

The year 2007 proved to be a highly successful one for the faculty. Our drive towards research excellence gained further momentum with some outstanding achievements by staff and students. Research activities focused on the following themes:

Manufacturing Technology: To improve system performance through research aimed at developing and advancing the manufacturing processes to support product optimisation and control through modelling and simulation.

Management Development for the Built Environment: To develop and improve management practitioners in all sectors and disciplines of the built environment.

Secure ICT Services: To propose solutions for improving information security in all ICT-related business services, including technical, administrative and managerial applications.

Staff with valid NRF ratings – December 2007

Faculty	A	B	C	P	Y	L	Total
Engineering, the Built Environment & Information Technology	-	1	2	-	1	-	4



Prof Henk de Jager, Dean: Faculty of Engineering, the Built Environment and IT



Prof Rossouw van Solms, Chairman: Faculty RTI Committee



Johan van Niekerk, Emerging Researcher of the Year

Faculty of Engineering, the Built Environment & Information Technology

Technology for tomorrow

Research Entities

SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

Cisco Academy Training Centre (CATC)

Mr Renaldo Rheeder: 041 504 3568

Centre for Information Security Studies (CISS)

Prof Rossouw von Solms: 041 504 3604

Spatial Technologies Unit

Prof Dalenca Pottas: 041 504 9100

SCHOOL OF ENGINEERING

Institute for Advanced Manufacturing Research (IAMER)

Dr Annelize Els-Botes: 041 504 3091

Automotive Component Technology Station (ACTS)

Prof Danie Hattingh: 041 504 3608

Manufacturing Technology Research Centre (MTRC)

Dr Annelize Els-Botes: 041 504 3091

Advanced Mechatronic Technology Centre (AMTC)

Mr Karl du Preez: 041 504 3644

SCHOOL OF THE BUILT ENVIRONMENT

Unit for the Study of Construction Processes (USCP)

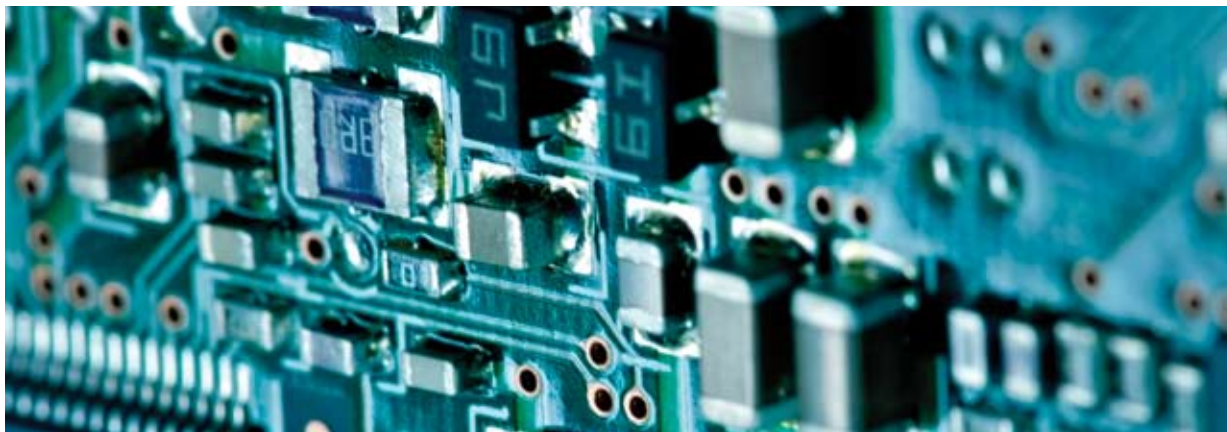
Prof John Smallwood: 041 504 2552

Unit for Building Research and Support

Mr Kobus Bekker: 041 504 3057



*Prof John Smallwood,
Faculty Researcher of the Year*



Highlights

- ▶ A R7.2 million Advanced Mechatronics Technology Centre (AMTC), a world class, state-of-the-art facility for undergraduate and postgraduate students was launched on 28 August 2007.
- ▶ The faculty successfully co-organised and hosted several conferences and seminars during 2007, including the Second Built Environment Conference, from 17 to 19 June 2007, the “Get Your Wheels Turning” seminar and the exhibition held at the South African Automotive Week during the first week of October 2007; and the Governance of ICT Risk and Information Security Conference (improving service delivery and sustainability in the public sector) (COGITRIS 2007), from 15 to 16 August 2007.
- ▶ Dr Hannalie Lombard was awarded her PhD by the University of Plymouth, United Kingdom, for her doctorate “Optimised Fatigue and Fracture of Friction Stir Welded Aluminium Plate”.
- ▶ Ms Darelle van Greunen was invited to be one of the keynote speakers at the third annual Intranet Conference, held from 26 - 29 November 2007 in Midrand, Johannesburg.
- ▶ Prof John Smallwood visited India during September 2007 as part of an NRF-funded research project, “The Health and Well-being of Older Workers in Construction”.
- ▶ The Technology Station (ACTS) was acknowledged by the Chief Executive Officer (CEO) of Tshumisano Trusts for its outstanding performance under the leadership of Prof Danie Hattingh. It became one of Tshumisano’s flagship technology stations and secured a further grant from the trust for the financial years of 2007 and 2008. In addition, ACTS, together with the ESRF and ILL in Grenoble (France), ran a series of residual stress scanning experiments by neutron and synchrotron scanning.
- ▶ Prof John Smallwood played an instrumental role in the launch of the first *Journal of Construction of the Association of Schools of Construction of Southern Africa*.
- ▶ The School of ICT initiated the signing of a Memorandum of Understanding (MOU) between NMMU and EADS Secure Networks from France in the field of radio communications systems.
- ▶ A number of visiting professors were part of the research activities of the faculty during 2007. They included academics from Michigan University, Reutlingen University, Ingolstadt University of Applied Science, Braunschweig-Wolfenbüttel University of Applied Science and the University of Plymouth.
- ▶ The VWSA-DAAD International Chair in Automotive Engineering initiated a number of graduate and postgraduate research projects that furthered industry-university collaboration.
- ▶ NMMU took the lead in establishing an advanced diffraction group for materials engineering with the launch of the Workshop on Materials Engineering Research and Advanced Diffraction Methods in Johannesburg on 23 – 24 August 2007.

External links

Faced with the current fast-changing, technologically-focused environment and the increasing demand for the commercialisation of research, the faculty took on a number of contract and other research projects for industry. Partnerships were established with industry to carry out joint research projects in collaboration with SAP Research, Eskom, PBMR, GMSA Foundation, VWSA and the CSIR.

We believe that co-operation with industry and other institutions is an important building block towards our research successes. We operate in close relationship with international universities and research institutes such as the universities of Michigan, Plymouth, Florida, Reutlingen, Sheffield, and Goethe, universities of applied sciences of Braunschweig-Wolfenbüttel, Ingolstadt, Hochschule Esslingen, and the European Synchrotron Radiation Facility (ESRF) and the Institute Laue-Langevin (ILL).

Researcher of the Year

Prof John Smallwood is head of the Department of Construction Management, programme director of the MSc (Built Environment) programme, and is director of the Unit for the Study of Construction Processes (USCP).

He is a fellow of the Chartered Institute of Building (CIOB) and a member of the Association of Construction Project Managers (ACPM), the Ergonomics Society of South Africa (ESSA), and the Institute of Safety Management (IoSM). As a registered professional construction manager he serves on the Council of the South African Council for the Project and Construction Management Professions (SACPCMP). He serves on several other professional bodies both in South Africa and overseas and is an NRF C-rated researcher.

His research focuses on health and safety, occupational health, ergonomics, primary promotion, HIV/Aids and health and wellbeing in construction. Prof Smallwood is also involved in a number of international research projects and made a notable contribution in policy development concerning the environment in which construction workers work.

He has an extensive publishing record including a chapter on health and safety for the *Royal Institute of British Architects (RIBA) Architect’s Handbook of Construction Project Management* in the capacity as principal co-author. He supervises and promotes a range of research at postgraduate level and is an active organiser and contributor of construction management seminars, workshops and conferences, both in South Africa and abroad.

Emerging Researcher of the Year

Johan van Niekerk's doctoral research focuses on the role humans play in information security processes. Currently he is working towards a holistic model to manage such a security culture on all levels, from policy making down to employee education. His research impacts directly on those he teaches and, he believes, has improved his ability to lecture.

Mr Van Niekerk believes writing up your own ideas and opinions for a publication is probably one of the purest forms of introspective and self-evaluation available. As a former non-academic employee of the institution, he has revised his opinion of formal research. "I now believe research is something that everyone at the university should be involved in."

Institute for Advanced Manufacturing and Engineering Research (IAMER)

Manufacturing Technology Research Centre (MTRC)

The centre completed research in the following areas:

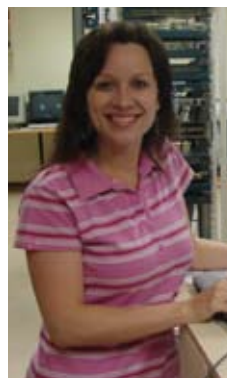
- Laser materials processing,
- Friction stir processing,
- Thermal systems and CFD modelling.

VWSA-DAAD International Chair in Automotive Engineering: current projects in collaboration with industry are in the field of manufacturing, knowledge management, air conditioning, engine control and intelligent vehicle design. In total, 36 students are involved in the various projects with six at master's level, three at doctoral level and one at post-doctoral level.

Automation and control. This project is being done in collaboration with VWSA and Reutlingen University, Germany. The Intelligent Maintenance Systems for Industrial Manufacturing research area has strong collaboration with the University of Michigan, USA. Two master's students successfully completed their projects in this field.

The institute made a number of research visits, collaborated with several universities and, as mentioned previously, undertook contract work for industry. Staff attended various conferences, presentations and workshops. The institute also welcomed a number of high-profile visitors including Dr Axel Steuwer, who acted as an international advisor to high-level material science projects and research.

Prof Igor Gorlach, who presented papers at conferences locally and overseas, established a joint research project with the University of Florida. This project is supported by the NRF under the Knowledge Interchange & Collaboration (KIC) programme.



Matric of the Year 1998 Kerry-Lynn Thompson is a great NMMU success story. She completed her tertiary studies at NMMU graduating with a DTech: Information Technology in 2008. During this ten-year study period Kerry has received many awards and bursaries; she has presented papers both nationally and internationally, published several articles and in 2007 qualified as one of only two people in Africa to become a Cisco Certified Networking Professional 'Trainer of Trainers'.



Mr Vuyo Mjali (centre) successfully completed his research project on Friction Stir Processing of Laser-Hybrid Welded Aluminium Joints to obtain his MTech in mechanical engineering in April 2007. His promoter was Dr Annelize Els-Botes and his co-promoter Prof Danie Hattingh.



NMMU conferred an honorary professorship upon University of Plymouth Pro Vice-Chancellor and Dean of the Faculty of Technology Prof Neil James (seated) in recognition of his significant contribution to the university's School of Engineering in the field of industrial failure analysis. Behind him are (from left) former NMMU Vice-Chancellor Dr Rolf Stumpf, Prof Danie Hattingh and Prof Henk de Jager.



TOP AWARD . . . Mechanical engineering master's student Louis von Wielligh was awarded the prestigious Rolls Royce Scholarship in April. The award is worth R50 000. Mr Von Wielligh was nominated by his promoter, Prof Danie Hattingh, and co-promoter, Dr Annelize Els-Botes.

Built Environment

UNIT FOR THE STUDY OF CONSTRUCTION PROCESS (USCP)

This unit renders community service, conducts research, and publishes and disseminates information in construction. In 2007 it published six peer-reviewed journal papers and 18 conference papers. These were presented at a range of international congresses and conferences on the subjects of the built environment, construction in developing countries, construction economics, construction management, cost engineering, ergonomics, facilities management, health and safety, housing and procurement.

The unit also co-organised the Second Built Environment Conference in June under the auspices of The Association of Schools of Construction of Southern Africa.

In terms of postgraduate study, the USCP produced one PhD and two MSc (Built Environment) students in 2007.

Information Technology

INSTITUTE FOR ICT ADVANCEMENT (IICTA)

The IICTA hosts the Centre for Information Security Studies (CISS) that focuses primarily on the faculty research theme of "Secure ICT Services". The niche area, business information risk and security, was approved by the Institutional Research Development Programme (IRDP) of the NRF in 2006. An NRF focus area project, Governance of IT Risk and Information Security, is also registered in the institute. Other research areas prominent in IICTA are usability studies, mobile technologies and health informatics.

During 2007, IICTA was prominent in the organisation of three conferences. Three peer-reviewed journal publications and a number of peer-reviewed conference papers, both international and national, stemmed from institute members. Twenty masters' and one doctoral student, who were active in IICTA research activities, graduated in 2007.

Highlights

- ▶ The completion of an IT governance and security project at Eden District Municipality. The successful outcome was an IT strategic objective plan to effectively govern and secure the IT systems of a local authority.
- ▶ The continuing collaboration on user interface design and usability evaluation with SAP Research headed by Ms Darelle van Greunen, which now leads all user-experience related research for SAP Research, Pretoria. It involves collaboration as well with the remaining 12 SAP research centres around the world, including Germany, China, India, USA and Russia. Ms Van Greunen will also lead a European Union-funded research project on ICT interoperability in emerging economies.
- ▶ The Africa Drive Project (ADP), an initiative that aims at structuring a blended learning approach using computers in the classroom.
- ▶ Prof Reinhardt Botha spent three months as visitor to the Chair of m-Business and multi-lateral security at Goethe University, Frankfurt, where he co-hosted a doctoral seminar.

Publications

ARTICLES IN DOE-ACCREDITED JOURNALS

BUYS, N.S. & TONONO, E. 2007. Reasons for the transformation of facilities management in the public sector. *ACTA Structilia* 14 (2), pp 76 - 90.

BUYS, N.S. & MAVASA, T. 2007. The management of government immovable assets. *ACTA Structilia* 14 (1), pp 81 - 92.

CRAFFORD, G.J. & SMALLWOOD, J.J. 2007. Client's views on quantity surveying competencies. *ACTA Structilia* 14 (1), pp 33 - 55.

ELS-BOTES, A. MC GRATH, P.J. & PIENAAR, H.J. Bending behaviour of laser-formed high strength low alloy (HSLA) steel sheet. *R & D Journal* 23 (1), pp 35 - 38.

FLOWERDAY, S. & VON SOLMS, R. 2007. What constitutes information integrity? *South African Journal of Information Management* 9 (4).

MANTHE, M. & SMALLWOOD, J.J. 2007. The appropriateness of built environment tertiary education: Perspectives of academics and postgraduate students. *Journal of Engineering Design and Technology* 5 (2), pp 102 - 119.

SMALLWOOD, J.J. & HAUPT, T.C. 2007. Impact of the construction regulations: Architects' perceptions. *Journal of Engineering Design and Technology* 5 (1), pp 23 - 34.

SMALLWOOD, J.J. & HAUPT, T.C. 2007. Construction Ergonomics: An Indian and South African comparison. *Ergonomics SA* 19 (1), pp 30 - 43.

THOMAS, G.D.A. & BOTHA, R.A. 2007. Secure mobile device use in healthcare: guidance from HIPAA and ISO 17799. *Information Systems Management* 24 (4), pp 333 - 342.

VAN NIEKERK, T.I., HUA, T. & HATTINGH, D.G. 2007. Experimental implementation of complex curvature friction stir welding. *R & D Journal* 23 (2), pp 5 - 17.

CONFERENCE PAPERS SUBMITTED TO THE DOE FOR SUBSIDY

ALLEN, C. & SMALLWOOD, J.J. Improving construction planning through 4D planning. *Proceedings of the second Built Environment conference: Port Elizabeth, South Africa*, 17 - 19 June 2007.

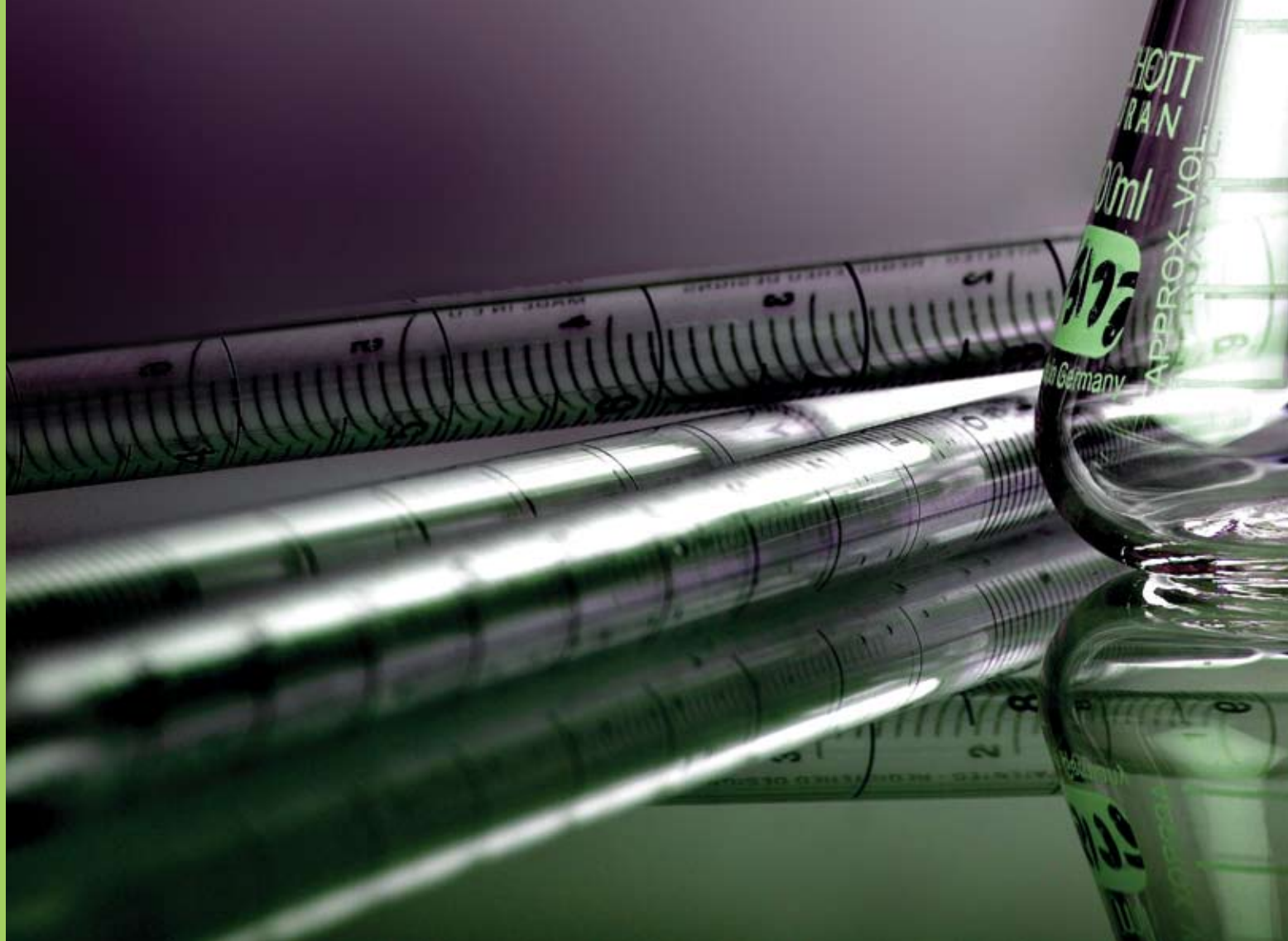
FUTCHER, L. & VON SOLMS, R. SecSDM: A model for integrating security into the software development life cycle. *Fifth World Conference on Information Security Education: New York, America*. 19 - 21 June 2007.

DASCHIEVICI, L., GHELAISE, D., GORLACH, I & SIMIONESCU, C. Mathematical modelling of thermal area in cutting process. *International conference on competitive manufacturing: Stellenbosch, Cape Town*, 31 January - 2 February 2007.

GORLACH, I.A. Modelling of thermal stresses in thermo abrasive blasting nozzles. *International conference on competitive manufacturing: Stellenbosch, Cape Town*, 31 January - 2 February 2007.

GORLACH, I.A., WESSEL, O. Case Study: Automation strategies at Volkswagen. *World Congress on Engineering 2007: London, UK*, 2 - 4 July 2007.

GOSS, R., BOTHA, M. & VON SOLMS, R. Utilising fuzzy logic and neutral networks for effective, preventative intrusion detection in a wireless environment. *SAICSIT 2007 Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists "Riding the wave of Technology": Fish River Sun, South Africa*, 2 - 3 October 2007.



The Faculty of Health Sciences prides itself on the inherent diversity of professional health training that it offers to its students. The faculty consists of six departments and trains professionals in:

- ▶ nursing science,
- ▶ pharmacy,
- ▶ human movement science and sports management,
- ▶ psychology,
- ▶ environmental health,
- ▶ social development professions,
- ▶ biomedical technology and
- ▶ radiography.

The varied range of training programmes offered also shapes the research undertakings in the faculty.

Two categories of research can be distinguished in the faculty. The one pertains to research that supports and enriches staff teaching in their relevant sub-disciplines. The other relates to areas where critical mass has been developed by individuals or groups of staff.

The current focal areas are career guidance, drug utilisation and cyclic dipeptide research. The researchers in these fields have received international recognition for their contributions and have attracted international funding. Other equally relevant research relates to HIV/Aids, diabetes, medicinal plants, health promotion and disease prevention, biokinetics, the treatment of chronic diseases, environmental health and the management of vulnerable groups.



*Prof Raj Naidoo, Dean:
Faculty of Health Sciences*



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



*Emerging Researcher of the Year,
Gareth Kilian*

Faculty of Health Sciences

Caring for tomorrow

The faculty collaborates with a variety of national and international partners to the benefit of its recruitment of prospective researchers and the enrichment of its research. The array of research activities undertaken in 2007 attests to the faculty's continued commitment to its mission of disseminating knowledge to help prevent and treat disease, and to promote the health and well-being of the community.

Staff with valid NRF ratings – December 2007

Faculty	A	B	C	P	Y	L	Total
Health Sciences	-	1	1	-	-	-	2

Research Entities

Cyclic Peptide Research Unit

Prof Pieter Milne: 041 504 2760

Drug Utilisation Research Unit

Prof Ilse Truter: 041 504 2131



*Researcher of the Year,
Prof Ilse Truter*

Research successes

CAREER DEVELOPMENT OF SOUTH AFRICAN CHILDREN

One of the research success stories to have developed over the last decade in the Department of Psychology is Professor Mark Watson's research on the career development of South African children. This project has taken several paths, one of which has been the longitudinal research of children's career aspirations and occupational gender stereotypes. Initiated in 1998 when the children were in pre-primary school, the 39 children from Nelson Mandela Bay are now in grade 10 and will be invited to take part again for the eleventh time.

Results from this research indicate that most children consistently aspire over time to careers that are people-focused. They aspire to careers that are of a high status in terms of professional stature and length of training required at a tertiary level. Gender stereotyping of careers tends to decrease over time.

Another path that this research project has taken is the exploration of rural and disadvantaged children's career aspirations. This dimension of the project has resulted in international collaboration with an Australian academic and the opportunity to explore and compare rural children's career development in the two countries. The latest results of this study for rural, Xhosa-speaking children indicate that they aspire to people-related careers and to careers of a more scientific, analytical nature. They also aspire almost exclusively to high status occupations. The findings to date indicate that these children limit the range of careers which they believe a particular gender can do.

CYCLIC PEPTIDE RESEARCH UNIT (CPRU)

Researching the chemical, biological and pharmaceutical properties of cyclic peptides and medicinal plants is an endeavour to improve human life.

The positive impact of the unit can be gauged by the fact that 23 postgraduates successfully obtained their degrees (18 MScs and five PhDs), while seven of the master's students received their degree *cum laude* and three the Billiton Award for the best master's degree by dissertation. Two of the master's students were awarded the Young Scientist of the Year award for their podium presentation at the annual conference of the Academy of Pharmaceutical Sciences of South Africa. Some are now working as academics at the Griffith University in Australia and at Wits University, while others have entered the pharmaceutical industry where they, too, contribute to the improvement of human life.

In 2007 the unit continued its research with various national researchers in South Africa and its collaboration and student exchange programme with the University of Göteborg in Sweden.

DRUG UTILISATION RESEARCH UNIT (DURU)

The World Health Organisation defines drug utilisation research as research into the marketing, distribution, prescription and use of medicine in a society with special emphasis on the resulting medical, social and economic consequences. It is a multi-disciplinary research area. The unit is headed by a woman with expertise in both business management and pharmacy, Prof Ilse Truter.

In just over 14 years, DURU has produced 33 refereed research articles, over 200 local and international conference presentations and has successfully supervised 12 masters' students, two doctorates and 21 honours levels treatises.

Most of the current projects focus on central nervous system disorders such as anxiety and depression, attention-deficit hyperactivity disorder

and pain management, and the management aspects related to medicine prescribing and use in general. Although research is mainly academically focused, studies are practically orientated and the results are passed on to industry and the community.

Faculty Researcher of the Year

Prof Ilse Truter (who has seven degrees including a doctorate in pharmacoepidemiology, the science that assists us in understanding how and why people use medicines), focuses her research mainly on central nervous system medicine and/or conditions, for example, the prescribing and usage patterns of antidepressants, anxiolytics, antipsychotics and medicine used for Attention Deficit/Hyperactivity Disorder (ADHD). It is not only important that the right medicine be prescribed; it must also be prescribed and used in the correct dosage and be available at an affordable cost to the patient. Several studies have been conducted in which dosages were investigated and compared in different patient populations, for example, in the elderly or in children. Research is also conducted into the use, and reasons for use, of painkillers. Differences in medicine use between females and males are also being examined.

Emerging Researcher of the Year

Gareth Kilian's research focuses on liposome encapsulated dipeptides. From his investigation he hopes to develop a model liposome system for inclusion of selected cyclic dipeptides (CDP) using a multifactorial approach, and to test the CDP-liposomes for biological activity which will include anticancer, antibacterial and ion-channel activity. The results will be compared with un-encapsulated CDP activity to determine if the encapsulation process enhances activity.

Highlights

- ▶ Prof Ilse Truter presented papers at the Pharmaceutical Sciences World Congress (PSWC 2007), 3rd World Congress of the Board of Pharmaceutical Sciences of FIP, and the RAI Congress Centre, in Amsterdam, in April 2007. She was selected to serve on the International Advisory Board of the new *Jordan Journal of Pharmaceutical Sciences* (JJPS). Prof Truter was also elected chairman of the Cape Midlands Branch of the Pharmaceutical Society of South Africa and was selected for the Advanced Health Management Programme, an internationally co-certified short course management development programme offered by the Foundation for Professional Development in association with the Department of Epidemiology and Public Health of Yale University.
- ▶ Prof Mark Watson became an invited member of the International Editorial Advisory Panel for the *British Journal of Guidance and Counselling*. He was invited to serve as an international discussant at the International Association of Vocational and Educational Guidance international conference in Padua, Northern Italy, in September. Prof Watson was also placed in the B3 category of the NRF Evaluation and Rating system.
- ▶ Prof Rosa du Randt was elected to the SRSA Sport Research Commission (SRC). She was also elected to the executive committee of the newly formed South African Association for Human Movement Sciences (SAAHMS), which was officially constituted on 14 June 2007, and she will chair this association's research committee.
- ▶ Prof Pieter Milne was elected chairman of the Heads of Schools meeting held on 28 June 2007. He was also co-opted to serve on the Education Committee of the Pharmacy Council.
- ▶ Prof Ilse Truter, Prof Juanita Strumpher and Prof Rosa du Randt attended the 5th Annual IRENSA Research Ethics Seminar at The Colleges of Medicine of South Africa in Rondebosch, Cape Town, on 13 and 14 August 2007.

Publications

ARTICLES IN DOE-ACCREDITED JOURNALS

JORDAAN, I., SPANGENBERG, J.J., WATSON, M.B. & FOUCHÉ, J.P. 2007. Burnout and its correlates in South African clinical and counselling psychologists. *ACTA Academia* 39 (1), pp 176 - 201.

JORDAAN, I., SPANGENBERG, J.J., WATSON, M.B. & FOUCHÉ, J.P. 2007. Emotional stress and coping strategies in South African clinical and counselling psychologists. *South African Journal of Psychology* 37 (4), pp 835 - 855.

KATENDE-KYENDA, N.L., LUBBE, M.S., SERFONTEIN, J.H.P. & TRUTER, I. 2007. Antimicrobial prescribing patterns in a group of private primary health care clinics in South Africa. *Health SA* 12 (1), pp 21 - 29.

KAIRUZ, T.E. & TRUTER, I. 2007. A descriptive study of anxiolytic and hypnotic prescribing according to age and sex. *International Journal of Pharmacy Practice* 15 (4), pp 301 - 306.

MASHOLOGU-KUSE, T.T. 2007. Families of street children in the Transkei – a developmental perspective. *Social Work* 43 (1), pp 61 - 71.

PRETORIUS, B.M.L., TERBLANCHE, S.S. & TSHIWULA, J.L. 2007. Perceptions of relationship violence: a youth perspective. *Social Work* 43 (2), pp 117 - 138.

RICHARDS, D.A., BRADSHAW, T.J., MAIRS, H., RICKS, E., STRUMPHER, J., WILLIAMS, N. & RICHARDSON, R. 2007. Can community volunteers work to trace patients defaulting from scheduled psychiatric clinic appointments? *South African Medical Journal* 97 (10), pp 946 - 948.

WATSON, M.B., MCMAHON, M. 2007. School and work: Connections made by South African and Australian primary school children. *South African Journal of Education* 27 (4), pp 565 - 577.

CHAPTER IN A BOOK SUBMITTED TO THE DOE FOR SUBSIDY

WATSON, M.B. 2007. Postmodern career counselling and beyond in: K. MAREE (Ed). *Shaping the story*. Van Schaik: Pretoria.





The Faculty of Law enjoyed another successful, productive year in 2007, producing and participating in research of exceptional quality. The work covers a range of disciplines, from legal theory to applied law, in line with the institutional focus of promoting justice in our province the Eastern Cape, in South Africa, and even beyond into other developing countries.

Staff with valid NRF ratings – December 2007

Faculty	A	B	C	P	Y	L	Total
Law	-	-	2	-	2	-	4



*Prof Henk Delpont, Acting Dean:
Faculty of Law*



*Prof Elmarie Knoetze, Chairperson:
Faculty RTI Committee*

Faculty of Law

Defining tomorrow

Research Entities

Institute for Sustainable Government and Development (ISGAD)

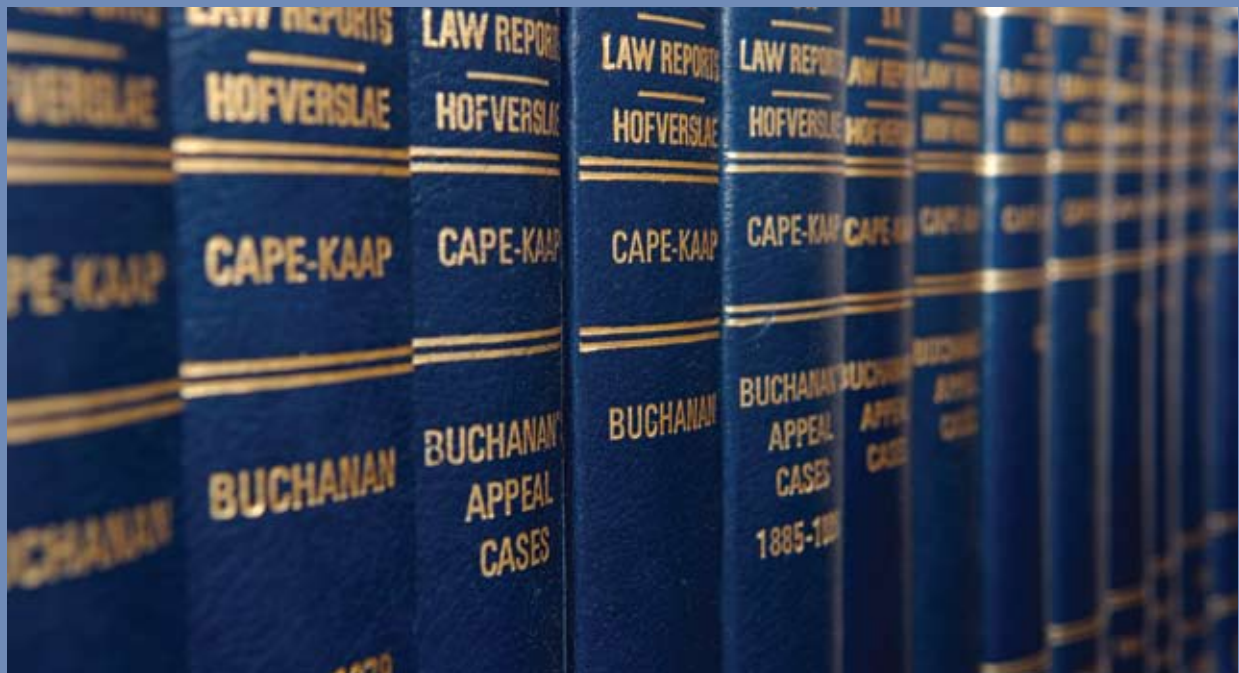
Prof Hennie van As: 041 504 1200

Labour and Social Security Unit (LSSLU)

Prof Adriaan van der Walt: 041 504 2199



*Researcher of the Year:
Prof Narnia Bohler-Muller*



Highlights

- ▶ Three staff members received NRF rating status during 2007. Prof PJ Badenhorst was rated a C2 researcher, Prof Patrick Vrancken a C3 researcher and Prof Elmarie Knoetze a Y2 researcher.
- ▶ During 2007 the faculty maintained its prolific publishing record. Of significance is the increased publication in foreign journals. Staff were involved in the publication of books and/or the revision of chapters in works previously published. Special mention should be made of the sustained contributions by professors Henk Delpont (Property and Estate Agency Law) and Pieter Badenhorst (Property Law and Petroleum and Mineral Law).
- ▶ Several staff embarked upon collaborative research projects as envisaged in the NMMU research strategy, for example:
 - Dr Deon Erasmus is engaged in a joint research project on “vulnerable witnesses” with the Law Commission of Mauritius.
 - Dr Avinash Govindjee is scientific project co-ordinator and co-author of an International Labour Organisation (ILO) supported project on “Developing a Conceptual and Normative Framework for Micro-health Insurance as a Social Security Instrument in India”.
 - Prof Patrick Vrancken is a member of the Committee of the International Law Association on the “Outer edge of the continental shelf”.
- ▶ Under the editorship of Prof Adriaan van der Walt, the accredited law journal *Obiter* published peer-reviewed research articles. Eight articles were written by NMMU faculty staff members, 30 by academics at other universities, one by an international author and four by non-university authors, including ex-students who now practise law.
- ▶ For the third year in succession, in collaboration with the Faculty of Law of the University of the Western Cape, the faculty hosted the annual Law Conference of the Universities of the Western and Eastern Cape. This was the fourth such conference. Several staff also participated in other international, national, regional and local conferences.

- ▶ The faculty maintained its strong research links with the legal profession through, for example, the work of Prof Henk Delpont as author of the rubric “Recent Articles and Research” in the attorneys’ journal *De Rebus* (six issues), and as the general editor of the *Commercial Law Bulletin* (six issues).
- ▶ Mr Eugene van der Berg continued his sustained contribution towards legal commentary to the legislature on the Firearms Control Act 60 of 2000.
- ▶ Prof Patrick Vrancken’s “Input on clauses 1 and 4(1) of the National Environmental Management Integrated Coastal Management Bill” March 2007, resulted in an amendment of clause 4(1).

Labour and Social Security Law Unit (LSSLU)

The LSSLU is a self-funding training and research body. Under the leadership of Prof Adriaan van der Walt it continues to successfully present the Practical Labour Law Programme and to develop labour law capacity in the Eastern Cape. Several students on the programme qualified and are proceeding with an LLM in Labour Law.

The unit carried out contract research in collaboration with a leading Johannesburg firm of attorneys following the public sector strike. It also developed international links with the National Law School of India University in Bangalore and the Labour Relations Commission in Mauritius following research visits by Dr Avinash Govindjee to India and Prof Van der Walt to Mauritius.

Publications

ARTICLES IN DOE ACCREDITED JOURNALS

BADENHORST, P.J. & PIENAAR, J.M. 2007. Accession of lots: Accessio per Artes Magicas? *Obiter* 28 (2), pp 380 - 386.

BADENHORST, P.J. & MOSTERT, H. 2007. Ambit of mineral rights: Paving the way for new order disputes. *Journal of SA Law* 2 (2), pp 409 - 422.

BADENHORST, P.J. & MOSTERT, H. 2007. A 3 (1) (2) Mineral and Petroleum Resources Development Act van 2002: 'n herbeskouing. *Journal of SA Law* 3 (3), pp 469 – 493.

BOHLER-MULLER, N. 2007. Some thoughts on the Ubuntu Jurisprudence of the Constitutional Court. *Obiter* 28 (3), pp 590 - 599.

BOHLER-MULLER, N. 2007. On desire, transcendence and sacrifice. *Law and Critique* 18, pp 253 - 274.

BOHLER-MULLER, N. 2007. Judicial deference and the deferral of justice in regard to same sex marriages and in public consultation. *De Jure* 40 (1), pp 90 - 112.

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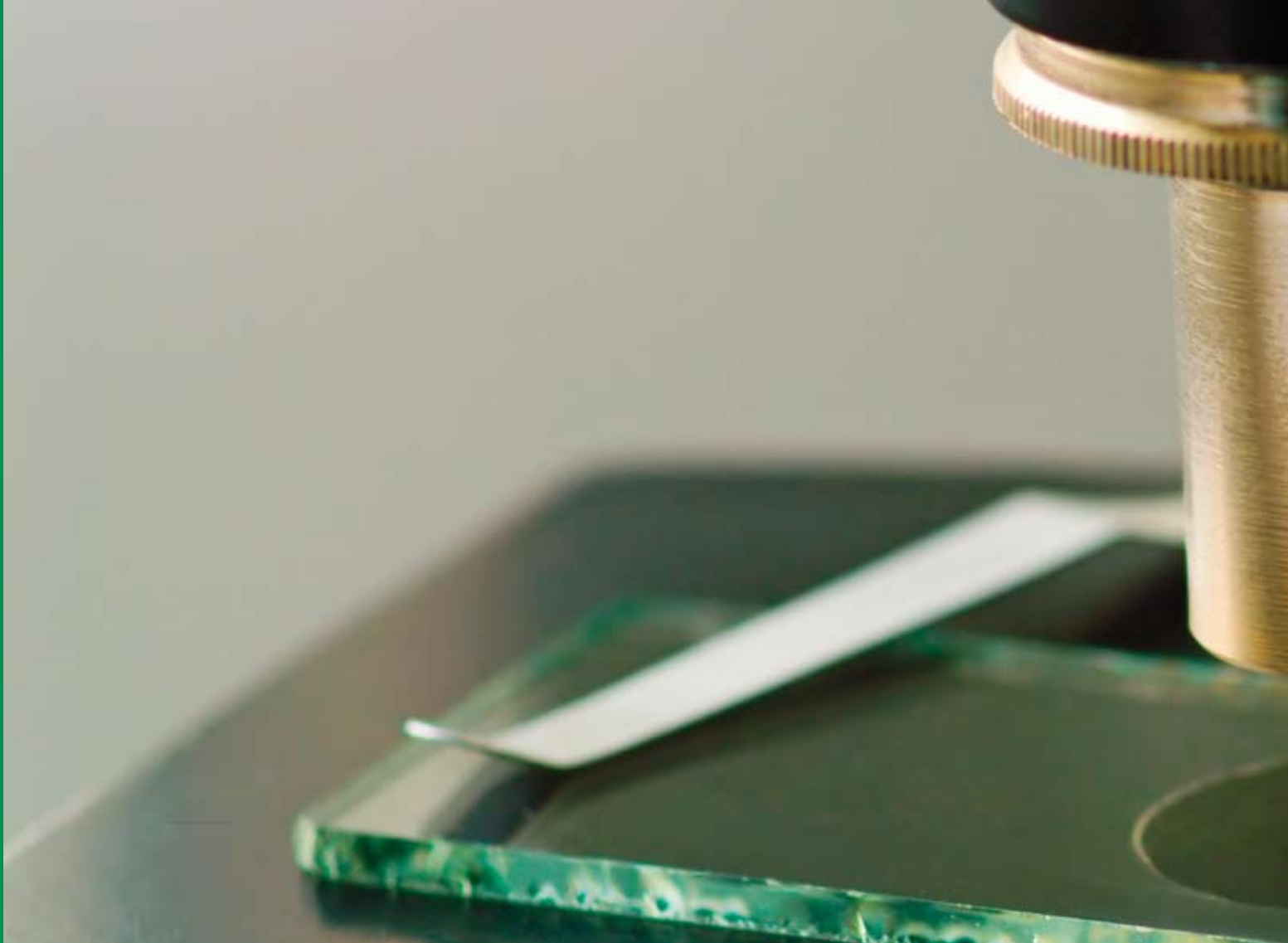
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The faculty has committed itself to increase its research capacity in response to the many new research opportunities opening up for us. At present just over half our academic staff have doctorates; we plan to increase this number over the next few years. This in turn will enable us to increase the number of postgraduate students registered for masters' and doctoral degrees in the Science Faculty. Part of our growth strategy will also include increasing our research links with foreign institutions, both in Africa and further abroad.

Three events stand out as research highlights for the Science Faculty in 2007:

- ▶ Prof JR Botha (Physics) was awarded a SARChI Research Chair in nanophotonics.
- ▶ The Society for Conservation Biology's annual conference, organised by members of faculty and attended by more than 1600 delegates from across the world, was a resounding success and brought much credit to NMMU, according to the many reports received.
- ▶ The Institute for Chemical Technology, InnoVenton, launched the Kilo-Lab laboratory for testing chemical processes. This is a unique facility at an academic institution and an asset for NMMU.



Prof Andrew Leitch, Dean: Faculty of Science and Chairman: Faculty RTI Committee



Ms Sharlene Govender, Emerging Researcher of the Year

Staff with valid NRF ratings – December 2007

Faculty	A	B	C	P	Y	L	Total
Science	1	3	19	-	2	4	29

Faculty of Science

Discovering tomorrow

Research Entities

Institutes for Chemical Technology and Downstream Chemical Technology Station, and InnoVenton

Prof Ben Zeelie: 041 504 3281

Centres

Telkom Centre of Excellence

Prof Janet Wesson: 041 504 2087

Centre for African Conservation Ecology

Prof Graham Kerley: 041 504 2316

Centre for Energy Research

Prof Ernest van Dyk: 041 504 2259

Units

Research Unit for Platinum Group Chemistry

Prof Jan du Preez: 041 504 2286

Integrated Environmental and Coastal Management (IEMC)

Dr Derek du Preez: 041 504 2721



Prof Graham Kerley, Researcher of the Year (see page 4)



Research niche areas

The faculty defined its research niche areas for the coming years:

- ▶ Energy for the future;
- ▶ Environmental and natural resource management and utilisation;
- ▶ Novel materials, products and processes;
- ▶ Science education for a changing world;
- ▶ Next generation IT solutions.

Emerging Researcher of the year

Ms Sharlene Govender (Biochemistry and Microbiology) was the Emerging Researcher of the Year for the Science Faculty. Her research, which forms part of her doctoral studies, is in medical microbiology and epidemiology.

Highlights

ENERGY FOR THE FUTURE

The establishment of the Centre for Energy Research in October 2006 was fortuitous considering the serious energy-related issues facing the country today. After its first full year of operation, the centre has already earned itself considerable respect both in the Eastern Cape and further afield. With a focus on renewable energy, this multi-disciplinary centre under the direction of Prof Ernest van Dyk has established itself as the leading research centre for photovoltaic module research in South Africa.

Expertise in solar thermal (hot water) systems underpinned the centre's project to install solar thermal systems in some of the university's residences in 2007, so reducing NMMU's dependence on Eskom for energy. Many postgraduate students have incorporated these activities into their master's and doctoral degrees, which are now extremely relevant, and generous funding from both government and the private sector has been obtained.

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT AND UTILISATIONS

- ▶ The faculty's environmental scientists, led by Prof Graham Kerley, hosted the international Society for Conservation Biology's annual conference for five days in July. The conference attracted 1600 academics and guests from across the world and placed NMMU on the international map in terms of conservation biology. The prestigious journal *Nature* gave the conference significant exposure in an editorial and in its general news columns.
- ▶ NMMU Researcher of the Year Prof Graham Kerley (Zoology) was a finalist in the Nelson Mandela Bay Citizen of the Year awards for his conservation initiatives in the region.
- ▶ NRF A-rated researcher Prof Richard Cowling (Botany) continued to produce excellent work and make an international impact as an authority on the Eastern Cape's subtropical thicket biome.
- ▶ Work by Prof Tris Wooldridge (Zoology), Prof Janine Adams (Botany) and Dr Phumelela Gama (Botany) and their students attracted the attention of the Department of Water Affairs and Forestry, leading to the signing of a Memorandum of Understanding for joint research collaboration.
- ▶ Projects of Prof Eileen Campbell, Dr Derek du Preez and others from Botany and their students included the study of the potential use of algae from the region.
- ▶ The Centre for African Conservation Ecology (ACE) continued its research in various terrestrial projects in the Eastern Cape, with many students playing an important role.
- ▶ In the field of geosciences, Prof Vincent Kakembo was awarded a SANPAD grant for a three-year developmental project with partners in Holland. Prof Peter Booth was invited to an international workshop in Argentina on Gondwanaland and the Cape Fold Belt mountain range.

- ▶ NMMU signed a memorandum of understanding with the Mantis Collection, the owners of Shamwari and other private game lodges, to work together in identified fields of conservation. This strategic partnership is working well and is an example of a successful link between NMMU and one of our regional stakeholders.
- ▶ Dr Nomakwezi Mzilikazi (Zoology) returned after a successful 12-month sabbatical as a Humboldt Fellow at Philipps Marburg University in Germany. NMMU is funding the purchase of specialised animal respiratory equipment for her to continue the research programme she initiated in Germany.
- ▶ The Research Diving Group, managed by Dr Ronel Nel with support from Dr Deo Winter (Zoology), continues its research on the marine protected area off Sardinia Bay, in collaboration with colleagues from Bayworld.
- ▶ We are proud that two of our academics, Prof Richard Cowling (Botany) and Mr Andries Brönn (Agriculture and Game Ranch Management) were each involved in collaborative research projects, the results of which were published in two papers that appeared in the journal *Nature* during 2007.
- ▶ Prof Dan Baird, one of our leading researchers and a professor of Zoology, retired at end of 2007 after many years of service to the institution. We are fortunate that he will maintain his research links to the faculty as a Research Associate and Emeritus Professor.

NOVEL MATERIALS, PRODUCTS AND PROCESSES

- ▶ The award of the SARChI research Chair to Prof Reinhardt (JR) Botha (Physics) in September 2007 will boost the faculty's research activities in the fields of novel materials. Funded by the Department of Science and Technology, the research Chair in nanophotonics will enable Prof Botha and his students to research semi-conducting epitaxial layers of nanometer dimensions for photonic applications, such as lasers and detectors.
- ▶ The NRF awarded NMMU with R5m for a metalorganic vapour phase epitaxy (MOVPE) reactor. Prof Botha and his team are the only researchers in South Africa with this expertise, having been involved since the mid-1980s when the original MOVPE reactor was purchased for the Physics Department. Since then more than 35 master's and doctoral students have completed their respective degrees based on the growth or analysis of MOVPE grown semi-conducting structures.
- ▶ Prof JH Neethling (Physics) and his team successfully completed 15 months of research (worth R8.4 million) for the Pebble Bed Modular Reactor (PBMR) Company. The project entailed analysing the quality of the thin silicon carbide (SiC) coating protecting the nuclear fuel pebbles to be used in the next generation of nuclear reactors for South Africa. The university has signed an enabling agreement with the company for the next phase of the research. This entails acquiring a high-resolution transmission electron microscope (TEM) at a cost of several million rands. It would be the only one in South Africa and NMMU is seeking financial support for its acquisition.
- ▶ A major success for our chemical technology research institute, InnoVenton, was the launch of the Kilo-Lab facility in 2007. The only one at an academic institution in South Africa, the Kilo-Lab tests the processes of various formulations being researched. With generous funding from the Tshumisano Trust, InnoVenton continued to train many postgraduate students in 2007 and provides a facility to hundreds of local and regional companies for chemical analyses and other analytical services.
- ▶ The research output of Prof Tommy Gerber and his students in the Chemistry Department remains consistently high in respected international scientific journals. Of note is Prof Gerber's research into elements such as technetium.
- ▶ Dr Saartjie Roux (Biochemistry and Microbiology) and colleagues are making headway and increasing their expertise in the diabetes research group. Currently they are studying the effects and efficacy of the indigenous *Sutherlandia frutescence* plant in the treatment of the disease. The project has the financial support of a local company (Value Added Life).

We were saddened by the death of Prof Chris Imrie (Chemistry) who died after a short illness in November 2007. Prof Imrie was a leader in the field of 'green chemistry', in which industrial processes are evaluated and optimised in terms of their effect on the environment. He led an active research group with successful students. His passing leaves a significant gap in the Chemistry Department.

SCIENCE EDUCATION FOR A CHANGING WORLD

- ▶ About 200 grade 12 learners meet every Saturday morning for 21 weeks in the year to improve their maths and science skills under the auspices of the Govan Mbeki Sasol Maths Development Programme run by Dr Hennie Boshoff. This is also run as a research project with several Maths researchers involved.
- ▶ Within the Department of Computer Science and Information Systems, Prof Charmain Cilliers has initiated a research group concentrating on computer science education. They will examine new ways to teach this important discipline to our students.

NEXT GENERATION ICT SOLUTIONS

- ▶ The Telkom-sponsored Centre of Excellence, directed by Prof Janet Wesson, has two primary areas of research: distributed multimedia applications and optical fibre characterisation. Human Computer Interaction (HCI) is one of the emerging research themes gaining attention internationally and is addressed in the Distributed Multimedia Research Unit. Prof Wesson is South Africa's national representative on the IFIP TC13 committee of the international HCI fraternity.
- ▶ The Optical Fibre Characterisation Unit (headed by Prof Andrew Leitch) received funding from the African Laser Centre (ALC) to host the first Workshop on Optical Fibre Technologies for postgraduate students from across Africa. The research activities of the Telkom Centre of Excellence continue to attract to NMMU students from Africa and the rest of the world for postgraduate studies.



Publications

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The George Campus is situated in the Southern Cape at the heart of the Garden Route, about 300km west of Port Elizabeth. The activities of the campus focus predominately on natural resource management. Apart from tourism, several major South African industries such as forestry, agriculture, game ranching and nature conservation also prosper, giving scholars a natural interface between economics and the environment.

"Sustainable resource management is a niche research area for us. This broad focus area is so critical for our world today," says the campus's new principal Prof Christo Fabricius.

It's a research area that provides national and international postgraduates with a diverse ecological environment that ranges from a semi-desert terrain to the watery climes of the adjacent coastline, all within an hour's drive of the campus. This outdoor laboratory takes in the Great Karoo, the Little Karoo, forest plantations, indigenous forest, unique fynbos and a coastline that is being rapidly developed.



*Prof Christo Fabricius,
George Campus Principal*



*Dr Glen Taylor, Chairman:
Faculty RTI Committee*



*Mr Willie Louw, Emerging Faculty
Researcher of the Year*

George Campus

Growing tomorrow



Research events

- ▶ The campus hosted the 35th International Forestry Students' Symposium, South Africa.
- ▶ NMMU in partnership with Forestry Solutions, hosted a conference on forest engineering.
- ▶ "Saasveld 75" commemorated 75 years of existence of the Saasveld Campus, now called George Campus, and this took centre stage in 2007. The symposium focused on the "big three" of sustainable natural resource management – environment, economy and social development. A number of articles from presenters emanating from the event were published.
- ▶ New George Campus principal Prof Christo Fabricius and former Rhodes University student Nigel Chalmers were awarded Ecology and Society's Ralf Yorke Memorial Prize for the most innovative paper in 2007, for their article "Expert and Generalist Local Knowledge about Land-cover Change on South Africa's Wild Coast: Can Local Ecological Knowledge Add Value to Science?" that appeared in *Ecology and Society* 12 (1): 10.



*Ms Maryna Lehmann-Maritz,
Faculty Researcher of the Year*

Research activities

COST AND REWARD IN TEAM ASSIGNMENTS

Tertiary institutions worldwide have included distributed collaborative learning assignments in a variety of programmes with the aim of teaching students virtual team skills. However, the management and execution of these assignments have proved difficult and unsatisfactory. Case studies have shown that success or failure is highly related to the student's perception of the cost of participation compared to the rewards. Joke van Niekerk's research addressed cost and reward as motivating factors in such assignments and is a case study in how data are generated, using action research, and then used in a traditional grounded theory study.

CAPE ELAND

This research by Stefan Hattingh focused on spekboom (*Portulacaria afra*) and ouman saltbush (*Atriplex nummularia*) as an alternative food source to lucerne (*Medicago sativa*) for Cape eland (*Taurotragus oryx*) in an intensive production system. The eland's placid nature, its high reproductive rate and the fact that eland fatten easily have made it the subject of many studies into its feasibility for domestication. Eland are better adapted to hot, semi-arid environments than domesticated herbivores and feed on a wide range of plant species that are potentially poisonous to cattle. Spekboom occurs naturally in the Oudtshoorn district of the Karoo and is an important food source for many browsing game species in the Eastern Cape. It is also the preferred browse species for domestic goats. Ouman saltbush has been cultivated successfully in the area as a supplement feed for the ostrich industry and is recommended as a supplement feed for sheep in arid areas.

ZEBRA

The focus of this research by Dr Laurence Watson was the management of Cape mountain zebra in Western Cape Nature Reserves. It was done in collaboration with Cape Nature.

KLIPSPRINGER

In collaboration with the Table Mountain Fund and the South African National Parks Board, MTech student E. Marell and Dr Laurence Watson investigated the management of reintroduced klipspringer in Table Mountain National Park.

RUSA DEER

This research by MTech student G Roques-Rogery and Dr Laurence Watson looked at the management of introduced rusa deer in New Caledonia, in collaboration with the French Agricultural Research Centre for International Development (CIRAD), New Caledonia.

ASSEGAIBOS CATCHMENTS

A cost benefit analysis of land restoration by several staff members and MTech student A B Currie in the Assegaaibos catchments was investigated in terms of water yield and tourism benefit.

Other research examined the impact of extra-limitable game on mosaic thicket (Dr Laurence Watson and A G Schmidt) and bio-energy usage and development in natural resource management (Dr Glen Taylor).

Researcher of the Year

The research of Ms Maryna Lehmann-Maritz (Agricultural Management) focuses on dairy cow nutrition in pasture-based production systems of the Southern Cape. The objective of the research is to assist the farmer sustain a competitive advantage that is central to the long-term viability of the industry in this region. Proper nutritional management is vital for remaining competitive in the dairy industry. Her research is not only of academic value but assists the sustainability of dairy farmers, their farm workers and family.

Ms Lehmann-Maritz believes that creating knowledge through research is vital in order to invest in the future of generations to come. With this in mind, Ms Lehmann-Maritz is set on starting her PhD and will continue her work with young agricultural researchers who have the ability to change the future of the South African agricultural industry.

Emerging Researcher of the Year

Mr Willie Louw's expertise is related to the forestry industry. The publication of several articles regarding processes for the selection of contractors servicing the forestry industry, together with his contribution as a supervisor to many postgraduates makes him the 2007 category winner.

Publications

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Publications

ARTICLES IN DOE-ACCREDITED JOURNALS

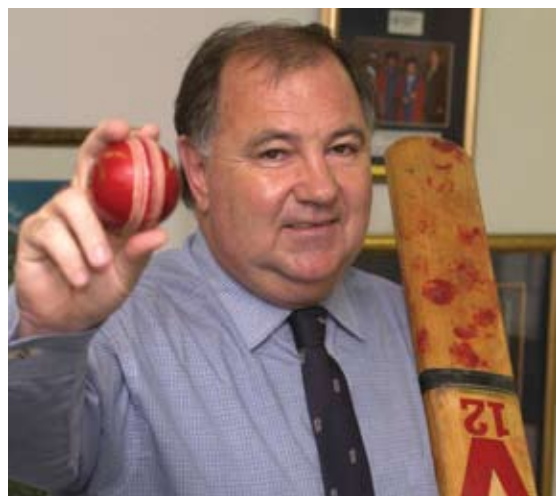
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Dr Richard Stretch, Researcher of the Year, Support Services



Dr Jill von der Marwitz and student assistant Lucia Mtshake, both from the HIV/AIDS Unit, during a recent visit to the Empilweni Hospital in Port Elizabeth.





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