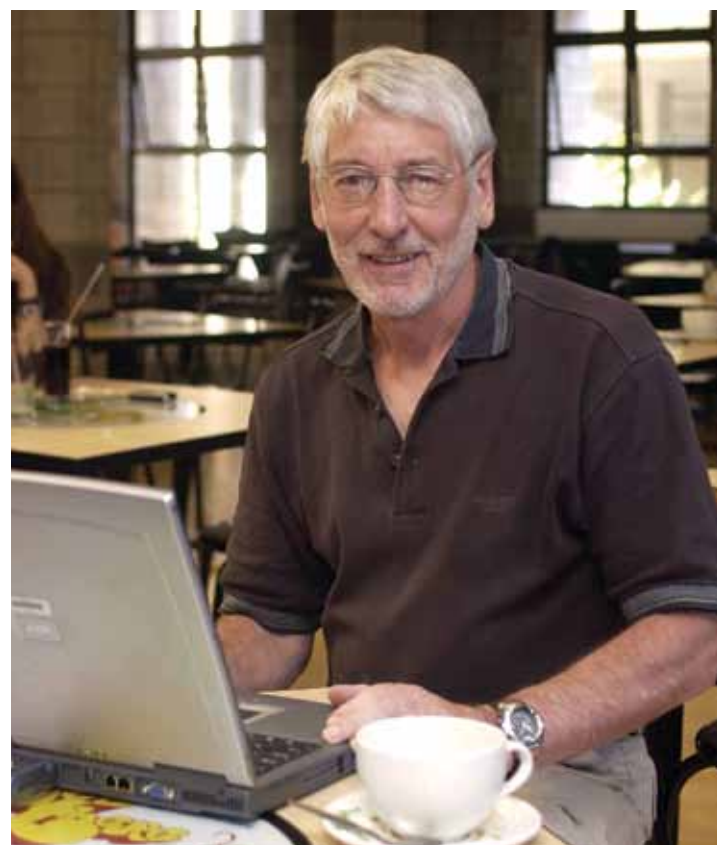
- ▶ To provide an enabling and supportive environment to develop the research and publication capacity of academic staff
- ▶ To develop strategic research partnerships collaborations nationally and internationally
- ▶ To increase the research productivity of academic staff and students (including undergraduate students)
- ▶ To increase the numbers of students enrolled for research degrees
- ▶ To promote the recognition of creative outputs as a form of scholarship

RESEARCH THEMES	DRIVER
Media, Communication and Culture Discourses in a Developmental Context	Prof Bert Olivier and Prof Danie Jordaan
Democracy and Service Delivery within a Developmental Context	Dr Wela Manona and Mr Mzikayise Binza
Creating Space and Place for People in South Africa's Developing Urban Regions	Prof Gavin McLachlan
Identity and Marginality in South African Literature	Prof Helize Janse van Vuuren and Dr Mary West
Conflict and Transformation in Africa	Dr Lyn Snodgrass and Dr Gavin Bradshaw
Transculturality in Music, Art and Design	Ms Mary Duker
Creative Practice	Ms Mary Duker
Political Ideologies and Thought, African Socio-political Development, and International Relations: Theory and Practice	Dr Wendy Isaacs-Martin and Ms Joleen Steyn-Kotze

## RATED RESEARCHERS

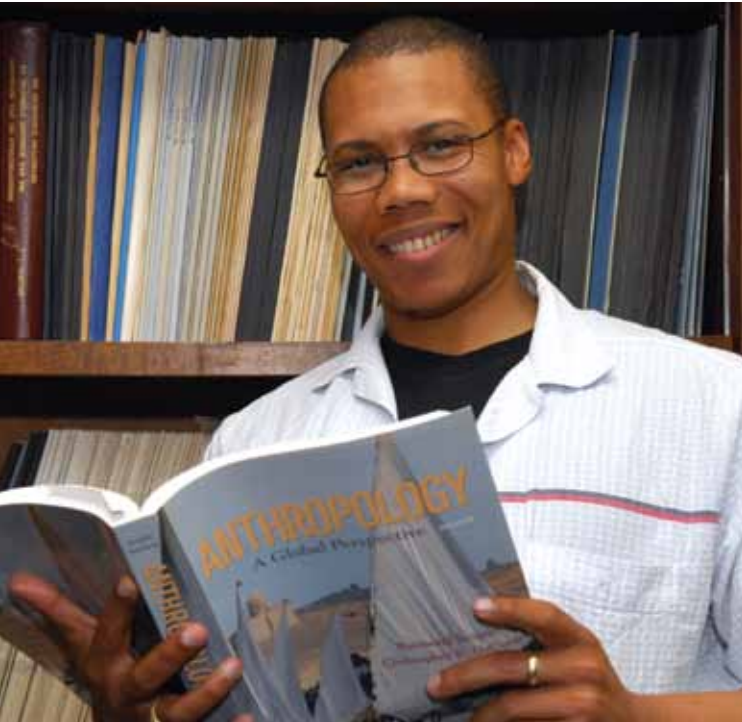
Surname, Initials, Title	Rating Category
Janse van Vuuren, HE, Prof	C2
Hibbert, L, Prof	L
Kotze, EF, Prof	C2
Olivier, G (Bert), Prof	C1

## Faculty Researcher of the Year



*Prof Bert Olivier, Faculty Researcher of the Year 2008*

## Emerging Faculty Researcher of the Year



*Mr Theodore Petrus, Emerging Faculty Researcher of the Year*

Dr Ted Petrus is a lecturer in the Department of Sociology and Anthropology. Dr Petrus' research interests focus on witchcraft-related crime, as well as issues of cultural and ethnic diversity. He considers witchcraft-related crime as an important area of study because it exposes, among other things, the relationship between crime and culture, or cultural beliefs. This has important implications for debates about multiculturalism, human rights and cultural rights.

Cultural and ethnic diversity continues to be an issue of relevance in the South African context. Problems related to prejudice, discrimination and racism for example, are still prevalent in society and therefore research into these issues is necessary.

## Research entities

### RAYMOND MHLABA RESEARCH UNIT FOR PUBLIC ADMINISTRATION AND LEADERSHIP

**Head:** Dr Shakes Binza

**Email:** Mzikayise.Binza@nmmu.ac.za

**Tel:** 041 504 2256

This unit for public administration and leadership provides research and consultancy services to organisations, civil society movements and the business sector in South Africa and beyond.

The unit hosted the first Raymond Mhlaba Memorial Lecture on 22 August 2008 where former president Thabo Mbeki was the guest speaker. The title of his speech was "Leadership for development in the 21<sup>st</sup> century: nation building revisited".

The unit was involved in research on public-private partnerships in the metropolitan government: perspectives on governance, value for money and the roles of selected stakeholders and the history of transformation of an apartheid capital city into a democratic provincial capital city.



*Mr Weza Moss (trustee at the Raymond Mhlaba Trust), Vice-Chancellor Prof Derrick Swartz, Former President Thabo Mbeki, Eastern Cape premier Mbulelo Sogoni (EC Premier) and Nelson Mandela Bay mayor Nondumiso Mapazi at the inaugural Raymond Mhlaba Memorial Lecture on 22 August 2008.*

## UNIT FOR THE STUDY AND RESOLUTION OF CONFLICT

**Head:** Dr Gavin Bradshaw

**Email:** Gavin.Bradshaw@nmmu.ac.za

**Tel:** 041 504 2913

This unit offers research, training programmes and intervention in conflict and has been involved in a needs assessment of the situation in Sudan's Darfur province to establish the possibilities for assistance to the people of the region in the form of conflict management interventions, research, academic exchange, and development facilitation.

## Highlights and achievements



*Prof Liesel Hibbert, newly appointed Head, Department of Applied Language Studies.*



*Prof Helize Janse van Vuuren, C-Rated Researcher*

- ▶ The faculty hosted Dr Joya Uraizee, a Fulbright scholar from the University of Minnesota.
- ▶ Prof Thoko Mayekiso was appointed by the Council of the Academy of Science of South Africa (ASSAf), to serve on the ASSAf Peer Review Panel for Scholarly Journals in the Social Sciences and related fields category.
- ▶ The Department of Language and Literature hosted a colloquium on *"Interrogating Whiteness"* attended by national and international speakers. The best papers from the colloquium are to be published in an Information Sciences Institute (ISI-listed) literary journal, *English in Africa*, under the guest editorship of Dr Mary West.



*Dr Sheena Goddard received her Doctoral Degree from Rhodes University.*

- ▶ The following staff members completed their doctoral degrees in 2008:
  - Dr Jacqui Dornbrack from Wits University
  - Dr Wendy Isaacs-Martin from the University of Cape Town
  - Dr Sheena Goddard from Rhodes University

## ONGOING INTERNATIONAL RESEARCH COLLABORATION

- ▶ Profs Peter Cunningham and Henk Pauw and a postgraduate student cooperated in international research on intercultural communication and diversity management with colleagues from Rhodes University, University of Applied Science Nürtingen-Geisslingen in Germany and California State University and the University of Mississippi.
- ▶ Prof Otto Terblanche was involved in a joint research project with Prof Dr Annick Schramme, Department of Political and Social Sciences and Cultural Management, University of Antwerpen, Belgium. This project examines the relations between Belgium (Flanders) and South Africa.
- ▶ Prof Thoko Mayekiso is involved in international research collaboration with Dr Larry Icard from Temple University School of Social Administration Center for Intervention and Practice Research, Profs JB Jemmott and GA Heeren from the University of Pennsylvania, Philadelphia, Dr G Barnes from Temple University, Philadelphia, Dr Z Ngwane from Haverford College, Haverford, and Dr A O'Leary Centers for Disease Control and Prevention, Atlanta, on men having sex with men.



# Capacity building

The faculty hosted a series of capacity building workshops facilitated by international and national scholars including:

- ▶ Dr Philden Ndlela's presentation on 8 August 2008 entitled *Orature and the Discourse of Liberation*: A reading of two speeches by the late Robert Sobukwe, former SRC president at Fort Hare in 1949, and President Nelson Mandela's speech, "I am prepared to die".
- ▶ Dr Nhlanhla Thwala, Director of the Language School, Wits University on 2 September 2008 entitled *The Quest for Better Research Productivity*.
- ▶ Prof Ogoh Alubo, Professor of Sociology (Health and Social Development) Department of Sociology, University of Jos, Nigeria presented the following:
  - Guest lecture on *Citizenship and Integration in Nigeria: Challenges for Nation Building* on 29 September 2008.
  - Research methodology workshop on *Lure and Pitfalls of Qualitative Research* on 6 October 2008.
  - Writing retreat from 1 to 4 October 2008 at St Francis Bay.
- ▶ Prof Jeremy Hawthorn, an international literary scholar from Trondheim, Norway, facilitated a research writing workshop.

## Publications

### ARTICLES IN DOE-ACCREDITED JOURNALS

BOTHA, M. E. & VAN VUUREN, H.E. 2008. "Onze strijd, onze heldendood ...": Kreatiewe verwerking van patriotiese stof uit Celliers se oorlogsdagboek in Winterbach se *Niggie*. *Tydskrif vir Geesteswetenskappe* 48 (1), pp 111 – 128.

BOTHA, M. E. & VAN VUUREN, H.E. 2008. Die enigmatiese aard van die treksterfiguur in Ingrid Winterbach se *Niggie*. *Tydskrif vir letterkunde* 45 (2), pp 48 – 71.

ERFANI, F. & WHITMIRE, J.F. 2008. Ricoeur and the pre-political. *Continental Philosophy Review* 41 (4), pp 501 – 521.

ERFANI, F. 2008. Fixing Marx with Machiavelli: Claude Lefort's Democratic Turn. *Journal of the British Society for Phenomenology* 39 (2), pp 200 – 214.

FELIX, N., DORNBRACK, J. & SCHECKLE, E. 2008. Parents, homework and socio-economic class: Discourses of deficit and disadvantage in the "new" South Africa. *English Teaching: Practice & Critique* 7(2), pp 99 – 112.

HURST, A.M. 2008. Humanising research: The cares that drive researchers. *Acta Academica* 40 (3), pp 1 – 34.

HURST, A.M. 2008. The Impotence of Pseudo-Antagonism: A Derridean Response to Žižek's Charge of Practical Irrelevance. *South African Journal of Philosophy* 27 (1), pp 10 – 26.

JOHN, P. 2008. Die tyd van die triekster: "identiteit" in enkele hedendaagse Afrikaanse prosatekste. *Literator* 29 (3), pp 1 – 24.

KASESE-HARA M., MAYEKISO, T., MODIPA, O., MXOBE, N. & MANGO, T. 2008. Depression, mothers' concerns and life-events experienced by HIV-positive, HIV-negative and mothers with unknown HIV status in Soweto. *South African Journal of Psychology* 38 (3), pp 575 – 588.

KOCH, E. & DORNBRACK, J. 2008. The use of language criteria for admission to higher education in South Africa: issues of bias and fairness investigated. *Southern African Linguistics and Applied Languages Studies* 26 (3), pp 333 – 350.

KONIK, A. 2008. Cultural artefacts as places of political contestation: Radical democracy, discursive 'groundlessness' and *The Name of the Rose*. *South African Journal of Art History* 23 (1), pp 258 – 274.

KONIK, A. 2008. The political significance of 'presentism' in Annaud's *The Name of the Rose* (1984). *South African Journal of Art History* 23 (2), pp 89 – 105.

KOTZÉ, E.F. 2008. English-Afrikaans Skoolwoordeboek / School Dictionary. *International Journal of Lexicography* 21 (2), pp 207 – 212.



NEALER, E. & RAGA, K. 2008. A physical environmental management perspective on municipal water supply: proposals for Tlokwe City Council. *The Journal for Transdisciplinary Research in Southern Africa* 4 (1), pp 157 – 173.

NEALER, E. & RAGA, K. 2008. Knowledge about the origin of a municipality's potable water: A prerequisite for consolidation of more effective local governance. *Journal of Public Administration* 43 (3.1), pp 294 – 307.

OLIVIER, B. 2008. Architecture as consumer space. *South African Journal of Art History* 23 (1), pp 93 – 106.

OLIVIER, B. 2008. Negotiating the 'paranoiac structure' of human knowledge: Fowles's *The Magus* and Lacan. *South African Journal of Psychology* 38 (1), pp 176 – 199.

OLIVIER, B. 2008. The humanities, technology, and universities. *Phronimon: Journal of the South African Society for Greek Philosophy and the Humanities* 9 (1), pp 5 – 21.

OLIVIER, B. 2008. Trauma and Literature: Derrida, 9/11 and Hart's *The Reconstructionist*. *Journal of Literary Studies* 24 (1), pp 32 – 58.

OLIVIER, B. 2008. Women's 'nature' and architectural design. *South African Journal of Art History* 23(3), pp 66 – 74.

PETRUS, T.S. 2008. Satanism-related and Witchcraft-related Crimes: Possible Interdisciplinary Links between Anthropology and Criminology in the Study of 'Ritualistic Crimes'. *Acta Criminologica* 21 (2), pp 139 – 149.

POSTEL, G. 2008. The Unsettling Side of Death: Post-colonial Irony in Bosman's *Unto Dust*. *Safundi* 9 (2), pp 193 – 205.

POTGIETER, Z. 2008. From 'Other' to 'other', from symphony to film: musical representation of women in Berlioz's *Symphonie fantastique* and in the film *The Appointment*. *Acta Academica* 40 (4), pp 79 – 107.

RAGA, K. & ALBRECHT, W. 2008. Determining an ethical basis for public sector procurement management: The South African local sphere of government. *Journal of Public Administration* 43 (4.1), pp 781 – 797.

SOMNISO, M.M. 2008. Intertextuality shapes the poetry of Xhosa poets. *Literator* 29 (3), pp 1 – 17.

STEYN-KOTZE, J. 2008. Civic culture and the Botswana democracy: experiences from the Botswana Democratic Party. *Acta Academica* 40 (4), pp 153 – 186.

SUBBAN, M., PILLAY, P., BHOWAN, K., RAGA, K. 2008. Towards effective service delivery via customer relationship management. *Alternation* 14 (1), pp 34 – 58.

TERBLANCHE, H.O. 2008. Jacob Kohler: Meestervakman en Entrepreneur. *South African Journal of Cultural History* 22 (2), pp 1 – 19.

VAN VUUREN, H.E. 2008. Plagiaat? Appropriasie? Kulturele oorplanting? Huldiging? Brandende kwessies rondom mondelinge tradisies - Eugene Marais en die San opnuut bekyk. *Journal of Literary Studies* 24 (4), pp 85 – 112.

VAN VUUREN, H. E. 2008. "Alles vloei en niks hou stand": 'n Verkenning van Ingrid Winterbach se *Die boek van toeval en toeverlaat*. *Stilet* 20 (1), pp 163 – 176.

## CHAPTERS IN BOOKS SUBMITTED TO THE DOE FOR SUBSIDY

HURST, A.M. 2008. Derrida *vis-a-vis* Lacan: Interweaving Deconstruction and Psychoanalysis.



Dr Andrea Hurst, a postdoctoral fellow in the Department of Journalism, Media and Philosophy, published a book, *Derrida vis-à-vis Lacan – Interweaving Deconstruction and Psychoanalysis*, at Fordham University Press, New York, in May 2008. Reviewers described this book as having "resolved an impasse that has existed for 30 years' in this field".





# Faculty of Business and Economic Sciences

*Managing tomorrow*

The vision of the faculty emphasises its commitment to being engaged in relevant and innovative research. The ultimate objective is to integrate research into the activities of the faculty to serve as a basis for knowledge creation and application processes, as it relates to the various fields of study in the faculty.

With this as our main point of departure, the aim is to produce research that addresses real world issues in a practical manner. In an attempt to optimise its limited research capacity, the faculty resolved to direct its current diverse set of research interests and initiatives towards a limited number of focus areas or research themes.

RESEARCH THEMES	DRIVER
Leadership, governance and ethics	Prof Elmarie Venter
SMME, entrepreneurship and local economic development	Prof Piet Naude

The central themes are thus development and leadership with a specific focus on the African continent. With this as the common base, the task is to consolidate research activities in a constructive manner; furthermore, to encourage schools and departments within the faculty to focus their research activities on these themes via the formation of cross-disciplinary research teams.



*Prof Hendrik Lloyd, Chairperson, Faculty RTI Committee*



*Prof Miemie Struwig received the best paper award at the Global Management IT conference in NY*

In spite of the faculty's traditional overwhelmingly strong focus on professional education (rather than conventional research), the faculty succeeded in graduating six master's degree candidates by dissertation, 46 master's degree candidates by treatise and six doctoral candidates.

Furthermore, faculty members published 21 articles in accredited journals and received recognition for research papers presented at various national and international conferences. In this regard, one of our senior researchers Prof Miemie Struwig received the best paper award at the Global Management and Information Technology conference held in New York, with the paper entitled: "Exploring the value profiles of business students in South Africa".

Currently the faculty also has four research units. These research units are being re-aligned to the research activities of the various schools in the faculty as well as to the newly-identified faculty research themes. With this as the foundation, complimented by initiatives to increase the research capacity of staff, the faculty is confident that it has started on a growth trajectory that will see a marked escalation in its research outputs during the next years.



*Rated researchers in the Faculty of Business and Economic Sciences are (back from left), Profs Elroy Smith, Laetitia Radder, Cecil Arnolds, (front) Profs Madele Tait, Miemie Struwig and Elmarie Venter.*

## RATED RESEARCHERS

Surname, Initials, Title	Rating Category
Arnolds, CA, Prof	L
Radder, L, Prof	C2
Struwig, FW, Prof	L
Smith, EE, Prof	L
Tait, M, Prof	Y2
Venter, E, Prof	Y2

## Faculty Researcher of the Year

Prof Piet Naude was appointed as first full-time Director of the NMMU Business School in October 2008. Until that time, he was Professor of Ethics in the NMMU Business School and Director of the Unit for Professional Ethics.

During 2008, Prof Naude delivered papers at academic conferences in Stellenbosch, Heidelberg (Germany), Lobensfeld (Germany), Grahamstown and Cape Town. The highlight was a presentation on fair global trade from an African perspective held during the world congress of ISBEE (International Society for Business, Economics and Ethics) in Cape Town on 15 July. In the mean time, this presentation has been accepted as chapter in a book from an international publisher in 2009.

One of the first South African articles on ethics in the accounting profession was published in the prestigious South African Journal of Accounting Research (SAJAR) and The University of Chicago published an article in its journal Criterion on "Anthropological challenges in a post-liberation South Africa".



*Prof Piet Naude, Faculty Researcher of the Year*



To make research accessible to a wider public, Prof Naude conducted regular workshops and four of his contributions were published in national newspapers (Rapport and Mail & Guardian).

Apart from his formal research activities, Prof Naude writes a weekly column, Boardroom Basics, in the business section of the Herald and has recently started a short weekly radio show on AlgoaFM, speaking on general business and ethical issues.

## Emerging Faculty Researcher of the Year



*Prof Eileen Mazibuko, Emerging Faculty Researcher of the Year*

Prof Noxolo Eileen Mazibuko is currently a full professor in the Department of Business Management in the School of Management Sciences at NMMU. She started her research career investigating black female entrepreneurs, but soon changed focus to include organisational commitment and employee share ownership.

Most of her current research focuses on societal marketing with specific emphasis placed on the health sector. Her nursing background provides a good platform to pursue such studies. She is specifically passionate about researching HIV/Aids issues.

Prof Mazibuko is currently collaborating with two leading researchers nationally and internationally, enabling

her to provide valuable guidance on how to pursue collaborative research projects. Their collaborative research projects revolve around retail and customer satisfaction with specific emphasis on emerging markets and disadvantaged communities. She is also the representative of her faculty on the Institutional Research Ethics committee.

## Research Entities

### LABOUR RELATIONS AND HUMAN RESOURCES UNIT

**Head:** Prof Dave Berry

**Email:** David.Berry@nmmu.ac.za

**Tel:** 041 504 2363

Through engagement with its community, this unit developed a useful network for learning purposes making active use of practitioners in classroom teaching, and using factories as classrooms. This reciprocity in the learning process has seen unit staff being requested to assist with practical problems in the field. This service provision served to strengthen the staff's practical strengths, provided the base for new case studies and opened the door for research projects.

Some of the specific research activities with which the unit was involved included the following:

- Conducting a remuneration survey on behalf of manufacturing organisations in the Nelson Mandela Bay region for 29 technical occupations which were deemed as scarce skills in the region.



*Prof Dave Berry, Head, Labour Relations and Human Resources Unit*

- ▶ Conducting engagement surveys for organisations to identify critical areas for improvement at divisional, departmental and managerial levels in these organisations. Feedback from the surveys was used for individual managerial development.
- ▶ Conducting research into the causes of absenteeism at a local automotive company.
- ▶ Conducting a longitudinal survey on trade unions and democracy in a large trade union federation.

## TOURISM RESEARCH UNIT



*Mr Hugh Bartis, Head, Tourism Research Unit*

**Head:** Hugh Bartis  
**Email:** Hugh.Bartis@nmmu.ac.za  
**Tel:** 041 504 4089

During 2008, the Tourism Research Unit (TRU) engaged in a few exciting initiatives, although strictly speaking, these were not all research projects.

However, the involvement of TRU was important as it provided opportunities for the entity to profile itself and highlight some of its competencies.

The TRU participated in the Tourism Month Celebrations in September 2008 co-hosted by Nelson Mandela Bay Tourism, the Southern Africa Tourism Services Association, Nelson Mandela Bay Municipality and 2 Boyz Advertising. This initiative entailed an educational programme which empowered more than 70 secondary school tourism

educators in the Bay. The programme involved a series of presentations, visits to various tourist services and attractions, and a key note address by a representative for the FIFA Local Organising Committee on opportunities for learners.

The TRU successfully hosted a one-day workshop in October 2008 for 15 tourism educators from the Fort Beaufort school district focusing on one of the learning outcomes for Grade 11 learners. As many of the tourism educators have had no formal training in tourism, some had difficulty in interpreting some of learning outcomes and the associated assessment. Tourism academics were able to facilitate this workshop and assist the educators.

In November 2008, the TRU was awarded a tender to draft a heritage conservation plan. This plan was for the proposed site where the Cradock Four Memorial will be constructed in Nelson Mandela Bay. This project is ongoing and will be the first on the conservation plan to be adopted for a local heritage site in the Bay.

## UNIT FOR PROFESSIONAL ETHICS

**Head:** Prof Piet Naudé  
**Email:** ethics@nmmu.ac.za  
**Tel:** 041 504 2339

The Unit for Professional Ethics is situated in the NMMU Business School. This unit was primarily responsible for organising the very successful global ISBEE congress (International Society of Business, Ethics and Economics) which was held in Africa for the first time. The director, Prof Piet Naudé, is the immediate past president of the Business Ethics Network of Africa (BEN-Africa) and has been elected to represent Africa on the executive of ISBEE over the next four years.

At a local level, the unit was involved in the continued professional training of SAICA (South African Institute of Chartered Accountants) as well as the South African Medical Association which requires practising doctors to undergo an annual refreshment courses in ethics.

The unit was further responsible for developing an appropriate curriculum in business ethics and governance for the new degree in financial planning and continued its academic teaching functions in media and public service ethics.

## UNIT FOR APPLIED MANAGEMENT SCIENCES

**Head:** Dr Suzette Viviers

**Email:** Suzette.Viviers@nmmu.ac.za

**Tel:** 041 504 4062

At the end of 2007 the Unit for Applied Business Management changed its name and scope to include all colleagues in the School of Management Sciences (UASM). The UAMS acts as the consulting and research arm for the various departments comprising the School (Business Management, Logistics, Marketing Management as well as Management and Entrepreneurship).

In 2008 the unit had 39 members. The Management Committee members include Dr Suzette Viviers (Director), Prof Elmarie Venter, Prof Laetitia Radder, Prof Norman Kemp, Dr John Burger and Prof Johan Bosch (in an advisory capacity).



*Dr Suzette Viviers, Head, Unit for Applied Management Sciences*

The table below provides a summary of the research outputs of the members of the unit:

Research output category	Number of outputs
BCom Honours treatises	26
BTech treatises	8
MCom dissertations	2
MTech dissertations	3
MBA treatises	5
DCom degrees	2
Conference proceedings and papers presented at conferences	12
Refereed (subsidy earning) publications	10
Other refereed publications	3
Books published / chapters in books published	1

## SOCIALLY RESPONSIBLE INVESTING (SRI)

Dr Suzette Viviers investigated the emerging phenomenon of socially responsible investing (SRI) as part of her doctoral studies and has since published several articles on the topic. She has also been invited to act as keynote speaker at two local SRI conferences and is currently conducting research with Dr Neil Eccles, Noah Chair of Responsible Investment at UNISA.

In its broadest sense SRI relates to an intricate process of integrating ethical as well as environmental, social and corporate governance (ESG) considerations into investment analysis and ownership practices. The main SRI strategies include:

- ▶ Negative (exclusionary) screening: avoiding investments in morally undesirable companies, industries and countries. Such investors often base their investment criteria or screens on their religious convictions and hence avoid investments associated with tobacco, alcohol, gambling, weapons and pornography.
- ▶ Positive (inclusionary) screening: investing in companies which are deemed good corporate citizens, i.e. companies that value their stakeholders and place a high premium on corporate governance. In South Africa a great deal of emphasis is placed on the promotion of Broad-Based Black Economic Empowerment (BBBEE) as well as the development of social infrastructure (the building of schools, clinics, roads etc).
- ▶ Best-of-class screening: combining positive and negative screening strategies.
- ▶ Shareholder activism: actively engaging with management boards on ESG considerations through dialogue, proxy voting and divesting from companies that fail to transform.
- ▶ Cause-based (targeted) investing: supporting particular causes, such as BBBEE or social infrastructural development, by investing directly in it.

The first SRI fund in South Africa, the Community Growth Fund, was launched in June 1992. Many of the early SRI funds were structured as empowerment orientated special purpose vehicles (SPVs) in line with the new government's reconstruction and Development programme and empowerment initiatives. The SPV structure however proved unsustainable in the aftermath of the emerging market crisis in 1998/9 and resulted in large scale losses. As a result, institutional investors became very reluctant to invest in a socially responsible manner.

Fortunately, perceptions have changed and several new SRI funds have seen the light in recent years. The majority of these SRI funds employ a cause-based (targeted) investing strategy, although strong growth has also been noted in the number of Shari'ah (Islamic law) compliant funds. These funds typically avoid companies producing alcohol, tobacco, non-Halaal foodstuffs and weapons as well as those associated with gambling, entertainment and pornography. Financial institutions and companies with high levels of debt, debtors and interest earnings are also excluded.

## RECREATIONAL VALUE OF TROUT FISHING IN SOUTH AFRICA

The National Environmental Management: Biodiversity Act, no.10 of 2004 has cast considerable doubt on the future of trout as a food source and a recreational fishing resource in South Africa. The "trout issue" is a sensitive one, especially to the many fly fishermen in South Africa, and it has even received media coverage on MNet's Carte Blanche.

The economic case for the trout fishing industry in South Africa has up to now, however, not been convincingly made. Mr Gatogang's MCom study was the first formal attempt to estimate a recreational value for trout in South Africa. His study focused specifically on the trout fishery situated in and around the village of Rhodes in the North Eastern Cape.

The travel cost method was applied in his study. It is the most suitable method for determining the value of trout because travel cost is often the main expenditure incurred. The study aimed to provide policy makers with information regarding the value of trout fishing in the Rhodes region, so as to create an awareness of the economic trade-offs associated with alien fish eradication.

Through the application of the travel cost method, the consumer surplus per trout fly-fishermen was estimated to be R19 677.69 for 2007, while the total consumer surplus was estimated to be R13 774 384.40. The study concluded that trout make a valuable economic contribution to the Rhodes region and that the rivers and streams in the Rhodes region should be carefully managed.

## RESEARCH: STUDENT VALUE PROFILES

Since 2007 Prof Miemie Struwig has been investigating the value profiles of students. These values are important to study since today's students represent the future leaders of society. The purpose of this research project is to explore the students' personal values – the general standards by which individuals formulate attitudes and beliefs according to which they behave - to determine what interventions may be necessary before they enter the world of work. To do this, a longitudinal study and a cross-sectional study are part of the project.

The Personal Value Statement (PVS) instrument was used to explore the personal values of students. Three samples were included in the project – business students in South Africa (2007), students from other faculties in South Africa (2008) and Chinese students (2008).

The findings of the 2007 study were generally consistent with findings of researchers who have examined the value profiles of the student populations around the world (see, for example, Kumar & Nonis, 1997; Simmons & Penn, 1994 and Vogel, 1992).

Prof Struwig's results indicate significant differences between male and female students in terms of three of the five evaluative attitudes (political, social and economic). Results also reveal that South African female students are more competitive and power orientated. Although this can be attributed to greater gender equality, it also reflects a broader trend in South African society. It should be pointed out, however, that Prof Struwig did not include the evaluative attitude of religion in her research because it "could be confusing to the South African multi-cultural student".

As values direct how people behave and think, it is important to note that the respondent South African students tended to be humanitarian-oriented (ranked first by both male and female students).

These and other findings thus far may provide some useful insights for educators and business managers. It may help business managers understand the behaviours of their employees. More important is that these findings provide some useful guidelines for educators. If educators understand the values of their students they may be able to manage ethical situations in the class room and help them to use appropriate teaching styles etc.



The researcher is currently analysing the results of the 2008 study and preliminary results show interesting comparisons, since the Chinese students have a different dominant value profile to that of the South African student, but there are some evaluative attitudes that are similar.

## Publications

### ARTICLES IN DOE-ACCREDITED JOURNALS

NAUDÉ, P.J. 2007. In defence of partisan justice: What can African business ethics learn from John Rawls? *African Journal of Business Ethics* 2(1), pp 40 – 44.

ADENDORFF, C., VENTER, E. & BOSHOFF, C. 2008. The impact of family harmony on governance practices in South African Greek family businesses. *Management Dynamics* 17(3), pp, 28 – 44.

ALLEN-ILE, C.O.K. & BERRY, D.M. 2008. Trade unionism in Botswana: Oil or clog in the wheel of progress. *Journal of Public Administration* 43(3.1), pp 16 – 25.

BOSHOFF, C., MAZIBUKO, N.E. 2008. Measuring customer satisfaction with a municipality's waste

management service: A preliminary instrument. *Management Dynamics* 17 (2), pp 14 – 16.

DICKEN, M.L. 2008. First observations of young of the year and juvenile great white sharks (*Carcharodon carcharias*) scavenging from a whale carcass. *Marine and Freshwater Research* 59, pp 596 – 602.

HAINES, R.J. & ROBINO, C. 2008. Local productive development policies and development corporations: A paradigm shift? *Africanus, Journal of Development Studies* 38 (1), pp, 3 – 14.

HOSKING, S.G. 2008. An economic approach to allocating river water to estuaries in South Africa. *Coastal Management* 36(1), pp 35 -46.

NAUDÉ, P.J. 2008. Ethics education in accounting: An outsider perspective. *South African Journal of Accounting Research* 22(1), pp 1 – 17.

NAUDÉ, P.J. 2008. On Edmund Schlink (1903-1984). *Scriptura* 97, pp 122 – 136.

NAUDÉ, P.J. 2008. What has Accra do to with New York? An analysis of moral discourse in the Accra Confession.



NGTT: *Nederuits Gereformeerde Teologiese Tydskrif* 49 (3 & 4), pp 206 – 216.

PERKS, S. & SMITH, E.E. 2008. Employee perceptions regarding whistle-blowing in the workplace: A South African perspective. *SA Journal of Human Resources Management* 6 (2), pp 15 – 24.

PERKS, S. & SMITH, E.E. 2008. Focused training programmes for solving growth problems of very small businesses. *Acta Commercii* 8 (1), pp 145 – 159.

SMITH, E.E. & KRÜGER, J. 2008. A critical assessment of the perceptions of graduates regarding their generic skills level: An exploratory study. *South African Journal of Economic & Management Sciences* 11(2), pp 121-138.

VIVIERS, S. & VENTER, D.J.L. 2008. Corporate social responsibility – a SMME perspective. *African Journal of Business Ethics* 2(1), pp 20 – 27.

VIVIERS, S. 2008. Socially responsible (ethical) investing in South Africa. *African Journal of Business Ethics* 1(1), pp 21 – 30.

VIVIERS, S., BOSCH, J.K., V.D.M.SMIT, E. & BUIJS, A. 2008. Is responsible investing ethical? *South African Journal of Business Management* 39 (1), pp 15 -25.

VIVIERS, S., BOSCH, J.K., V.D.M.SMIT, E. & BUIJS, A. 2008. The risk-adjusted performance of responsible investment funds in South Africa. *Investment Analysts Journal* 68, pp 1 – 17.

VIVIERS, S., ECCLES, N.S., DE JONGH, D. BOSCH, J.K., V.D.M.SMIT, E., & BUIJS, A. 2008. Responsible investing in South Africa - drivers, barriers and enablers. *South African Journal of Business Management* 39(4), pp 15 – 28.

## CONFERENCE PAPERS SUBMITTED TO THE DOE FOR SUBSIDY

ARNOLDS, C.A. & KODUA-AGYEKUM, K. Improving the global competitiveness of South African textile firms. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday Festival of the Southern Africa Institute for Management Scientists: Muldersdrift, South Africa, 14 – 17 September 2008.*

ARNOLDS, C.A. A longitudinal assessment of restricting at a merged Higher-Education Institution: The importance of Leadership. *Second International Business Conference on Leadership and Sustainable Business Development. Port Elizabeth, South Africa, 28 – 29 August 2008.*

BOSCH, J.K., VENTER, D.J.L. & ROOS, C., LOUW, L. The development of Management Competencies and quality of tuition as perceived by graduates in the Business and Economic Sciences. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday Festival of the Southern Africa Institute for Management Scientists: Muldersdrift, South Africa, 14 – 17 September 2008.*

KRÜGER, J., ROOTMAN, C., VAN VUUREN, E. Investigating motivational factors influencing satisfaction and commitment of small business employees. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday Festival of the Southern Africa Institute for Management Scientists: Muldersdrift, South Africa, 14 – 17 September 2008.*

NCWADI, M.R. & LE ROUX, P. An exploratory study into the impact of the LBSCs in the development of SMMEs in Nelson Mandela Metropole, South Africa: A regression analysis. *Global and local dynamics in African business and development – IAABD: Florida, USA, 20 – 24 May 2008.*

NCWADI, M.R. & PIETERSEN, J. An exploratory study into factors influencing the willingness of informal businesses to become formalised - a case study of informal businesses in a few selected townships of Port Elizabeth. *Global and local dynamics in African business and development – IAABD: Florida, USA, 20 – 24 May 2008.*

SHARP, G.D., TAIT, M. & LOGIE, G.C. An exploratory investigation into the statistical methods used in management research. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday Festival of the Southern Africa Institute for Management Scientists*: Muldersdrift, South Africa, 14 – 17 September 2008.

STRUWIG, F.W. Exploring the value profiles of business students in South Africa. *The Global Management & Information Technology Research Conference*: New York, USA, 21 – 24 May 2008.

TAIT, M., BOSCH, J.K., SHARP, G.D. & LIU, Z. Impact of South African tourism service quality on Chinese tourists' satisfaction. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday*

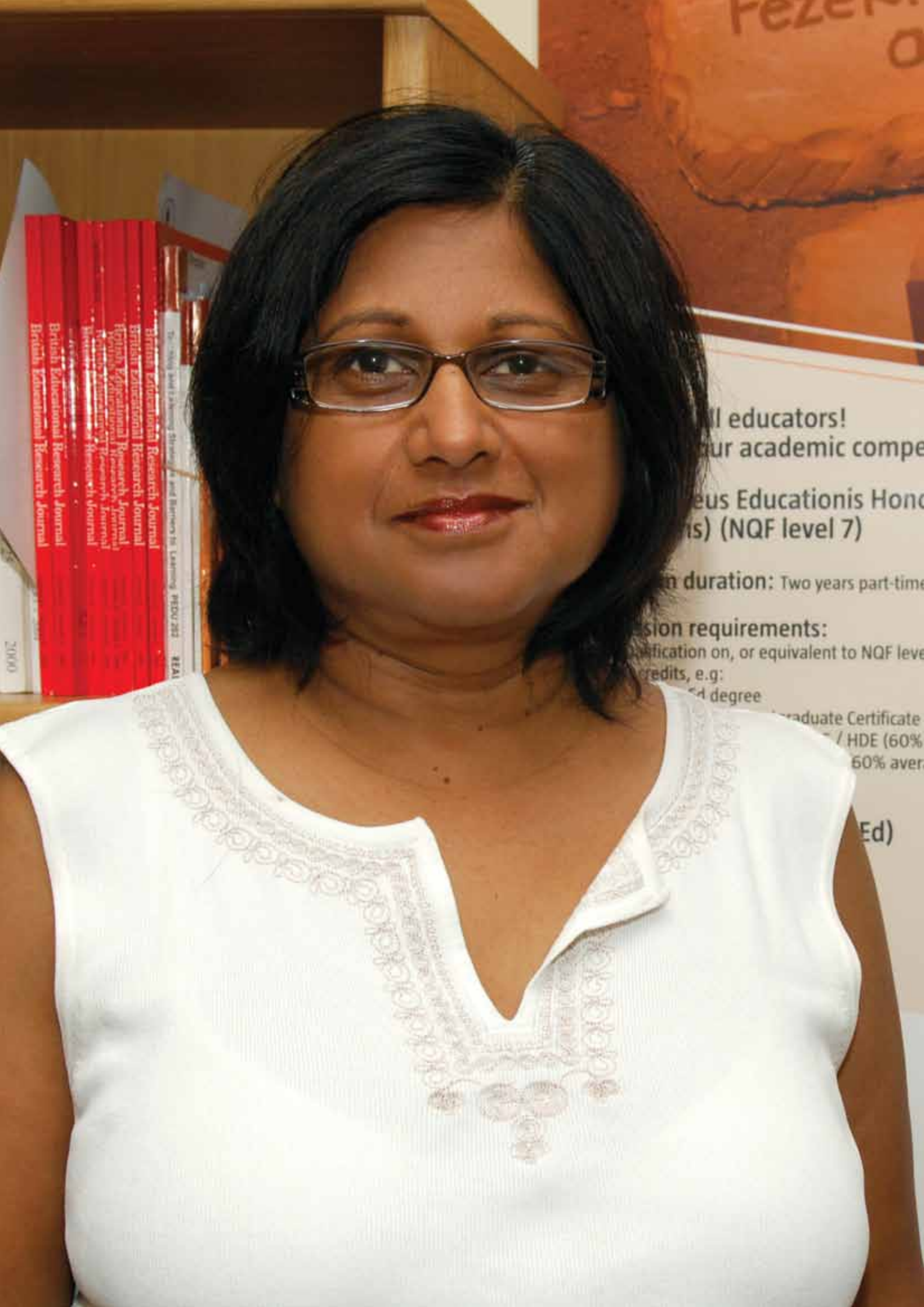
*Festival of the Southern Africa Institute for Management Scientists*: Muldersdrift, South Africa, 14 – 17 September 2008.

VENTER, E., FARRINGTON, S. & SHARP, G.D. The relational-based factors that impact on the successful functioning of copreneurial businesses: a proposed model. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday Festival of the Southern Africa Institute for Management Scientists*: Muldersdrift, South Africa, 14 – 17 September 2008.

VIVIERS, S. Going green: An SMME Perspective. *20<sup>th</sup> Annual Conference and 21<sup>st</sup> Birthday Festival of the Southern Africa Institute for Management Scientists*: Muldersdrift, South Africa, 14 – 17 September 2008.







# Faculty of Education

*Guiding tomorrow*

During 2008 academics in the Faculty of Education produced 20 conference presentations, 25 peer-reviewed journal articles, two technical reports, five chapters in books, two books, one doctoral degree, and six master's degrees. Factors which assisted the facilitation of these outputs were a series of writing retreats, intra-faculty research capacity development forums, participation in the Eastern Province Postgraduate Research Conference, our Research Open Day, international cooperation and the numerous research and development projects which operate in the faculty.

The main research focus areas were school management, science and mathematics education, and mental and physical health-related issues in schools, including issues around HIV and Aids.

A product of the visual methodologies research project which ran in Motherwell was a pictorial book, *Picturing Hope*, which was launched by Juta at our Research Open Day. A textbook, *Dealing with HIV and AIDS in the classroom*, by academics in the faculty was also published by Juta. A number of staff members also contributed to a UNESCO IIEP/id21 Insights Education book aimed at *Arts-based and other participatory strategies for teacher development in the age of Aids*.

RESEARCH THEMES	DRIVER
Educational management and leadership	Prof Prakash Singh
Special educational needs	Prof Tilla Olivier
Curriculum studies	Prof Sylvan Bignon
HIV and AIDS in education	Prof Lesley Wood
Science and Mathematics education	Prof Paul Webb
Initial teacher education	Ms Noluthando Toni

Swedish-South Africa Links grant award for the promotion of scientific literacy;

- Donation of 120 computers by the Dell Foundation for six schools in and around Missionvale linked to our IT in Schools research project; and
- The rating of another member of the faculty by the NRF.

## RATED RESEARCHERS

Surname, Initials, Title	Rating Category
Olivier, MAJ, Prof	C3
Webb, P, Prof	C3
Wood, LA, Prof	L

## Highlights of the year were

- The upgrading of the Faculty of Education Research, Technology and Innovation Unit to the Centre of Educational Research, Technology and Innovation;
- The establishment of the Action Research; Science, Mathematics and Technology Education; and Health Promoting Schools units;
- The National Research Foundation (NRF) funded



*Prof Nonnie Botha, Chairperson, Faculty RTI Committee*

## Faculty Researcher of the Year



*Prof Tilla Olivier, Faculty Researcher of the Year*

Prof Tilla Olivier's impressive curriculum vitae speaks for itself. Prof Olivier is dedicated to making a difference. She has completed 14 research projects and is involved in eight others. She has shared her research at 46 national and 26 international conferences, and has published 35 articles in subsidised and international journals.

"I have established an experienced practice of qualitative research that deals with social issues such as sexual abuse and AIDS, psychiatric problems such as Anorexia Nervosa and Tourette's Syndrome, and issues regarding morale and self-efficacy," said Prof Olivier, who in 2002 received the Honorary Medal of the Education Association of South Africa for her contribution to education over ten years.

Making a difference in her own community drives Prof Olivier's research. Two of her own projects, in collaboration with Dr Lesley Wood, exemplify this.

The "I can make a difference" project in Motherwell seeks to involve parents more in education, despite their poverty. The "sky is the limit" project in Walmer township aims at countering the negative impact of poverty through education.

## Emerging Faculty Researcher of the Year

Although a relative newcomer to educational research, Prof Lesley Wood brings her expertise gained from her years in the field of social work to a changing educational environment.

In her three years at the Faculty of Education, she has published nationally and internationally based on her participatory research aimed at improving the well-being of both teachers and learners. Her main focus of research is HIV and Aids in teaching, designing programmes and research projects to encourage stakeholders to take action to offset the educational and social challenges that the pandemic brings.

Proceeding from a critical theoretical stance, she has been a forerunner in introducing values-based action research into the faculty and on a national level through her publications and research engagements.

She is currently involved in several national and local research projects, working closely with colleagues from this and other universities. She was awarded a fellowship from the HIV and AIDS Centre at Columbia University in New York City in 2008, based on her participatory research with teachers to address HIV from a gender perspective.

"I am driven by my passion to help people to take control of their own lives to improve their socio-emotional circumstances. I believe that everyone has great potential and it is our duty as researchers to help unleash that transformative potential.



*Prof Lesley Wood,  
Emerging Faculty Researcher  
of the Year*



“My aim is not to create knowledge for knowledge’s sake, but to enable others to develop epistemologies and practices that will help them to rise above and change oppressive circumstances.” Lesley is an NRF-rated researcher.

## Oslo Celebration Grant Recipients

In celebration of a decade of fruitful academic partnership between South Africa and Norway, the Norwegian Ministry of Education and Research offered research grants for four researchers, two from Norway and two from South Africa, to pursue research on education and gender.

The two South African academics, Prof Laetitia Greyling and Ms Pam Austin, who were awarded this prestigious Oslo Celebration Grant, are both from the faculty of Education at NMMU. Each researcher received a grant of approximately R119 000.

Prof Greyling’s research study focuses on ‘barriers to learning’ in education and Ms Austin’s research on promoting mathematics education according to the Family Maths equity principles. The researchers have made contact with a number of Norwegian academics and will visit Norway in 2009



*Prof Laetitia Greyling (left) and Ms Pam Austin, recipients of the prestigious Oslo Celebration Grant*

## Research Entities

### CENTRE FOR EDUCATIONAL RESEARCH, TECHNOLOGY AND INNOVATION (CERTI)



*Prof Paul Webb, Director, CERTI*

**Director:** Prof Paul Webb

**Tel:** 041 504 4206

#### Action Research Unit

**Head:** Prof Lesley Wood

**Tel:** 041504 2834

#### Health Promoting Schools Unit

**Head:** Prof Tilla Olivier

**Tel:** 041 504 2377

#### Science, Maths and Technology Education (SMATE) Unit

**Head:** Prof Paul Webb

**Tel:** 041 504 4206

### IN-SCHOOL RESEARCH IN SCIENCE AND MATHEMATICS EDUCATION

Our research in-schools during 2008 has included studies on strategies for promoting scientific literacy, developing complex learning communities, the generative use of computers, and the effects of language on learning of science and mathematics.

The research on scientific literacy was conducted in seven schools in the Tyumie Valley (below Hogsback), 10 in Port Elizabeth and with the educational trust READ in about 150 schools in seven provinces. The research revealed that scores of primary school learners who participated

in the scientific literacy strategy improved statistically significantly in terms of their problem-solving abilities and their ability to read in English and to write and listen in isiXhosa compared to control groups of students. The data also indicated that the teachers could be trained to successfully implement the strategy to produce acceptable levels of argumentation and scientific writing among their learners.

The scientific literacy team were awarded Sweden-South Africa links funding (Swedish Vetenskap/NRF funded) to promote scientific literacy in schools in both countries and beyond. A grant was also received from the DG Murray Trust for implementation of the strategy.

Research on the Family Maths programme research revealed factors which contribute to developing a successful complex learning community of parents, teachers and learners while a study on the generative use of computers in schools allowed comment on attaining critical outcomes of the South African curriculum. A language and mathematics study on introducing authentic discussion into classrooms provided insights into the use of language, particularly the use of code-switching by teachers and learners, in bilingual classrooms.



## Publications

### ARTICLES IN DOE-ACCREDITED JOURNALS

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DE LANGE, N. & OLIVIER, M.A.J. 2008. Nurturing human capital: A challenge for higher education institutions? *South African Journal of Higher Education* 22 (1), pp 41 – 63.

DE LANGE, N., OLIVIER, M.A.J. & WOOD, L.A. 2008. Participatory video documentary: just for whom? *Education as change* 12 (2), pp 109 – 122.

DELPORT, A.C. & MANGWAYA, E. 2008. Profiling learners and teachers at remote rural secondary schools: a case study. *Africa Education Review* 5 (2), pp 220 – 238.

DU PLESSIS, A. & WEBB, P. 2008. Generative use of computers: promoting critical outcomes of the South African curriculum. *Education as change* 12 (1), pp 15 – 27.

HOLDERNESS, W.L., BOLD, C., HENRY, D. & WOOD, M. 2008. Extending boundaries: young people as action researchers. *Journal of Education* 43, pp 57 – 78.

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OLIVIER, M.A.J. & WILLIAMS, E. 2008. Teaching mentally-disabled learners. *Acta Academica* 38 (3), pp 223 – 245.

OLIVIER, M.A.J., VENTER, D.J.L. & VAN DER WALT, J.L. 2008. A Group of Sexually Abused Adolescents' Perceptions of their Future Life-Roles: An Exploratory Study. *Journal of Psychology in Africa* 18 (1), pp 75 – 80.

SINGH, P. & MANSER, P.G. 2008. Relationship between the perceived emotional intelligence of school principals and the job satisfaction of educators in a collegial environment. *Africa Education Review* 5 (1), pp 109 – 130.

VAN RENEN, C.G. 2008. Explorations through picture books: Opportunities for teaching and learning. *Journal of Language Teaching* 42 (1), pp 7 – 21.



VILLANUEVA, G. & WEBB, P. 2008. Scientific investigations: The effect of the 'Science Notebooks' approach in Grade 6 classrooms in Port Elizabeth, South Africa. *African Journal of Research in Mathematics, Science and Technology Education* 12 (2), pp 13 – 16.

WEBB, L. & WEBB, P. 2008. Introducing Discussion into Multilingual Mathematics Classrooms: An Issue of Code Switching? *Pythagoras* 67, pp 26 – 32.

WEBB, P., WILLIAMS, Y. & MEIRING, L. 2008. Concept cartoons and writing frames: Developing argumentation in South African science classrooms? *African Journal of Research in Mathematics, Science and Technology Education* 12 (1), pp 4 – 17.

WOOD, L.A. & OLIVIER, M.A.J. 2008. A model to increase teacher self-efficacy. *Acta Academica* 40 (1), pp 236 – 252.

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## CHAPTERS IN BOOKS SUBMITTED TO THE DOE FOR SUBSIDY

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OLIVIER, M.A.J, WOOD, L.A & DE LANGE, N. 2008. Changing our eyes: Seeing hope in: De Lange, N., Mitchell., C., Stuart, J. (Eds). *Putting People in the Picture. Visual methodologies for Social Change*. Sense Publishers: Rotterdam.

## CONFERENCE PAPERS SUBMITTED TO THE DOE FOR SUBSIDY

GELDENHUYS, J.L., FOX, T.D. & VOS, N.B. A group of Port Elizabeth Mathematics learners' experience of cross-cultural peer tutoring. *Proceedings of the 14<sup>th</sup> Annual Congress of the Association for Mathematics Education of South Africa (AMESA) volume 1: Port Elizabeth, South Africa, 30 June – 4 July 2008*.







# Faculty of Engineering, the Built Environment & Information Technology

*Creating tomorrow*

The faculty's striving towards research excellence gained remarkable impetus during 2008, with staff and students involved in applied, developmental and industry-related research and technology transfer. Not only have our researchers enhanced their profiles among leading researchers nationally and internationally, but the faculty also succeeded in securing and strengthening its strategic partnerships. We operate in close relationship with international universities and research institutes and have participated in a number of research programmes.

Extensive progress was also made in our research entities, as indicated by the number of publications and postgraduate students. The faculty's ongoing focus to establish world-recognised niche areas required further restructuring of our research entities during 2008.

The Institute for ICT Advancement (IICTA) was restructured focusing on information security services with specialisation in health informatics, IT service management, user experience and information security management and governance. Furthermore, the internationally-renowned Friction Stir Processing research team acquired a new leading edge Friction Stir Welding (FSW) system at a cost of R7m.

RESEARCH THEMES	DRIVER
Manufacturing technology	Prof Danie Hattingh
Management development for the Built Environment	Prof John Smallwood
Secure ICT Services	Prof Rossouw von Solms

Our postgraduate students continuously prove themselves among the best in the country and 2008 was no exception. One of our PhD students, Bridgette Gasa, currently a PhD Construction Management student, won the DST Women in Science Award in August 2008 while Louis von Wielligh, a master's graduate, received the S2A3 bronze medal from the Southern Africa Association for the Advancement of Science.



*Dr Shaleen Els, Director, RCD and Mr Louis von Wielligh.*



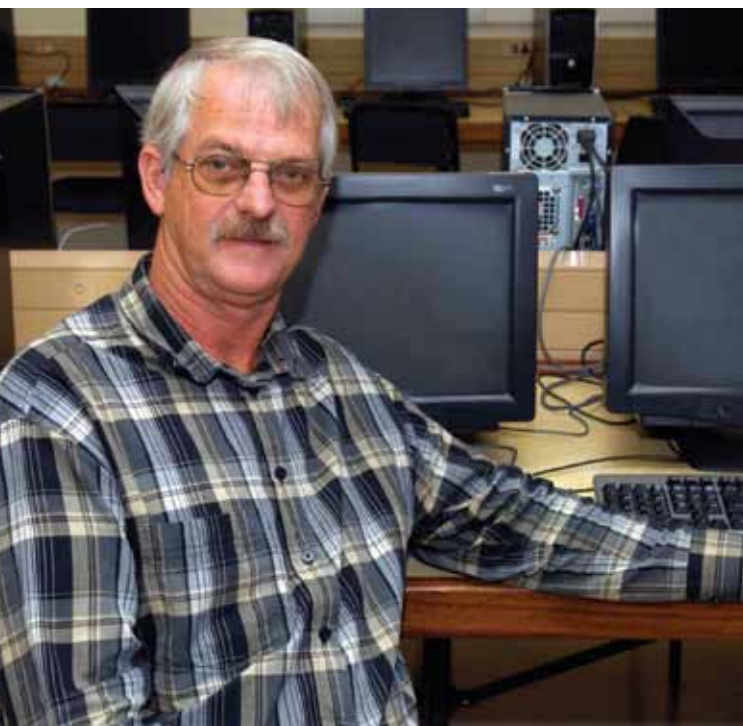
*Ms Bridgette Gasa, won the DST Women in Science Award 2008*

We have also increased our pool of staff holding doctorates and NRF research ratings. Furthermore, two adjunct professorships were awarded to Prof Josephus Theodorus Maria de Hosson from the University of Groningen and Prof Axel Steuwer from Lund University.



*(L-R) Dr Annelise Els Botes, Prof Henk de Jager and Prof Josephus Theodorus Maria de Hosson from the University of Groningen.*





*Prof Rossouw von Solms, Chairman, Faculty RTI Committee, was re-elected as President of the South African Institute for Computer Scientists and Information Technologists (SAICSIT).*

## Faculty Researcher of the Year



*Prof John Smallwood, Faculty Researcher of the Year*

## RATED RESEARCHERS

Surname, Initials, Title	Rating Category
Botha, RA, Prof	C3
Hattingh, DG, Prof	C1
Smallwood, JJ, Prof	C3
Von Solms, R, Prof	B3
McGrath, P, Prof	C3



*Prof Reinhardt Botha, School of ICT, one of our C-rated researchers*

## Emerging Faculty Researcher of the Year



*Dr Annelize Els-Botes, Emerging Faculty Researcher of the Year*

## School of Engineering

Seven students received their master's degree during the 2008 graduation ceremonies, including Louis von Wielligh of the Department of Mechanical Engineering, who was awarded the S2A3 bronze medal from the Southern Africa Association for the Advancement of Science for the best dissertation in the field of engineering.



The number of accredited publications increased compared to 2007 with the number of accredited journal publications increasing from six in 2007 to ten in 2008.

Similarly, the number of conference proceedings increased from six in 2007 to ten in 2008. A further attempt to increase the number of accredited publications was made with the appointment of two adjunct professors (international) within the Institute for Advanced Manufacturing and Engineering Research (IAMER). The effectiveness of these appointments should be evident over the next two to three years. Prof Patrick McGrath attained his C category NRF-rating, thereby increasing the number of NRF-rated researchers within the school to two.



*Prof Patrick McGrath, newly appointed C-rated staff at IAMER*

## R7m process development system for NMMU

The work of Nelson Mandela Metropolitan University's Prof Danie Hattingh and the Friction Stir Research team at the university's IAMER received a welcome boost with a new Process Development System valued at R7m imported from the USA. This is a leading edge Friction Stir Welding (FSW) system developed by MTS Systems Corporation. The platform will provide the research team at NMMU with advanced capability and versatility to explore a wide range of FSW technology applications and facilitate the transition of FSW from the laboratory to the production floor.

Prof Hattingh indicated that the FSW group at NMMU has made significant internationally accepted contributions to the knowledge pool related to the FSW process. "We

are seen as leaders in certain aspects of our work but have reached the limits of the old platform and it was essential to obtain the new platform to continue to maintain our international standing. The new platform will allow us to attract more postgraduate students locally and internationally and will give us a real chance to establish this FSW research group at NMMU as a world authority, it will also promote the field of Science and Engineering in South Africa," he said.

## AMTS project

Prof Igor Gorlach has been leading a joint research project titled "Conceptual Design of Reconfigurable Manufacturing Systems". The project is part of the Advanced Manufacturing Technology Strategy (AMTS), which is sponsored by the Department of Science and Technology and managed by the CSIR. The project commenced in 2007 by forming design groups consisting of researchers from the engineering faculties of various South African universities. NMMU is in a consortium with the North-West and Pretoria universities. In total, there are eight universities participating in the project, now into its second phase and expected to run for another four years.

## Research Entities

### FRICTION PROCESSING RESEARCH INSTITUTE (FPRI)

**Director:** Dr Annelize Els-Botes

**Email:** Annelise.Els-Botes@nmmu.ac.za

**Tel:** 041 504 3091



*Prof Danie Hattingh, professor in Mechanical Engineering (from left), Vice-Chancellor Prof Derrick Swartz and Jim Freeman, welding/mechanical engineer, FSW Group at MTS Systems, USA.*

# School of the Built Environment

## UNIT FOR THE STUDY OF CONSTRUCTION PROCESSES (USCP)

**Head:** Prof John Smallwood  
**Email:** John.Smallwood@nmmu.ac.za  
**Tel:** 041 504 2551

This unit provides community service, conducts research, publishes and disseminates information, and co-organises national and international conferences

Through this unit, 15 peer-reviewed journal papers and 25 conference papers were published in 2008. These were presented at various international congresses and conferences, the subject areas being mainly the built environment, construction in developing countries, construction management, cost engineering, construction logistics, construction economics, ergonomics, and health and safety

The unit was involved as co-organiser of *The Third Built Environment Conference*, Cape Town, from 6 to 8 July 2008, under the auspices of the Association of Schools of Construction of Southern Africa

With regards to postgraduate study, the USCP produced two PhD, one DTech and one MSc (Built Environment) graduates in 2008. A member of the unit was also a keynote speaker at an international conference in February 2008 and is also recognised as a NRF C3-rated researcher

A member of the unit also contributed as co-author to a chapter of a book during 2008 and conducted research in collaboration with other international researchers as part of an inter-governmental programme

## UNIT FOR BUILDING RESEARCH AND SUPPORT (UBRS)

**Head:** Mr Kobus Bekker  
**Email:** JP.Bekker@nmmu.ac.za  
**Tel:** 041 504 3075

## GROUP FOR HUMAN SETTLEMENT DEVELOPMENT

**Leader:** Prof Kobus van Wyk  
**Email:** JJ.vanWyk@nmmu.ca.za  
**Tel:** 041 504 3498

This group provides various forms of community service, conducts research and disseminates information in the housing management niche area. A member of the group presented a paper at a national conference in Cape Town, October 2008, was also a keynote speaker at another national conference in East London

There was also involvement within the group as co-promoter for one DTech and supervisor for one MSc graduate. Research on housing education that had previously been done was taken up in the Standard Generating Body: Housing documents. A number of short learning programmes on housing management were also developed during 2008.

The housing management model that has been developed has been published in an international journal and is also being used in the education of housing officials in the Eastern Cape. A member of the group was also invited to serve on an NRF Housing Expert Panel as well an evaluation panel of South African Qualifications Authority (SAQA).

# School of ICT

## INSTITUTE FOR ICT ADVANCEMENT (IICTA)

**Director:** Prof Rossouw von Solms  
**Email:** Rossouw.VonSolms@nmmu.ac.za  
**Tel:** 041 504 3604

During 2008, the Institute for ICT Advancement (IICTA) conducted research which focused on:

- ▶ Information security governance, including research on policies, procedures, risk management, awareness, legislation, etc.
- ▶ Security technologies, including research on network security, intrusion detection, firewalls, viruses, etc.
- ▶ Access control and privacy, with specific reference to mobile technology.
- ▶ Information technology service management.

- Health information, specifically the security aspects thereof.

Usability and user experience aspects including research on user interface design guidelines for different platforms and devices, usability evaluation methods and techniques most suited to the different user interfaces and different evaluation metrics to be employed in different application domains.

Twenty-seven master's and 15 doctoral students participated in research projects in these areas. Specific needs were addressed through collaborative research projects with industry and government.

Two peer-reviewed journal publications and 10 peer-reviewed conference papers, both international and national, stemmed from institute members. Nine masters' and one doctoral student, who were active in IICTA research activities, graduated in 2008.

SAFIPA (South Africa-Finland Knowledge Partnership on ICT) funding has been secured for a pilot phase of the "Made-in-South Africa socio-technical methods and education for local software industry to contribute to socio-economic development" project. The partners in the project are Cape Peninsula University of Technology (CPUT) Department of IT (coordinator), the University of Pretoria (UP) Department of Informatics, Nelson Mandela Metropolitan University (NMMU) School of IT (Prof Dalenca Pottas), and the University of Kuopio (UKu) Healthcare Information Systems Research and Development Unit (HIS R&D).



Ms Darelle van Greunen was elected Vice President of the Computer Society of South Africa (CSSA).

Ms Darelle van Greunen, a lecturer at NMMU's School of Information Communication and Technology (ICT), has been elected vice-president, as well as an executive board member of the Computer Society of South Africa (CSSA), a professional organisation with some 4 500 members that advises government and industry on all issues affected by computing.

She was nominated for the Department of Science and Technology's Achiever's Award for South African Women Scientists in Industry. Ms van Greunen was also elected as the honorary secretary of the SAICSIT Council and serves as a member of the executive council.

As part of her research focus, she published a number of papers at both national and international conferences.

Ms van Greunen offered usability training workshops to Western Cape government web designers to enhance the usability of their e-Government sites. She was a keynote speaker at the annual CSSA conference held in Sandton in May 2008 and also presented an international workshop on "disruptive innovation" at the annual SAP Research Summit in Dresden, Germany, in June 2008. The summit was attended by some 350 researchers.

At the CISCO Conference, hosted by the School of ICT, NMMU won the Award for the Best Regional CISCO Academy in Sub-Saharan Africa Region for 2008, and Dr Kerry-Lynn Thomson (right), lecturer in the School of ICT, won the award for the best CISCO instructor for 2008.

Furthermore, Renaldo Rheeder in another success for NMMU, was acknowledged with a special award by the CISCO executive since the sub-Saharan region under his care is regarded as one of the best in the world.

## Publications

### ARTICLES IN DOE-ACCREDITED JOURNALS

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BUYS, F. & SIDLOYI, X. 2008. Comparative analysis of design management procedures in manufacturing and architecture. *Acta Structilia* 15 (2), pp 29 – 44.

CUMBERLEGE, R., BUYS, F. & VOSLOO, D. 2008. A review on the effectiveness of the Joint Building Contracts Committee Series 2000 Principal Building Agreement - A contractor's perspective. *Acta Structilia* 15 (2), pp 97 – 114.

GEMINIANI, F.L. & SMALLWOOD, J.J. 2008. A critical review of the effectiveness of the Department of Labour (DoL) Occupational Health and Safety (OH&S) Inspectorate in relation to the construction industry in South Africa. *Acta Structilia* 15 (2), pp 5 – 28.

GERBER, M. & VON SOLMS, R. 2008. Information security requirements - Interpreting the legal aspects. *Computers & Security* 27 (5 – 6), pp 124 – 135.

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GORLACH, I. 2008. The Application of High Velocity Air Fuel Process for the Deposition Coatings. *R & D Journal* 24 (9), p 16.

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LOMBARD, H., HATTINGH, D.G., STEUWER, A. & JAMES, M.N. 2008. Effect of process parameters on the residual stresses in AA5083-H321 friction stir welds. *Materials Science & Engineering A-Structural Materials Properties Microstructure and Processing* 501, pp 119 – 124.

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MARKS, A.M. & CRONJE, J.C. 2008. Randomised Items in Computer-based Tests: Russian Roulette in Assessment? *Educational Technology & Society* 11 (4), pp 41 – 50.

MOSS, I. & SMALLWOOD, J.J. 2008. An investigation of training and mentoring of emerging contractors in the Eastern Cape. *Acta Structilia* 15 (2), pp 115 – 125.

MUSONDA, I. & SMALLWOOD, J.J. 2008. Health and safety (H&S) awareness and implementation in Botswana's construction industry. *Journal of Engineering, Design and Technology* 6 (1), pp 81 – 90.

OPHOFF, J.A. & BOTHA, R.A. 2008. Mobile

Communications: User Perception and Practice. *South African Computer Journal* 40, pp 63 – 73.

RAMOKOLO, B. & SMALLWOOD, J.J. 2008. The capacity of emerging civil engineering contractors. *Acta Structilia* 15 (2), pp 45 – 74.

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WESSEL, O. & GORLACH, I. 2008. A Comparative Study of Automation Strategies at Volkswagen in Germany and South Africa. *South African Journal of Industrial Engineering* 19 (1), pp 149 – 168.

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FLOWERDAY, S. & DEAS, M. A user centric model for online identity and access management. *Proceedings of the ISSA 2008 Innovative Minds Conference: Johannesburg, South Africa*, 7 – 9 July 2008.

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practice. *IST- Africa 2008 Conference Proceedings*: Windhoek, Namibia, 7 – 9 May 2008.

MANTHE, M.F. & SMALLWOOD, J.J. A model towards enhanced tertiary built environment education. *5<sup>th</sup> Post Graduate Conference on Construction Industry Development*: Bloemfontein, South Africa, 16 – 18 March 2008.

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OZUMBA, A.O.U. & SHAKANTU, M.W.W. Improving site management process through ICT. *5<sup>th</sup> Post Graduate Conference on Construction Industry Development*: Bloemfontein, South Africa, 16 – 18 March 2008.

OZUMBA, A.O.U. & SHAKANTU, M.W.W. Achieving ubiquity in the site management process: a theoretical study of the potential for innovative ICT solutions. *COBRA 2008: The construction and building research conference of the Royal Institution of Chartered Surveyors*: Dublin, Ireland, 4 – 5 September 2008.

OZUMBA, A.O.U. & SHAKANTU, M.W.W. Improving materials management through utilisation of information and communication technology beyond 2010. *Quantity Surveying Conference 2008*: Johannesburg, 9 – 10 October 2008.

POSTHUMUS, S. & VON SOLMS, R. Agency theory: Can it be used to strengthen IT Governance? *Proceedings of the IFIP TC 11 23<sup>rd</sup> International Information Security Conference*: Milan, Italy, 7 – 10 September 2008.

SHAKANTU, M.W.W. Construction site materials and waste vehicular logistics: a case study from Cape Town, South Africa. *The ASOCSA Third Built Environment Conference 2008*: Cape Town, South Africa, 6 – 8 July 2008.

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*Rinker International Conference*: Florida, USA, 9 – 11 March 2008.

SMALLWOOD, J.J. & HAUPT, T.C. Persons with disabilities: an underutilized construction resource. *Proceedings of CIB W99 International Conference 14<sup>th</sup> Rinker International Conference*: Florida, USA, 9 – 11 March 2008.

SMALLWOOD, J.J. & HAUPT, T.C. Support work and formwork performance: Built environment practitioners' perception. *Proceedings of CIB W99 International Conference 14<sup>th</sup> Rinker International Conference*: Florida, USA, 9 – 11 March 2008.

SMALLWOOD, J.J. Structured construction management student vacation work: mentor and student feedback on a pilot project. *The Third Built Environment Conference*: Cape Town, South Africa, 6 – 8 July 2008.

SMALLWOOD, J.J. The influence of clients on contractor health and safety (H & S). *Proceedings of CIB W99 International Conference 14<sup>th</sup> Rinker International Conference*: Florida, USA, 9 – 11 March 2008.

SMALLWOOD, J.J. The practice of construction management: *CME 25 Conference Construction economics "Past, Present and Future"*. Reading, UK, 16 – 18 July 2008.

SMALLWOOD, J. & ROSSOUW, J.H. The implementation of Quality Management systems in South African Construction. *The Construction and Building Research Conference of the Royal Institution of Chartered Surveyors*: Dublin, UK, 4 – 5 September 2008.

SMIT, D. & VAN GREUNEN, D. South African's rainbow nation - an ideal HCI laboratory. *Proceedings of the 13<sup>th</sup> Annual Conference of the European Learning Styles Information Network*: Gent, Belgium, 23 – 25 June 2008.

BUYS, N.S. & TONONO, E. A need for a transformation strategy for facilities management in the public sector. *5<sup>th</sup> Post Graduate Conference on Construction Industry Development*: Bloemfontein, South Africa, 16 – 18 March 2008.

VAN GREUNEN, D. & PIETERSEN, C. Reflections on the Africa Drive Project: Lessons in Blended Learning and Technology Usage. *IST-Africa 2008 Conference & Exhibition*: Windhoek, South Africa, 7 – 9 May 2008.

VAN GREUNEN, D. & YERATZIOTIS, A. e-Government: Living up to the challenge of culture context. *Annual Conference and Festival of the Southern Africa Institute for Management Sciences*: Muldersdrift, South Africa, 14 – 17 September 2008.

VAN NIEKERK, J.F. & VON SOLMS, R. Bloom's Taxonomy for Information Security Education. *Proceedings of the ISSA 2008 Innovative Minds Conference*: Johannesburg, South Africa, 7 – 9 July 2008.







# Faculty of Health Sciences

*Caring for tomorrow*

A diverse range of training programmes for the health professional within various health disciplines is offered by NMMU's Faculty of Health Sciences. The faculty consists of eight professional disciplines each with the aim of training professionals within the biomedical technology, environmental health, human movement science & sport management, nursing science, pharmacy, psychology, radiography and social development professions fraternities.

The year 2008 boasts uniqueness within the development of research for the faculty in that it has identified two research themes to aid research collaboration. The researchers in these fields have received international recognition for their respective contributions to research and have been successful in attracting national and international funding.

## The themes are:

- ▶ Optimising lifespan development and performance, spearheaded by Prof Mark Watson – the faculty's 2008 Researcher of the Year; and
- ▶ Health and disease management responsive to regional needs, led by Prof Ilse Truter. The latter theme also serves as the faculty's cross-faculty research theme with the intention to attract collaborators from other faculties at NMMU.

RESEARCH THEME	DRIVER
Optimising lifespan development and performance	Prof Mark Watson

Other equally relevant research undertaken in the faculty, but with less critical mass relates to the care of vulnerable groups, diabetes, health promotion & disease prevention, health and welfare systems research, HIV/Aids, medicinal plants and optimising physical performance in sport and the workplace.

With such an array of research activities, the Faculty of Health Science strives towards the recognition of its mission of preventing and treating illness and enhancing health and wellness for the betterment of the community. In promoting these endeavours, it also prides itself on national and international public and private sector collaborative partnerships, which add value to stakeholders.



*Prof Rosa du Randt, Chairperson, Faculty RTI Committee*

## Medicinal plant research

Dr Nanette Smith completed her PhD in Biochemistry and Microbiology, graduating in 1993 from the former UPE, with majors in both Biochemistry and Chemistry. Dr Smith began lecturing at the former Sharley Cribb Nursing College now known as Lilitha, a nursing college in the Eastern Cape. She continued lecturing at the former PE Teknikon in 1990 where she continued working on her PhD.

Medicinal plant research requested by Mr Mike Pantsi on behalf of a group of sangomas began in 2000 under the competent control of Dr Maryna van de Venter (Department of Biochemistry & Microbiology). The research rallies around the validation of sangoma medicinal herbs and plants. The departments are prolific in the testing of medicinal plants for diabetic and cancer care together with immune stimulating properties. The Biomedical Technology unit focuses its research on antimicrobial screening and histology. Staff members involved with the research endeavours include Ms Siphokazi Siko (Co-treatment of type II diabetes with metformin and medicinal plant) and Mr Nicolas Wickens (Toxicity studies on two South African anti-diabetic plants) who are promoted / supervised by Dr Nanette Smith.

Departments within the faculty intend to form a consortium with regards to diabetic research under the advisory role of Dr Saartjie Roux together with Dr Maryna Van de Venter.

The anti-microbial research is partially funded by the NRF and all students involved in the project are independently funded by NRF bursaries.

The Department of Biomedical Technology boasts impressive equity graduation numbers with the majority of its postgraduates being females with excellent employment opportunities. This benchmarking status of educational diversity is further strengthened by the postgraduate success of international students.

### RATED RESEARCHERS

Surname, Initials, Title	Rating Category
Milne, PJ, Prof	C3
Truter, I, Prof	C2
Watson, MB, Prof	B3

## Faculty Researcher of the Year



*Prof Mark Watson, Faculty Researcher of the Year*

Prof Mark Watson has obtained four degrees including a doctorate which focuses on the career development of a disadvantaged South African population. Recently, Prof Watson's research interests have broadened with his appointment as an Associate Fellow at the Institute of Employment Research at the University of Warwick, England. This position will involve international collaborative research between Australia, England and South Africa in the exploration of new and innovative career theory and practice that can support adults, especially vulnerable adults, in labour market transitions during turbulent economic times. This research would impact on a national level with career education and career awareness programmes, together with the issue of career assessment.

## Emerging Faculty Researcher of the Year

Ms Ottilia Brown-Baatjies studies in the broad field of health psychology. She is currently focusing on strengths-based concepts in general and more specifically on family resilience. This is an innovative field of study in the South African context and while the project was initially exploratory, it is moving towards testing the relevance of available models for our context. The current research is specifically focused on examining the usefulness of The Resiliency Model of Family Stress,

Adjustment and Adaptation for the South African study. The value of this type of research is twofold: Using a family resilience framework in an intervention context could lead to reduction in dysfunction and enhance family functioning and individual well-being. Using models specifically tailored to the South African context will enhance interventions and will be able to influence policy development.



*Ms Otilia Brown-Baatjies, Emerging Faculty Researcher of the Year*

## Career Development of South Africa Children

In last year's annual report, Prof Watson's research on the career development of South African children over the last decade was described. This longitudinal research has continued and is now in its eleventh year, with children who were initially interviewed in their Grade 1 year presently enrolled in Grade 11. This research demonstrates that most children and adolescents consistently aspire over time to careers that are people-focused and that are of a high professional status. The gender stereotyping of careers, however, has generally decreased over the last decade.

Prof Watson's career research on adolescents has expanded more recently to include international comparative work (Australia) and research in other African countries. His current research is exploring the occupational aspirations of Zambian adolescents, their perceptions of barriers to their career development and their career decision-making beliefs.

## Research Entities

### DRUG UTILISATION RESEARCH UNIT (DURU)

**Head:** Prof Ilse Truter

**Email:** Ilse.Truter@nmmu.ac.za

**Tel:** 041 504 2131

### CYCLIC PEPTIDE RESEARCH UNIT

**Head:** Prof Pieter Milne

**Email:** Pieter.Milne@nmmu.ac.za

**Tel:** 041 504 2760

The mission of this unit is to conduct research on the chemical, biological and pharmaceutical properties of cyclic peptides in an endeavour to improve human life. In alignment with the vision and mission of NMMU the unit fosters collaborations between biological sciences and pharmaceutical chemistry to develop students in scientific research and possibly develop therapeutic agents.

In 2008 the unit continued its research work with various national researchers in South Africa and its collaboration and student exchange programme with the University of Göteborg in Sweden.

The unit boasts outputs in the form of one publication, and three conference proceedings of which one was the winner of a poster presentation. Highlights and special achievement awards included the appointment of staff members as an evaluator for Health SA Gesondhied, an appointment by the South African Pharmacy Council as an evaluator of courses leading to a certificate of qualification for pharmacist's assistants and an appointment as a member of an expert committee of the medicines control council.

The geographical position of the university has allowed the Pharmacy Department to develop both applied and basic areas of research. The strong presence of the pharmaceutical industry – the Aspen Pharmacare production site is in the Nelson Mandela Metropole – and three tertiary-level hospitals has led to the development of research in the areas of pharmaceutical technology and drug development, as well as applied clinical pharmacology.

Research in the division of pharmaceuticals is led by Mr



Gareth Kilian and involves strong collaborative ties with local industry. A postgraduate research programme is currently being offered in collaboration with Aspen Pharmacare in the fields of product development as well as pharmaceutical process development and validation.



*Research in the area of drug development is led by Prof Pieter Milne from the pharmaceutical chemistry division. This research group is involved in the development of synthetic dipeptides, proven to be biologically and chemically stable.*

The pharmaceutical chemistry division, in collaboration with the Department of Biochemistry and Microbiology, is also involved in the screening of African traditional medicines and is working very closely with traditional healers.

Research in the field of pharmacoepidemiology is undertaken by members of the division of pharmacy practice under Prof Ilse Truter. They are currently involved in various studies relating to CNS drugs (including analgesics, antidepressants and medicines for Attention Deficit Hyperactivity Disorder) as well as the role of the pharmacist in pharmaceutical care. They have published several refereed articles over the last few years, and two of the pharmacy practice staff members are also involved in research into complementary and alternative medicine.

Research in the division also includes a study on the availability of South African pharmaco-economic data and its use in the development of drug formularies in both the public and private sector, and a study on the use of insulin

in the treatment type II diabetes, from both a medical and social perspective.

Research in applied pharmacology is aimed at improving health care practices for the community. Areas of involvement include research into the management of diabetic patients in the public and private sector as well as research into the application of pharmaceutical care principles in the day-to-day working environment of the pharmacist. Research in the area of diabetic management is undertaken by Ms Jane McCartney and Ms Shirley-Anne Boschmans, who work closely with the local Department of Health. The work to date has primarily focused on the management of diabetic patients attending public sector health care facilities within the metropole. This research work provided the foundation from which to identify future research projects aimed at intervention steps in an attempt to improve diabetic care.

A drug utilisation study investigating the impact of the Women's Health Initiative Study on the prescribing patterns of hormone replacement therapy in a defined population is also being conducted.

Research in the area of HIV/Aids has been initiated by Ms Beverley Gold and Ms Sue Burton, who are investigating the development of a tool for the monitoring of adverse effects of anti-retroviral drugs, for use by pharmacists at local wellness clinics.

## Highlights

- The Department of Human Movement Science and Sport Management hosted the 2008 biennial South African Sport and Recreation Conference, SASReCon, from 27-29 June. This is the primary sport science conference in South Africa. It brings together South African sport science researchers and practitioners to share insights and learn from each other. It endeavours to bridge the gap between science and practice while also acting as a forum for the academic, sport science and research community to present and share results of recent projects. More than 300 participants from southern Africa as well as from Iran, India, England, America and some European countries, attended the conference while keynote speakers came from Canada, England, Switzerland, America and South Africa to ensure a truly international perspective on the relevant themes addressed at the conference.



*Dr Pierre Olivier (left), Department of HMS in action.*

- Members of the Department of Human Movement Science and Sport Management also presented four papers and a poster at international conferences and published three articles in peer reviewed journals during 2008.

- Executive Dean Prof Raj Naidoo presented a seminar entitled "Holistic Health Care in the context of Complementary and Alternative Health Care Practices," to the Sahlgrenska Academy at Göteborg University, Sweden, in May 2008. This resulted in a collaboration to develop a postgraduate (doctoral) elective curriculum on holistic health care for the Sahlgrenska Academy which caters for a wide spectrum of health professional training and health sciences research.

- Prof Ilse Truter of the Pharmacy Department was asked to conduct a research project for a local medical aid administrator on the potential abuse of over-the-counter medicine. A report was submitted to the medical aid administrator in November 2008. The project has the potential to be continued provided that further funding is made available. In addition, Prof Truter and the pharmacy department boasts the attendance of numerous conference proceedings as indicated herewith; (1) The Pharmaceutical Society of South Africa (PSSA) 63<sup>rd</sup> Conference & AGM, Spier Wine Estate, Stellenbosch, 8 to 11 May 2008. Prof Truter attended the conference as Chairperson of the Cape Midlands Branch of the PSSA. (2) 68<sup>th</sup> International Congress of FIP (International Pharmaceutical Federation), Basel, Switzerland, 30 August to 4



*Prof Ilse Truter, Department of Pharmacy.*

September 2008. (3) 2<sup>nd</sup> Clicks Pharmacy Conference, Cape Town International Convention Centre, Cape Town, 10 to 12 September 2008. (4) Tenth Prestigious Student Research Conference of the Faculty of Health Sciences, NMMU, 9 October 2008. (5) Prof Truter was sponsored by NMMU to attend the HERS-SA Academy 2008, University of Cape Town Graduate School of Business, Waterfront, Cape Town, 21 to 27 September 2008.

► The faculty proudly boasted the success of Prof Truter who held her inaugural lecture on 18 November 2008 titled “The four P’s of Pharmacy: Potions, Products, Profits and People”. Prof Truter, who has seven degrees, further went on to successfully complete the Advanced Health Management Programme (AHMP), an internationally co-certified short-course management development programme offered by the Foundation for Professional Development (FPD) in association with the Department of Epidemiology and Public Health of Yale University, a scholarship awarded by USAID.

► Prof Truter was invited to serve on the following boards - the NRF Specialist Panel to rate scientists in Health Sciences (2008 to 2010); the editorial board of the International Journal of Pharmacy Practice. In addition, Prof Truter has been selected to serve on the HERS Academy.

► Prof Watson of the Psychology Department was asked to serve as an invited member of the International Editorial Advisory Panel for the *British Journal of Guidance and Counselling*. He also received an Associate Fellowship through Warwick University.

► Dr Smith was selected to serve on the Council for Higher Education National Health Laboratory Services (NHLS Board) and prestigiously selected as a reviewer for the journal *Pharmaceutical Biology*.

► Ms Boschmans was elected as member of the South African Pharmacy Council.

► Prof Dalena van Rooyen head of the Department of Nursing Science visited the Botswana Nursing and Midwifery Council in Gaborone. In July 2008, she visited the University of Manchester to re-establish the inter-university research collaborations while in November 2008 she visited California State University

to establish a collaborative research project focusing on research capacity building of the faculty in addressing the tuberculosis epidemic.



*Prof Dalena van Rooyen, Head, Department of Nursing Science.*

► The Department of Nursing Science was approved for a grant of R13 800 000 from *The Atlantic Philanthropies* over three year starting in July 2008. The purpose of the grant is to strengthen the institutional capacity of the Lilitha College of Nursing in order to enhance the training and research capacity.

► Dr Zoleka Soji was awarded SANPAD (SA/Netherlands Research Programme on Alternatives in Development) research funding.

## **Publications**

### **ARTICLES IN DOE-ACCREDITED JOURNALS**

BROWN-BAATJIES, O., FOUCHE, P. & GREEF, A. 2008. The development and relevance of the Resiliency Model of Family Stress, Adjustment and Adaptation. *Acta Academica* 40 (1) pp 78 – 126.

DAVIES, R., DU RANDT, R., VENTER, D. & STRETCH, R. 2008. Cricket: Nature and incidence of fast-bowling injuries at an elite, junior level and associated risk factors. *The South African Journal of Sport Medicine* 20 (4), pp 115 – 118.

KATENDE-KEYENDA, N.L., LUBBE, M.S., SERFONTEIN, H.P. & TRUTER I. 2008. Prevalence of possible drug-drug



interactions between antiretroviral agents in different age groups in a section of the private health care sector setting in South Africa. *Journal of Clinical Pharmacy & Therapeutics* 33 (4), pp 393 – 400.

KATENDE-KEYENDA, N.L., LUBBE, M.S., SERFONTEIN, H.P. & TRUTER I. 2008. Prevalence of drug-drug interactions of antiretroviral agents in the private health care sector in South Africa. *South African Medical Journal* 98 (2), pp 109 – 113.

MCMAHON, M. & WATSON, M. 2008. Children's career development: Status quo and future directions. *The Career development Quarterly* 57 (1), pp 4 – 6.

MCMAHON, M. & WATSON, M. 2008. Systemic Influences on Career Development: Assisting Clients to Tell Their Career Stories. *The Career Development Quarterly* 56 (3), pp 280 – 288.

MCMAHON, M., WATSON, M., FOXCROFT, C. & DULLABH, A. 2008. South African Adolescent's Career Development through the Lens of the Systems Theory Framework: An exploratory study. *Journal of Psychology in Africa* 18 (4), pp 531 – 538.

OLIVIER, PE. & DU TOIT, D.E. 2008. Isokinetic neck strength profile of senior elite rugby union players. *Journal of Science and Medicine in Sport* 11 (2), pp 96 – 105.

SOJI, Z. & PRETORIUS, B. Occupational stress among social workers within the Department of Social Development. *The Social Work Practitioner-Researcher* 20 (3), pp 358 – 373.

VAN DER MERWE, E., HUANG, D., PETERSON, D., KILLIAN, G., MILNE, P.J., VAN DE VENTER, M. & FROST, C. 2008. The synthesis and anticancer activity of selected kiketopiperazines. *Peptides* 29 (8), pp 1305 – 1311.

VAN ROOYEN, D., LE ROUX, L. & KOTZE, W.J. 2008. The experiential world of the oncology nurse. *Health SA* 13 (3), pp 18 – 30.

WATSON, M. & MCMAHON, M. 2008. Children's career development: Metaphorical images of theory, research and practice. *The Career Development Quarterly* 57 (1), pp 75 – 83.

## CHAPTERS IN BOOKS SUBMITTED TO THE DOE FOR SUBSIDY

WATSON, M.B & MCMAHON, M. 2008. Children's career development learning: A foundation for lifelong career development in: Skorikov, V.B. & Patton, W. (Eds). *Career development in Childhood and Adolescence*. Sense Publishers: Rotterdam.

WATSON, M.B & MCMAHON, M. 2008. Integration and Identity Issues in: Arthur, N. & Pedersen, P. (Eds). *Case Incidents in Counseling for International Transitions*. American Counseling Association: USA.

WATSON, M.B. 2008. Career maturity assessment in an international context in: Athanasou, J.A & Van Esbroek, R. (Eds). *International Handbook of Career Guidance*. Springer: Netherlands.





**The Faculty of Law experienced an exciting year with the appointment of a new Executive Dean, Prof Vivienne Lawack-Davids, in July 2008.**

The faculty is very fortunate in that the promotion of research constitutes one of the dean's priorities for the faculty. Subsequently, Prof Lawack-Davids took over the position as Faculty RTI Coordinator, with effect from 1 January 2009. Under her leadership and with the support of the members of the faculty, the Faculty RTI Committee and the NMMU RTI Committee, the faculty is expected to maintain, and surpass, its productivity in participating in and producing research of exceptional quality.

During 2008 the faculty lost one of its most prolific researchers, Prof Pieter Badenhorst, to Deakin University in Australia. All indications are, however, that the research mentorship relationships established between certain established researchers and emerging researchers in 2008 will hopefully alleviate the gap left by Prof Badenhorst. Other established researchers are also working very hard to increase the research output of the faculty.

The research conducted in 2008 covers a broad range of legal disciplines, from legal theory to applied law, aligned with the institutional focus area of promoting justice.

Moreover, various innovative research projects illustrate the faculty's endeavours to establish and strengthen collaborative and international research links. What follows is a synopsis of some research highlights in the academic year of 2008.

## Research strategy

After various workshops, the most notable the faculty's strategic planning session from 29 to 30 September 2008, at Cape St Francis, under the leadership of Prof Vivienne Lawack-Davids, a faculty research strategy was devised for the next three years. Not only is the strategy aligned with the institutional research strategy, but it also reflects the vision and mission of the Faculty of Law, approved in November 2008. The faculty's research strategy is aimed at maintaining and enhancing the research culture in the faculty and various deliverables have been identified and are being acted upon to meet this objective. The faculty is in the process of implementing its strategic objectives, which includes its research strategy.



*Prof Elmarie Knoetze, Chairperson, Faculty RTI Committee*



The mission of the Faculty of Law is as follows:

*"The NMMU Faculty of Law is an engaged faculty committed to excellence, integrity and justice through teaching, learning and research".*

The vision is:

*"To empower our stakeholders through legal education, research and engagement driven by justice, integrity and excellence".*

It is evident from the above that the pursuit of justice is central to the make-up of the faculty and hence, a broad research theme has been identified which ties in with this pursuit, namely, to conduct legal research in response to societal needs.

Each department in the faculty is currently engaged in distilling this theme into departmental research themes. This process will be finalised in 2009.

RESEARCH THEME	DRIVER
Legal research in response to societal needs (Social responsiveness)	Prof Vivienne Lawack-Davids

## RATED RESEARCHERS

Surname, Initials, Title	Rating Category
Bohler-Muller, N, Prof	Y2
Knoetze, E, Prof	Y2
Vrancken, PHG, Prof	C3

## Faculty Researcher of the Year



*Prof Narnia Bohler-Muller, Faculty Researcher of the Year*

## Emerging Faculty Researcher of the Year



*Dr Deon Erasmus, Emerging Faculty Researcher of the Year*

## Postgraduate qualifications obtained

During 2008 two staff members obtained postgraduate qualifications. During the European academic year of 2006/2007, Mr David Abrahams attended and successfully completed his LLM degree in international humanitarian law at the Université de Genève, Switzerland. He was the first South African to formally obtain this prestigious, specialised qualification in March 2008. NMMU postgraduate student and staff member Ms Lynn Biggs was awarded her LLM Labour Law Coursework degree cum laude.

## Postgraduates who graduated

The faculty is proud to have delivered 13 coursework master's graduates in labour law under the supervision of Prof Adriaan Van der Walt, and one in the child witness programme under the supervision of Dr Deon Erasmus. The faculty also produced two LLM research graduates supervised by Prof Narnia Bohler-Muller (cum laude) and Dr John von Bonde respectively. Of particular significance, was the delivery by Prof Adriaan Van der Walt of a doctoral graduate, Prof Pieter Wagener, with his thesis entitled "Human Rights and Labour Law: The Influence of Globalisation in the SADC".

# Collaborative research

Various staff members embarked upon collaborative research projects as envisaged in the faculty's research strategy. The endeavours of four colleagues are briefly set out below.

Mr David Abrahams' interest in the field of international humanitarian law has resulted in a Memorandum of Understanding in 2008 between the NMMU Faculty of Law and the regional delegation of the International Committee of the Red Cross based in Pretoria. Mr Abrahams' qualification in international humanitarian law has enabled him to pursue the development of a master's programme in international humanitarian law for the faculty. Moreover, Mr Abrahams is currently in the process of negotiating a possible collaborative relationship with the Faculty of Law of the Université de Genève. It is envisaged that NMMU's LLM (International Humanitarian Law) will be construed similar to that practised in Geneva, and hence a collaborative relationship would greatly benefit NMMU's Faculty of Law.

In an ongoing project, Prof Adriaan Van der Walt assisted the Department of Labour in Mauritius with the drafting of labour legislation. Links with a view to embarking



*Colleagues in action at the Ministry of Labour, Mauritius.*

on collaborative research were established and will be developed during 2009. It is envisaged that several LLM students will be recruited as a result.

Prof Avinash Govindjee is involved in a project on "Developing a Conceptual and Normative Framework for Micro-Health Insurance as a Social Security Instrument in India".

Prof Patrick Vrancken is involved in an ongoing project on the "Legal aspects of marine tourism" in collaboration with Prof Marc Miller, School of Marine Affairs, University of Washington, Seattle, USA.



*Mr David Abrahams absorbing the European sun in front of the Faculty of Law at the University of Geneva.*

# Conference facilitation

For the fourth year in succession, in collaboration with the Faculty of Law of the University of the Western Cape, this faculty hosted the Fifth Annual Law Conference of the Universities of the Western and Eastern Cape. For the first time delegates from universities other than the universities of the Western and Eastern Cape participated in the conference. What started off as a four-person private law workshop in East London in 2004, has grown into a national conference which has become an excellent forum for both established and emerging researchers to present either completed research, or research in progress. Various papers of NMMU colleagues have subsequently been published in accredited law journals. The conference will again be hosted by the Faculty of Law.



*The founders of the Annual Law Conference of the Universities of the Western and Eastern Cape, with the former Acting Dean, Prof Henk Delport (from left) Prof Elmarie Knoetze (NMMU), Prof Francois De Villiers (University of the Western Cape), Prof Henk Delport and Prof Digby Koyana (Walter Sisulu University).*

## Research entities

### LABOUR AND SOCIAL SECURITY LAW UNIT (LSSLU)

**Head:** Prof Adrian van der Walt

**Email:** Adrian.VanDerWalt@nmmu.ac.za

**Tel:** 041 504 2199

The mission of the LSSLU in so far as it relates to research, is set out in the following selected objectives:

- ▶ To undertake research on labour and social security law;
- ▶ to undertake contractual investigations and research relating to labour and social security law;

- ▶ to disseminate information on labour and social security law matters; and
- ▶ to provide a forum for communicating research findings.

The unit excelled in the delivery of the following research outputs: four articles published in accredited journals; one paper delivered at an international conference; three papers delivered at national/local conferences; and one international research visit.

## Publications

### ARTICLES IN DOE-ACCREDITED JOURNALS

BADENHORST, P.J. & CARNELLEY, M. 2008. Review of a Refusal to Grant a Prospecting Right - Global Pact Trading 207 (Pty) Ltd The Minister of Minerals and Energy; the Regional Manager: Minerals and Energy, Free State Region; The Deputy Director-General: Minerals and Energy (Case Nr 3118/2006 (O) Unreported). *Obiter* 29 (1), pp 113 – 123.

BADENHORST, P.J. & MOSTERT, H. 2008. Duelling prospecting rights: A non-custodial second? *Journal of South African Law* 4, pp 819 – 833.

BADENHORST, P.J. & SHONE, R.W. 2008. “Minerals”, “Petroleum” and “Operations” in the Mineral and Petroleum Resources Development Act 28 of 2002: A Geologist as Devil’s Advocate for a Change? *Obiter* 29 (1), pp 33 – 52.

BADENHORST, P.J. & COETZEE, L. 2008. Unjustified Enrichment: Having a friend wear different hats, who needs enemies? - *Mndi v Malgas* 2006 2 SA 182 (EPD). *Obiter* 29 (1), pp 101 – 112.

BELL, K. & ABRAHAM, D. 2008. The Use of Child Soldiers in Armed Conflict. *Obiter* 29 (2), pp 162 – 190.

BIGGS, L. 2008. The Application of Section 197 of the Labour Relations Act in an Outsourcing Context (Part 1). *Obiter* 29 (3), pp 425 – 452.

BOHLER-MULLER, N. 2008. Against Forgetting: Reconciliation and Reparations after the Truth and Reconciliation Commission. *Stellenbosh Law Review* 19 (3), pp 466 – 482.



BOHLER-MULLER, N. 2008. On a Cosmopolis to Come. *Social and Legal Studies* 17 (4), pp 559 – 571.

DELPORT, H. J. 2008. Cancelling an Instalment Sale of Land - *Merry Hill (Pty) Ltd v Engelbrecht* 2008 2 SA 544 (SCA); *Van Niekerk v Favel* 2008 3 SA 175 (SCA). *Obiter* 29 (2), pp 302 – 316.

DELPORT, H. J. 2008. Description of a Sectional title Unit in a Deed of Sale - *Erf 411 Robertsville Property CC v New Market Developments (Pty) Ltd* 2007 2 SA 179 (W). *Obiter* 29 (1), pp 87 – 92.

DELPORT, H. J. 2008. Eviction of a tenant after termination of a lease of residential premises. *Obiter* 29 (3), pp 472 – 488.

ERASMUS, D. 2008. Voluntary associations and the Constitution: *Eastern Province Athletics Association v Association of Athletics SA*. *Journal for Juridical Science* 33 (1), pp 102 – 110.

GOVINDJEE, A. & VAN DER WALT, A. 2008. Employment without Rights? - *Discovery Health Limited v CCMA* 2008 7 BLLR 633 (LC); and *"Kylie" v CCMA* 2008 9 BLLR 870 (LC). *Obiter* 29 (3), pp 542 – 557.

HOLNESS, D. & GOVINDJEE, A. 2008. The realisation of the constitutional right to food in South Africa. *De Jure* 3 (41), pp 524 – 544.

KNOETZE, I. 2008. Deskundige Getuienis van Breingolfafdrucke en "Thermal Imaging". *Obiter* 29 (3), pp 489 – 501.

LAWACK-DAVIDS, V.A. 2008. The Legal and Regulatory Framework of the National Payment System (NPS) - Peeling the Layers of the Onion. *Obiter* 29 (3), pp 453 – 471.

MUKHEIBER, A. 2008. Wrongful Life - The SCA Rules in - *Steward v Botha* (340/2007) [2008] ZASCA 84 (3 June 2008). *Obiter* 29 (3), pp 515 – 523.

PARTINGTON, J. & VAN DER WALT, A. 2008. Re(viewing) the Constitutional Court's Decision in *Sidumo*. *Obiter* 29 (2), pp 209 – 237.

VON BONDE, J.C. 2008. Restorative Justice: Bringing Back the Pillory? *Obiter* 29 (2), pp 133 – 142.

VRANCKEN, P. & TAIT, M. 2008. Southern African can be a tough country for Tourism Service Providers ... Even with an exemption clause *Drifters Adventure Tours CC v Hircock* 2007 1 All SA 133 (SCA). *Speculum Juris* 22 (1), PP 139 – 145.

WAGENER, P. 2008. Globalisering en 'n verdeelde gemeenskap in Suid Afrika. *Tydskrif vir Geesteswetenskappe* 48 (4), pp 401 – 411.







# Faculty of Science

*Discovering tomorrow*

The Science Faculty has embarked on a strategic plan to grow the research activities of the faculty. An important component of the plan will be to increase the capacity of its researchers. Various interventions in this regard have enabled an increasing number of our academics to complete their doctoral studies.

## RATED RESEARCHERS

Surname, Initials, Title	Rating Category
Adams, JB, Prof	C2
Baird, D, Prof	B3
Booth, GL, Prof	C2
Booth, PWK, Prof	C3
Botha, JR, Prof	C2
Campbell, EE, Prof	C3
Christopher, AJ, Prof	B2
Cowling, RM, Prof	A1
Downing, TG, Dr	Y2
Engelbrecht, JAA, Prof	C2
Ferg, EE, Dr	C3
France-Jackson, H, Prof	C1
Frost, CL, Prof	C3
Gerber, TIA, Prof	C2
Groenewald, NJ, Prof	C1
Kakembo, V, Prof	L
Kerley, GIH, Prof	C1
Leitch, AWR, Prof	B3
Lombard, AT, Dr	C2
McClelland, CW, Prof	C3
Neethling, JH, Prof	C3
Somai, BM, Dr	L
Strydom, NA, Dr	Y2
Van de Venter, M, Dr	L
Van Dyk, EE, Prof	C2
Venter, A, Prof	L
Wagener, MC, Prof	C1
Wesson, JL, Prof	C3
Whittington, PA, Dr	C3
Wooldridge, TH, Prof	C1
Zeelie, B, Prof	C2

In addition, attention is being given to assisting emerging researchers to become established in their fields of expertise. The faculty has also given much attention to increasing the throughput rates for postgraduate students. This has resulted in a record number of students graduating with higher degrees at the 2009 graduation ceremony.

The highlights of the faculty for 2008 indicate that five years after the merger, the faculty is growing from strength to strength with many exciting activities taking place. There has been an increase in the number of postgraduate students joining us from throughout South Africa, and even further afield. This is surely a reflection of the quality of our academic programmes and the marketability of our graduates.

One of the highlights of 2008 was news that Prof Richard Cowling (Department of Botany) received an "A1" rating by the National Research Foundation. An A1-rating refers to researchers who are unequivocally recognised by their peers as leading international scholars in their field for the high quality and impact of their recent research outputs. This outstanding achievement places Prof Cowling (photo next page) at the top of his field in South Africa as an international botanist. Most of his research is user-inspired and embedded in a social process that leads to implementation.

RESEARCH THEMES	DRIVER
Energy for the future	Prof Ernest van Dyk
Environmental and natural resource management	Dr Derek du Preez
Novel materials, products and processes	Prof Ben Zeelie
Science education for a changing world	Prof Werner Olivier
Next generation ICT solutions	Prof Janet Wesson





*Prof Richard Cowling received an A1 rating by the NRF*

The majority of the faculty's research activities fall into the following focus areas:

## Energy for the Future

The Centre for Energy Research is an entity in which research focused on renewable energy issues of relevance in South Africa is conducted. Although housed in the Science Faculty, its strength is the multidisciplinary approach with which research problems are addressed. Participating researchers come from engineering and economics as well as from physics, chemistry and statistics. Under the direction of Prof Ernest van Dyk, current research activities are being funded by Eskom, Telkom, the metro, and government through the departments of Trade and Industry, and Science and Technology. The focus areas include solar (photovoltaic) energy, wind energy, solar thermal, battery design, energy economics, and energy management. This centre is also involved in various exciting projects to grow awareness about renewable energy sources for a sustainable future. One of these projects is the preparation of a postgraduate programme in renewable energy, being prepared with the support of Oldenburg University in Germany. It is hoped this new postgraduate master's programme can start in 2011.

NMMU signed a Memorandum of Understanding with the Altron group during 2008. The Science Faculty's involvement in this regard is significant, with Willard

Batteries (part of the Altron group of companies) sponsoring the use of a multi-channel battery capacity cycling equipment for the ongoing battery research work of Dr Ernst Ferg (Department of Chemistry).

## Environmental and Natural Resource Management

A key development for 2008 was the launch of a new NRF-funded research niche area at NMMU. With Prof Graham Kerley as team leader, the research niche area, "Building a biodiversity-based economy in the Eastern Cape", will help address issues related to this particular focus of the faculty.

On the terrestrial side, the Centre for African Conservation Ecology (ACE), continued to play a significant role in various terrestrial research projects in the Eastern Cape, including studies of the Cape leopard. Director of ACE Prof Kerley was recently appointed to the Board of South African National Parks after an invitation from the Minister of Environmental Affairs. Prof Kerley has also been awarded a prestigious international Madame Curie Fellowship, to spend six months working at the Polish Academy of Science.

In the field of Geosciences, Prof Vincent Kakembo made good progress with his SANPAD-funded research activities, in collaboration with partners in the Netherlands. Prof Kakembo specialises in soil erosion, hill slope hydrology, geographical information systems (GIS) and remote sensing in his area of expertise in applied geomorphology. His SANPAD project focuses on land degradation issues in the Eastern Cape.



*Dr Kwezi Mzilikazi, Senior Lecturer in Zoology*

Dr Nomakwezi Mzilikazi, a senior lecturer in zoology, has been able to forge ahead with her research work, with the installation of the specialised animal respiratory equipment. She had a number of visitors (local, as well as from Germany and Australia) in 2008, all attracted by the quality of her research and the availability of the excellent research equipment and facilities.

On the marine side, Prof Janine Adams has been appointed to Chair the Board of the Water Research Commission (WRC) for South Africa. As a Botanist, her estuarine research continues to attract national and international recognition.

Dr Nadine Strydom joined the faculty as a senior lecturer in zoology during 2008. With her research focus on fish larvae, her presence will considerably strengthen the marine and coastal research activities at NMMU.

Also in the marine field, Dr Ronel Nel continues to head the research diving group of the faculty. She has experienced a significant growth in the number of postgraduate students registering under her supervision. Her research includes studies on the marine-protected area off Sardinia Bay, in collaboration with colleagues from Bayworld.

## Novel Materials, Products and Processes

Prof Tommy Gerber (2008 Faculty Researcher of the Year) leads a small but highly-focused group of postgraduate students in the Chemistry Department who continue to excel and produce research outputs in respected international scientific journals. During 2008 Prof Gerber and his colleagues hosted the Sixth International Symposium on Technetium and Rhenium. More than 60 distinguished guests from all over the world participated in this prestigious symposium. The group's research focus is the development of radiopharmaceuticals containing the metals rhenium and technetium for cancer therapy and the early detection of Alzheimer's disease.

The faculty is also proud that Dr Maryna van de Venter of the Department of Biochemistry and Microbiology was the Science Faculty Emerging Researcher of the Year for 2008. The focus of Dr Van de Venter's research is the validation of anticancer and antidiabetic activities of plants used in traditional medicine to treat these conditions.

Two new academics who joined the faculty as lecturers during 2008 are Dr Hajierah Davids and Dr Gill Dealtry. Both are active researchers, also focusing on understanding the antidiabetic activities of indigenous plants.



*Prof Reinhardt Botha, Chair in Nanophotonics*

Prof Reinhardt Botha of the Department of Physics was awarded a prestigious Research Chair in nanophotonics from January 2008. Funded by the Department of Science and Technology through the SARCHI initiative, the Chair will be a significant boost to the faculty's research activities in the fields of novel materials. As part of the nanophotonics research activities, a new state-of-the-art metal-organic chemical vapour deposition (MOCVD) reactor has been ordered. Valued at more than R7m, it will be unique in Africa and will replace the original system which has been the workhorse in the Physics Department since 1985. The new MOCVD system is designed for the deposition of ultrathin films of zinc oxide, to be used for research towards developing UV detectors and other photonic applications.

On the subject of nanomaterials, Prof Andrew Leitch has been appointed to Chair the Advisory Board of the Nanotechnology Strategy of the Department of Science and Technology. The purpose of this board is to advise the Department of Science and Technology (DST) in developing the nanotechnology strategy for South Africa.

NMMU recently signed an agreement with the Pebble Bed Modular Reactor Company to conduct research on the nuclear fuel required for the next generation of nuclear power stations in South Africa. Spearheaded by Prof Jan Neethling, of the Department of Physics, the research entails an electron microscope study of the special coatings required for the nuclear fuel. Prof Neethling is both nationally and internationally known for his vast expertise in the field of electron microscopy.

As a result, the DST has committed to establishing a national centre for high resolution electron microscopy at NMMU, within the Faculty of Science. The national centre will have state-of-the-art facilities in high resolution electron microscopy. Our Institute for Chemical Technology, InnoVenton, continues to excel in the field of applied chemistry. With several commercialisation achievements last year, the latest major project involves collaboration with scientists from Jacobs University in Germany. The project centres around the production of biofuels, high protein food and bioplastics for industry.

The parties recently signed a Memorandum of Understanding to develop and promote this technology in Africa. The Eastern Cape coast was selected for the establishment of pilot sites for introduction of the German-based technology since it has an ideal annual climatic temperature conditions, incoming solar radiation levels and a mix of industrial activity.

The technology utilises marine micro-algae to capture and convert waste industrial greenhouse gas  $\text{CO}_2$  through photosynthesis in a low-cost photobioreactor system which has proven highly successful in current use in Germany. The  $\text{CO}_2$  is converted into biomass which could be converted into biofuels, bioactive substances, chemicals, high protein food, building materials and bioplastics, using InnoVenton's technology in bio-processing.

The proposed research and development plan includes the installation and demonstration of a 200m<sup>2</sup> photobioreactor at NMMU by December 2009, capable of producing two tons of dry biomass annually.

2008 also saw the first students registering for the new postgraduate qualification (BSc Honours in Formulation Science). This new qualification is presented by InnoVenton and links up with the postgraduate research being conducted in the institute.

## Science Education for a changing world

One of the focus areas of the faculty continues to be research in science education. The Govan Mbeki Maths Development Unit (established during 2008) is involved in activities focused at growing skills in the important field of maths and science education.

These include the Grade 12 Maths and Science Learnership Programme run by Dr Hennie Boshoff and funded by Sasol, VW and the NMMU Trust. The impressive results from last year's DVD-based programme, which ran for 21 weeks at Missionvale Campus, confirmed the success of this intervention. It is pleasing to note that the programme is in great demand, with enquiries being received about the DVDs from across the country and further afield. In the metro, more than 500 Grade 12 learners applied for the 150 positions available for this year. Ms Pragashni Padayachee, a lecturer in the Department of Mathematics, is involved in the programme, as part of her studies towards her doctorate in maths education.



*Ms Pragashni Padayachee, lecturer in the Maths Dept, involved in the Maths Learnership Programme*

Prof Charmain Cilliers and students in the Department of Computing Sciences have grown their research activities in computer science education. They are also engaged in a collaborative research project with colleagues from Makerere University (Kampala, Uganda), focused on researching new ways to teach this discipline.





*Prof Charmain Cilliers, Department of Computing Sciences*

## Next generation ICT solutions

Research in the Telkom-sponsored Centre of Excellence continued in 2008. Directed by Prof Janet Wesson, head of the Department of Computing Sciences, the centre focuses on two main areas of research: distributed multimedia applications, and optical fibre characterisation for the telecommunications industry.

Staff and students from both units participated in the annual SATNAC conference. This has become the premier telecommunications conference for southern Africa. It is pleasing to note that postgraduate students active in the centre have grown considerably over the past few years.



## Faculty Researcher of the Year



*Prof Thomas Gerber, Faculty Researcher of the Year*

## Emerging Faculty Researcher of the Year



*Dr Maryna van de Venter, Emerging Faculty Researcher of the Year*

# Research Entities

## **InnoVenton: Institute for Chemical Technology and Downstream Chemicals Technology Station**

**Director:** Dr Gary Dugmore

**E-mail:** Gary.Dugmore@nmmu.ac.za

**Tel:** 041 504 3465

## **Telkom Centre of Excellence & its sub-entities (CoE)**

**Director:** Prof Janet Wesson

**E-mail:** Janet.Wesson@nmmu.ac.za

**Tel:** 041 504 2323

## **Centre for African Conservation Ecology (ACE)**

**Director:** Prof Graham Kerley

**E-mail:** Graham.Kerley@nmmu.ac.za

**Tel:** 041 504 2316

## **Centre for Energy Research (CER)**

**Director:** Dr Ernest van Dyk

**E-mail:** Ernest.VanDyk@nmmu.ac.za

**Tel:** 041 504 2259

## **Integrated Environmental and Coastal Management Unit (IECM)**

**Head:** Dr Derek du Preez

**E-mail:** Derek.DuPreez@nmmu.ac.za

**Tel:** 041 504 2721

# Publications

## **ARTICLES IN DOE-ACCREDITED JOURNALS**

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The broad research focus area of the George Campus is sustainable resources management, with a specific focus on the application of management principles and practices, at the interface between natural resources, communities, governance and businesses. Communities, government departments and business structures are grappling with change due to social-economic activities, political pressure, global warming and energy shortages. New management principles and practices therefore need to be developed, to mitigate the impact of these changes on the well-being of present and future generations.

NMMU's George Campus aims to develop research methods to understand the nature and impact of change in societal structure and provide a framework/model to support sustainable resources management. This incorporates multidisciplinary approaches that advance fundamental understanding of the impact of human activities on the communities, government departments, and business structures as well as the natural environment.

Postgraduate students, research associates and visiting academics interested in applied research to improve the management of social and ecological systems in conservation, forestry, agriculture, tourism, or local economic development, should find the George Campus one of the most scenic, stimulating and unique places in the world for postgraduate studies. Our campus provides a unique living and learning environment for researchers and postgraduate students who care about the earth and its management. The campus and its neighbouring landscapes is a laboratory for sustainability science, where "green" technologies, management principles and resource use principles are applied, monitored and tested as part of curricula and research projects.

RESEARCH THEME	DRIVERS
Sustainable resource management	Prof Christo Fabricius and Dr Laurence Watson

## International collaboration in resilience assessment

Campus Principal Prof Christo Fabricius has been working with the International Resilience Alliance ([www.resalliance.org](http://www.resalliance.org)) to develop a better understanding of resilience in practice. As a founding member of the southern African node of the Resilience Alliance, he has participated in working group sessions in Sweden, Nairobi and Tajikistan. In 2008 he presented four papers on resilience in social-ecological systems at national and international conferences, authored and co-authored several papers on the topic and contributed to several funding proposals. He serves on the editorial board of Ecology and Society.



Rangelands in Roghun, Tajikistan, where Prof Christo Fabricius is assessing the resilience of two rural villages in collaboration with the Resilience Alliance.



During 2008 Prof Fabricius lead a consortium of scientists from the United Kingdom, Switzerland, Nigeria, Kenya and South Africa in conducting an assessment of ecosystem services and poverty in sub-Saharan Africa. The research culminated in a synthesis report to the UK's Department for International Development, a paper at an international symposium, and a multi-authored book. The work shed light on the links between ecosystem services and poverty in sub-Saharan Africa and emphasized the importance of natural resources to the most vulnerable sectors of society: the rural poor.

## Ralf Yorke Memorial Prize

In March 2008 Prof Fabricius and former Rhodes University student Nigel Chalmers received Ecology and Society's Ralf Yorke Memorial Prize for the most innovative article in the journal. The editors selected the article "Expert and generalist local knowledge about land-cover change on South Africa's Wild Coast: can local ecological knowledge add value to science?" from among 65 submitted manuscripts for the prize, which has a cash value of 500 euros. Ecology and Society ([www.ecologyandsociety.org](http://www.ecologyandsociety.org)) is a highly-rated international academic journal which focuses on sustainability, people and ecosystems. It has a wide readership and is influential in international science circles.

Prof Fabricius was also one of the 25 international speakers invited to deliver key papers at the acclaimed Resilience2008 symposium in Stockholm in April 2008. This landmark event, co-organised by the International Council for Science, Royal Swedish Academy of Sciences and Resilience Alliance, was attended by more than 600 academics and policy makers from many countries and disciplines.

## Action Research

Various staff members and students were engaged in relevant research projects during 2008.

A project on leopard and caracal ecology in the George region was initiated by Alex Brackowski, a first-year nature conservation student, supported by Dr Laurence Watson, a lecturer in the nature conservation and game ranch management programmes. Although these carnivores are frequently sighted in the George region, little is

known about the diet, density and habitat use of these species in the area. With the increasing development in the George region and the close proximity of the natural vegetation to farmlands and residential areas, conflict between landowners and these two carnivores may be expected to increase. Research aimed at understanding the ecology of these species is therefore vital to manage any conflict that may arise between humans and these carnivores in the future.

The research will ultimately culminate in postgraduate qualifications for Alex. He is presently collecting and analyzing scats of both species. In addition, Alex is using cameras around George Campus to monitor the movement and to facilitate the identification of individual animals in the area. The research is sponsored by MTO Forestry and Fairfield Tours.



*Alex Brackowski doing field work.*

Drs Glen Taylor and Brian Mather conducted research aimed at sustainable methods of energy utilisation for the natural resource industries. The two areas of research were the use and manufacture of fatty acid methyl esters (FAME) as a fuel for diesel engines. The other was the use of methane gas from the dairy industry as a renewable and sustainable form of energy.



*Dr Glen Taylor, Chairman, Faculty RTI Committee.*

Trans-esterification was used, using virgin triglycerides oil (sunflower and canola), followed by used vegetable oil, once some expertise was acquired. Methanol was used as the alcohol, and potassium hydroxide (KOH) as base catalyst.

High quality biodiesel was produced and a larger scale plant was constructed for production of FAME using canola oil obtained from a local farmer. The design of the plant resulted in significant cost advantages and could produce approximately 10 000 litres a week with the possibilities of further capacity development. FAME was purified using a resin specifically designed for biodiesel purification. This proved to be very successful and FAME was used on a number of different agricultural machinery. Glycerol by-product was stockpiled for future research (in process of being investigated). Useful techniques were obtained at laboratory level and aspects such as an energy source for animal feeds, organic fertiliser and a possible organic weed killer showed promise.

Vegetable oil was obtained from various sources, and following titration and pre-transesterification was trans-esterified and used in two vehicles to assess suitability as an automotive fuel. This was very successful and a quality fuel was produced with care in pre-production and subsequent manufacture.

Forest Engineering activities in the South African context currently contribute approximately 70% to the cost of a plantation production cycle. It is therefore critical that these activities be executed in a most efficient way in order to improve the viability of commercial forest operations. For this reason, forest engineering research receives considerable attention in South Africa and is also an important research focus at the George Campus. The forestry programme is currently involved in three research

projects for which industry funding was secured. The first concentrates on Pinus sawtimber tree optimisation in South Africa, where a comparison of mechanised tree optimisation (harvester) versus current manual methods is made. The second is a study of the feasibility of different technologies for semi-mechanised and mechanised wattle (*Acacia mearnsii*) debarking, compared to traditional manual methods. The third looks at cut-to-length versus tree-length and full-tree mechanised harvesting in Eucalyptus. This will determine the affects of tree size and ease of debarking (stripability) on harvesting system selection.

An increased fuel load in commercial plantations has been identified as a key contributing factor to intense and destructive fires. A research project by forestry lecturer Tiaan Pool on fuel load management methods aims to find a cost-effective way of managing fuel loads that will not be harmful to the environment and will give protection to commercial trees. The results of an MTech study titled "The Effect of Modified Fuel Load on Fire Behaviour in Pine and Eucalypt Stands in the Mpumalanga Highveld Forestry Region, South Africa" will help foresters choose the best fuel management system to use on their plantations.

The success of the South African plantation forest industry is to a large extent based on reliable decision support systems. The classification of forest landscapes in terms of environmental factors such as climate, geology, topography and soils, as well as the scientific evaluation of such land units, are a prerequisite for precision forest management. Dr Josh Louw, in collaboration with the Council for Scientific and Industrial Research, the University of Stellenbosch and Komatiland Forestry, is the project leader of a study on forest site classification and evaluation of a national forest site classification system for the summer rainfall region of South Africa. This geographic database will serve as important platform for forest managers to address challenges related to improving the efficiency of forest operations, to ensure environmentally responsible forest management operations, and to minimize the anticipated negative impact of climate change. One aspect that is currently of interest is the influence of site specific biophysical factors on the properties of wood. Two MTech students are conducting research projects in the Mpumalanga escarpment area to test the influence of environmental gradients on the properties of sawn timber as well as the pulping properties of wood fibre. The outcomes of this study will have far reaching

implications for forest planning, harvest scheduling and forest product utilisation.

Research based on the work of a graduate student on beekeeping has allowed for staff to play an advisory role in the development of 12 emergent beekeepers in a number of Southern Cape agricultural land reform projects. This initiative is a collaborative venture between NMMU, Southern Cape Bee Industry Organisation, South Cape College and the Western Cape Department of Agriculture. Other problem-solving actions include honey bee activity and pollination during the bloom period of fruit and seed crops in the Southern Cape region.

## Research collaboration in Agriculture

The need for collaboration between government departments and higher education institutions can significantly strengthen South Africa's capacity for research and skills development, particularly in the agricultural sector. At the end of 2008, Mr Cobus Dowry, the Western Cape Minister of Agriculture, signed a Memorandum of Understanding (MoU) at the Outeniqua Experimental farm in George between the Department of Agriculture – Western Cape and NMMU. The main objective of the MoU is to train future agricultural researchers. As a result, the Department of Agriculture (Institute for Plant and Animal Production) has made its facilities available to postgraduate students. Students can also complete their practical training and internships on approved research projects of mutual interest to both parties. Two students benefited from this opportunity during 2007/2008, two more are currently involved and a further three have been identified for the 2009/2010 experiential learning cycle.

## Sustainable farming in practice

George Campus academics have, for the past year, been working with a group of dairy farmers who wish to develop a better understanding of sustainable farming in practice. The study group's focus is on holistic management of ecosystem services, with a particular emphasis on soil quality, with the ultimate aim of better forage production with lower input costs. The group will eventually put all the lessons learnt into a toolkit, aimed at assisting commercial and emerging farmers.

## Publications

### ARTICLES IN DOE-ACCREDITED JOURNALS

JORDAAN, J.W., BRAND, T.S., BHIYA, C. & AUCAMP, B.B. 2008. An evaluation of the slaughter age on the profitability of intensive slaughter ostrich production. *Australian journal of experimental agriculture* 48 (6-7), pp 916 – 920.

SCHUMANN, M., WATSON, L.H. & SCHUMANN, B.D. 2008. Attitudes of Namibian commercial farmers toward large carnivores: The influence of conservancy membership. *South African Journal of Wildlife Research* 38 (2), pp 123 – 132.

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SWANEPOEL, F.J.C., TAYLOR, G.J., WEBB, E.C. & STROEBEL, A. 2008. Effect of nutrition on testicular traits of tropically adapted yearling beef bulls. *Australian journal of experimental agriculture* 48 (6-7), pp 950 – 953.

TAYLOR, G.J., SWANEPOEL, F.J.C., WEBB, E.C. & STROEBEL, A. 2008. Effect of heifer frame size on their subsequent reproductive performance and preweaning performance of their calves. *Australian journal of experimental agriculture* 48 (6-7), pp 945 – 949.

VENTER, J.A. & WATSON, L.H. 2008. Feeding and habitat use of buffalo (*Syncerus caffer caffer*) in the Nama-Karoo, South Africa. *Peptides* 38 (1), pp 42 – 51.

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CUNDILL, G. & FABRICIUS, C. 2008. Adaptive co-management under resource-poor conditions: lessons from South Africa in: Burns, M. & Weaver, A. (Eds). *Exploring Sustainability Science - a Southern African perspective*. Sun Press: Stellenbosch, South Africa.

ONOJAEFE, D.P. & LEANING, M. 2008. Managing cybercafés: Achieving mutual benefits through partnership in: Adomi, E.E. (Ed). *Security and Software for Cybercafés*. IGI Global: USA.



# Entities Reporting Directly to the DVC:RTP

## HIV/AIDS UNIT



*Vice Chancellor Prof Derrick Swartz (from left), Dr Jill von der Marwitz, Director: HIV/AIDS Unit, with the Honourable Vittorio Prodi, Chairman of the European Union parliamentary delegation who was hosted by NMMU to gain further insight into the EU grant for HIV-integrated management support project activities.*

**Head:** Dr Jill von der Marwitz  
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The most noteworthy achievement of 2008 was the award of the Higher Education AIDS Programme (HEAIDS) European Union grant of R3 463 062m to NMMU. The EU grant made provision to strengthen the institutional comprehensive HIV response through the inclusion of capacity-building initiatives for strategic management, academic and support structures. The grant includes funding for research scholarships, including three masters' and one postdoctoral fellowship.

In addition, the unit was involved in assisting the higher education sector in developing the gaps/needs analysis tool for higher education institutions and the writing of the sector synthesis report. The data obtained by the synthesis report facilitated the development of other sector key activities conducted by external service providers for higher education. The unit was directly involved with the development of the HIV/Aids sector policy framework which was endorsed by the Minister of Education in October 2008.

The unit was also awarded a contract by the Elizabeth Glaser Paediatric AIDS Foundation to conduct an evaluative survey in 2008. A number of other research contracts were also awarded to the unit.

## CENTRE FOR THE ADVANCEMENT OF NON-RACISM AND DEMOCRACY

The Centre for the Advancement of Non-Racism and Democracy seeks to harness collective institutional capabilities in relation to academic endeavours in research, teaching and learning, evidence-based advocacy and interventions in advancing non-racialism and democracy. The activities of the new centre will be multi/inter/cross/trans-disciplinary and will be informed by a shared understanding of the interdependence of research, advocacy, education and intervention.

Specifically, the centre will strive to undertake cutting-edge social research, educational engagement and advocacy aimed at raising public understanding and policy support for the pursuit of a non-racial, democratic South Africa.

The centre's work will bring into focus important and inter-related questions about constructs of racism and its alternatives (non-racialism, multiculturalism, social justice, etc.), the relationship between race, class and gender inequality, identity, reconciliation and social cohesion and policies enabling transition to a non-racial, democratic society.

## Support Services

### RATED RESEARCHERS

Department	Surname, Initials, Title	Rating Category
Higher Education Access & Development Services	Foxcroft, CD, Prof	C2
Sport Bureau	Stretch, RA, Dr	C1



*South Campus, Summerstrand*



*Bird Street Campus*



*George Campus*



*Missionvale Campus*



*North Campus, Summerstrand*



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